START

Title: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

Volume: 1204

Issues: 3-4
PATENT: 5,687,420 - 5,692,233

Date: NOVEMBER 18 - NOVEMBER 25 1997

UMI Number: 10426.00

Note:

REEL NO: 15

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

VOL
1204

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U.S.
DEPARTMENT
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Patent
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Office

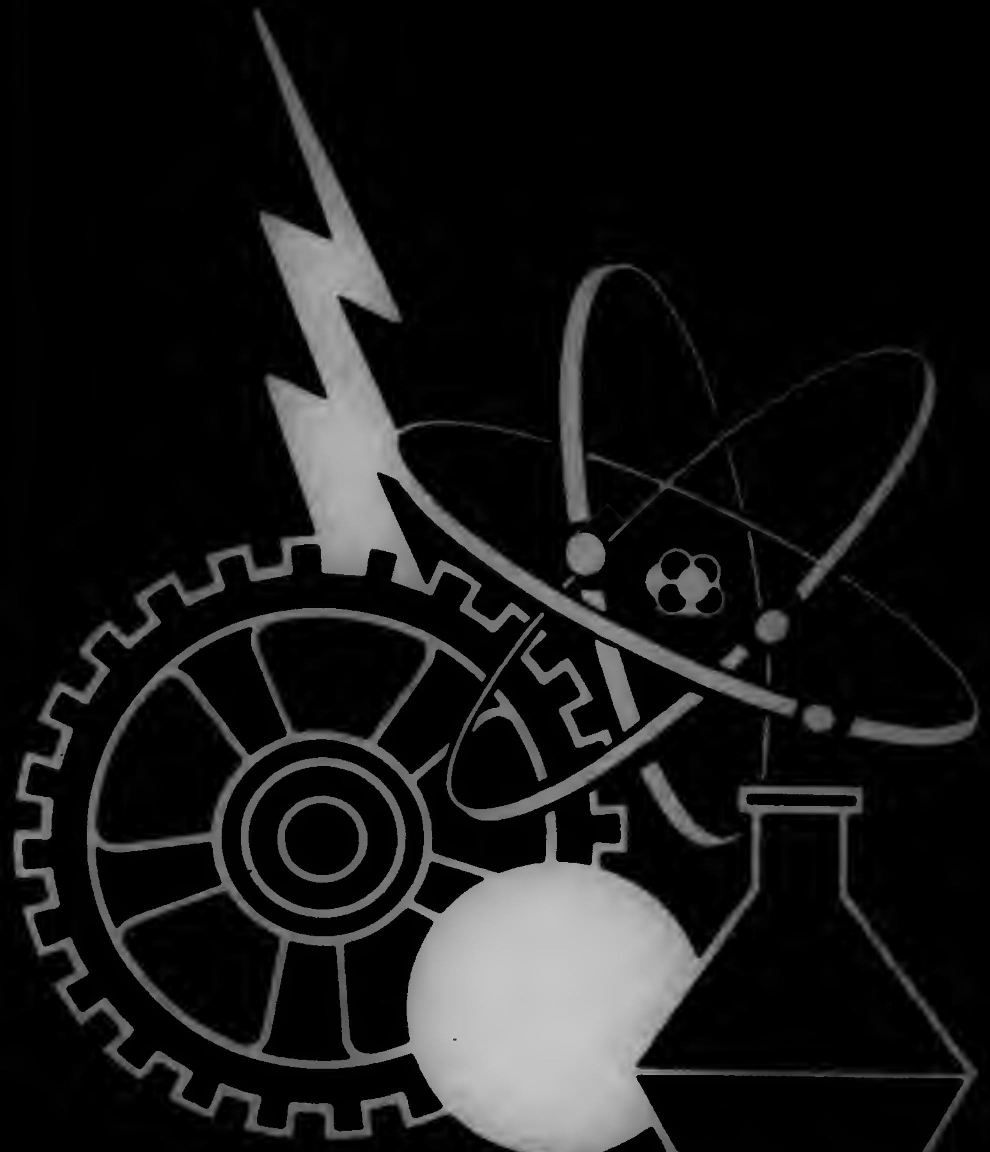
Vol. 1204 Number 3

OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 18, 1997



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1200 O.G. 98, on July 29, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was decreased, effective October 1, 1997, and was announced in the *Official Gazette* at 1202 O.G. 47, on September 16, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1997, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1180.00
International fees	
Basic fee	530.00
Basic supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	128.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	128.00
— Confirmation fee	64.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	49.00	98.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	360.00	720.00
USPTO was ISA but not IPEA	395.00	790.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	535.00	1070.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	465.00	930.00
Other National fees		
— For each independent claim in excess of 3	41.00	82.00
— For each claim in excess of 20.	11.00	22.00
— For each application containing a multiple dependent claim	135.00	270.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 9, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 15, 1994 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,363,508 through 5,365,606
Reissue Patents based on the above identified patents.

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Attention is drawn to the patents which were issued on November 13, 1990 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,969,213 through 4,970,727
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 11, 1986 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,621,377 through 4,622,695
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g). as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $525.00
By other than a small entity $1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,050.00
By other than a small entity $2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,580.00
By other than a small entity $3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $700.00
(2) unintentional $1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED September 10, 1997 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,677	06/848,607	05/24/88
(4,540,720)	(06/401,472)	(09/10/85)
Re. 32,969	07/116,579	06/27/89
(4,540,568)	(06/625,249)	(09/10/85)
4,539,722	06/485,941	09/10/85
4,539,731	06/489,521	09/10/85
4,539,733	06/537,806	09/10/85
4,539,735	06/556,897	09/10/85
4,539,738	06/414,197	09/10/85
4,539,740	06/556,982	09/10/85
4,539,756	06/612,346	09/10/85
4,539,760	06/541,026	09/10/85
4,539,763	06/563,042	09/10/85
4,539,780	06/555,967	09/10/85
4,539,782	06/599,652	09/10/85
4,539,783	06/530,950	09/10/85
4,539,787	06/442,149	09/10/85
4,539,803	06/515,633	09/10/85
4,539,815	06/687,818	09/10/85
4,539,820	06/610,159	09/10/85
4,539,821	06/682,500	09/10/85
4,539,824	06/658,628	09/10/85
4,539,828	06/361,963	09/10/85
4,539,832	06/533,360	09/10/85
4,539,834	06/580,269	09/10/85
4,539,835	06/589,902	09/10/85
4,539,836	06/516,872	09/10/85
4,539,841	06/579,724	09/10/85
4,539,848	06/634,478	09/10/85
4,539,854	06/541,511	09/10/85
4,539,858	06/350,391	09/10/85
4,539,859	06/421,436	09/10/85
4,539,862	06/327,382	09/10/85
4,539,867	06/548,138	09/10/85
4,539,872	06/444,178	09/10/85
4,539,891	06/591,151	09/10/85
4,539,897	06/595,475	09/10/85
4,539,900	06/604,925	09/10/85
4,539,911	06/335,306	09/10/85
4,539,912	06/386,606	09/10/85
4,539,917	06/534,427	09/10/85
4,539,921	06/562,271	09/10/85
4,539,932	06/597,017	09/10/85
4,539,940	06/604,336	09/10/85
4,539,944	06/364,313	09/10/85
4,539,955	06/648,037	09/10/85
4,539,956	06/448,311	09/10/85
4,539,961	06/410,612	09/10/85
4,539,962	06/672,996	09/10/85
4,539,963	06/670,268	09/10/85
4,539,964	06/634,546	09/10/85
4,539,978	06/474,648	09/10/85
4,539,982	06/643,775	09/10/85
4,539,985	06/500,770	09/10/85
4,539,989	06/443,568	09/10/85
4,540,004	06/519,424	09/10/85
4,540,007	06/667,071	09/10/85
4,540,013	06/541,451	09/10/85
4,540,017	06/529,017	09/10/85
4,540,024	06/497,303	09/10/85
4,540,032	06/640,045	09/10/85
4,540,038	06/617,458	09/10/85
4,540,046	06/531,928	09/10/85
4,540,053	06/546,531	09/10/85
4,540,063	06/635,004	09/10/85
4,540,065	06/566,187	09/10/85
4,540,071	06/525,042	09/10/85
4,540,072	06/389,027	09/10/85
4,540,073	06/443,689	09/10/85
4,540,077	06/425,777	09/10/85
4,540,078	06/545,981	09/10/85
4,540,079	06/545,755	09/10/85
4,540,097	06/617,269	09/10/85
4,540,120	06/513,595	09/10/85
4,540,122	06/545,449	09/10/85
4,540,123	06/531,259	09/10/85
4,540,127	06/496,999	09/10/85
4,540,135	06/635,465	09/10/85
4,540,136	06/619,773	09/10/85
4,540,137	06/646,421	09/10/85
4,540,138	06/598,266	09/10/85
4,540,144	06/568,459	09/10/85
4,540,146	06/527,126	09/10/85
4,540,148	06/550,625	09/10/85
4,540,150	06/631,556	09/10/85
4,540,157	06/490,957	09/10/85
4,540,163	06/676,439	09/10/85
4,540,165	06/404,707	09/10/85
4,540,169	06/538,594	09/10/85
4,540,172	06/230,514	09/10/85
4,540,174	06/601,011	09/10/85
4,540,176	06/526,307	09/10/85
4,540,185	06/620,159	09/10/85
4,540,188	06/601,936	09/10/85
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4,540,193	06/507,127	09/10/85
4,540,197	06/516,034	09/10/85
4,540,198	06/468,052	09/10/85
4,540,202	06/346,753	09/10/85
4,540,216	06/515,804	09/10/85
4,540,220	06/529,817	09/10/85
4,540,226	06/455,183	09/10/85
4,540,228	06/508,361	09/10/85
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4,540,236	06/514,684	09/10/85
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4,540,261	06/631,155	09/10/85
4,540,273	06/464,903	09/10/85
4,540,275	06/445,996	09/10/85
4,540,291	06/527,518	09/10/85
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4,540,389	06/481,363	09/10/85
4,540,395	06/465,878	09/10/85
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4,540,404	06/459,117	09/10/85
4,540,408	06/373,288	09/10/85
4,540,423	06/531,557	09/10/85
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4,540,444	06/407,611	09/10/85
4,540,446	06/602,578	09/10/85
4,540,449	06/584,996	09/10/85
4,540,458	06/612,220	09/10/85
4,540,460	06/572,337	09/10/85
4,540,464	06/605,082	09/10/85
4,540,483	06/566,487	09/10/85
4,540,496	06/478,683	09/10/85
4,540,498	06/499,717	09/10/85
4,540,499	06/509,726	09/10/85
4,540,517	06/557,364	09/10/85
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4,540,572	06/566,578	09/10/85
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4,540,590	06/564,246	09/10/85
4,540,600	06/588,890	09/10/85
4,540,601	06/636,368	09/10/85
4,540,602	06/420,384	09/10/85
4,540,605	06/614,864	09/10/85
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4,540,614	06/492,253	09/10/85
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4,540,617	06/676,232	09/10/85
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4,540,642	06/595,203	09/10/85
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4,540,650	06/531,781	09/10/85
4,540,651	06/549,601	09/10/85
4,540,653	06/643,812	09/10/85
4,540,655	06/660,241	09/10/85
4,540,657	06/617,782	09/10/85
4,540,658	06/507,588	09/10/85
4,540,667	06/433,606	09/10/85
4,540,668	06/258,177	09/10/85
4,540,678	06/561,012	09/10/85
4,540,680	06/578,244	09/10/85
4,540,683	06/621,796	09/10/85
4,540,685	06/451,975	09/10/85
4,540,686	06/618,590	09/10/85
4,540,691	06/600,008	09/10/85
4,540,694	06/604,198	09/10/85
4,540,695	06/407,278	09/10/85
4,540,700	06/577,692	09/10/85
4,540,701	06/515,653	09/10/85
4,540,702	06/412,964	09/10/85
4,540,704	06/500,801	09/10/85
4,540,711	06/482,261	09/10/85
4,540,723	06/610,909	09/10/85
4,540,731	06/544,845	09/10/85
4,540,732	06/547,520	09/10/85
4,540,734	06/635,555	09/10/85
4,540,742	06/440,916	09/10/85
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4,540,747	06/615,096	09/10/85
4,540,755	06/429,733	09/10/85
4,540,760	06/669,319	09/10/85
4,540,762	06/560,222	09/10/85
4,540,768	06/658,944	09/10/85
4,540,770	06/643,651	09/10/85
4,540,777	06/591,404	09/10/85
4,540,778	06/618,854	09/10/85
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4,540,801	06/513,469	09/10/85
4,540,805	06/655,833	09/10/85
4,540,818	06/490,730	09/10/85
4,540,819	06/489,654	09/10/85
4,540,823	06/620,976	09/10/85
4,540,826	06/522,774	09/10/85
4,540,828	06/469,550	09/10/85
4,540,831	06/611,459	09/10/85
4,540,832	06/604,072	09/10/85
4,540,847	06/333,533	09/10/85
4,540,852	06/496,152	09/10/85
4,540,856	06/499,241	09/10/85
4,540,858	06/523,084	09/10/85
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5,243,147	07/858,230	09/07/93
5,243,150	07/944,023	09/07/93
5,243,152	07/693,439	09/07/93
5,243,164	07/627,655	09/07/93
5,243,169	07/609,795	09/07/93
5,243,176	07/833,674	09/07/93
5,243,187	07/778,928	09/07/93

5,243,196	07/873,213	09/07/93
5,243,201	07/928,023	09/07/93
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5,243,244	07/797,182	09/07/93
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5,243,267	07/957,234	09/07/93
5,243,274	07/925,684	09/07/93
5,243,278	07/653,585	09/07/93
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5,243,304	07/864,877	09/07/93
5,243,310	07/826,547	09/07/93
5,243,312	07/809,542	09/07/93
5,243,325	07/811,642	09/07/93
5,243,329	07/760,012	09/07/93
5,243,330	07/801,538	09/07/93
5,243,333	07/921,136	09/07/93
5,243,344	07/708,061	09/07/93
5,243,345	07/842,855	09/07/93
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5,243,415	07/680,840	09/07/93
5,243,424	07/700,696	09/07/93
5,243,429	07/915,509	09/07/93
5,243,460	07/789,582	09/07/93
5,243,461	07/691,970	09/07/93
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5,243,477	07/809,189	09/07/93
5,243,483	07/741,626	09/07/93
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5,243,504	07/921,216	09/07/93
5,243,532	07/792,880	09/07/93
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5,243,544	07/637,601	09/07/93
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5,243,665	07/826,197	09/07/93
5,243,679	07/832,445	09/07/93
5,243,680	07/891,706	09/07/93
5,243,683	07/911,065	09/07/93
5,243,690	07/435,895	09/07/93
5,243,692	07/489,682	09/07/93
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Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

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4,926,248, Re. S.N. 08/787,569, Jan. 22, 1997, Cl. 358/501, SCANNING RECORDING TYPE PRINTING METHOD AND APPARATUS FOR INCREASING IMAGE QUALITY BY CONTROLLING TONE DOT LOCATIONS WITHIN IMAGE PIXELS, Shinya Kobayashi, et. al., Owner of Record: *Inventors*, Attorney or Agent: Carl I. Brundidge, Ex. Gp.: 2612

5,113,506, Re. S.N. 08/854,087, May 9, 1997, Cl. 395/400, SYSTEM HAVING AN ADDRESS GENERATING UNIT AND A LOG COMPARATOR PACKAGED AS AN INTERGRATED CIRCUIT SEPARATE FROM CACHE TAG MEMORY AND CACHE DATA MEMORY, John P. Moussouris, et. al., Owner of Record: *Tandem Computers Inc., San Francisco, Calif.*, Attorney or Agent: James P. Hao, Ex. Gp.: 2315

5,204,394, Re. S.N. 08/923,035, Sept. 3, 1997, Cl. 524/125, POLYMER MIXTURE HAVING AROMATIC POLYCARBONATE, STYRENE I CONTAINING COPOLYMER AND/OR GRAFT POLYMER AND A FLAME-RETARDANT, ARTICLES FORMED THEREFROM, Johannes C. Gosens, et. al., Owner of Record: *General Electric Corp., N.Y.*, Attorney or Agent: John Young, Ex. Gp.: 1511

5,254,751, Re. S.N. 08/545,092, Oct. 19, 1995, Cl. 568/798, METHOD FOR THE DECOMPOSITION OF CUMENE HYDROPEROXIDE ACIDIC CATALYST TO PHENOL AND ACETONE, Vladimir M. Zakoshansky, Owner of Record: *General Electric Co., Schnectady, N.Y.*, Attorney or Agent: Thomas J. Vetter, Ex. Gp.: 1204

5,426,606, Re. S.N. 08/879,516, June 20, 1996, Cl. 365/189.50, SEMICONDUCTOR MEMORY DEVICE SYNCHRONOUS WITH EXTERNAL CLOCK SIGNAL FOR OUTPUTTING DATA BIT THROUGH A SMALL NUMBER OF DATA LINES, Yasuhiro Takai, Owner of Record: *Nec Corp., Tokyo, Japan*, Attorney or Agent: Patrick J. Finnan, Ex. Gp.: 2511

5,429,329, Re. S.N. 08/887,755, July 3, 1997, Cl. 105/166, COMPOSITE MICRODOT AND METHOD, Charles D. Loving, Owner of Record: *William D. Stratford, Missoula, Mont.*, Attorney or Agent: Daiva Tautvydas, Ex. Gp.: 3103

5,438,529, Re. S.N. 08/886,820, Mar. 10, 1997, Cl. 364/709.010, PERCUSSION INPUT DEVICE FOR PERSONAL COMPUTER SYSTEMS, Louis B. Rosenberg, et. al., Owner of Record: *Immersion Human Interface Corp.*, Attorney or Agent: Lee Van Pelt, Ex. Gp.: 2306

5,440,480, Re. S.N. 08/907,848, Aug. 8, 1997, Cl. 364/401, METHOD FOR DETERMINING FLEXIBLE DEMAND IN A MANUFACTURING PROCESS, John R. Costanza, Owner of Record: *Jit Institute of Technology Inc.*, Attorney or Agent: Sandy Seth, Ex. Gp.: 2411

5,443,045, Re. S.N. 08/917,636, Aug. 22, 1997, Cl. 123/299, TWO-STROKE FUEL-INJECTED INTERNAL COMBUSTION ENGINE, Pierluigi Marconi, Owner of Record: *Bimota, Rimini, Italy*, Attorney or Agent: Richard Minnich, Ex. Gp.: 3402

5,446,359, Re. S.N. 08/920,112, Aug. 26, 1997, Cl. 318/701, CURRENT DECAY CONTROL IN SWITCHED RELUCTANCE MOTOR, Gary E. Horst, Owner of Record: *Emerson Electric Co., St. Louis, Mo.*, Attorney or Agent: Robert McAughan, Ex. Gp.: 2107

5,448,607, Re. S.N. 08/924,281, Sept. 5, 1997, Cl. 378/004, X-RAY TOMOGRAPHY SYSTEM WITH GANTRY PIVOT AND TRANSLATION CONTROL, Gilbert W. McKenna, Owner of Record: *Analogic Corp., Peabody, Mass.*, Attorney or Agent: Steven Mills, Ex. Gp.: 2506

5,448,856, Re. S.N. 08/927,759, Sept. 11, 1997, Cl. 49/340, VEHICLE BODY WITH POWERED LIFT TYPE TAILGATE, Thomas S. Moore, et. al., Owner of Record: *Chrysler Corp., Auburn Hills, Mich.*, Attorney or Agent: Gregory A. Stubbs, Ex. Gp.: 3508

5,449,368, Re. S.N. 08/927,494, Sept. 11, 1997, Cl. 606/157, LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING DEVICE AND METHOD FOR IMPLANTATION AND REMOVAL THEREOF, Lubomyr I. Kuzmak, Owner of Record: *Inventor*, Attorney or Agent: Ross F. Hunt Jr., Ex. Gp.: 3309

5,450,053, Re. S.N. 08/920,367, Aug. 29, 1997, Cl. 338/18, USE OF VANADIUM OXIDE IN MICROBOLOMETER SENSORS, R. Andrew Wood, Owner of Record: *Honeywell, Inc., Minneapolis, Minn.*, Attorney or Agent: Roger Jensen, Ex. Gp.: 2202

5,451,264, Re. S.N. 08/927,305, Sept. 11, 1997, Cl. 134/003.000, METHOD FOR REMOVING HARDENED CONCRETE, Jarvis M. James Jr., Owner of Record: *Inventor*, Attorney or Agent: Steven J. Hultquist, Ex. Gp.: 1307

5,512,237, Re. S.N. 08/923,455, Sept. 4, 1997, Cl. 420/49, PRECIPITATION HARDENABLE MARTENSITIC STAINLESS STEEL, Anna Hultin-Stigenberg, Owner of Record: *Sandvik Ab, Sandviken, Sweden*, Attorney or Agent: Brian O'Shaughnessy, Ex. Gp.: 1308

5,537,789, Re. S.N. 08/924,934, Sept. 9, 1997, Cl. 52/313, COMPRESSION MOLDED DOOR ASSEMBLY, Ronald C. Minke, et. al., Owner of Record: *Therma-Tru Corp., Sylvania, Ohio*, Attorney or Agent: William G. Conger, Ex. Gp.: 3504

5,551,347, Re. S.N. 08/925,054, Sept. 8, 1997, Cl. 104/60, HUMAN AMUSEMENT RIDE, Leroy H. Gutknecht, Owner of Record: *Newera Capital Corp., Burnaby, Canada*, Attorney or Agent: Jack C. Munro, Ex. Gp.: 3103

5,552,995, Re. S.N. 08/882,838, July 26, 1997, Cl. 364/468, CONCURRENT ENGINEERING DESIGN TOOL AND METHOD, Donald H. Sebastian, et. al., Owner of Record: *Trustees of the Stevens Institute of Technology*, Attorney or Agent: Charles Brainard, Ex. Gp.: 2306

5,563,699, Re. S.N. 08/901,797, July 28, 1997, Cl. 355/311, DOCUMENT FEEDER WHICH DETERMINES A DOCUMENT PATH USING A DETERMINED PAGE LENGTH, Youichi Tsukamoto, Owner of Record: *Ricoh Co., Ltd., Tokyo, Japan*, Attorney or Agent: Surinder Sachar, Ex. Gp.: 2105

5,580,169, Re. S.N. 08/921,204, Aug. 27, 1997, Cl. 366/256, MILKJUG WITH FROTH-FORMING DEVICE FOR MAKING "CAPPUCCINO" AND THE LIKE, Tiziano Ghidini, Owner of Record: *Frabosk Casalinghi, Lumezzane, Italy*, Attorney or Agent: Joseph Lerch, Ex. Gp.: 3405

5,582,231, Re. S.N. 08/916,729, Aug. 18, 1997, Cl. 164/525, SAND MOLD MEMBER AND METHOD, June-Sang Siak, Owner of Record: *General Motors Corp., Detroit, Mich.*, Attorney or Agent: Lawrence Plant, Ex. Gp.: 3205

5,583,339, Re. S.N. 08/920,074, Aug. 26, 1997, Cl. 250/339.130, INFRARED METHOD AND APPARATUS FOR MEASURING GAS CONCENTRATION OF A PLURALITY OF COMPONENT GASES IN A SAMPLE, Karl H. Black, et. al., Owner of Record: *Sensors Inc., Saline, Mich.*, Attorney or Agent: Frederick Burkhart, Ex. Gp.: 2506

5,588,048, Re. S.N. 08/861,174, May 21, 1997, Cl. 379/127, GEOGRAPHICALLY MAPPED TELEPHONE ROUTING METHOD AND SYSTEM, Daniel E. Neville, Owner of Record: *800 Adept, Inc., Altamonte Springs, Fla.*, Attorney or Agent: Edward M. Livingston, Ex. Gp.: 2601

5,622,030, Re. S.N. 08/919,655, Aug. 28, 1997, Cl. 53/436, METHOD OF PACKAGING RESILIENTLY COMPRESSIBLE ARTICLES, C. Edward Steed, Owner of Record: *Chemical Bank, New York, N.Y.*, Attorney or Agent: James Raden, Ex. Gp.: 3201

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,396,806, Reexam. No. 90/004,753, June 27, 1997, Cl. 381/068, HEARING AID AMPLIFIER, Jared A. Anderson, Owner of Record: *A & L Ventures I, Orinda, Calif.*, Attorney or Agent: Kenneth R. Allen, Townsend and Townsend and Crew, San Francisco, Calif., Ex. Gp.: 2605, Requester: David J. Cushing, Sughrue Mion Zinn MacPeak & Seas, Washington, D.C.

4,425,481, Reexam. No. 90/004,754, July 3, 1997, Cl. 381/068, PROGRAMMABLE SIGNAL PROCESSING DEVICE, Stephan Mangold, et. al., Owner of Record: *Resound Corp., Redwood City, Calif.*, Attorney or Agent: Patrick C. Keane, Burns Doane Swecker & Mathis, Ex. Gp.: 2605, Requester: Sughrue Mion Zinn MacPeak & Seas, Washington, D.C.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED AUGUST 25, 1997 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
340,546	71/365,878	11/17/1936
340,550	71/369,365	11/17/1936
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340,607	71/363,155	11/17/1936
340,618	71/379,580	11/17/1936
340,663	71/378,523	11/17/1936
340,674	71/379,891	11/17/1936
340,678	71/380,874	11/17/1936
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340,709	71/363,639	11/17/1936
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1,053,108	73/072,742	11/16/1976
1,053,110	73/082,160	11/16/1976
1,053,111	73/082,334	11/16/1976
1,053,119	73/038,420	11/16/1976
1,053,121	73/051,281	11/16/1976
1,053,122	73/065,012	11/16/1976
1,053,128	73/061,108	11/16/1976
1,053,129	73/061,578	11/16/1976

Department of Commerce

Patent and Trademark Office

Request for Comments on Patent Formalities Treaty

Agency: Patent and Trademark Office, Commerce

Action: Notice of request for public comments

Summary: The Patent and Trademark Office is seeking comments to obtain views of the public on the international effort to simplify the formal requirements associated with patents and the consequent changes to United States law and practice. Comments may be offered on any aspect of this effort.

Dates: All comments are due by December 1, 1997.

Addresses: Persons wishing to offer written comments should address those comments to the Commissioner of Patents and Trademarks, Box 4, Patent and Trademark Office, Washington, D.C. 20231, marked to the attention of Mrs. Lois E. Boland.

Comments may also be submitted by facsimile transmission to (703) 305-8885 or by electronic mail through the Internet to plt.comments@uspto.gov. All comments will be maintained for public inspection in Room 902 of Crystal Park II, at 2121 Crystal Drive, Arlington, Virginia.

For Further Information Contact: Mrs. Lois E. Boland by telephone at (703) 305-9300, by fax at (703) 305-8885 or by mail marked to her attention and addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

Supplementary Information:

1. Background

The United States has been involved in an effort to reduce the formal requirements associated with patent applications and patents in the different countries of the world. A committee of experts, meeting under the auspices of the World Intellectual Property Organization (WIPO), continues to develop treaty articles and rules which attempt to minimize the formal requirements associated with patent applications and patents. Upon conclusion, these treaty articles and rules will simplify the formal obligations and reduce the associated costs for patent applicants and owners of patents in obtaining and preserving their rights for inventions in many countries of the world. The next (5th) committee of experts meeting will take place at WIPO in December of 1997. It is likely that two additional such meetings will take place in 1998. The issue of when a Diplomatic Conference will be convened to conclude these negotiations will be discussed in a March 1998 meeting at WIPO. WIPO has suggested that a 1999 Diplomatic Conference may be possible.

The United States Patent and Trademark Office (USPTO), leading the negotiations for the United States, is interested in obtaining comprehensive comments to assess continued support for the effort. Prior to each of the previous meetings of the committee of experts, the USPTO informally solicited and received comments on the then-current drafts of the treaty articles, rules and notes. In light of the impending conclusion of this effort, the USPTO desires to ensure that the text of the treaty is disseminated as widely as possible and the opportunity to provide comments is correspondingly comprehensive.

Written comments may be offered on any aspect of the draft treaty articles, rules or notes or expected implementation in the United States. Comments are also welcome on the following issues:

— the formalities/substantive distinction, discussed, specifically, with respect to Article 5, below;

— the subject matter appropriate for treaty articles versus that which should be relegated to rules; and

— whether this effort should be concluded by a separate treaty or as a protocol to the Patent Cooperation Treaty.

2. Brief Summary of the Draft Treaty

The current text of the draft treaty includes 16 articles, 17 rules and associated notes. A brief summary of selected articles and, where significant, associated rules follows. To the extent that a given article is not summarized, it is considered to be self-explanatory. Insofar as this effort is focused upon and limited to formal matters associated with patent applications and patents, the USPTO expects that, upon implementation, changes to our patent law would be minimal. However, to the extent the need for any such change has been identified for a given draft article or rule, it is noted below. This discussion is intended, only, to highlight various articles and rules; it is not intended as a comprehensive treatment of the draft texts. The draft texts, identified in Part 3, below, should be consulted for a complete understanding of the effort that is under way.

Article 1 - Abbreviated Expressions - This article provides definitions for terms used throughout the text of the draft articles and rules. For the most part, this article is self-explanatory. The USPTO has supported a broadening of the definition for the term "owner" to include owners of both applications and patents.

Article 2 - Applications and Patents to Which the Treaty Applies - This article defines the scope of the treaty by virtue of the types of applications and patents that are intended to be encompassed by its terms.

Article 3 - National Security - This article preserves the right of Contracting Parties to apply measures deemed necessary for the preservation of national security.

Article 4 - Filing Date - This article is viewed by the USPTO as one of the more important features of this effort. It mandates that a Contracting Party must provide a filing date for an application as of the date that the following elements are filed with its Office:

(i) an indication that submitted elements are intended to be an application;
(ii) indications allowing the identity of the applicant or person submitting the application to be established or contacted;
(iii) a description; and
(iv) if the description is not in an accepted language, an indication that the application contains a description.

This filing date requirement is fairly minimal and would greatly simplify the conditions imposed upon the grant of filing dates to patent applications throughout the world. Note that this article would mandate the acceptance, for filing date purposes, of patent applications in any language, subject to the furnishing of later translations. The USPTO has supported this article, with the knowledge that our claim requirement in section 111 (a) of title 35, United States Code, would have to be deleted. Note that such a requirement is not included for provisional applications filed under section 111 (b) of title 35, United States Code. The remainder of the article and Rule 2 provide additional details concerning the grant of filing dates.

Article 5 - Application - This article is another of the more important features of this effort. It mandates that no Contracting Party may impose any requirement relating to the form or contents of an application which is different from or additional to any requirement applicable under the Patent Cooperation Treaty (PCT) to an international application. In essence, this article states that if an applicant submits an application to a national office that complies with the requirements of the PCT, that national office can impose no different or additional requirements on that national application. Of course, Contracting Parties would be free to impose requirements that are more liberal, from an applicant's perspective, than the PCT. Of note, the International Bureau of WIPO has expressed the view that the incorporation of the "form or contents" requirements from the PCT into this article would mandate the application of the PCT unity of invention standard for all national applications. The USPTO has taken exception to this view insofar as unity of invention is considered to be a substantive matter that is outside the scope of this effort. This article also provides that the Regulations shall include requirements regarding the filing of applications in paper and electronic form.

Article 6 - Validity of Patent; Revocation - This article mandates that once a patent has been granted, it may not be revoked or invalidated on the ground of non-compliance with certain formal requirements enunciated in Article 5.

Article 7 - Representation; Address for Service - This article addresses requirements regarding representation, address for service and powers of attorney. Importantly, the article provides that Contracting Parties may not mandate representation for, among other things, the filing of a translation, the furnishing of drawings or the payment of any fee.

Article 8 - Signature; Article 9 - Request for Recordal of Change in Name and Address; Article 10 - Request for Recordal of Change in Ownership; Article 11 - Request for Recordal of Licensing Agreement or Security Interest; and Article 12 - Request for Correction of a Mistake. These provisions, and associated rules, are considered to be self-explanatory. It has been the position of the-USPTO that much of the detail in these articles would be more appropriate for a rule insofar as including such a level of detail in treaty articles may render the result unnecessarily inflexible. (While this issue is highlighted here with respect to these enumerated articles, it may apply to the level of detail associated with other articles.)

Article 13 - Extension of a Time Limit Fixed by the Office - This article, with Rule 14, mandates that the Offices of all Contracting Parties must provide for, at the least, a first extension for any time limit set by the Office.

Article 14 - Further Processing; Restoration of Rights - This article mandates that all Contracting Parties must provide for the further processing of applications and the restoration of rights related to applications/patents where compliance with a requirement takes place outside of a time limit originally established by an Office. The article also provides for intervening fights under certain circumstances.

Article 15 - Addition and Restoration of Priority Claim - This article provides for the late claiming of priority of an earlier application where a subsequent application is timely filed and for the delayed filing of the subsequent application. The United States currently permits late claiming of priority and supports the concept of accepting the delayed filing of the subsequent application. With regard to accepting the delayed filing of a subsequent application, an amendment to section 119 of title 35, United States Code, would be warranted.

Article 16 - Regulations - This provision provides the basis for the draft rules that follow. As noted above, there are, currently, 17 draft rules that accompany the text of the treaty.

3. Text of the Draft Treaty, Rules and Notes

The text of the current draft of the patent law treaty, with associated rules and notes, is available via the USPTO's World Wide Web site at http://www.uspto.gov via a link to WIPO's World Wide Web site. The documents are PLT/CE/V/2 and PLT/CE/V/3.

Requests for paper copies of the text may be made in writing to Mrs. Lois E. Boland at the above address or by telephone at (703) 305-9300.

October 15, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

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37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Philippe Lecreux) may join in the application by promptly filing an appropriate oath or declaration complying with 37 CFR 1.497. The international application number is PCT/FR95/00734 and was filed on 07 June 1995, in the names of Philippe Lecreux and Bruno Hibon for the invention entitled Technical Service Units. The national stage application number is 08/750,084 and has a 35 U.S.C. 371(c) date of 09 December 1996.

Errata

"All reference to Patent No. D. 385,631 to Ronald Feret, of Tennesse, for NASAL INHALER appearing in the Official Gazette of October 28, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,674,584 to Ralph McGrath, et. al. of Ohio, for ENHANCED INSULATION PANEL appearing in the Official Gazette of October 07, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,680,334 to Dennis Silva, et. al. of California, for HAND-HELD DATA COLLECTION COMPUTER TERMINAL HAVING POWER MANAGEMENT ARCHITECTURE INCLUDING SWITCHABLE MULTI-PURPOSE INPUT DISPLAY SCREEN appearing in the Official Gazette of October 21, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,681,114 to Cecil Richison, et. al. of Wisconsin, for VENTED POUCH ARRANGEMENT AND METHOD appearing in the Official Gazette of October 28, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,681,414 to Steven D. Hogge, et. al. of California, for CONTINUOUS PROCESS AND APPARATUS FOR MANUFACTURING CONDUCTIVE POLYMER COMPONENTS appearing in the Official Gazette of October 28, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,681,781 to James G. Hnat, et. al. of Pennsylvania, for MANUFACTURE OF CERAMIC TILES FROM FLY ASH appearing in the Official Gazette of October 28, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,684,027 to Klaus Hirth, et. al. of California, for TREATMENT OF PLATELET DERIVED GROWTH FACTOR RELATED DISORDERS SUCH AS CANCERS appearing in the Official Gazette of November 04, 1997, should be deleted since no patent was granted."

Pilot for Filing Trademark Applications in an Electronic Environment

Scope of Pilot Program: On or before November 30, 1997, the U.S. Patent and Trademark Office (PTO) will implement a pilot project to allow electronic filing of trademark applications. The pilot will be limited to ***applications*** filed under Sections 1(a), 1(b) and 44(d) of the Trademark Act. Applications based on Section 44(e) of the Act will not be included in the pilot because of the added complexity involved in the transmission and receipt of documents certifying registration in an applicant's country of origin.

Requirements for Participation: The PTO will invite a small number of filers to participate in this pilot. Pilot participants must have access to the following: (1) a personal computer; and, (2) a specified computer network browser. Access to a scanner or digital camera for creating digitized images in *gif* or *jpg* format will be necessary for the submission of specimens required for applications filed under Section 1(a) and/or special form drawings containing figurative elements for filings under any Section of the Trademark Act. Participants must also maintain a deposit account with the PTO for payment of required filing fees.

Before the application is submitted electronically, the applicant must print and maintain a paper application, and the application must be personally signed and dated by the applicant in permanent ink, pursuant to 37 C.F.R. 1.4(d). Participants also must create and maintain a verified statement, signed and dated by the applicant in permanent ink stating that: (1) the information in the electronic submission is identical to the information in the paper application; and, (2) the symbol shown in the signature block on the electronic application has been adopted by the applicant to verify the contents of the application. These two documents should not be forwarded to the PTO but should be retained by the applicant or the applicant's representative.

Duration: It is anticipated that the pilot project will run for sixty days. However, the period for the pilot project may be extended if necessary. After review and analysis of the pilot results, the PTO plans to broaden the scope of the electronic-filing program by inviting additional participants and accepting electronic submissions of documents other than applications for the registration of trademarks and service marks.

For the purposes of this pilot only, the following requirements are waived.

Rule 1.1(a)

The requirement of 37 CFR 1.1(a) that communications intended for the Patent and Trademark Office must be mailed to the street address of the Office is waived.

Rule 2.51

The requirement of 37 CFR 2.51(e) that an application for the registration of a mark that can be represented in typewritten form include a drawing of the mark typed in capital letters on a separate sheet of paper complying with the requirements of Setion 2.52 is waived.

Rules 2.52(b) & 2.52(c)

The requirements of 37 CFR 2.52(b) and (c) that drawings must be made on paper is waived.

Rules 2.56 & 2.58(a)

The requirement of 37 CFR 2.56 and 37 CFR 2.58(a) that applications under Section 1(a) of the Act include *three* specimens of the trademark or service mark as used on or in connection with the goods or services in commerce is waived. Instead, participants must electronically file only *one* specimen of the trademark or service mark as used on or in connection with the goods or services in commerce.

Point of Contact for this Notice:

Name: Craig Morris
Telephone number: (703) 308-8910 ext. 36
Fax Number: (703) 308-9395

Mailing Address:
Office of the Assistant Commissioner
for Trademarks
Suite 10B10
2900 Crystal Drive
Arlington, Virginia 22202-3513

October 21, 1997

PHILIP G. HAMPTON, II
Assistant Commissioner
for Trademarks

Certificates of Correction
For the Week of November 18, 1997

D. 325,246
D. 346,230
D. 375,555
D. 376,906
D. 379,272
D. 382,604
D. 382,910
4,696,949
5,189,742
5,210,839
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5,346,733
5,395,842
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5,421,405
5,428,019
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Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

September 29-October 3, 1997

Date Issued	Type of Case⁽¹⁾	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
9-30	OPP	80,070	Executive Greetings, Inc. v. CalComp, Inc.	2(d)	Opposition Dismissed	"DRAWING BOARD" [computer suppplies and accessories; greeting cards, invitations, announcements, etc.]	"DRAWINGBOARD" [computer graphics digitizer tablets]		No
9-30	OPP	97,405	Bugle Boy Industries, Inc. v. Stefcom S.p.A.	2(d)	Opposition Dismissed	"BUGLE BOY" [clothing and footwear]	"BULL BOYS" [footwear]		No
10-1	EX	74/510,312	John A. Notaras and Angelo L. Notaras	2(d)	Refusal Affirmed		"EDGE EATER" [power operated lawn edgers]	"WEED EATER" [weed and grass cutting machinery for edging and trimming lawns]	No
10-3	EX	74/528,720	Int'l. Multi-Media Corp.	2(e)(1)	Refusal Reversed		"INTERNATIONAL MULTI-MEDIA CORPORATION" [financial services, namely, financial analysis and consultation in the field of wireless telecommunications; consulting and research services for others in the field of wireless communications]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box ____________
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Please address mail as follows:

Box ____________
FEE (or NO FEE)
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail as follows:

Box ____________
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI^3) in Sunnyvale, California.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(334) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
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	New Haven Free Public Library	Not Yet Operational
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	West Lafayette Siegesmund Engineering Library, Purdue University	(765) 494-2872
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Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 630-6120
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
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PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director	308-0661	12/26/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director	308-1235	03/29/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	02/15/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director	308-2351	03/06/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	06/08/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	09/05/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	11/10/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-3900	11/10/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3900	10/16/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	12/18/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-3900	05/29/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	10/27/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director	308-1113	10/10/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	01/23/96
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	11/15/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	11/27/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-2168	06/04/96

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

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TRADEMARK OPERATION

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Condition of Trademark Applications as of October 1, 1997

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/20/97	08/11/97
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/26/97	07/21/97
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/27/97	08/18/97
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/26/97	07/14/97
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/26/97	07/11/97
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/26/97	06/18/97
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/27/97	08/07/97
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions— Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/18/97	08/08/97
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/24/97	06/20/97
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	08/25/97	—0—
Renewals (All Classes)	08/25/97	—0—
Section 12(c) Publications (All Classes)	08/25/97	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

NOVEMBER 18, 1997

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,219,880 (3371st)

SIGNAL-PROCESSING AND CONVERSION SYSTEMS

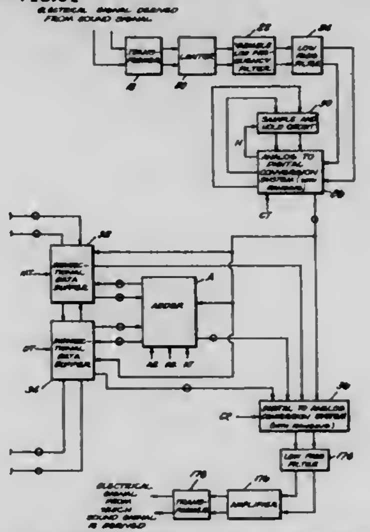
Charles R. Nichols, Pasadena, Calif., assignor to Invest America Counseling Services, Inc., Annapolis, Md.

Reexamination Request No. 90/004,119, Jan. 25, 1996.

Reexamination Certificate for Patent 4,219,880, issued Aug. 26, 1980, Ser. No. 902,455, May 3, 1978.

Int. Cl.⁶ G06F *19/00*

U.S. Cl. 364—718.01


ELECTRICAL SIGNAL DERIVED FROM SOUND SIGNAL
ADDER
ELECTRICAL SIGNAL FROM WHICH SOUND SIGNAL IS DERIVED
AMPLIFIER

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **9** and **10** is confirmed.

Claims **1–8** are cancelled.

9. A digital to analog converter system for generating an analog signal of which successive digitally-represented, multidigit signal sets are indicative, comprising:

means for receiving said successive digitally-represented signal sets and for generating modified digitally-represented, multidigit signal sets having values which are indicative in each case of the value of an unmodified digitally-represented signal set multiplied by a factor representative of a variable range classification for said unmodified signal sets, said receiving and generating means including means for generating signals representative of said range classification;

converter means for producing in response to said modified digitally-represented signal sets, an analog signal of which said modified signal sets are indicative;

means for generating in response to said analog signal and said signals representative of said range classification, a modified analog signal having values along portions thereof, indicative for each portion, of the values along a corresponding portion of said unmodified analog signal divided by a factor indicative in each case of the multiplication factor for an unmodified digitally-represented signal set corresponding to the portion of said unmodified analog signal; and

timing means for preventing changes in said variable range classification which would be represented by successively greater multiplication factors within a predetermined time interval and permitting changes in said variable range classification which are represented by successively smaller multiplication factors within said predetermined interval.

B1 4,293,245 (3372nd)

STRUCTURAL SYSTEM AND STRUCTURAL ELEMENTS FOR USE AND CONSTRUCTION OF EARTH FILLED WALLS

Felix P. Jaecklin, Ennetbaden, Switzerland, assignor to Geotech Lizens AG, Engelberg, Switzerland

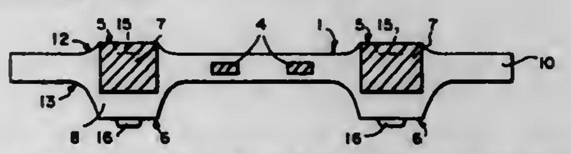
Reexamination Request No. 90/004,463, Nov. 20, 1996.

Reexamination Certificate for Patent 4,293,245, issued Oct. 6, 1981, Ser. No. 46,847, Jun. 8, 1979.

Claims priority, application Switzerland, Jun. 13, 1978, 6411/78; Nov. 21, 1978, 8313/78

Int. Cl.⁶ E02D *5/00*

U.S. Cl. 405—272



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3**, **6–8**, **14**, **16–19** and **22–24** is confirmed.

Claims **1**, **2**, **4**, **5**, **9–13**, **15**, **20**, **21** and **25–27** are cancelled.

3. The system of claim **1** in which there is at least one longitudinal beam having an L-type cross-section with an upright L-portion extending upwards from said flat support portion and being positioned at the outer edge portion of the longitudinal beam, said upright L-portion being arranged at an angle relative to said main plane of the frame or slab so as to form a sloping front and/or internal surface of said board retaining the earth material, said sloping being chosen so as to form an overhang to the front side of the wall.

B1 4,406,284 (3373rd)

ULTRASONIC HANDPIECE DESIGN

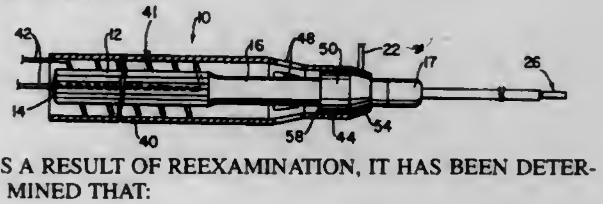
Anton Banko, Bronx, N.Y., assignor to Surgical Design Corp., Long Island, N.Y.

Reexamination Request No. 90/004,235, May 3, 1996.

Reexamination Certificate for Patent 4,406,284, issued Sep. 27, 1983, Ser. No. 245,667, Mar. 20, 1981.

Int. Cl.⁶ A61B *17/32*

U.S. Cl. 606—169



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–8**, dependent on an amended claim, are determined to be patentable.

1. An ultrasonic instrument comprising:

means for converting electrical energy into *ultrasonic* longitudinal vibratory motion,

workpiece means having one end coupled to said converting means and receiving the longitudinal vibratory motion of said converting means so that said workpiece also vibrates longitudinally, said workpiece means having a free work producing end spaced from said coupled end,

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a housing within which said converting means is located and from which the free work producing end of said workpiece means extends, and

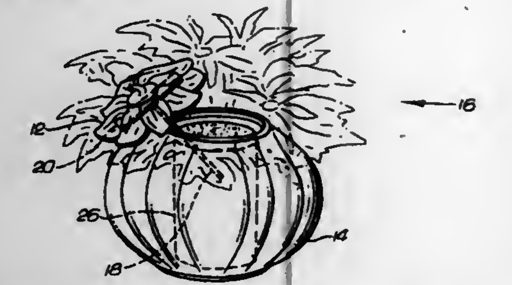
support means of a low coefficient of friction non-elastic material engaging said housing and said workpiece means to permit *ultrasonic* vibratory longitudinal sliding motion of said workpiece means relative to said housing.

B1 4,521,990 (3374th)

RETAINER FOR ATTACHING FLORAL LID CONTAINER

John F. Murray, Pacific Palisades, Calif., assignor to Roll International Corporation, Los Angeles, Calif.

Reexamination Request No. 90/004,533, Jan. 28, 1997.
Reexamination Certificate for Patent 4,521,990, issued Jun. 11, 1985, Ser. No. 601,734, Apr. 19, 1984.
Continuation of Ser. No. 546,960, Oct. 31, 1983, abandoned.
Int. Cl.^{6} A01G *5/00;* **A47G** *7/00*
U.S. Cl. 47—41.12



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. In combination,

a container for holding a bouquet of flowers with the flower stalks projecting through an opening in the container;

a lid removably mountable on said container to close said opening when said container is not in use for holding the flowers;

a crossbar releasably engageable with said lid;

a body of stalk supporting material removably positioned within said container for receiving and supporting the ends of the flower stalks with the flowers positioned outside said container; and

a shaft fixedly connected at one end to said crossbar extending generally perpendicularly therefrom, said shaft having its opposite end received within and supported by said body of stalk supporting material, said shaft being of sufficient length to pass through said opening with its one end supporting said crossbar and said lid outside said container in adjacent relation to said flowers when said container is in use for holding flowers.

B1 4,985,196 (3375th)

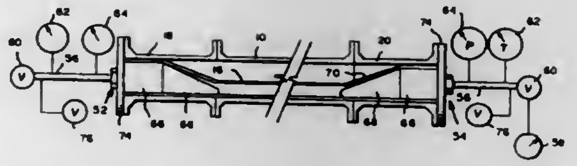
PIPE LINER PROCESS

Patrick LeDoux, and Lue Fourgaut, both of New Orleans, La., assignors to Pipe Liners, Inc., Metairie, La.

Reexamination Request No. 90/004,229, Apr. 24, 1996.
Reexamination Certificate for Patent 4,985,196, issued Jan. 15, 1991, Ser. No. 114,949, Oct. 30, 1987.
Int. Cl.^{6} B29C *63/38;53/08*
U.S. Cl. 264—516

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **12–19** is confirmed.



Claims **1** and **20** are determined to be patentable as amended.

Claims **2–11**, dependent on an amended claim, are determined to be patentable.

New claims **21** and **22** are added and determined to be patentable.

1. A process for installing in situ a thermoplastic liner in a generally horizontally extending pipe, comprising the steps of:

(a) providing a hollow generally cylindrical liner formed of thermoplastic material having an original outer diameter larger than the inside diameter of the pipe to be lined and a predetermined wall thickness;

(b) altering the cross-sectional shape of the liner to reduce the cross-sectional dimension therof at a shape memory activation temperature, so as to permit the liner to be pulled into the pipe;

(c) pulling said altered liner into said pipe such that end portions of said liner extend beyond opposite ends of said pipe;

(d) partially expanding the liner end portions which extend beyond the opposite ends [other] *of the* pipe by mechanical means inserted into said liner end portions such that said expanded lining end portions approximate the original cylindrical shape of said liner;

(e) sealing the expanded lining end portions beyond the opposite ends of said pipes to seal the interior of said liner at its opposite ends;

(f) subsequent to the step of sealing the liner and while maintaining the liner sealed, generally conforming said liner to the interior wall of the pipe while maintaining substantially the original predetermined wall thickness by (1) injecting a heated fluid into and through said sealed liner, (2) pressurizing the interior of said liner to a first predetermined pressure above atmospheric pressure by means of said heated fluid and (3) reheating said liner to a predetermined temperature by heat transfer from said heated fluid to said liner, whereby, the liner returns substantially to its remembered cylindrical shape;

(g) then increasing the pressure in said liner to a second predetermined pressure above said first predetermined pressure to conform the liner substantially precisely to the interior wall surface contours of the pipe; and

(h) while the liner is still hot, introducing a cooling fluid into the liner for flow therethrough to fix the liner in final form in conformance to the interior wall of the pipe.

B1 5,062,052 (3376th)

LOGIC CONTROLLED PLASTIC MOLDING MACHINE WITH PROGRAMMABLE OPERATOR INTERFACE

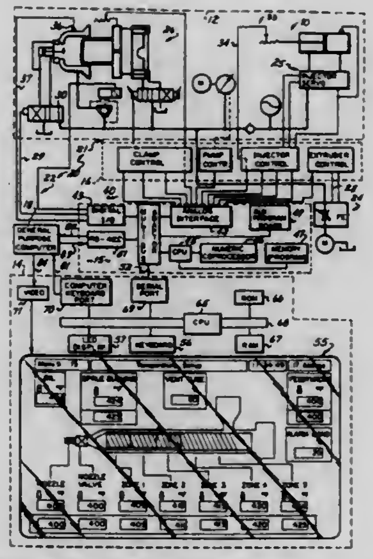
Ronald M. Sparer, Madeira, and Dale P. Werle, Batavia, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Reexamination Request No. 90/003,163, Aug. 18, 1993.
Reexamination Certificate for Patent 5,062,052, issued Oct. 29, 1991, Ser. No. 368,570, Jun. 20, 1989.
Int. Cl.^{6} G06F *15/00*
U.S. Cl. 364—473.03

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** and **9–13** is confirmed.

Claims **5–8** are cancelled.



9. A plastics molding machine comprising:

a plurality of operable machine elements interconnected and interrelated so as to perform a plastics forming process in response to program controlled output signals including analog output signals;

means for generating feedback signals, including analog feedback signals from said machine elements;

a real time signal processor including means for generating said output signals in real-time response to control signals and said feedback signals, including said analog feedback signals;

a dedicated programmable logic process controller having programmed means for generating said control signals in accordance with a predetermined combination and sequence of steps and in accordance with a plurality of command signals;

an operator station including means for accepting entered data, and means for displaying information to an operator in response to display signals;

an operator station interface including a programmable general purpose digital computer having at least two inputs including a command data input connected to said operator station for receiving said entered data from and for transmitting display signals to, said operator station, and having means connected to said controller for transmitting said command signals to said controller;

programmed means in said operator station interface for controlling the operation of said computer to generate said display signals and to generate command signals in response to said entered data.

B2 5,114,777 (3377th)

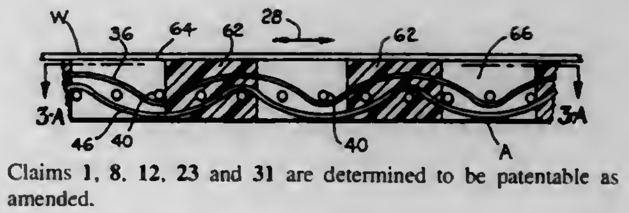
WOVEN MULTILAYER PAPERMAKING FABRIC HAVING INCREASED STABILITY AND PERMEABILITY AND METHOD

Hermann Gaisser, Sondelfingen, Germany, assignor to Wangner Systems Corporation, Greenville, S.C.

Reexamination Request Nos. 90/004,054, Dec. 11, 1995 and 90/004,151, Feb. 23, 1996.
Reexamination Certificate for Patent 5,114,777, issued May 19, 1992, Ser. No. 763,039, Aug. 5, 1985.
Reexamination Certificate B1 5,114,777, issued Jul. 18, 1995.
Int. Cl.^{6} B32B *3/24;5/22;* **D03D** *1/00;3/04;7/12*
U.S. Cl. 428—137

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **17–22** is confirmed.



Claims **1**, **8**, **12**, **23** and **31** are determined to be patentable as amended.

Claims **2–7**, **9–11**, **13–16** and **24–30**, dependent on an amended claim, are determined to be patentable.

New claims **32–47** are added and determined to be patentable.

41. A permeable flat woven multilayer papermaking fabric having increased fabric stability in a machine direction of a papermaking machine, said fabric being of the type which includes a paper support side and a roller contact side facilitating travel as an endless belt in said machine direction wherein said woven fabric comprises:

a first warp layer of first load bearing warp yarns extending in said machine direction on said paper support side of said fabric;

a second layer of second load bearing warp yarns extending in said machine direction on said roller contact side of said fabric;

stacked warp yarn pairs defined by respective ones of said first and second warp yarns of said first and second warp layers arranged in a generally vertically stacked superposed position one over the other along the entire fabric length;

said stacked warp yarn pairs being arranged relative to one another in a cross-machine direction in said fabric to provide desired fabric permeability;

a warp balancing weft yarn interwoven with said first and second warp layers to bind said respective ones of said first and second warp yarns in said stacked pairs;

said warp balancing weft yarn interwoven in a warp balancing weave pattern with said stacked pairs of warp yarns which maintains said warp yarns stacked upon one another and in general vertical alignment in said weave pattern; and

a resinous layer carried by said fabric for contacting said paper including passages facilitating flow of air through said fabric and resinous layer; and

whereby a fabric having increased fabric stability in the machine direction and a desired permeability is provided.

42. A permeable flat woven multilayer papermaking fabric having increased fabric stability in a machine direction of a papermaking machine, said fabric being of the type which includes a paper support side and a roller contact side facilitating travel as an endless belt in said machine direction wherein said woven fabric comprises:

a first warp layer of first load bearing warp yarns extending in said machine direction on said paper support side of said fabric;

a second layer of second load bearing warp yarns extending in said machine direction on said roller contact side of said fabric;

stacked warp yarn pairs defined by respective ones of said first and second warp yarns of said first and second warp layers arranged in a generally vertically stacked superposed position one over the other along the entire fabric length;

said stacked warp yarn pairs being arranged relative to one another in a cross-machine direction in said fabric to provide desired fabric permeability;

a warp balancing weft yarn interwoven with said first and second warp layers to bind said respective ones of said first and second warp yarns in said stacked pairs;

said warp balancing weft yarn interwoven in a warp balancing weave pattern with said stacked pairs of warp yarns which

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maintains said warp yarns stacked upon one another and in general vertical alignment in said weave pattern; and

said first layer and second layers of warp yarns weave in selected sequence over said weft yarns, under said weft yarn, and over and under said weft yarn;

whereby a fabric having increased fabric stability in the machine direction and a desired permeability is provided.

B1 5,176,239 (3378th)
ADVERTISING FITTING

Alexander Findlay, and Mark Bartlett, both of Auckland, New Zealand, assignors to Escalator Advertising Limited, Auckland, New Zealand

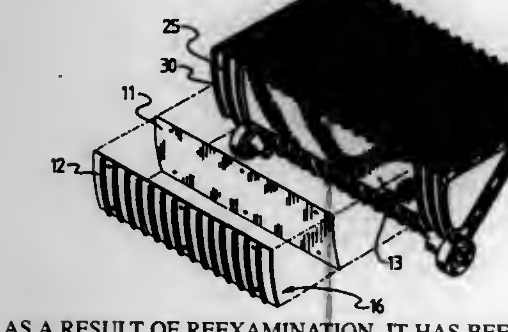
Reexamination Request No. 90/004,455, Nov. 18, 1996.

Reexamination Certificate for Patent 5,176,239, issued Jan. 5, 1993, Ser. No. 767,835, Sep. 30, 1991.

Claims priority, application New Zealand, Jun. 13, 1991, 238537

Int. Cl.^{6} B66B *23/12*

U.S. Cl. 198—321



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

New claims **7–55** are added and determined to be patentable.

7. A riser for an escalator step forming a front face of an escalator step, and having a defined external profile allowing relative movement between adjacent steps, comprising a recess formed in a portion of said riser for receiving indicia display means therein, said recess having a backing surface at a rear portion thereof; and a removable transparent or translucent cover dimensioned so as to cover said recess and having an external profile corresponding to the defined external profile of said steps.

B1 5,210,930 (3379th)
METHOD OF MANUFACTURING WOUND CORE

Tadatoshi Watabe, Tokyo, and Shoichi Miyasaka, Chino, both of Japan, assignors to Denki Tetsushin Industries Co., Ltd., Tokyo, Japan

Reexamination Request No. 90/004,108, Dec. 29, 1995.

Reexamination Certificate for Patent 5,210,930, issued May 18, 1993, Ser. No. 793,986, Nov. 18, 1991.

Claims priority, application Japan, Aug. 5, 1991, 3-284249

Int. Cl.^{6} H01F *41/02*

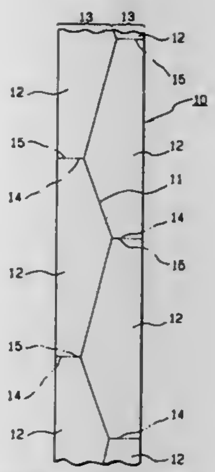
U.S. Cl. 29—609

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **6** and **7** are cancelled.

Claim **1** is determined to be patentable as amended.

Claims **3–5**, dependent on an amended claim, are determined to be patentable.



1. A method of manufacturing a wound core comprising the steps of:

(a) cutting one belt shaped strip of magnetic material along one polygonal line that extends in a longitudinal direction of said strip so as to form two continuous strips of said material, each said continuous strip consisting of a sequential connection of individual long pentagonal shaped portions wherein the width of each pentagonal shaped portion changes to be narrow at a leading end thereof, and to be wide in a middle part and narrow again at a trailing end; and

(b) forming a core by continuous winding of one of said pentagonal shaped portions so as to maintain a center line thereof at a fixed position in the width direction of said portion to form a wound core with a hexagonal cross section *having two opposing sides, each of a length greater than any of the individual lengths of the four remaining sides;*

wherein said cutting step is performed so that a length of each pentagonal shaped portion from said leading end to the wide middle part is smaller than a length from the wide middle part to the trailing end, said cutting step providing pentagonal shaped portions that form a core with an elongated hexagonal cross-section.

B1 5,244,624 (3380th)
METHOD OF INSTALLING A NEW PIPE INSIDE AN EXISTING CONDUIT BY PROGRESSIVE ROUNDING

Campbell H. Steketee, Jr., Salem, Oreg., assignor to Nu-Pipe, Inc., Salem, Oreg.

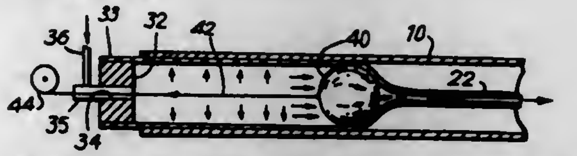
Reexamination Request Nos. 90/004,141, Feb. 20, 1996 and 90/004,415, Oct. 18, 1996.

Reexamination Certificate for Patent 5,244,624, issued Sep. 14, 1993, Ser. No. 734,374, Jul. 22, 1991.

Division of Ser. No. 249,452, Sep. 26, 1988, Pat. No. 5,034,180, which is a continuation-in-part of Ser. No. 180,904, Apr. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 76,973, Jul. 28, 1987, Pat. No. 4,867,921, which is a continuation of Ser. No. 846,322, Mar. 31, 1986, abandoned.

Int. Cl.^{6} B29C *63/34*

U.S. Cl. 264—516



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** and **9–11** is confirmed.

Claim **8** is determined to be patentable as amended.

1. A method of installing a new pipe inside a length of existing conduit comprising the steps:

inserting within the length of the conduit a length of normally rigid thermoplastic pipe while in a collapsed condition of reduced diameter,

heating at least one end portion of the collapsed pipe to render it flexible, rounding said end portion, and inserting a traveling plug within the rounded end portion, with such traveling plug enabling the restricted passage of pressurize fluid therepast through the collapsed pipe,

restraining the traveling plug against movement through the thermoplastic pipe from the rounded end portion,

injecting a hot fluid under pressure into said end portion and past the traveling plug until a length of the collapsed thermoplastic pipe ahead of the plug becomes heated and flexible, and

allowing the traveling plug to advance at a controlled speed through the pipe from the rounded end portion while continuing to inject hot fluid under pressure into the pipe behind and past the plug to maintain the pipe in a heated flexible condition to progressively reform the length of pipe to a rounded shape as the plug travels through the pipe.

B1 5,269,721 (3381st)
METHOD AND APPARATUS FOR PROCESSING POULTRY

Cornelis Meyn, Oostzaan, Netherlands, assignor to Machinefabriek Meyn B.V., Oostzaan, Netherlands

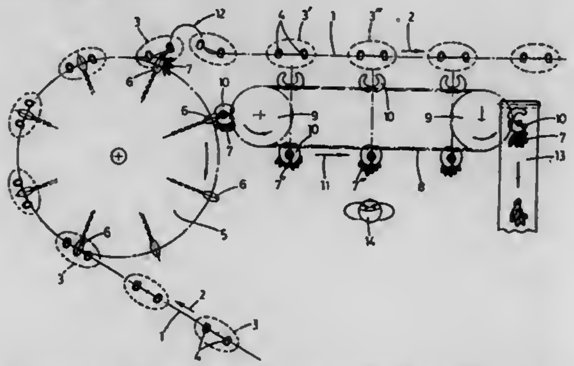
Reexamination Request Nos. 90/004,115, Jan. 31, 1996 and 90/004,263, Jun. 4, 1996 and 90/004,609, Apr. 23, 1997.

Reexamination Certificate for Patent 5,269,721, issued Dec. 14, 1993, Ser. No. 938,000, Aug. 28, 1992.

Claims priority, application Netherlands, Sep. 3, 1991, 91 01484

Int. Cl.^{6} A22C *21/06*

U.S. Cl. 452—117



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–9** is confirmed.

Claims **1** and **2** are cancelled.

Claims **3** and **10** are determined to be patentable as amended.

New claims **11-15** are added and determined to be patentable.

3. A method for processing poultry carcasses [as set forth in claim 1, further comprising the step of] *comprising the following steps:*

(*a*) *suspending poultry carcasses from a suspension conveyor at spaced intervals;*

(*b*) *conveying said carcasses through a processing station;*

(*c*) *removing the entrails from abdominal cavities of said carcasses as said carcasses are conveyed through said processing station;*

(*d*) *in an automated process at least partially separating said entrails from said carcasses without hanging said entrails on said carcasses and transferring said entrails to an inspection conveyor which extends parallel to a portion of said suspension conveyor, and conveys said entrails past an inspection station;*

(*e*) *synchronizing the velocities of said suspension conveyor and said inspection conveyor to that the carcass and the entrails which were removed therefrom pass the inspection station at the same time;*

(*f*) *removing said entrails from said inspection conveyor after they pass said inspection station, and*

(*g*) *wherein step* (*d*) *further comprises* separating said entrails from said carcasses at said processing station and transferring them to gripping means on said inspection conveyor.

B1 5,364,759 (3382nd)
DNA TYPING WITH SHORT TANDEM REPEAT POLYMORPHISMS AND INDENTIFICATION OF POLYMORPHIC SHORT TANDEM REPEATS

Charles T. Caskey, and Albert O. Edwards, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Reexamination Request No. 90/003,901, Jul. 21, 1995.

Reexamination Certificate for Patent 5,364,759, issued Nov. 15, 1994, Ser. No. 647,655, Jan. 31, 1991.

Int. Cl.^{6} C12Q *1/68;* **C07H** *15/12;* **G01N** *33/48;33/566*

U.S. Cl. 435—6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12**, **16**, **17**, **21** and **24** is confirmed.

Claims **13**, **18**, **22**, **23** and **25** are determined to be patentable as amended.

Claims **14**, **15**, **19** and **20**, dependent on an amended claim, are determined to be patentable.

New claim **26** is added and determined to be patentable.

1. A DNA profiling assay for detecting polymorphisms in at least one short tandem repeat, comprising the steps of:

extracting DNA from a sample to be tested;

amplifying said at least one short tandem repeat in the extracted DNA, wherein the short tandem repeat sequence is characterized by the formula $(A_wG_xT_yC_z)_n$ wherein A,G,T, and C represent the nucleotides; w, x, y and z represent the number of each nucleotide and range from 0 to 7; the sum of w+x+y+z ranges from 4 to 7; and n represents the repeat number and ranges from about 5 to 50; and

detecting said polymorphisms by identifying said amplified extension products for each different sequence, wherein each different sequence is differentially labelled.

B1 5,437,466 (3383rd)
IN-LINE ROLLER SKATE

Antonin A. Meibock, Cleveland, Ohio, and John E. Svensson, Seattle, Wash., assignors to K-2 Corporation, Vashon, Wash.

Reexamination Request No. 90/004,404, Oct. 16, 1996.

Reexamination Certificate for Patent 5,437,466, issued Aug. 1, 1995, Ser. No. 94,576, Jul. 19, 1993.

Int. Cl.^{6} A63C *1/02;17/06*

U.S. Cl. 280—11.22

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **5** and **6** are determined to be patentable as amended.

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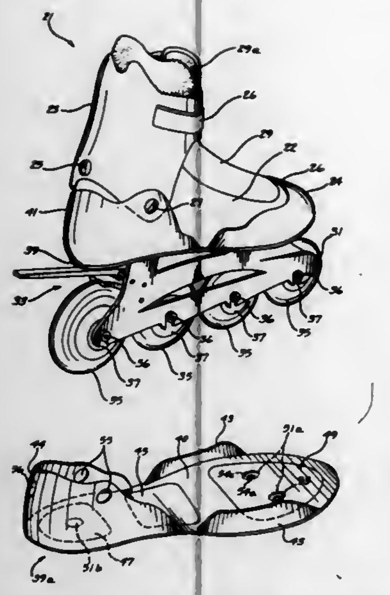


Claims **2–4**, dependent on an amended claim, are determined to be patentable.

1. In an in-line roller skate having an upper shoe portion and a lower frame portion, said upper shoe portion being adapted to support a skater's foot and said upper shoe portion being positioned upwardly adjacent said lower frame portion, and said lower frame portion including a plurality of wheels rotatable in a common, longitudinally extending plane of rotation, the improvement wherein said upper shoe portion comprises:

a non-rigid shoe portion adapted to receive [a skater's foot] *and substantially enclose the entire foot of the skater, said non-rigid shoe portion having a toe area and a heel area adjacent the toes and the heel of the skater,* said non-rigid shoe portion [formed of] *comprising* a substantially soft, pliable, *and breathable* material, said material adapted to allow air to circulate around the skater's foot, said non-rigid shoe portion including a vamp and a vamp fastener coupled to said vamp to secure said non-rigid shoe portion over the top of the skater's foot;

support means positioned adjacent selected areas of said non-rigid shoe portion for [provide] *providing* support to aid the skater in maintaining said in-line roller skate in a substantially vertical position, said support means including an ankle support cuff for surrounding an ankle portion of said non-rigid shoe portion, said support means further including a heel counter [for] cupping the heel [of the skater's foot] *area of the non-rigid shoe portion,* wherein said heel counter and said ankle support cuff are pivotally interconnected, said support means being positioned adjacent only portions of said non-rigid shoe [position] *portion,* said vamp not being substantially covered by said support means such that air circulates through said non-rigid shoe portion to cool the skater's foot while skating; and

a base portion, said base portion *being substantially rigid when attached to said lower frame portion, said base portion* having an upper surface for receiving the skater's foot and a lower surface [for] providing a connecting interface between said lower *frame* portion and said upper shoe portion, *said upper surface having a portion for engaging the toe area of the non-rigid shoe portion for substantially preventing lateral movement of the toe area relative to the base portion,* said ankle support cuff and said heel counter [vertically] extending [said support means upward] *vertically upwardly* from said base portion, said non-rigid shoe portion being permanently affixed to said base portion *at least at said toe area and said heel area for substantially preventing movement therebetween at least in a horizontal plane,* wherein at least a portion of said non-rigid shoe portion extends continuously from said base portion to at least the top of said ankle support cuff.

B1 5,452,951 (3384th)
ELECTRONIC COMPONENT RACK

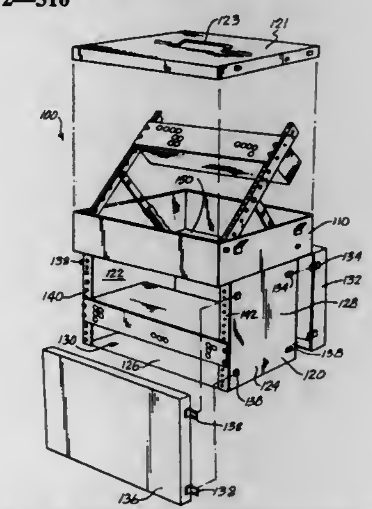
Hyman H. Peller, Upper Montclair, N.J., assignor to Raxxess Metalsmiths Inc., Prospect Park, N.J.

Reexamination Request No. 90/004,392, Sep. 23, 1996.

Reexamination Certificate for Patent 5,452,951, issued Sep. 26, 1995, Ser. No. 183,473, Jan. 18, 1994.

Int. Cl.⁶ A47B *88/00*

U.S. Cl. 312—310



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **19**,**20** are confirmed.

Claims **1-16** are cancelled.

Claims **17**, **18**, **21**, **22**, **25**, **26**, **28**, **30** and **32** are determined to be patentable as amended.

Claims **23**, **24**, **27**, **29** and **31**, dependent on an amended claim, are determined to be patentable.

19. The apparatus as claimed in claim **16**, wherein said preselected opening plane is oriented at an angle to said predetermined opening plane.

B1 5,458,282 (3385th)
CARD HAVING MAGNETIC SHEET SECURED TO ONE SURFACE

John J. Martin, Louisville, Ky., assignor to Crane Productions, Inc.

Reexamination Request No. 90/004,508, Jan. 8, 1997.

Reexamination Certificate for Patent 5,458,282, issued Oct. 17, 1995, Ser. No. 915,537, Jul. 20, 1992.

Int. Cl.⁶ B42D *15/02*

U.S. Cl. 229—92.8

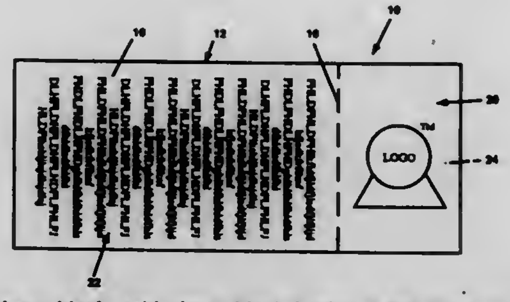
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–12**, dependent on an amended claim, are determined to be patentable.

New claims **13–17** are added and determined to be patentable.

1. A card, comprising:



a planar blank, said planar blank having a first planar surface and a second planar surface, *said planar blank having a first edge and an opposed second edge and a third edge and an opposed fourth edge,* said planar blank having at least one line of perforations dividing said planar blank into a first section and a second section; and, a thin flexible, magnetic sheet material having magnetic materials therein, said magnetic sheet material being capable of magnetically holding said card to a magnetic substance, said magnetic sheet material being secured to said first planar surface within said first section *and contained entirely therewithin and defining an exterior surface, said magnetic sheet material extending substantially from said third* edge of said blank to said opposed fourth edge of said blank and substantially from said first edge partways toward said opposed second edge; where said first section of said card having said magnetic sheet material secured thereto can be separated from said second section of said card along said at least one line of perforations.

B1 5,478,356 (3386th)
CYANOIMIDES AND COMPOSITIONS USEFUL FOR BLEACHING

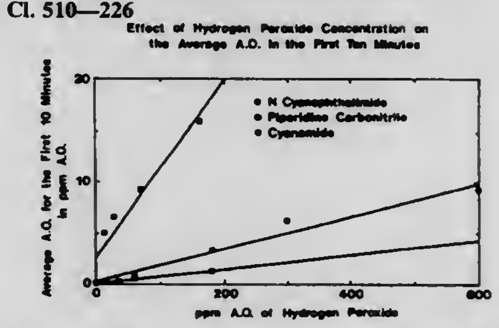
Thomas W. Kaaret, Alamo, Calif., assignor to Clorox Company, Oakland, Calif.

Reexamination Request No. 90/004,397, Sep. 30, 1996.

Reexamination Certificate for Patent 5,478,356, issued Dec. 26, 1995, Ser. No. 240,248, May 10, 1994.

Int. Cl.⁶ D06L *3/02;* **C11D** *3/28;3/395*

U.S. Cl. 510—226

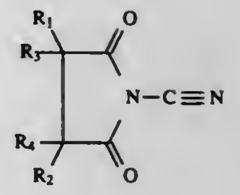


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

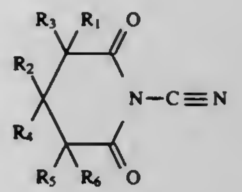
The patentability of claims **1–29** is confirmed.

1. A composition, useful for bleaching, comprising:

(a) an activator compound, the activator compound having either of the following structures



or

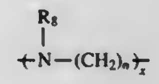


where R_1 and R_2 taken together with the carbon atoms to which they are attached form a ring containing 4 to 6 carbon atoms, whereby the carbon atoms in the ring may be singly or multiply substituted with hydrogen, C_1–C_{20} alkyl, C_1–C_{20} alkoxy, C_1–C_{20} alkanoyl, phenyl, benzoyl, middle halogen, amino, amine salt, phosphate or phosphonate group, sulfate or sulfonate group, cyano or cyanoamino group, or with a cyclic group of 4 to 6 carbon atoms, or with a nitrogen-containing heterocyclic group of 4 to 6 atoms, or

where R_1 and R_2 taken together with the carbon atoms to which they are attached form a heterocyclic ring containing 5 to 7 atoms containing one or two hetero atoms selected from the group consisting of O, S, and N-R_7, where R_7 is hydrogen or a C_1–C_{20} alkyl, C_1–C_{20} alkoxy, C_1–C_{20} alkanoyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, phenyl, benzoyl, middle halogen, amino, amine salt, phosphate or phosphonate group, sulfate or sulfonate group, cyano or cyanoamino group, and

where R_3, R_4, R_5, and R_6 are the same or different and independently represent hydrogen, C_1–C_{20} alkyl (straight chain, branched chain, or cycloalkyl), C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_1–C_{20} alkanoyl, C_1–C_{20} ethoxylate or propoxylate, phenyl, benzoyl, C_7–C_{20} aralkyl, alkenylcyanoamino; or

where R_1, R_2, R_3, R_4, R_5, and R_6 are the same or different and independently represent hydrogen, C_1–C_{20} alkyl (straight chain, branched chain, or cycloalkyl), C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_1–C_{20} alkanoyl, C_1–C_{20} ethoxylate or propoxylate, phenyl, benzoyl, C_7–C_{20} aralkyl, alkenylcyanoamino, or a polyalkenylamino of the type



$$\left(\overset{\overset{\displaystyle R_8}{|}}{N}-(CH_2)_n\right)_x$$

where n=1 or 2 and X is 1–10 and R_8 is hydrogen or cyano, a Group IA metal, or any of the foregoing radicals containing a substitutable carbon atom on which is substituted a C_1–C_5 alkyl, C_1–C_5 alkoxy, C_1–C_5 alkanoyl, middle halogen, amino or an amine salt, carboxylate, phosphate or phosphonate group, sulfate or sulfonate group, cyano, cyanoamino or hydroxyl group; and

(b) a peroxygen source in a sufficient amount to form an oxidizing agent derivative of the activator compound when the peroxygen source and the activator are in a solvent therefor.

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B1 5,487,938 (3387th)
SILICA SUPPORTED TRANSITION METAL CATALYST

Lee Spencer, Pearland; Brian W. S. Kolthammer, Lake Jackson; Miriam P. Ripplinger, Lake Jackson; Jeffrey J. Wooster, Lake Jackson; Pak-Wing S. Chum, Lake Jackson, and Jacquelyn A. deGroot, Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Reexamination Request No. 90/004,472, Nov. 29, 1996.

Reexamination Certificate for Patent 5,487,938, issued Jan. 30, 1996, Ser. No. 336,947, Nov. 10, 1994.

Division of Ser. No. 21,705, Feb. 24, 1993, Pat. No. 5,420,092, which is a division of Ser. No. 854,175, Mar. 20, 1992, Pat. No. 5,231,151, which is a continuation-in-part of Ser. No. 644,053, Jan. 18, 1991, abandoned.

Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—332

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–11 is confirmed.

1. In a process for extruding an ethylene/alpha-olefin copolymer into a film, the improvement comprising employing as said ethylenealpha-olefin copolymer one having greater than about 17 percent high density fraction and a M_w/M_n ratio of less than about 3.6 to form a film having a gauge from about 0.4 to about 1.2 mils, a percent ultimate stretchability of at least about 280, and a puncture resistance of at least about 250 ft-lbs/cm^3.

B1 Des. 367,846 (3370th)
VEHICLE STARTER CABLE

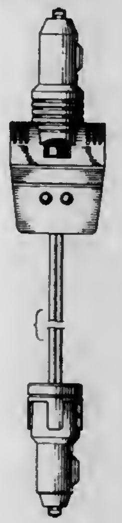
Eitan B. Moshe, Canoga Park, Calif., assignor to Sun-Mate Corp., Canoga Park, Calif.

Reexamination Request No. 90/004,411, Oct. 15, 1996.

Reexamination Certificate for Patent Des. 367,846, issued Mar. 12, 1996, Ser. No. 37,888, Apr. 24, 1995.

Int. Cl.^{6} 13 *03*

U.S. Cl. D13—144



REISSUES

NOVEMBER 18, 1997

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,662
VALVE OPERATING APPARATUS

Shinichi Murata; Noboru Nakamura; Michiyasu Yoshida, and Hideki Miyamoto, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

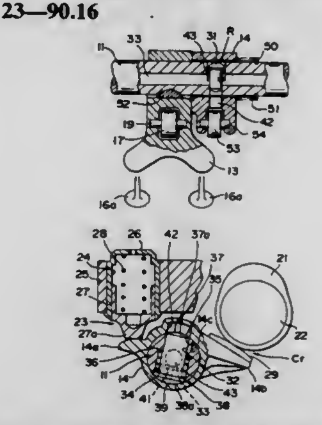
PCT No. PCT/JP91/00053, § 371 Date Sep. 18, 1991, § 102(e) Date Sep. 18, 1991, PCT Pub. No. WO91/10816, PCT Pub. Date Jul. 25, 1991

Original No. 5,186,128, dated Feb. 16, 1993, Ser. No. 762,021, Jan. 18, 1991. This PCT application Jan. 18, 1991, Ser. No. 389,315

Claims priority, application Japan, Jan. 18, 1990, 2-009425; Mar. 31, 1990, 2-033577; Mar. 31, 1990, 2-033578; Mar. 31, 1990, 2-033579

Int. Cl.^{6} F01L *1/34;1/18*

U.S. Cl. 123—90.16 **76 Claims**



74. A valve operating apparatus for use in an engine, comprising:

- *a camshaft with low- and high-speed cams mounted thereon;*
- *a low-speed rocker arm having an end against the stem of a valve, said low-speed rocker arm being swingable by said low-speed cam to actuate said valve;*
- *a high-speed rocker arm supported parallel to said low-speed rocker arm, said high-speed rocker arm being swingable by said high-speed cam, the swing of said high-speed rocker arm being transmitted through a transmitting mechanism to said low-speed* rocker arm in response to an operating status of the engine; and
- *first biasing means for normally pressing said high-speed rocker arm against said high-speed cam, said first biasing means having a first end and a second end, said first end being disposed against an upper surface of said high-speed rocker arm, said second end being in contact with a stationary member of the engine disposed above said rocker shaft, said stationary member being non-movable with respect to a longitudinal axis of said rocker shaft.*

Re. 35,663
METHOD AND APPARATUS FOR TRANSPORTATION OF MATERIALS

Kinji Mori, Yokohama; Yasuo Suzuki, Ebina; Masayuki Orimo, Machida; Shoji Miyamoto, Kawasaki, and Hirokazu Ihara, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

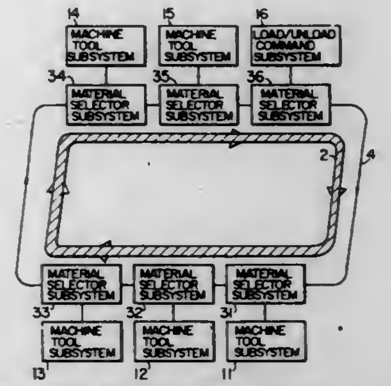
Reissued No. 1,033,862, dated Mar. 31, 1992, Ser. No. 454,860, Jan. 16, 1990. Continuation of Ser. No. 454,860, Jan. 16, 1990, Pat. No. Re. 33,862, which is a continuation of Ser. No. 143,960, Jan. 14, 1988, abandoned. Application for reissue Mar. 31, 1992, Ser. No. 783,129

Claims priority, application Japan, Oct. 29, 1982, 57-189060

Int. Cl.^{6} B65G *43/00*

U.S. Cl. 198—341 **32 Claims**

24. A producing system comprising;


14
MACHINE TOOL SUBSYSTEM
15
MACHINE TOOL SUBSYSTEM
16
LOAD/UNLOAD COMMAND SUBSYSTEM
34
MATERIAL SELECTOR SUBSYSTEM
35
MATERIAL SELECTOR SUBSYSTEM
36
MATERIAL SELECTOR SUBSYSTEM
2
4
MATERIAL SELECTOR SUBSYSTEM
MATERIAL SELECTOR SUBSYSTEM
MATERIAL SELECTOR SUBSYSTEM
33
32
31
MACHINE TOOL SUBSYSTEM
MACHINE TOOL SUBSYSTEM
MACHINE TOOL SUBSYSTEM
13
12
11

- transporting means for transporting materials to be used for production of an object;
- a plurality of subsystems of machine tools each for processing at least a selected one of the materials transported by said transporting means;
- detecting means provided to each of said subsystems for detecting the materials transported by said transporting means;
- unloading means provided to each of said subsystems for unloading from said transporting means the materials which the associated subsystem requires;
- a plurality of control means respectively provided to each of said subsystems for controlling the unloading means of the associated subsystem; and
- transmitting means for transmitting therethrough information among the plurality of control means which have been provided to each of said subsystems, respectively,
- wherein a control means includes means for instructing the associated uploading means to unload materials based on a request for material issued by the associated subsystem, a detection of materials by the associated detecting means and information transmitted through said transmitting means from the other control means.

Re. 35,664
FRICTION WELDING

John Gilbert Searle, Hednesford, England, assignor to Rolls-Royce plc, London, England

Original No. 5,148,957, dated Sep. 22, 1992, Ser. No. 780,461, Oct. 22, 1991. Application for reissue Feb. 10, 1995, Ser. No. 387,222

Claims priority, application United Kingdom, May 6, 1989, 8910452

Int. Cl.^{6} B23K *20/12*

U.S. Cl. 228—2.1 **6 Claims**

1. Apparatus for use in welding a first component and a second component together by friction welding, comprising drive means operative to generate reciprocatory movement, a component holder operative to hold said first component, linking means operative to

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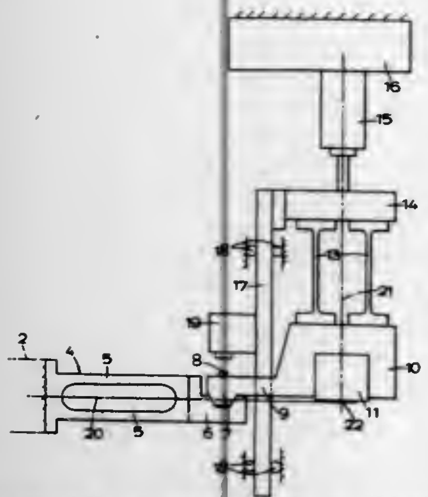


transmit reciprocatory movement from said drive means to said component holder so that in operation said first component performs reciprocatory heat-generating movement, pressure means operative to exert pressue on said component holder so that in operation said first component also performs welding movement, said pressure means being such as to accommodate the heat-generating movement during friction welding, and wherein said linking means comprises at least one flexible element which is alternately in compression and in tension as it transmits said reciprocatory movement from said drive means to said component holder and which bends or flexes to accommodate the welding movement of said component holder during friction welding.

Re. 35,665

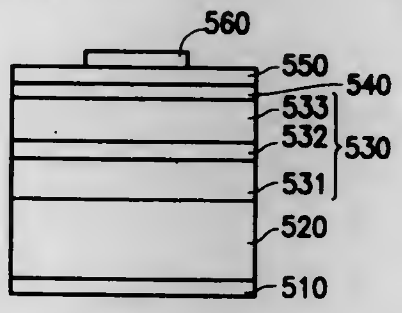
SURFACE LIGHT EMITTING DIODE WITH ELECTRICALLY CONDUCTIVE WINDOW LAYER

Jyh-Feng Lin, Hua-Lien; Chuan-Ming Chang, Hsinchu; Biing-Jye Lee, Hsinchu, and Ming-Jiunn Jou, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Original No. 5,481,122, dated Jan. 2, 1996, Ser. No. 279,874, Jul. 25, 1994. Application for reissue Jun. 25, 1996, Ser. No. 668,601

Int. Cl.⁶ H01L *33/00*

U.S. Cl. 257—94 **18 Claims**



1. A light emitting diode comprising:

a GaAS substrate of a first conductivity type, which has a back electrical contact;

a double hetero-structure of AlGaInP on the substrate;

[a transparent] *an* ohmic contact layer on the double hetero-structure;

a conductive transparent ITO window layer over the ohmic contact layer; and

a front electrical contact on the window layer.

PLANT PATENTS

GRANTED NOVEMBER 18, 1997

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,120

TORENIA PLANT 'SUNRENIMU'

Yuki Nagase, Seki, Japan, assignor to Suntory Limited, Osaka, Japan

Filed Nov. 20, 1995, Ser. No. 559,840

Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct variety of the torentia plant characterized as to novelty by its semi-erect habit, dark reddish purple flower petal with light purple floral tube without yellow eye color, substantially as shown and described.

10,121

CARNATION PLANT NAMED JAZZ

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 1, 1996, Ser. No. 608,624

Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—70.2 **1 Claim**

1. A new and distinct carnation plant named Jazz, as described and illustrated.

10,122

DAHLIA PLANT NAMED BISUYEL

Christoph Kleinhanns, Eisleben, Germany, assignor to Saatzucht Quedlinburg GmbH, Quedlinburg, Germany

Filed Jun. 3, 1996, Ser. No. 660,068

Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87.8 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named Bisuyel, as illustrated and described.

10,123

DAHLIA PLANT NAMED BAYEL

Christoph Kleinhanns, Eisleben, Germany, assignor to Saatzucht Quedlinburg GmbH, Quedlinburg, Germany

Filed Jun. 3, 1996, Ser. No. 657,364

Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87.8 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named Bayel, as illustrated and described.

10,124

DAHLIA PLANT NAMED BAPUR

Christoph Kleinhanns, Eisleben, Germany, assignor to Saatzucht Quedlinburg GmbH, Quedlinburg, Germany

Filed Jun. 3, 1996, Ser. No. 657,649

Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87.8 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named Bapur, as illustrated and described.

10,125

DAHLIA PLANT NAMED BAYELOR

Christoph Kleinhanns, Eisleben, Germany, assignor to Saatzucht Quedlinburg GmbH, Quedlinburg, Germany

Filed Jun. 3, 1996, Ser. No. 659,967

Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87.8 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named Bayelor, as illustrated and described.

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PATENTS

GRANTED NOVEMBER 18, 1997

ERRATA

For CLASS	See PATENT NO.
068–017	5,687,586
072–424	5,687,613
123–502	5,687,702
237–019	5,687,908
434–226	5,688,136
434–247	5,688,137
482–135	5,688,216
222–606	5,688,425
437–048	5,688,661
438–217	5,688,722
503–227	5,688,737
503–227	5,688,738
564–479	5,688,854
530–388	5,688,927
530–391	5,688,928
546–202	5,688,960
554–098	5,688,982
588–200	5,689,038
348–094	5,689,281
385–123	5,689,578

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PATENTS

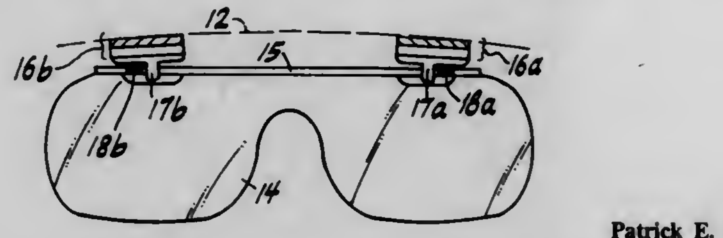
GRANTED NOVEMBER 18, 1997

GENERAL AND MECHANICAL

5,687,420

DEVICE FOR AFFIXING SUNSHADES TO A CAP

Tyler O. Chong, 425 E. 86th St., #7-F, New York, N.Y. 10028
Filed Jun. 18, 1996, Ser. No. 666,677
Int. Cl.⁶ A42B *1/06*
U.S. Cl. 2—10 **8 Claims**



1. A device for affixing sunshades to a cap having a brim projecting on a front side thereof over a wearer's face comprising:

(a) a pair of sunshades having an upper rib with left and right side portions thereof positioned substantially on opposite sides of the sunshades in a widthwise direction thereof;

(b) anchoring means having left and right side members for anchoring to the brim of the cap at positions substantially corresponding to the positions of the left and right side portions of the upper rib of the sunshades when the sunshades are placed in an operative position with respect to said brim; and

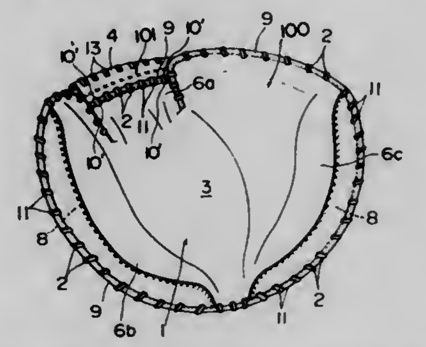
(c) attachment means for attachment of the left and right side members of the anchoring means to the left and right side portions of the upper rib of the sunshades in order to hold the sunshades in the operative position on the brim of the cap,

wherein said upper rib has a cam surface which abuts against a stationary surface of said anchoring means so as to provide a detent position for maintaining the sunshades stably in position when they are rotated to or from the operative position.

5,687,421

BASEBALL MITT AND GLOVE PROTECTING COVERS, AND BASEBALL MITT AND GLOVE WITH PROTECTIVE COVERS

Hideaki Murai, Osaka, Japan, assignor to KSK Co., Ltd., Akune, Japan
Filed Apr. 22, 1992, Ser. No. 872,075
Claims priority, application Japan, Jul. 23, 1991, 3-065563 U; Mar. 4, 1992, 4-020510 U
Int. Cl.⁶ A41D *13/10*
U.S. Cl. 2—19 **4 Claims**



1. A baseball mitt protecting cover in combination with a baseball mitt, for protecting a catching face of the baseball mitt, wherein the baseball mitt includes a portion for receiving a hand, a catching face, a rear surface and a retaining strap on the rear surface of the mitt, comprising:

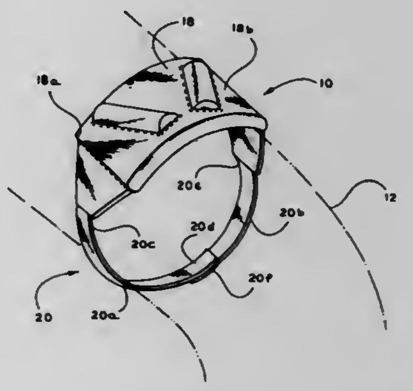
a supple sheet cover body sized to protect the catching face of the baseball mitt; and

fastening means for removably fastening said supple sheet cover body on the catching face of said mitt.

5,687,422

KNEE PADS FOR SPORTS USE

Patrick E. Wurst, 3118-B Crepe Myrtle Ct., and Samuel S. Klement, 509 N. Westover Blvd., No. 1432, both of Albany, Ga. 31707
Filed Feb. 13, 1996, Ser. No. 600,516
Int. Cl.⁶ A41D *13/06*
U.S. Cl. 2—24 **2 Claims**



1. A knee guard, comprising:

a substantially elongated rectangular foam member having a top surface and a bottom surface,

a pair of substantially elongated semi-circular foam members adjacently spaced and connected to the top surface of the substantially elongated rectangular foam member,

an elongated flexible sheet covering the top and bottom surfaces of the substantially elongated foam member and the pair of semi-circular foam members,

the sheet having perimeter edges sewn together thereby securing the substantially elongated rectangular foam member within the folded sheet,

the folded sheet having a first end and an oppositely spaced second end, a first elongated strap having a first end connected to the first end of the folded sheet,

the first strap having a second end oppositely spaced from its first end,

the first strap's second end having one half of a hook and loop fastener connected thereto,

a second elongated strap having one end connected to the second end of the folded sheet,

the second strap having a second end oppositely spaced from its first end, the second strap's second end having one half of a hook and loop fastener connected thereto,

at least one elastic pocket disposed on the folded sheet, and

the pocket being fabricated from a substantially elastic material.

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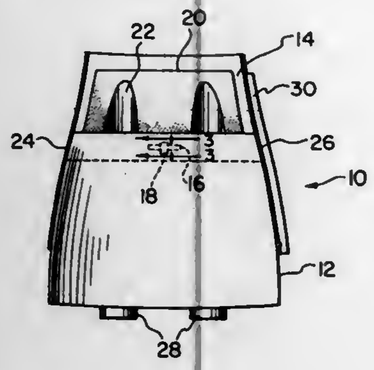
5,687,423
VENTILATED, FLEXIBLE JACKET HAVING A MEANS FOR INTERCONNECTING THE CAPE AND BODY PORTIONS

Stanley M. Ross, 11059-130 A Street, Surrey, British Columbia, Canada, V3T 3P1

Filed Sep. 1, 1994, Ser. No. 299,300

Int. Cl.^{6} A41D *1/02;3/00*

U.S. Cl. 2—93 **8 Claims**



1. A jacket or coat, comprising:
(a) a body portion for enclosing the trunk and only a lower portion of the chest of a user;
(b) a cape having sleeves for enclosing the shoulders and arms and a portion of the chest of a user; and
(c) means for interconnecting the body portion and a top of the cape which permits relative movement of the two and air flow through substantially the whole upper chest and back region of a user.

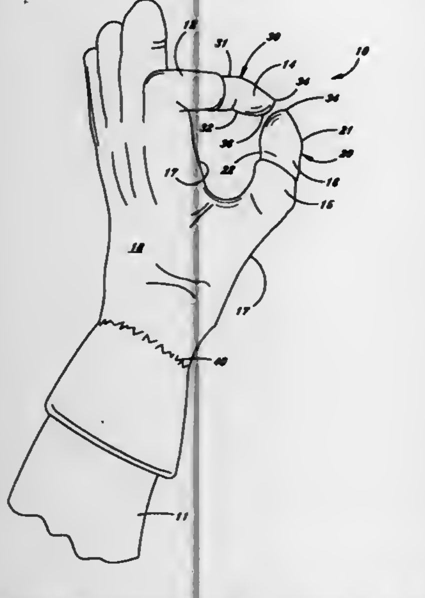
5,687,424
HAND COVERING HAVING ANATOMICALLY SHAPED FINGER TIP

Francis J. Masley, Wilmington, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jun. 10, 1996, Ser. No. 661,270

Int. Cl.^{6} A41D *19/00*

U.S. Cl. 2—163 **20 Claims**



13. An improved hand covering of the type having an index finger stall, a thumb stall, a palm portion, and a dorsal portion, the improvement comprising:

at least an index finger covering fixedly attached to said index finger stall, said index finger covering having a substantially elliptical cross section, an upper portion, a lower portion, a ridge formed from the union of the upper portion and the lower portion, and an arching transition section from said lower portion to said upper portion, wherein said index finger covering defines substantially the same shape as a human index finger tip; and

a thumb covering fixedly attached to the thumb stall, said thumb covering defining first and second portions, said first portion corresponding to an outermost phalange of a thumb, said second portion corresponding to a base phalange of said thumb, wherein an angle "ø" is defined between an axis substantially parallel to said first potion of said thumb covering and an axis substantially parallel to said second portion of said thumb covering, said angle "ø" ranging from about 120° to about 170°;

wherein the improved hand covering provides a wearer with improved dexterity and tactility, thereby, allowing the wearer to perform fine motor skill operations.

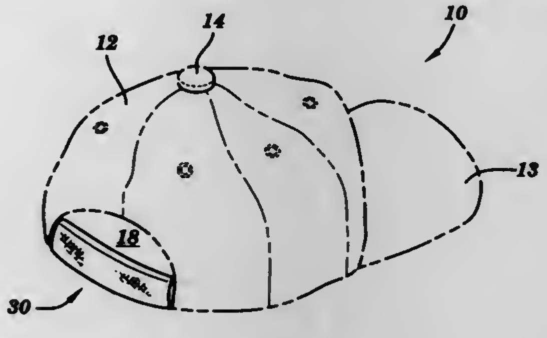
5,687,425
CAP STRAP CUSHION AND METHOD OF USE THEREOF

Stephen James Blosser, P.O. Box 141, New Baltimore, N.Y. 12124

Filed Jun. 4, 1996, Ser. No. 658,086

Int. Cl.^{6} A42C *5/00*

U.S. Cl. 2—209.13 **9 Claims**



1. A cap strap cushion attachable to one or more adjustable straps of a baseball-style cap, comprising:

a pliable tubular member having a first open end and a second open end, each of said open ends defining an inseparable edge;

an interior channel extending from said first open end to said second open end;

said first open end and said second open end each being configured so that either of said one or more adjustable straps can be inserted into and through said interior channel;

said pliable tubular member being sized to receive said one or more adjustable straps therein; and

wherein said pliable tubular member comprises a synthetic fleece.

5,687,426
BICYCLE HELMET

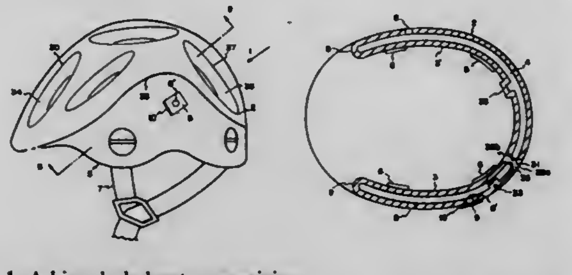
Gerhard Sperber, Hersbruck, Germany, assignor to Elasto Form, Sulzbach-Rosenberg, Germany

Continuation of Ser. No. 570,826, Dec. 12, 1995, abandoned, which is a continuation of Ser. No. 121,921, Sep. 17, 1993, abandoned. This application Aug. 28, 1996, Ser. No. 704,172

Claims priority, application Germany, Feb. 25, 1993, 43 05 745.4; Aug. 9, 1993, 43 26 667.3; Aug. 9, 1993, 9311851 U; Aug. 31, 1993, 43 29 297.6

Int. Cl.^{6} A42B *3/00*

U.S. Cl. 2—411 **17 Claims**



1. A bicycle helmet, comprising:

an integrally molded helmet body having an inner shell and an outer shell, the inner and outer shells being concentrically spaced apart and integrally connected to each other by first shell connecting means disposed proximate an edge portion of the helmet body, the inner and outer shells further being integrally connected by second shell connecting means disposed proximate an intermediate portion of the shells spaced from the edge portion, the second shell connecting means including an annular wall of a through opening contained in the helmet body between the shells, the annular wall including integrally molded converging wall portion and diverging wall portion in a direction from the outer shell to the inner shell, thereby to reinforce the helmet body, the spaced apart inner and outer shells forming an air passageway therebetween, the air passageway being filled with air; and

an air outlet being disposed on the helmet body, the air outlet being in fluid communication with the air passageway, the air in the air passageway being dischargeable through the air outlet in case a shock or impact force results in a pressure on the shells.

5,687,427
INTEGRAL SAFETY HELMET FOR MOTORCYCLISTS, MOTORISTS, SPORTS DRIVERS INCLUDING AN IMPROVED VISOR

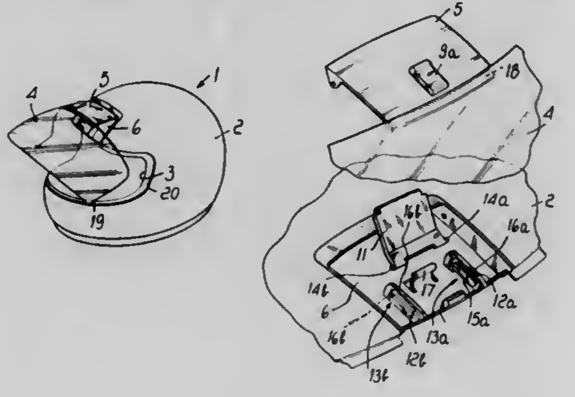
Cario Lamattina, Lomagna, and Cesare Landi, Milan, both of Italy, assignors to Cesare Landi S.r.l., Milan, Italy

Filed Jun. 19, 1996, Ser. No. 667,975

Claims priority, application Italy, Jun. 29, 1995, BG950032 U; Dec. 6, 1995, MI95A2577

Int. Cl.^{6} A42B *3/22*

U.S. Cl. 2—424 **6 Claims**



1. A safety helmet for motorcyclists, motorists, and sports drivers of an integral type, having an opening visor, comprising a hollow cap body having, on a front side thereof, a window, at said window a visor being arranged, said visor being connected to a supporting element extending on said visor at a central top region of a front side of said cap body, said supporting element being pivoted to said cap body at a top region thereof and recessed with respect to said visor, said supporting element being adapted to swing about a pivoting axis thereof, arranged substantially perpendicular to a symmetry plane of said cap body, for opening and closing said visor, said window being provided with a recessed edge to receive therein an edge of said visor in a closing condition of said visor in which said visor edge is substantially continuous with the profile of said cap body, said supporting element being provided with locking means for locking said visor in a closing position thereof, said locking means comprising a tooth element mounted on said supporting element and adapted to be engaged with or disengaged from an abutment provided on a front side of said cap body, above said window, wherein said tooth element is rigid with a slide element associated with said supporting element and accessible from an outer side of said supporting element, said slide element sliding with respect to said supporting element for disengaging said tooth element from said abutment as counterbiassed by resilient means.

5,687,428
GOGGLES

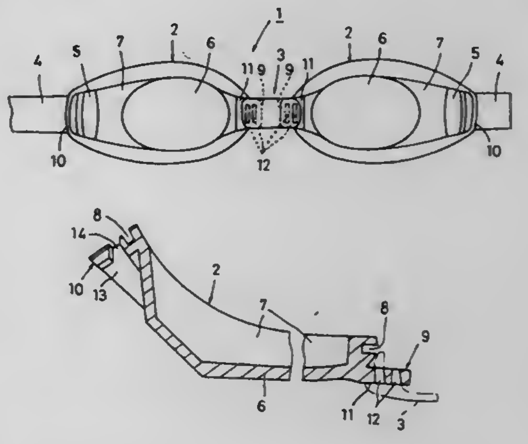
Tamenobu Yamamoto, Higashi-Osaka, Japan, assignor to Yamamoto Kogaku Co., Ltd, Higashi-Osaka, Japan

Filed Feb. 28, 1996, Ser. No. 608,438

Claims priority, application Japan, Mar. 23, 1995, 7-064459

Int. Cl.^{6} A61F *9/02*

U.S. Cl. 2—445 **7 Claims**



7. Goggles comprising:

a left eyecup having a first inner end and a second opposite end, the first inner end of the left eyecup having a left mount portion, the left mount portion having a plurality of engagement holes;

a right eyecup having a first inner end and a second opposite end, the first inner end of the right eyecup having a right mount portion, the right mount portion having a plurality of engagement holes;

a connecting member, removably connected to one of the plurality of engagement holes in the left mount portion of the left eyecup and to one of the plurality of engagement holes in the right mount portion of the right eyecup, so that the left and right eyecups are interconnected; and

an elastic band having a first end and a second end, the first end of the elastic band connected to the second opposite end of the left eyecup and the second end of the elastic band connected to the second opposite end of the right eyecup.

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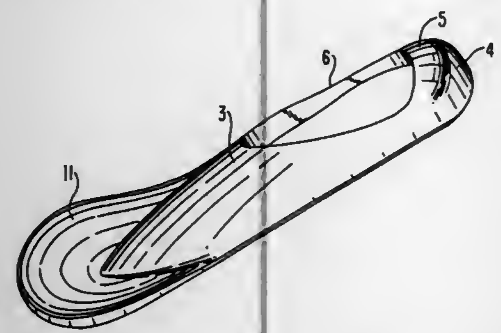
5,687,429
URINAL

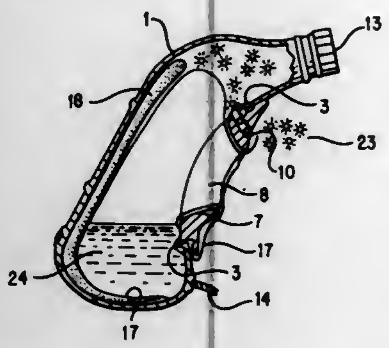
Søren Rahlff, Nivå, Denmark, assignor to Jan Tholstrup, Tappernoje, Denmark
PCT No. PCT/DK94/00377, § 371 Date Jul. 14, 1995, § 102(e) Date Jul. 14, 1995, PCT Pub. No. WO95/10250, PCT Pub. Date Apr. 20, 1995
PCT Filed Oct. 10, 1994, Ser. No. 448,581
Claims priority, application Denmark, Oct. 8, 1993, 1128/93
Int. Cl.^{6} A47K *11/00*
U.S. Cl. 4—144.4 **20 Claims**



1. Urinal for a woman comprising an elongated inlet member to be inserted between the labia majora of a woman, said inlet member comprising an inlet opening with a periphery, the latter forming at least a partial seal around a female urethral orifice during use, said inlet member further comprising a flow duct between the inlet opening and an outlet opening delimited by a right and left lateral wall, said lateral walls preferably being arranged symmetrically around a longitudinal plane of symmetry, and by a front and rear wall, said inlet member furthermore being sealingly connected to a collecting container, at the outlet opening so that the liquid can pass through the flow duct and into the collecting container, external surfaces of the right and left lateral walls diverging in a direction away from the inlet opening at least in an area directly around the periphery of the inlet opening, the internal wall surfaces of the inlet member diverge in a direction from the inlet opening to the outlet opening, thus forming a reverse funnel.

5,687,430
PERFUMED URINE COLLECTION VESSEL FOR MEN AND WOMEN

Mieko Itai, Oaza Kannawa 999-6, Beppu City, Oita Pref., Japan
Filed Aug. 5, 1994, Ser. No. 287,287
Int. Cl.^{6} A47K *11/12*
U.S. Cl. 4—144.2 **4 Claims**



1. A commode for men and women comprising:

a waste collection vessel having at least one opening in a wall thereof, said wall opening shaped to conform to a user's body for receiving waste discharge;

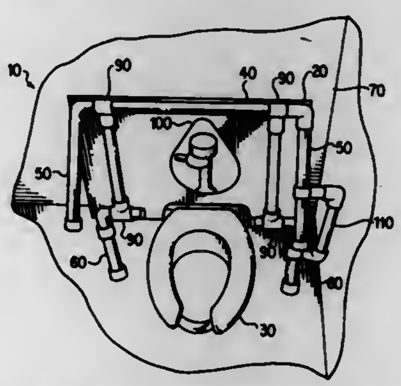
a perfumed sheet disposed within said vessel;

an annular packing ring including an outer portion having a diameter to be sealingly received in said wall opening, and an inner portion, said packing further including a vent hole therethrough;

a liquid impervious bag disposed within said vessel, said bag having a mouth portion extending through said packing along said inner portion, said mouth portion being folded over said packing and further extending along said outer portion, said mouth portion having a terminal end portion sealingly secured in said wall opening by said packing, said terminal end portion being unsecured adjacent said vent hole to allow communication between the vessel interior and ambient.

5,687,431
TOILET TRANSFER BENCH

David Allen Garrett, 2851 Elderwood Rd., Salem, Va. 24153
Filed Sep. 7, 1995, Ser. No. 524,844
Int. Cl.^{6} E03D *11/00*
U.S. Cl. 4—254 **2 Claims**



1. A toilet transfer bench for use over existing toilets which are attached at the back of the toilet to a wall, the toilet having a toilet seat, wherein the toilet transfer bench comprises:

a rigid platform including a back edge, a front edge and two side edges, wherein the back edge of the platform is hingedly connected to the wall behind the existing toilet, the platform having an opening generally corresponding in location and size to the opening of the existing toilet seat when the toilet transfer bench is positioned over the existing toilet, the width of the platform being sufficient to permit a user to slide onto the platform and to roll to facilitate dressing and personal hygiene;

a plurality of vertical legs attached at the top of each leg near the front edge of the platform, wherein the height of each leg attached near the front edge of the platform is sufficient to support the platform at a height that is at least as high as the height of the toilet seat;

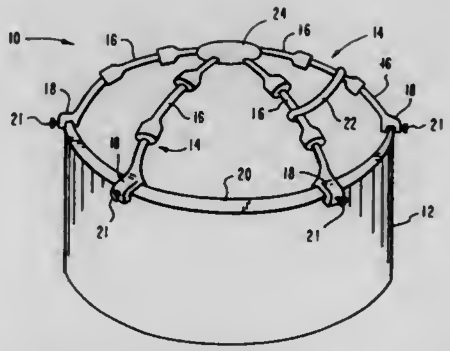
a plurality of vertical legs attached at the top of each leg near the back edge of the platform, wherein the vertical legs attached near the front and back edges of the platform are hingedly attached to the platform; and

a bar member pivotally connected to the front and back legs at one side edge of the rigid platform.

5,687,432
PORTABLE FRAME COMPRISED OF INTERLOCKING FLEXIBLE RIBS

Charles C. J. Genzel, P.O. Box 34, West Davenport, N.Y. 13860
Continuation of Ser. No. 298,134, Aug. 30, 1994, abandoned. This application Jan. 22, 1996, Ser. No. 589,646
Int. Cl.^{6} E04H *4/08*
U.S. Cl. 4—498 **14 Claims**

1. A frame for supporting a pool or spa cover sheet, said frame extending above said pool or spa and including:



at least one central hub positioned above said pool or spa and having a plurality of locations therein to which ribs can be removably held,

a plurality of flexible ribs extending from said central hub to the edge of said pool or spa, said ribs including removably interlocking segments connected end-to-end in a snap-lock manner,

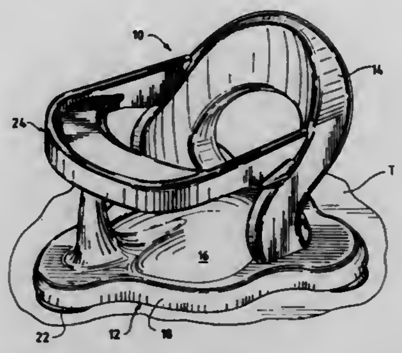
said segments having at one end thereof a portion where another segment can be inserted for joining said segments in end-to-end fashion, the joined ends of said segments including protruding and recessed portions that snap-lock to have said segments interlock when joined,

end members having a first portion connected to the ends of said ribs remote from said central hub and a second portion being adapted to conform to the contour of the edge of said pool or spa and to rigidly abut against said edge to secure said frame thereagainst, said end members providing a portion of the length of said ribs,

said frame being flexed and dome-shaped when in place over said pool or spa, the highest portion of said frame above said pool being said at least one central hub, said frame being held securely in place by forces between said rib segments when said ribs are flexed between the edge of said pool or spa and said central hub.

5,687,433
CHILD BATH SEAT

Michael S. Garner, Northbrook; Craig S. Scherer, Wilmette, and Michael C. Thuma, Desplaines, all of Ill., assignors to BRK Brands, Inc., Aurora, Ill.
Filed Jun. 27, 1996, Ser. No. 670,556
Int. Cl.^{6} A47K *3/12*
U.S. Cl. 4—572.1 **5 Claims**



1. A molded child bath seat comprising:

a molded, partly open back;

a base to which the back is coupled, said base adapted to extend in a first plane in use;

first and second spaced apart tray support elongated side elements;

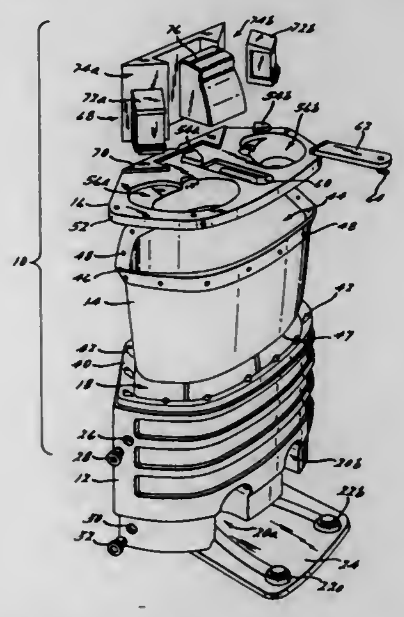
an elongated child retaining member which extends from the base, centrally located at an end of the base, displaced from the back and equidistant from the tray supporting elements wherein the retaining member has a free end displaced from the base, wherein the free end carries first and second spaced apart, opposed, surfaces for balancing and slidably retaining a tray;

first and second manually operable latch elements carried, at least in part, on the tray supporting elements;

a tray linearly movable in a second plane which is parallel to said first plane wherein the tray carries first and second slots for receiving the first and second tray supporting elements and a balancing element which extends therefrom, between the slots, wherein the balancing element is linearly slidable in said second plane to engage spaced apart surfaces and engages another portion of the free end and is not liftable from those surfaces when so engaged and wherein the latch elements define a plurality of spaced apart locking positions for the tray.

5,687,434
PORTABLE STAND-ALONE SINK UNIT

Richard Leach Tagg, Sandhutton, England, assignor to Poly-John Enterprises Corporation, Whiting, Ind.
Filed Mar. 20, 1996, Ser. No. 618,869
Int. Cl.^{6} A47K *1/00*
U.S. Cl. 4—625 **14 Claims**



13. A portable wash station, comprising:

a rigid outer water tank for directly holding a volume of fresh water dispensed therein whereby water in said rigid outer water tank is in direct contact with sidewalls of said rigid outer water tank;

a flexible inner water tank seated within said rigid outer tank and secured to said rigid outer water tank by an inner tank retainer whereby water in said outer rigid water tank is able to directly contact an outer surface of said flexible inner water tank;

a sink basin affixed over said inner and outer tanks including at least one sink, at least one water faucet for dispensing water from said outer water tank into said at least one sink and at least one drain for draining water from said sink and into said flexible inner tank;

said flexible inner tank having an associated volume that increases as said water is dispensed from said outer tank into said flexible inner tank, and that decreases as said water is removed from said flexible inner tank;

a disposal access port defined in said sink basin allowing access to said flexible inner tank for removal of said water from said flexible inner tank;

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said disposal access port including a disposal access port lid lockably engaged with said sink basin; and

a foot pump operatively coupled to said faucet and said outer tank for controlling dispensing of said water through said faucet.

5,687,435

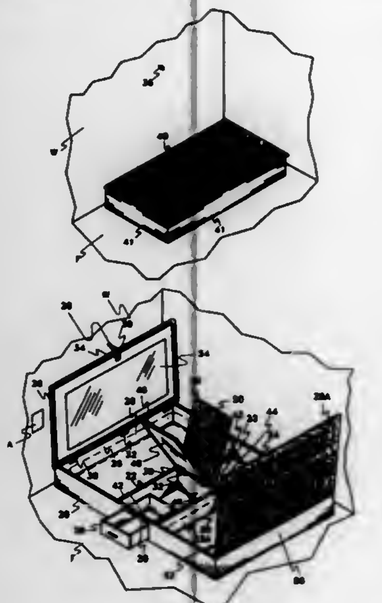
SPACE SAVER PLATFORM HIDING BED AND STORAGE

Amy L. Dufresne, 77 Bismark St., Manchester, N.H. 03102

Filed Apr. 4, 1996, Ser. No. 628,318

Int. Cl.^{6} A47B *83/00*

U.S. Cl. 5—10.1 **20 Claims**



1. An article of furniture for enclosing a mattress comprising:

(a) a housing having a plurality of sidewall support members extending upwardly from a floor to form an enclosure having an open top,

(b) a cover mounted on said housing for closing said open top,

(c) means for joining said plurality of sidewall support members together at angles to form said housing,

(d) a flexible device for pivotally joining said cover to one of said sidewall support members, and

(e) an external covering for said cover,

(f) said sidewall support members and said cover comprising rigid material that can support a predetermined weight,

(g) said external covering made of carpet material stationarily fixed to an outer side of said cover and enveloping to an inner side of said cover and fastened thereto.

5,687,436

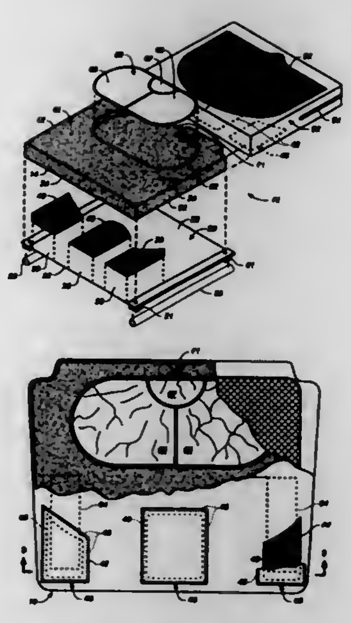
WHEELCHAIR SEATING CUSHION HAVING ADJUSTABLE TOP CONTOUR SHAPE

Grant C. Denton, Boulder, Colo., assignor to Jay Medical Ltd., Boulder, Colo.

Filed Aug. 9, 1996, Ser. No. 694,536

Int. Cl.^{6} A47C *27/02*

U.S. Cl. 5—653 **12 Claims**



1. A seating cushion assembly for use in a wheelchair, comprising:

a) a flexible foam cushion formed for mounting on a seat base of a wheelchair to substantially cover said base; and

b) at least one wedge-shaped insert member oriented to taper in traverse direction across said cushion assembly and removably positioned at a support location between said foam cushion and said seat base and formed to raise a top surface of said foam cushion at said support location to provide a lateral support contour in said top surface for a user seated on said cushion assembly, said foam cushion further having sufficient thickness and resiliency to permit the user to temporarily sit safely directly over said insert member during use of said cushion assembly.

5,687,437

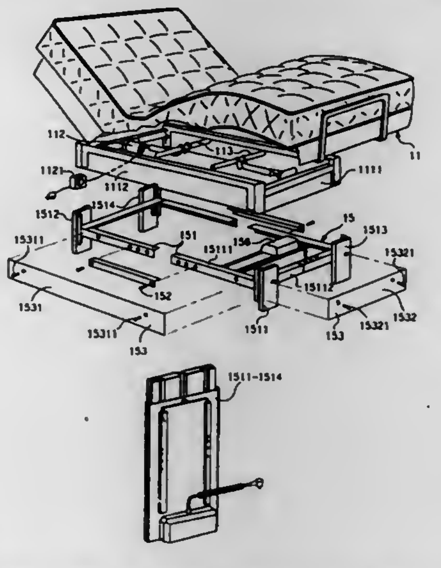
MODULAR HIGH-LOW ADJUSTABLE BED BASES RETROFITTED WITHIN THE VOLUMES OF, AND COOPERATIVELY OPERATIVE WITH, DIVERSE EXISTING CONTOUR-ADJUSTABLE BEDS SO AS TO CREATE HIGH-LOW ADJUSTABLE CONTOUR-ADJUSTABLE BEDS

Aaron Goldsmith, 3250 E. 19th St., Long Beach, Calif. 90804

Continuation-in-part of Ser. No. 435,799, May 3, 1995, which is a continuation-in-part of Ser. No. 193,796, Feb. 8, 1994, Pat. No. 5,490,298. This application Feb. 13, 1996, Ser. No. 600,759

Int. Cl.^{6} A61G *7/00*

U.S. Cl. 5—611 **26 Claims**



22. A high-low base retroffitable to and susceptible of integration with a contour-adjustable bed having a rectangular peripheral space frame to the end of raising and lowering the contour-adjustable bed in elevation above a floor, the high-low base comprising:

four upper members each of which fits to a respective corner of the rectangular peripheral space frame of the contour-adjustable bed so as to insubstantially increase a volume and an area of this peripheral space frame, the four members essentially being within the volume and within the area of the peripheral space frame;

a first plurality of lower members disposed on the floor under the four upper members substantially in a shadow of the peripheral space frame; and

a second plurality of elongate elevation means, connecting between the first plurality of lower members and the four upper members within the volume and within the area between them, for variably controllably extending in length so as to locate the four upper members at different distances of separation from the plurality of lower members thereby to raise and to lower the contour-adjustable bed having the peripheral space frame that is attached to the four upper members;

wherein because the four upper members insubstantially increase the volume and the area of the peripheral space frame, because the first plurality of lower members are substantially in the shadow of the space frame, and because the second plurality of elongate elevation means connect between the first plurality of lower members and the four upper members, the entire high-low base is insubstantially larger in area upon the floor than the contour-adjustable bed that it serves to lift.

5,687,438

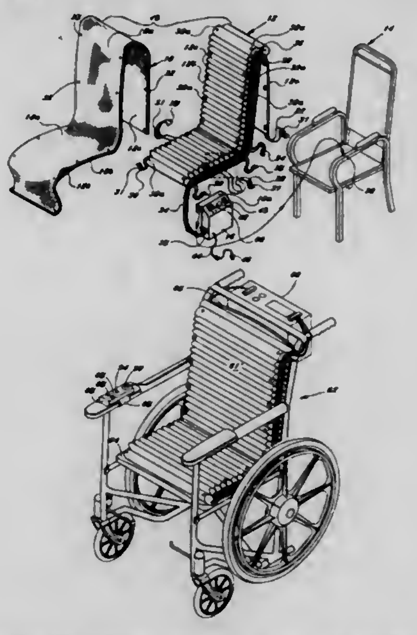
ALTERNATING LOW AIR LOSS PRESSURE OVERLAY FOR PATIENT BEDSIDE CHAIR AND MOBILE WHEEL CHAIR

John Biggie; Lydia B. Biggie, both of Lighthouse Point, and Kevin Zigarac, Sunrise, all of Fla., assignors to Sentech Medical Systems, Inc., Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 286,008, Aug. 4, 1994, Pat. No. 5,509,155. This application Feb. 29, 1996, Ser. No. 610,113

Int. Cl.^{6} A61G *7/04*

U.S. Cl. 5—654 **9 Claims**



1. An alternating pressure air sac overlay for therapeutic treatment of an immobile patient's skin while seated in a wheel chair, comprising:

an array of elongated independently sealed air sacs constructed of an airtight material, sized in length to fit across a wheel chair, said individual air sacs being tubular in shape, mounted in a fixed side-by-side array, the overall longitudinal length of the air sac array being sized to fit at least on a seat of said wheel chair, a first group of independent air sacs being separated by a second group of air sacs in a side-by-side array, so that every other one of said air sacs in said first group and every other alternating one of said air sacs is contiguous with said first group to form said second group of air sacs;

first conduit manifold connected to said first group of air sacs;

second conduit manifold connected to said second group of air sacs;

a battery powered air pump having an inlet and an outlet for providing pressurized air in fluid communication and connected to said first conduit manifold and said second conduit manifold;

controllable air inlet valve means connected to said air pump and said first conduit manifold and said second conduit manifold, whereby in a first position, said air inlet valve means provides air pressure only to said first conduit manifold from said air pump, and in a second position, provides air under pressure only to said second conduit manifold from said air pump;

means including timing circuits for controlling air in a timed sequence into said first conduit manifold and said second conduit manifold from said air pump connected to said air pump;

an electrical battery power supply connected to said air pump, said electrical battery power supply having means for recharging; and

said timing circuits connected to said electrical battery power supply and said means for controlling air in a timed sequence;

a coverlet comprising a liquid impervious barrier means removably connectable to said air sac array, covering said air sac array to provide a protective shield against liquids reaching said air sac array, said coverlet porous to water vapor molecules, said coverlet including means for attachment to said wheel chair seat.

5,687,439

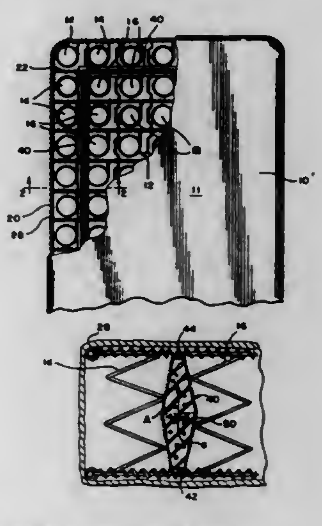
BORDER STABILIZING MEMBER AND INNERSPRING ASSEMBLY USING SAME

Robert F. Wagner, Medina, Ohio, assignor to Ohio Mattress Company Licensing and Components Group, Middleburg Heights, Ohio

Division of Ser. No. 205,933, Mar. 3, 1994, Pat. No. 5,467,488, which is a continuation-in-part of Ser. No. 84,735, Jun. 29, 1993, abandoned, and a continuation of Ser. No. 833,683, Feb. 11, 1992, Pat. No. 5,239,715. This application Jun. 6, 1995, Ser. No. 468,442

Int. Cl.^{6} A44C *27/00*

U.S. Cl. 5—717 **17 Claims**



1. An innerspring assembly comprising:

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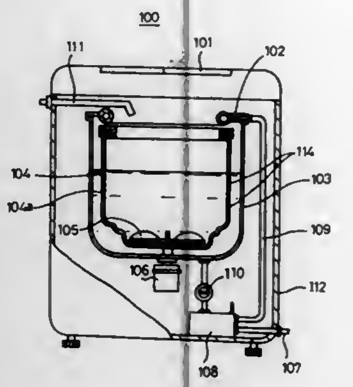
a plurality of springs each having a longitudinal axis and being organized into rows and forming a support surface with a top and bottom, with at least a first row of springs and a second row of springs spaced inboard from said first row and generally parallel to said first row, with a gap thereby being formed between said first and second rows;
means for retaining said springs in said assembly; and
an elongated stabilizing and reinforcing beam of resilient foamaceous material which can be compressed under load and will thereafter return to its original shape upon removal of said load,
said stabilizing member having a longitudinal axis extending along its elongated length, and a generally diamond-shaped cross-section orthogonal to said longitudinal axis, said cross-section having a major axis as measured along the diagonal between where two diametrically opposed corners would be with the sides of the diamond-shape being fully extended to terminate at a point, and a minor axis as measured along the diagonal between where the other two diametrically opposed corners would be with the sides of the diamond-shape being fully extended to terminate at a point,
said stabilizing member being located between said first and second rows of springs in said gap with said major axis thereof being aligned substantially parallel to said longitudinal axes of said springs.

5,687,440

WASHING METHOD CAPABLE OF PREVENTING THE FORMATION OF SUDS IN A WASHING MACHINE

Tae-Sik Min, Seoul; Seung-Jun Lee, and Chung-Sik Jung, both of Inchon, all of Rep. of Korea, assignors to Daewoo Electronics Co., Ltd, Seoul, Rep. of Korea
Filed Nov. 16, 1995, Ser. No. 558,889
Claims priority, application Rep. of Korea, Apr. 29, 1995, 95-10388; Apr. 29, 1995, 95-10398
Int. Cl.⁶ D06F *39/08*
U.S. Cl. 8—158 **20 Claims**

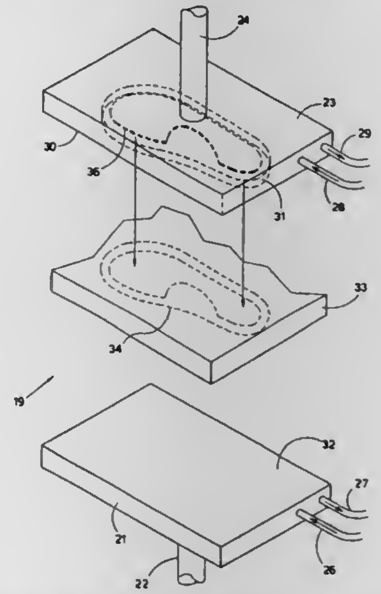


20. A washing method by a washing machine having a spin tub for accommodating articles to be washed and a container for mounting the spin tub in the container, the spin tub having means for interconnecting a space in the container and a gap between the spin tub and the container, the method comprising the steps of:
(1) introducing a first amount of a washing liquid into the spin tub until a height of the washing liquid in the container reaches a first height;
(2) recirculating a first portion of the washing liquid in the container, and spraying the first portion of the washing liquid into the spin tub, while introducing a second amount of the washing liquid into the spin tub until the height of the washing liquid reaches a second height higher than the first height;
(3) washing the articles in the spin tub, while recirculating and spraying the first portion of the washing liquid during a first period;
(4) draining a predetermined amount of the washing liquid in the container out of the washing machine, while washing the articles in the spin tub, the predetermined amount being one-third of a quantity of the washing liquid in the container when the height of the washing liquid is the second height;
(5) recirculating a second portion of the washing liquid remaining in the container, and spraying the second portion of the washing liquid into the spin tub, while washing the articles during a second period;
(6) repeating steps 4 and 5 three times;
(7) introducing a first amount of a rinsing water into the spin tub until a height of the rinsing water in the container reaches a third height;
(8) recirculating a first portion of the rinsing water in the container, and spraying the first portion of the rinsing water into the spin tub, while introducing a second amount of the rinsing water into the spin tub until the height of the rinsing water reaches a fourth height higher than the third height;
(9) agitating the articles in the rinsing water in the spin tub, while recirculating and spraying the first portion of the rinsing water during a third period;
(10) draining a predetermined amount of the rinsing water in the container out of the washing machine, while agitating the articles in the rinsing water in the spin tub, the predetermined amount being one-third of a quantity of the rinsing water in the container when the height of the rinsing water is the fourth height;
(11) recirculating a second portion of the rinsing water remaining in the container, and spraying the second portion of the rinsing water into the spin tub, while agitating the articles in the rinsing water in the spin tub during a fourth period; and
(12) repeating steps 10 and 11 three times.

5,687,441

FOOTWEAR'S INSOLE AND A PROCESS FOR ITS MANUFACTURE

Adi Rachman, Tel-Aviv, and Emanuel Kaplan, Ramat Gan, both of Israel, assignors to Nimrod Production (1979) Ltd., Tel-Aviv, Israel
Filed Dec. 28, 1995, Ser. No. 580,289
Claims priority, application Israel, Jan. 4, 1995, 112246
Int. Cl.⁶ A43D *9/00;* **A43B** *13/38*
U.S. Cl. 12—142 R **4 Claims**



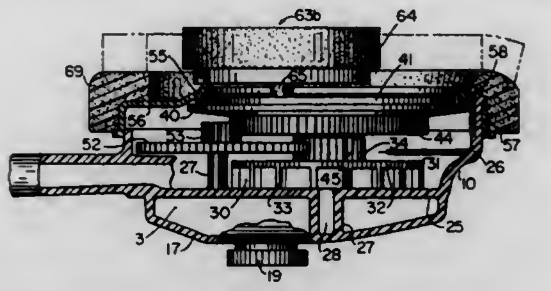
1. A method of making a footwear insole, comprising:
(i) preparing a board of material being a member selected from the group of porous and foamed cross-linked synthetic polymers;
(ii) preheating the board to at least the softening point of said material;

(iii) inserting the preheated board in a stamp device;
(iv) pressing the board and stamping into it a footprint shaped cavity while cooling by the stamping device having a stamping die and a stamping die bearing pressing plate;
(v) attaching a sock lining to said footprint shaped cavity; and
(vi) suitably cutting the board.

5,687,442

RANDOM ORBITAL POWER CLEANER

Scott S. McLain, 7070 Mallard Crossing, Waterford, Wis. 53185
Filed Jun. 7, 1996, Ser. No. 660,647
Int. Cl.⁶ A46B *13/06*
U.S. Cl. 15—29 **10 Claims**

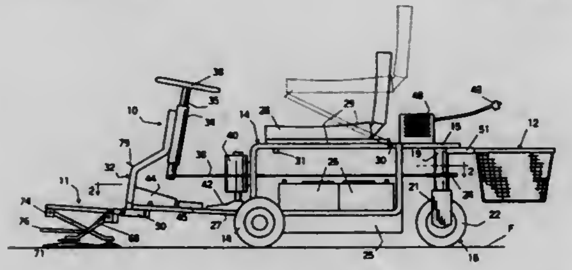


1. A water-powered cleaning apparatus comprising:
a base member disk rotatably mounted in a housing wherein said base member disk is driven by a water powered turbine drive mechanism, said base member disk mounted for driven rotation on a central axis;
an orbital head mounted on said base member disk for free and random rotation on an axis that is parallel to and radially offset from said central axis of said base member disk;
said orbital head having a cleaning medium attached thereto.

5,687,443

MOTORIZED JANITORIAL CART WITH ACCESSORIES

Terry D. Moore, 2415 Hinton Rd., Dacula, Ga. 30211
Filed Aug. 18, 1995, Ser. No. 516,881
Int. Cl.⁶ A47L *11/24;11/00*
U.S. Cl. 15—98 **10 Claims**

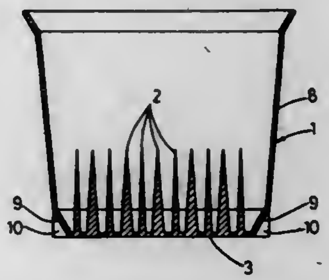


1. A cart, for use as a janitorial cart, said cart comprising a frame having a top surface, a front end, a rear end and spaced sides,said top surface defining a plane, a rear end and spaced sides, said top surface defining a plane, a rear extension extending in the plane of said top surface and extending rearwardly thereof, a wheel assembly fixed to said rear extension and depending therefrom, said wheel assembly comprising a single wheel placed generally along a longitudinal centerline of said frame, a pair of wheels adjacent to said front end of said frame, one wheel of said pair of wheels being mounted on each side of said frame, a forward extension having a front and a rear, said forward extension from said front end of said frame, seating means carried on said top surface of said frame, drive means mounted to said frame for causing rotation of said pair of wheels, steering means mounted to said forward extension for selectively rotating said single wheel about a vertical axis, control means for said drive means mounted on said forward extension, a pan carried by said frame, power supply means secured within and to said pan and coupled with said drive means, and accessory attaching means selectively attaching a cleaning accessory to the front of said forward extension for cleaning a floor.

5,687,444

DEVICE FOR CLEANING PAINT BRUSHES OR THE LIKE

Johannes Cornelis Hakker, Noorderweg 81c, NL-3761 EV Soest, Netherlands
PCT No. PCT/NL94/00172, § 371 Date May 17, 1996, § 102(e) Date May 17, 1996, PCT Pub. No. WO95/02976, PCT Pub. Date Feb. 2, 1995
PCT Filed Jul. 22, 1994, Ser. No. 581,616
Claims priority, application Netherlands, Jul. 22, 1993, 9301288
Int. Cl.⁶ A46B *17/06;* **B44D** *3/12;3/00*
U.S. Cl. 15—104.92 **10 Claims**



1. A device for cleaning a brush (**11**), comprising a container (**1**, **12**) for a cleaning fluid and a plurality of elongated wiping elements (**2**) projecting upwardly in their longitudinal direction substantially from a bottom (**3**) of the container, wherein each wiping element (**2**) has at least one sharp scraping edge (**4**) along at least a part of its upward length, said scraping edge being adapted to cooperate with the bristles of the brush (**11**) to be cleaned, wherein each wiping element (**2**) has a polygonal cross section with a long and short side from an end adjacent the bottom (**3**) toward a free end thereof and tapers from the bottom, said wiping elements (**2**) being arranged in such a pattern that in two mutual perpendicular directions successive wiping elements (**2**) are aligned alternatingly with their iong and short side, respectively, in the respective direction.

5,687,445

LENS WIPE

Gretchen Ruth Hocking, Livonia, Mich., assignor to Gretchen R. Hocking, Livonia, Mich.
Filed Jul. 22, 1996, Ser. No. 683,977
Int. Cl.⁶ G02C *13/00;* **A47L** *13/17*
U.S. Cl. 15—104.93 **1 Claim**

1. A lens wiping device comprising:
(a) a wiping material having a periphery extending therearound, said wiping material treated with an anti-fogging solution;
(b) a piping material having first and second ends, said piping material being secured to and extending around the entire periphery of the wiping material, the first end of the piping material being secured to a corner of the wiping material and the second end of the piping material extending beyond the wiping material and overlapping the first end thereof; and
(c) a first releasable fastener means secured to the second end of the piping material and a cooperating second releasable fastener means secured to the piping material adjacent the first

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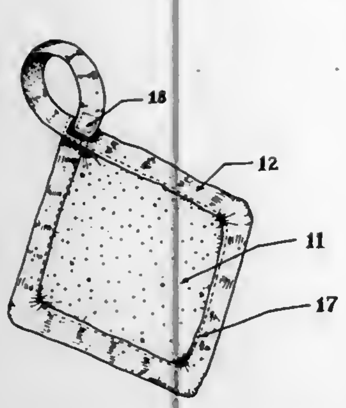


end thereof, whereby the piping material may be formed into a loop which facilitates attachment of the device to a support.

5,687,446

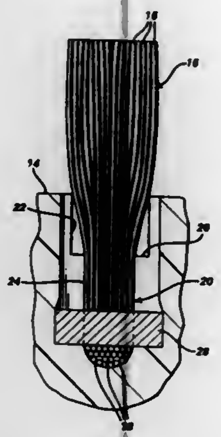
BRISTLED ARTICLE

Albert C. Chen, East Brunswick; Peter Hrinko, Jr., Fair Lawn; Kevin G. Yost, Short Hills, all of N.J., and John R. Kent, Yardley, Pa., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Continuation of Ser. No. 509,005, Jul. 27, 1995, Pat. No. 5,590,438, which is a continuation of Ser. No. 311,237, Sep. 23, 1994, abandoned, which is a continuation of Ser. No. 798,362, Nov. 21, 1991, abandoned. This application Jun. 21, 1996, Ser. No. 667,762

Int. Cl.⁶ A46B *9/04*

U.S. Cl. 15—195 **23 Claims**



1. A bristled article comprising:

(a) a plurality of bristles folded into tufts having free ends;

(b) at least one tuft cavity in a base having an upper outer surface contiguous to an open top end of said tuft cavity, said base having a bottom outer surface opposite said upper outer surface; and

(c) an anchoring means that holds the plurality of tufted bristles together inside the tuft cavity and the free ends of the tufted bristles remain outside of the tuft cavity wherein the cross-sectional area of said tuft cavity decreases by at least one step such that said tuft cavity is broadest at the surface contiguous to the open top end of said cavity and narrows toward a closed bottom end of said cavity, wherein said cross-sectional area of said tuft cavity between said at least one step and said closed bottom end is smaller than said cross-sectional area of said tuft cavity at said surface contiguous to said top end of said cavity, and said open top end has an inner surface which contacts at least some of said plurality of bristles in a way that is effective to prevent splaying of the free ends of the tufted bristles;

wherein said anchoring means is disposed only between said at least one step and said bottom outer surface of said base.

5,687,447

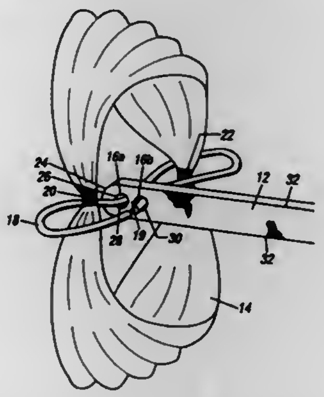
STIFF HANDLED BACK SCRUBBER DEVICE

Cheryl Bynum, and Bart L. Bynum, both of Ransom Canyon, Tex., assignors to Bynum Concepts Inc., Lubbock, Tex.

Filed Sep. 11, 1995, Ser. No. 526,847

Int. Cl.⁶ A47L *13/46*

U.S. Cl. 15—229.13 **19 Claims**



1. A washing device comprising

a stiff, elongated handle with first and second ends, a first end having first and second adjacent openings therethrough;

a scrubbing element with a first portion disposed adjacent to said first and second openings on a first side of said handle and a second portion disposed adjacent to said first and second openings on a second side of said handle; and

a clasp looped through said first and second openings, around said first and second portions of said scrubbing element disposed adjacent to said first and second sides of said handle, and around a portion of said handle disposed between said first and second openings, thereby affixing said scrubbing element to said handle.

5,687,448

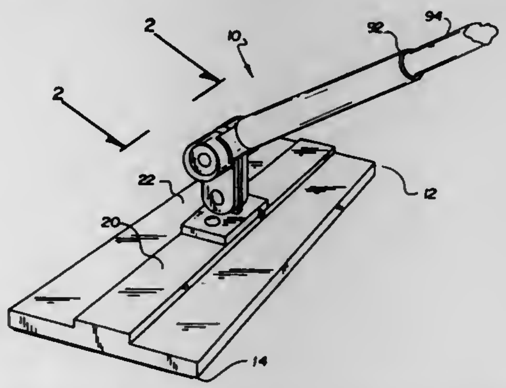
ADJUSTABLE CEMENT FINISHING TOOL

Walter C. Dye, Jr., 31964 Camino Marea, Temecula, Calif. 92592

Filed Mar. 4, 1996, Ser. No. 610,322

Int. Cl.⁶ E01C *19/44;19/22*

U.S. Cl. 15—235.8 **2 Claims**



1. An adjustable cement finishing tool comprising, in combination:

a generally horizontal rectangular rigid planar float having a substantially planar lower surface, an upper surface with a centrally located longitudinal raised portion, and a centrally located pair of threaded bores formed on the raised portion;

a rigid mounting bracket having a horizontal rectangular rigid planar base with a pair of receiving holes formed thereon, an upwardly extending lower tongue member with a rounded upper edge, straight parallel side edges, and a centrally located through hole, and a pair of threaded bolts wherein each bolt is separately disposed through a receiving bole and threadedly secured within one of the bores of the float to thereby fixedly secure the mounting bracket to the float;

a swiveling member having a generally tubular rigid shell with a horizontally positioned longitudinal central axis, a centrally located and substantially semicircular groove formed on an upper portion the shell and aligned in a plane perpendicular to the central axis, a centrally located upper tongue formed of a pair of spaced upper tongue members extending downwards and positioned on opposing sides of the lower tongue member and in facing contact therewith and with each upper tongue member having a rounded upper edge, straight parallel side edges, and a centrally located through hole, a threaded bolt disposed within the through holes of the upper and lower tongues members and secured with a nut to thereby fixedly fasten the tongue members together, a rigid cylindrical inner member slidably disposed within the shell, the inner member having a smooth exterior surface, a horizontally positioned longitudinal axis, a centrally located receiving bore extending through a central portion of the inner member at a location perpendicular to the longitudinal axis, and a generally crescent-shaped recess formed on a lower extent of the exterior surface in communication with the receiving bore, a generally rectangular plate having a curved interior surface that conforms to the shape of the exterior surface of the inner member and a centrally positioned receiving bore disposed therethrough, and a fastening bolt having an elongated threaded upper portion disposed through the receiving bore of the inner member and the receiving bore of the plate and a lower crescent shaped head seated within the recess of the inner member; and

a generally tubular arm having a central axis, an open upper end adapted for receiving an elongated handle, a sealed lower end with an axially aligned and threaded bore formed thereon, and a threaded nut fixedly secured to the lower end of the bolt, and wherein the bolt of the swiveling member is threadedly secured to the nut and within the bore of the arm to thereby couple the float to the arm, and wherein rotating the arm in one direction about its central axis allows the lower end of the arm to be engaged with the swivelling member to thereby preclude pivotal movement of the float, and wherein rotating the arm in an opposite direction about its central axis allows the lower end of the arm to be disengaged from the swivelling member and thereby allow pivotal movement of the float within an angular limit as set by the groove on the shell.

5,687,449

SOOT BLOWER UNIT

Richard Zachay, Voerde, and Karl Albers, Wesel, both of Germany, assignors to Bergemann GmbH, Wesel, Germany

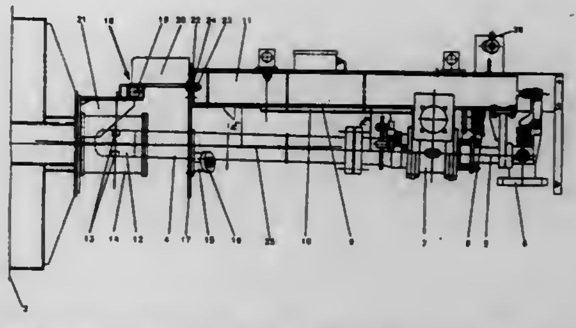
Filed Nov. 17, 1995, Ser. No. 559,934

Claims priority, application Germany, Dec. 3, 1994, 44 43 128.7

Int. Cl.⁶ A47L *5/38*

U.S. Cl. 15—316.1 **4 Claims**

1. A soot blower unit with an axially movable soot blower for cleaning heating surfaces of a heat exchanger, comprising: a lance tube and a travel carrier with a track rail; said travel carrier being secured to a wall of said heat exchanger; a blower carriage connected to a rear end of said lance tube and being movable on said track rail; said lance tube being driven from a rest position by said blower carriage axially into said heat exchanger; a lance tube guide, said lance tube having a front end guided into said lance tube guide; an end plate, said lance tube guide being secured to said wall of said heat exchanger through said end plate said lance tube guide being adjustably spaced from the travel carrier; said track rail of said travel carrier being vertically spaced by a first spacing from a front end of said lance tube in said rest position of said lance tube, said track rail of said travel carrier being vertically spaced by a second spacing from a rear end of said lance tube held by said blower carriage, said first spacing being less than said second spacing for forming an angle between said lance tube and said track rail.



5,687,450

MACHINE, SUCH AS A VACUUM CLEANER, WHICH EXHAUSTS A CLEAN GAS, WHICH MACHINE HAS A PROTECTIVE BUMPER

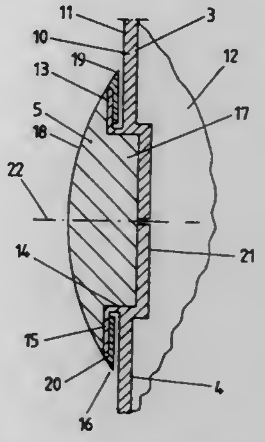
Klaus Stein, and Heinz Kaulig, both of Velbert, Germany, assignors to Stein & Co. GmbH, Velbert, Germany

Filed Sep. 8, 1995, Ser. No. 525,493

Claims priority, application Germany, Sep. 10, 1994, 44 32 231.3; Oct. 15, 1994, 44 36 935.2

Int. Cl.⁶ A47L *9/10*

U.S. Cl. 15—325 **10 Claims**



1. A vacuum cleaner for movement along a floor, said vacuum cleaner comprising:

a housing having suction producing means;

said housing comprising a top portion, a bottom portion, and a plurality of side walls extending between said top portion and said bottom portion;

means for permitting movement of said housing along a floor;

means, extending from said housing, for conveying suction externally of said housing;

said means for conveying suction being in fluid communication with said suction producing means;

a protective bumper for protecting said housing from contact with external objects, said protective bumper being disposed on said housing;

said housing comprising at least one connection for directing exhaust air to said protective bumper; and

said protective bumper comprising a porous structure being disposed to accept exhaust air from said at least one connection and exhaust the exhaust air received from said housing.

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5,687,451

REVOLVING DOOR DEVICE

Lothar Singer, Heimsheim, Germany, assignor to Geze GmbH & Co., Leonberg, Germany

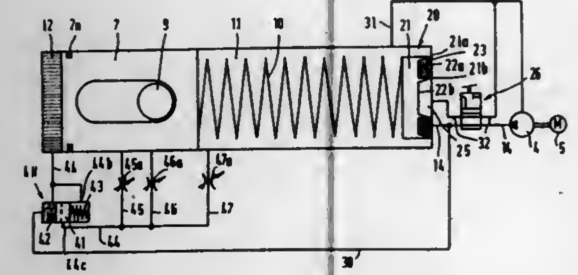
PCT No. PCT/EP94/02257, § 371 Date Apr. 8, 1996, § 102(e) Date Apr. 8, 1996, PCT Pub. No. WO95/02107, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 10, 1994, Ser. No. 591,495

Claims priority, application Germany, Jul. 10, 1993, 43 23 150.0

Int. Cl.^{6} E05F *1/00*

U.S. Cl. 16—71 **23 Claims**



1. Door drive for a building door, comprising:

a hydraulic piston-cylinder unit with a piston slidably guided in a hydraulic cylinder while forming a pressure chamber for a hydraulic medium and an unpressurized chamber,

a door position controlling output shaft drivingly connected with the piston,

a closing spring in said unpressurized chamber, said closing spring being operably supported at one end on the piston and at the other opposite end on a movable hydraulic pressure pad,

a motor driven opening device with an electric motor driven hydraulic pump for pressurizing the hydraulic medium to operably move the piston,

and a control valve assembly for controlling the pressure of the hydraulic medium as a function of a momentary force of the closing spring to thereby control adjustment of the hydraulic medium pressure in the pressure chamber and the pressure on the hydraulic pressure pad.

5,687,452

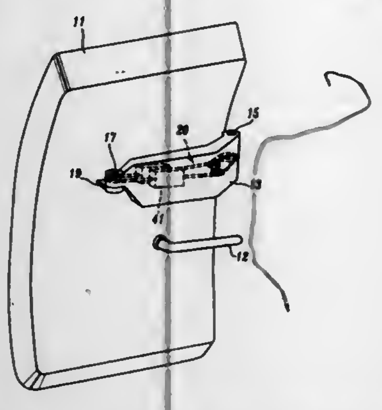
HYDRAULIC SNUBBER FOR AIRCRAFT

Tomio Hamatani, Seattle; Sun Gil Kim, Redmond; Donald K. Franklin, Renton, all of Wash., and Michael P. Conner, Danville, Vt., assignors to The Boeing Company, Seattle, Wash.

Filed May 2, 1995, Ser. No. 432,846

Int. Cl.^{6} E05F *5/02*

U.S. Cl. 16—82 **19 Claims**



1. A translating door system that includes a hinge arm having first and second ends, first and second sprockets, the first sprocket rotatably attached to the first end of the hinge arm, the second sprocket rotatably attached to the second end of the hinge arm, and a roller chain wrapped around the first and second sprockets, and having first and second ends, the improvement comprising a snubber, said snubber including:

(a) a hydraulic device including a housing mounted to the hinge arm, a piston located in the housing, and a through-rod connected to the piston and extending through the housing, the ends of the through-rod coupled to the first and second ends of the roller chain; the housing and the piston defining two hydraulic fluid compartments located on opposite sides of the piston; and

(b) a flow regulation system in fluid communication with the two hydraulic fluid compartments for snubbing the movement of the hinge arm by controlling the rate of hydraulic fluid flow between the first and second fluid compartments, the flow regulation system comprising at least one flow regulator connected in parallel with at least one high pressure relief valve, the high pressure relief valve for relieving excessive forces applied to the door.

5,687,453

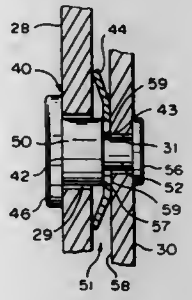
GROUNDING WASHER AND ARRANGEMENTS FOR CONDUCTIVE HINGE JOINTS

Richard Megregian, Farmington Hills; James E. Van Hout, Auburn Hills, and John S. Latimer, III, Bloomfield Hills, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Apr. 17, 1995, Ser. No. 422,461

Int. Cl.^{6} E05D *11/00*

U.S. Cl. 16—221 **7 Claims**



1. In an arrangement for a conductive hinge joint, the hinge joint including first and second components which are electrically connected to one another proximate pivot holes through the components, through which pivot holes a pivot pin passes, the improvement comprising:

the pivot pin being a rivet having a first head for abutting a first surface of the first hinge component and an axially spaced head for abutting a first surface of the second hinge component to hold the hinge components in pivotal relationship with respect to one another;

the rivet including a stop portion of a diameter smaller than the first head extending from the first head throughout the pivot hole toward the second head to keep the first and second components in spaced relation to one another in the first hinge component;

the rivet including a shank portion of a smaller diameter than the stop portion extending from the stop portion through the pivot hole in the second hinge component for joining the stop portion to the second head; and

a conductive washer disposed around the shank portion of the rivet and between the first and second hinge components, the conductive washer being spring loaded so as to be under a constant load to maintain electrical contact between the washer and the first and second hinge components.

5,687,454

COILER CAN TRANSPORT SYSTEM BETWEEN TWO DRAWING FRAMES

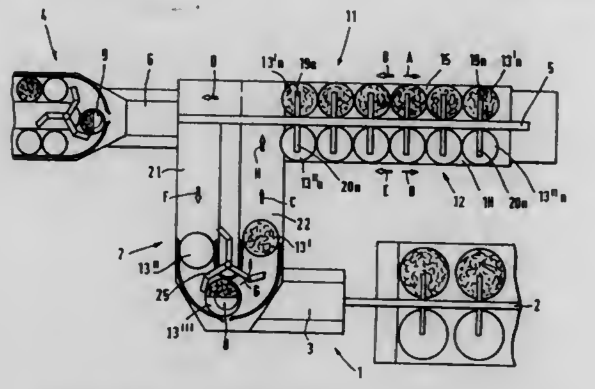
Manfred Langen, Mönchengladbach, Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Jun. 5, 1996, Ser. No. 658,644

Claims priority, application Germany, Jun. 10, 1995, 195 21 185.5

Int. Cl.^{6} D01G *21/00;* **B65G** *65/00;* **B65H** *75/16*

U.S. Cl. 19—159 A **14 Claims**



1. A drawing frame system comprising

(a) a first drawing frame having an output discharging produced sliver;

(b) a can filling device situated at said output for charging consecutively supplied cans with sliver;

(c) a second drawing frame having an input;

(d) a first creel row for receiving a plurality of cans charged with sliver;

(e) a second creel row for receiving a plurality of cans charged with sliver;

(f) sliver supplying means for withdrawing slivers simultaneously from the plurality of cans alternatingly from said first and second creel rows and introducing the slivers into said input of said second drawing frame; and

(g) a coiler can transport system for moving sliver-filled cans from said can filling device to said first and second creel rows and for moving empty cans from said first and second creel rows to said can filling device; said coiler can transport system including:

  (1) an intake track extending to said can filling device for supplying sliver-filled cans to said can filling device;

  (2) an outlet track extending from said can filling device for removing empty cans from said can filling device;

  (3) a first conveyor situated along said first creel row for moving sliver-filled cans into and for moving empty cans out of said first creel row; said first conveyor being connected to said intake track and said outlet track; and

  (4) a second conveyor situated along said second creel row for moving sliver-filled cans into and for moving empty cans out of said second creel row; said second conveyor being connected to said intake track and said outlet track.

5,687,455

RELEASABLE CIRCULAR FASTENER

Gary E. Alexander, 9624 Brookline Ave., Baton Rouge, La. 70809

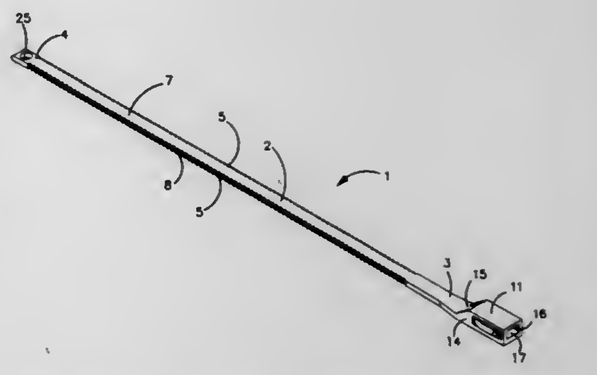
Filed Jan. 18, 1996, Ser. No. 588,444

Int. Cl.^{6} B65D *63/00*

U.S. Cl. 24—16 PB **27 Claims**

1. A releasable fastener comprising:

a pliable elongated body member having a head end opposite a tail end, a lower body surface substantially parallel to an upper body surface, and a pair of substantially parallel side body surfaces, said side body surface being substantially perpendicular to said upper and lower body surfaces, said side body surfaces connecting said upper body surface to said lower body surface, said upper body surface containing a plurality of tooth members;



a buckle member attached to said head end of said body member, said buckle member having a top buckle surface substantially parallel to a bottom buckle surface, said top and bottom buckle surfaces being substantially parallel to said upper and lower body surfaces, said buckle member also having a pair of substantially parallel sidewalls, said sidewalls being substantially perpendicular to said top and bottom buckle surfaces, said sidewalls connecting said top buckle surface to said bottom buckle surface, said top buckle surface, said bottom buckle surface, and said sidewalls being positioned to define a buckle channel substantially parallel to said body member, said buckle channel having an open body end and an open free end, said buckle channel being sized to allow said body member to pass through said open free end, said buckle channel, and said open body end; and

an arm for preventing said body member from retreating within said buckle channel, said arm mounted in and substantially coplanar with said top buckle surface, said arm having an X, a Y and a Z axis, said arm having a control end and a lip end, said lip end having at least one lip depending therefrom, said lip being adapted to engage said tooth members of said body member when said body member is inserted into said buckle channel, said arm being pivotable about its Y axis, whereby said lip end and said lip may be raised by depressing said control end.

5,687,456

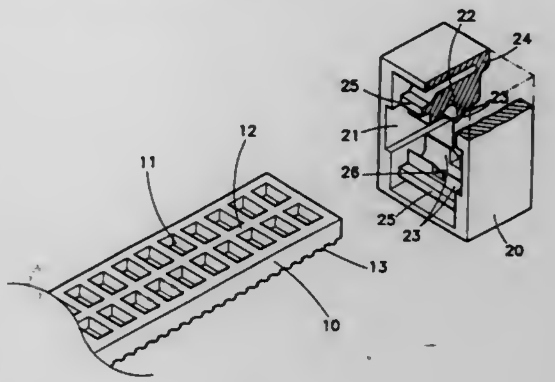
TYING DEVICE

Kun-Sheng Chang, No. 25, Alley 59, Chung Cheng Rd., Luchou Hsiang, Taipei Hsien, Taiwan

Filed Aug. 9, 1996, Ser. No. 694,608

Int. Cl.^{6} B65D *63/10*

U.S. Cl. 24—16 PB **4 Claims**



1. A tying device, comprising:

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a binding strip, provided with a plurality of blocking incisions, which are arranged along the longitudinal direction on one side of said binding strip, defining the front side thereof; and

a lock head, having a lead opening passing through said lock head, two locking plates, extending from opposite inner walls of said lead opening into said lead opening, having a free end each, and a plurality of locking pawls on each of said looking plates; wherein the improvement comprises:

a ridge along the longitudinal direction on the front side of said binding strip, dividing said blocking incisions into two rows along the longitudinal direction of said binding strip;

a plurality of slots, each of said slots being cut into one of said locking pawls to accommodate said ridge of said binding strip, such that said locking pawls fit into said blocking incisions, having a blocking effect;

two protrusions, each of them on the free end of one of said locking plates; and

a grooved surface on the back side of said binding strip, for increasing surface friction.

5,687,457
CLAMPING BAND

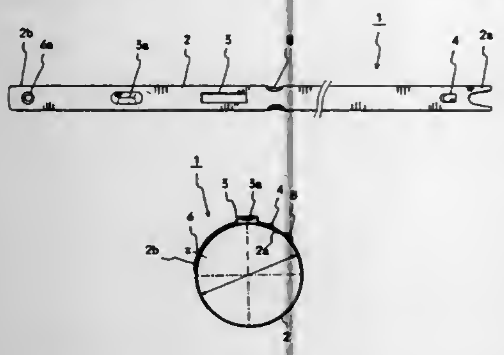
Taira Hama, Chino, Japan, assignor to Kabushiki Kaisha Mihama Seisakusho, Nagano-ken, Japan

Filed Feb. 21, 1996, Ser. No. 604,657

Claims priority, application Japan, Nov. 1, 1995, 7-285337

Int. Cl.^{6} B65D *63/00*

U.S. Cl. 24—20 CW **20 Claims**



1. A clamping band, comprising:

a metallic band having a first end and a second end, the first end of said band having a form of a Y-shaped fork including a pair of fork pieces;

said band having a pair of concave sections formed in each side edge margin of said band, said concave sections being capable of respectively accommodating the fork pieces of the Y-shaped fork when said band is formed into a loop with said first end being overlapped by said band and said concave sections facing inwardly; and

said band including a clamping ear having a gate shape, said clamping ear being disposed at a position on said band overlapping said first end when said band is formed into said loop, said clamping ear being compressible in the circumferential direction of said loop to permit reduction of a diameter of said loop.

5,687,458
CLIP FOR RELEASABLY ATTACHING ARTICLES TOGETHER

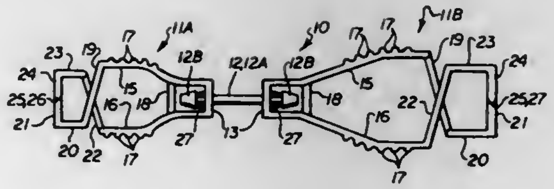
Jo Ellen Coker, 113 Lakewood Dr., Baytown, Tex. 77520

Filed Mar. 25, 1996, Ser. No. 622,562

Int. Cl.^{6} A44B *21/00*

U.S. Cl. 24—336 **4 Claims**

4. A clip for maintaining articles releasably clipped together, comprising:



a first resilient clip member and a second resilient clip member each having a generally flat vertical rear wall at a rearward end with a circular hole extending therethrough;

a plurality of short thin projections surrounding said hole on an inward side of said rear wall in circumferentially spaced relation and converging angularly inward a short distance therefrom with the outer ends thereof forming a segmented circle having a diameter smaller than the diameter of said circular hole; and

a rod-like tether member having a central portion of a first diameter and an enlarged diameter headed portion at opposite ends slidably received through a respective said circular hole and retained by said projections; whereby

said first and second clip members are each rotatably and releasably connected to said tether member to allow relative rotational movement between each said clip member and said tether member and said projections being capable of being sheared by said headed portion upon an axial force of predetermined magnitude to allow said clip members to become disconnected therefrom.

5,687,459
LABEL AGAINST SHOPLIFTING OF GARMENTS

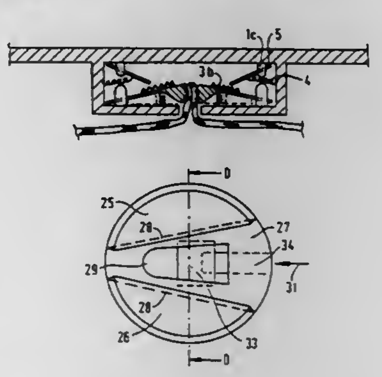
Arthur Vanmoor, 18761 W. Dixie Hgwy #209, N. Miami Beach, Fla. 33180

Filed Jan. 6, 1995, Ser. No. 378,381

Claims priority, application Netherlands, Jul. 9, 1992, 9201231; Jul. 28, 1994, 9401250

Int. Cl.^{6} A44B *9/00*

U.S. Cl. 24—704.1 **7 Claims**



1. A device for temporary attachment to goods having flexible material for the protection thereof against theft, comprising:

a member having a side with a recess formed therein, said recess having a given shape, and said recess being bounded laterally by undercut side walls;

a part having a shape substantially complementary to said recess of said member and being adapted to be inserted in said recess;

said recess of said member and said part defining a space therebetween for receiving and clamping a layer of flexible material of the goods to be protected against theft without penetrating through the flexible material;

a protrusion formed on said part and said recess having a plurality of indentations formed therein; and

said protrusion on said part releasably locking with said plurality of indentations in said recess of said member with the layer of material clasped in between.

5,687,460
FASTENING DEVICE PARTICULARLY FOR SPORTS SHOES

Massimo Foffano, Treviso; Roberto Gorza, Feltre, and Riccardo Perotto, Volpago del Montello, all of Italy, assignors to Nordica S.p.A., Trevignano, Italy

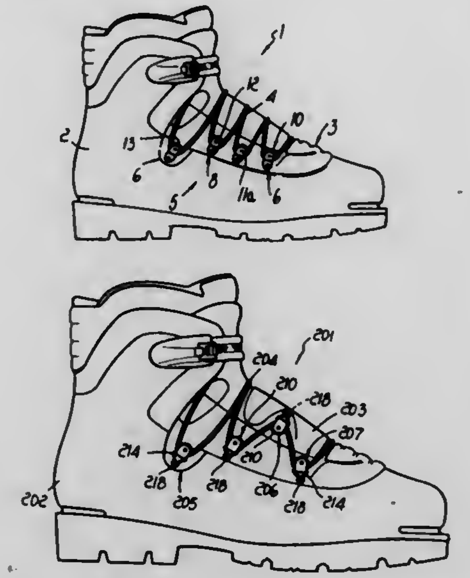
PCT No. PCT/EP95/00001, § 371 Date Ang. 31, 1995, § 102(e) Date Aug. 31, 1995, PCT Pub. No. WO95/18552, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 2, 1995, Ser. No. 530,262

Claims priority, application Italy, Jan. 5, 1994, TV940001 U; Feb. 22, 1994, TV940008 U

Int. Cl.^{6} A43C *3/02*

U.S. Cl. 24—713.4 **3 Claims**



1. A fastening device connected to a shoe, the fastening device comprising a fastening lace and at least one pulley member connected to the shoe, said pulley member comprising:

a first end;

a second end arranged distally from the first end;

an extension which extends between the first and second ends;

a pulley element for sliding engagement with the fastening lace, said pulley element being rotatably pivoted to said first end about a pulley pivot axis;

a first pivot connection which pivotally connects said second end of the pulley member to the shoe such that said second end may rotate about a first pivot axis; and

a second pivot connection arranged at said extension between the first and second ends which pivotally connects said first end to said second end such that said first end may freely rotate about a second pivot axis;

wherein said first pivot axis and said second pivot axis are arranged mutually distally from one another and wherein said first pivot axis extends substantially perpendicularly with respect to said second pivot axis.

5,687,461
YARN END ASPIRATION APPARATUS

Helmut Kohlen, Erkelenz, Germany, assignor to W. Schlafborst AG & Co., Moenchengladbach, Germany

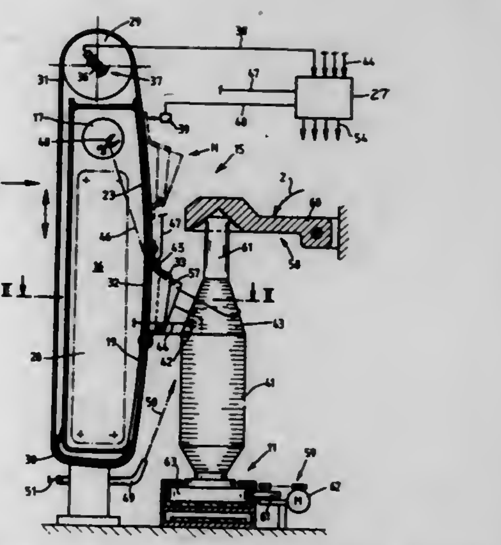
Filed May 15, 1996, Ser. No. 647,797

Claims priority, appilcation Germany, May 31, 1995, 195 19 827.1

Int. Cl.^{6} B65H *73/00;67/08*

U.S. Cl. 28—294 **18 Claims**

1. Apparatus for pneumatically aspirating a yarn end from a spinning cop adapted for use with spinning cops having yarn windings of different thicknesses, the apparatus comprising:



a housing defining an interior chamber and a generally vertical aspirating slit opening into the chamber,

means for applying a suction source to the interior chamber of the housing,

a belt sealably disposed over the aspirating slit of the housing and having an air passage formed through the belt and a nozzle affixed outwardly to the belt about the air passage, and

a drive for displacement of the belt relative to the housing between a sealing position wherein the aspirating slit is closed by the sealing belt, and at least one aspirating position wherein the air passage of the belt is in communication with the aspirating slit of the housing to apply suction through the nozzle.

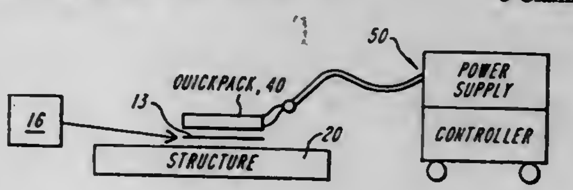
5,687,462
PACKAGED STRAIN ACTUATOR

Kenneth B. Lazarus, Boston; Mark E. Lundstrom, Cambridge; Jeffrey W. Moore, Concord, and Edward F. Crawley, Cambridge, all of Mass., assignors to Active Control Experts, Inc., Cambridge, Mass.

Division of Ser. No. 188,145, Jan. 27, 1994. This application Nov. 18, 1994, Ser. No. 342,370

Int. Cl.^{6} H01L *41/22*

U.S. Cl. 29—25.35 **8 Claims**



1. A method of forming an electro-active device, comprising the steps of:

preparing first and second flex circuits including first and second electrodes on respective electrode surfaces of said flex circuits,

bonding at least one piezoelectric element between the first and second electrodes in electrical contact with said flex circuits to form a mechanical coupling between said flex circuits and said at least one piezoelectric element over substantially its entire surface area to form a unitary electro-active structure in which in-plane strain of said at least one piezoelectric element is effectively transferred to opposite surfaces of said flex circuits which are opposed to said electrode surfaces; and

bonding one of said opposite surfaces of one of said flex circuits to an object such that in-plane strain of the at least one piezoelectric element mechanically acts on said object through said one flex circuit when signals are applied to the electrodes.

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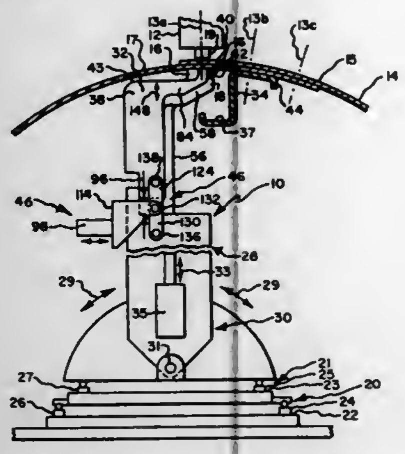
5,687,463
APPARATUS FOR POSITIONING OF TOOLING EFFICIENTLY

David Michalewski, Cheektowaga, and Ernest K. Krell, Lewiston, both of N.Y., assignors to Gemcor Engineering Corp., Buffalo, N.Y.

Division of Ser. No. 135,914, Oct. 13, 1993, Pat. No. 5,555,616. This application Jun. 6, 1995, Ser. No. 465,728

Int. Cl.⁶ B23P *11/00*

U.S. Cl. 29—243.53 **4 Claims**



1. Riveting apparatus comprising anvil means having an anvil surface for receiving a rivet, workpiece clamping means having at least one clamping portion for clampingly engaging a workpiece, said anvil means and said workpiece clamping means being located adjacent one side of said workpiece, frame means for supporting said anvil means and said clamping means, and means for extending and retracting said clamping means relative to said frame means and said anvil means for movement of said clamping portion toward and away from the workpiece in a first direction, said clamping means comprising at least one extending body portion connected at one end portion thereof to said frame means and including means for supporting said at least one clamping portion offset in a second direction from said clamping means body portion and wherein said anvil means comprises a body portion connected at one end portion thereof to said frame means and including means for supporting said anvil surface offset in said second direction from said anvil means body portion, said second direction being substantially orthogonal to said first direction.

5,687,464
APPARATUS FOR PULLING GOLF CLUB SHAFTS FROM CLUB HEADS

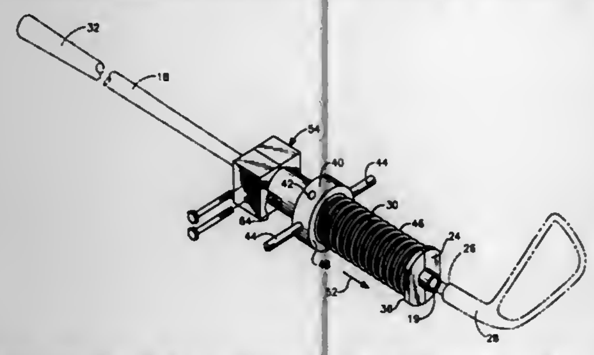
Perry C. Marshall, 103 Granada Ct. North, Plant City, Fla. 33566

Filed Dec. 20, 1995, Ser. No. 575,565

Int. Cl.⁶ B23P *19/04*

U.S. Cl. 29—263 **9 Claims**

1. An apparatus that separates a golf club shaft and a hosel of the golf club head that are secured to one another by an adhesive, comprising:



- a guide tube member having a diameter sufficient to axially receive therein the shaft and hand grip of a golf club;
- a hosel push member positioned at a leading end of said guide tube member, said hosel push member having a leading end adapted to abuttingly engage an annular shoulder defined by a juncture of said shaft and said hosel, said hosel push member having a trailing end slideably received within said leading end of said guide tube member, said hosel push member having a radially outwardly extending flange positioned between the leading and trailing ends of said hosel push member, and said leading end of said guide tube disposed in abutting relation to a trailing side of said flange;
- said guide tube having external threads formed substantially along its extent;
- an internally threaded drive means push member disposed in screwthreaded engagement with said external threads of said guide tube so that said internally threaded drive means push member is displaced in a trailing-to-leading direction toward said hosel when rotated in a first direction and in a leading-to-trailing direction away from said hosel when rotated in a second direction;
- a drive means disposed in ensleeving relation to said guide tube, said drive means having a leading end abutting said trailing side of said flange of said hosel push member and said drive means having a trailing end abutting a leading side of said drive means push member; and
- an anti-rotation means secured to said shaft in abutting relation to a trailing end of said guide tube, said anti-rotation means adapted to prevent rotation of said guide tube upon rotation of said drive means push member;
- whereby advancement of said internally threaded drive means push member in a trailing-to-leading direction applies pressure to said drive means in said trailing-to-leading direction and hence said hosel push member and said hosel in said trailing-to-leading direction so that said hosel separates from said shaft when said adhesive is thereafter weakened by application of heat to said hosel.

5,687,465
METHOD OF REMOVING A BUBBLE FROM A LIQUID CRYSTAL DISPLAY ELEMENT

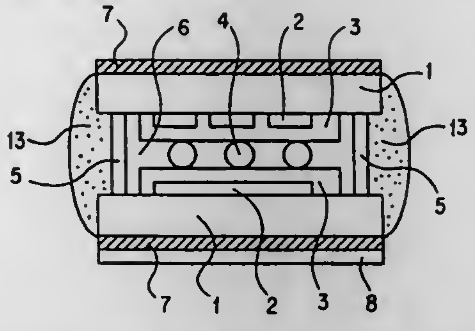
Shoji Hinata, and Yoichi Ono, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 53,570, Apr. 28, 1993, abandoned, which is a division of Ser. No. 922,376, Jul. 31, 1992, abandoned. This application May 8, 1995, Ser. No. 438,032

Claims priority, application Japan, Aug. 1, 1991, 3-192972; Aug. 1, 1991, 3-192973; Jun. 29, 1992, 4-170335; Jun. 29, 1992, 4-170336; Jun. 29, 1992, 4-170337; Jun. 29, 1992, 4-170338; Jul. 1, 1992, 4-174140

Int. Cl.⁶ B29C *73/00*

U.S. Cl. 29—402.01 **2 Claims**



1. A method of removing a bubble formed in a liquid crystal material contained in a liquid crystal display element, said liquid crystal display element having a pair of flexible substrates sealed to each other by a sealing member with a plurality of spacers disposed therebetween and defining a predetermined space between said substrates, said space being sealed and said liquid crystal material being contained within said sealed space, each of said substrates containing a gas barrier film and an orientating film, said orientating film being in contact with said liquid crystal material, said method comprising the steps of:

- placing said liquid crystal display element with the bubble formed in said liquid crystal material in a vacuum dryer; and
- subjecting said liquid crystal display element to a reduced pressure in said vacuum dryer while said space is sealed for a time period to remove the bubble from said sealed space.

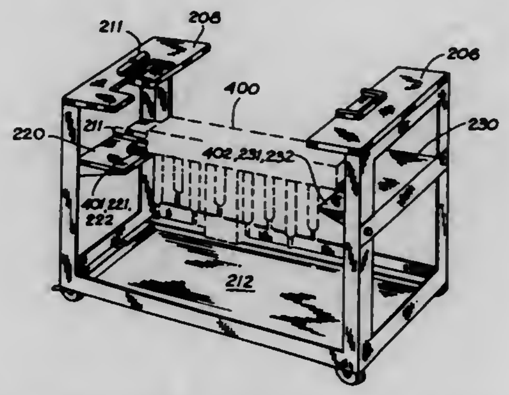
5,687,466
MAINTENANCE RACK FOR POWER SYSTEM RECLOSERS

Carlos Flores, 1514 S. Kentucky, Roswell, N. Mex. 88201

Filed May 8, 1995, Ser. No. 436,845

Int. Cl.⁶ B23Q *7/00;1/25*

U.S. Cl. 29—402.03 **2 Claims**



2. A method of performing a maintenance task on a first type of recloser device and a second type of recloser device, both recloser devices being of the type used in the distribution of electrical energy, said method comprising the steps of:

- (a) providing said first type of recloser device, said first type of recloser device having a head cover requiring removal to gain access to service a recloser mechanism;
- (b) providing a maintenance rack comprising:
  - a tiered frame structure;
  - a service member formed as part of said frame structure, said service member comprising a first support arrangement defining an open area flanked by a first and second support plate, said open area and each of said first and second support plates, being sized for accommodating a suspended support of said first type of recloser device for performing a service task; and
  - a detachable service member formed to attach to said frame structure, said detachable service member comprising a rotatable bar member mounted on opposing pivot support members that are attached to said frame structure, said rotatable bar member being formed for attaching to said second type of recloser device for positioning said second type of recloser device in a first service position and performing a first service task, said rotatable bar member being formed for facilitating rotation of said attached second type of recloser device to a secured second position and performing a second service task;
- (c) positioning said first type of recloser device within said open area;
- (d) supporting said first type of recloser device on said first and second support plates;
- (e) securing said first type of recloser device to said first and second support plates using a latch means;
- (f) removing said head cover;
- (g) servicing said first type of recloser device;
- (h) removing said first type of recloser device from said maintenance rack;
- (i) providing said second type of recloser device, said second type of recloser device having mounting means to effect a suspended service task;
- (j) attaching said rotatable bar to said second type of recloser device using said mounting means;
- (k) securing said rotatable bar with attached second type of recloser device to said opposing pivot support members;
- (l) rotating said bar and attached second type of recloser device to a desired service position; and
- (m) servicing said second type of recloser device.

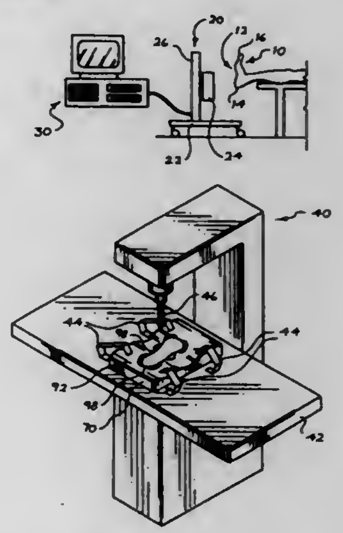
5,687,467
METHOD FOR PREPARING AN ORTHOTIC APPLIANCE

John Bergmann, Evanston, Ill.; David Parker, Orem, Utah, and Tom Sawyer, Winnetka, Ill., assignors to Bergmann Orthotic Lab, Inc., Northfield, Ill.

Filed Nov. 30, 1994, Ser. No. 347,579

Int. Cl.⁶ B23Q *17/00*

U.S. Cl. 29—407.05 **16 Claims**



1. A method of preparing an orthotic appliance for correctly supporting a foot comprising the steps of:

- measuring a foot topography;
- translating the foot topography into a three dimensional mathematical model;
- relaying the three dimensional model and added corrections through a computer to control a milling machine;
- milling a positive mold of the corrected foot topography;
- forming a material over the positive mold to create a formed side and an exposed side; and
- milling the exposed side of the material to form a corrected bottom side of the orthotic appliance.

5,687,468
PROCESS FOR MANUFACTURING A MAGNETIC CIRCUIT FOR A VALVE

Waldemar Hans, Bamberg, and Robert Schmidt-Hebbel, Hirschaid, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE95/00522, § 371 Date Sep. 11, 1996, § 102(e) Date Sep. 11, 1996, PCT Pub. No. WO96/08647, PCT Pub. Date Mar. 21, 1996

PCT Filed Apr. 13, 1995, Ser. No. 646,244

Claims priority, application Germany, Sep. 13, 1994, 44 32 525.8

Int. Cl.⁶ H01F *41/02*

U.S. Cl. 29—602.1 **9 Claims**

1. A method for manufacturing a magnetic circuit for a valve having a longitudinal valve axis, the valve including an internal field and a valve jacket, the internal field and the valve jacket positioned substantially concentric with the longitudinal valve axis, the method comprising the steps of:

- (a) forming a single-part valve housing having a magnetic property, the single-part valve housing having an external

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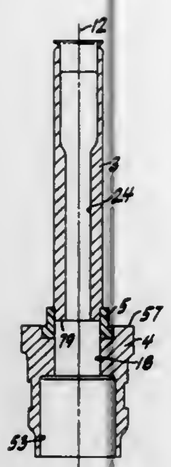


contour substantially corresponding to a predetermined contour of the internal field and the valve jacket;

(b) mounting an intermediate ring on the single-part valve housing, the intermediate ring including an intermediate ring material;

(c) placing the single-part valve housing in a pressing tool to form a free-space opening, the valve housing including a valve housing material;

(d) applying a force to the intermediate ring using the pressing tool, the force at least partially displacing the intermediate ring material and the valve housing material radially in the direction of the longitudinal valve axis, the intermediate ring material and the valve housing material being displaced into the free-space opening for binding the intermediate ring material with the valve housing material; and

(e) radially-widening an internal opening in the valve housing up to the intermediate ring using a machining operation, the internal opening being radially-widened for separating the internal field from the valve jacket and for forming the external contour of the valve housing.

5,687,469
METHOD FOR USING A WRAPPING MATERIAL HAVING A COLD SEAL ADHESIVE FOR COVERING FLOWER POTS

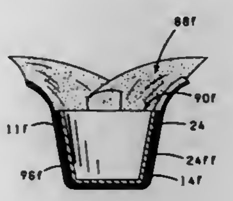
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

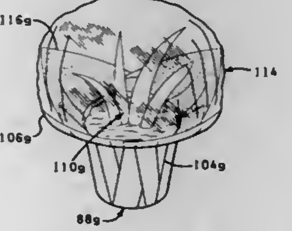
Continuation-in-part of Ser. No. 385,604, Feb. 9, 1995, Pat. No. 5,560,181, Ser. No. 370,334, Jan. 9, 1995, Pat. No. 5,537,800, Ser. No. 253,513, Jun. 3, 1994, abandoned, and Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851, which is a continuation-in-part of Ser. No. 1,001, Jan. 6, 1993, Pat. No. 5,307,606, said Ser. No. 385,604is a continuation of Ser. No. 313,675, Sep. 27, 1994, abandoned, which is a continuation of Ser. No. 188,183, Jan. 28, 1994, Pat. No. 5,388,386, which is a continuation of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 370,334is a continuation of Ser. No. 253,648, Jun. 3, 1994, abandoned, which is a continuation of Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 253,513is a continuation of Ser. No. 108,093, Aug. 17, 1993, Pat. No. 5,472,752, which is a continuation of Ser. No. 24,573, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 464,694, Jan. 16, 1990, Pat. No. 5,208,027, which is a continuation of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jun. 6, 1995, Ser. No. 469,937

Int. Cl.⁶ B21D *35/00*

U.S. Cl. 29—469.5 **9 Claims**

1. A method of using a wrapping material to form a wrapper,





comprising:

providing a pot having an outer peripheral surface and a bonding material comprising a cold seal adhesive disposed on at least a portion of the outer peripheral surface, said cold seal adhesive bonding only to itself, said cold seal adhesive being substantially nonreleasable;

providing a sleeve made by forming at least one flexible sheet of material into a predetermined shape for receiving a flower pot, the sleeve comprising a first end, a second end and an outer peripheral surface, an opening intersecting at least the first end forming an inner peripheral surface and a retaining space, the sleeve further comprising a bonding material on at least a portion of the inner peripheral surface, said bonding material comprising a cold seal adhesive, said cold seal adhesive bonding only to itself, said cold seal adhesive being substantially nonreleasable;

disposing the pot into the sleeve by inserting the pot into the open first end of the sleeve;

aligning at least one portion of the bonding material on the pot with at least one other portion of the bonding material on the sleeve by disposing at least the one portion of the bonding material on the outer peripheral surface of the pot adjacent to at least the one other portion of the bonding material on the inner peripheral surface of the sleeve;

connecting the aligned and adjacent portion of the bonding material on the sleeve with the aligned and adjacent portion bonding material on the pot by pressing the adjacent and aligned portion of the bonding material on the sleeve against the adjacent and aligned portion of the bonding material on the pot, thereby causing a bonding connection between said portions such that the sleeve is connected to the pot, wherein any portion of the bonding material on the sleeve and any portion of the bonding material on the pot which are non-aligned cannot bond the sleeve and the pot together, wherein the sleeve is connected to the pot only by the bonding connection between the aligned and connected bonding material on both the pot and the sleeve, and wherein the pot bonded to the sleeve forms a wrapper.

5,687,470
METHOD FOR FORMING AN RF SHIELDED ENCLOSURE

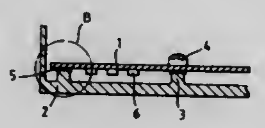
Mikko Veijo Tapani Halttunen, Oulu, and Markku Gunnar Kankaanpää, Salo, both of Finland, assignors to Nokia Mobile Phones Limited, Espoo, Finland

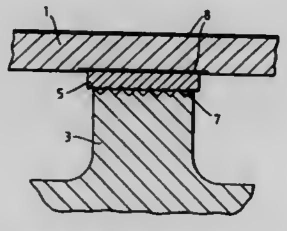
Filed Nov. 5, 1992, Ser. No. 972,145

Claims priority, application Finland, Nov. 6, 1991, 915242

Int. Cl.⁶ H01S *4/00;* **H05K** *9/00*

U.S. Cl. 29—592.1 **10 Claims**





1. A method of connecting two members to each other to form an RF shielded enclosure comprising steps of:

providing a first one of the two members with a plurality of recesses along an edge of a wall of the first member;

applying an electrically conductive fluid at an area of a second one of the two members that is intended to mate with the edge of the first member's wall; and

connecting the two members to each other with the electrically conductive fluid being sandwiched between the two members and extending, at least partially, into the recesses along the first member's wall.

5,687,471
METHOD OF AND APPARATUS FOR COVERING ROTOR MAGNETS

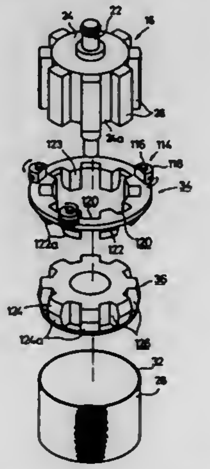
Hiroyuki Noguchi; Takeshi Mizuno; Kenji Morii, and Tokio Kikuchi, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1995, Ser. No. 490,540

Claims priority, application Japan, Jun. 14, 1994, 6-132090; Jun. 14, 1994, 6-132091

Int. Cl.⁶ H05K *15/02*

U.S. Cl. 29—598 **5 Claims**



1. A method of covering permanent magnets of a rotor with a cylindrical member, comprising the steps of:

providing a rotor with opposite ends and having a plurality of permanent magnets thereon which are spaced at given angular intervals around said rotor;

forcing a holding jig having a plurality of grooves of inserting said permanent magnets therein and a plurality of tapered teeth, together with a movable jig, into an insertion end of the cylindrical member, whereby said teeth expand said cylinder member at said insertion end radially outwardly to a diameter greater than a diameter of the rotor, wherein a largest outer diameter of said movable jig is greater than an interior diameter of said cylindrical member when the cylindrical member is in a non-expanded state;

inserting said rotor together with said movable jig into said cylindrical member while being guided by said holding jig, wherein said movable jig further expands the cylindrical member with said rotor having one of said opposite ends continuously engaging and forcing said movable jig during the insertion; and

after said rotor has been inserted in said cylindrical member, removing said holding jig and said movable jig from said opposite ends of said rotor, for thereby leaving said permanent magnets covered with said cylindrical member.

5,687,472
METHOD OF MANUFACTURING A VACUUM INTERRUPTER

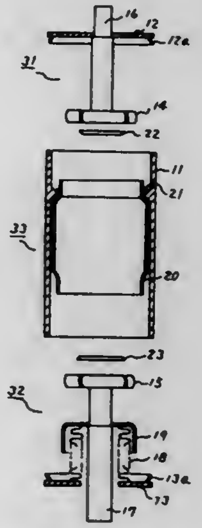
Mitsutaka Honma, Saitama-ken; Hiromichi Somei, Tokyo; Tadahiro Aihara, Tokyo; Tsuneyo Seki, Tokyo, and Atsushi Yamamoto, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 3, 1995, Ser. No. 433,015

Claims priority, application Japan, May 12, 1994, 6-097790; Apr. 4, 1995, 7-078507

Int. Cl.⁶ H01H *11/06;* **B23K** *31/02*

U.S. Cl. 29—622 **14 Claims**



1. A method of manufacturing a vacuum interrupter, including, a vacuum enclosure composed of an insulating tube and a pair of metal flanges including a fixed-side flange and a movable-side flange, both ends of said insulating tube being sealed by said metal flanges, respectively, a pair of electrodes including a fixed electrode and a movable electrode provided in said vacuum enclosure which are able to make and break contact, at least one contact joined to a facing surface of at least one of said electrodes, and a pair of conducting shafts including a fixed-side conducting shaft and a movable-side conducting shaft, each of said conducting shafts being electrically connected at one end thereof to a back surface of one of said pair of electrodes and being outside of said vacuum enclosure at another end thereof for connecting one of said pair of electrodes to said outside, respectively, said method comprising the steps of:

preparing a fixed-side subassembly composed of said fixed electrode, said fixed-side conducting shaft and a fixed-side flange jointed as one unit;

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preparing a movable-side subassembly composed of said movable electrode, said movable-side conducting shaft and a movable-side flange jointed as one unit;
preparing an insulating tube subassembly composed of at least said insulating tube;
preparing an assembly such that said movable-side subassembly, said insulating tube subassembly and said fixed-side subassembly are superimposed with first solders for gas-tight sealing inserted between said movable-side subassembly and one end surface of said insulating tube subassembly and between another end surface of said insulating tube subassembly and said fixed-side subassembly, and with at least one second solder for contact soldering inserted between said at least one contact and at least one of said electrodes; and
heating and evacuating said assembly in a vacuum furnace to evacuate inside said vacuum enclosure and to soider by said first solders and said second solder, thereby to obtain said vacuum interrupter;
whereby gas-tight soldering of said insulating tube and said metal flanges and soldering of said at least one contact and at least one of said electrodes being carried out simultaneously in said heating and evacuating step.

5,687,473
APPARATUS AND METHOD FOR MOUNTING A HAIRPIN TUBE TO A HEAT EXCHANGER

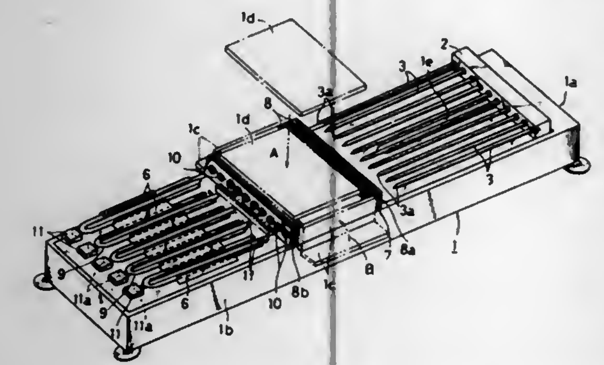
Kenji Tokura, Osaka, Japan, assignor to Kyoshin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 5, 1995, Ser. No. 523,618

Claims priority, application Japan, Oct. 5, 1994, 6-241454; Mar. 8, 1995, 7-048658

Int. Cl.⁶ B23P *15/26*

U.S. Cl. 29—727 **12 Claims**



1. An apparatus for mounting a hairpin tube to a heat exchanger body, which comprises:
a base;
a reciprocating member movable forward and backward longitudinally of said base;
a rod member mounted on said reciprocating member and insertable into through holes defined in each of plural radiation fins stacked in the heat exchanger body from the through hole of the radiation fin closer to one end of the heat exchanger body to the radiation fin closer to the opposite end of the heat exchanger body;
a hairpin tube transporting member for transporting the hairpin tube such that an open end of the hairpin tube is inserted into the through hole of the radiation fin closer to the opposite end of the heat exchanger body; and
means for imparting motion to said rod member for smoothly inserting said rod member into said through holes wherein said motion is independent of the motion of said reciprocating member.

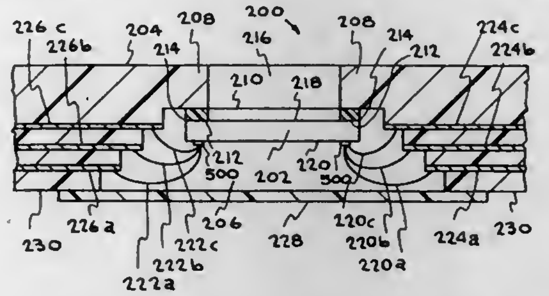
5,687,474
METHOD OF ASSEMBLING AND COOLING A PACKAGE STRUCTURE WITH ACCESSIBLE CHIP

Ahmad Hamzehdoost, Sacramento, and Leonard Lucio Mora, San Jose, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 96,333, Jul. 23, 1993, abandoned, which is a division of Ser. No. 876,249, Apr. 30, 1992, abandoned. This application Jan. 11, 1996, Ser. No. 587,830

Int. Cl.⁶ H05K *3/30*

U.S. Cl. 29—832 **10 Claims**



1. A method for directly cooling an integrated-circuit die, having a front and back surface, mounted in an integrally formed package assembly comprising the steps of:
fixing said back surface of an unpackaged integrated-circuit die to a mounting surface formed on an inwardly extending portion of a package body having a cavity formed therein for accepting said unpackaged integrated-circuit die to form an integral package assembly of said previously unpackaged integrated circuit die and said package body; and
exposing said back surface of said fixed integrated-circuit die through a central opening formed in said package body to provide direct cooling to said back surface of said integrated circuit die in said integral package assembly.

5,687,475
PROCESS FOR DETERMINING THE POSITION AND/OR CHECKING THE SEPARATION AND/OR CHECKING THE COPLANARITY OF THE LEADS OF COMPONENTS

Günter Doemens, Holzkirchen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

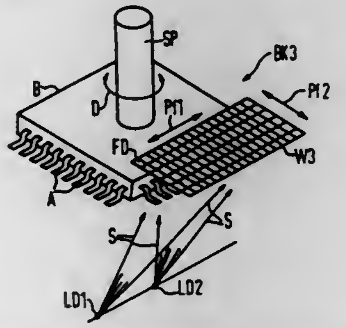
Continuation of Ser. No. 307,749, Sep. 26, 1994, Pat. No. 5,502,890. This application Apr. 1, 1996, Ser. No. 625,128

Claims priority, application Germany, Mar. 24, 1992, 42 09 524.7

The portion of the term of this patent subsequent to Sep. 26, 2014, has been disclaimed.

Int. Cl.⁶ H05K *3/30*

U.S. Cl. 29—833 **19 Claims**



1. A process for determining the position and/or checking the separation and/or checking the coplanarity of the leads (A) of components (B), which are removed from a predetermined removal position of a component preparation device by means of a equipping head (BK2; BK3; BK4) and are positioned in a predetermined position on a printed circuit board (LP) or a ceramic substrate, characterized in that in each case one direct shadow of the region of the leads at one side of the component is generated successively by illumination from two different directions on the photosensitive surface of a local resolution optoelectronic transducer (W2; W3; W4) fitted to the planting head (BK2; BK3; BK4), and in that the spatial position of the leads (A) is computed from the differing position of corresponding shadow edges of the leads (A) on the optoelectronic transducer (W2; W3; W4).

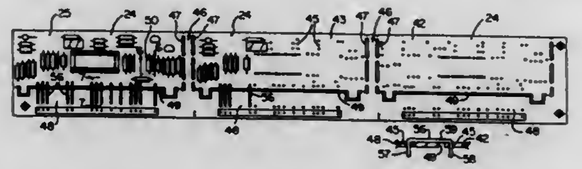
5,687,476
METHOD OF MAKING PRINTED CIRCUIT ARRANGEMENT

Keith A. Van Liere, Jenison, Mich., assignor to RobertShaw Controls Company, Richmond, Va.

Division of Ser. No. 202,791, Feb. 28, 1994, Pat. No. 5,525,763. This application Jan. 19, 1996, Ser. No. 588,966

Int. Cl.⁶ H01R *9/06*

U.S. Cl. 29—843 **16 Claims**



1. A method of making a printed circuit board arrangement having a first printed circuit board with a first component carrying side and a first opposite printed circuit side and a second printed circuit board with a second component-carrying side and a second opposite printed circuit side comprising the steps of:
forming a securing means having a plurality of conductive jumper wires, each jumper wire having a generally L-shaped configuration and opposite end means;
securing one of said opposite end means to said first printed circuit side and securing another of said opposite end means to said second printed circuit side;
forming an opening means passing through said first printed circuit board;
forming a tab means extending from said second printed circuit board and
disposing said tab means in said opening means.

5,687,477
APPARATUS FOR AUTOMATIC MANUFACTURE OF WIRING HARNESSES

Louis Soriano, Aubagne, France, assignor to The Whitaker Corporation, Wilmington, Del.

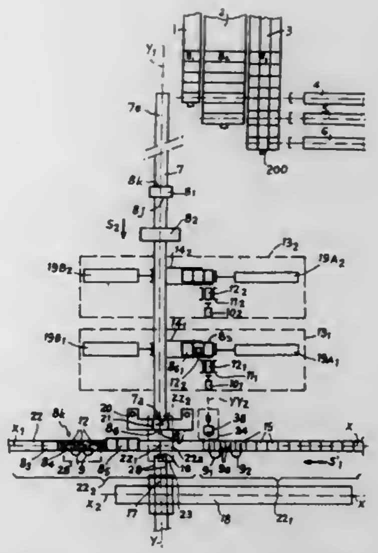
Continuation of Ser. No. 78,287, Jun. 22, 1993, abandoned. This application Oct. 3, 1996, Ser. No. 725,690

Claims priority, application France, Dec. 18, 1990, 90 16625

Int. Cl.⁶ H01R *43/20;* B23P *19/00*

U.S. Cl. 29—872 **9 Claims**

1. A method of manufacturing a wiring harness having a plurality of wires with wire ends, said ends to be inserted in recesses of components, comprising the steps of:
a) providing at least one main conveyor capable of transporting said wires by means of a plurality of clamps transfer claims situated on said main conveyor;
b) providing at least one secondary conveyor capable of transporting a plurality of transfer trays, said transfer trays being suitable for receiving at least one of said components, a portion of said secondary conveyor being situated in an insertion zone having a portion of said main conveyor situated herein;
c) providing at least one loading station along said secondary conveyor, said loading station being equipped with a supply of identical components;
d) disposing at least one transfer tray on said secondary conveyor, said transfer tray being provided with a holding jig for holding said components disposed in said loading section;



e) actuating said secondary conveyor to position said transfer tray into a location corresponding with one of said loading station;
f) transferring said transfer tray onto said loading station and loading said transfer tray with at least one of said components; with which said loading station is equipped wherein a front face of said component is aligned adjacent to a front face of said transfer tray;
g) transferring said transfer tray back onto said secondary conveyor from said loading station;
h) actuating said secondary conveyor so as to place said transfer tray fitted with said component in said insertion zone and; wherein said front face of said transfer tray faces said insertion means;
i) inserting by an insertion means, the ends of said wires previously disposed in said transfer clamps into said recesses of said components loaded said transfer tray; and
j) transferring said transfer tray on said main conveyor.

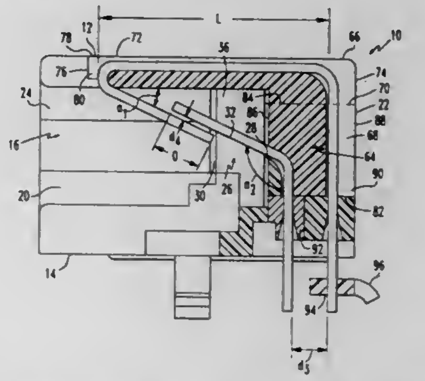
5,687,478
METHOD OF REDUCING ELECTRICAL CROSSTALK AND COMMON MODE ELECTROMAGNETIC INTERFERENCE

Yakov Belopolsky, Harrisburg, Pa., assignor to Berg Technology, Inc., Reno, Nev.

Division of Ser. No. 346,640, Nov. 30, 1994. This application Apr. 19, 1996, Ser. No. 597,072

Int. Cl.⁶ H01R *43/00*

U.S. Cl. 29—884 **15 Claims**



1. A method for reducing electrical crosstalk and common mode interference in a modular jack assembly for receiving another connecting element having contacts for signal transmission comprising the steps of:

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(a) providing an outer insulative housing having top and bottom walls and opposed lateral walls all defining an interior section and said housing also having front and rear open ends;

(b) positioning a first plurality of generally parallel conductive means in said insulative housing in a first arrangement of planar sections which is comprised of a common rear planar section having an upper edge, a common upper planar section extending forwardly from the upper edge of said rear planar section and itself having a front edge and a common terminal oblique planar section having a first terminal edge sloping downwardly and rearwardly from said front edge of said upper planar section;

(c) positioning a second plurality of generally parallel conductive means in said insulative housing in a second arrangement of planar sections which has a common lower planar section having an upper edge and a common oblique planar section extending upwardly and forwardly from said upper edge in a common oblique planar section having a second terminal edge which extends beyond the first terminal edge of the oblique planar section of the first plurality of conductive means such that said oblique planar sections of the first and second plurality of conductive means are positioned in overlapping relation and the portions of both of said first and second pluralities of conductive means that are located in said oblique planar sections are positioned for engaging the contacts of said other connecting element when said other connecting element is inserted into the front open end of the housing for signal transmission; and

(d) providing an insulative insert in which said first plurality of conductive means are at least partially retained and said insulative insert has an upper section having a base and upper sides and a rear and terminal ends and is positioned so that the base side of said insulative insert is superimposed over the rear open end of the insulative housing and the upper end of said insulative insert is adjacent the top side of the insulative housing such that the terminal end of said insulative insert extends into the interior section of the insulative housing.

5,687,479

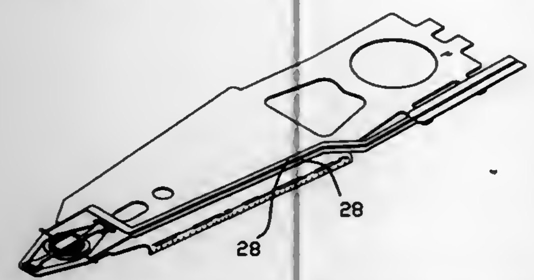
ELECTRICAL TRACE INTERCONNECT ASSEMBLY

Jeffry S. Bennin, Hutchinson; Todd Boucher, Stewert, both of Minn.; Jeffrey W. Green, Sioux Falls, S. Dak.; Gary E. Gustafson, Darwin, Minn.; Ryan Jurgenson, Hutchinson, Minn., and Brent D. Lien, Minneapolis, Minn., assignors to Hutchinson Technology Incorporated, Hutchinson, Minn.

Division of Ser. No. 227,978, Apr. 15, 1994, abandoned. This application Apr. 19, 1996, Ser. No. 634,972

Int. Cl.^{6} H01R *43/16*

U.S. Cl. 29—885 **23 Claims**



1. A method of manufacture for a trace interconnect conductor suitable for mating with a suspension assembly of the type including flexible and rigid regions and for transmitting electrical signals to and from a head assembly, said method of manufacture comprising the steps of:

manufacturing out of a planar sheet of conductive material an elongated, and generally flat trace conductor having rigid and flexible regions that correspond to the rigid and flexible regions in the suspension assembly, a distal end adapted for electrically coupling to an electrical terminal in a head assembly, a proximal end adapted for coupling to processing circuitry, a first major surface, and a second major surface, and

pre-shaping the trace conductor such that at least a portion of the trace conductor matches the surface topology of at least a portion of the suspension assembly to which the trace conductor is to be applied.

5,687,480

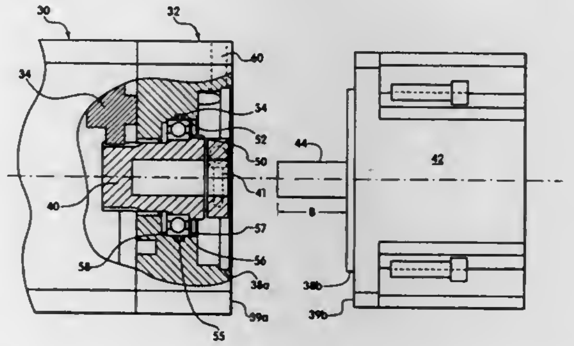
METHOD FOR MOUNTING A SEALED GEARHEAD CONFIGURATION

Yefim Khariton, Brooklyn, and Avi Telyas, Roslyn Heights, both of N.Y., assignors to Bayside Controls, Inc., Port Washington, N.Y.

Filed Jan. 24, 1996, Ser. No. 592,866

Int. Cl.^{6} F16H *1/26*

U.S. Cl. 29—893.2 **2 Claims**



1. A method for mounting a motor with a shaft onto a gearhead including an input pinion gear, comprising the steps of:

inserting the motor shaft into the input pinion gear;

securing the gearhead to the motor, whereby the input pinion gear is automatically positioned along the motor shaft; and

clamping the input pinion gear to the motor shaft,

wherein the gearhead includes a gearhead pilot ring and the motor includes a motor pilot ring with about 0.001 inch to about 0.002 inch clearance between the gearhead pilot ring and the motor pilot ring, wherein said gearhead pilot ring engages said motor pilot ring prior to said step of securing, with the input pinion gear and motor shaft connection determining the alignment between the gearhead pilot ring and the motor pilot ring.

5,687,481

SHAVING APPARATUS WITH ELECTRICALLY ADJUSTABLE CUTTING UNIT

Jan De Boer; Jacobus N. Dekker; Andries T. Reeder; Albertus J. C. Van Der Borst, and Pieter De Pooter, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

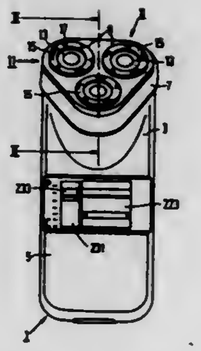
Filed May 31, 1995, Ser. No. 455,613

Claims priority, application European Pat. Off., Jun. 1, 1994, 94201557

Int. Cl.^{6} B26B *19/14*

U.S. Cl. 30—43.1 **59 Claims**

1. A shaving apparatus comprising an electric motor, at least one adjustable cutting unit provided with an external cutting member with at least one hair trap opening and an internal cutting member drivable relative to the external cutting member by means of said electric motor, an electrical actuator and an electrical control unit provided with at least one electrical input and at least one electrical output, characterized in that said cutting unit is adjustable by means of said actuator and said actuator is controllable by means of said electrical control unit.



5,687,482

ROTATING TRIMMING LINE FOR BRUSH CUTTERS

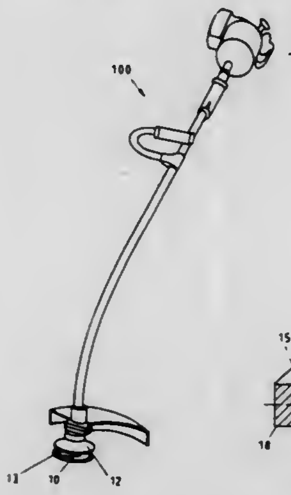
Martin Behrendt, Hamburg, Germany, assignor to Dolmar GmbH, Hamburg, Germany

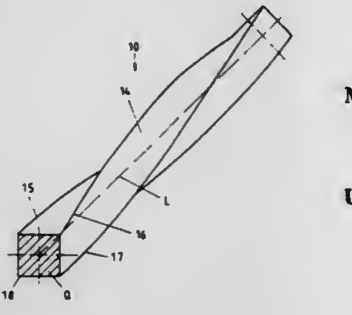
Filed Aug. 8, 1995, Ser. No. 512,606

Claims priority, application Germany, Aug. 11, 1994, 94 12 925.8

Int. Cl.^{6} A01D *55/00;* B26B *27/00*

U.S. Cl. 30—276 **6 Claims**





1. A brush cutter comprising:

a drive motor; and

a rotating trimming line having a first end secured to the drive motor for rotational movement of the trimming line, the trimming line having a longitudinal axis and a plurality of lateral edges with lateral surfaces therebetween, the lateral surfaces each defining a smooth surface along the longitudinal axis of the trimming line;

wherein the rotational trimming line has a radially symmetric cross-section having a constant size and shape along the longitudinal axis, the angle of the cross section relative to the longitudinal axis varying continuously by a constant amount along the longitudinal axis of the trimming line.

5,687,483

ELECTRIC HAND TOOL GUIDED WITH TWO HANDS

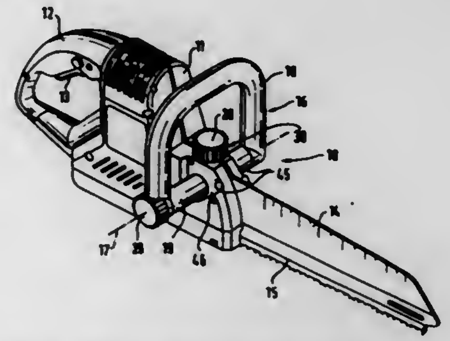
Werner Neubert; Joachim Schadow; Joachim Mueller, all of Stuttgart; Manfred-Otto Staebler, Waldenbuch; Manfred Dohr, Esslingen, and Heinz Warkentin, Allmersbach im Tal, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 189,107, Jan. 31, 1994, abandoned. This application Oct. 2, 1995, Ser. No. 538,068

Claims priority, application Germany, Jan. 30, 1993, 43 02 676.1

Int. Cl.^{6} B25G *1/06*

U.S. Cl. 30—312 **9 Claims**



1. An electric hand tool guided with both hands, comprising a tool housing; a stationary handle; and an additional movable handle, said additional handle being turnable about a turning axis and being also displaceable longitudinally substantially along said turning axis, said additional handle being formed as a gripping bracket having two opposite ends, and having a member which extends through said tool housing substantially along said turning axis and connects said ends of said gripping bracket with one another, said member being formed as a spacer pipe which is substantially closed at its both ends and provided with a flattening having a region which is received in a respective flattened tubular opening; and an outwardly releasable clamping device fixing said region of said flattening.

5,687,484

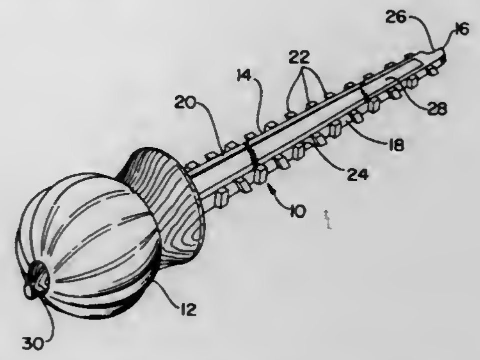
PUMPKIN CARVING KNIFE

Michael Hahn, 3340 SE. Federal Hwy., Suite 232, Stuart, Fla. 34997

Filed Mar. 25, 1996, Ser. No. 622,197

Int. Cl.^{6} B27B *21/00*

U.S. Cl. 30—502 **9 Claims**



9. A child safe cutter for use by children in carving pulpy round fruits and capable of clearing particulate from a kerf being formed in said fruits to prevent jamming of said cutter therein, said cutter comprising:

a handle for gripping the cutter, said handle baving a nub with a tapered profile;

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an elongated blade mounted on said handle and extending away therefrom to define a tip, said elongated blade having at least one edge and a thickness defined by two opposing sides, said blade having a trough along at least one of said two opposing sides;

said tip having a hook formed thereon extending from said at least one edge and curving toward a centerline of the blade;

a plurality of cutting teeth positioned transversely along at least a portion of said at least one edge in an area between the handle and the tip, each of said cutting teeth being provided with at least one cutting edge extending slightly beyond the thickness of said blade and being alternately angularly disposed relative to each other at an angle of between about 5 and 45 degrees from the normal direction relative to an axis defined along the length of said blade.

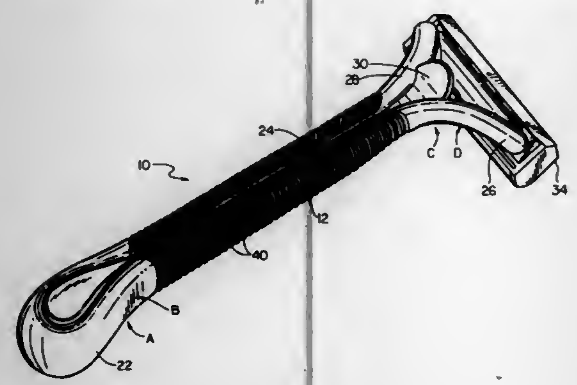
5,687,485
RAZOR HANDLE

Jill Marie Shurtleff, South Boston, and Tzu-Jun Yen, Brookline, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed May 15, 1996, Ser. No. 648,466

Int. Cl.^{6} B26B *21/52*

U.S. Cl. 30—526 **28 Claims**



24. A handle for a wet razor comprising:

an elongate handle member bent at a forward end and at an opposed rearward end towards the surface of the skin of a user being shaved in the shaving position and having a generally elongate central region between said forward and rearward ends, said handle member having a first principal surface, an opposed second principal surface and opposed lateral side surfaces,

wherein said handle member further comprises a cartridge mounting structure provided at said forward end and a longitudinally extending elongated orienting channel for a finger of a user provided at said central region disposed in said first principal surface, and

said bent rearward end further comprises a bulbous thickened portion extending as projected onto a plane parallel to said first principal surface, in a direction transverse to said elongated channel with a width generally greater in a direction transverse to the longitudinal axis than said central region, said bulbous portion being bent away from said second principal surface forming an ergonomic gripping pad for the curved fleshy part of a thumb and a finger of the hand of the user grasp the bulbous portion,

whereby a user places said bulbous portion in a palm of the hand and exerts a force on said elongate finger orienting channel with a finger of the hand to controllably manipulate said razor handle.

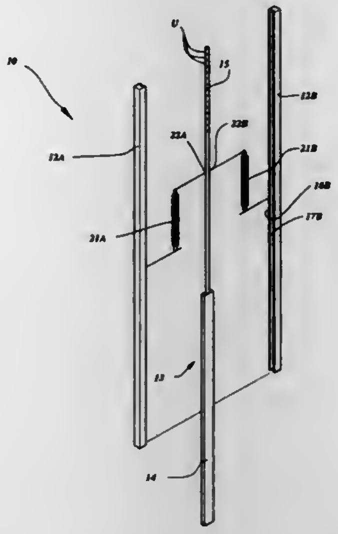
5,687,486
GRADE ROD

Dennis Eugene Foltz, Mt. Mourne, N.C., assignor to Earnhardt Equipment Company, Huntersville, N.C.

Filed Mar. 20, 1996, Ser. No. 618,845

Int. Cl.^{6} G01C *15/06*

U.S. Cl. 33—296 **10 Claims**



1. A grade rod for measuring the depth of cut required to level a ground surface relative to a benchmark elevation location, said grade rod comprising:

(a) an elongated reference member having a reference mark for defining a predetermined elevation at the benchmark elevation location;

(b) an elongated extension member slidably mounted adjacent to said reference member, and having a base end thereof for engaging the ground surface;

(c) said reference member being vertically movable relative to said extension member along a longitudinal axis thereof to permit vertical adjustment of the reference mark;

(d) an elongated coil spring connected to said reference member and said extension member and extending parallel to the longitudinal axis of said extension member for normally maintaining the reference mark a preset spaced distance from the base end of said extension member such that upon sliding vertical movement of said reference member relative to said extension member, said coil spring creates a biasing force urging the return of said reference mark to its original spaced distance from the base end of said extension member; and

(e) scale means carried by one of said reference member and said extension member for indicating to the user the vertical adjustment required to locate the reference mark at said predetermined elevation at any point on the ground surface to thereby determine the depth of cut necessary for leveling the ground surface relative to the benchmark elevation location.

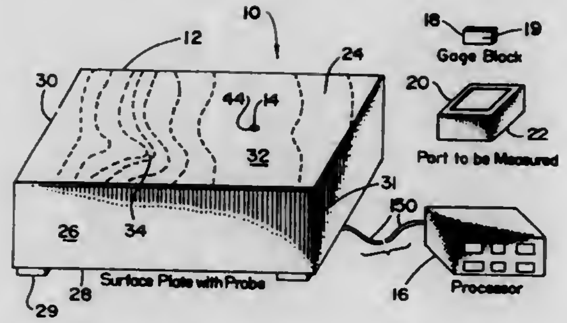
5,687,487
FLATNESS TESTER

Douglas W. Johnson, Coon Rapids, Minn., assignor to Dogwood Restorations, Coon Rapids, Minn.

Filed Sep. 25, 1995, Ser. No. 533,077

Int. Cl.^{6} G01B *21/30;21/20*

U.S. Cl. 33—501.02 **32 Claims**



1. A test apparatus for measuring the flatness of a side of an object comprising, in combination:

a) a surface plate having a solid datum plane testing surface for making contact with the side of the object, with the testing surface having a periphery, with the surface plate having a bore extending at least partially therein from an opening in the testing surface, with the opening being spaced from the periphery; and

b) an electrical probe in the surface plate for electrically measuring the distance between the plane at the opening and a portion of the side of the object when the side of the object lies flat on the testing surface over the opening such that the flatness of the side of the object may be determined, with the electrical probe comprising a probe body and a contact member for displacement relative to the probe body, with the probe having a transducer for converting input energy of the contact member into output energy of an electrical form, with the probe body immobilized in the bore and with the contact member adjacent the opening, with the contact member being movable between a position inwardly of the plane to a position outwardly of the plane, with the contact member being resiliently biased to project out of the opening and beyond the plane for contacting the side of the object whereby the flatness of the side of the object may be determined.

5,687,488
GAUGE FOR PREPARATION OF DRAWINGS WITH VIRTUAL DEEPNESS EFFECT ACHIEVEMENT AND METHOD FOR USING THEREOF

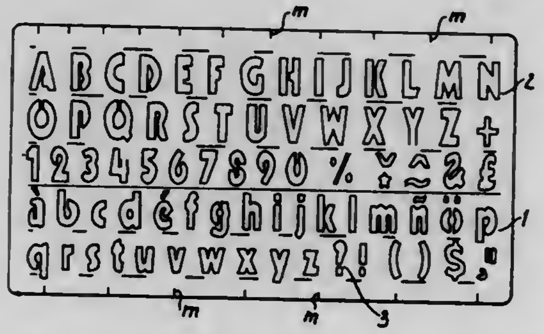
Manricio Araújo De Sousa, Av. Professor Fonseca Rodrigues, 520 - Pinheiros, São Paulo - SP, Brazil, 05461-010

Filed May 1, 1995, Ser. No. 432,012

Claims priority, application Brazil, Jan. 5, 1995, 9500111-5

Int. Cl.^{6} B43L *13/20*

U.S. Cl. 33—565 **4 Claims**



1. Gauge for preparation of drawings to be viewed with virtual deepness effect achievement, consisting essentially of:

a base part having stencil cutout elements of any one or combination of letters and/or graphic elements and/or semi or totally pre-formed drawings for drawing reproduction on a determined surface, and

said base part having an elongated straight edge with a first scale therealong having markings of reference points with progressively decreasing distances therebetween to permit an element to be repetitively drawn along a line on a medium with progressively decreasing distances between elements corresponding to the progressively decreasing distances between the reference points of the first scale so as to produce a drawing, which can be viewed with virtual deepness.

5,687,489
GUIDE ASSEMBLY

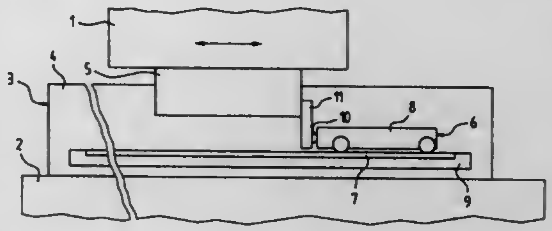
Sebastian Tondorf, Waging, and Christian Callimici, Miesbach, both of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Oct. 23, 1995, Ser. No. 546,803

Claims priority, application Germany, Oct. 25, 1994, 44 38 079.8

Int. Cl.^{6} G01B *5/02;5/004*

U.S. Cl. 33—706 **32 Claims**



1. A guide assembly for a machine-tool or a measuring machine, comprising:

guide means mounted on a machine-tool or measuring machine bed as an independent structural element and comprising a guide rail and an encoder, said encoder being mounted on the guide rail as a separate unit, said encoder having a scale, a scanning head for measuring a displacement path of a slide, and a housing for sealing the scale and the scanning head, the housing being connected to the guide rail; and

the slide being displaceable on the guide rail and connected with a machine-tool carriage or a measuring machine carriage.

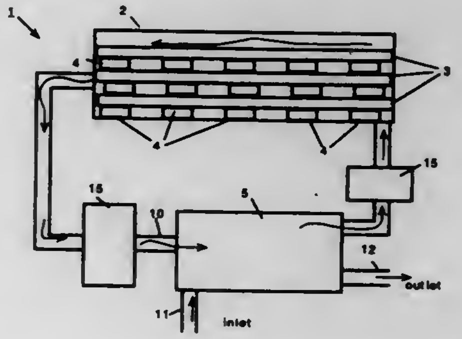
5,687,490
METHOD OF DRYING LUMBER

Jack B. Harrison, 3450 Palmdale Dr., Wasilla, Ak. 99654

Filed Aug. 1, 1996, Ser. No. 690,754

Int. Cl.^{6} F26B *13/30*

U.S. Cl. 34—92 **8 Claims**



1. A method of drying wood, having a moisture content comprising the steps of:

a) placing a plurality of lengths of frozen wood into a drying chamber;

b) sealing the drying chamber;

c) creating a positive pressure within the drying chamber;

d) forcing a quantity of chilled, dry air into the drying chamber and around the plurality of lengths of frozen wood; and

e) repeating step (d) until the moisture content of the plurality of lengths of frozen wood reaches a desired level.

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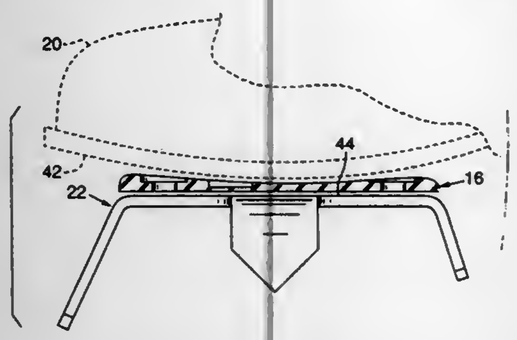
5,687,491
SNOWSHOE WITH CONTOURED FOOTBED

Perry A. Klebahn, San Francisco, Calif., assignor to Atlas Snow-Shoe Company, San Francisco, Calif.

Filed Jan. 26, 1996, Ser. No. 592,125
Int. Cl.^{6} A43B *5/04*

U.S. Cl. 36—124 **8 Claims**



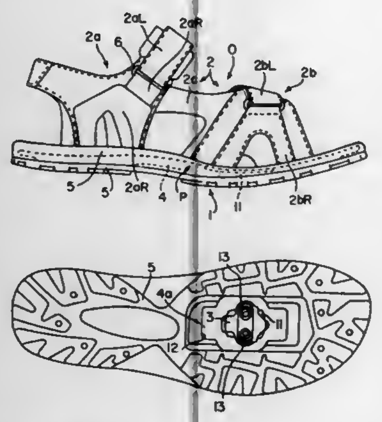
1. In a snowshoe having a frame, a deck supported by the frame, a front claw and a footwear harness assembly connected to the front claw for securing a ball portion of a user's shoe or boot to the snowshoe, the improvement comprising:
   the front claw being rigid and having an upper surface and having means for pivotally attaching said claw to said frame with a generally horizontal axis of rotation, and
   a footbed fixedly secured to the upper surface of the front claw, so that the footbed moves in unison with the front claw, the footbed having a contoured upper surface such that the footbed is concave in that a front end and a rear end of the footbed are higher than a central area of the footbed, so as to cradle the bottom of the user's shoe or boot at the ball of the foot, directly over the generally horizontal axis of rotation of the front claw,
   whereby the contoured upper surface of the footbed helps the user properly locate the ball of the foot on the footbed and on the front claw of the snowshoe, and whereby the contour of the footbed helps prevent slipping of the user's shoe fore and aft and in rotation relative to the snowshoe.

5,687,492
SANDAL

Tsutomu Muraoka, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Jun. 18, 1996, Ser. No. 665,420
Claims priority, application Japan, Jun. 23, 1995, 7-181060
Int. Cl.^{6} A43B *5/14;3/12*

U.S. Cl. 36—131 **28 Claims**



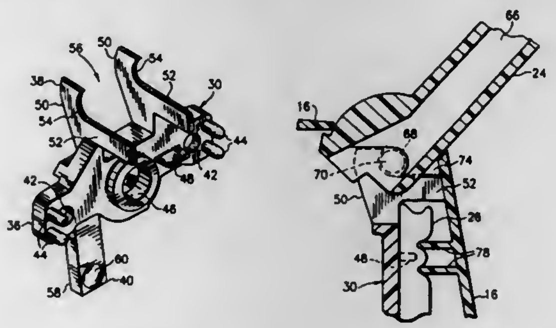
1. A sandal comprising:
a sole (1);
a strap (2) connected to the sole (1), wherein the strap (2) defines a rear side open space between a heel portion of the strap (2*a*) and a heel portion of the sole, wherein the strap (2) defines a lateral side open space between a side portion of the strap (2*c*) and a side portion of the sole, and wherein the strap (2) defines a front side open space between a toe portion of the strap (2*b*) and a toe portion of the sole; and
wherein the sole (1) includes:
   a rigid middle sole (4) that extends along substantially an entire longitudinal length of the sole (1);
   a flexible first covering sole (5) disposed on a lower surface of the middle sole (4), wherein the covering sole (5) includes a window (12) for exposing a portion of the middle sole (4); and
   first and second cleat attachment holes (11) disposed in the window (12) for fixing a cleat (3) to a bottom surface of the sole (1).

5,687,493
COMBINED RETAINING MEMBER FOR AN ELECTRIC APPLIANCE

Peter A. Czerner, Trumbull, and George M. Drizos, Cheshire, both of Conn., assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 11, 1996, Ser. No. 583,910
Int. Cl.^{6} D06F *75/26;75/28*

U.S. Cl. 38—88 **17 Claims**



1. A unitary retaining member for an electric iron comprising:
a first section for attachment to a housing of the iron, the first section having a strain relief section for contacting an electric cord;
a second section extending from the first section having a curved portion that forms part of a pivotable connection point of a bushing for the electric cord into the housing; and
a third section extending from the first section for holding an electronic module between the third section and the housing.

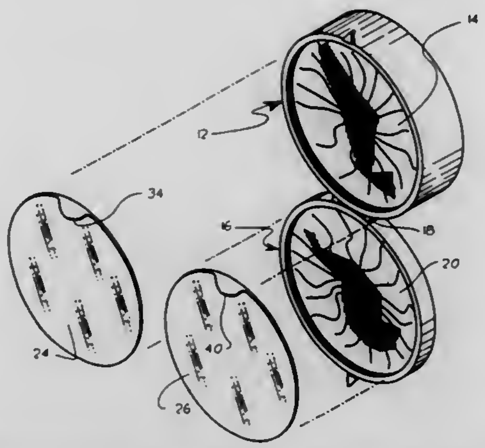
5,687,494
CYLINDRICAL OBJECT DISPLAYING BADGE

Ronald D. Laurent, 420½ Violet Ave., Monrovia, Calif. 91016

Filed Apr. 10, 1995, Ser. No. 419,459
Int. Cl.^{6} A44C *3/00*

U.S. Cl. 40—1.6 **1 Claim**

1. A cylindrical object displaying badge comprising:
an inner container formed of a substantially transparent material;
an outer container formed of a substantially transparent material pivotally mounted to an edge of the inner container;
said inner container incorporating a first axial length substantially greater than an axial length of the outer container;
a closure means for releasably securing the outer container to the inner container in a closed configuration which can be manually released to permit pivoting of the container in an open position;
an inner transparent retaining plate removably secured to said inner container as a means for releasably securing a first disk-shaped object within said inner container;



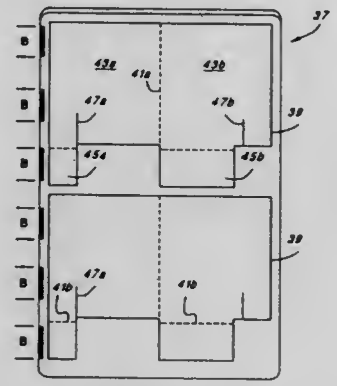
an outer transparent retaining plate removably secured to said outer container as a means for releasably securing a second disk shaped object within the outer container;
a securing device coupled to a surface of the inner container as a means for mounting the badge to an article of clothing;
said outer container further comprising a circular outer base plate and substantially cylindrical outer side wall projecting substantially orthogonally from an outer periphery of the outer base plate; wherein said outer cylindrical side wall is shaped to define an annual retaining groove adapted to receive the periphery of the outer retainer plate so as to secure the outer retaining plate in a spaced relationship relative to the outer base plate;
said inn container further comprising a circular inner base plate and substantially cylindrical inner side wall projecting substantially orthogonally from an outer periphery of the inner base plate; wherein said inner cylindrical side wall is shaped to define an annual retaining groove adapted to receive the periphery of the inner retainer plate so as to secure the inner retaining plate in a spaced relationship relative to the inner base plate;
wherein the inner and outer retaining plates each include a lift tab extending from the peripheral thereof toward the center of the plates as a means for facilitating manual removal of the inner and outer retaining plates from the annual groove of the inner and outer containers, respectively.

5,687,495
POP-UP ITEMS HAVING PRESSURE-SENSITIVE ADHESIVE

John K. Volkert, Northfield, Ill., assignor to Papermasters, Inc., Northfield, Ill.

Filed Apr. 7, 1995, Ser. No. 418,943
Int. Cl.^{6} G09F *1/00*

U.S. Cl. 40—124.08 **11 Claims**



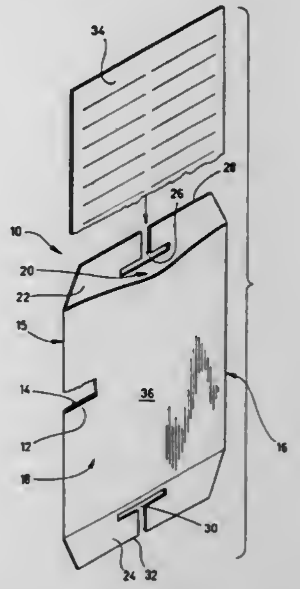
1. A pop-up item, which comprises
a front sheet having a front surface and a rear surface,
a rear sheet, and
pressure-sensitive adhesive attaching said front and rear sheets to each other,
said rear sheet having a front release surface so that said pressure-sensitive adhesive adheres to the rear surface of said front sheet when said front and rear sheets are separated from each other,
said front sheet having die-cut therein a pop-up structure that is generally divided into two halves interconnected along a fold-line, with said halves having different overall shapes but including at least two flag sections of generally similar size and shape and at least two hinged subpanels,
so that, following separation of said die-cut pop-up structure entirely from said rear sheet to expose all said pressure-sensitive adhesive upon its rear surface, said die-cut pop-up structure can be folded along said fold-line to superimpose one flag section atop the other to join both together and create a pop-up element of planar configuration in the form of said joined flag sections and said hinged subpanels which subpanels are unaligned as a result of said different overall shapes of said two halves, with each subpanel having an exposed surface which carries pressure-sensitive adhesive,
whereby said pop-up element can be affixed to a supporting surface or to a pair of hinged-together panels in a manner that said pop-up element assumes a three-dimensional configuration.

5,687,496
NOTE-HOLDING ACCESSORY FOR A SAFETY HELMET

Oliver McEnroe, 155 Fulton Ave., Toronto, Ontario, Canada, M4K 1Y2

Filed May 1, 1995, Ser. No. 431,747
Int. Cl.^{6} A42B *1/24*

U.S. Cl. 40—329 **4 Claims**



1. A method of storing information that permits quick retrieval of the information by a wearer of a safety helmet, the helmet comprising a rigid outer shall shell and a domed inner harness with straps, the method comprising:
   inscribing the information onto a sheet;
   inserting the sheet into a pocket defined by a flexible planar holder that is dimensioned to fit against the harness and has a transparent face permitting viewing of the information on the sheet; and.
   attaching the holder to one strap of the harness and to another strap of the harness such that the holder is held against the harness with the transparent face facing downward toward an open bottom of the helmet

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whereby, the wearer can retrieve the information by removing the helmet from his head.

5,687,497

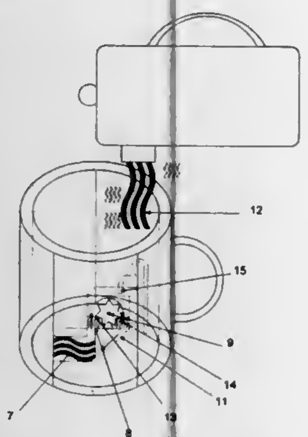
FLUID VESSEL AMUSEMENT

Steven Jerome Moore, 9 Sonoma Rd., Cortlandt Manor, N.Y. 10566

Filed Jan. 2, 1996, Ser. No. 581,894

Int. Cl.^{6} G09F *19/02*

U.S. Cl. 40—406 **7 Claims**



1. A vessel for receiving and dispensing fluids comprising:
an outer vessel shell for grasping said vessel;
an inner vessel shell;
and means connecting the outer vessel shell to the inner vessel shell, such that the outer vessel shell and the inner vessel shell together define an open container, said open container defining an open space, said open space being open to ambient air;
said outer vessel shell and said inner vessel shell forming a cavity between them, said cavity containing:
a display shell for displaying motion to a person viewing said vessel;
a motion device disposed within said display shell;
and a means for moving said motion device coupled with said motion device, said means capable of activating said motion device to motion in response to the addition of fluids into said open space.

5,687,498

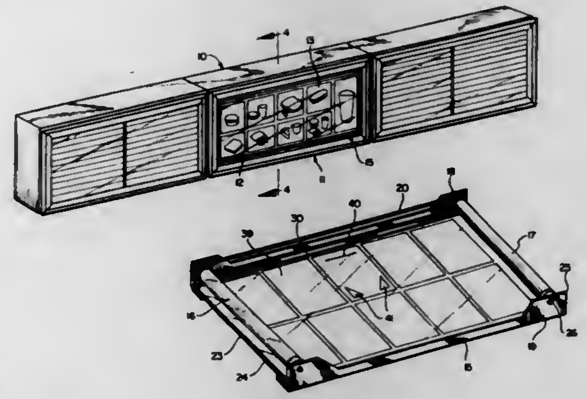
DISPLAY APPARATUS FOR CHANGEABLE SIGN

William W. Keyser, and David B. Keyser, both of Evergreen Park, Ill., assignors to Florida Plastics International, Inc., Evergreen Park, Ill.

Filed Jul. 19, 1995, Ser. No. 504,254

Int. Cl.^{6} G09F *11/08*

U.S. Cl. 40—518 **3 Claims**



1. A display film having a series of linear slits and a corresponding series of pairs of transparent retainers affixed to said film, each retainer pair comprising first and second triangular shapes in confronting alignment and defining pockets between the shapes and the film, said pockets being capable of supporting information-bearing inserts.

5,687,499

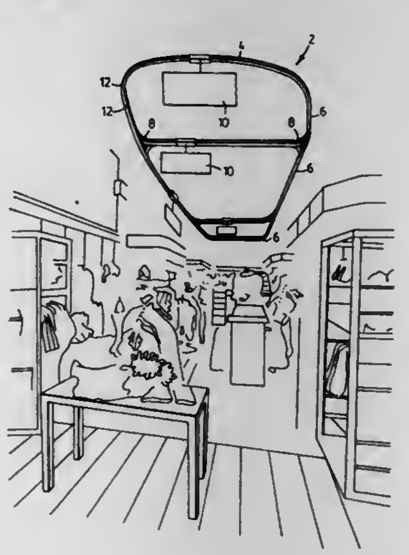
OVERHEAD ADVERTISING DISPLAY SYSTEM

Stephen Brnjac, 400 Bloor Street East, Unit 58, Mississauga, Ontario, Canada, L5A 3M8

Continuation-in-part of Ser. No. 67,104, May 26, 1993, abandoned. This application Sep. 29, 1995, Ser. No. 536,251

Int. Cl.^{6} G09F *11/12*

U.S. Cl. 40—524 **9 Claims**



1. A dynamic advertising display system comprising:
(a) an endless display path secured to a ceiling;
(b) display means depending from said display path;
(c) connecting means extending vertically downwardly from said endless display path for connecting said advertising display means to said endless display path;
(d) drive means for continuously driving said display means along said display path, said display means continuously secured to said drive means for continuous movement of said display means along said display path;
(e) said connecting means including drive gear means for rotating said advertising display means about a vertical axis, and pulley drive means for vertically moving said advertising display means.

5,687,500

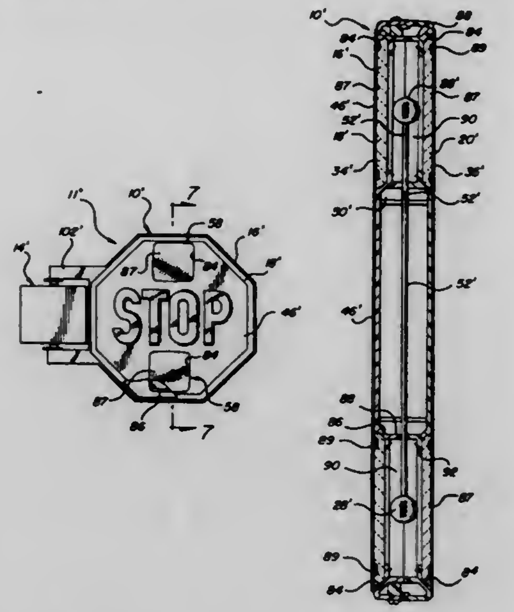
STOP SIGN HOUSING WITH FLASHING LIGHTS

Ronald C. Lamparter, Grosse Pointe Shores, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Sep. 8, 1995, Ser. No. 525,120

Int. Cl.^{6} G09F *13/04*

U.S. Cl. 40—572 **18 Claims**



1. A sign assembly comprising:
a sign housing having front and rear faces with at least one aperture formed in said front face and a recessed support flange extending about said aperture and recessed from said front face;
a lens connected by fasteners to said sign housing over said aperture and supported by said recessed support flange so that said front face and an outer face of said lens are substantially coplanar;
at least one light element disposed in said aperture behind said lens and operatively connected to said sign housing between said front and rear faces illuminating said lens,
said rear face including a second aperture formed therein aligned with said aperture of said front face, and including a second lens connected adjacent said second aperture,
said rear face including a recessed support flange about said second aperture for supporting said second lens so that said rear face and an outer face of said second lens are substantially coplanar, and
said front face including two apertures and two lenses having outer faces that are substantially coplanar with the front face and said rear face including two second apertures and two second lenses that are substantially coplanar with the rear face.

5,687,501

SEALING APPARATUS FOR EXCLUSION OF WATER FROM UNDERWATER GUN BARRELS

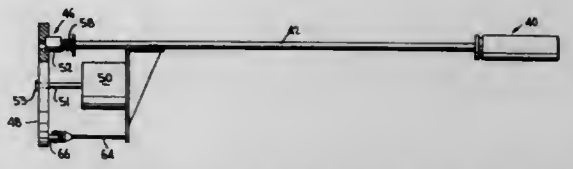
Joseph J. Stace, Narragansett; Laurence M. Dean, Newport, and Ivan N. Kirschner, Portsmouth, all of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1996, Ser. No. 613,814

Int. Cl.^{6} F41A *21/00*

U.S. Cl. 42—1.14 **13 Claims**

1. An underwater gun barrel seal for preventing fluid from entering a gun barrel comprising:
a muzzle seal means joined to a muzzle of said gun barrel, said muzzle seal means allowing discharge from said gun barrel;



a sealing plate joined in a movable relation to said barrel and having at least one firing aperture therein, said sealing plate having at least two positions in relationship to said gun barrel, a first position wherein communication through said gun barrel muzzle is prevented by said sealing plate and a second position wherein communication through said gun barrel muzzle is allowed through said firing aperture, said muzzle seal means being positioned against said sealing plate; and
an actuating means joined between said sealing plate and said gun barrel for moving said sealing plate between said first position and said second position.

5,687,502

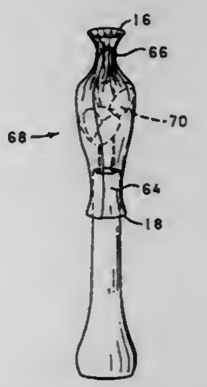
VASE CONTAINING A FLORAL GROUPING

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Division of Ser. No. 242,497, May 13, 1994, Pat. No. 5,488,813, which is a continuation-in-part of Ser. No. 188,183, Jan. 28, 1994, Pat. No. 5,388,386, which is a continuation of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, May 21, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jun. 5, 1995, Ser. No. 461,480

Int. Cl.^{6} A01G *5/00;* **A47G** *7/00*

U.S. Cl. 47—41.01 **12 Claims**



1. A plant package, comprising:
a vase having a top end, a bottom end, an outer surface, and an inner surface which defines and encompasses an inner space, the inner space accessible via an opening in the top end;
a floral grouping having a bloom end and a stem end, the stem end disposed within the inner space of the vase, the bloom end of the floral grouping extending a distance from the top end of the vase; and
a wrapper comprising a sheet of material having an inner surface and an outer surface, the sheet of material further comprising a connecting bonding material disposed upon a portion thereof for connecting to the outer surface of the vase and a closure bonding material also disposed upon a portion of the sheet of material for effecting a sealed area, wherein the sheet of material is wrapped about the vase such that the sheet of material is connected by the connecting bonding material to a portion of the outer surface of the vase and wherein the bloom

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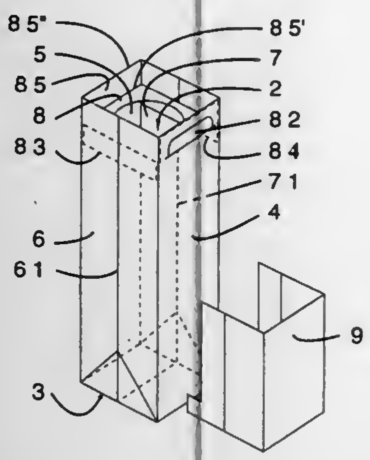
end of the floral grouping is completely encompassed and surrounded by the sheet of material and wherein a portion of the sheet of material is sealed together by the closure bonding material disposed thereon forming a floral containing space within which is contained the bloom end of the floral grouping.

5,687,503
VASE

Vernon Leslie D'Costa, 7 Saltmarsh Lane, Hayling Island, Hampshire P011 0JT, United Kingdom
PCT No. PCT/GB94/00876, § 371 Date Oct. 27, 1995, § 102(e) Date Oct. 27, 1995, PCT Pub. No. WO94/25375, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 25, 1994, Ser. No. 537,698
Claims priority, application United Kingdom, Apr. 27, 1993, 9308692
Int. Cl.⁶ A01G *5/00;* **A47G** *7/00*
U.S. Cl. 47—41.01 **18 Claims**



1. A collapsible flower vase of waterproof sheet material, comprising:

a base forming a closed bottom of the vase and a plurality of walls cut from a sheet of the waterproof sheet material and watertightly joined together to form the vase, the base and the walls being interconnected by watertight folds and glued together to form a watertight seal, the vase when in an erected state having an open mouth at the end opposite the base, two of the walls and the base having watertight creases, the creases being flattenable and the folds being openable on erection of the vase from a collapsed, substantially flat state to an erected state,

an apertured stiffening member which is arrangeable within the open mouth of the vase when the vase is erected, the apertured stiffening member to hold the open mouth open, the apertured stiffening member forming an opening through which the stems of the flowers supported in the vase can extend;

the waterproof sheet material remaining waterproof not only in the walls and the base, but also at the folds and at the creases, during initial construction of the vase, during collapse of the vase at the creases and folds and during erection of the vase, whereby the vase is unlined.

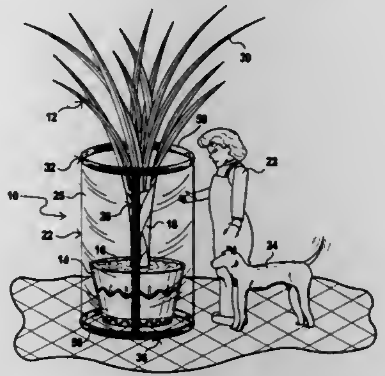
5,687,504
MANUFACTURED SEED COTYLEDON RESTRAINT

William C. Carlson, Olympia; Jeffrey E. Hartle, Federal Way, both of Wash., and Barbara K. Bower, Hot Springs, Ark., assignors to Weyerhaeuser Company, Tacoma, Wash.
Continuation of Ser. No. 781,773, Oct. 23, 1991, Pat. No. 5,427,593, which is a continuation-in-part of Ser. No. 604,656, Oct. 26, 1990, Pat. No. 5,236,469. This application Mar. 31, 1995, Ser. No. 414,021
Int. Cl.⁶ A01C *1/06;* **A01G** *1/00;* **A01H** *5/00*
U.S. Cl. 47—57.6 **32 Claims**

1. A manufactured seed comprising:
(a) totipotent plant tissue having a shoot end; and
(b) a restraint, enclosing at least the shoot end, that resists penetration by the shoot end during germination, permits access of the totipotent plant tissue to gases and liquids, is contacted by the shoot end substantially at onset of germination, and is shed distally off the shoot end during germination.

5,687,505
PLANT PEN

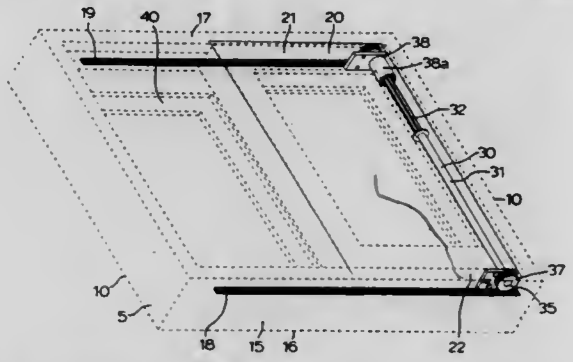
Robert W. Haufler, and Suzanne Haufler, both of 3 Felway Dr., Coram, N.Y. 11727
Filed Jul. 15, 1996, Ser. No. 680,137
Int. Cl.⁶ A01G *9/02*
U.S. Cl. 47—72 **1 Claim**



1. A plant pen assembly in combination comprising:
a) a floor standing house plant including a pot, fertilized soil within said pot, and a plant stem and branches including low hanging branches extending up from said pot;
b) a plant pen comprising a flexible sheet of broad flat generally rectangular thin transparent plastic material formed into a vertical floor standing cylinder surrounding said house plant and being open at the top to support low hanging branches and at the bottom with the two vertical side edges overlapping each other;
c) means for holding said vertical side edges of said flexible sheet together comprising a strip of engageable hook and loop material on each of said vertical side edges facing each other to mate together in a removable manner; and
d) means for enhancing the safety and appearance of the top and bottom edges of said cylinder comprising a first piece of tubing having a longitudinal slit to fit upon the top edge of said flexible sheet and a second piece of tubing having a longitudinal slit to fit upon the bottom edge of said flexible sheet, said second piece of tubing sitting on said floor, the top edge of said flexible sheet extending through the slit in the first piece of tubing and touching the top of the inner surface of said first piece of tubing with the edges of the first piece of tubing defining the slit therein being biased against the surfaces of said flexible sheet, and the bottom edge of said flexible sheet extending through the slit in the second piece of tubing and touching the bottom inside surface of said second piece of tubing and the edges of the second piece of tubing defining the slit therein being biased against the surfaces of said sheet.

5,687,506
PARALLEL BALANCE SYSTEMS

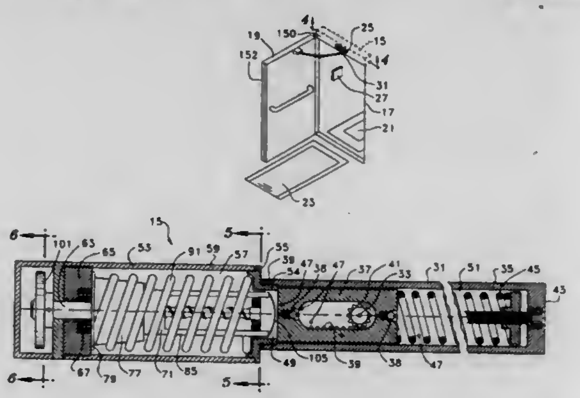
Bob Davies; Sean Davies; Shaul Goldenberg, and Sinnathamby Kupenthirarajan, all of Weston, Canada, assignors to 420820Ontario Limited, c.o.b. Preferred Engineering Inc., Vaughan, Canada
Continuation-in-part of Ser. No. 281,620, Jul. 28, 1994. This application Dec. 23, 1994, Ser. No. 362,995
Int. Cl.⁶ E05D *15/58*
U.S. Cl. 49—260 **27 Claims**



1. A closure assembly having two ends comprising a first and second track disposed proximate each end of the assembly respectively, and a slidable and pivotable closure member, the closure member including framing sections therefor and being engaged with the first and second tracks proximate first and second pivots adjacent the pivotable end of the member, the first and second pivots being interconnected by a multiple segment shaft disposed within framing sections of said closure member, the shaft including at least two portions, the shaft providing for accurate installation, retention, removal, adjustment and alignment of the first and second pivots within the first and second tracks in a substantially parallel line with respect to one another and for pivotally supporting the closure member which may be safely and securely pivoted away from the closure assembly, whereby the first and second interconnected pivots are adapted to remain engaged with the first and second tracks while supporting the closure member both when it is pivoted away from the closure assembly and when it is slidable relative to the tracks.

5,687,507
APPARATUS FOR SELECTIVE ALTERATION OF OPERATING PARAMETERS OF A DOOR

Mark A. Beran, Niwot, Colo., assignor to Dorma Door Controls Inc., Reamstown, Pa.
Continuation of Ser. No. 92,962, Jul. 19, 1993, abandoned. This application Sep. 29, 1995, Ser. No. 537,035
Int. Cl.⁶ E05F *11/24*
U.S. Cl. 49—340 **16 Claims**



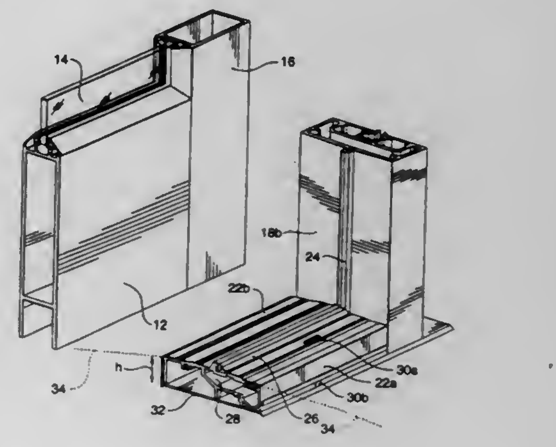
1. An apparatus for controlling opening and closing of a door, comprising:

(A) a cylinder for guiding a piston linearly along an axis, said piston having a slot and a rack gear formed within said slot, and a pinion gear engages said rack-gear of said piston, said pinion gear being coupled to a connecting arm for moving the door;
(B) a spring that provides a door closing force, said door closing force urging said piston in a first direction along said axis, wherein said cylinder and said piston form a first fluid chamber, and said door closing force is dampened by a flow of fluid from said first fluid chamber; and
(C) a rotatable drive screw that provides a door opening force, said door opening force urging said piston in a second direction along said axis, said second direction being opposite said first direction;

wherein said spring and said rotatable drive screw are positioned on opposite sides of said piston.

5,687,508
WATER RESISTANT DOOR ASSEMBLY

Edward T. Fitzhenry, Jr., and Aki Oi, both of Dublin, Ga., assignors to YKK Corporation of America, Marietta, Ga.
Continuation of Ser. No. 550,203, Oct. 30, 1995, abandoned. This application Feb. 11, 1997, Ser. No. 797,206
Int. Cl.⁶ E06B *1/70*
U.S. Cl. 49—471 **8 Claims**



1. A water resistant door assembly, comprising
a door frame having an interior side and an exterior side;
a door hingedly mounted within said frame, said door having an interior side and an exterior side;
a threshold attached to a lower portion of said frame, the threshold having a height selected to be equal to or greater than a water head at a preselected design wind load pressure;
a gasket provided in said threshold for sealing said door, said gasket defining a boundary between the interior and exterior sides of said door frame;
a gutter trough within said threshold; and
a first weep hole positioned on a first portion of said threshold, and a second weep hole positioned on a second portion of the threshold lower than said first portion, said first and second weep holes being positioned on the exterior side of said door frame and in continuous flow communication with one another on the exterior of said door via said gutter trough.

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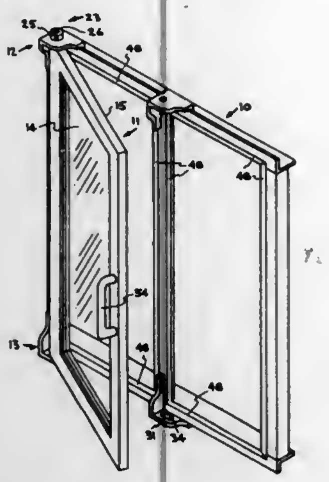
REFRIGERATOR DOOR ASSEMBLY AND METHOD

Louis Barroero, San Leandro, and John P. Rivers, Livermore, both of Calif., assignors to Frigidyne North America, Inc., Oakland, Calif.

Continuation-in-part of Ser. No. 294,193, Aug. 22, 1994, abandoned, which is a continuation of Ser. No. 70,561, Jun. 1, 1993, abandoned, which is a division of Ser. No. 826,883, Jan. 28, 1992, Pat. No. 5,228,240. This application Mar. 7, 1995, Ser. No. 399,773

Int. Cl.⁶ E05F *1/10*

U.S. Cl. 49—386 **5 Claims**



1. A refrigerator door assembly adapted to be mounted on a stationary frame of a refrigeration unit comprising;

a door frame,

a vertically aligned hinge assembly having a sheath means incorporated into the refrigerator door assembly,

two hinge pin means, and

a torsion bar wherein one end of said torsion bar is secured to one of the hinge pin means and a portion of said torsion bar is anchored to said sheath means, said torsion bar being square in section and said sheath means being deformed in a middle section of its length, thereby anchoring said torsion bar to said sheath means.

5,687,510

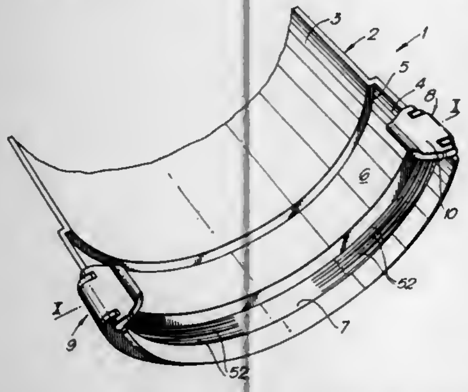
GUTTERING ARRANGEMENT

Jacek Lech Basista, Tunbridge Wells, England, assignor to Hunter Plastics Limited, London, England

Filed Aug. 3, 1995, Ser. No. 510,707

Int. Cl.⁶ E04D *13/068;* **F16B** *2/20*

U.S. Cl. 52—11 **16 Claims**



1. A guttering arrangement including a guttering element defining a seat adapted to receive an end of a length of guttering, the seat being provided with a channel for receiving sealing strip to be in sealing engagement with the exterior of said length of guttering, said guttering element being provided with two separate clips mounted and retained on the guttering element, each clip having a portion directed inwardly across the seat adapted for engaging and retaining an edge of said length of guttering, each clip having a portion defining connecting formations adapted for engaging corresponding connecting formations formed on the exterior of the part of the element defining said seat, the connection formations on the clip being formed on a portion of the clip which is received in a recess formed on the exterior of a rib protruding from the under-side of the seat of said guttering element and accomodating said channel with two upstanding projections on either side of the recess, the clip defining gaps adapted for accommodating the projections when the clip engages the seat, the connecting formations being such that the clip having a limited degree of movement between a first position and a second position, a first part of the connecting formation on the clip engaging a first part of the connecting formation on the guttering element when the clip is in the first position and a second part of the connecting formation on the clip engaging a second part of the connecting formation on the guttering element when the clip is in the second position.

5,687,511

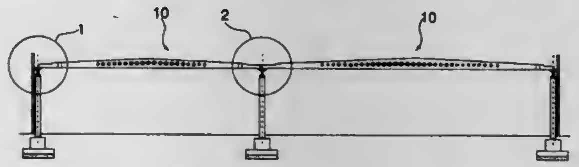
PREFABRICATED TILE WITH A PLURALITY OF LIGHT DIFFUSION SITES FOR REALIZING BUILDING ROOFINGS

Alberto Dal Lago, Milan, Italy, assignor to DLC S.r.l., Milan, Italy

Filed Nov. 1, 1995, Ser. No. 551,430

Int. Cl.⁶ E04B *7/12*

U.S. Cl. 52—18 **4 Claims**



1. Prefabricated tile for building roofing which comprise a plurality of light diffusion sites (13) which are arranged side-to-side, said light diffusion sites (13) comprising openings (15) which extend through a lower flat slab (11) of said tile wherein said lower flat slab (11) has mutually opposite side walls (12) which extend upwardly with decreasing height from the middle to the ends of said tile and having through said side walls (12) openings (14) which are provided to make the whole structure lighter and allow service equipment to be run through.

5,687,512

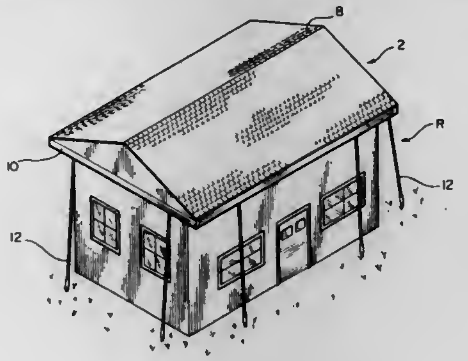
HURRICANE LOCKDOWN SYSTEM

Norman W. Spoozak, 904 Koko Isle Cr., and Richard L. Rudolph, 7525 Nakalele St., both of Honolulu, Hi. 96825

Filed May 8, 1996, Ser. No. 646,857

Int. Cl.⁶ E04B *7/00*

U.S. Cl. 52—23 **21 Claims**



1. A lockdown system for a low rise building including a roof structure with sheathing disposed over a plurality of roof rafters, the roof structure forming eaves around a periphery thereof, said system comprising:

a) a rafter cable for being secured around the eaves of the roof structure;

b) a plurality of anchor cables operably secured to said rafter cable and for being secured to the ground, said anchor cables being under tension such that lift forces generated during high winds are counteracted;

c) a plurality of brackets for being secured to the roof rafters in the eaves;

d) a plurality of pipe members being secured to said brackets and for being secured to the roof rafters; and

e) said rafter cable being threaded through said pipe members.

5,687,513

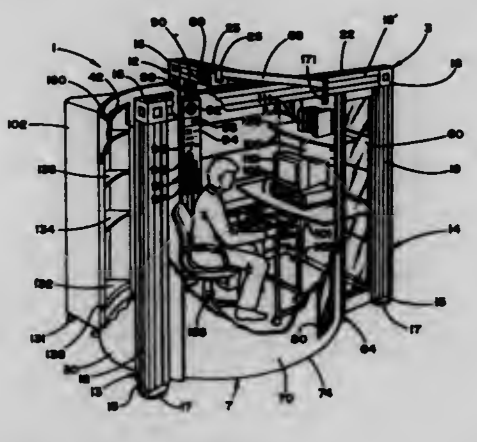
DYNAMIC WORKSPACE MODULE

Mark A. Baloga, Grand Rapids, Mich.; Paul B. Siebert, Chicago, Ill.; Marvin LaLone, Alto, Mich.; David J. Luzenske, Grandville, Mich.; Brian B. Chambers, Byron Center, Mich.; Michael E. Tingley; Gregg R. Draudt, both of Cambridge, Mass., and Steven W. Eriksson, Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Division of Ser. No. 145,073, Oct. 29, 1993, Pat. No. 5,452,541, which is a division of Ser. No. 819,396, Jan. 10, 1992, Pat. No. 5,282,341. This application May 25, 1995, Ser. No. 450,564

Int. Cl.⁶ A47B *5/00*

U.S. Cl. 52—32 **30 Claims**



1. A workspace module, comprising:

a freestanding framework, including at least one vertical column;

a sidewall assembly supported by said framework, and defining a workspace configured to support a user therein, and including a worksurface region and a seat region disposed adjacent to a forward portion of said worksurface region;

power and communication equipment of the type adapted to support office activities;

wherein said column is positioned adjacent to both said seat region and said forward portion of said worksurface region, and has said power and communication equipment mounted on a face of said column interior to said workspace; said column, said worksurface region, and said seat region defining in plan a work arrangement wherein said column is positioned generally laterally adjacent to said seat region and further wherein each of said column and said work region are easily accessible by a user positioned in said seat region without reaching over the other of said column and said work region.

5,687,514

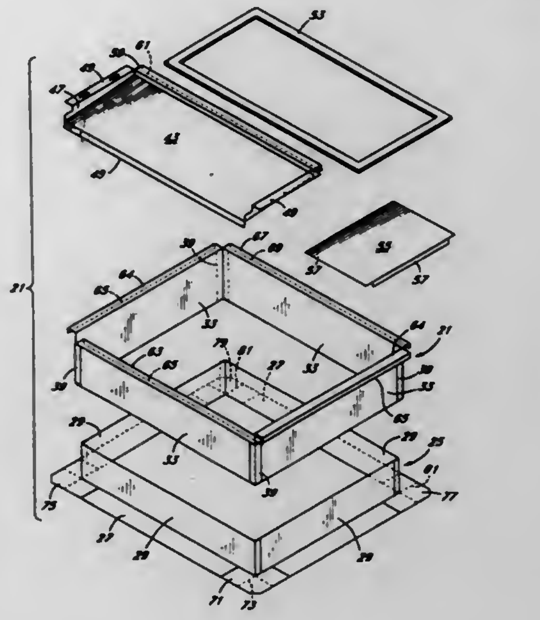
ADJUSTABLE CURB WITH FLASHING

John Joseph Gillispie, 6532 Joshua Tree, Orange, Calif. 92677

Filed Jan. 3, 1996, Ser. No. 582,277

Int. Cl.⁶ E04D *1/36*

U.S. Cl. 52—58 **15 Claims**



1. A curb comprising:

a base portion having a plurality of vertical walls, each vertical wall having an associated flange portion;

an upper portion having a plurality of vertical walls bounded on their upper portion by associated rails, and defining a plurality of holes in said vertical walls of said upper portion to facilitate attachment to said vertical walls of said base portion; and

a pitch pan attached to said upper portion and supported by said rails, and defining pitch pan surface sloped with respect to said rails and terminating in a lower lip extending over and beyond a vertical wall of said upper portion.

5,687,515

MONUMENT DISPLAY CASE AND MOUNTING ASSEMBLY

Robert Wallace Rodrigues, 325 W. Maple Ave., Bound Brook, N.J. 08805, and Wallace Joseph Rodrigues, 125 S. 17th Ave., Manville, N.J. 08835

Continuation-in-part of Ser. No. 490,565, Jun. 15, 1995, abandoned. This application Aug. 21, 1996, Ser. No. 701,022

Int. Cl.⁶ E04H *13/00*

U.S. Cl. 52—103 **9 Claims**

1. In combination with a cemetery headstone, a display case comprising

a bottom panel;

a front panel;

two opposite side panels;

two roof panels;

a back panel hingedly attached to said bottom panel, said panels being joined to one another by means of molding sections at respective edges thus defining a central storage chamber;

means for locking said back panel in a closed position;

one or more platform means contained within said chamber and supported therein by attachment to said side panels; and

a mounting assembly comprising a top and a bottom assembly plate, bolted to a top and a bottom cover plate and threaded

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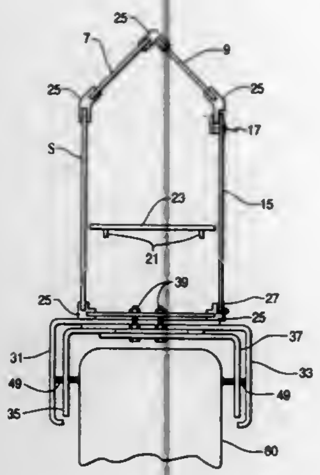


swivel bolts for detachably securing said display case to said headstone.

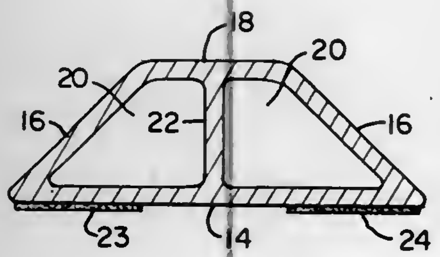
5,687,516
PARKING SPACE CENTERING DEVICE FOR MOTOR VEHICLES

Michael P. Sheehan, 2675 S. Columbine St., Denver, Colo. 80210, and James W. Wanek, 6871 E. Eagle Pl., Highlands Ranch, Colo. 80126

Filed May 14, 1996, Ser. No. 648,208

Int. Cl.^{6} E01F *9/00;* **E04H** *6/42*

U.S. Cl. 52—174 **13 Claims**



1. A parking space centering device for use in combination with a floor surface and contactable with a front tire of a motor vehicle to enable placement of the motor vehicle in predetermined relation to the floor surface comprising:

a resilient body of a length adapted to approximate a width of the tire and of a height adapted to be substantially less than a radius of the tire, and said body having side walls merging upwardly toward one another at approximately a 45° angle from a common base, an upper, substantially flat surface portion between said sidewalls and securing means for securing said body to said floor surface for extension transversely of the direction of travel of the motor vehicle and near an entrance end of said floor surface wherein movement of the from tire of the motor vehicle over said substantially flat surface portion of said body will establish alignment of the motor vehicle in predetermined relation to said floor surface.

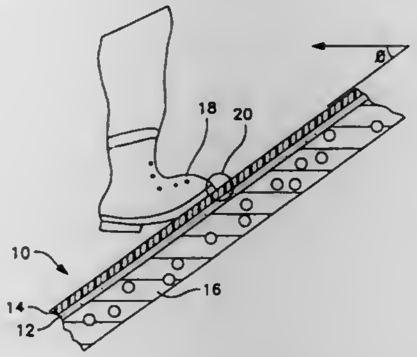
5,687,517
SKID-RESISTANT ROOFING UNDERLAYMENT

Robert Alan Wiercinski, Lincoln, and Robert Francis Jenkins, Wakefield, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Sep. 21, 1995, Ser. No. 531,437

Int. Cl.^{6} E04D *5/10*

U.S. Cl. 52—177 **15 Claims**



1. A flexible sheet-like roofing underlayment comprising: a pressure-sensitive waterproofing adhesive layer comprising a material selected from the group of rubber bituminous material and synthetic material, said waterproofing adhesive layer being attached to a continuous multi-layer carrier support sheet on a major face thereof, said carrier support sheet comprising corrugations of at least 5 ridges per lineal inch and at least four film layers wherein a first film layer has a first direction of orientation and wherein another film layer has a second direction of orientation different from said first direction of orientation, at least one film layer of said at least four film layers being located outermost of said layers, said ridges being aligned in a machine direction of said carrier support sheet, such that, when installed in a direction perpendicular to the direction of roof slope, said ridges are operative to minimize skidding of foot traffic on the underlayment, each of said at least four film layers having a direction of orientation about 40–50 degrees from the direction of said ridges, said carrier support sheet having an average thickness and said ridges having a height of 1.25–20 times the average thickness of said carrier support sheet; and said carrier support sheet, on a major face opposite said waterproofing adhesive layer, further comprising a coating having a lower Young's modulus of elasticity than the outermost of said at least four film layers of said carrier support sheet.

5,687,518
WINDOW FRAME HAVING OUTER FRAME MEMBER MADE OF RESIN

Takayuki Endo, Narashino, and Susumu Maeda, Ichikawa, both of Japan, assignors to Tokuyama Corporation, Yamaguchi, Japan

Filed Nov. 8, 1996, Ser. No. 745,773

Claims priority, application Japan, Nov. 10, 1995, 7-292481

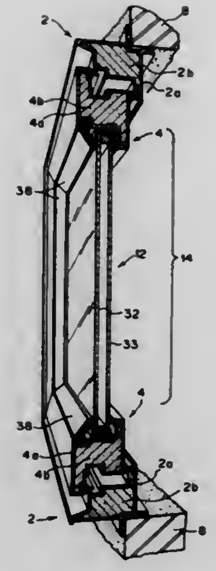
Int. Cl.^{6} E06B *1/04*

U.S. Cl. 52—204.1 **7 Claims**

1. A resin window frame comprising:

an outer frame member made of resin blended with cellulose-based fine powder, said outer frame member having a hollow portion; and

a wooden core member having shape and size at least partially corresponding to said hollow portion of the outer frame member, wherein said wooden core member is engagedly inserted into said hollow portion of the outer frame member.



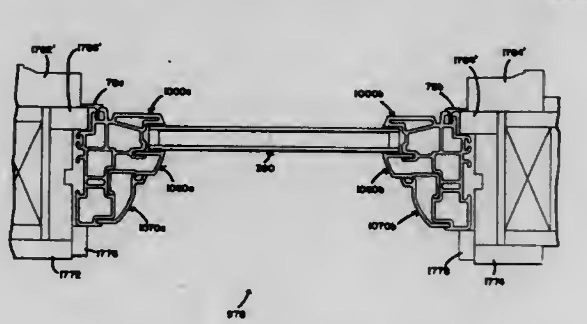
5,687,519
METHOD OF COMBINING COMPONENTS TO FORM DIFFERENT TYPES OF WINDOWS SUITABLE FOR VARIOUS INSTALLATION SITUATIONS

Todd W. Bruchu, Lake Elmo, Minn., assignor to Andersen Corporation, Bayport, Minn.

Continuation-in-part of Ser. No. 325,995, Oct. 19, 1994, Pat. No. 5,491,940. This application Jun. 15, 1995, Ser. No. 490,798

Int. Cl.^{6} E06B *1/30;1/36*

U.S. Cl. 52—213 **15 Claims**



1. A window frame of a type that may be used to convert a window suitable for pocket window installation into a window suitable for new construction installation, comprising:

a connecting means for connecting the window frame to the window, wherein the connecting means includes a channel on the frame into which the window is secured by snap fit, and the channel is defined by a base wall and opposing sidewalls, and the base wall is formed to be slightly convex, so that the sidewalls extend in convergent fashion therefrom; and

a mounting means for mounting the window frame within rough opening.

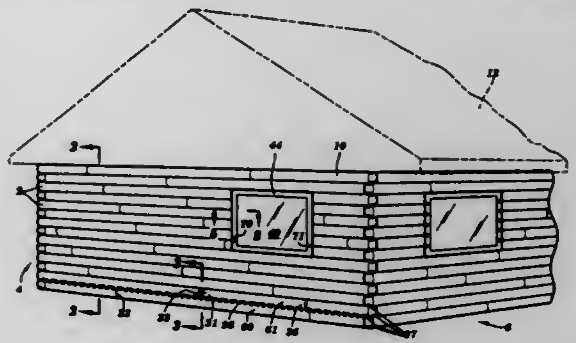
5,687,520
SEALING SYSTEM FOR LOG BUILDINGS

David A. Stranahan, R.D. #3, Box 3273A, Lake George, N.Y. 12845, and Mary T. Schuh, P.O. Box 295, Lake Luzerene, N.Y. 12846

Filed Jun. 26, 1996, Ser. No. 671,267

Int. Cl.^{6} E04B *1/10*

U.S. Cl. 52—233 **6 Claims**



1. A log building having multiple sealing channels, said log building comprising:

a plurality of interconnected walls, each of said walls being in the form of a plurality of stacked courses of end to end logs and wherein each course has a top surface;

a plurality of horizontally-oriented channels located between courses of logs in said walls, wherein each of said channels is formed from a pair of complementary grooves with one of said grooves located in a top surface of a course of logs and the other of said grooves located in a bottom surface of said course of logs, and wherein each of said channels extends substantially the entire length of its associated pair of courses of logs;

at least one vertically-oriented bore that extends from the top surface of one of said courses to a bottom surface of said course and wherein said bore connects to a channel on a lower surface of said course; and

a quantity of injected sealing material located in said channels and said at least one bore.

5,687,521
TRANSLUCENT BLOCK ASSEMBLIES

Marion Carlson, and Julian Carlson, both of Beaumont, Calif., assignors to Carlson Ventures, Inc., and Fairmount Ventures, both of Beaumont, Calif.

Continuation of Ser. No. 489,531, Jun. 12, 1995, abandoned, which is a continuation-in-part of Ser. No. 353,407, Dec. 9, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 659,470

Int. Cl.^{6} E04C *1/42*

U.S. Cl. 52—308 **10 Claims**

1. A translucent block assembly, comprising:

a window frame defining an opening;

a plurality of translucent blocks juxtaposed in abutment with one another in the opening, each of said translucent blocks having mutually spaced locating portions forming a gap at the periphery thereof;

an elongate connector extending around said opening between said window frame and said translucent blocks;

said window frame having a step-shaped recess extending around the opening, and said step-shaped recess being open along one lateral side thereof and inwardly of said window frame to allow insertion of said translucent blocks and said elongate connector into the opening; and

a retainer engaging said elongate connector and said frame and fixedly securing said elongate connector and said translucent blocks relative to said frame;

said elongate connector having a first portion thereof abutting the peripheries of said translucent blocks and a second portion

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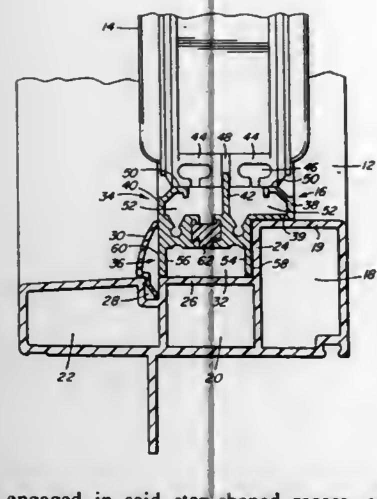


thereof engaged in said step-shaped recess, and said first portion of said elongate connector including a longitudinally extending alignment projection which fits snugly into said gaps in said translucent blocks for aligning and retaining said blocks.

5,687,522
FORMWORK FOR BUILDING A CONCRETE WALL

Philippe Durand, 3, alleé de la Rive, F-78740 Vaux-sur-Seine, and Françoise Dauron, 51, rue Haute, F-78250 Meulan, both of France

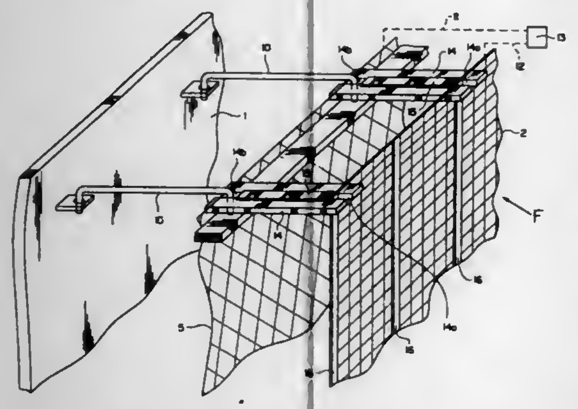
PCT No. PCT/FR93/00548, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/25776, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 9, 1993, Ser. No. 351,347

Claims priority, application France, Jun. 11, 1992, 92 07042

Int. Cl.⁶ E04G *11/06;* E04B *2/54*

U.S. Cl. 52—414 **20 Claims**



1. In a sacrificial formwork for building a concrete wall, the formwork having a first outer wall (1) and a second outer wall (2), the improvement comprising:

the first outer wall (1) positioned generally parallel to and at a distance from the second outer wall (2), the second outer wall (2) having a plurality of first openings (9), at least one inner filtering wall (5) positioned generally parallel to and between the first outer wall (1) and the second outer wall (2) and forming a first space (3) between the first outer wall (1) and the at least one inner filtering wall (5) and a second space (8) between the second outer wall (2) and the at least one inner filtering wall (5), the at least one inner filtering wall (5) having a plurality of second openings (6), a first diameter of each of the first openings (9) being less than a second diameter of each of the second openings (6), such that when fluidic concrete is poured within the first space (3) aggregates of the fluidic concrete of a size smaller than the second diameter are allowed to pass from the first space (3) through the second openings (6) to the second space (8).

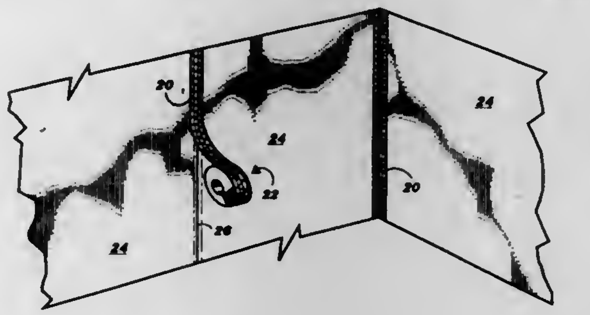
5,687,523
DRYWALL TAPE

Ronald A. Stough, Hinsdale, Mont., assignor to E-Z Taping System, Inc., Green Bay, Wis.

Continuation-in-part of Ser. No. 297,320, Aug. 26, 1994, Pat. No. 5,486,394. This application Aug. 10, 1995, Ser. No. 513,386

Int. Cl.⁶ B32B *3/10;* E04B *2/00*

U.S. Cl. 52—417 **5 Claims**



1. A fire wall comprising:

a) a supportive substructure;

b) a first sheet of drywall fastened to the supportive substructure;

b) a second sheet of drywall fastened to the supportive substructure adjacent to the first sheet to define a seam therebetween; and

c) a strip of drywall tape affixed to the first sheet and the second sheet to bridge the seam, wherein the drywall tape has a pressure-sensitive adhesive which joins a first paper layer to the drywall sheets and an adhesive joins a second layer of paper to the first layer of paper with a reinforcing layer therebetween, and wherein the second layer of paper has a release layer thereon.

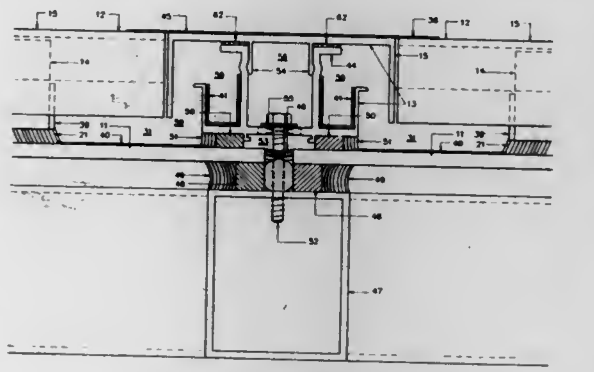
5,687,524
APPARATUS FOR SEALING PANEL JOINTS OF BUILDING SURFACES

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Feb. 10, 1995, Ser. No. 387,416

Int. Cl.⁶ E04C *3/00*

U.S. Cl. 52—461 **17 Claims**



1. An apparatus covering intersections of plurality of panel joint seals located between a plurality of panels on a building structure, each of said panels having an interior side and an exterior side to prevent from said structure's exterior to said structure's interior, said apparatus comprising:

(a) a plurality of vertical joint covering members, each of said vertical joint covering members having first and second ends, and covering a length of one of said plurality of vertical panel joint seals to form a first pressure-equalized cavity between said vertical joint covering member and said vertical panel joint seal;

(b) a plurality of horizontal joint covering members, each of said horizontal joint covering members having first and second ends and covering a length of one of said plurality of horizontal panel joint seals to form a second pressurized-equalized cavity between said horizontal joint covering member and one of said horizontal panel joint seal;

(c) means for fastening each of said horizontal joint covering members to said exterior side of each said panels bordering one of said plurality of horizontal panel joint seals covered thereby;

(d) means for fastening each of said vertical joint covering members to said exterior side of each said panels bordering said vertical panel joint seal covered thereby; and

(e) means for connecting said horizontal joint covering members and said vertical joint covering members converging at said intersection.

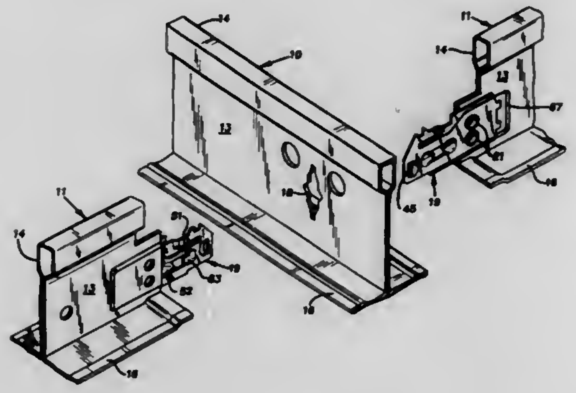
5,687,525
STAB-IN REMOVABLE END CLIP

Gerald L. Koski, Parma; James J. Lehane, Columbia Station; Douglas B. Hooper, Lakewood, and Paul D. LaLonde, Avon, all of Ohio, assignors to USG Interiors, Inc., Libertyville, Ill.

Continuation of Ser. No. 248,761, May 25, 1994, Pat. No. 5,517,796. This application May 17, 1996, Ser. No. 650,912

Int. Cl.⁶ E04B *5/00*

U.S. Cl. 52—506.07 **1 Claim**



1. An end connector on opposed runners used in a suspension ceiling grid system having elongated grid runners including a through runner and two opposed runners interconnected at intersections, each of the runners including a vertical web with the web of the through runner having an elongated vertically extending slot into which the end connectors of said opposed runners project, the end connector being generally planar and projecting into said slot from one side while another identical connector projects into the slot from an opposite side of the web, the slot having opposed sides that provide a width sufficient to receive both of said connectors in laterally abutting relation, the connectors each being arranged with respect to the slot to provide a first end lock with said slot, the slot having a configuration that avoids the risk of receiving and laterally restricting a connector to an incorrect one of its sides, said slot and connectors having respective configurations that allow the connectors to each be installed in said slot with a stab-in motion and to each be removed from said slot by relative manipulation of said through runner and its associated runner to release said first end lock without tools.

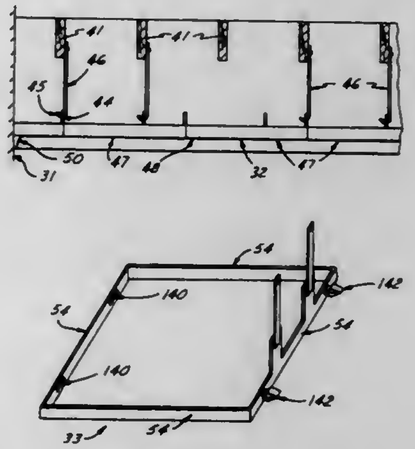
5,687,526
TRACKLESS DROP CEILING SYSTEM

Guido Benvenuto, 8870 Broderick Road, Windsor, Ontario, Canada, N9A 6Z6; Dino Coletti, 2941 St. Clair Avenue, Windsor, Ontario, Canada, N9E 4A1, and Lanny Elliott, 2018 Charlene Street, Tecumseh, Ontario, Canada, N9K 1B1

Filed Nov. 8, 1995, Ser. No. 554,312

Int. Cl.⁶ E04B *9/18*

U.S. Cl. 52—506.08 **32 Claims**



1. A trackless ceiling tile system having a plurality of adjacent tiles, comprising:

a plurality of adjacent supported and interlocked tiles, each of said tiles having a principal surface and each of said tiles having at least one elongated suspension member associated therewith;

one end of each of said elongated suspension members being attached to one of said tiles and the other end of each of said elongated suspension members being attached to an overhead structure;

each of said tiles further having at least one interlocking structure on a first edge and at least one interlocking structure on a second edge, said first and second edges being at opposite sides of each of said tiles;

wherein said interlocking structures of adjacent tiles engage to interlock said tiles in said trackless ceiling tile system, said elongated suspension members being flexible straps and wherein said tiles each have at least one slotted tab defining a slot position perpendicular to the principal surface of said tile and wherein said flexible straps are looped through said slots of said slotted tabs.

5,687,527
SUSPENDED CEILING FOR CLEANROOMS

Jean-Luc Bikard, Cicero, N.Y., and Martin Craig Helmus, Grandville, Mich., assignors to Clestra Cleanroom (S.A.), Strasbourg, France

Filed May 30, 1996, Ser. No. 657,628

Claims priority, application France, Feb. 22, 1996, 96 02371

Int. Cl.⁶ E04B *9/00*

U.S. Cl. 52—506.08 **12 Claims**

1. Suspended ceiling structure for cleanroom comprising a pressurized plenum, a lower face thereof defined by filter plates supported by a metallic structure having the shape of a horizontal grid, comprising extrusions (P1, P2, P3) crossing at a right angle, said extrusions (P1, P2, P3) having upper channels (15, 15') associated in such a manner that they form a continuous channel around each mesh of the grid and they form a support for a filter plate (13, 13'), said channels (15, 15') being filled with a material in which is received the lower end of a peripheral skin (14, 14') surrounding said filter plates (13, 13') to assure the sealing between the plenum and the volume beneath the ceiling structure, wherein each extrusion (P1, P2, P3) comprises at least one horizontal lateral groove

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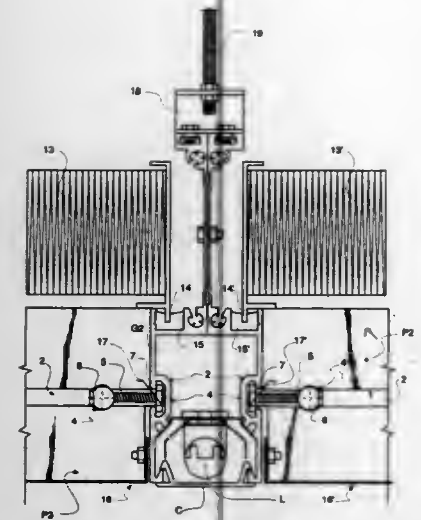
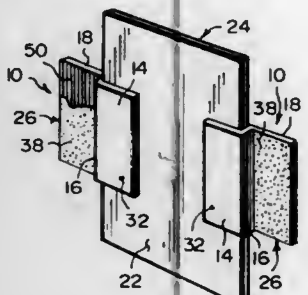


(3) located in one of the vertical sides thereof, upon its full length and having the shape of a slide (2) and having at each end housings (4) opening to said lateral vertical sides to cooperate with fixation means (5, 6, 7) for affixing each of said extrusions to a perpendicular extrusion, said fixation means (5, 6, 7) also cooperating with a slide (2) of said perpendicular extrusion, which results in the continuous character of the upper channels (15, 15') of each mesh.

5,687,528
PATCH FASTENER DEVICE FOR A PLASTERBOARD WALL

Duane A. Rouch, 176 Daly Rd., East Northport, N.Y. 11731
Filed May 14, 1996, Ser. No. 645,526
Int. Cl.^{6} E04G *23/02*
U.S. Cl. 52—514 **1 Claim**

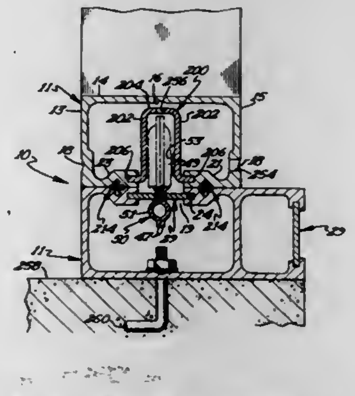


1. A patch fastener device for a plasterboard wall in preparation for plastering, comprising:

a) a plasterboard wall having an opening to be filled;
b) a plasterboard patch within said opening shaped and sized to fill said opening;
c) a sheet member of rigid material formed by stamping and bending for securing said patch within said opening comprising a first flat segment shaped in the form of a rectangle having first and second oppositely facing parallel bend lines, the distance between said bend lines being approximately the thickness of said plasterboard wall, a second flat segment extending from the first bend line of and at right angles to said first flat segment and lying flat against one side of said patch, and a third flat segment extending from the second bend line of said first flat segment and at right angles to said first flat segment in a direction opposite to that of said second flat segment and lying flat against a side of said wall opposite to that of said second flat segment, said wall and patch abutting opposite sides of said first flat segment;
d) means on the surface of said second flat segment facing said patch and means on the surface of said third flat segment facing said wall for securing said second and third flat segments to said patch and wall, respectively;
e) said securing means each comprising an adhesive layer with a peel off cover strip; and
f) said second and third flat segments each having a plurality of spaced apertures for accommodating a plaster compound to be applied to cover said device.

5,687,529
FASTENING DEVICE

Richard Pickering, Plymouth, Minn., assignor to WorldTec Systems, Inc., Minnetonka, Minn.
Filed Jun. 7, 1996, Ser. No. 659,953
Int. Cl.^{6} E04B *2/46*
U.S. Cl. 52—582.2 **18 Claims**

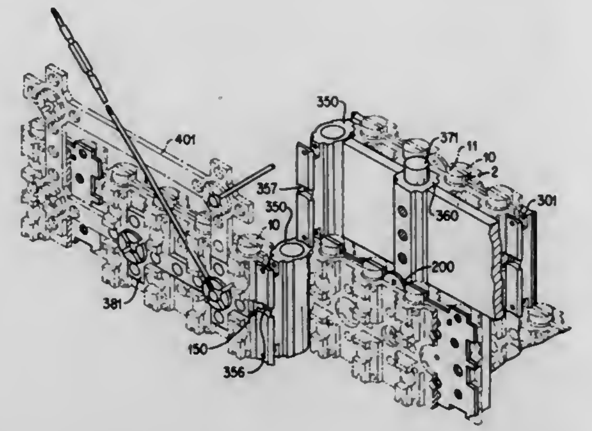


1. Fastening device comprising, in combination: a first elongated hollow channel having an elongated slit opening formed and defined by first and second free edges, with the first and second free edges including first and second slots parallel to and opening into the slit opening; a carrier having generally U-shaped cross sections, with the carrier including first and second support walls having upper ends terminating in first and second shelves extending in opposite directions, with the first shelf being slideable in the first slot and the second shelf being slideable in the second slot, with the first and second support walls extending into the hollow channel; and a first fastening element mounted between the first and second support walls with forces tending to pull the fastening element from between the first and second support walls causing the upper ends of the support walls to separate and move the first and second shelves apart and into their respective slots.

5,687,530
COMPOSITE BUILDING UNIT

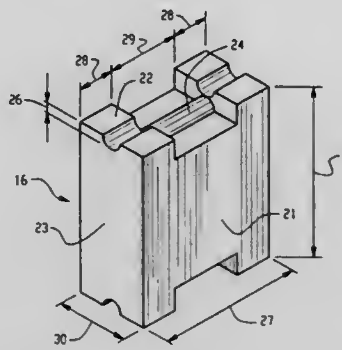
Franciscus Anthonius Maria Van der Heijden, Kastelenplein 73, NL-5653 LP Eindhoven, Netherlands
Filed May 17, 1995, Ser. No. 443,287
Claims priority, application Netherlands, May 18, 1994, 9400813
Int. Cl.^{6} E04B *2/32*
U.S. Cl. 52—592.6 **16 Claims**

1. A composite building unit comprising at least one volume element having an upper surface with at least one projection and a bottom surface with at least one cavity positioned and configured to accommodate a projection from another volume element and at least one support element substantially perpendicular to said upper and bottom surface of said volume element, wherein said volume element is provided with at least one channel extending from said upper surface to said bottom surface and said support element is connected to said volume element at said channel.



5,687,531
HORIZONTAL FLUE TECHNOLOGY FOR CARBON BAKING FURNACE

Bryan R. Nelson, Miffinburg, Pa., and En-Sheng Chen, Spring, Tex., assignors to North American Refractories Company, State College, Pa.
Filed Feb. 14, 1995, Ser. No. 388,753
Int. Cl.^{6} E04C *1/10*
U.S. Cl. 52—596.1 **18 Claims**

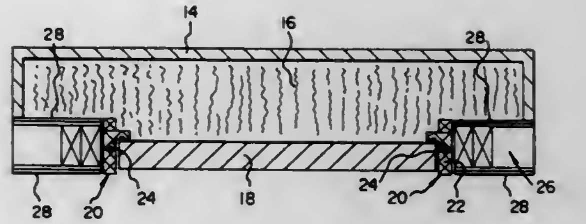


1. A specially shaped construction component having a unique geometry for constructing dimensionally stable structures wherein said component comprises two opposing side surfaces, two opposing H-shaped face surfaces perpendicular to said side surfaces and forming a recess in each of said side surfaces, two opposing end surfaces perpendicular to said side surfaces and said face surfaces, each said side surface having keys projecting therefrom, the keys including at least one tongue and at least one groove.

5,687,532
FIRE ENDURANCE RATED PLASTIC ARTICLES FOR USE IN FIRE RATED ASSEMBLIES

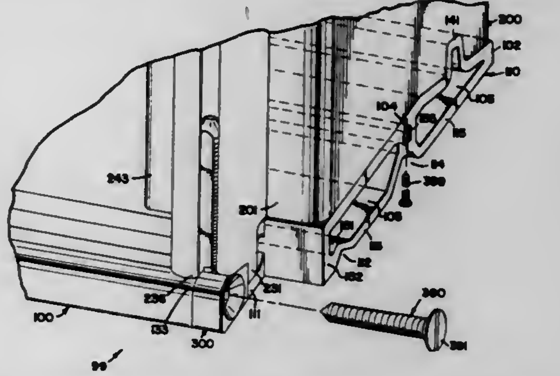
Bruce M. Torrey, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.
Filed May 6, 1996, Ser. No. 642,979
Int. Cl.^{6} E06B *1/52;1/30*
U.S. Cl. 52—656.3 **4 Claims**

1. A thermoplastic extruded door frame having an exterior surface and an interior honeycomb configuration forming a plurality of cavities, said cavities being filled with an intrumescent material.



5,687,533
METHOD AND APPARATUS FOR CONNECTING WINDOW FRAME SEGMENTS

Todd W. Bruchu, Lake Elmo, Minn., assignor to Andersen Corporation, Bayport, Minn.
Filed Jun. 15, 1995, Ser. No. 490,801
Int. Cl.^{6} E04B *1/38*
U.S. Cl. 52—656.9 **20 Claims**



15. A corner assembly connecting a first window frame segment at a desired angle relative to a second window frame segment, comprising:

- a first member having a shaft portion and a head portion, wherein said head portion has a greater effective diameter than said shaft portion; and
- a second member having a threaded shaft and a ring, wherein said threaded shaft is anchored within an opening in an end of the first window frame segment, and said ring is proximate an adjacent end of the second window frame segment, and said shaft portion of said first member extends through said ring and into the adjacent end of the second window frame segment, and said ring is retained between said head portion and the second window frame segment.

5,687,534
FRAME ELEMENT AND INSERTION ELEMENT FOR STABLES

Bjarne Kongsgaard, Ikast; Knud Haargaard, Horsens, and Thomas Olsen, Soroe, all of Denmark, assignors to Ikadan System A/S, Ikast, Denmark
PCT No. PCT/DK93/00258, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO94/04021, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 10, 1993, Ser. No. 382,010
Claims priority, application Denmark, Aug. 11, 1992, 1006/92
Int. Cl.^{6} E04C *2/42*
U.S. Cl. 52—664 **10 Claims**

1. A flooring for stables composed of a plurality of module elements positionable on a support, each module element comprising a four-sided, open bottomed frame element (1) and an insertion

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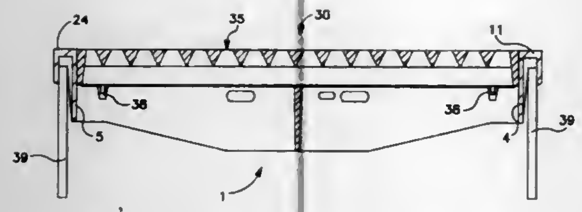
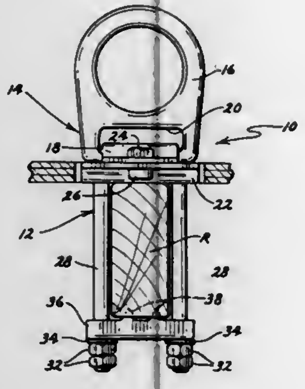


element (30) which is supported within said frame element; each said frame element including two opposed pairs of sides, (2,3,4,5) two supporting profiles (6,7) respectively extending between said pairs of opposed sides, and connection means on each side to connect with a connection means of an adjacent frame element, said supporting profiles and the sides of the frame element defining top surfaces (22,23) for supporting the insertion element in the frame element; and each said insertion element defining an upper flooring surface.

5,687,535
DETACHABLE ROOF ANCHOR
Bradley A. Rohlf, Red Wing, Minn., assignor to D B Industries, Inc., Red Wing, Minn.
Filed Nov. 3, 1995, Ser. No. 552,629
Int. Cl.⁶ E04B *1/38*
U.S. Cl. 52—713 **34 Claims**



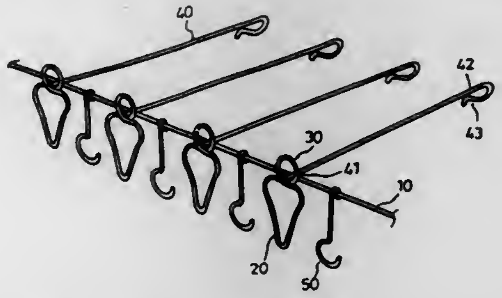
1. A roof anchor to which may be attached a fall protection device for providing fall protection to workers located on a roof, the roof having a support structure including a rafter having a top, a bottom and two opposing sides, the roof anchor being attachable to the rafter, the roof also including a roof base having an upper surface for attachment of shingles thereto the roof base being fastened to a plurality of rafters, the roof anchor comprising:

a permanent roof anchor portion fixedly attached to the roof rafter, said permanent roof anchor portion extending generally downwardly from the upper surface of the roof base;

a detachable roof anchor portion releasably attached to said permanent roof anchor portion to which the fall protection device may be releasably attached said detachable roof anchor portion extending generally upwardly from the upper surface of the roof base; and

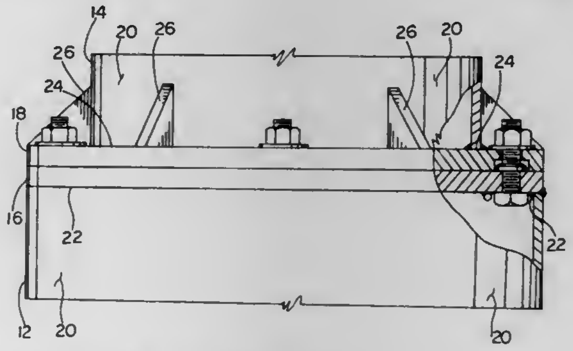
releasable attachment means for releasably attaching said detachable roof anchor portion to said permanent roof anchor portion while said permanent; roof anchor portion remains fixedly attached to the roof rafter.

5,687,536
FRAME STRUCTURE FOR THE FRAMEWORK OF A REINFORCED CONCRETE FLOOR
Hsia-Sen Lin, No. 27, Ing Min 1 Lane, Tao Ing Road, Bar Der City, TaoYuan, Taiwan
Filed Feb. 27, 1996, Ser. No. 607,393
Int. Cl.⁶ E04C *5/16*
U.S. Cl. 52—719 **9 Claims**



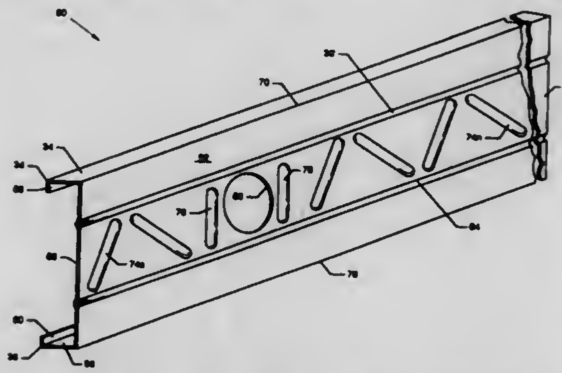
1. A frame structure comprising:
at least one base rod;
a plurality of struts respectively fastened to said at least one base rod;
a plurality of shear members respectively fastened to said at least one base rod;
a plurality of horizontal connecting hooks, each having a first end fixedly connected to said at least one base rod and a second end terminating in a hooked portion for connecting other frame structures to form a framework for a reinforced concrete floor; and
a plurality of downward hooks respectively connected to said at least one base rod.

5,687,537
MODULAR ANTENNA POLE
Myron C. Noble, Plymouth, Ind., assignor to Pi Rod Inc., Plymouth, Ind.
Filed May 24, 1996, Ser. No. 653,018
Int. Cl.⁶ E04H *12/00*
U.S. Cl. 52—726.3 **18 Claims**



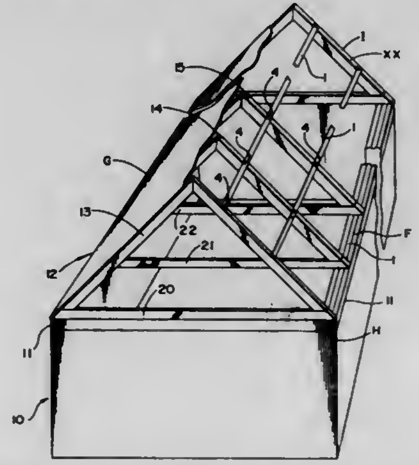
1. A modular antenna pole comprising:
a series of aligned cylindrical sections of upwardly decreasing diameters, adjacent sections of said series each including a top circular flange and a bottom circular flange, each of said sections including an outer circumferential surface and top and bottom transverse surfaces, said top flange being secured to the top transverse surfaces of each section, said bottom flange being secured to the bottom transverse surfaces of each section and extending radially outwardly from said outer circumferential surface, to permit a bottom flange of a higher section to rest on a top flange of a lower section, said top and bottom flanges including a plurality of complementally spaced mating bores so that adjacent sections can be bolted together.

5,687,538
FLOOR JOIST WITH BUILT-IN TRUSS-LIKE STIFFNER
Raymond C. Frobosilo, Lido Beach, and Ernest S. Viola, Huntington, both of N.Y., assignors to Super Stud Building Products, Inc., Astoria, N.Y.
Filed Feb. 14, 1995, Ser. No. 388,290
Int. Cl.⁶ E04C *3/07*
U.S. Cl. 52—731.7 **16 Claims**



1. A joist with a built-in truss-like stiffener, comprising:
an elongated metallic member having a C-shaped cross section composed of a web, two sides extending at right angles from said web in the same direction from said web, and two lips extending toward each other from said two sides; two spaced apart, parallel embossed beads formed in said web and extending the full length of said web; a series of discrete embossed beads formed in said web between said two spaced apart, parallel embossed beads, said discrete embossed beads being arranged in a zig-zag pattern along the entire length of said web and being entirely free from contact with said two spaced apart, parallel embossed beads; at least one pair of additional embossed beads formed in said web between said two spaced apart, parallel embossed beads and between two adjacent ones of said series of discrete embossed beads, said additional embossed beads oriented differently than said two adjacent ones of said series of discrete embossed beads; and a hole through said web located between said at least one pair of additional embossed beads.

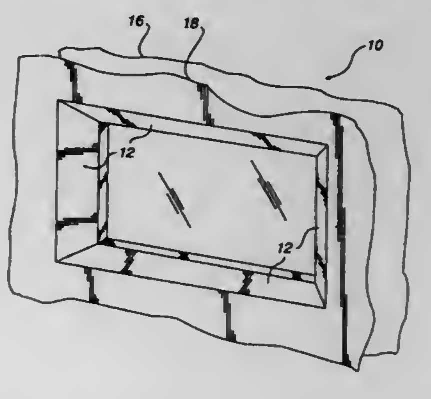
5,687,539
METHODS OF ROOFING CONSTRUCTION UTILIZING A POSITIONING OR FASTENING STRAP
William Ralph Bond, 4710 Asdee La., Woodbridge, Va. 22192
Division of Ser. No. 448,687, May 24, 1995. This application Jul. 19, 1996, Ser. No. 683,477
Int. Cl.⁶ E04G *21/18;* **E04B** *1/10*
U.S. Cl. 52—748.1 **33 Claims**



1. A method of laying down strips of tar or felt paper on a roof utilizing at least one fastening strap, wherein said at least one strap comprises an elongated, flexible, durable and non-stretchable strap, said at least one strap being substantially flat and having one major side and one opposite major side, wherein each strip of tar or felt paper has a leading longitudinal edge and a lagging longitudinal edge parallel to said leading longitudinal edge and has a premarked line thereon near and parallel to said lagging edge to define an overlapping area, and wherein said roof comprises at least one base having an extended area defined by a front side, a rear side opposite said front side, and two opposite lateral sides adjacent and perpendicular to said front and rear sides, said method comprising the following steps:

a) laying down a first strip of tar or felt paper on said at least one base such that a leading longitudinal edge of said first strip is alined with said front side of said at least one base,
b) holding said first strip in place while a first strap is laid down over said overlapping area of said first strip,
c) securing or fastening said first strap to said at least one base by means of fastening means,
d) laying down a second strip of tar or felt paper over said overlapping area of said first strip such that a leading longitudinal edge of said second strip is alined with said premarked line on said first strip,
e) holding said second strip in place while a second strap is laid down over said second strip in said overlapping area,
f) securing or fastening said second strap to said at least one base by means of fastening means,
g) laying down a third strip of tar or felt paper over said overlapping area of said second strip such that a leading longitudinal edge of said third strip is alined with said premarked line on said second strip,
h) holding said third strip in place while a third strap is laid down over said third strip in said overlapping area,
i) securing or fastening said third strap to said base by means of fastening means, and
j) repeating steps g) and h) for each successive strip of tar or felt paper up to said rear side of said at least one base.

5,687,540
METHOD OF FINISHING WINDOW OPENINGS
Godfrey J. R. Thomas, 516-13th St. S., Lethbridge, Alberta, Canada, T1J 2W2
Continuation of Ser. No. 206,720, Mar. 7, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 517,459
Int. Cl.⁶ E06B *3/00*
U.S. Cl. 52—745.15 **10 Claims**



1. A method for finishing window openings in walls having interior and exterior surfaces for increasing the amount of light admitted through a window unit mounted in said opening comprising providing an exterior wall having interior and exterior surfaces and having a window opening formed therein for receiving a window unit, modifying said window opening by removing wall material for flaring said wall adjacent said window opening from

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said window unit to said interior surface of said wall at an angle of between 10 degrees and 70 degrees with respect to a plane perpendicular to said wall, thereby providing increased light transmission through said window.

5,687,541

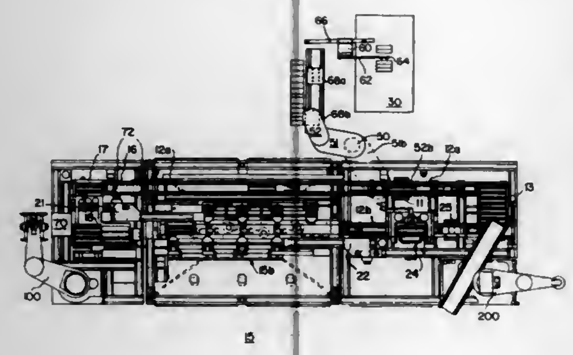
AUTOMATED APPARATUS AND METHOD FOR PREPARING CONTACT LENSES FOR INSPECTION AND PACKAGING

Wallace Anthony Martin, Orange Park; Russell James Edwards, Jacksonville, both of Fla.; Borge Peter Gundersen, Tikob, Denmark; Darren Scott Keene, Jacksonville, Fla.; Ture Kindt-Larsen, Holte, Denmark; John Mark Lepper, Jacksonville, Fla.; Niels Jørgen Madsen, Allerød; Thomas Christian Ravn, Helsignor, both of Denmark; Daniel Tsu-Fang Wang, Jacksonville, and William Edward Holley, Ponte Vedra Beach, both of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Division of Ser. No. 258,557, Jun. 10, 1994, Pat. No. 5,578,331. This application Jan. 5, 1995, Ser. No. 461,826

Int. Cl.^{6} B65B *57/10;55/22;* **C08J** *7/00*

U.S. Cl. 53—54 **18 Claims**



1. An automated apparatus for automatically inspecting and packaging contact lenses in a contact lens fabrication facility, said apparatus comprising:

(a) an inspection pallet for transporting a plurality of contact lens packages, each of said packages adapted to receive a contact lens for inspection thereof;

(b) an automatic lens inspection station for optically inspecting a plurality of contact lenses carried in said packages transported by said inspection pallet and generating a first signal for each defective lens;

(c) an articulated robotic transfer device for periodically transferring a first predetermined number of individual packages from said inspection pallet to an intermediate consolidation buffer and depositing said packages on said consolidation buffer;

(d) a controller for tracking and identifying each individual contact lens inspected and conveyed from said inspection station to said consolidation buffer, said control means including means for storing said first signals identifying individual contact lenses determined to be defective and generating a second signal to cause said articulated robotic transfer device to discard any individual contact lens identified by said inspection station as being defective prior to the deposit of said package on said consolidation buffer; and

(e) second robotic transfer device for transferring a second predetermined amount of individual packages from said consolidation buffer to a packaging station during a period of operation.

5,687,542

ISOLATION MODULE FOR MOLDING AND PACKAGING ARTICLES SUBSTANTIALLY FREE FROM CONTAMINANTS

Mark Lawecki, Apollo; Eugene A. Gelblum, Mt. Lebanon; Michelle Robinson, Zelienople; Ralph E. Wolstenholme, Westfield, and Eugene B. Wolstenholme, Southampton, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Aug. 22, 1995, Ser. No. 518,027

Int. Cl.^{6} B65B *55/00*

U.S. Cl. 53—122 **30 Claims**

1. Apparatus for manufacturing and packaging a plurality of articles substantially free from contaminants, the apparatus comprising:

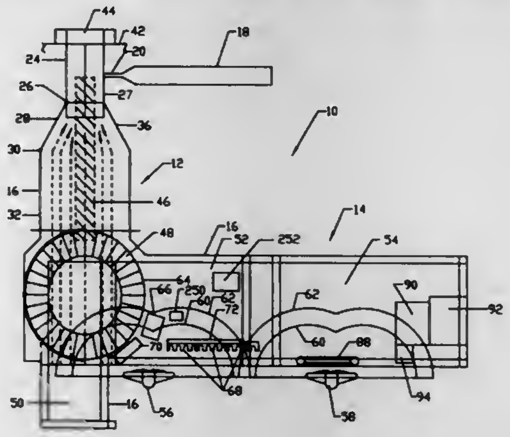
a first enclosure defining an environment;

a second enclosure containing air and defining an environment of at least class 100,000, wherein said second enclosure contains said first enclosure and the environment of said first enclosure is cleaner than the environment of said second enclosure;

an air filter disposed between said first enclosure and said second enclosure to filter air from the second enclosure before such air enters the first enclosure;

at least one molding module located in said first enclosure, said molding module including at least one mold for molding the articles; and

at least one packaging module located in said first enclosure for packaging the molded articles.



5,687,543

CASE SEALING SYSTEM

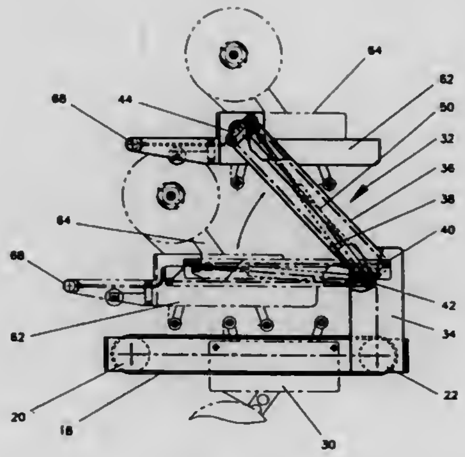
Joe Augustine Shing-Tak Lam, Richmond, Canada, assignor to Belcor Industries Inc., Canada

Filed May 28, 1996, Ser. No. 654,497

Int. Cl.^{6} B65B *61/00*

U.S. Cl. 53—136.4 **13 Claims**

1. A packaging machine comprising a frame, a support surface on said frame, an arm means, means mounting said arm means on said frame solely on one side of said support surface, said arm means being a parallel link mechanism composed with a pair of parallel arms, said means mounting including a first pair of spaced parallel pivotal connections a first of said pair of parallel connections pivotably mounting a first arm of said pair of parallel arms adjacent to one of its ends to said frame and a second of said first pair of spaced parallel pivotal connections pivotably mounting a second of arms of said pair of parallel arms adjacent to its end adjacent to said one end of said first arm to said frame, a support frame, a second pair of spaced parallel pivotal connections one for each said arm of said pair of parallel arms to pivotably connect its said arm to said support frame said second pair of parallel pivotal connections each being positioned adjacent to an end of its arm remote from said first pair of parallel pivotal connections, said parallel pivotal connections of said first and second pair of parallel pivotal connections permitting rotation of said arms about substantially parallel axes, locking positioning means interconnecting said pair of arms to releasably lock said arms in selected positions, a support beam mounted at one end to said support frame and extending as a cantilever from said support frame in a direction to project over said surface, a package closing means mounted over said surface on said support beam and control means for controlling said locking positioning means.



5,687,544

PACKAGING AND SEALING APPARATUS

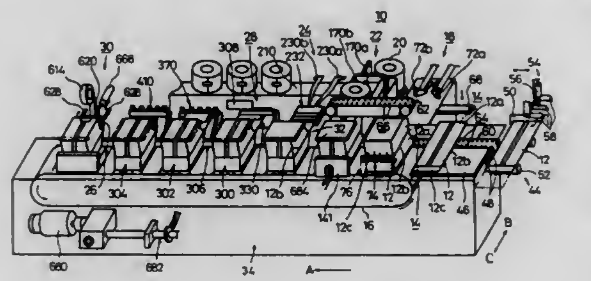
Nobuyuki Watabe; Taijiro Fujita; Kazuo Okutsu; Makoto Ikeda, and Yoshiyuki Ishii, all of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 15, 1996, Ser. No. 647,733

Claims priority, application Japan, May 16, 1995, 7-117333; May 16, 1995, 7-117441; Aug. 3, 1995, 7-198618

Int. Cl.^{6} B65B *7/10;43/34;43/52;51/06*

U.S. Cl. 53—136.5 **48 Claims**



1. A packaging and sealing apparatus comprising:

a conveyor for conveying a package having an opening in an end thereof in a direction, with the opening being oriented transversely to said direction;

an opening mechanism for forming the package forcibly to an open configuration before a product is inserted into the package;

an inserting mechanism for inserting the product into the package which has been formed by said opening mechanism;

an open end forming mechanism for forming flatwise an open end of the package with the product inserted therein;

a folding mechanism for folding the flatwise formed open end into a folded end; and

a sealing mechanism for fixing the folded end;

said opening mechanism, said inserting mechanism, said open end forming mechanism, said folding mechanism, and said sealing mechanism being successively arranged along said direction.

5,687,545

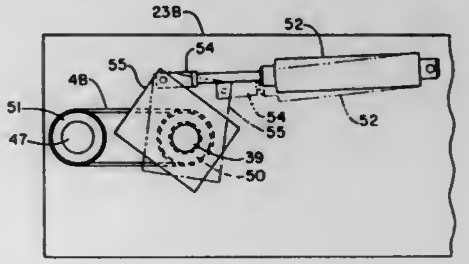
APPARATUS FOR SEALING AND SEPARATING PERFORATED FLEXIBLE BAGS

Tony D. Baker, Hudson, Ohio, assignor to Advanced Poly-Packaging, Inc., Akron, Ohio

Filed Oct. 6, 1995, Ser. No. 540,560

Int. Cl.^{6} B65B *61/20*

U.S. Cl. 53—284.7 **16 Claims**



1. In an apparatus for filling and sealing flexible poly bags provided on a continuous roll, the apparatus having means for heat sealing filled bags, the improvement comprising:

drive means for conveying the bags in a first direction into a position for filling and sealing;

brake means carried by a plate for holding said drive means when one of the bags reaches said filling position;

clamp means for maintaining the bags in position during sealing;

means for rotating said plate with an actuating cylinder to reverse said drive means by rotating said plate to cause said drive means to rotate in a direction opposite said first direction for detaching one of the bags from the continuous roll after sealing; and

guide means for guiding the bags into engagement with said drive means.

5,687,546

METHOD FOR PROVIDING A DECORATIVE COVER ABOUT A FLORAL GROUPING

Donald E. Weder; Joseph G. Straeter, both of Highland, and William F. Straeter, Breese, all of Ill., assignors to Southpac Trust International, Inc.

Continuation-in-part of Ser. No. 93,838, Jul. 19, 1993, Pat. No. 5,467,573, Ser. No. 247,121, May 20, 1994, Pat. No. 5,452,560, and Ser. No. 329,607, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 253,648, Jun. 3, 1994, abandoned, which is a continuation of Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned, said Ser. No. 93,838is a continuation-in-part of Ser. No. 963,882, Oct. 20, 1992, Pat. No. 5,408,803, which is a continuation-in-part of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, said Ser. No. 963,882is a continuation-in-part of Ser. No. 893,586, which is a continuation of Ser. No. 707,417, which is a continuation of Ser. No. 502,358, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, and Ser. No. 249,761, said Ser. No. 247,121is a continuation of Ser. No. 949,175, Sep. 22, 1992, Pat. No. 5,339,601, which is a continuation-in-part of Ser. No. 926,098, Aug. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, said Ser. No.

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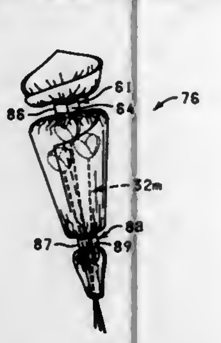
926,098is a continuation-in-part of Ser. No. 687,701, Apr. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 649,263, Jan. 30, 1991, abandoned, which is a continuation of Ser. No. 248,960, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, said Ser. No. 949,175is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 949,175is a continuation-in-part of Ser. No. 876,947, May 1, 1992, Pat. No. 5,396,992, which is a continuation of Ser. No. 708,521, May 31, 1991, Pat. No. 5,161,348, which is a division of Ser. No. 360,367, Jun. 2, 1989, Pat. No. 5,038,933.

This application Jun. 5, 1995, Ser. No. 465,480

Int. Cl.^{6} B65B *11/02;11/48;25/02*

U.S. Cl. 53—397 **28 Claims**



1. A method for providing a decorative covering for a floral arrangement having a flower portion and a stem portion, comprising:
providing a sheet of material having an upper surface, a lower surface and an outer periphery;
providing a band having a first end and a second end and a bonding material disposed on at least a portion thereof, the first end of the band connected to the sheet of material;
extending the sheet of material about at least a portion of the floral arrangement such that a portion of the sheet of material extends about at least a portion of the stem portion, about the flower portion and extends a distance beyond the flower portion of the floral arrangement; and
extending the band about the portion of the sheet of material extending beyond the flower portion of the floral arrangement so as to form a crimped portion in the sheet of material at a position beyond the flower portion of the floral arrangement and connecting the second end of the band to either a portion of the band or to the crimped portion of the sheet of material via the bonding material for securing the band in the position about the crimped portion of the sheet of material extending beyond the flower portion of the floral arrangement to provide a decorative covering for the floral arrangement.

5,687,547
WRAPPING MATERIAL FOR PROVIDING A DECORATIVE COVERING

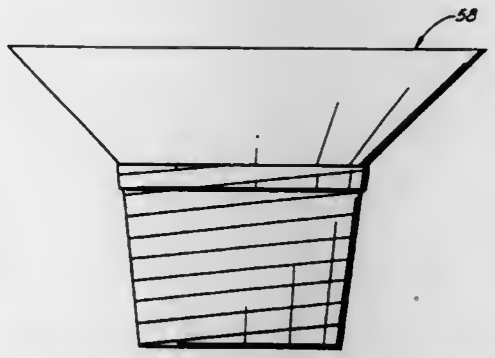
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Continuation of Ser. No. 305,246, Sep. 13, 1994, Pat. No. 5,473,856, which is a continuation of Ser. No. 991,737, Dec. 17, 1992, Pat. No. 5,345,745, which is a continuation of Ser. No. 876,947, May 1, 1992, Pat. No. 5,396,992, which is a continuation of Ser. No. 708,521, May 31, 1991, Pat. No. 5,161,348, which is a division of Ser. No. 360,367, Jun. 2, 1989, Pat. No. 5,038,933. This application Sep. 29, 1995, Ser. No. 536,899

Int. Cl.^{6} B65B *67/08*

U.S. Cl. 53—397 **3 Claims**

1. A method for providing a decorative skirt portion for a pot having an upper end, a lower end, a bottom, a height extending generally between the upper and the lower ends, and an outer



peripheral surface extending generally between the upper and the lower ends of the pot, comprising:
providing a skirt having a rim portion;
positioning the skirt at the upper end of the pot such that the rim portion engages the pot and the skirt extends from the upper end of the pot; and
securing the rim portion to the pot.

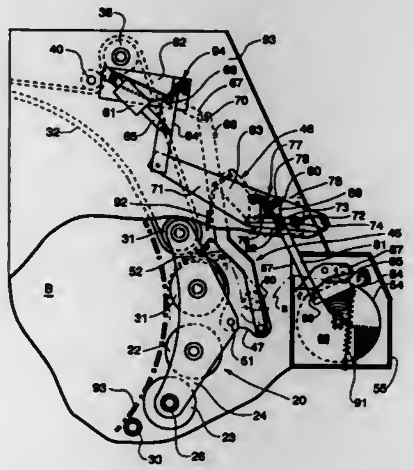
5,687,548
DISPENSER CONTROL SYSTEM FOR ROUND BALE WRAPPING APPARATUS

John R. McClure, New Holland, and Mark K. Chow, Paoli, both of Pa., assignors to New Holland North America, Inc., New Holland, Pa.

Filed May 21, 1996, Ser. No. 651,026

Int. Cl.^{6} B65B *13/04;41/00*

U.S. Cl. 53—399 **11 Claims**



11. In a round baler, the method of wrapping comprising
providing a main frame, a sledge assembly mounted on said main frame for movement between a bale starting position and a full bale position, said sledge assembly including at least two rollers extending transversely of said main frame, crop engaging means having a plurality of elements with crop engaging surfaces supported along a continuous path on said main frame, said path including at least in part a span that cooperates with the rollers of said sledge assembly to define a bale forming chamber for receiving crop material, dispensing means carried on said sledge assembly, control means for controlling the position of said dispensing mechanism relative to said sledge assembly, and sensing means associated with said control means for providing an electrical signal indicative of the position of said dispensing means,
supplying wrapping material,
dispensing said wrapping material into said bale forming chamber to circumferentially wrap a cylindrical package of crop material formed in said bale forming chamber,

moving said dispensing means between an extended position at which said wrapping material is dispensed and a retracted position,
controlling the position of said dispensing mechanism relative to said sledge assembly,
sensing initially the retracted position of said dispensing means,
sensing the fully extended position of said dispensing means for insertion of said wrapping material into said bale forming chamber,
dispensing wrapping material into said bale forming chamber to circumferentially wrap a cylindrical package of crop material to form a bale under condition where said dispensing means has been retracted to a precut position,
sensing said precut position of said dispensing means during dispensing,
retracting said dispensing means from its precut position,
cutting said wrapping material, and
maintaining said dispensing means in its initial retracted position.

5,687,549
METHOD AND AN APPARATUS FOR FORMING AND FILLING PACKAGES

Jan Jostler, and Ingemar Broden, both of Halmstad, Sweden, assignors to Joker System Aktiebolag, Halmstad, Sweden

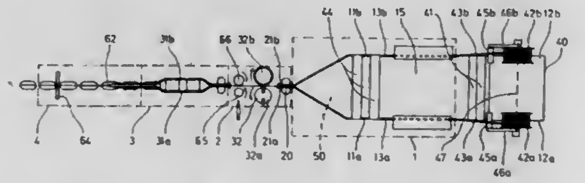
PCT No. PCT/SE94/00417, § 371 Date Nov. 3, 1995, § 102(e) Date Nov. 3, 1995, PCT Pub. No. WO94/25345, PCT Pub. Date Nov. 10, 1994

PCT Filed May 5, 1994, Ser. No. 553,511

Claims priority, application Sweden, May 5, 1993, 9301560

Int. Cl.^{6} B65B *9/00*

U.S. Cl. 53—450 **14 Claims**



1. A method of forming and filling packages comprising:
longitudinally advancing a folded strip of material having opposite longitudinal edges at which thickened material is provided,
said folded strip of material being longitudinally advanced with the thickened material in confronting relation form a web with an open, upper end, a closed lower end and opposite walls,
sealing the web along longitudinally spaced, transverse joints, at which said walls are joined together to produce successive pockets along the web, the transverse joints extending from the closed, lower end of the web upwardly towards the upper end with the thickened material thereat,
forming lines of weakness at said joints extending from said lower end towards said upper end,
forming recesses in said walls at upper ends of said lines of weakness and below said thickened material at said upper end of the web,
opening the pockets of the web at said open, upper end of the web by engaging the thickened material thereat and guidably moving the edge with said thickened material away from one another as said web undergoes longitudinal advance,
introducing a substance into the now open pockets as said pockets advance past a filling station,
closing and sealing said pockets by engaging said thickened material at the upper end of the web and guidably moving the thickened material of the two walls into contact with one another, and
joining said thickened material at the two walls to one another to form packages containing said substance.

5,687,550
BLOW MOLDING SEALED CONTAINER SYSTEM

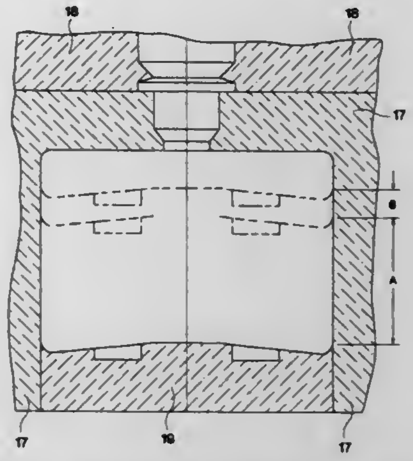
Bernd Hansen, Heerstrasse 16, D-74429 Sulzbach-Laufen, Germany, and Willy Leu, Mosll, Switzerland, assignors to Bernd Hansen, Sulzbach-Laufen, Germany

Filed Oct. 31, 1995, Ser. No. 551,025

Claims priority, application Germany, Nov. 3, 1994, 44 39 231.1

Int. Cl.^{6} B65B *47/08*

U.S. Cl. 53—453 **8 Claims**



1. A method for manufacturing a sealed container filled with a liquid substance, comprising the steps of:
positioning a portion of an extruded tube in a blow mold to form a container having a body with a body diameter, a detachably mounted head to facilitate opening the container with a head diameter considerably smaller than the body diameter and a transition part between the body and the head substantially extending in a radial plane, the tube baving a diameter slightly greater than the head diameter, the blow mold including main laws between top jaws and a mold base;
closing a bottom end of the tube forming a bottom of the container;
blowing air into the tube, after the tube bottom end is closed, and simultaneously moving the mold base in a first movement toward the top jaws of the blow mold to decrease a space inside the main jaws;
filling the container in the blow mold with the liquid substance;
moving the mold base further toward the mold top jaws until the container is free of air; and
forming a top segment of the tube with the top jaws into the container head and sealing the formed container.

5,687,551
PRODUCT HOLDING HOPPER AND POUCH EXPANDER FOR FILLING POUCHES AND METHODS

Steven F. Mustain, Milford, Ohio; Joseph D. Greenwell, Florence, Ky.; Jerome Brugger, Melbourne, Ky.; Michael E. Myers, Bellevue, Ky., and Richard A. Schaeffer, Maineville, Ohio, assignors to R. A. Jones & Co. Inc., Cincinati, Ohio

Filed Nov. 14, 1994, Ser. No. 338,872

Int. Cl.^{6} B65B *1/06;7/06;39/02;43/34*

U.S. Cl. 53—468 **55 Claims**

1. Apparatus for dispensing product into pouches and comprising:
a horizontally mounted, rotatable filler wheel mounted for rotation about a first axis;
means on said wheel for moving pouches through a path along a periphery portion of said filler wheel;
a product supply apparatus mounted for rotation about a second axis spaced from said first axis add having a periphery operably overlying a segment of the periphery portion of said filler wheel;

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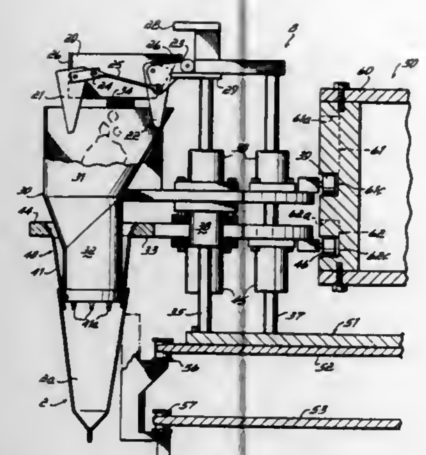


at least one product dispenser mounted on and rotating with said filler wheel for receiving product as it is dropped from said product supply means in said segment; and,

said product dispenser including a product accumulation means for receiving product from a product supply station, holding product, transporting product to a product filling station, and dropping said product into registered pouches at said filling station.

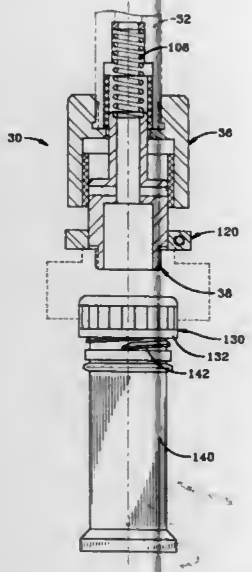
5,687,552
ADAPTER SYSTEM FOR A CAPPING MACHINE FOR APPLYING AT LEAST ONE PREDETERMINED AXIAL LOAD

John G. Barca, Dublin, Ohio, assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 20, 1996, Ser. No. 620,047

Int. Cl.^{6} B67B *3/20;* **B65B** *7/28*

U.S. Cl. 53—490 **8 Claims**



1. An apparatus for placing a cap on a container, said apparatus comprising:

a rotatable spindle reciprocable between a first position and a second position, said rotatable spindle having a proximal end portion and a distal end portion, said proximal end portion constructed to be attached to a capping machine;

a first adapter mounted on said distal end portion of said spindle, said first adapter defining an upper bore, an intermediate bore, and a lower bore, said upper and lower bores connected by said intermediate bore;

a second adapter having a proximal end portion and a distal end portion, said second adapter reciprocably mounted on said first adapter to accommodate relative movement of said adapters between a collapsed orientation and an extended orientation, wherein said adapters are moved towards said collapsed orientation as said rotatable spindle moves from said first position to said second position, said second adapter including a lower portion constructed to be received in said first adapter lower bore, said second adapter including an upper portion projecting from said lower portion, said upper portion constructed to project through said first adapter intermediate bore and into said first adapter upper bore;

a compression spring acting between said first and second adapters; and

a capping head having a proximal end portion and a distal end portion, said proximal end portion of said capping head mounted on said distal end portion of said second adapter, said capping head distal end portion constructed to retain releasably a cap.

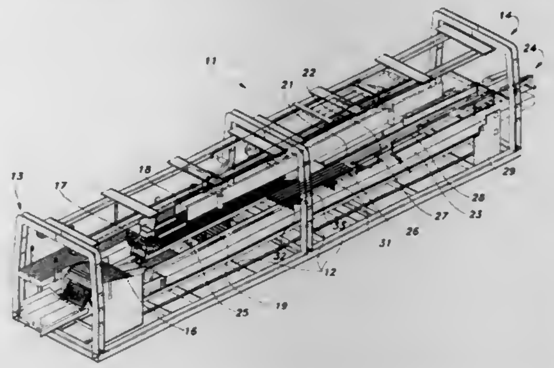
5,687,553
PACKAGING MACHINE WITH RETRACTABLE BED PLATES

Don B. Malanowski, Marietta, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Jun. 10, 1996, Ser. No. 661,131

Int. Cl.^{6} B65B *59/00;43/52*

U.S. Cl. 53—504 **20 Claims**



1. An article packaging machine for packaging articles such as bottles or cans into preformed cartons, said packaging machine comprising:

a frame;

carton conveyor means mounted to said frame for conveying the cartons along a predetermined carton path;

a first guide rail on one side of said carton path for supporting one end of the cartons as they are conveyed along said carton path;

a second guide rail on the opposite side of said carton path for supporting the opposite ends of the cartons as they are conveyed along said carton path, said second guide rail being selectively movable toward and away from said first guide rail to define carton paths of different widths for accommodating cartons of different sizes, said first and said second guide rails defining a gap therebetween;

at least one bed plate mounted for selective movement between a first position wherein said bed plate is located in said gap for underlying and supporting the cartons moving along said carton path and a second position displaced from said gap;

motive means for moving said bed plate between said first and second positions in response to appropriate control signals;

switch means coupled to said motive means for producing a first control signal to cause said motive means to move said bed plate to its first position, and for producing a second control signal to cause said motive means to move said bed plate to its said second position; and

means for actuating said switch means to produce said first control signal when said gap widens beyond a predetermined threshold and for actuating said switch means to produce said second control signal when said gap narrows beyond a predetermined threshold.

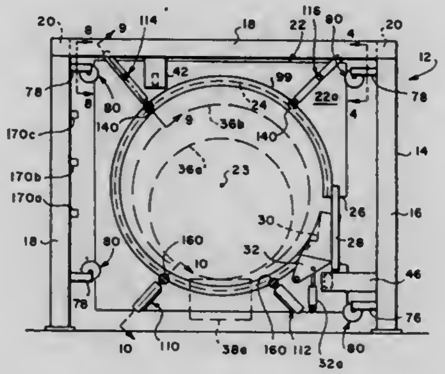
5,687,554
ROLL STRAPPING APPARATUS

Ralph T. Brown, 712 Roaming Rd., Allen, Tex. 75002

Filed Jan. 4, 1996, Ser. No. 582,725

Int. Cl.^{6} B65B *13/04*

U.S. Cl. 53—589 **14 Claims**



6. Apparatus for applying a flexible strap in a predetermined position on an article, such as a roll of paper product, said apparatus comprising:

a frame;

a strap guide member comprising a plate having a substantially flat surface thereon and mounted on said frame for substantially linear movement to a position for applying said strap to an article in a predetermined position on said article, said guide member including means for guiding and supporting said strap for application to said article;

bearing means for supporting said guide member on said frame and for allowing movement of said guide member to a position to be aligned with a surface on said article to be strapped so that said strap is placed in a predetermined plane with respect to said surface;

actuator means for moving said guide member to a position for applying said strap in said predetermined position on said article; and

plural guide member positioning devices supported on said substantially flat surface independent of each other for positioning said guide member to lie in a predetermined plane in relation to a surface on said article to be strapped, said positioning devices being spaced apart about a central axis of an opening formed in said plate for receiving said article in such a way that upon engagement of said positioning devices with said article said guide member is caused to lie in said predetermined plane substantially parallel to the plane of said surface on said article engaged by said positioning devices, in response to movement of said guide member by said actuator means.

5,687,555
APPARATUS FOR MOWING, AERATING, AND/OR COLLECTING

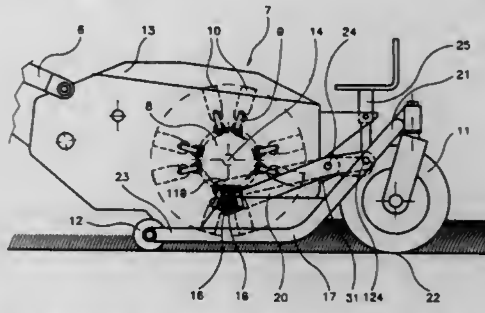
Laurent Klein, Spicheren, France, assignor to Amazone Machines Agricoles S.A., Forbach, France

Filed Nov. 15, 1995, Ser. No. 559,287

Claims priority, application Germany, Nov. 15, 1994, 44 40 825.0

Int. Cl.^{6} A01D *34/64*

U.S. Cl. 56—249 **17 Claims**



1. An apparatus for mowing and for at least one of aerating and collecting comprising a frame;

a cultivation device having a casing and disposed movably in a vertical direction relative to the frame;

an adjustable front guide element having a first continuous contact with a ground surface, wherein the adjustable front guide element is disposed in front of the cultivation device;

a rear guide element having a second continuous contact with the ground surface, wherein the rear guide element is disposed in rear of the cultivation device, wherein the adjustable front guide element and the rear guide element set an operating level of the cultivation device;

a control mechanism attached to the casing;

an axle running perpendicular to a direction of travel of the cultivation device and supported by the control mechanism in an area of the cultivation device such that a vertical position of the axle is set with the control mechanism;

a first common traverse disposed between the adjustable front guide element and the rear guide element and pivotably attached to the control mechanism for pivoting around the axle, wherein the adjustable front guide element and the rear guide element are rotatably supported by the first common traverse.

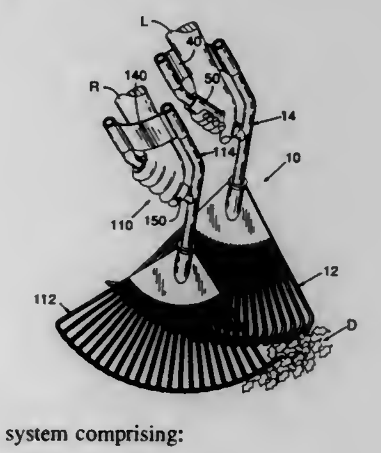
5,687,556
RAKE SYSTEM INCLUDING RAKE-LIKE ARM EXTENSIONS

David R. Lintz, 1775 NW. 137th, Portland, Oreg. 97229

Filed Jan. 23, 1996, Ser. No. 589,946

Int. Cl.^{6} A01D *7/00*

U.S. Cl. 56—400.01 **19 Claims**



9. A rake system comprising:

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a left arm extension including a first multi-fine rake head, a generally Y-shaped left arm handle and a left forearm brace, said left arm handle having a first elongate extension shaft which secures to said first rake head and a first elongate grip shaft which projects proximally from said first extension shaft at an acute angle to define a handhold for a user's left hand, said left forearm brace extending between said first extension shaft and said first grip shaft to engage the user's left arm, thereby opposing pivot of said first rake head about said left arm handhold; and

a right arm extension including a second multi-tine rake head, a generally Y-shaped right arm handle and a right forearm brace, said right handle having a second elongate extension shaft which secures to said second rake head and a second elongate grip shaft which projects proximally from said second extension shaft at an acute angle to define a handhold for a users right hand, said right forearm brace extending between said second extension shaft and said second grip shaft to engage the user's right arm, opposing pivot of said second rake head about said right arm handhold.

5,687,557
OPEN STEEL CORD STRUCTURE

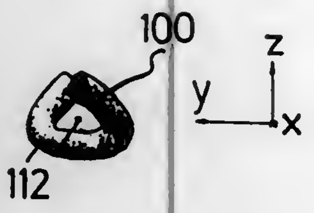
Xavier De Vos, Oudenaarde, and Frans Van Giel, Gullegem, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Continuation of Ser. No. 348,228, Nov. 28, 1994, abandoned. This application Oct. 28, 1996, Ser. No. 741,626

Claims priority, application European Pat. Off., Dec. 15, 1993, 93203523; Mar. 8, 1994, 94200584; May 19, 1994, 94201415

Int. Cl.^{6} D02G *3/02;3/36*

U.S. Cl. 57—902 **20 Claims**



1. A steel cord comprising:

a plurality of strength elements each twisted with a twist pitch into the cord, each of the strength elements having a projection in a plane perpendicular to a longitudinal central axis of the steel cord and taking the form of a two-dimensional curve throughout at least one twist pitch length thereof, as viewed into the longitudinal axis direction,

wherein the curve of at least one of the strength elements is convex throughout the at least one twist pitch length, the convex curve having a radius of curvature varying between a maximum and a minimum so that micro-gaps are formed between the convexly curved strength element and the other strength elements adjacent thereto, the gaps being substantially smaller than the twist pitch and enabling rubber penetration.

5,687,558
FIBER SUPPLY ARRANGEMENT FOR OPEN-END ROTOR SPINNING

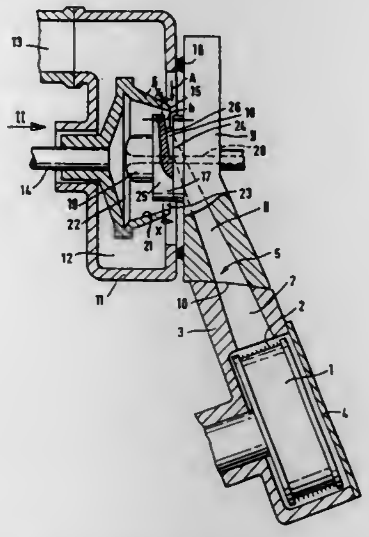
Fritz Stahlecker, Bad Überkingen, Germany, assignor to Hans Stahlecker, Suessen, Germany

Continuation-in-part of Ser. No. 228,000, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 908,995, Jul. 6, 1992, abandoned. This application Mar. 8, 1996, Ser. No. 613,986

Claims priority, application Germany, Jul. 13, 1991, 41 23 255.0

Int. Cl.^{6} D01H *4/00*

U.S. Cl. 57—413 **32 Claims**



1. An open-end rotor spinning arrangement comprising:

a rotor housing,

a spinning rotor disposed in said rotor housing, said spinning rotor having an open end, a fiber collecting groove, a sliding surface which conically widens from adjacent the open end to the fiber collecting groove, and a closed bottom,

a fiber feeding duct defining a fiber feeding path and extending between a fiber opening device and a fiber feeding mouth, said fiber feeding mouth opening towards the sliding surface, and

a cover which has a projection which in use projects into the open end of the spinning rotor while leaving an overflow gap for transport air, said cover containing the fiber feeding mouth,

wherein said fiber feeding duct exhibits a delivery cross-section which is a smallest cross-section of the fiber feeding duct, said delivery cross-section having an ideal diameter defined as the diameter of a circular area equivalent to the area of the delivery cross-section,

wherein said mouth is a slot-shaped mouth extending in close proximity to the sliding surface and having a height in an axial direction of the spinning rotor which is smaller than said ideal diameter and a width in a circumferential direction of the spinning rotor which is significantly larger than said ideal diameter, said mouth having a mouth cross-sectional area at least the size of the delivery cross-section,

and wherein said slot-shaped mouth is bounded on its axial side nearest the fiber collecting groove by a substantially radially extending fiber guiding surface which deflects travel path of substantially all fibers in a radially outward direction toward an initial fiber impact location on the sliding surface which is spaced from the collecting groove by at least ⅔ of the total axial length of the rotor from said open end of the rotor to said collecting groove, whereby stretching and parallelizing of said fibers on said sliding surface is facilitated.

5,687,559
HYDROGEN-COMBUSTION GAS TURBINE PLANT

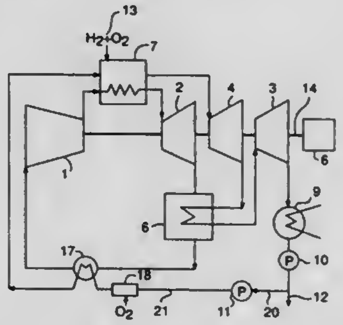
Iwataro Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Feb. 16, 1996, Ser. No. 601,323

Claims priority, application Japan, Feb. 20, 1995, 7-030727

Int. Cl.^{6} F02C *6/00;1/06*

U.S. Cl. 60—39.182 **6 Claims**



1. A hydrogen-combustion gas turbine plant including an electrical power generator having a rotor shaft, a first turbine on a turbine shaft coupled to the rotor shaft, a second turbine on said turbine shaft, a third turbine on said turbine shaft, and a condenser connected to an outlet of said third turbine, said third turbine outputting steam and said condenser condensing the steam output from said third turbine, said plant comprising:

(a) a first system for using inert gas as a working fluid, the first system including a compressor on said turbine shaft, a first heat exchanger, and a second heat exchanger, the first heat exchanger heating gas compressed by said compressor and supplying said compressed gas to a high pressure intake of said second turbine, the second heat exchanger cooling gas exhausted from said second turbine and supplying the cooled gas to a low pressure intake of said compressor; and

(b) a second system for using steam as a working fluid, the second system including said first heat exchanger and said second heat exchanger, said first heat exchanger using heat generated by combustion of a gas mixture including hydrogen and oxygen to heat said inert gas, said first heat exchanger supplying steam resulting from the combustion to a high pressure intake of said first turbine, said second heat exchanger using heat from said inert gas of said first system to heat steam exhausted from a low temperature outlet of said first turbine, said second heat exchanger passing the heated steam to said third turbine.

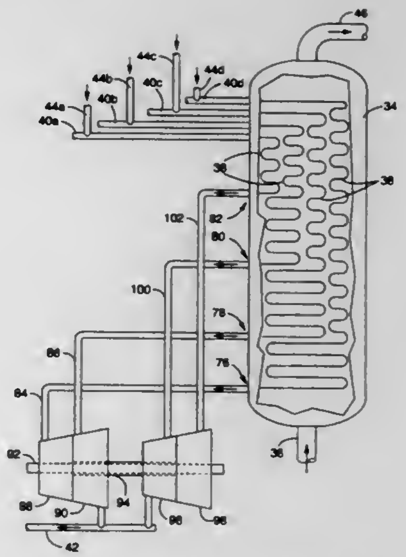
5,687,560
STEAM RAISING APPARATUS FOR PERFORMANCE ENHANCED GAS TURBINE POWERPLANTS

Clarence W. Janes, Sacramento, Calif., assignor to California Energy Commission, Sacramento, Calif.

Continuation-in-part of Ser. No. 182,661, Jan. 12, 1994, Pat. No. 5,490,377, which is a continuation-in-part of Ser. No. 139,525, Oct. 19, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,674

Int. Cl.^{6} F02C *3/30*

U.S. Cl. 60—39.58 **5 Claims**



1. A steam raising heat exchanging apparatus, comprising:

(a) a hot-gas-to-fuel heat exchanger, said heat exchanger including a hot gas inlet and a cool gas outlet, said heat exchanger including a plurality of coil means for receiving fuel and water, said heat exchanger including means for producing multiple pressure steam/fuel mixtures;

(b) pressure increasing means for increasing the pressure of low pressure steam/fuel mixtures produced by said heat exchanger, said pressure increasing means including a steam/fuel inlet coupled to said heat exchanger, said pressure increasing means including a steam/fuel outlet; and

(c) pressure reducing means for reducing the pressure of high pressure steam/fuel mixture produced by said heat exchanger, said pressure reducing means including a steam/fuel inlet coupled to said heat exchanger, said pressure reducing means including a steam/fuel outlet coupled to said steam/fuel outlet of said pressure increasing means.

5,687,561
DUCTED FAN GAS TURBINE ENGINE ACCESSORY DRIVE

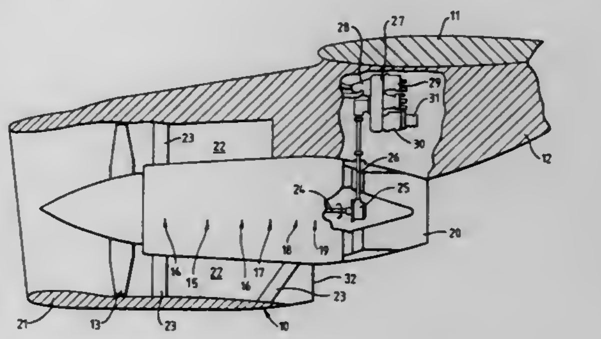
Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, London, England

Continuation-in-part of Ser. No. 204,287, Mar. 10, 1994, abandoned. This application Apr. 10, 1996, Ser. No. 631,855

Claims priority, application United Kingdom, Sep. 17, 1991, 9119852

Int. Cl.^{6} F02C *7/32;* **F02K** *3/04*

U.S. Cl. 60—226.1 **3 Claims**



1. A ducted fan gas turbine engine for mounting on an aircraft comprising a fan and a low pressure turbine, said low pressure turbine driving said fan through a load transmitting shaft which interconnects said low pressure turbine and said fan directly, said load transmitting shaft being connected through an intermediate shaft to accessories of said gas turbine engine wherein said intermediate shaft directly interconnects said load transmitting shaft and said accessories, said load transmitting shaft being free of any connection to any high pressure turbine and any gear element at least between said fan and said low pressure turbine.

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5,687,562

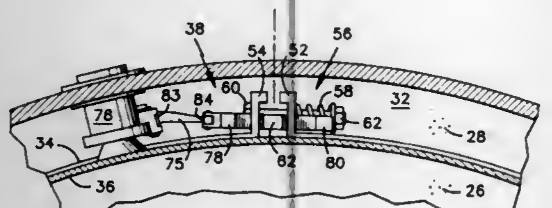
BYPASS AIR VALVE FOR TURBOFAN ENGINE

Jeffrey B. Stewart, Palm Beach Gardens, and Alan B. Minick, Stuart, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 30, 1995, Ser. No. 496,995

Int. Cl.^{6} F02K *3/04*

U.S. Cl. 60—226.3 **16 Claims**



1. A bypass air valve in a turbofan engine, comprising:
a liner, having a circumference;
a strap, surrounding said liner, having a width, a length, a first flange attached to a lengthwise end of said strap, and a second flange attached to the other lengthwise end of said strap;
means for biasing said strap in contact with said liner, said biasing means attached to said strap;
a selective actuator, for unwrapping a segment of said strap from said liner and circumferentially translating said strap a distance around said circumference of said liner; and
means for passage of bypass air through said liner and said strap.

5,687,563

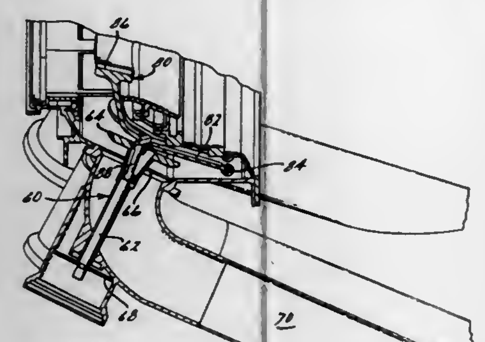
MULTI-SPOOL TURBOFAN ENGINE WITH TURBINE BLEED

Robert S. Thompson, Jr., Brighton, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Jan. 22, 1996, Ser. No. 589,649

Int. Cl.^{6} F02C *9/18;* F02K *3/075*

U.S. Cl. 60—226.3 **2 Claims**



1. In a multi-spool by-pass turbofan engine comprising a low pressure spool having a fan at a forward end and a low pressure turbine at an aft end thereof, and a high pressure spool having a high pressure compressor at a forward end in fluid flow communication with the fan on said low pressure spool and a high pressure turbine at the aft end thereof, a combustor in fluid flow communication between the high pressure compressor and the high pressure turbine on said high pressure spool, a combustion gas duct between the high and low pressure turbines on said high and low pressure spools, respectively, a by-pass duct extending from the fan on said low pressure spool to a point aft of the high pressure turbine on said high pressure spool, and an alternator driven by the high pressure spool of said engine, the improvement comprising:
a plurality of circumferentially spaced poppet valves in said combustion gas duct immediately aft of the high pressure turbine on said high pressure spool; and
a plurality of flow diverters connected to said poppet valves, respectively, and movable into said combustion gas duct upon opening of said valves, said poppet valves being individually openable at engine idle conditions to provide a fluid flow path from said high pressure turbine through said valves to said by-pass duct so as to increase the expansion ratio across the high pressure turbine to produce a relatively high RPM thereof at idle conditions while concomitantly reducing the expansion ratio across the low pressure turbine to reduce the speed of said low pressure spool and of the fan thereon thereby reducing air mass flow to the high pressure compressor on said high pressure spool and minimizing fuel consumption at idle speed.

5,687,564

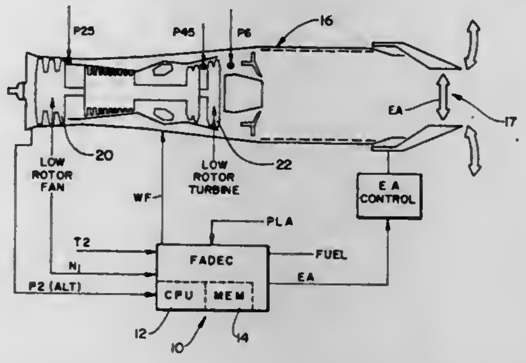
LOW ROTOR VIBRATION AVOIDANCE IN AIRCRAFT GAS TURBINE ENGINES

James B. Kelly, Lake Worth; Kenneth D. Olson, Royal Palm Beach; Johnny B. Davis, Jupiter, and Gerald Bracci, Tequesta, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 4, 1995, Ser. No. 566,846

Int. Cl.^{6} F02K *1/15*

U.S. Cl. 60—235 **4 Claims**



1. A gas turbine engine having a low pressure rotor system characterized by:
means for providing a first plurality of altitude signals below a first engine operating altitude and a second plurality of altitude signals above said first altitude;
means for controlling engine exhaust pressure in response to an exhaust area signal;
signal processing means for providing said exhaust area signal and for controlling low pressure rotor speed, said signal processing means comprising means for storing a first schedule for providing said exhaust area signal to increase engine exhaust pressure with altitude in response to said first plurality of altitude signals and to decrease engine exhaust pressure with altitude in response to said second plurality of altitude signals; and for storing a second schedule for decreasing low pressure rotor speed with altitude in response to said first plurality of altitude signals and increase low pressure rotor speed with altitude in response to said second plurality of altitude signals.

5,687,565

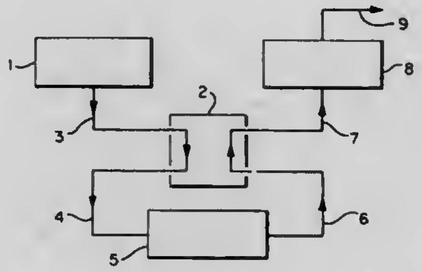
CONTROL OF EXHAUST EMISSIONS FROM AN INTERNAL COMBUSTION ENGINE

Frank S. Modica, Naperville; Mark K. Barr, Wheaton; George A. Huff, Naperville; Roger H. Cayton, Naperville; Bruce D. Alexander, Villa Park, and Richard A. Kretchmer, Clarendon Hills, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 29, 1995, Ser. No. 564,479

Int. Cl.^{6} F01N *3/00*

U.S. Cl. 60—274 **23 Claims**



1. A method for reducing the concentration of carbon monoxide, organic compounds and sulfur oxides in an exhaust gas from an internal combustion engine which comprises:
(a) contacting the exhaust gas with a sulfur oxide absorbent in a first contacting zone and absorbing with the sulfur oxide absorbent at least a portion of the sulfur oxides in the exhaust gas wherein said sulfur oxide absorption is substantially irreversible at temperatures which are less than or equal to that of said exhaust gas;
(b) contacting the effluent gas from said first contacting zone with a catalyst in a second contacting zone and catalyzing the conversion of at least a portion of the carbon monoxide and organic compounds in the effluent gas from said first contacting zone to innocuous products; and
(c) transferring heat from the exhaust gas to said second contacting zone by indirect heat exchange.

5,687,566

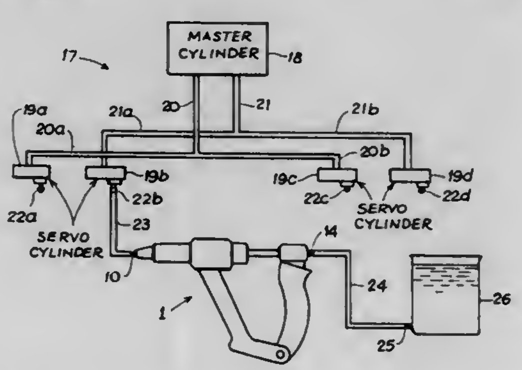
ARRANGEMENT AND METHOD FOR REMOVAL OF AIR FROM A HYDRAULIC SYSTEM

Jon A. Petty, 18834 N. 45th Ave., Glendale, Ariz. 85308

Filed May 15, 1995, Ser. No. 441,187

Int. Cl.^{6} F16D *31/02*

U.S. Cl. 60—327 **32 Claims**



1. An arrangement for removing a contaminant from a hydraulic system, comprising a member for introducing hydraulic fluid into the hydraulic system, said introducing member having an inlet for communicating with a source of hydraulic fluid, an outlet discrete from said inlet for communicating with the hydraulic system a holding chamber for hydraulic fluid to be discharged through said outlet, an expelling element for forcibly expelling hydraulic fluid through said outlet, and a device for fixing the effective volume of said chamber at any one of a plurality of values.

23. A method of removing at least one contaminant from hydraulic systems, comprising the steps of making a first adjustment to fix the effective volume of a chamber at a first value; introducing a first quantity of hydraulic fluid into said chamber while maintaining said first adjustment; forcing said first quantity of hydraulic fluid from said chamber into a hydraulic system; making a second adjustment to fix the effective volume of said chamber at a second value different from said first value; introducing a second quantity of hydraulic fluid into said chamber while maintaining said second adjustment; and forcing said second quantity of hydraulic fluid from said chamber into a hydraulic system.

5,687,567

METHOD AND DEVICE FOR OPERATING A HYDRAULIC TOOL

Mikael Hansson, Orsa, and Mikael Nilsson, Alvdalen, both of Sweden, assignors to Pressmaster Tool AB, Alvdalen, Sweden

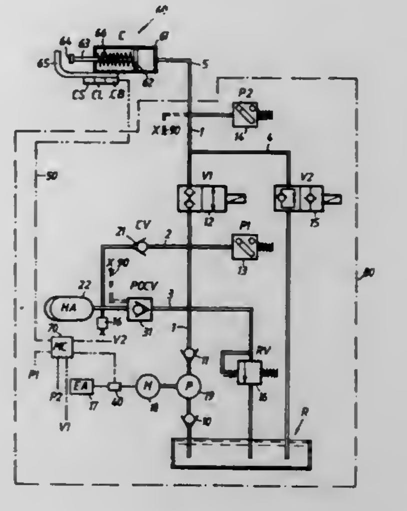
PCT No. PCT/SE94/00966, § 371 Date May 1, 1996, § 102(e) Date May 1, 1996, PCT Pub. No. WO95/14173, PCT Pub. Date May 26, 1995

PCT Filed Oct. 20, 1994, Ser. No. 619,588

Claims priority, application Sweden, Nov. 18, 1993, 9303824

Int. Cl.^{6} F16D *31/02*

U.S. Cl. 60—413 **5 Claims**



1. A method for operating an hydraulic tool (C) having an independent, portable hydraulic power unit (**80**) which includes an hydraulic circuit (**1**) having a pump (**19**), a power source (**17**), a pump-operating motor (**18**) operable from the power source, and a motor control means (**40**), wherein the pump (**19**) is adapted to produce a predetermined first pressure level (P2) for corresponding pressurization of the tool (C), characterized by charging an hydraulic accumulator (**22**) connected to the hydraulic circuit (**1**) to a second hydraulic pressure level (P1) which at most is equal to the first pressure level (P2) that can be produced by the pump (**19**); emptying the charged accumulator (**22**) into the tool for initial activation thereof, wherein the accumulator is adapted to maintain when empty a pressure level which is considerably lower then the first pressure level; causing the pump (**18**) to act against the tool filled from the accumulator (**22**) after emptying of the accumulator, while isolating the accumulator from the pump so as to establish a tool working pressure which corresponds to the first pressure level P2, and thereafter isolating the tool (C) from the pump (**19**) and emptying the hydraulic fluid content of the tool into the tank (R); and by causing the pump (**19**), isolated from the tool (C), to charge the accumulator (**22**) to the second pressure level.

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5,687,568

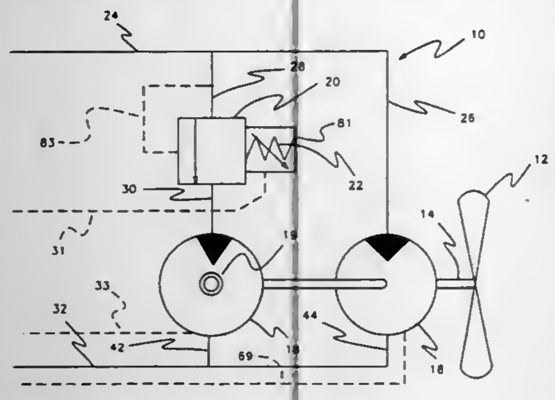
HYDRAULIC MOTOR SYSTEM

Jeffrey J. Buschur, Bellbrook, Ohio, assignor to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Continuation of Ser. No. 341,426, Nov. 17, 1994, Pat. No. 5,561,978. This application Mar. 13, 1996, Ser. No. 614,495

Int. Cl.⁶ F16D *31/02;* **F15B** *11/00*

U.S. Cl. 60—424 **18 Claims**



1. An hydraulic drive apparatus comprising:

(a) a supply line for receiving an hydraulic fluid;

(b) displacement chamber means defining a plurality of displacement chambers, each connected to said supply line for progressive filling by said hydraulic fluid in response to an increase of flow rate in said supply line;

(c) a plurality of working surfaces, each positioned within one of said displacement chambers for movement in response to said progressive filling; and

(d) flow division means for apportioning the flow of said hydraulic fluid between said displacement chambers; said at least one of said plurality of working surfaces being coupled to a drive shaft and applying a tongue to drive said shaft for driving a component.

5,687,569

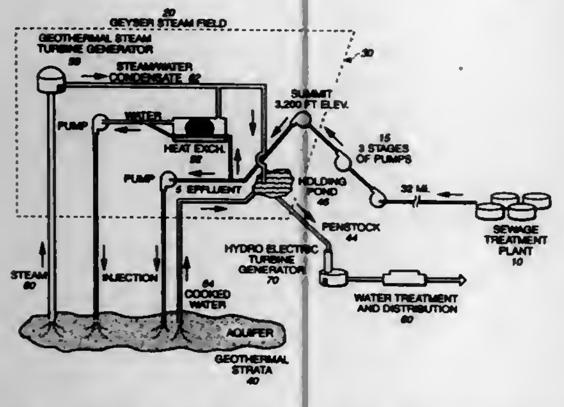
METHOD OF COMBINING WASTE WATER TREATMENT AND POWER GENERATION TECHNOLOGIES

Leonard Leroux Stewart, 4358 Chico Ave., Santa Rosa, Calif. 95407

Filed Oct. 19, 1995, Ser. No. 545,110

Int. Cl.⁶ F03G *7/00*

U.S. Cl. 60—641.2 **19 Claims**



1. A method of employing waste water effluent in power generation comprising the steps of:

delivering waste water effluent to a geothermal steam field;

injecting said effluent into said field;

collecting steam from said field; and

extracting energy in the form of electricity from said steam by expansion in a steam turbine-generator system thereby producing condensate.

5,687,570

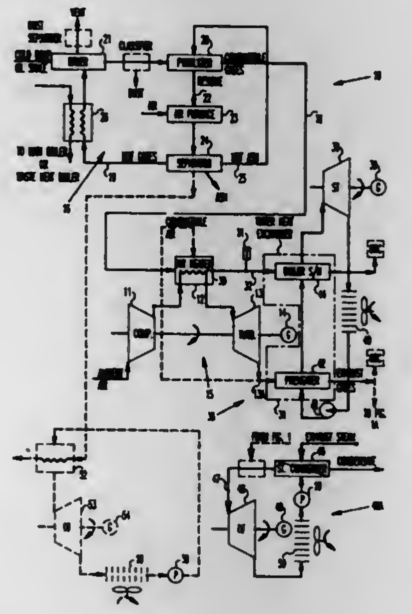
EXTERNALLY FIRED COMBINED CYCLE GAS TURBINE SYSTEM

Lucien Y. Bronicki, Yavne; Daniel Goldman, Raanana, and Joseph Sinia, Ramat Gan, all of Israel, assignors to Ormat Industries Ltd., Yavne, Israel

Continuation of Ser. No. 202,476, Feb. 28, 1994, abandoned. This application Jan. 31, 1996, Ser. No. 594,476

Int. Cl.⁶ F01K *23/10*

U.S. Cl. 60—655 **35 Claims**



1. An externally fired gas turbine system of the type having a compressor for compressing ambient air and producing compressed air, an air heat exchanger for heating the compressed air to produce heated compressed air, and a turbine coupled to said compressor and to a generator for expanding said heated compressed air to drive the generator and compressor, and to produce expanded air, said system comprising:

a) an external combustion chamber operatively associated with said heat exchanger;

b). means for supplying fuel and air to said external combustion chamber for indirectly heating said compressed air to produce said heated compressed air, and to produce heat depleted combustion products;

c) a closed Rankine cycle power plant having a water heat exchanger for vaporizing water and producing steam, means for applying said heat depleted combustion products to said water heat exchanger, a steam turbine for expanding the steam and producing power and expanded steam, a steam condenser for condensing the expanded steam and producing condensate, and means for returning said condensate to said water heat exchanger; and

d) means for feeding back said expanded air to said external combustion chamber.

5,687,571

COMBUSTION CHAMBER WITH TWO-STAGE COMBUSTION

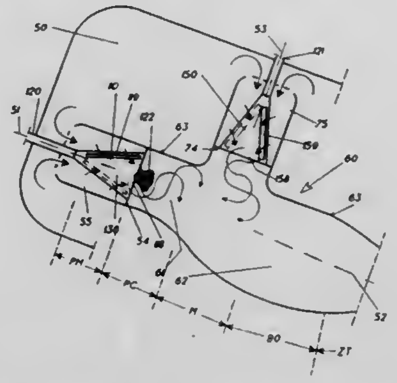
Rolf Althaus, Kobe, Japan, and Jakob J. Keller, Dottikon, Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Feb. 5, 1996, Ser. No. 596,770

Claims priority, application Switzerland, Feb. 20, 1995, 487/95

Int. Cl.⁶ F23R *3/30;3/34*

U.S. Cl. 60—737 **7 Claims**



1. A combustion chamber with two-stage combustion, comprising:

a wall defining a precombustion space and a main combustion space,

at least one primary premixing burner mounted at a head of the precombustion space, the at least one primary premixing burner having two hollow bodies defining an interior premixing space, with center axes of the bodies being offset so that adjacent edges of the bodies define longitudinally extending inlet gaps on opposite sides of the interior premixing space for a tangentially directed flow of combustion air into the interior premixing space,

means for introducing combustion air through the inlet gaps into the premixing space,

fuel nozzles to inject fuel into the premixing space to mix with the combustion air inside the premixing space, wherein a premixture of fuel and air is produced at a burner outlet,

means for igniting the premixture at the burner outlet, and

at least one secondary premixing burner mounted on the wall downstream of the precombustion space, the at least one secondary burner having a premixing space to produce a secondary fuel and air mixture into the combustion chamber for auto-ignition of the secondary mixture.

5,687,572

THIN WALL COMBUSTOR WITH BACKSIDE IMPINGEMENT COOLING

Jeffrey P. Schrantz, Apple Valley, Minn., and David R. Squire, Phoenix, Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Nov. 2, 1992, Ser. No. 970,420

Int. Cl.⁶ F23R *3/06*

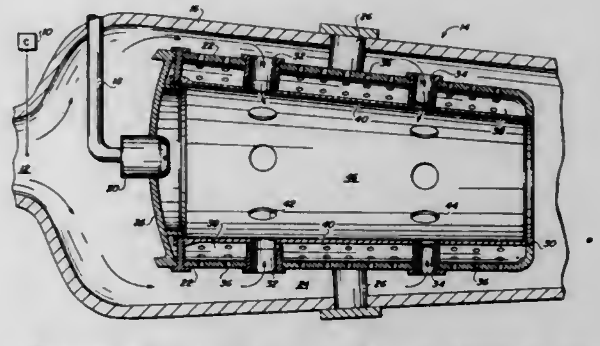
U.S. Cl. 60—753 **21 Claims**

1. A combustor for a gas turbine engine, comprising:

a combustor housing having an inlet for recieving pressurized air for combustion therein;

an outer metallic shell inside said housing and mounted thereto, said outer shell having primary and secondary air holes and a plurality of smaller cooling air holes; and

an inner, thin walled, ceramic liner mounted to and disposed within said outer shell, and cooperating therewith to define a cooling space between said outer shell and said ceramic liner, said ceramic liner having primary and secondary openings respectively communicating with said primary and secondary air holes, said ceramic liner being otherwise nonporous, said cooling air holes adapted to direct the pressurized air into said cooling space for impingement cooling of said ceramic liner.



5,687,573

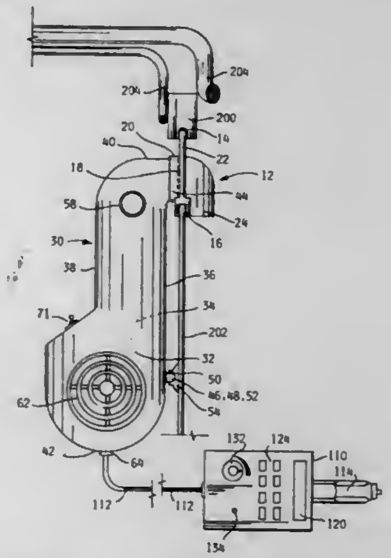
THERMAL CONTROL DEVICE FOR COOLING OR HEATING PARKED VEHICLES

Ping-Ho Shih, 1416 S. 9th St., Alhambra, Calif. 91803

Filed Jun. 6, 1996, Ser. No. 656,767

Int. Cl.⁶ F25B *21/02*

U.S. Cl. 62—3.6 **20 Claims**



1. A thermal control device for cooling or heating parked vehicles, said device comprising:

a) a door frame/window interfacing fixture having means for being attached between a vehicle door frame and a corresponding vehicle window, with said fixture further having an air exhaust sleeve that projects into the passenger compartment and vents to the vehicle exterior,

b) a device housing having:

(1) an air exhaust port that frictionally fits into the air exhaust sleeve on said fixture,

(2) an air outlet port,

(3) a d-c motor that operates a fan,

(4) a temperature control module that uses a Peltier-effect thermoelectric element that produces a hot or cold temperature,

(5) a power/voltage-polarity selecting switch that controls the voltage applied to said d-c motor and the polarity of the voltage applied to said temperature control module, wherein the hot or cold temperature produced by said temperature controlled module is dependent upon the applied voltage polarity, wherein the selected temperature output from said temperature control module is forced out the outlet port of said device housing into the passenger compartment by said fan, and

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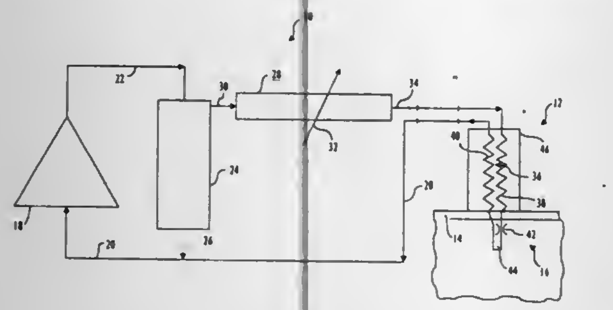
c) a device control unit attached to said device housing, via a power cable, wherein said unit having means for controlling the time that the voltage, derived from a voltage source, is to be applied to said device housing.

5,687,574
THROTTLE CYCLE CRYOPUMPING SYSTEM FOR GROUP I GASES

Ralph C. Longsworth, Allentown, and Francis T. Lotz, Whitehall, both of Pa., assignors to APD Cryogenics, Inc., Allentown, Pa.

Filed Mar. 14, 1996, Ser. No. 615,131
Int. Cl.⁶ B01D *8/00;* **F25B** *19/02*
U.S. Cl. 62—55.5 **18 Claims**



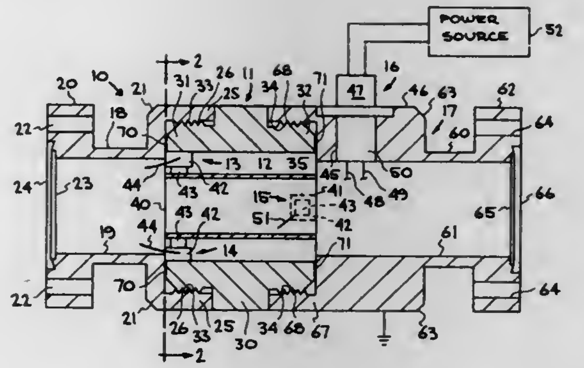
1. A cold trap system for pumping a Group I gas, comprising:
a cryopumping surface for exposure inside a vacuum chamber and path means having an inlet and an outlet and thermodynamically connected to said surface for circulating cryogenic refrigerant through said path means and for cooling said surface, in operation, at least one Group I gas freezing on said surface;
a heat exchanger having a high pressure path with an inlet and an outlet, and a low pressure path with an inlet and an outlet, said paths being in heat transfer relationship to each other;
a refrigerant flow restrictor connected for refrigerant flow between said outlet of said high pressure path of said heat exchange and said inlet of said path means of said cryopumping surface, the outlet of said path means being connected to said inlet of said low pressure heat exchanger path, said heat exchanger being located proximate said cryopumping surface and said flow restrictor; and
a refrigerant compressor, an aftercooler and flow lines between said compressor and said aftercooler and said heat exchanger to complete a refrigeration cycle, said flow lines being uninsulated, and approximately at ambient temperature when in operation with a mixed refrigerant.

5,687,575
MINIATURE THERMO-ELECTRIC COOLED CRYOGENIC PUMP

Robert F. Keville, Valley Springs, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Apr. 29, 1996, Ser. No. 639,669
Int. Cl.⁶ B01D *8/00*
U.S. Cl. 62—55.5 **20 Claims**

1. A cryogenic pump, including:
an inlet flange piece,
an outlet flange piece,
a heat sink operatively connected intermediate said inlet and outlet flange pieces and having an opening therein,
a low temperature tubulation positioned within said opening of said heat sink, and

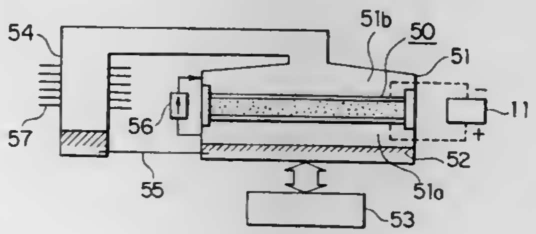


a plurality of thermo-electric chips positioning within said opening of said heat sink and radially secured intermediate said low temperature tubulation and said heat sink.

5,687,576
WATER-EVAPORATION TYPE COOLING SYSTEM BASED ON ELECTROLYTIC REACTION AND WATER-EVAPORATION TYPE COOLING METHOD THEREFOR

Tetsuo Moriguchi, and Shiro Yamauchi, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1996, Ser. No. 682,379
Claims priority, application Japan, Jul. 24, 1995, 7-187360; Nov. 15, 1995, 7-296951; Feb. 22, 1996, 8-035003
Int. Cl.⁶ F25D *9/00*
U.S. Cl. 62—56 **20 Claims**

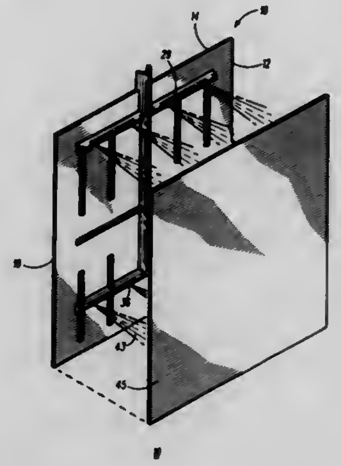


18. A water evaporation type cooling method using a hermetically sealed housing including a gas and divided into first and second spaces by solid electrolytic membrane means having porous electrodes on surfaces of its solid high polymer electrolyte which allows protons to selectively pass, comprising the steps of:
applying a direct-current voltage to between said porous electrodes to cause water electrolysis on a solid electrolytic membrane means surface at a first space side;
transferring protons produced by the water electrolysis through said solid electrolytic membrane means to a solid electrolytic membrane means surface at a second space side; and
causing a water production reaction to take place on said solid electrolytic membrane surface at the second space side to produce a difference in humidity between said first and second spaces to decrease the temperature of water reservoired in said first space.

5,687,577
APPARATUS AND METHOD FOR SPRAY-COOLING AN ELECTRONIC MODULE

Gerald W. Ballard, West Dundee; James W. Turocy, Arlington Heights, and Thomas R. Beise, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1996, Ser. No. 630,284
Int. Cl.⁶ F25D *17/02;23/12;* **H05K** *7/20*
U.S. Cl. 62—64 **19 Claims**

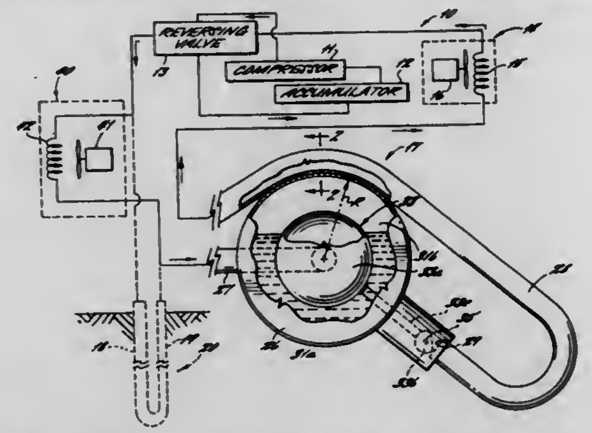


1. An apparatus for spray-cooling an electronic module, the apparatus comprising:
a plate having a first layer and a second layer opposed to the first layer, the second layer comprising a first substrate;
a fluid distributing manifold disposed proximate the first layer; and
a nozzle housing having an aperture, the nozzle housing disposed in the first fluid distributing manifold, the aperture positioned to discharge a fluid away from the second layer.

5,687,578
HEAT PUMP APPARATUS AND RELATED METHODS PRODUCING ENHANCED REFRIGERANT FLOW STABILITY

Robert W. Cochran, Lakeland, Fla., assignor to ECR Technologies, Inc., Lakeland, Fla.

Filed Nov. 27, 1995, Ser. No. 563,159
Int. Cl.⁶ F25B *41/00*
U.S. Cl. 62—113 **42 Claims**

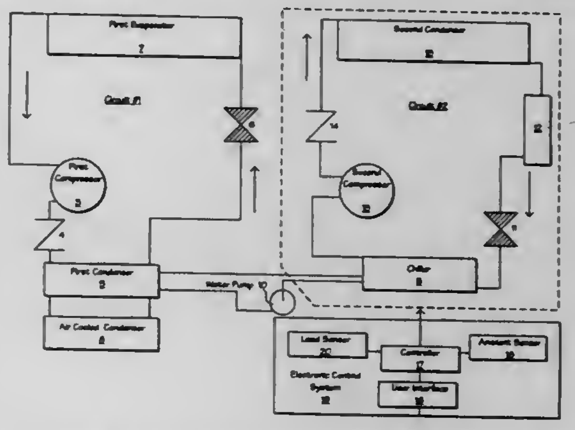


40. A method for stabilizing refrigerant flow through a liquid refrigerant flow control valve connected in fluid communication between a condenser and an evaporator of a heat pump apparatus, the liquid flow control valve comprising a housing for containing liquid refrigerant and vapor refrigerant above the liquid refrigerant, and a float movable within the housing for controlling a flow of refrigerant passing through an expansion orifice based upon a level of liquid refrigerant within the housing, the method comprising the steps of:
providing a greater amount of cooling adjacent an upper portion of the housing to more rapidly condense vapor refrigerant responsive to a level of liquid refrigerant in the housing being relatively low; and
providing a lesser amount of cooling adjacent an upper portion of the housing to less rapidly condense vapor refrigerant responsive to a level of liquid refrigerant in the housing being relatively high.

5,687,579
DOUBLE CIRCUITED REFRIGERATION SYSTEM WITH CHILLER

Mikhail M. Vaynberg, 411 Hazelwood, San Francisco, Calif. 94127

Filed Sep. 12, 1994, Ser. No. 304,362
Int. Cl.⁶ F25B *7/00;41/00*
U.S. Cl. 62—175 **6 Claims**



1. A double circuited refrigeration system for cooling a product load to a predetermined temperature comprising:
a. a first circuit having a first compressor coupled to provide compressed hot gas to a liquid cooled condenser which in turn is coupled to provide liquid to an evaporator which in turn is coupled to provide hot gas to the first compressor, the first circuit further having a first air cooled condenser coupled in parallel with the liquid cooled condenser;
b. a second circuit having a second compressor coupled to provide compressed hot gas to a second air cooled condenser which in turn is coupled to provide liquid to a chiller which in turn is coupled to provide hot gas to the second compressor;
c. a water pump is coupled to circulate water between the first condenser and the chiller; and
d. means for selectively operating the first circuit or both circuits simultaneously.

5,687,580
REFRIGERATOR AND METHOD FOR CONTROLLING TEMPERATURE THEREOF BY CONTROLLING COOL AIR DISCHARGE DIRECTION

Seong-wook Jeong, Suwon; Jae-in Kim, Seoul; Yun-seog Kang, Suwon; Suk-hang Park, Suwon, and Yong-myoung Kim, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co. Ltd., Suwon, Rep. of Korea

Filed Nov. 29, 1995, Ser. No. 564,652
Claims priority, application Rep. of Korea, Nov. 30, 1994, 94-32116; Dec. 10, 1994, 94-33558; Dec. 12, 1994, 94-33751; Oct. 25, 1995, 95-37171
Int. Cl.⁶ F25D *17/08*
U.S. Cl. 62—186 **49 Claims**

1. A refrigerator comprising:

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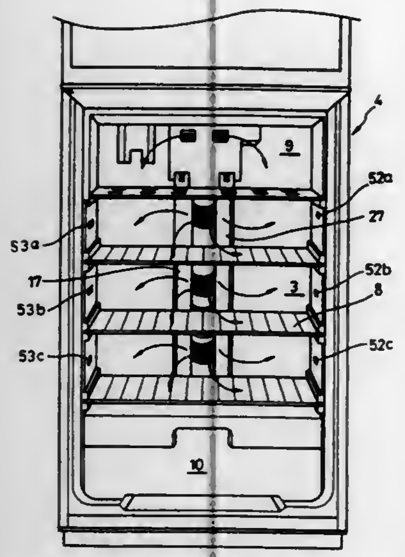
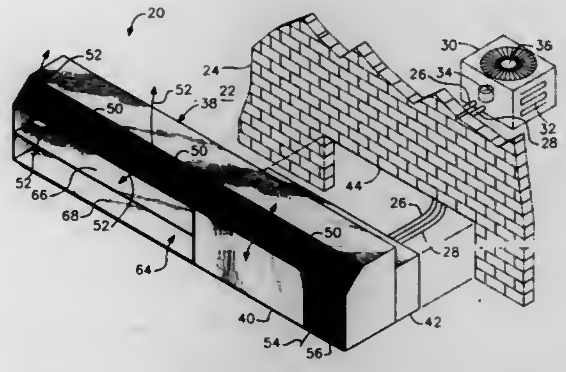




a body having a freezer compartment and a refrigeration compartment;

an evaporator for producing cool air and providing said cool air to said freezer and refrigeration compartments;

a housing installed in a predetermined position of said refrigeration compartment and having a guide path for guiding said cool air from said evaporator into said refrigerator and a cool air path for guiding said cool air downward from said guide path; and

a plurality of discharge holes vertically formed to correspond to respective sections of said refrigeration compartment in the center of said housing, for guiding said cool air which flows through said cool air path to be dispersedly discharged into said refrigeration compartment;

wherein said cool air path is provided with a first path and a second path at both sides of said discharge holes, first linking paths for linking respective discharge holes to said first path and second linking paths for linking respective discharge holes to said second path, and each of said discharge holes is provided with a first discharge portion directly linked to said first linking path and a second discharge position directly linked to said second linking path, said first discharge portion is communicated with said second discharge portion, and said first and second discharge portions are formed to be mutually stepped and eccentric toward said first linking path and said second linking path, respectively.

5,687,581
SPLIT-SYSTEM CONSOLE PACKAGE AIR CONDITIONING UNIT

Miller Price, 900 Colonial Dr., Morristown, Tenn. 37814

Filed May 3, 1996, Ser. No. 642,444

Int. Cl.^{6} F25D *23/12; 17/06;* **A47B** *77/08*

U.S. Cl. 62—263 **19 Claims**

1. Split-system retrofit conversion apparatus for replacing a self-contained package air conditioning unit of the type including within a single cabinet an indoor air heat exchange coil and an indoor air blower for circulating indoor air over the indoor air heat exchange coil, an outdoor air heat exchange coil and an outdoor air blower for circulating outdoor air over the outdoor air heat exchange coil, and a refrigerant compressor connected in a closed refrigerant circuit with the indoor air heat exchange coil and the outdoor air heat exchange coil, the self-contained package air conditioning unit being located within a building, and the single cabinet having an opening allowing outdoor air access to the outdoor air heat exchange coil through a corresponding opening in a wall of the building, and the single cabinet occupying a floor area within the building, said retrofit conversion apparatus comprising:

an indoor unit including an indoor cabinet sized so as to occupy the same floor area as the single cabinet of the self-contained package air conditioning unit and so as to cover at least the opening in the wall of the building;

said indoor cabinet being interiorly subdivided into at least a plenum compartment and an indoor heat exchanger compartment;

said indoor cabinet having at least one of a room air return opening communicating with indoor room air and a ventilation opening communicating with the opening in the wall of the building;

said indoor cabinet having an air discharge opening formed in a wall of said plenum compartment;

an indoor heat exchanger within said indoor heat exchanger compartment;

an indoor air mover within said indoor cabinet and connected to said plenum compartment for drawing room air in through said at least one of a room air return opening and a ventilation opening, passing air over surfaces of said indoor heat exchanger, and discharging air via said plenum compartment through said air discharge opening; and

refrigerant line connections for connecting said indoor heat exchanger to an outdoor unit including an outdoor heat exchanger and a system refrigerant compressor.

5,687,582
REFRIGERATION SYSTEM FLUID TUBE SEAL

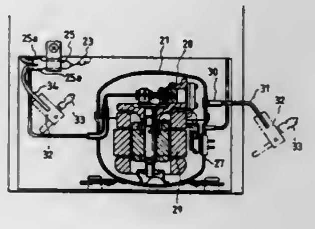
Masao Mangyo, Fujisawa; Takao Kawashima, Kawasaki, and Yuji Mori, Chigasaki, all of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

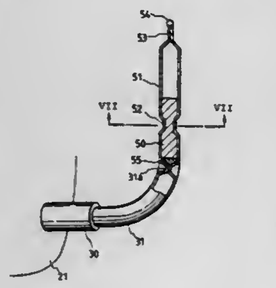
Division of Ser. No. 539,511, Oct. 6, 1995, Pat. No. 5,606,867, which is a division of Ser. No. 295,585, Aug. 25, 1994, Pat. No. 5,577,391. This application Jan. 9, 1997, Ser. No. 780,915

Claims priority, application Japan, Aug. 26, 1993, 5-211650; Aug. 26, 1993, 5-211651

Int. Cl.^{6} F25D *19/00*

U.S. Cl. 62—298 **5 Claims**





1. A refrigeration system comprising:

a series of a refrigerant flow passage including therein a compressor, a condenser, an expansion mechanism and an evaporator;

a refrigerant containing, as a main component, one of hydrocarbon and HFC-152a;

a lubricating oil having solubility with said refrigerant; and

a fluid tube having a base end hermetically connected to said refrigerant flow passage, a distal end and an intermediate portion extending from said base end to said distal end, said intermediate portion having a first portion which is pinched to be closed and a second portion extending from said first portion to said distal end, said second portion receiving therein an elastomer having a diameter substantially equal to an inner diameter of said second portion, said second portion having a third portion which is deformed to reduce a sectional area thereof so that an inner wall of said third portion tightly fits on said elastomer.

5,687,583
AIR CONDITIONER HAVING OPENING/CLOSING MECHANISM FOR AIR-FLOW DIRECTION CHANGING BLADES

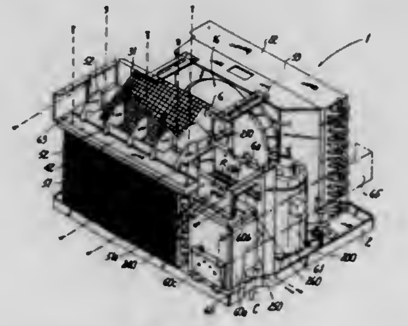
Syoji Tunekawa, Nitta-machi; Jyunichi Goya, Oizumi-machi; Fujio Suzuki, Ota; Yosuke Inagaki, Oizumi-machi, and Shigeo Akaishi, Menuma-machi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

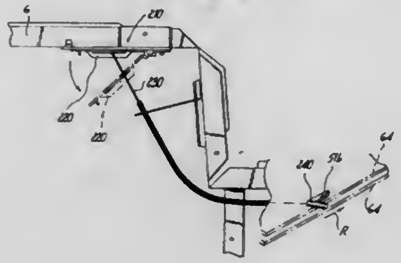
Filed Mar. 15, 1996, Ser. No. 618,469

Claims priority, application Japan, Apr. 27, 1995, 7-127164

Int. Cl.^{6} F25D *17/04*

U.S. Cl. 62—404 **8 Claims**





1. An air conditioner having a body, a front panel facing a room, plural air-flow direction changing blades provided at an opening of said front panel, and a path for supplying the outside air into said opening, including:

an open/close operation member which is provided to an operation portion of said body as to be manipulated through a gap between said air-flow direction changing blades from the room; and

a closing member which is linked to said open/close operation member and serves to selectively open or close said path in accordance with an operation state of said open/close operation member.

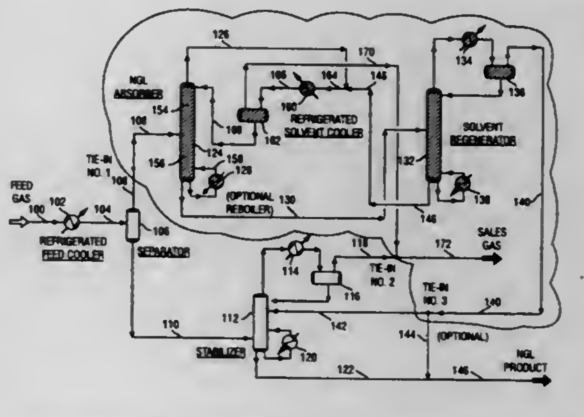
5,687,584
ABSORPTION PROCESS WITH SOLVENT PRE-SATURATION

Yuv R. Mehra, The Woodlands, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 549,276, Oct. 27, 1995, Pat. No. 5,561,988. This application Aug. 30, 1996, Ser. No. 697,829

Int. Cl.^{6} F25J *3/00*

U.S. Cl. 62—632 **10 Claims**



1. In an absorption process for recovery of a desired component and all components heavier than the desired component from a feed gas stream containing components of varying degrees of volatility's wherein the feed gas stream is counter-currently contacted in an absorber column with a lean solvent stream comprised of the heaviest components present in the feed gas stream to produce an overhead stream having lighter undesired components, the improvement comprising pre-saturating the lean solvent with the lighter undesired components of the feed gas stream obtained from the overhead stream of the absorber column.

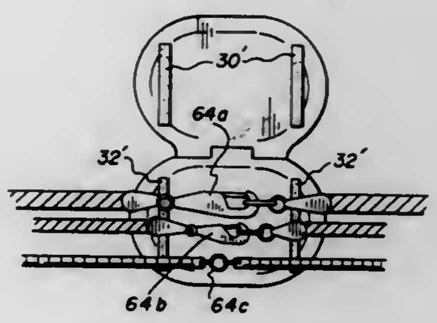
5,687,585
NECKLACE CHAIN SEPARATION DEVICE AND A MULTIPLE STRAND NECKLACE UNIT

Kathryn L. Ferrell, HC 66, Box 19, Big Springs, W. Va. 26137

Filed Feb. 9, 1996, Ser. No. 599,006

Int. Cl.^{6} A44C *15/00*

U.S. Cl. 63—21 **5 Claims**



1. A necklace strand separation device for maintaining the separation of portions of a plurality of necklace strands comprising: (a) a shell having (i) an internal chamber with a rearward edge and a forward edge, (ii) spaced apart openings, (b) a pair of engagement members attached to said shell within said chamber and extended from said rearward edge to adjacent said forward edge for engaging said portions of necklace strands, said members being in mutual engagement when the shell is in its closed position, said members being polymeric foam pads.

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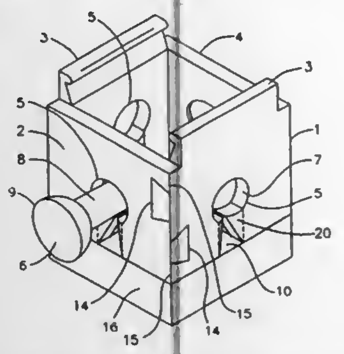
5,687,586
INTERCONNECTABLE JEWELRY SETTING FOR THE CONSTRUCTION OF JEWELRY PIECES

Sam Facini, 613 Knollwood Rd., Franklin Lakes, N.J. 07417
Filed Jul. 1, 1996, Ser. No. 674,101
Int. Cl.^{6} A44C *17/02*
U.S. Cl. 63—26 **20 Claims**



1. A jewelry setting which is interconnectable with other jewelry settings to form a jewelry piece without the need for soldering or welding, comprising;

a frame for mounting a gemstone, formed from a stamped, sheet metal piece having two ends which are joined together, said frame comprising an upper collar portion, a bottom portion and at least one side;

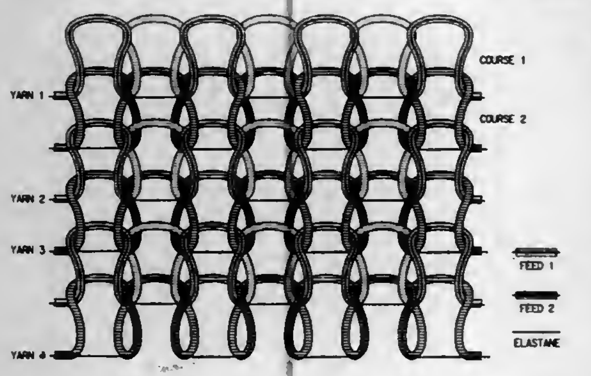
a ball link joint inserted into the side of the frame, comprising a shaft and two ball ends, for connecting two contiguous jewelry settings by inserting one of the ball ends into the side of each of the two contiguous jewelry setting frames;

a key-lock clip opening located in the side of the frame for receiving the shaft of the ball-link joint and retaining the ball end of the ball-link joint; and

a cover in the shape of the frame, attached to the bottom portion of the frame to provide additional structural support to the frame.

5,687,587
ELASTIC DOUBLE-KNIT FABRIC

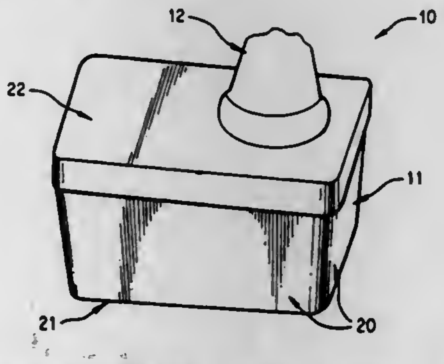
Gerard Henri Ferdinand Michel, Meyrin, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
PCT No. PCT/US94/03992, § 371 Date Nov. 28, 1995, § 102(e) Date Nov. 28, 1995, PCT Pub. No. WO94/24352, PCT Pub. Date Oct. 27, 1994
PCT Filed Apr. 12, 1994, Ser. No. 530,129
Claims priority, application Germany, Apr. 17, 1993, 9305795 U
Int. Cl.^{6} D04B *7/04*
U.S. Cl. 66—196 **12 Claims**



1. Process for manufacturing a double-knit fabric from elastic yarns (1) and (3) and hard yarns (2) and (4) by plating one elastic yarn (1) with a hard yarn or filament (2) on the dial at a first feed (1), characterized in that two independent elastic yarns (1) and (3) are plaited with independent hard yarns or filaments (2) and (4), and that the second elastic yarn (3) is plaited with a second hard yarn or filament (4) on the cylinder at a second feed (2).

5,687,588
PACKAGE ASSEMBLY FOR GRANULAR PRODUCT

Jean-Luc Azzani, Rome, Italy, and Henri Cornette, Pontoise, France, assignors to The Procter & Gamble Company, Cincinnati, Ohio
PCT No. PCT/US94/11760, § 371 Date Sep. 11, 1996, § 102(e) Date Sep. 11, 1996, PCT Pub. No. WO95/11330, PCT Pub. Date Apr. 27, 1995
PCT Filed Oct. 14, 1994, Ser. No. 628,728
Claims priority, application European Pat. Off., Oct. 18, 1993, 93870203; Dec. 14, 1993, 93203509
Int. Cl.^{6} D06F *39/02*
U.S. Cl. 68—17 R **2 Claims**

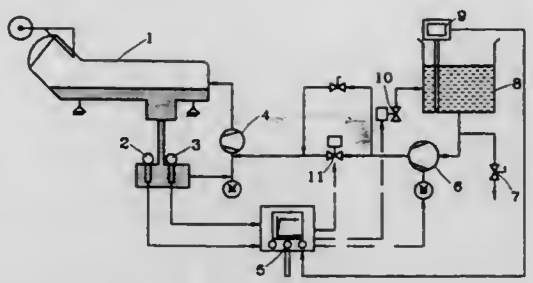


1. A package assembly (10) containing a granular product, said package assembly comprising a reclosable container (11) of thermoplastic material having an internal volume and an external surface; a device (12) for dispensing said granular product; and a means for the releasable attachment of said dispensing device to said external surface of said container, wherein the internal volume of said container is not in direct communication with said releasably attached dispensing device when said container is closed, said dispensing device having a body (13), said body having at least one opening (14) allowing for a quantity of granular product required for one washing cycle of an automatic washing machine to be admitted to said body and to release said granular product from said body directly into a drum of an automatic washing machine during said washing cycle, said means for releasably attaching said dispensing device being at least one projection on said external surface of said container which engages said opening of said dispensing device, said reclosable container having a side wall (20), a bottom surface (21), and a top surface (22) defining said internal volume, and wherein at least a part of said top surface is a removable lid (126) allowing access to said granular product in said container, said removable lid being connected to said reclosable container by means of a hinge device (123), said hinge device being located adjacent to, and parallel with, a part of said side wall.

5,687,589
BATCH DYEING SYSTEM WITH AUTOMATIC CHEMICAL-DOSING AND PH CONTROL SYSTEM

Shin-Chuan Yao; Jongfu Wu; Feng Biau Lin; Li-Ren Wang; Wei-Chin Wu; Yu-Cheng Wang, and Judson Lee, all of Tu Cheng, Taiwan, assignors to China Textile Institute, Taipei, Taiwan
Filed Mar. 7, 1996, Ser. No. 611,512
Int. Cl.^{6} D06B *23/00*
U.S. Cl. 68—12.07 **9 Claims**

1. An immersion dye system with automatic chemical input and pH value control, comprising:



a dye machine containing a dye liquor,

a pH gauge measuring pH value of the dye liquor,

a thermometer measuring a temperature of the dye liquor,

a chemical tank containing a dye chemical, the chemical tank being in controllable fluid communication with the dye machine,

a continuous action depth gauge being installed in the chemical tank and measuring level of the dye chemical therein,

supplying means providing said fluid communication and conducting the dye chemical from the chemical tank to the dye machine, and

a controller receiving measurements from said pH gauge, thermometer and depth gauge and having pH value control and volume control modes of operation, desired pH values and dye chemical input parameters being input in the controller during the pH value control mode of operation and the volume control mode of operation, respectively;

said supplying means further including:

a chemical input pump connected to an output of the chemical tank.

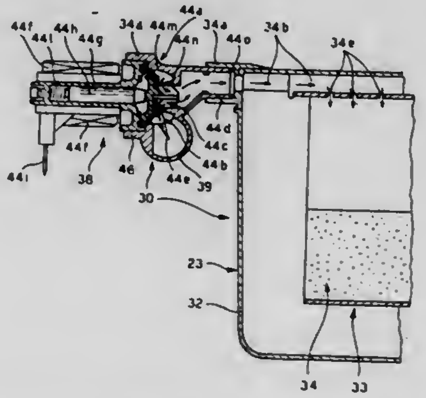
a mixing valve connected to an output of the chemical tank and mixing the dye liquid flowing from the chemical tank, and

a chemical input valve positioned between the chemical input pump and the dye machine;

said controller controlling operation of said chemical input pump, mixing valve and chemical input valve according to said desired pH values and dye chemical input parameters and in response to said measurements received from the pH gauge, thermometer, and depth gauge.

5,687,590
DISTRIBUTION VALVE-MIXING DRAWER ASSEMBLY FOR THE SELECTIVE SUPPLY OF DETERGENTS OR OTHER SUBSTANCES TO THE WASHING DRUM OF A WASHING MACHINE OR THE LIKE

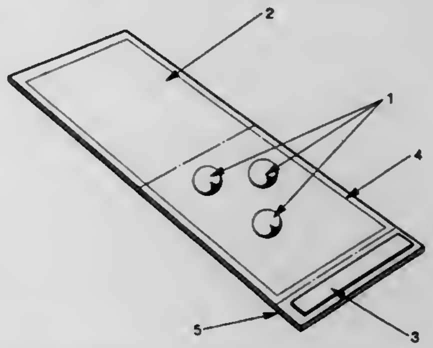
Giuseppe Borroni, and Stefano Francalanci, both of Varese, Italy, assignors to Tecnoplastica Prealpina S.p.A., Tradate, Italy
Filed Nov. 24, 1995, Ser. No. 562,627
Int. Cl.^{6} D06F *39/02*
U.S. Cl. 68—17 R **32 Claims**



1. An assembly for the selective supply of detergents to the washing drum of a washing machine, comprising a drawer (23) for holding detergents having a fixed body (32) and a mobile portion (33) provided with at least a first and a second compartment (34, 35) for containing a respective detergent, said fixed body (32) having at least a first and a second inlet member (34*a*, 35*a*) for a flow of liquid for removing the detergent from a respective compartment (34, 35) which is then discharged enriched with detergent into the washing drum of the washing machine, and a valve device (38) comprising a collector pipe (39) for collecting the flow of liquid for removing the detergent and at least a first and a second valve element (44, 45) each having a respective bowl (44*a*, 45*a*) leading into said collector pipe (39) and a respective outlet member (44*d*, 45*d*) for emission of a respective flow of liquid towards a corresponding inlet member (34*a*, 35*a*) of the detergent drawer (23); wherein each of said outlet members (44*d*, 45*d*) of each valve elements (44, 45) is coupled directly and hermetically to the respective inlet member (34*a*, 35*a*) of the respective compartment (34, 35) of the drawer (23), and wherein are provided means (54, 55, 56) for attaching said valve device (38) directly to the fixed body (32) of said drawer (23) for the detergents.

5,687,591
SPHERICAL OR POLYHEDRAL DRY CLEANING ARTICLES

Michael Peter Siklosi, and Thomas Allen DesMarais, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 493,199, Jun. 20, 1995, abandoned. This application Oct. 17, 1995, Ser. No. 543,970
Int. Cl.^{6} D06F *39/02*
U.S. Cl. 68—212 **7 Claims**



1. A fabric cleaning article comprising a substantially spherical, or polyhedral, compressible absorbent substrate carrying a cleaning composition comprising an organic solvent, a polyacrylate emulsifier, water, 1-2 octanediol and optional surfactants removable to fabrics by contact therewith.

5,687,592
MECHANICAL LOCK FOR A REMOVABLE HARD DISK DRIVE AND A REMOVABLE MEMORY CARD

Mark B. Penniman, and John Busch, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.
Filed Jul. 23, 1993, Ser. No. 96,318
Int. Cl.^{6} E05B *73/00*
U.S. Cl. 70—14 **11 Claims**

1. A portable computer and lock combination, comprising:

a portable computer comprising a chassis having a hard disk drive compartment and a door for opening and closing said hard disk drive compartment and at least one card receiving slot; and

a lock comprising a lock body and locking means disposed at one end of said lock body and a flange disposed about said lock body;

said lock being lockingly engageable by said locking means with an opening in said chassis such that when said lock is so

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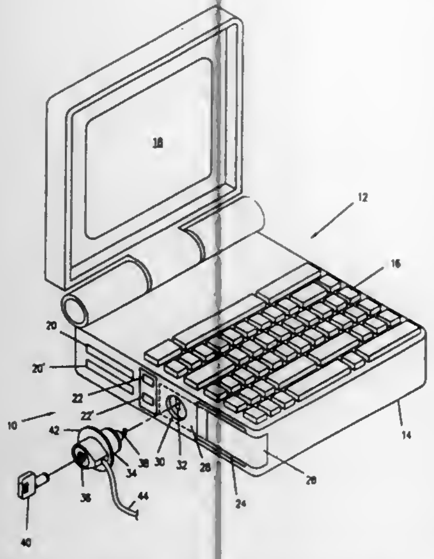


engaged said flange prevents cards from being removed from said at least one card receiving slot; and said flange further prevents said door from being opened such that said door is maintained in a closed position.

said lock thereby simultaneously securing both said at least one card receiving slot and said disk drive compartment of said computer from unauthorized access thereto.

5,687,593
HANDCUFFS

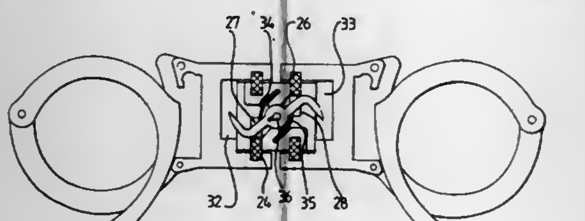
Geoffrey William Cross, Pedmore, England, assignor to Hiatt and Company Limited, United Kingdom

Filed Jul. 12, 1995, Ser. No. 501,585

Claims priority, application United Kingdom, Jun. 1, 1995, 9511068

Int. Cl.^{6} E05B ***75/00***

U.S. Cl. 70—16 **6 Claims**



1. A handcuff comprising:

a pair of lockable bracelet members;

a connecting member;

two pivot means providing pivotal connection of the pair of bracelet members to the connecting member about respective pivot axes, said bracelet members being movable relative to one another between an extended position for use and a folded position in which the bracelet members overlie one another;

a catch member having formations engageable with the pair of bracelet members for retaining the bracelet members in said extended position relative to the connecting member; and

means movably mounting the catch member in the connecting member.

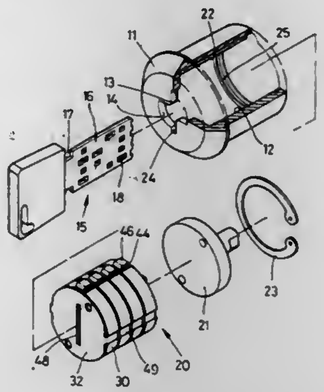
5,687,594
LOCK AND KEY COMBINATION WITH CHANGEABLE COMBINATION OF LOCKING PIECES

Teng-Kuo Wang, P.O. Box 96-405, Taipei 10098, Taiwan

Filed Jan. 18, 1996, Ser. No. 588,505

Int. Cl.^{6} E05B ***27/00***

U.S. Cl. 70—495 **8 Claims**



1. A lock and key combination comprised of a casing, a lock cylinder mounted within said casing, and a key for turning said lock cylinder between a locking position and an unlocking position, said lock cylinder comprised of a plurality of locking pieces connected in a stack and retained in a line in a locating groove inside said casing and fastened with a driving element by a clamp, said key comprising a key blade having a plurality of key blade slots, wherein each locking piece comprises:

a base having a short cylindrical configuration having a front recess, a keyway in a middle of said front recess, a plurality of retainer element receiving chambers and spring receiving chambers perpendicularly connected to the keyway of said base at two opposite sides within said front recess, a top recess on a periphery in communication with said front recess, two opposite side notches on a periphery at two opposite sides, and two opposite retaining holes at a back side thereof respectively connected to said side notches;

a first spring element mounted within the top recess of said base;

an actuating plate mounted within the front recess of said base, having a projecting locating plate at a top side thereof perpendicularly inserted into the top recess of said base and forced outwards by said first spring element, an elongated slot in a middle in alignment with the keyway of said base for the passing of said key, and a plurality of inverted T-shaped control slots disposed at two opposite sides adjacent the elongated slot of said actuating plate, a thickness of said actuating plate being thinner than a depth of the front recess of said base;

a plurality of retainer elements respectively mounted in said retainer element receiving chambers and said spring receiving chambers, each retainer element comprising a flat tail received in one retainer element receiving chamber, a flat guide plane perpendicularly extending from one end of said flat tail to guide the movement of the respective retainer element in a fixed course, an arched front contact tip extending forwards from said flat guide plane and partially projecting into the keyway of said base, and a lug at one side of said flat guide plane inserted into one control slot of said actuating plate;

a plurality of second spring elements respectively mounted within said spring receiving chambers and stopped against the flat tails of said retainer elements to force said retainer elements toward the keyway of said base; and

a cover covered on said base to hold said actuating plate inside the front recess of said base, said cover comprising an elongated slot in a middle in alignment with the elongated slot of said actuating plate and the keyway of said base for the insertion of said key, two backward hooks respectively forced into the side notches of said base and hooked in the retaining holes of said base.

5,687,595
METHOD OF AND APPARATUS FOR CORRECTING CURVATURE OF ROLLED METAL STRIP

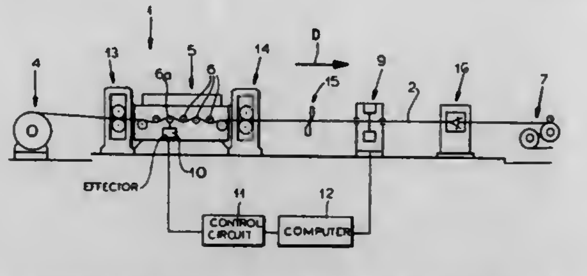
Oskar Noe; Rolf Noe, and Andreas Noe, all of Mülheim, Germany, assignors to BWG Bergwerk- und Walzwerk-Maschinenban GmbH, Duisburg, Germany

Filed Jan. 24, 1996, Ser. No. 592,720

Claims priority, application Germany, Jun. 3, 1995, 195 20 541.3

Int. Cl.^{6} B21D ***1/06***

U.S. Cl. 72—8.3 **9 Claims**



1. A method of correcting curvature of rolled metal strip in a strip plane resulting in deviation of longitudinal edges of the strip from linearity, said method comprising the steps of:

(a) passing a rolled metal strip of a strip thickness of 0.5 mm to 2 mm through a stretch-bend leveler having a plurality of rollers alternately engaging said metal strip from opposite sides thereof;

(b) downstream of said stretch-bend leveler continuously measuring a shape of said longitudinal edges to detect a deviation corresponding to horizontal curving of the strip in the strip plane defined by a shorter edge and an opposed longer edge; and

(c) pivoting at least one of said rollers in at least one plane thereof selected from a horizontal plane and a vertical plane in response to said deviation and in relation to said deviation so as to selectively lengthen the shorter edge of said strip to correct said horizontal curving and straighten said strip with coarse correction initially by a pivotal displacement of one of said rollers in said vertical plane and subsequent fine correction by pivotal displacement of one of said rollers in said horizontal plane.

5,687,596
CALENDERING ALUMINUM PROFILES FOR PRODUCING SPACER FRAMES FOR INSULATING GLAZING UNITS

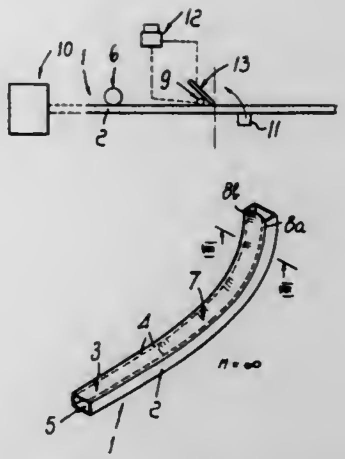
Fortunato Vianello, Vallio di Roncade, and Dino Moschini, San Cipriano, both of Italy, assignors to FOR.EL. BASE di Vianello Fortunato & C. S.n.c., Vallio di Roncade, Italy

Filed Oct. 26, 1995, Ser. No. 548,940

Claims priority, application Italy, Oct. 31, 1994, TV94A0127

Int. Cl.^{6} B21D ***7/028;7/12***

U.S. Cl. 72—14.8 **14 Claims**



1. In combination a bending machine for bending profiles for insulating glazing unit spacer frames, the profiles having a perforated surface on which minute holes are formed and perimetric edges between which said perforated surface extends, the machine including:

feeding means for feeding a profile along a working flow path at an automatically controllable pitch increment;

a bending station;

a rotation arm;

and a calendering device, said rotation arm cooperating with said bending station and said calendering device for imparting to the profile a desired bending angle,

and said calendering device comprising:

a curving means for producing a preliminary cross deformation of said perforated surface so as to obtain between said perimetric edges an inside curve; and

an automatically controlled microbending station for forming on said profile, in cooperation with said rotation arm a number n of minute bends in which an increment of a bending angle α tends to zero and an increment in a bend pitch p tends to zero, said microbending station being located along said working flow path, downstream of said curving means, and immediately upstream of said bending station;

and wherein said bending station comprises punching means for acting on said profile, during operation of said microbending station, at said perimetral edges for preventing undulation thereof.

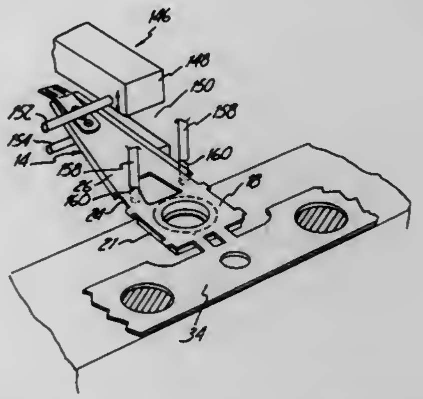
5,687,597
GRAM LOAD ADJUSTING SYSTEM FOR MAGNETIC HEAD SUSPENSIONS

Mark T. Girard, Hutchinson, Minn., assignor to Hutchinson Technology Incorporated, Hutchinson, Minn.

Filed May 31, 1996, Ser. No. 656,639

Int. Cl.^{6} B21D ***7/12***

U.S. Cl. 72—21.4 **35 Claims**



1. A head suspension adjusting system for adjusting a parameter of a suspension of the type having a load beam with a spring region, a mounting region on a proximal end of the load beam and a head-receiving region on a distal end of the load beam, the system including:

a load beam-engaging member for engaging the load beam and supporting the head-receiving region of the load beam at adjust positions with respect to the mounting region;

an actuator for driving and positioning the load beam-engaging member;

a heat source for applying heat to at least the spring region of the load beam;

a pre-adjust input terminal for receiving information representative of a measured pre-adjust parameter value of the suspension;

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memory for storing parameter adjust data representative of suspension parameter value changes as a function of load beam adjust positions; and

a controller coupled to the pre-adjust input terminal, actuator, heat source and memory, for actuating the actuator as a function of the measured pre-adjust parameter value and the parameter adjust data, and for actuating the heat source, to adjust the parameter of the suspension to a desired parameter value.

5,687,598
PRESS HAVING CUSHIONING CYLINDERS EACH HAVING TWO CHAMBERS WHOSE PRESSURE DIFFERENCE IS ADJUSTABLE TO CONTROL BLANK-HOLDING FORCE

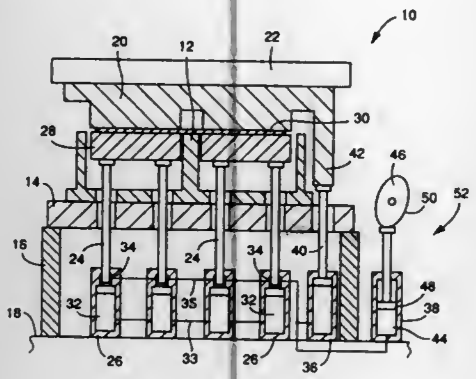
Kazunari Kirii, Aichi-ken, and Norihisa Hirao, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 7, 1995, Ser. No. 466,772

Claims priority, application Japan, Jul. 15, 1994, 6-163906

Int. Cl.^{6} B21D *24/08*

U.S. Cl. 72—21.5 **9 Claims**



1. A press having a vertically reciprocable die, a stationary punch disposed below said die, and a pressure member disposed adjacent said punch such that said pressure member is vertically movable relative to said punch, said die and said punch cooperating with each other to perform a pressing operation on a blank placed on said pressure member as said die is lowered relative to said punch while said blank is held by and between said die and said pressure member, said press further comprising:

a plurality of cushion pins having upper ends to support said pressure member;

a plurality of cushioning cylinders associated with lower ends of said cushion pins and having pistons movable over a distance larger than an operating stroke of said pressure member during said pressing operation, each of said cushioning cylinders having a first pressure chamber and a second pressure chamber, both said first and second pressure chambers being isolated from atmospheric pressure, volumes of said first and second pressure chambers decreasing and increasing, respectively, as said cushion pins are lowered, said first and second pressure chambers containing fluid under respective first and second fluid pressures, said cushioning cylinders generating a blank-holding force which varies with a difference between said first and second fluid pressures, said blank-holding force being transmitted to said pressure member through said cushion pins to hold said blank; and

pressure adjusting means for controlling at least one of said first and second fluid pressures to control said difference between said first and second fluid pressures for regulating said blank-holding force according to a predetermined optimum pattern of change of said blank-holding force as said pressure member is lowered during said pressing operation.

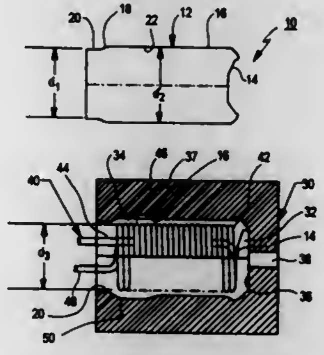
5,687,599
METHOD OF FORMING A CAN WITH AN ELECTROMAGNETICALLY FORMED CONTOURED SIDEWALL AND NECKED END

Roger H. Donaldson, Lancaster County; Horst F. Arfert, Chesterfield County; Daniel F. Cudzik, Chesterfield County, and Robert P. Foetisch, Chesterfield County, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jan. 4, 1996, Ser. No. 582,714

Int. Cl.^{6} B21D *26/14;19/12*

U.S. Cl. 72—62 **24 Claims**



1. A method of manufacturing a metal container including a body having a bottom wall with a cylindrical sidewall extending therefrom and having an open end, the method comprising the steps of:

pre-necking the open end of the sidewall to form a reduced diameter section;

electromagnetic forming of the sidewall after the pre-necking to form an outwardly expanding contoured sidewall; and

performing necking proximate the reduced diameter section to achieve a further reduced diameter conical necked end by radially inwardly advancing an external forming member into contact with the sidewall against counterpressure provided by a pair of relatively axially displaceable inner members disposed within the can interior.

5,687,600
METAL SPUTTERING TARGET ASSEMBLY

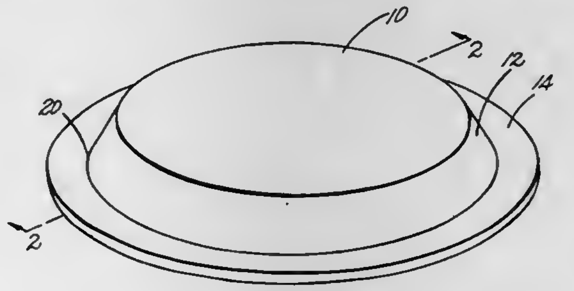
Roger Alan Emigh, Post Falls, Id., and William Bryce Willett, Veradale, Wash., assignors to Johnson Matthey Electronics, Inc., Spokane, Wash.

Continuation of Ser. No. 329,231, Oct. 26, 1994, abandoned.

This application Aug. 1, 1996, Ser. No. 690,988

Int. Cl.^{6} B21D *22/16*

U.S. Cl. 72—69 **16 Claims**



1. A method of making a metal sputtering target assembly comprising a sputtering target having a top which includes a target surface, having substantially the same microstructure as the metal from which the target surface is made, and an extension, comprising:

providing a metal blank;

clamping the metal blank between a rotatable spindle and a die;

rotating the metal blank and the die; and

deforming the metal blank by progressively applying pressure to a discrete area of the blank while rotating and continuing to apply pressure at differing radials of the blank to form the extension and the flange without causing disruption of the microstructure of the metal at the target surface, whereby the microstructure of the target surface is substantially the same as the microstructure of the metal blank from which it is made.

5,687,601
GROUP FOR CLAMPING AND DRAGGING A PIPE OR ROD FOR PIPE BENDERS WITH OR WITHOUT AN INNER MANDREL AND ROD BENDERS, AND MACHINES FOR CLAMPING MECHANICAL PARTS IN GENERAL

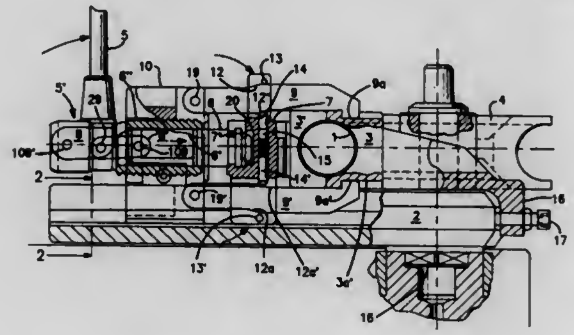
Alessandro Caporusso, and Mario Caporusso, both of Piedimonte S. Germano, Italy, assignors to C.M.L. Costruzioni Meccaniche Liri S.R.L., Piedimonte San Germano, Italy

Filed May 3, 1996, Ser. No. 642,260

Claims priority, application Italy, May 12, 1995, RM95A0310

Int. Cl.^{6} B21D *7/04;9/05*

U.S. Cl. 72—149 **3 Claims**



1. A vise for clamping a pipe or rod or section bar or other mechanical part,

comprising a jaw (**3**) and a relatively movable counterjaw (**3'**),

a support (**10**) housing a piston (**6**) to which said counterjaw (**3'**) is rendered integral through a cart (**7**);

pliers with two catches (**9**, **9'**) hinged upon said support (**10**) to rotate vertically and endowed with hooks (**9*a***, **9*a'***) for engaging two corresponding cavities (**3*a***, **3*a'***) provided on respectively upper and lower surfaces of said jaw, said catches having their profile with an inner and outer raising (**12**, **12*a***; **12'**, **12*a'***) exteriorly of a working field of the pliers themselves, said cart having two pegs (**13**, **13'**) respectively fit for engaging each one of said outer raisings to cause the closing of the catches by way of advancement of said cart in a forward direction against said outer raisings themselves, an opening of the catches being caused by backward motion of said cart and by contact of an outer profile of the counterjaw (**3'**) itself against the inner raising (**12'**, **12*a'***) of the catches.

5,687,602
CONDUCTOR FOR A FLAT CABLE, AND MANUFACTURING METHOD AND EQUIPMENT THEREFOR

Haruo Saen; Ryuzo Suzuki, both of Tochigi; Hiroshi Fujii, and Atsushi Iizuka, both of Gunma, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

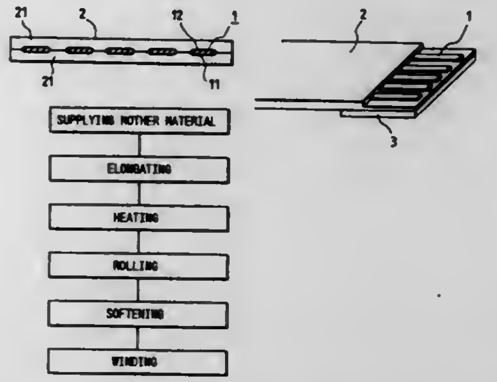
Division of Ser. No. 228,394, Apr. 15, 1994, Pat. No. 5,481,894.

This application Dec. 14, 1994, Ser. No. 355,686

Claims priority, application Japan, Apr. 16, 1993, 5-089766; Aug. 2, 1993, 5-210859; Feb. 21, 1994, 6-47873

Int. Cl.^{6} B21B *27/06*

U.S. Cl. 72—202 **4 Claims**



1. Equipment for manufacturing a conductor for a flat cable, comprising:

elongating means for receiving a conductive material of a determined size having an elongation ratio of at least 10% which has been plated with tin or tin alloy plating with a substantially uniform thickness over an entire periphery thereof and elongating said conductive material of determined size to form an elongated material;

heating means for heating said elongated material to form a heated material;

rolling means for rolling said heated material to form a flat conductor; and

softening means for softening the flat conductor;

wherein said heating means is disposed to interpose between said elongating means and said rolling means, and the elongation, heating and rolling means are arranged so as to be executed successively.

5,687,603
STRIP SIDE-GUIDES

Vincent Van Coppenolle, Eeklo, Belgium, assignor to Sidmar, N.V., Gent, Belgium

Filed Dec. 5, 1995, Ser. No. 567,309

Claims priority, application European Pat. Off., Dec. 6, 1994, 94870191

Int. Cl.^{6} B21B *39/20;* **B21D** *43/16*

U.S. Cl. 72—250 **2 Claims**

1. Side guides intended for rolling mills in the metallurgical industry, in which a strip is conveyed onto a series of rollers wherein said side-guides are divided in a succession of segments which are placed in an alternation of first and second segments;

said first segments of a substantially rectangular shape and having a width allowing insertion between two successive rollers

said second segments intended to be placed above a corresponding roller, said second segments each having a lower end of substantially semicircular shape,

said first segments between rollers being slightly offset compared to a vertical plane formed by the second segments above the rollers;

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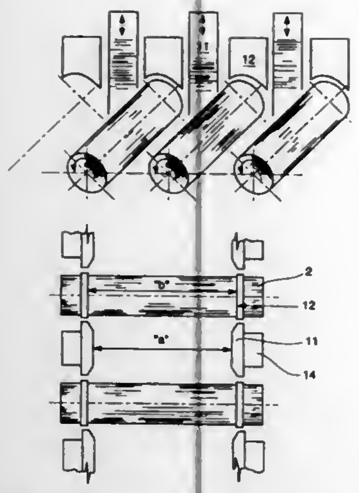


wherein spacing between two opposite first segments placed between the rollers is smaller than spacing between two opposite second segments placed above the rollers.

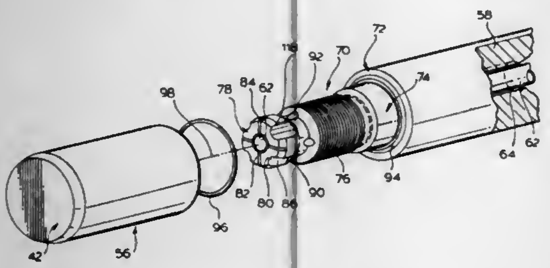
5,687,604

THERMAL CONTROLLED MANDREL WITH REPLACEABLE TIP FOR COPPER AND BRASS EXTRUSION

Paul H. Robbins, Aurora, Canada, assignor to Exco Technologies Ltd., Markham, Canada

Filed May 30, 1996, Ser. No. 652,685
Int. Cl.^{6} B21C *23/20*

U.S. Cl. 72—265 **22 Claims**



1. In a tube extrusion apparatus for extruding a tube of metal having an extrusion temperature above the annealing temperature of H13 tool steel, such as brass and copper and the like, said extrusion apparatus comprising:

i) an extrusion container for a billet of such metal to be extruded;
ii) an extrusion die at an extruding end of said container
iii) an extrusion ram for entering an open end of said container opposite said extrusion die;
iv) said extrusion ram having a piercing mandrel located centrally of said ram and co-axial therewith; said ram when positioned in said container providing alignment of said piercing mandrel with said die such that when said piercing mandrel is extended from said ram to pierce a billet of metal in said container, said piercing mandrel travels through said die to define an annulus through which a tube of metal at its extruding temperature is extruded;
v) said piercing mandrel having a stem portion with a leading tip, said tip having a cooling channel, cooling fluid being supplied to said cooling channel in said tip and removed therefrom by a cooling fluid supply tube in said stem portion of said mandrel;
vi) a replaceable tip for said piercing mandrel, said tip having an axially extending bore with a blind end which defines a working leading face for said tip, said tip bore having an internal female thread for threadably engaging an external male threaded component of said stem portion to complete mounting of said tip on said stem;
vii) a modified shape for said bore of said tip and a complementary modified shape for said stem component to which said tip is threaded, said stem component having a reduced portion of a length corresponding in length with said bore depth, said reduced portion having an innermost annular shoulder, a proximate male threaded portion, and a distal end, said tip having at said bore entrance an annular ledge for engaging said shoulder, an adjacent female threaded portion for engaging said male threaded portion,

the improvement being characterized in improved cooling for said tip and comprises:

viii) said distal end of said stem component reduced portion defining a stop where said blind end of said tip bore contacts said stop, said stop having a planar face and said distal end having a corresponding mating planar face for sealing engagement and transfer of thrust forces from said tip to said stem reduced portion;
ix) a cooling channel system comprising a disperser provided in said mating faces of said tip blind end and said stem distal end for dispersing cooling fluid outwardly of said mating faces as such cooling fluid flows out of said stem distal end from said cooling fluid supply tube, said cooling channel system further comprising an annular channel at the perimeter of said mating faces in communication with said disperser to direct radially flowing cooling fluid annularly of the perimeter of said mating faces;
x) said cooling channel system further comprising about the perimeter of said stem reduced portion a plurality of equidistant longitudinally directed channels which are in communication with said annular channel, cooling fluid flowing from said annular channel longitudinally of said tip along said longitudinal channels;
xi) said stem component reduced portion having a cooling fluid outlet device for collecting cooling fluid from said longitudinal channels and directing spent cooling fluid outwardly and along said stem.

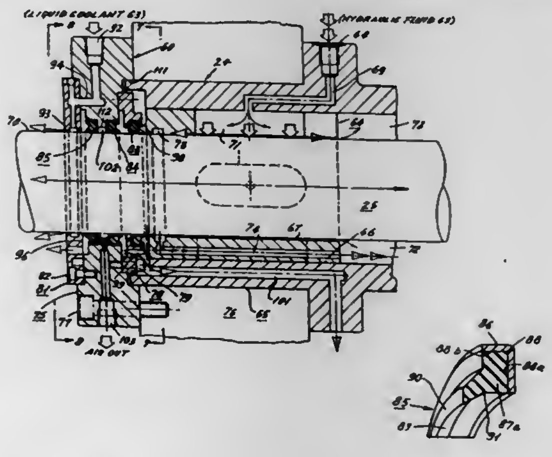
5,687,605

WIPING UNIT FOR RAM OF BODYMAKER

Ralph Main, San Pedro, Calif., assignor to Sequa Corporation, Hackensack, N.J.

Continuation of Ser. No. 295,232, Aug. 23, 1994, abandoned. This application Jul. 2, 1996, Ser. No. 674,288
Int. Cl.^{6} B21D *22/00;22/21*

U.S. Cl. 72—347 **18 Claims**



1. A bodymaker for transforming metal cups into elongated can bodies, said bodymaker comprising:

an elongated ram having a front end and a cylindrical outer surface, and a tool on said ram at said front end;
a hydrostatic bearing surrounding said ram and including:
pressurized hydraulic fluid supporting said ram for horizontal longitudinal reciprocating movement, said hydraulic fluid being applied at high pressure to said cylindrical outer surface of said ram;
a groove disposed annularly and on a forward end of said bearing for relieving the high pressure of said hydraulic fluid at the forward end of said bearing; and
a still disposed annularly, in close proximity to said cylindrical outer surface, and in front of said groove, for limiting a thickness of hydraulic fluid left on said cylindrical outer surface after said hydraulic fluid passes through said groove and said sill;
drive means operatively engaged with said ram to impart said reciprocating movement to said ram to move said ram forward in a working stroke followed by rearward movement of said ram in a return stroke;
a die set forward of said bearing for transforming said cups into said can bodies as said cups are driven one by one through said die set by said tool as said ram operates through said working stroke;
a liquid coolant which impinges upon said outer surface at a location on said ram disposed in front of said bearing;
first and second ring wipers having aligned respective first and second apertures through which said ram extends;
said first and second ring wipers being self-biased into engagement with the cylindrical outer surface, and including respective flexible annular first and second flaps that define the respective first and second apertures;
said first and second flaps having respective radially inward first and second free edges that are biased radially inward into low pressure engagement with said outer surface;
said first flap being forward of said second flap and both of said flaps being in front of said bearing;
said first flap being inclined rearward and radially outward from said first free edge to shear liquid coolant that is forward of said first flap from said outer surface is a forward direction as said ram moves rearward;
said second flap being inclined forward and radially outward from said second free edge to shear hydraulic fluid that is rearward of said second flap from said outer surface in a rearward direction as said ram moves forward.

5,687,606

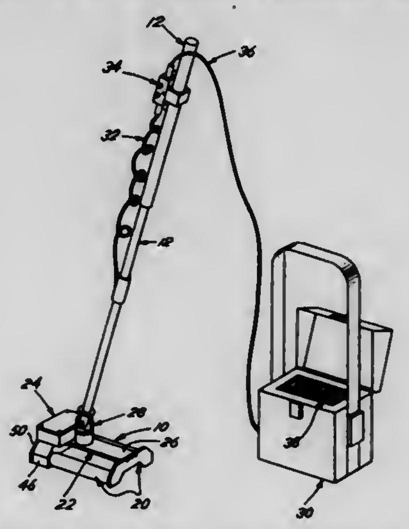
MOISTURE DETECTOR

Sean Kevin Reilly, Antioch, Calif., assignor to Boart Longyear Company, Martinez, Calif.

Filed Jan. 4, 1996, Ser. No. 582,697
Int. Cl.^{6} G01M *3/04;* G01T *5/10;* G01N *22/04*

U.S. Cl. 73—73 **22 Claims**

22. A method of detecting moisture in a length of insulated pipe



comprising the steps of holding a detector assembly against insulated pipe to be tested through use of a pole, said detector assembly being mounted on an end of said pole by a swivel assembly which permits pivoting about two different axes, said detector assembly being of the type which measures hydrogen based on the principle of neutron back scatter and including a pair of thermal neutron detectors, conducting signals through electrical means from said detector assembly to a readout assembly which is carried by an operator separately and is not mounted on said pole, and said detector assembly including a generally C-shaped surface or arcuate contoured surface which is held against insulated pipe to be tested.

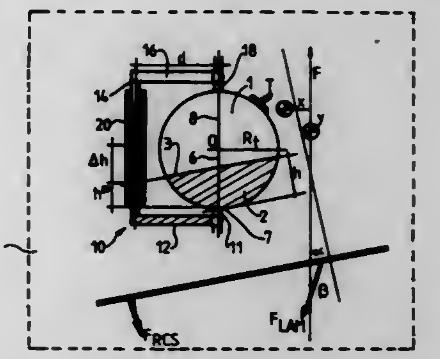
5,687,607

METHOD OF MEASURING THE QUANTITY OF FUEL IN A TANK OF A SPACE VEHICLE SUCH AS A SATELLITE

Rolf Brandt, Oegstgeest, and Bernhard Hufenbach, Amsterdam, both of Netherlands, assignors to Agence Spatiale Europeenne, Paris Cedex, France

Filed Jun. 7, 1996, Ser. No. 659,804
Claims priority, application France, Jun. 8, 1995, 95 06760
Int. Cl.^{6} G01F *23/00*

U.S. Cl. 73—290 R **16 Claims**



1. A method of measuring the quantity of fuel in a tank of a space vehicle, the method including a step of measuring the level of fuel in the tank during at least one acceleration stage of the space vehicle and wherein the fuel level is measured by detecting the level of fuel in a tube having a first end in communication with a first region of the tank constituting a bottom of the tank relative to an acceleration direction, and having a second end in communication with a second region of the tank spaced apart from the first region.

5,687,608

CONNECTOR FOR CONCENTRIC TUBES ATTACHED TO A FUEL GAUGE

Howard Richard Shaffer, Millersburg; William Jesse Rudy, Jr., Annville, and Daniel Eugene Stahl, Hummelstown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 24, 1995, Ser. No. 410,191
Int. Cl.^{6} G01F *23/26*

U.S. Cl. 73—304 C **13 Claims**

1. A connector for a fuel gauge in a fuel cell where the fuel gauge is of the type having an inner tube and a spaced-apart concentric outer tube, and a spacing formed between the walls of each tube, comprising:

a housing mountable to an outer surface of the outer tube and having conductive sections respectively electrically connectable to the outer and inner tubes and also connectable to the fuel gauge;
said housing includes a bore therethrough alignable with a corresponding opening through the wall of the outer tube, and an inner contact assembly mounted within said housing bore to extend beyond said housing and through said outer tube opening; and

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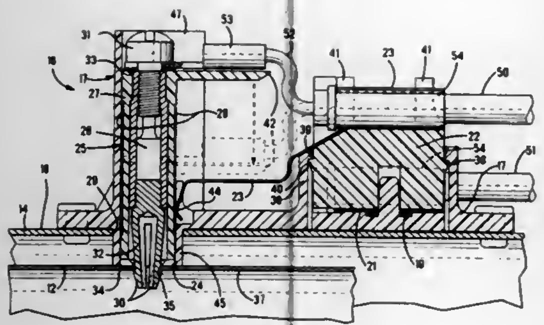
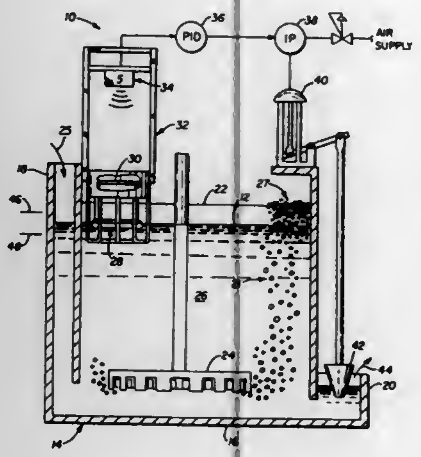


said inner contact assembly includes a first end and a second end, wherein said inner contact assembly is movable with respect to said housing for becoming electrically engaged with the wall of the inner tube wherein said second end would be exposed outwardly of the wall of the outer tube for being electrically connected to the fuel gauge, said inner contact assembly being the conductive section connectable to the inner tube.

5,687,609
METHOD AND APPARATUS FOR MINERAL FLOTATION CELL LEVEL DETECTION

Michael O. Schmalzel, Tucson, Ariz., assignor to Cyprus Amax Minerals Company, Englewood, Colo.
Filed Oct. 5, 1995, Ser. No. 539,344
Int. Cl.^{6} G01F ***23/00***
U.S. Cl. 73—322.5 **15 Claims**



1. A level detector for providing an indication of a level of a liquid, comprising:

a generally circular shaped float defining an open central aperture and having a mass, a volume, a design level of submergence, and a submergence function, wherein the design level of submergence is selected to be at about a point corresponding to a submergence level where a first derivative of the submergence function is a maximum;

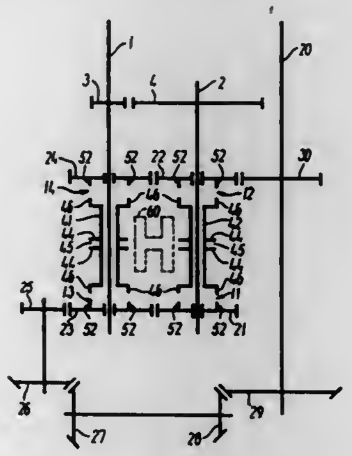
a reference member having a mass;

a support member connected to said float and to said reference member for holding said reference member above the liquid; and

reference member sensing means operatively associated with said reference member for sensing a position of said reference member and for generating an output signal related to the position of said reference member.

5,687,610
TOY GEARBOX AND A CLAW CLUTCH THEREFOR

Ole Vestergaard Poulsen, and Jan Hatting, both of Vejle, Denmark, assignors to Interlego AG, Baar, Switzerland
Division of Ser. No. 432,146, May 5, 1995. This application Jul. 10, 1996, Ser. No. 677,803
Claims priority, application Denmark, Sep. 22, 1993, 1071/93
Int. Cl.^{6} A63H ***31/08;*** **F16D** ***11/14***
U.S. Cl. 74—333 **3 Claims**



1. A toy gearbox comprising:

a primary driven shaft;

a driving shaft;

selectable gear wheel transmissions for transmission of rotational energy from the primary driven shaft to the driving shaft; and

an axially slidable driving means with claw clutches for selection of gear wheel transmission;

wherein the primary driven shaft drives a secondary driven shaft located in parallel with the primary driven shaft, the primary and the secondary driven shafts have respective driving means with respective guide grooves in positions opposite each other, and the gearbox has a gear shift means which is a single member having a first end for direct operation by a user and a second end which is partly slidable transversely to the direction of the driven shafts to directly engage the guide groove of the driving means of only one selected driven shaft, and partly axially slidable in the direction of the driven shafts to move the selected driving means axially, thereby engaging a selected claw clutch with associated gear wheel transmission.

5,687,611
PARKING BRAKE FOR USE WITH A POWER SHIFT TRANSMISSION

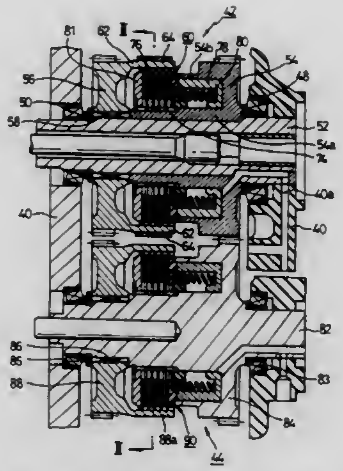
Sang Ho Sin, and Ki Sup Yoon, both of Incheon, Rep. of Korea, assignors to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea
Filed Dec. 28, 1995, Ser. No. 579,690
Claims priority, application Rep. of Korea, Dec. 29, 1994, 94-38863
Int. Cl.^{6} B60K ***41/26;*** **F16D** ***67/02***
U.S. Cl. 74—411.5 **6 Claims**

1. A power shift transmission with a parking brake, comprising:

a transmission housing;

an input assembly having an input shaft journalled on said transmission housing, an input gear fixed to the input shaft and an output gear rotatably fitted on the input shaft and selectively couplable to the input gear for unitary rotation therewith, said output gear having an array of teeth provided along an outer circumference thereof and a brake drum extending toward the input gear;

an idle assembly having an idle shaft journalled on said transmission housing in parallel with the input shaft of said input assembly, an input idle gear fixed to the idle shaft and remaining in meshing engagement with the input gear of said input assembly, and an output idle gear rotatably fitted on the idle shaft and selectively couplable to the input idle gear for unitary rotation therewith;



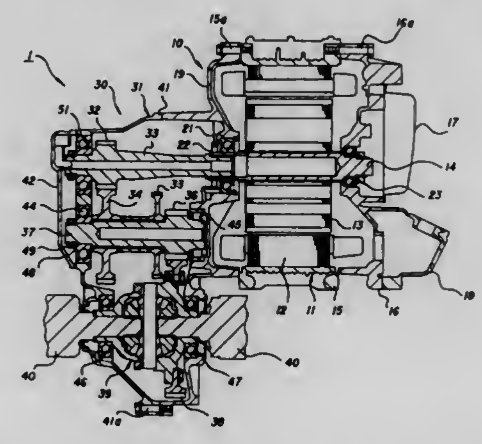
an output assembly having an output shaft in parallel with said input shaft and said idle shaft and a final driven gear fixed to the output shaft and remaining in meshing engagement with the output gear of said input assembly and the output idle gear of said idle assembly;

a brake band wound around the brake drum of the output gear of said input assembly in a side-to-side relationship with the teeth of said output gear; and

means for tightening said brake band to prevent rotation of the output gear of said input assembly and thereby the output shaft of said output assembly.

5,687,612
POWER TRANSMITTING APPARATUS FOR VEHICLE

Masahiro Imamura, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1996, Ser. No. 604,660
Claims priority, application Japan, Feb. 24, 1995, 7-036915
Int. Cl.^{6} B60K ***17/04***
U.S. Cl. 74—421 A **5 Claims**



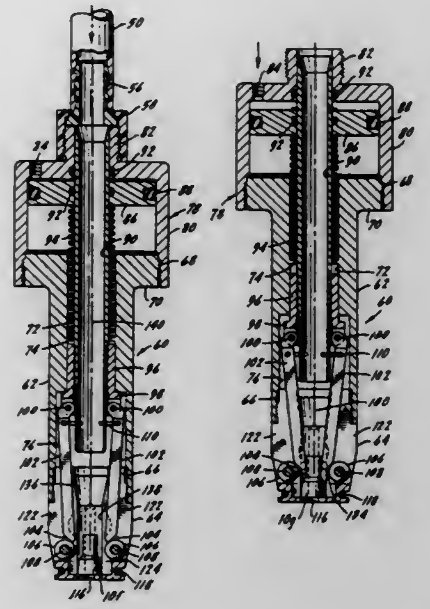
1. A power transmitting apparatus, for use in a vehicle, including a motor shaft of a vehicle-driving motor, an input shaft operatively connecting with the motor shaft, output shafts disposed in parallel with the input shaft and adapted to be connected with driven wheels of the vehicle, and a transmitting mechanism for transmitting driving power from the input shaft to the output shaft, said apparatus comprising:

a pair of motor shaft bearings supporting opposite end portions of said motor shaft, one of the end portions of said motor shaft being sole support for one of opposite end portions of said input shaft in such a manner that said motor shaft can transmit driving power from the vehicle driving motor to said input shaft; and

a bearing supporting the other end portion of said input shaft, a transmitting member of said transmitting mechanism being disposed adjacent to said other end portion of said input shaft remotely from a section where the one end portion of said input shaft is supported by the one end portion of said motor shaft.

5,687,613
CRIMP CONNECTOR APPLICATOR

Benjamin D. Swedberg, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.
Filed Feb. 13, 1996, Ser. No. 600,704
Int. Cl.^{6} H01R ***43/055***
U.S. Cl. 72—424 **9 Claims**



1. A crimp connector applicator, comprising:

a handgun having a body with a passageway through it, the passageway defining an axis and having an inlet at one end and an outlet at the other end, the cross-section and configuration of the passageway being such that a crimp connector can be propelled by a single pulse of air pressure into the inlet and through the passageway to the outlet;

a retainer pivotally attached to the handgun near the outlet and biased into the outlet such that the retainer will prevent a crimp connector propelled by air pressure from exiting the passageway, the retainer thereby defining a crimp station near said other end of the passageway;

at least two indentors mounted in the handgun and movable toward and away from said axis; and

actuator means mounted in the handgun for moving the indentors between a load position, wherein the indentors are outside of the passageway such that the passageway is unobstructed from the inlet to the retainer, a ready position, wherein the indentors move into the passageway and engage a connector located at the crimp station with a non-crimping force, and a crimp position, wherein the indentors engage a connector located at the crimp station, crimp said connector and advance it at least partially past the retainer.

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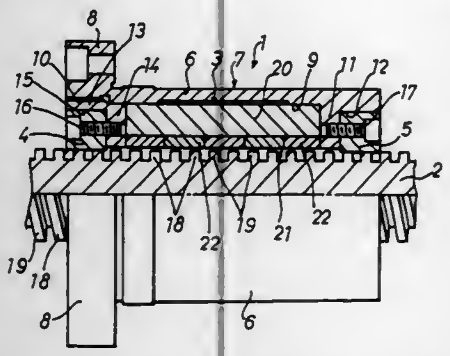
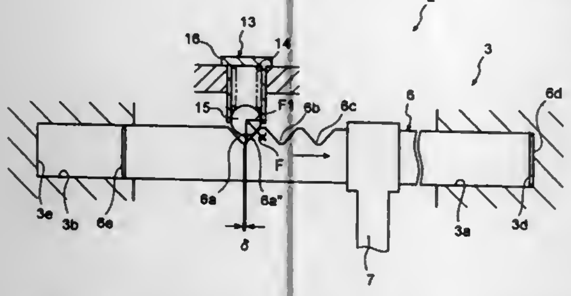
5,687,614
MAGNETIC SCREW DEVICE
Junichi Hashimoto, and Yukito Kubo, both of Yao, Japan, assignors to Koyo Machine Industries Co., Ltd., Yao, Japan
Filed Aug. 2, 1995, Ser. No. 510,565
Claims priority, application Japan, Sep. 26, 1994, 6-257442; Feb. 20, 1995, 7-056461
Int. Cl.⁶ F16H *25/20*
U.S. Cl. 74—459 **16 Claims**



1. A magnetic screw device comprising a screw shaft made of magnetic material and having ridges formed on the outer peripheral surface thereof, and a nut body fitted on the screw shaft with a clearance defined therebetween, said nut body having magnetic poles disposed on the inner periphery thereof, said magnetic screw device further comprising on the nut body side, a magnetic sleeve having a smoothly finished inner peripheral surface disposed substantially concentrically with said screw shaft, the inner peripheral surface of said magnetic sleeve being helically magnetized with said magnetic poles in opposed relation to the ridges of said screw shaft, and guide rings disposed on and attached to the opposite sides of said nut body as viewed in the thrust direction for holding said screw shaft substantially concentrically with said magnetic sleeve to slidably guide said screw shaft, wherein said nut body comprises the magnetic sleeve fitted on said screw shaft with a clearance defined therebetween, said guide rings disposed at the opposite ends of said magnetic sleeve as viewed in the thrust direction, and a housing for holding from the outer periphery side said magnetic sleeve and guide rings.

5,687,615
MANUAL TRANSMISSION
Tadashi Takemura; Kazuo Takami, both of Kyoto, and Shinji Nishioka, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 12, 1995, Ser. No. 527,321
Claims priority, application Japan, Sep. 14, 1994, 6-219937
Int. Cl.⁶ F16H *63/38*
U.S. Cl. 74—475 **11 Claims**

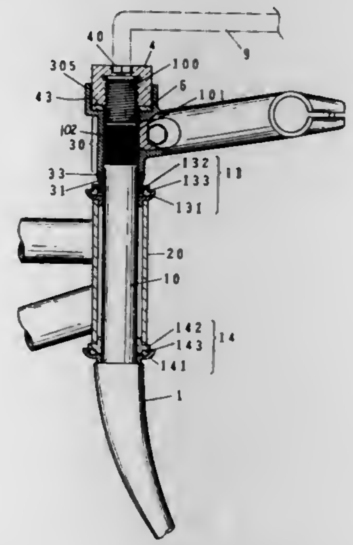


1. A manual transmission having a shift rail which is connected to a shift lever operable by a driver and which is supported by a housing so as to be axially movable, a sleeve connected to the shift rail via a shift fork, and a positioning mechanism for positioning the shift rail; the shift rail having end portions which respectively face surfaces of said housing, each of said shift rail end portions having an end face, and a plurality of engagement grooves formed at axial positions which respectively correspond to a plurality of gearshift positions; and said positioning mechanism being operable to engage with that engagement groove which corresponds to a desired gearshift position when the speed change for establishing the desired gearshift position is completed, the improvement comprising:

one of said shift rail end portions moves in a direction apart from said positioning mechanism and approaching a corresponding one of the housing surface as said shift rail axially moves during said speed change; and

said one shift rail end portion abutting on said corresponding one housing surface and said shift rail is axially held by the abutment between itself and said corresponding one housing surface and by said positioning mechanism after said speed change is completed.

5,687,616
HANDLE STEM FIXING DEVICE IN A BICYCLE
Kohei Marui, Kobe, Japan, assignor to Marui Co, Ltd., Kobe, Japan
Division of Ser. No. 311,123, Sep. 23, 1994, Pat. No. 5,553,511. This application Mar. 29, 1996, Ser. No. 624,333
Claims priority, application Japan, Oct. 5, 1993, 5-249533
Int. Cl.⁶ B62K *21/12*
U.S. Cl. 74—551.1 **17 Claims**

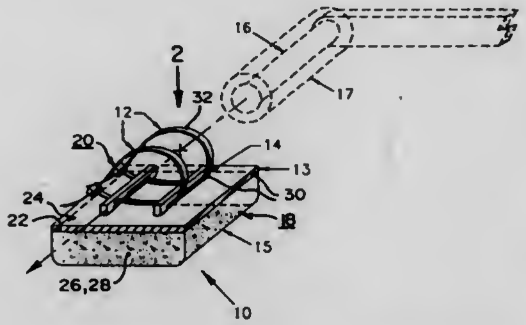


1. In a device for fixing a handle stem of a bicycle to a fork stem of the bicycle, the fork stem being rotatably inserted into a head pipe of a frame of the bicycle, the head pipe having an upper end and the fork stem having an upper portion which projects out from the upper end of the head pipe, the upper portion of the fork stem having an outer surface, the handle stem including a stem-binding cylinder having an inner surface, and the stem-binding cylinder being fixed on the upper portion of the fork stem, with the outer surface of the upper portion of the fork stem being pressed by the inner surface of the stem-binding cylinder so that the stem-binding cylinder does not rotate on the fork stem, an improvement wherein:

the outer surface of the fork stem includes a plurality of ribs parallel to the fork stem, the ribs being located where the outer surface of the fork stem is pressed by the stem-binding cylinder; and

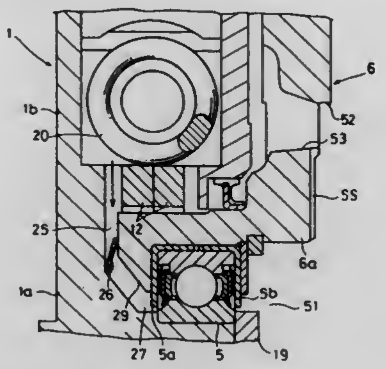
the stem-binding cylinder includes mutually opposed tightening ears, the tightening ears being perforated by holes, the stem-binding cylinder further including a bolt penetrating the holes in the tightening ears such that an inner diameter of the stem-binding cylinder decreases as the bolt is tightened.

5,687,617
CUSHION FOR A MOTORCYCLE GEARSHIFT LEVER
Anthony L. Wells, 70 Bedok South Road #08-288, Singapore, 1646, Singapore
Filed Nov. 6, 1995, Ser. No. 553,920
Int. Cl.⁶ G05G *1/18*
U.S. Cl. 74—564 **7 Claims**



1. A cushion for protecting a motorcycle rider's upper shoe from a motorcycle gearshift lever having a rubber sleeve, said cushion comprising:
- a) a pad member;
- b) a rigid base plate affixed to a top surface of said pad member;
- c) a pair of spaced apart mounting brackets extending up from a top surface of said rigid base plate; and
- d) a pair of cable tie wraps for attaching said base plate to the rubber sleeve by insertion through said mounting brackets and about the rubber sleeve of the gearshift lever.

5,687,618
FLYWHEEL ASSEMBLY
Koji Kajitani; Hirotaka Fukushima; Mamoru Okubo; Naoki Yanagida; Mitsuhiko Takenaka; Mitsuo Touji, and Kozo Yamamoto, all of Neyagawa, Japan, assignors to Daikin Clutch Corporation, Osaka, Japan
Division of Ser. No. 246,955, May 20, 1994, Pat. No. 5,511,446, which is a continuation of Ser. No. 938,863, Sep. 1, 1992, Pat. No. 5,355,747. This application Dec. 27, 1995, Ser. No. 580,428
Claims priority, application Japan, Sep. 4, 1991, 3-70801 U; Sep. 4, 1991, 3-70802 U; Sep. 4, 1991, 3-70803 U; Sep. 4, 1991, 3-70804 U; Sep. 4, 1991, 3-70805 U; Sep. 18, 1991, 3-237926; Nov. 8, 1991, 3-292954
Int. Cl.⁶ F16F *15/22;* **G05G** *1/00*
U.S. Cl. 74—573 F **6 Claims**



1. A flywheel assembly, comprising:

a first flywheel;

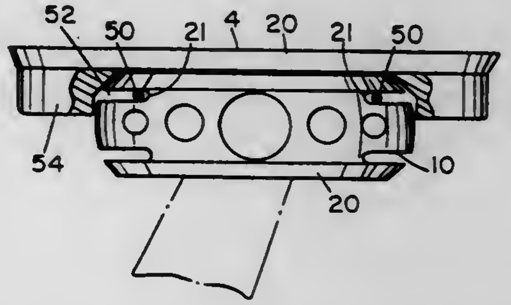
a second flywheel supported rotatably on said first flywheel, and together with said first flywheel defining an interior cavity, wherein said second flywheel includes a friction facing, a capturing channel formed radially inwardly of said friction facing for capturing escaped lubricating fluid driven on said friction facing-side by centrifugal force, and a plurality of circumferentially elongate through-holes extending from said capturing channel to said cavity for guiding fluid captured by said capturing channel to said cavity; and

a viscous damping mechanism disposed in said cavity for viscous damping of torsional vibrations between said flywheels through a fluid contained in said damping mechanism;

said first flywheel comprises a central first hub extending toward said second flywheel, and said second flywheel comprises a central second hub extending toward said first flywheel and enclosing said first hub;

said flywheel assembly including a bearing disposed between said first and second hubs, and guide means provided on said second flywheel radially inward of said plurality of through-holes, for guiding fluid from leakage out of said bearing toward said plurality of through-holes.

5,687,619
CLIPLESS BICYCLE PEDAL
Richard M. Bryne, 13039 Caminito Del Rocio, Del Mar, Calif. 92014
Continuation of Ser. No. 511,726, Aug. 7, 1995, Pat. No. 5,606,894, which is a continuation-in-part of Ser. No. 235,294, Apr. 29, 1994, abandoned. This appilcation Nov. 21, 1996, Ser. No. 754,690
Int. Cl.⁶ G05G *1/14;* **B62M** *3/10*
U.S. Cl. 74—594.6 **20 Claims**



1. A bicycle pedal having a pair of engagement extensions for engaging a locking mechanism having two inwardly biased tongues separated by a first spacing, the pair of engagement extensions being engaged by the locking mechanism when a contact surface of the bicycle pedal is adjacent a cleat surface to which the locking mechanism is affixed, the bicycle pedal comprising:

a support body having a body surface, a peripheral edge having two edge insets disposed diametrically opposite each other on said support body, and a bore running at least partially diametrically therethrough for receiving a spindle, said body surface having a recessed surface at least partially recessed from the contact surface, said recessed surface extending diametrically across said support body and having two ends so that each end of said recessed surface intersects one of said two edge insets in said peripheral edge wherein a diametric separation of said two edge insets is equal to or less than the first spacing;

a planar insert having a top insert surface and a thickness corresponding to a depth of said recessed surface from the contact surface for attachment to said recessed surface and having a pair of insert edges for defining the pair of engagement extensions, a distance between said pair of insert edges being greater than the first spacing so that said pair of insert edges overhang said edge insets; and

means for fastening said planar insert to said support body.

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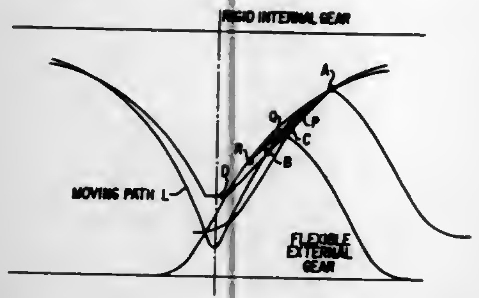
5,687,620
FLEXIBLE MESHING TYPE GEAR DEVICE WITH A PASSING TOOTH PROFILE

Shoichi Ishikawa, Kanagawa-ken, Japan, assignor to Harmonic Drive Systems, Inc., Tokyo, Japan
PCT No. PCT/JP95/00738, § 371 Date Feb. 15, 1996, § 102(e) Date Feb. 15, 1996, PCT Pub. No. WO95/28583, PCT Pub. Date Oct. 26, 1995
PCT Filed Apr. 14, 1995, Ser. No. 564,209
Claims priority, application Japan, Apr. 19, 1994, 6-104441
Int. Cl.^{6} F16H *37/04;55/08*
U.S. Cl. 74—640 **3 Claims**



1. A flexible meshing type gear device with a pass meshing tooth profile having a rigid internal gear, a flexible external gear inside the internal gear and a wave generator for flexing the external gear into an elliptical cross-sectional shape, causing the external gear to mesh partially with the rigid internal gear and rotating the mesh position of the two gears in the circumferential direction, rotation of the wave generator producing relative rotation between the two gears, the flexible meshing type gear device with a pass meshing tooth profile being characterized in that

(a) the rigid internal gear and the flexible external gear are both spur gears,

(b) the number of teeth of the flexible external gear is two greater than that of the rigid internal gear,

(c) the tooth profile of the flexible external gear is convex and the shape thereof is that of a curve obtained by subjecting a moving part portion which, at a moving path that the external gear describes relative to the internal gear, as determined by rack approximation, is convex relative to the internal gear, to similarity transformation at a reduction ratio λ using a limiting point of the contact between the two gears on the path as an origin, and

(d) the tooth profile of the rigid internal gear is concave and the shape thereof is that of a curve obtained by subjecting the same portion convex relative to the internal gear at the moving path to similarity transformation at an enlargement ratio $(1+\lambda)$ using the limiting point as the origin, whereby the meshing of the two gears maintains continuous contact and is of the passing type.

5,687,621
DIFFERENTIAL GEAR DRIVE MECHANISM

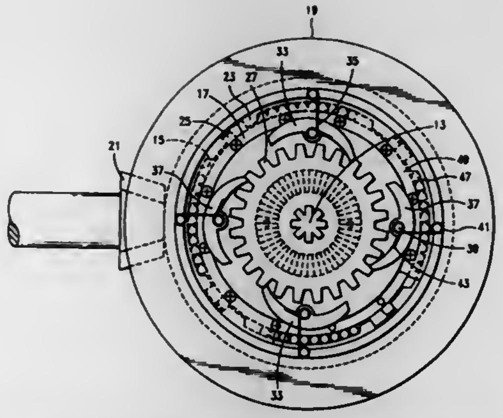
James R. Harden, 520 Redwood Ave., Ben Lomond, Calif. 95005
Filed Jun. 18, 1996, Ser. No. 665,486
Int. Cl.^{6} F16H *48/16*
U.S. Cl. 74—650 **5 Claims**

1. A differential gear drive mechanism comprising

a drive gear mounted for free rotation on an output shaft, said drive gear including

an outer ring gear element mounted coaxial to, and captured by, and adjustably interlocked with,

an inner ring portion which is rotatably mounted on said output shaft, said adjustable interlock permitting relative rotation between said inner and outer ring members for a few degrees of limited rotation in either direction around said output shaft,

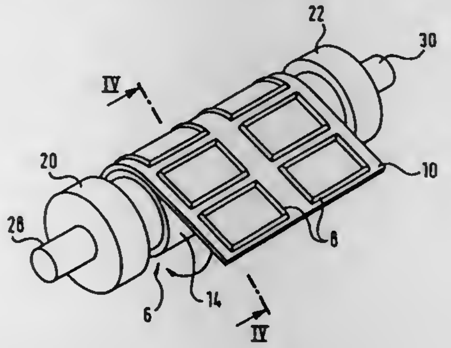


a first driven spur gear mounted coaxial to said drive gear on said output shaft and engaged therewith,

a multiplicity of first drive pawls pivotally secured to said drive gear inner ring portion and spring biased to alternately engage said driven spur gear teeth in coordinated action to rotate said driven gear in the same direction as said drive gear unless a counter torque imposed on said output shaft overcomes said spring bias to reverse the engagement of said pawls and to permit said drive gear to impose a counter torque on said output shaft.

5,687,622
PROCESS FOR THE MACHINING OF STAMPING PARTS PHOTOCHEMICALLY ETCHED OUT OF A CARRIER BASE, AND STAMPING WEBS OBTAINED THEREFROM

Joergen Gerhardt, Dragoer, Denmark, assignor to Gerhardt International A/S, Kastrup, Denmark
Continuation of Ser. No. 261,128, Jun. 14, 1994, abandoned. This application Jun. 25, 1996, Ser. No. 671,811
Claims priority, application Germany, Jan. 4, 1994, 44 00 106.1
Int. Cl.^{6} C23F *1/02*
U.S. Cl. 76—107.1 **10 Claims**



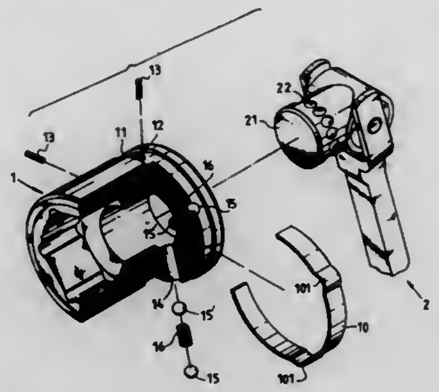
1. A process for the production of a carrier base provided with a cutting edge used to cut labels out of a label material on a supporting web as the supporting web with the label material proceeds past rolling cutting edges, said process comprising the steps of:

selectively photochemically etching the carrier base to provide multiple cutting edges which intersect and extend in both the rolling direction and transversely to the rolling direction, so that said edge protrudes above said etched carrier base and has longitudinal sides; and

milling said longitudinal sides with a frustoconical milling cutter rotating about its axis to mill said longitudinal sides to shape the cross section of said edge into a triangular shape with fluted sides, wherein the height of said edges extending in the rolling direction is smaller than the height of said edges transverse to the rolling direction except where the extending in the rolling direction edges and transverse edges intersect.

5,687,623
REVERSIBLE SOCKET WRENCH

Chih-Ching Hsieh, No. 64, Lane 107, Liang Tsun Rd., Fong Yuan City, Taichung Hsien, Taiwan
Filed Jul. 23, 1996, Ser. No. 681,349
Int. Cl.^{6} B25B *13/46*
U.S. Cl. 81—60 **3 Claims**



1. A reversible socket wrench comprising:

a socket having an outside annular groove, two radial locating holes in said outside annular groove, and two through holes respectively disposed opposite to said radial locating holes;

two spring pins respectively mounted in said radial locating holes of said socket and disposed in flush with a periphery of said socket;

two locating devices respectively mounted in said through holes of said socket and alternatively movable between an operative position and a non-operative position, each of said locating devices including an inner steel ball and an outer steel ball respectively mounted in two opposite ends of one of said through holes of said socket, and a spring arranged between said outer steel ball and said inner steel ball;

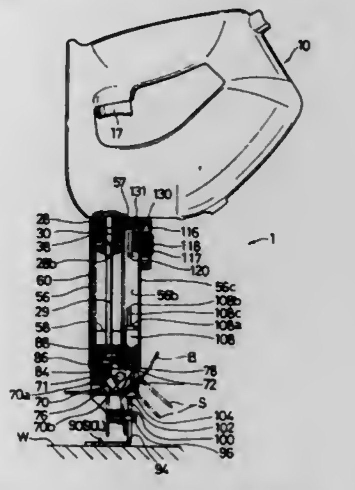
a clamp mounted around said outside annular groove of said socket and having two arched portions respectively curving outwards, said clamp being movable within said outside annular groove of said socket between a first position and a second position where one end thereof abuts a respective said spring pin for permitting one of said arched portions to be forced into alignment with one of said through holes of said socket so that one locating device is forced from said non-operative position into said operative position and said other locating device is released from said operative position and returned to said non-operative position; and

a handle adapted for turning said socket, said handle comprising a circular driving rod perpendicularly disposed at one end and adapted for inserting into said socket, and a plurality of rounded recesses spaced around said periphery and adapted for receiving one said inner steel ball;

wherein each of said through holes of said socket has an inner end defining first and second contact portions arranged on opposed inner surfaces to an edge of a respective through hole, said first contact portion having an axial length that is longer than a radius of said inner steel balls, and said second contact portion has an axial length that is shorter than said radius of said inner steel balls; said axial lengths extending along a longitudinal axis of a respective through hole said inner steel ball is disengaged from said driving rod of said handle when forced into contact with said second contact portion of said respective through hole and when said respective locating device is forced into said operative position and said driving rod of said handle is turned in one direction, thereby causing said driving rod of said handle to run idle; said inner steel ball is forced into engagement with said driving rod of said handle when it is forced into contact with said first contact portion of said respective through bole and when said respective locating device is forced into said operative position and said driving rod of said handle is turned in said reversed direction, thereby causing said socket to be turned with said driving rod of said handle.

5,687,624
CONTINUOUS SCREW DRIVING TOOL

Kazunori Tsuge, and Masahiko Inai, both of Anjo, Japan, assignors to Makita Corporation, Aichi-ken, Japan
Filed Feb. 20, 1996, Ser. No. 604,035
Claims priority, application Japan, Feb. 20, 1995, 7-030788
Int. Cl.^{6} B25B *23/06*
U.S. Cl. 81—434 **6 Claims**



1. A continuous-screw driving tool comprising:

a body having spindle rotatably driven by a drive device and adapted for mounting a driver bit thereon;

a case mounted on said body and having a longitudinal axis parallel to a longitudinal axis of said spindle;

a feeder box movable relative to said case in the axial direction of said case;

a stopper base mounted on said feeder box and movable therewith for abutment on a work into which a screw is to be driven;

first stopper means for limiting a first stroke end of said stopper base in a direction to extend outwardly from the case;

second stopper means for limiting a second stroke end of said stopper base on the side opposite to said first stroke end;

biasing means for normally biasing said stopper base in a direction toward said first stroke end;

screw feeding means operable to feed screws carried on a screw carrying belt to a position confronting said driver bit one after another when said stopper base is moved from said first stroke end toward said second stroke end against the biasing force of said biasing means;

said second stopper means including a first stopper member on the side of said case and a second stopper member on the side of said stopper base for abutment on said first stopper member, said second stopper member being movable with said stopper base as said stopper base is moved toward said second stroke end;

said feeder box being adapted to selectively mount any one of plural kinds of interchangeable stopper bases each suited for a different group of screws having different lengths; and

stroke changing means for changing the position of said second stroke end in accordance with an exchange of said stopper bases, said stroke changing means including a plurality of first abutting surfaces formed on one of said first and second stopper members, a single second abutting surface formed on the other, said first abutting surfaces being offset from each other in a direction parallel to said longitudinal axis of said

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case, and laterally offset from each other perpendicular to said longitudinal axis of said case, and shifting means for laterally shifting said first and second stopper members relative to each other, so that said second abutting surface selectively confronts either of said first abutting surfaces.

5,687,625
PILOT DEVICE FOR A SUSPENDED KNIFE OF A CUTTING MACHINE FOR CUTTING SHEET MATERIAL

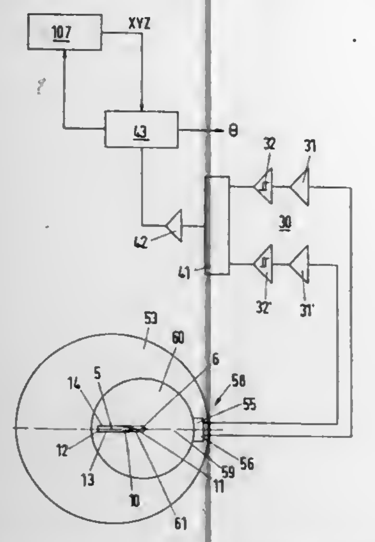
Mario Andrada Galan; Juan Carlos Cristo, and Bernardo Alcantara Perez, all of Madrid, Spain, assignors to Investronica, S.A., Madrid, Spain

Filed Apr. 5, 1995, Ser. No. 416,951

Claims priority, application European Pat. Off., Apr. 26, 1994, 94106511.2

Int. Cl.⁶ D06H *7/00;* B26D *5/00*

U.S. Cl. 83—74 **6 Claims**



1. In an automatically controlled cutting machine for cutting fabric sheet material spread out on a cutting table in multiple layers, wherein a cutting tool, which includes a cutting knife mounted to a cutting head, is controlled according to a three-dimensional coordinate system by means for moving the cutting tool along the X-and Y-axis and pivoting about the Z-axis for moving the knife tangently along a predetermined cutting path during cutting of the material, said cutting knife being mounted to said cutting head so as to be reciprocally movable along said Z-axis, said cutting tool further including guiding means for guiding the cutting knife and a pressure foot rigidly connected to the cutting head, the improvement comprising that:

said knife has a first end which is mounted in the cutting head so as to be freely rotatable around the Z-axis and a second end which includes a cutting edge for engaging the sheet material;

said guiding means is arranged adjacent to the second end of the knife and includes a socket rigidly connected to the cutting head and a support which is freely and rotatably mounted in said socket around a vertical axis, wherein the vertical axis is located adjacent to the cutting edge of said knife and spaced from said knife, and further wherein the vertical axis is parallel and spaced a predetermined distance from the Z-axis of the coordinate system;

said knife extends through said socket and through a slot in said support, said slot surrounding flanks of the knife and said slot is eccentrically positioned relative to said vertical axis and extends to a trailing edge of the knife; and

said socket further includes a sensor means for detecting at least one of an instantaneous rotation angle and a rotation direction of the support relative to the socket for providing correcting signals for controlling the movement of the knife about the Z-axis to regulate the cutting of the material by the knife along the predetermined cutting path in response to one of the detected rotation angle and rotation direction.

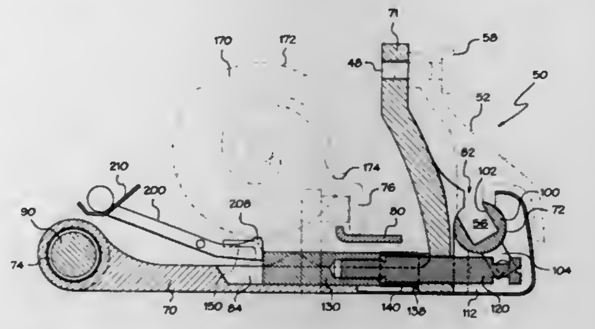
5,687,626
FOOD PRODUCT SLICER HAVING AN INTERLOCK MECHANISM

Richard P. Scherch, Johnston, Iowa; Timothy Allen Schrand, Oregonia, and Ellis Gale Short, Wapakoneta, both of Ohio, assignors to Premark FEG L.L.C., Wilmington, Del.

Filed Dec. 15, 1995, Ser. No. 573,073

Int. Cl.⁶ B26D *7/22*

U.S. Cl. 83—719 **11 Claims**



1. A food product slicer comprising:
a housing;
a slicing blade rotatably mounted on the housing;
a gauge plate, adjustable relative to the slicing blade, for setting a food product slice thickness;
a means for adjusting the gauge plate between a closed position and an open position;
a food product carriage mounted for reciprocation on the housing along a path of displacement;
a carriage support pivotally mounted on the carriage;
a plunging element, linked to the carriage support, which translates between a retracted position, and an extended position, the plunging element being translated by pivoting the carriage support;
an interlock bar stationarily mounted in the housing and extending over a first portion of the path of displacement of the carriage, the interlock bar blocking translation of the plunging element when the carriage resides in the first portion of the path of displacement, thereby preventing the carriage support from being pivoted to the extended position; and
an interlock plate pivotally mounted on the housing extending over a second portion of the path of displacement not covered by the interlock bar, and being pivotable from a first position at which the interlock plate blocks translation of the plunging element to the extended position and a second position at which the interlock plate does not block translation of the plunging element to the extended position, the interlock plate cooperating with the means for adjusting the gauge plate such that when the means for adjusting the gauge plate moves the gauge plate to the open position, the interlock plate is in the first position and when the means for adjusting the gauge plate moves the gauge plate to the closed position, the interlock plate is in the second position.

5,687,627
RAIL CUTTING DEVICE

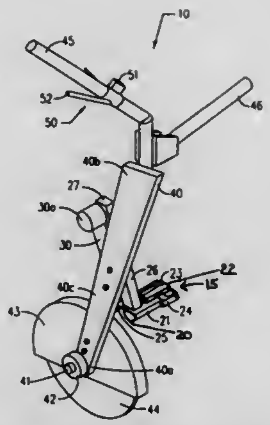
Timothy R. Wilson, 13-36th Ave Cir. S., Moorhead, Minn. 56560

Filed Sep. 21, 1995, Ser. No. 531,936

Int. Cl.⁶ B24B *27/08*

U.S. Cl. 83—745 **8 Claims**

1. A rail cutting device comprising:



a base having a clamping means for clamping to a rail and an elongate support member fixedly attached to said clamping means and extending upward therefrom and having a top end portion;
a pivot linkage having a first end and being pivotally connected to said support member and further having a second end; and
a cutting means comprising an elongate support column having a top portion, a bottom portion and a middle portion, and further comprising a rotatable shaft disposed at said bottom portion of said support column, a cutting member mounted to said rotatable shaft for rotation therewith, a motor means mounted on the bottom portion of the support column for actuating said rotatable shaft, and a handle means for steering said cutting means, said support column being pivotally connected to said pivot linkage, said handle means being conveniently disposed at the top portion of the support column in order for a user to operate said cutting means while standing up.

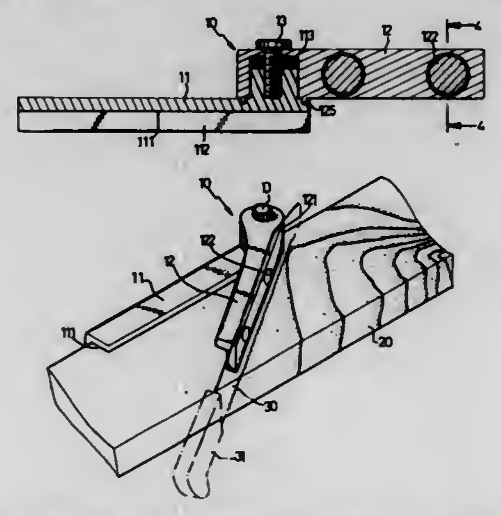
5,687,628
GUIDING DEVICE FOR WOOD CUTTING

Shu-Fen Liao, 105 Hsiangshan St., Tali county, Taichung Hsien, Taiwan

Filed Feb. 5, 1996, Ser. No. 596,517

Int. Cl.⁶ B27B *9/04*

U.S. Cl. 83—745 **1 Claim**



1. A guiding device for cutting a wood piece, the wood piece having an upper horizontal surface and a side straight surface, the guiding device comprising:
a positioning member having a generally L-shaped cross-section, the positioning member including a horizontal leg for abutting the upper surface of the wood piece and a vertical leg extending downwardly from the horizontal leg for abutting the side straight surface of the wood piece for positioning the guiding device relative to the wood piece;
the positioning member further having a first circular portion at an end thereof, the first circular portion having a horizontal lower side that is substantially coplanar with a lower surface of said horizontal leg and a horizontal upper side with a boss projecting upwardly from and perpendicularly to said upper side, wherein said boss and said vertical leg extend away from a horizontal plane of said horizontal leg in opposite vertical directions;
a guiding member including a second vertical portion for guiding a saw blade, said guiding member further including a second circular portion at an end thereof, the second circular portion having an underside provided with a recess pivotally receiving the boss therein to provide a pivotal relationship between the positioning member and the guiding member;
a plurality of holes provided in and arranged annularly about one of the first and second circular portions, and at least one positioning protrusion projecting from the other of the first and second circular portions and removably inserted into a respective one of said holes for positive engagement against pivotal movement between the circular portions in a selected one of a plurality of pivotal positions; and
adjusting means for releasably securing the guiding member to the positioning member in one of said selected pivotal positions;
the adjusting means including a bolt connected between the first and second circular portions, and a spring positioned in the recess between the first and second circular portions to bias them apart to facilitate adjustment between said plurality of pivotal positions.

5,687,629
PILOT DEVICE FOR A SUSPENDED KNIFE OF A CUTTING MACHINE FOR CUTTING SHEET MATERIAL

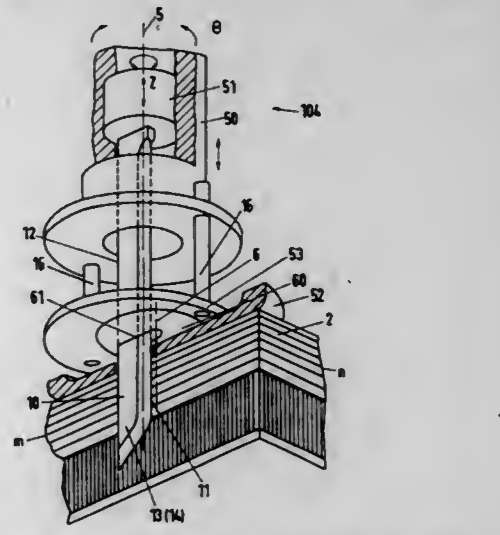
Mario Andrada Galan; Juan Carlos Cristo, and Bernardo Alcantara Perez, all of Madrid, Spain, assignors to Investronica, S.A., Madrid, Spain

Filed Apr. 5, 1995, Ser. No. 416,953

Claims priority, application European Pat. Off., Apr. 26, 1994, 94106512

Int. Cl.⁶ D06H *7/00;* B26D *1/10*

U.S. Cl. 83—747 **3 Claims**



1. In an automatically controlled cutting machine for cutting fabric sheet material spread out on a cutting table in multiple layers, wherein a cutting tool, which includes a cutting knife mounted to a cutting head, is controlled according to a three-dimensional coordinate system by means for moving the cutting tool along the X- and Y-axis and pivoting about the Z-axis for moving the knife tangently along a predetermined cutting path

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during cutting of the material, said cutting knife being mounted to said cutting head so as to be reciprocally movable along said Z-axis, said cutting tool further including guiding means for guiding the cutting knife and a pressure foot rigidly connected to the cutting head, the improvement comprising that:

said knife has a first end which is mounted in the cutting head so as to be freely rotatable around the Z-axis and a second end which includes a cutting edge for engaging the sheet material;

said guiding means is arranged adjacent to the second end the knife and includes a socket rigidly connected to the cutting head and a support which is freely and rotatably mounted in said socket around a vertical axis, wherein said vertical axis is located adjacent to the cutting edge of said knife and spaced from said knife, and further wherein the vertical axis is parallel and spaced a predetermined distance from the Z-axis of the coordinate system; and

said knife extends through said socket and through a slot in said support, said slot surrounding flanks of the knife and said slot is eccentrically positioned relative to said vertical axis and extends to a trailing edge of the knife such that the knife can twist about the vertical axis under the influence of lateral loads occurring during cutting to bring the force between said sheet material and the flanks of the knife and the bending force of the knife into a balanced equilibrium state.

5,687,630
CART FOR CUTTING UNITS

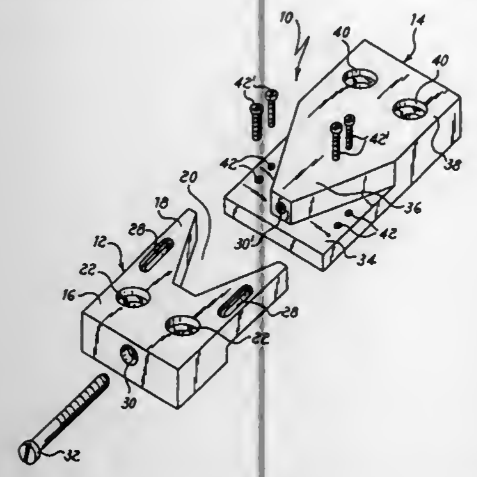
Elio Cavagna, Melegnano, Italy, assignor to Elio Cavagna S.r.l., Melegnano, Italy

Filed Oct. 18, 1995, Ser. No. 544,660

Claims priority, application Italy, Oct. 25, 1994, MI940703 U

Int. Cl.^{6} B26D *1/14;* **F16C** *29/12;23/00*

U.S. Cl. 83—824 **6 Claims**



1. A cart having mounted thereon a cutting unit of an apparatus for shearing paper and adapted for translatory movement on a bearing beam of said apparatus, said cart comprising

a) a first plate-shaped element consisting of a higher back sector and a shorter front sector, said shorter front sector being bifurcated to form two segments defining a cavity extending to said higher back sector;

b) a second plate-shaped element consisting of a higher back sector and a shorter front sector, said shorter front sector having on a surface an extension with a shape complementary to the cavity in said front sector of said first plate-shaped element, said extension being aligned with a plane defined by the back sector of said second plate-shaped element, said back sector with extension of said second plate-shaped element having a height equal to that of the back sector of said first plate-shaped element, and the front sector of said second plate-shaped element being sized to fit in a lower part of the shorter front sector of said first plate-shaped element;

c) means for adjustably connecting said first and second plate-shaped elements together so that the shorter front sector of said first plate-shaped element and the shorter front sector of said second plate-shaped element are contiguous and the extension on the surface of the shorter front sector of the second plate-shaped element extends into the cavity defined by the two segments of the shorter front sector of the first plate-shaped element and adjustable movement along a longitudinal axis defined by said extension and said cavity is permitted; and

d) means for trueing and fixing together said first and second plate-shaped elements.

5,687,631
SPEED CHANGE MECHANISM FOR SWASH PLATE TYPE HYDRAULIC MOTOR

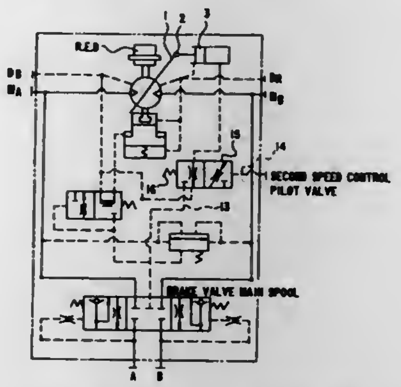
Hyong-Eui Kim, and Young-Bog Ham, both of Kyungnam, Rep. of Korea, assignors to Korea Institute of Machinery & Metals, Kyungnam, Rep. of Korea

Filed Dec. 30, 1994, Ser. No. 366,746

Claims priority, application Rep. of Korea, Dec. 30, 1993, 93-31212

Int. Cl.^{6} F01B *13/04*

U.S. Cl. 91—505 **4 Claims**



1. A speed change mechanism for a swash plate type hydraulic motor, comprising:

a housing;

a swash plate rockingly positioned in said housing;

an accommodating bore formed on a side wall of said housing;

a fixing pin accommodated into said accommodating bore and engaging said swash plate for preventing the rotation of said swash plate;

a shifting piston inserted into a cylinder formed within said housing for shifting said swash plate; and

a control valve built in said housing including a spool, a hydraulic pressure pilot line at one end of said spool, and a compression spring at the opposite end of said spool, said valve being positioned in a control line for the actuation of said swash plate shifting piston;

said swash plate being provided with a boundary edge between a first inclined face and a second inclined face, and sides which are spherically formed.

5,687,632
HYDRAULIC RODLESS CYLINDER TYPE ACTUATOR

Hiroshi Sugawa, 844-2, Iizawa, Kurobe-shi, Toyama-ken, Japan

Filed Nov. 2, 1995, Ser. No. 552,054

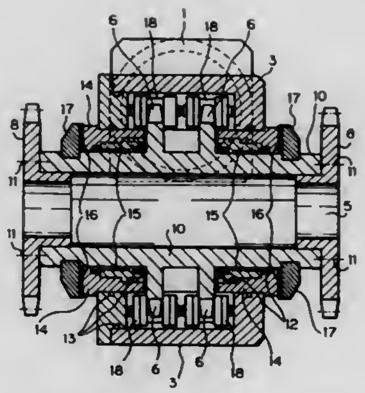
Claims priority, application Japan, Nov. 2, 1994, 6-293956

Int. Cl.^{6} F01B *29/00;9/00*

U.S. Cl. 92—88 **3 Claims**

1. A hydraulic rodless cylinder type actuator comprising:

a hydraulic cylinder;



a piston fluid-tightly received in said cylinder and movable along an axis of said cylinder;

housing elements respectively mounted on opposite ends of said cylinder;

a first output shaft and a second output shaft respectively accommodated in said housing elements, and protruding from said housing elements in a fluid-tight condition, and extending perpendicularly to and spaced from an axis of said cylinder;

a first inner sprocket and a second inner sprocket respectively affixed to said first and second output shafts within the respective housing elements;

a first outer sprocket and a second outer sprocket respectively affixed to said first and second output shafts;

a first inner chain and a second inner chain respectively anchored at one end to opposite sides of said piston, with each of said first and second inner chains being left free at the other end so as to form a free end portion, while having an intermediate portion thereof passed over a corresponding one of said first and second inner sprockets, and having a length great enough to extend in parallel to said cylinder;

chain cases respectively fluid-tightly communicated to said housing elements, and for respectively receiving and guiding said free end portions of said first and second inner chains between a position where said free end portions of said first and second inner chains leave the respective first and second inner sprockets and a position where said free end portions of said first and second inner chains extend in parallel to said cylinder; and

an outer chain passed over said first and second outer sprockets outside of said housing elements.

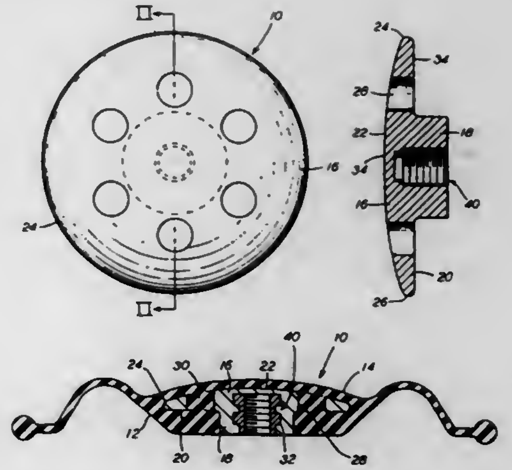
5,687,633
INSERT TYPE MEMBER FOR USE IN A FLEXIBLE TYPE PUMP DIAPHRAGM

Eldon S. Eady, Greensburg, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jul. 9, 1996, Ser. No. 677,265

Int. Cl.^{6} F01B *19/00*

U.S. Cl. 92—97 **22 Claims**



1. An improved insert type member for utilization in a flexible type diaphragm portion of a pump which will enable such flexible type diaphragm portion of such pump to be provided with a substantially uniform non-obtrusive surface area that will be positioned in such pump for intimate contact with a predetermined type material to be pumped, said improved insert type member comprising:

(a) a first disc-like portion, said first disc-like portion having both a first predetermined size and a first predetermined configuration;

(b) a second disc-like portion, said second disc-like portion having both a second predetermined size and a second predetermined configuration, said second disc-like portion being secured adjacent one surface thereof to a first surface of said first disc-like portion, said second disc-like portion extending from said first surface of said first disc-like portion for a predetermined distance and said second disc-like portion being disposed substantially in a center portion of said first surface of said first disc-like portion of said improved insert type member;

(c) a plurality of apertures formed through said first disc-like portion, said plurality of apertures having both a third predetermined size and a third predetermined configuration, said plurality of apertures providing an overall predetermined open area through said first disc-like portion for receiving a preselected rubber compound therein and thereby significantly improve bonding of said improved insert type member to such flexible type diaphragm portion of such pump; and

(d) a securing means engageable at least with said second disc-like portion for securing said improved insert type member to an elongated piston rod-like member disposed for reciprocal type movement within such pump.

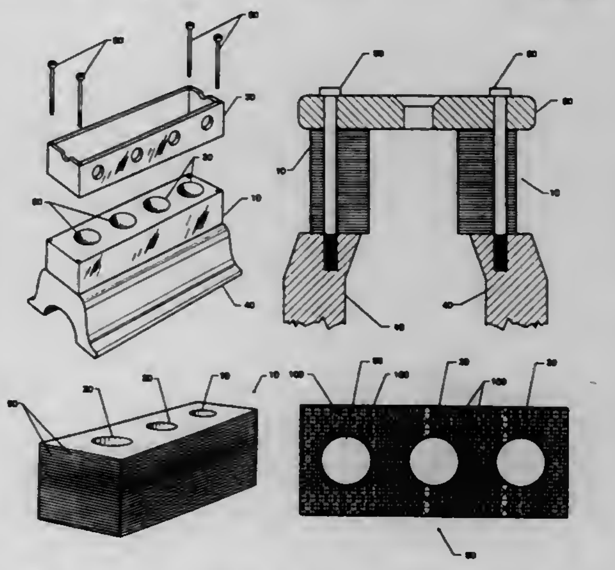
5,687,634
METHOD FOR MAKING A CARBON-CARBON CYLINDER BLOCK

Philip O. Ransone, Gloucester Pt., Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 416,599, Apr. 4, 1995. This application May 23, 1996, Ser. No. 652,736

Int. Cl.^{6} F01B *11/02*

U.S. Cl. 92—170.1 **21 Claims**



1. The method of making a carbon—carbon cylinder block comprising the steps of:

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weaving fiber tows having carbon fibers into two-dimensional fabrics;

heat treating the two-dimensional fabrics at a desired temperature;

prepregging the two-dimensional fabrics with a carbonaceous resin;

stacking the two-dimensional fabrics to form a block;

molding the block;

pyrolizing the block in an inert atmosphere;

densifying the block;

heat treating the block at a desired temperature to produce a desired thermal conductivity; and

machining at least one cylinder bore in the block.

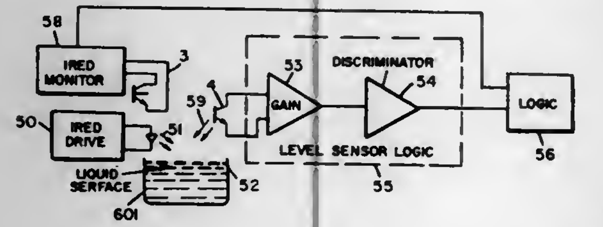
5,687,635
OPTO-ELECTRONIC LEVEL SENSOR

Donald R. Stockton, Seal Beach, and Michael C. Martin, Canyon Lake, both of Calif., assignors to Composite Specialties, Inc., Corona, Calif.

Filed Jul. 5, 1995, Ser. No. 498,084

Int. Cl.^{6} A47J *31/00;* **G01N** *21/85*

U.S. Cl. 99—281 **20 Claims**



1. In a beverage brewing apparatus having a vessel for retaining said beverage,

a liquid level detector for detecting the level of the liquid in the vessel,

a temperature monitor for sensing the temperature of said liquid,

switch means for selectively initiating operation of said apparatus,

decision logic means connected to receive signals from said liquid level detector, said temperature monitor and said switch means, and

brewing means connected to receive a control signal from said decision logic means whereby said brewing means initiates a brewing function.

5,687,636
COFFEEMAKER

Christian Diore, Saint Germain du Corbeis, and Christian Bernard Jouatel, Radon, both of France, assignors to Moulinex S.A., Bagnolet, France

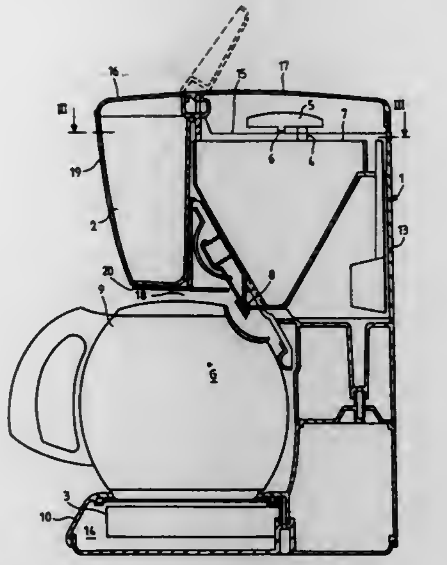
Filed May 20, 1996, Ser. No. 650,369

Claims priority, application France, May 18, 1995, 95 05875

Int. Cl.^{6} A47J *31/02*

U.S. Cl. 99—285 **8 Claims**

1. A coffeemaker comprising a housing (1), a cold water reservoir (2) in the housing, a water heater (3) in the housing, a water spout (5) in the housing supplied by the water heater (3), the water spout (5) having an outlet (6) arranged above a filter carrier (7) movably mounted in the housing (1), the filter carrier (7) having a flow opening (8) situated above a server (9) for collecting infusion resting on a base (10); the cold water reservoir (2) overhanging the base (10) and the filter carrier (7) being arranged behind the cold water reservoir (2).



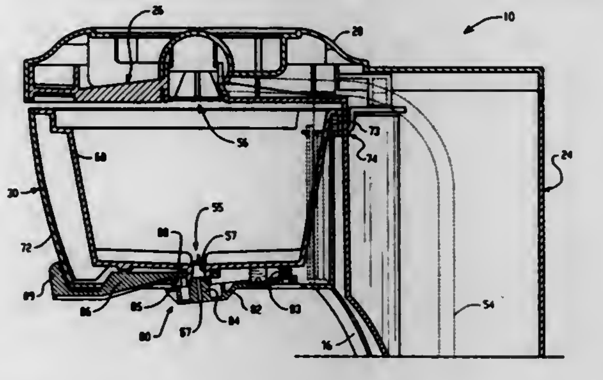
5,687,637
AUTOMATIC TEA BREWING DEVICE

Phillip L. Brookshire, Cincinnati, Ohio; Robert A. Demars, Woodland Hills, Calif.; David Dinunzio, Mentor, Ohio; Spencer L. Mackay, Agoura Hills, Calif.; Joseph F. Moore, Richmond, Va., and Craig Weidman, Wooster, Ohio, assignors to Healthometer, Inc., Bedford Hts., Ohio

Filed Apr. 28, 1995, Ser. No. 431,082

Int. Cl.^{6} A47J *37/00*

U.S. Cl. 99—295 **27 Claims**



1. A device for brewing hot tea comprising:

a water reservoir,

a combined water reservoir inlet and heated water distributor structure connected to and extending forward of the water reservoir,

a steeping chamber attached to the water reservoir and positioned under the combined water inlet and heated water distributor structure, and

a base for a brewed tea receptacle, the base positioned forward of the water reservoir and under the steeping chamber.

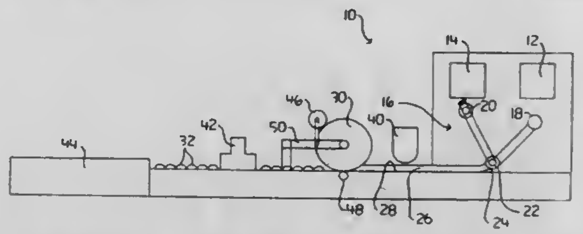
5,687,638
APPARATUS FOR PRODUCING FILLED FOOD PRODUCTS

Walter Makowecki, Edmonton, Canada, assignor to 562186 Alberta Ltd., Edmonton, Canada

Filed Sep. 20, 1995, Ser. No. 531,295

Int. Cl.^{6} A21C *9/00;9/06;11/00;* **A23P** *1/00*

U.S. Cl. 99—353 **8 Claims**



1. An apparatus for producing filled food products, comprising:

extruding means including multiple co-extrusion dies with parallel aligned outlets extruding a plurality of parallel elongated cylindrical filled food shells containing a filler material;

a single conveyor belt for advancing the plurality of parallel elongated cylindrical filled food shells from the extruding means along a predetermined path; and

a single rotary stamper disk in contact with the conveyor belt, the rotary stamper disk having a plurality of circumferential rows of stamping dies positioned transversely across the predetermined path whereby the cylindrical filled food shells are partitioned into filled food segments.

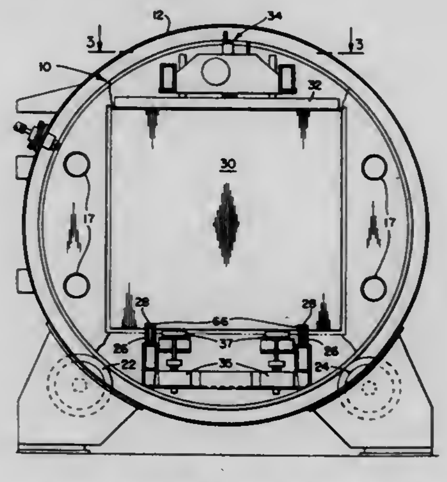
5,687,639
ROTATING VARIABLE HEIGHT CLAMPING DEVICE

Norman A. Planck, Jr., Madera, Calif.; Eduard Hendrikus Johannes Damhuis, Bousval, Belgium, and Sherman Howell Creed, Fresno, Calif., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 123,572, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 818,945, Jan. 10, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,901

Int. Cl.^{6} A61L *2/00;* **A47J** *27/18*

U.S. Cl. 99—369 **4 Claims**



1. An apparatus for rotating stacks of various heights, comprising:

a plurality of top members, where a top member is above each stack;

a central drive means for raising and lowering the top members;

means for allowing the top members to stop moving at different heights while the central drive continues to move;

means for locking the top members in position on top of the stacks;

means for lifting the stacks such that said means for lifting cooperates with said top members when in a locked position to clamp said stacks therebetween; and

means for rotating the top members, the means for lifting, and the stacks around a horizontal axis.

5,687,640
PANCAKE BATTER DISPENSING DEVICE AND APPARATUS FOR MAKING PANCAKES

André Sala, Route du stade, 74410 Saint-Jorioz, France

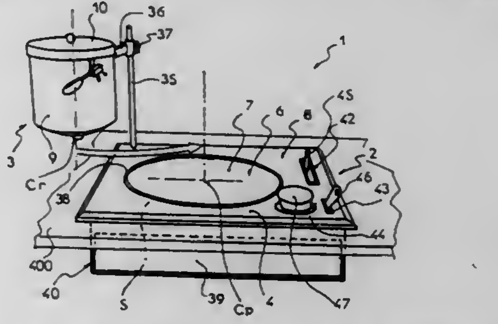
PCT No. PCT/FR95/00117, § 371 Date Oct. 22, 1996, § 102(e) Date Oct. 22, 1996, PCT Pub. No. WO95/20880, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 1, 1995, Ser. No. 693,323

Claims priority, application France, Feb. 4, 1994, 94 01479

Int. Cl.^{6} A47J *37/00;37/06;37/10;* **A21B** *1/48*

U.S. Cl. 99—423 **12 Claims**



1. A pancake batter dispensing device for an apparatus for making pancakes, including a hotplate (7), a container (9) containing a supply of batter (90) and which includes a flow outlet (13) with an opening and closing assembly (MFO), said container (9) retained on a work unit (2) and movable relative to the hotplate (7), in a resting position, in which the container is outside of a zone occupied by the hotplate, and a dispensing position in which the outlet is above and in the center of the hotplate.

5,687,641
HANDLING SHEET MATERIAL

Mark Williamson, Siddington House, Siddington, Chesire, United Kingdom, SK11 7LR, and Leslie Theophilus Baines, "Cobblestones" Old Hall Mews Old Hall Lane, Heaton Bolton, United Kingdom, BL1 7PW

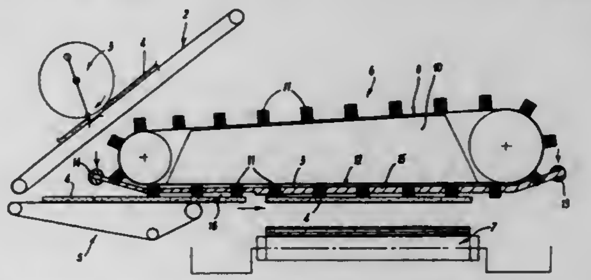
PCT No. PCT/GB94/01593, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO95/03988, PCT Pub. Date Feb. 9, 1995

PCT Filed Jul. 25, 1994, Ser. No. 586,734

Claims priority, application United Kingdom, Jul. 29, 1993, 9315742

Int. Cl.^{6} A21B *3/18;* **A21C** *9/00;9/04;* **A23P** *1/00*

U.S. Cl. 99—450.2 **16 Claims**



1. Apparatus for handling stretchable sheet material to form a stack of leaves thereof, said apparatus comprising a first supply conveyor (5) for supplying leaves (4) of stretchable, sheet material,

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a second transport conveyor (7) for transporting a stack of said leaves thereon, and a transfer device (**102**;**6**) for transferring said leaves from the first conveyor (**5**) to the second conveyor (**7**) in stacked disposition, wherein the transfer device (**102**;**6**) comprises an overhead fluid permeable suction surface (**104**;**8**) movable along a transport run (**106**;**9**) between a first position at which leaves are picked up from the first conveyor (**5**) and a second position at which said leaves are dropped therefrom onto the second conveyor (**7**), and pressure means (**10**) is provided to establish suction at said surface (**104**;**8**) to hold each leaf by reduced pressure to said surface (**104**;**8**) throughout the whole of said transport run between the flint and second position characterised in that a displacement device (**118**;**12**) is provided which is operable to apply a downward force to each leaf at the said second position to effect said dropping of the leaves onto the second conveyor (**7**) and further characterised in that said surface (**104**;**8**) has individual perforations or apertures (**110**;**18**) through which suction is applied wherein the perforations or apertures (**110**;**18**) are bounded by projections, said projections being inverted frustoconical or frustopyramidal shaped cups or sleeves or dimples (**112**,**114**;**11**).

5,687,642

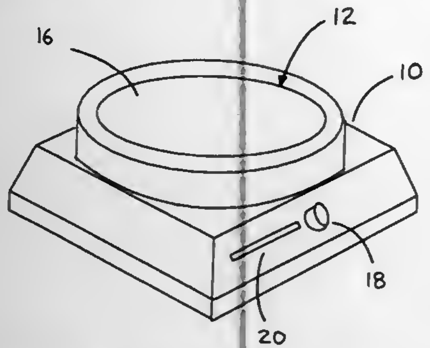
CONCAVE INDUCTION COOKING SURFACE FOR WOK COOKING

Nathan Chao, 38 Merrison St., Teaneck, N.J. 07666

Filed Oct. 10, 1995, Ser. No. 541,606

Int. Cl.^{6} A47J *37/10*; **H05B** *6/12*

U.S. Cl. 99—451 **4 Claims**



1. An induction heating device for bowl-shaped cooking pans, comprising: a bowl-shaped induction heating coil having a peripheral edge which defines a circle.

5,687,643

METHOD AND APPARATUS FOR PRODUCING A STRAPPED BALE OF COMPRESSED FIBERS

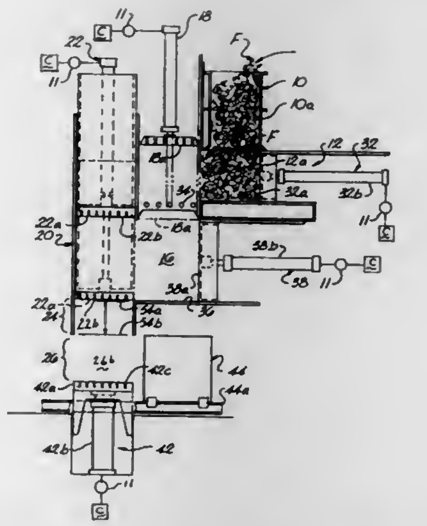
J. David Felts, 104 Weston Pl., Asheville, N.C. 28803; Kenneth W. Elliott, 306 Old Country Home Rd., Asheville, N.C. 28806, and David P. Zachary, 44 Lochencove Rd., Brevard, N.C. 28712

Filed Jan. 16, 1996, Ser. No. 587,221

Int. Cl.^{6} B30B *9/30*; **B65B** *27/12*

U.S. Cl. 100—3 **23 Claims**

12. A method for producing a strapped bale of compressible fibers comprising:
- supplying loose fibers;
- tramping said loose fibers in a stationary tramping chamber to create a compacted fiber mass of a predetermined amount of loosely compacted fibers during a tramping cycle;
- transferring said compacted fiber mass through a transfer opening to a stationary compression chamber which is laterally off-set and generally parallel to said tramping chamber;
- compressing said compacted fiber mass using a moveable main platen which moves axially in said compression chamber, and a co-axial moveable bottom platen, and compressing said compacted fiber mass in a compression section between a bottom position of said main platen and a top position of said bottom platen;
- placing straps around said compressed fiber block in a strapping section to form a strapped fiber bale; and
- ejecting said strapped fiber bale from said strapping section during an ejection cycle.



5,687,644

APPARATUS FOR EXPELLING AIR FROM STACKS OF SUPERIMPOSED SHEETS

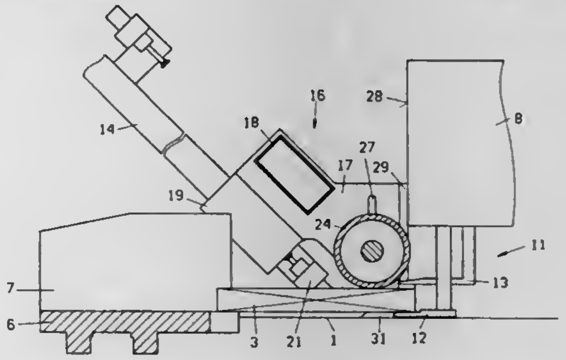
Harald Rann; Norbert Rilitz, and Holger Schauer, all of Hamburg, Germany, assignors to E.C.H. Will GmbH, Hamburg, Germany

Filed Jun. 13, 1996, Ser. No. 663,352

Claims priority, application Germany, Jun. 29, 1995, 195 23 699.8

Int. Cl.^{6} B30B *9/00*

U.S. Cl. 100—90 **20 Claims**



1. Apparatus for expelling air which is entrapped between the sheets of stacks of sheets including a topmost sheet, comprising means defining a first predetermined path for the advancement of successive stacks of a series of stacks from a first position to a second position in such a way that a stack advancing along said first path has a front portion; means for advancing successive stacks of the series along said first path including means for engaging the front portions of the stacks in said first positions thereof; and means for expelling entrapped air from the advancing stacks, including at least one air expelling device movable downwardly into pressure-exerting engagement with the topmost sheet of a stack advancing along said first path, and means for confining said at least one device to downward movements along a predetermined second path, said means for confining including at least one guide provided on said advancing means.

5,687,645

MECHANICAL PRESSING MACHINE

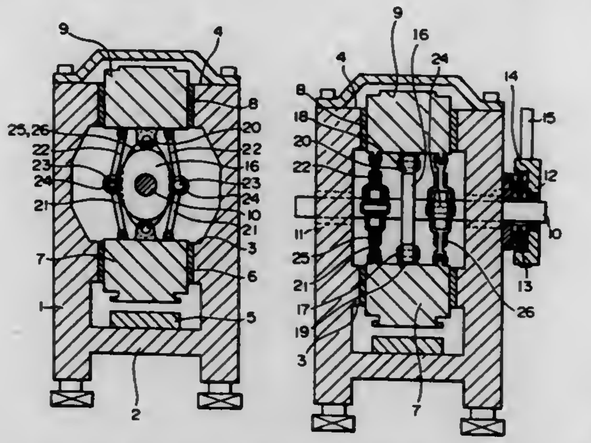
Heizaburo Kato, Shizuoka-ken, Japan, assignor to Sankyo Seisakusho Co., Tokyo, Japan

Filed Jun. 6, 1996, Ser. No. 660,791

Claims priority, application Japan, Jun. 19, 1995, 7-151342; Oct. 30, 1995, 7-281910

Int. Cl.^{6} B30B *1/26*

U.S. Cl. 100—282 **8 Claims**



1. A mechanical pressing machine comprising:
- a slider supported on a lower portion of a frame for sliding movement in a vertical direction, said slider carrying an upper press die at its lower surface;
- a dynamic balancer supported on an upper portion of said frame for sliding movement in the vertical direction, said dynamic balancer being equal in weight to said slider;
- a cam shaft rotatably supported on said frame, and extending in a horizontal direction, said cam shaft being connected at one end thereof to rotation transmission means;
- at least one press cam fixedly mounted on said cam shaft for rotation therewith, said press cam having a cam surface in contact with cam followers mounted respectively on an upper surface of said slider and a lower surface of said dynamic balancer;
- at least one pair of link mechanisms provided on opposite sides of said press cam, respectively, each of said link mechanisms comprising a pair of first and second links of the same length which are pivotally connected at one ends thereof to the upper surface of said slider and the lower surface of said dynamic balancer, respectively, and are pivotally connected together at the other ends thereof; and
- at least one dynamic balancer cam fixedly mounted on said cam shaft for rotation therewith, said dynamic balancer cam having a cam surface in contact with cam followers each of which is mounted on the interconnected other ends of said first and second links of a respective one of said link mechanisms.

5,687,646

METHOD OF PRODUCING STENCILS FOR USE IN SILK-SCREEN PRINTING

Akenobu Sakaguchi, 24-14, Aoyamadai 4-chome, Abiko-shi, Chiba 270-11, Japan

PCT No. PCT/JP94/00422, § 371 Date Aug. 31, 1995, § 102(e) Date Aug. 31, 1995, PCT Pub. No. WO94/21463, PCT Pub. Date Sep. 29, 1994

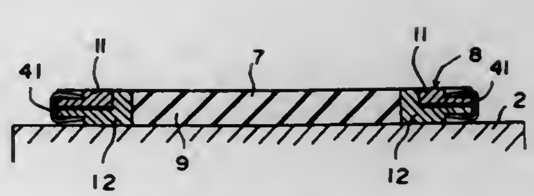
PCT Filed Mar. 16, 1994, Ser. No. 507,383

Claims priority, application Japan, Mar. 17, 1993, 5-082574

Int. Cl.^{6} B41M *1/12*

U.S. Cl. 101—129 **3 Claims**

1. Method of producing stencils for use in silk-screen printing, using a frame, a flat table, a platen, a heating head and silk, comprising the steps of:



- stretching the silk over the frame;
- providing a heat sensitive film attached to the silk,
- fixing the silk and heat sensitive film stretched over the frame, the fixed silk and heat sensitive film as well as the frame forming a silk-screen;
- putting the frame on the flat table at a predetermined position, allowing the silk to contact the platen; mounting the heating head for movement, and
- sweeping the silk-screen with the moveable heating head to make pores in the heat-sensitive film of the silk-screen, thereby producing a framed stencil.

5,687,647

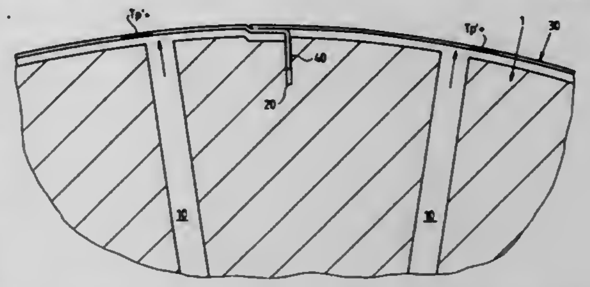
PLATE CYLINDER WITH FIXED TENSIONING PLATE MOUNTING DEVICE

James Brian Vrotacoe, Rochester; Roland Thomas Palmatier, Durham; Howard Walter Hoff, Lee, and Richard L. McKrell, Rye, all of N.H., assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.H.

Filed Apr. 26, 1996, Ser. No. 639,135

Int. Cl.^{6} B41F *13/10;21/00;7/02*

U.S. Cl. 101—375 **24 Claims**



1. A printing plate having a lead end and a tail end, a first bend and a second bend disposed at a first distance from the lead end, the first and second bends forming opposing angles on the printing plate, a third bend disposed at a second distance from the lead end, the third bend forming an opposing angle relative to the second bend, an angular end portion being formed between the third bend and the lead end, a recessed portion being formed between the second bend and the third bend, the tail end being bonded to the recessed portion.

5,687,648

DEVICE FOR FASTENING A RUBBER BLANKET UNIT TO A BLANKET CYLINDER

Helmut Puschnerat, Wachenheim, and Peter Schröder, Hessheim, both of Germany, assignors to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany

Filed May 3, 1996, Ser. No. 642,442

Claims priority, application Germany, May 5, 1995, 295 07 523 U; Nov. 6, 1995, 195 41 249.4

Int. Cl.^{6} B41F *1/28*

U.S. Cl. 101—415.1 **1 Claim**

1. In a rotary printing press, the combination comprising:
- a blanket cylinder;
- a narrow, axially extending, generally radially inwardly directed slit formed on a peripheral surface of said blanket cylinder

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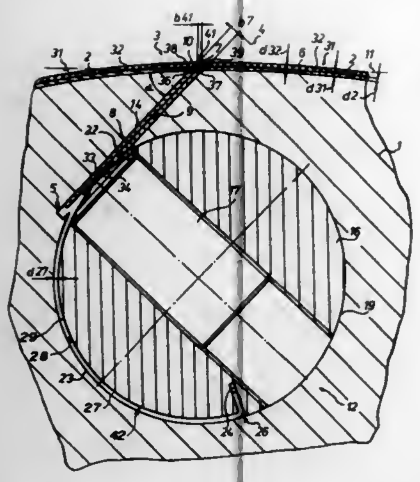


and extending inwardly into said cylinder from an outer surface of said cylinder, said slit being generally rectangular in cross-section and having a slit width;

a flexible rubber blanket unit having leading and trailing ends, said rubber blanket unit further having a rubber blanket fastened on an underlying support plate, said rubber blanket having a leading edge and a trailing edge, said support plate having a support plate thickness with a leading beveled end leg and a trailing beveled end leg, said support plate leading and trailing beveled end legs projecting past said blanket leading and trailing edges, each of said support plate leading and trailing beveled end legs having an inner face and an outer face, said support plate leading and trailing beveled end legs being insertable in said slit with said outer faces of said support plate leading and trailing beveled end legs being in direct contact with each other, and with said rubber blanket leading and trailing edges essentially abutting each other when said support plate leading and trailing beveled end legs are inserted in said slit, said slit width being uniformly slightly greater than twice said support plate thickness, said support plate leading and trailing beveled end legs filling said slit when said legs are inserted in said slit;

a rotatable pivot spindle supported in said blanket cylinder adjacent said cylinder slit for rotation about a longitudinal axis generally parallel to an axis of rotation of said blanket cylinder, said rotatable pivot spindle being rotatable between a support plate end leg insertion position and a support plate end leg clamped position; and

a plurality of pressure cams disposed axially spaced along said pivot spindle adjacent said slit, each of said pressure cams being individually spring-mounted, said plurality of pressure cams each directly contacting said inner face of one of said support plate leading and trailing beveled end legs generally perpendicularly to said inner and outer faces with a spring force, said spring forces of said pressure cams clamping said support plate leading and trailing beveled end legs in said narrow cylinder slit when said rotatable pivot spindle is in said support plate end leg clamped position.

5,687,649
MONORAIL TRACK STRUCTURE

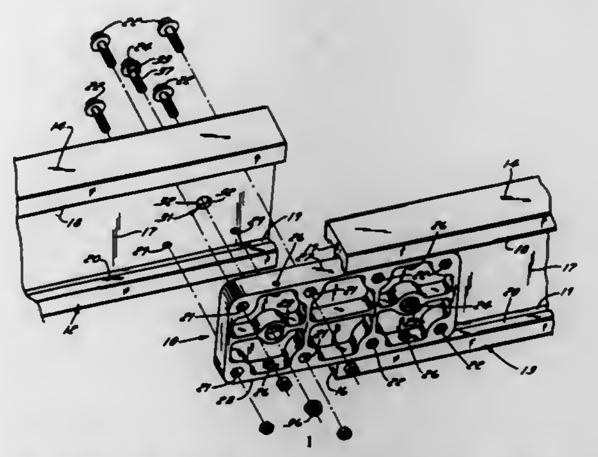
Timothy A. Koeninger, Ft. Thomas, and Weston R. Loomer, Walton, both of Ky., assignors to HK Systems, Inc., New Berlin, Wis.

Filed Apr. 10, 1996, Ser. No. 630,514
Int. Cl.^{6} E01B *25/24*

U.S. Cl. 104—106 **35 Claims**

1. A monorail track structure for a monorail vehicle including two sections of monorail track abutted end to end, the monorail track structure comprising:

a splice plate covering the joint between the two track sections, means for fastening the splice plate to the track sections, and



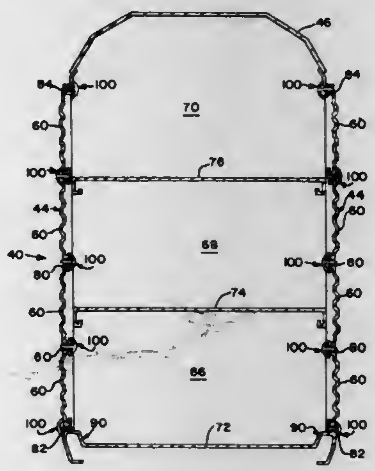
cam means for drawing the two track sections together by directly applying opposing longitudinal forces to said splice plate and to at least one of said track sections.

5,687,650
GAP CLOSING DEVICE FOR CLOSING GAPS IN AUTO RACK CAR SIDE WALLS

Richard F. Murphy, Batavia, and Michael K. Burke, Wheaton, both of Ill., assignors to Zeftek, Inc., Montgomery, Ill.

Filed Apr. 17, 1996, Ser. No. 633,591
Int. Cl.^{6} B61D *45/00*

U.S. Cl. 105—355 **17 Claims**



1. A self-locking flexible gap sealing device for closing an air gap in a side wall of an auto rack car, said side wall having a flange and a car structure spaced from said flange which define said air gap, said flange and said car structure having outer surfaces, and said flange having an inner surface, said gap sealing device comprising:

a closure flap for overlapping the air gap and engaging the outer surfaces of the flange and the car structure,

a spine extending from the closure flap and into the air gap,

means extending from the spine and foldable back against the spine and for engaging said inner surface of said flange, and

clip means for locking said engaging means into folding relation with said spine and for maintaining said engaging means in locking engagement with said inner surface of said flange,

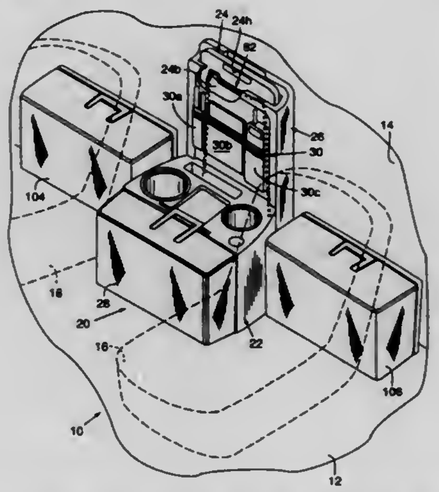
said engaging means and said clip means coacting to retain the closure flap in substantial sealing relation with the outer surfaces of the flange and the car structure, whereby contaminant-laden high velocity air is prevented from entering the air gap thereby protecting the finish on vehicles transported by the auto rack car.

5,687,651
TABLE AND STORAGE COMPARTMENT FOR A TRUCK CAB

Mark S. Hurayt, Aloha, and Joachim Paschke, Portland, both of Oreg., assignors to Freightliner Corporation, Portland, Oreg.

Filed May 3, 1996, Ser. No. 642,399
Int. Cl.^{6} A47B *37/00*

U.S. Cl. 108—44 **14 Claims**



1. A combination table and storage unit for a truck cab comprising:

a base adapted to be mounted on a floor in the cab, said base having at least one storage compartment formed therein,

an elongate table,

a table storage receptacle coupled to the base and extending upwardly therefrom defining an upright table-receiving sleeve having an open top through which said table may pass into and out of said sleeve and providing a rest for one end of the table, when out of the sleeve, and

an elongate substantially rigid table support in operative position extending between the base and the table for supporting said table in a substantially horizontal position over said base when out of said sleeve, said table support comprising an elongate support element pivotally connected adjacent one of its ends to said table for swinging between a first position disposed substantially parallel to said table to permit receipt in said sleeve and a second position extending at a substantial angle relative to the table and substantially vertically to provide support for said table.

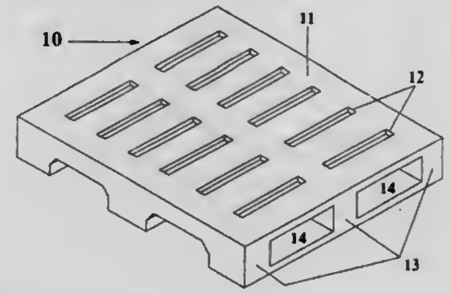
5,687,652
ORIENTED FIBER REINFORCED MONOLITHIC PLASTIC FOAM PALLET

Joseph G. Ruma, 1004 Bluebonnet Dr., Sunnyvale, Calif. 94086

Continuation-in-part of Ser. No. 083,360, Jun. 28, 1993, abandoned. This application Feb. 27, 1995, Ser. No. 394,795
Int. Cl.^{6} B65D *19/00*

U.S. Cl. 108—561 **30 Claims**

1. A monolithic pallet construction, comprising:



an upper deck,

a plurality of depending legs attached to said upper deck, and

a plurality of bottom supports attached to said depending legs, said bottom supports, said upper deck and said plurality of depending legs being integrally formed of a rigid plastic foam,

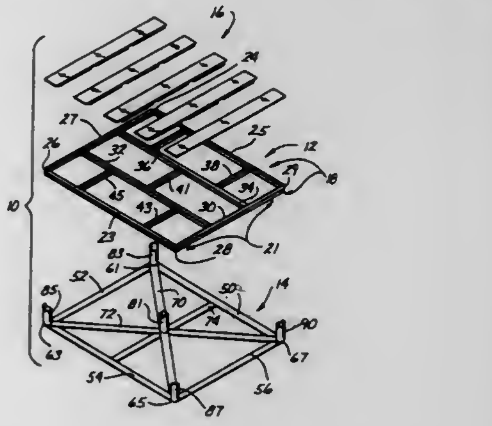
and oriented reinforcing fibers incorporated into said rigid plastic foam; within said upper deck, said oriented reinforcing fibers being oriented substantially parallel to a long axis of said upper deck; within said bottom supports, said oriented reinforcing fibers being oriented substantially parallel to a long axis of said bottom supports.

5,687,653
MODULAR METAL PALLET

Timothy R. Bumgarner, 22716 Via Santa Maria, Mission Viejo, Calif. 92691

Filed Mar. 15, 1995, Ser. No. 404,903
Int. Cl.^{6} B65D *19/00*

U.S. Cl. 108—51.1 **18 Claims**



1. A pallet having a loaded state and an unloaded state, comprising:

a top section disposed generally in a first plane and having a configuration including a plurality of sides alternating with corners of the top section;

a bottom section disposed generally in a second plane spaced from the first plane of the top section and having a configuration similar to the top section;

spacing means extending transverse to the first plane of the top section and the second plane of the bottom section for maintaining the top section and the bottom section in a spaced relationship;

a plurality of first spacing members included in the spacing means and having a fixed relationship with both the top section and the bottom section; and

at least one second spacing member included in the spacing means and having in the unloaded state a fixed relationship to one of the top section and the bottom section, and a movable relationship with respect to the other of the top section and the bottom section;

wherein the configuration of the other of the top section and the bottom section includes a camber.

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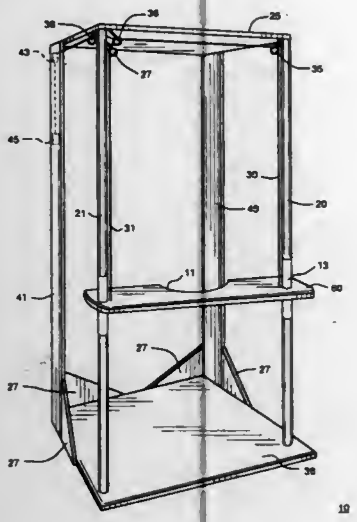
5,687,654
VERTICALLY ADJUSTABLE TABLE

Lloyd Huggins, P.O. Box 405, 20 Bagley Ave., Bucksport, Me. 04416

Filed Apr. 12, 1996, Ser. No. 631,263
Int. Cl.^{6} A47B *9/00*
U.S. Cl. 108—147 **5 Claims**



1. A table and chair combination that enables a user to enter and exit said chair without removing said table away from the front of said chair, said table and chair combination comprising:

- a table surface having opposing sides, said table surface being moveable in a vertical direction;
- a chair having arms and a height wherein said chair is positioned behind said table;
- two vertical guideposts, each having a top end, a bottom end and a length greater than the height of said chair, wherein said opposing sides of said table surface are slidably connected to said guideposts between the top end and the bottom end and wherein said guideposts are fixed in a stationary position in front of and on either side of said chair;
- a pulley system having a mechanical advantage and having at least one flexible cable having one end attached to said table surface and another end attached to a counterweight, wherein the weight of said counterweight corresponds to the weight of said table surface and the mechanical advantage of said pulley system, such that said table surface may be lowered by said user to place said table surface upon said arms of said chair placed between said guide posts so that said table surface is positioned in front of a user seated in said chair and such that said user can raise said table surface while seated in said chair so that said user can pass under said table surface when exiting said chair.

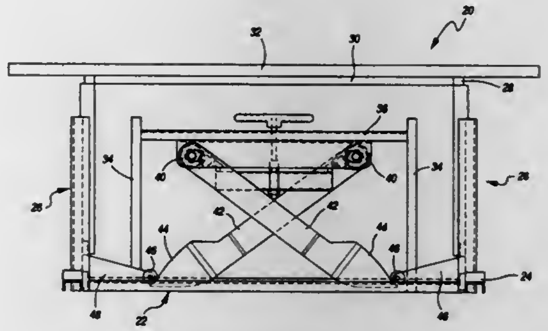
5,687,655
ADJUSTABLE HEIGHT LOAD BEARING SUPPORT STRUCTURE

Lavern L. Weinschenk, Jr., Davenport, and Jay R. Machael, Muscatine, both of Iowa, assignors to HON Industries Inc., Muscatine, Iowa

Filed Apr. 18, 1996, Ser. No. 634,592
Int. Cl.^{6} A47B *9/00*
U.S. Cl. 108—147 **24 Claims**

1. An adjustable height load bearing support structure comprising:

- a base frame;
- a generally planar support surface member;
- support assembly means configured to support said support surface member for vertical movement relative to said base frame;

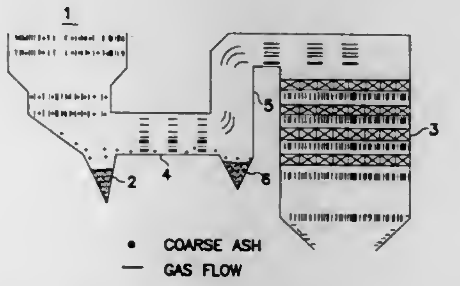


- at least one arm biased by a spring, said spring imposing changing biasing force on said arm, said arm being pivotable about an axis disposed beneath said support surface member and having a free distal end; said arm further having an effective moment arm; and
- cam means provided at the distal end of said arm and cooperable with said support assembly means for biasing said support assembly means throughout a range of vertical travel and continuously varying the effective moment arm of said arm to compensate for the changing force of the spring biasing of said arm wherein an upward force imposed by said arm on said support assembly means is substantially constant through the range of vertical travel of said support assembly means.

5,687,656
DENITRATION APPARATUS FOR A CAOL-FIRED BOILER

Shozo Kaneko; Norihisa Kobayashi, both of Tokyo; Kouhei Suyama, and Atsushi Morii, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1995, Ser. No. 547,125
Claims priority, application Japan, Oct. 25, 1994, 6-260254
Int. Cl.^{6} F23J *3/00*
U.S. Cl. 110—216 **2 Claims**



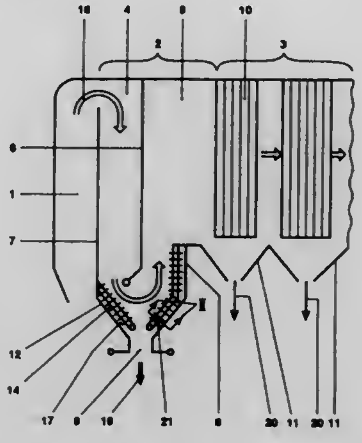
1. A coal-fired boiler arrangement, comprising:

- a coal fired boiler;
- a fuel economizer connected with said coal fired boiler, said fuel economizer having an exit;
- a horizontal passage having an upstream end connected at said exit and a downstream end;
- an air preheater; and
- an exhaust gas denitration apparatus installed between said downstream end and said air preheater, said denitration apparatus including a denitration reactor, at least one vertical passage provided upstream of and immediately preceding said denitration reactor so as to cause an upward flow of exhaust gas, and a hopper located below said at least one vertical passage, wherein said one vertical passage extends upwardly from said downstream end of said horizontal passage to said denitration reactor.

5,687,657
METHOD OF AND DEVICE FOR REDUCING THE DUST CONTENT OF THE EXHAUST GASES OF A STEAM GENERATOR

Geoarg Ziegler, Winterthur, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland

Filed Apr. 9, 1996, Ser. No. 629,736
Claims priority, application Germany, Jun. 12, 1995, 195 21 321.1
Int. Cl.^{6} F23B *7/00*
U.S. Cl. 110—234 **10 Claims**



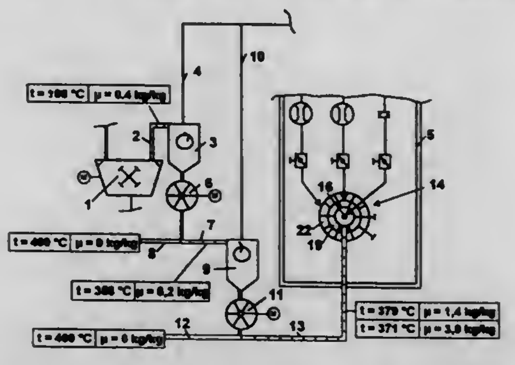
1. A method of reducing the dust content of the dust-laden exhaust gases of a steam generator which consists of a combustion chamber, a radiation part and a convection part and has at least two vertical gas passes, wherein the dust portion of the exhaust gases is reduced before the exhaust gases enter the convective part of the steam generator, the separation of the dust being improved in the region of the gas deflection from the vertical pass having downward flow to the vertical pass having upward flow by creating flow-stabilized stabilized zones, and the dust being discharged from this region by way of an opening.

5,687,658
METHOD OF INCREASING THE LEVEL OF VOLATILES IN A PULVERIZED COAL MIXTURE

Michael Streffing, Marl, and Alfons Leisse, Essen, both of Germany, assignors to Babcock Lentjes Kraftwerstechnik GmbH, Oberhausen, Germany

Filed Jun. 12, 1996, Ser. No. 662,058
Claims priority, application Germany, Jun. 13, 1995, 195 21 505.2
Int. Cl.^{6} F23D *1/00*
U.S. Cl. 110—347 **6 Claims**

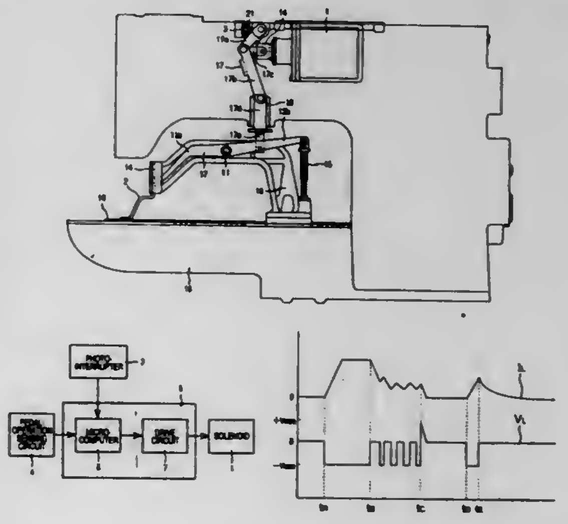
1. A method for burning coal with less than 10% volatiles in a burner supported by air, comprising the steps of: pulverizing coal in a pulverizer and supplying the pulverized coal to said burner and mixing with a vehicle in form of air in a first mixture; separating the coal from the air before the coal enters the burner and is combined into a second mixture with heated air; forwarding said second mixture at a higher temperature and with a lower level of coal; separating the coal from said second mixture and combining into a third mixture with heated air; and forwarding said third mixture at a higher temperature and with a higher level of coal.



5,687,659
WORK-SHEET PRESSING APPARATUS FOR SEWING MACHINE

Hirokazu Matsunaga, Tajimi, and Yuji Tagawa, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 12, 1996, Ser. No. 600,282
Claims priority, application Japan, Feb. 14, 1995, 7-025629
Int. Cl.^{6} D05B *19/12;29/02*
U.S. Cl. 112—470.01 **20 Claims**



1. An apparatus for moving a work-sheet pressing member of a sewing machine relative to a work-sheet supporting member to press a work sheet on the work-sheet supporting member, the apparatus comprising:

- a biasing device which produces a biasing force to move said work-sheet pressing member in a downward direction toward said work-sheet supporting member;
- a solenoid which moves, against said biasing force, said work-sheet pressing member in an upward direction away from said work-sheet supporting member;
- a control device which controls an energization of said solenoid so that said work-sheet pressing member is moved in said downward and upward directions;
- a detector which provides a detection signal indicating that said work-sheet pressing member is moved in said downward direction to a braking position which is predetermined relative to said work-sheet supporting member, said control device receiving said detection signal from said detector; and
- said control device controlling said solenoid such that, when the control device receives said detection signal during the downward movement of said work-sheet pressing member, the solenoid reduces a speed of said downward movement of the work-sheet pressing member.

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5,687,660

CLOTH EDGE CONTROL DEVICE FOR A SEWING MACHINE

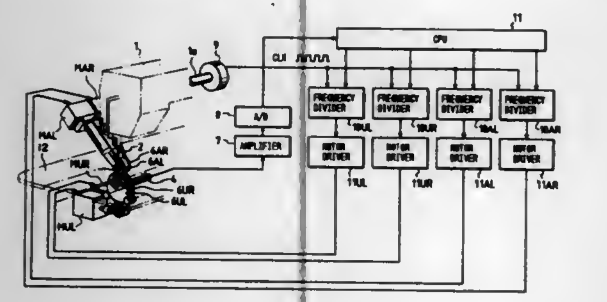
Hiroshi Honda, and Nozomi Iwasaki, both of Tokyo, Japan, assignors to Juki Corporation, Tokyo, Japan

Continuation of Ser. No. 227,107, Apr. 13, 1994, abandoned. This application Mar. 20, 1995, Ser. No. 406,794

Claims priority, application Japan, Apr. 13, 1993, 5-024436 U

Int. Cl.^{6} D05B *21/00*

U.S. Cl. 112—470.03 **4 Claims**



1. A cloth edge control device for a sewing machine, comprising:

a pair of rollers adapted to be positioned near a needle location, said rollers being rotatable about an axis perpendicular to a direction in which a cloth material is fed and being pushed against fed cloth material;

an optical sensor for detection of fed cloth material at a plurality of points on a line along a direction intersecting the feed direction; and

control means for detecting the position and curvature of the edge of fed cloth material according to light intercept signals from said optical sensor, and for rotating said rollers independently of each other according to said position and curvature thus detected.

5,687,661

FABRIC PIECE CONVEYING SYSTEM

Marvin Menzin, Lexington; Donald E. Burt, Danvers, and Henry R. Cofek, Groton, all of Mass., assignors to Design Technology Corporation, Billerica, Mass.

Filed Jan. 19, 1994, Ser. No. 183,732

Int. Cl.^{6} D05B *39/00*

U.S. Cl. 112—470.18 **102 Claims**

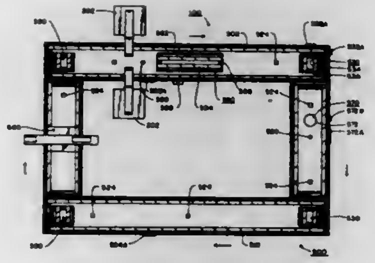
1. A fabric piece conveying system for applying a binding to an edge of a fabric piece, said apparatus comprising:

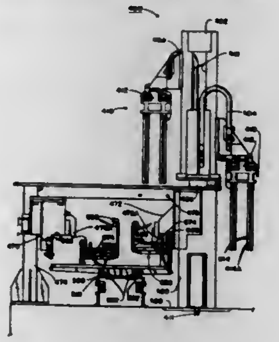
(a) a fabric piece fixture for holding said fabric piece;

(b) a conveyor for transporting said fabric piece fixture;

(c) at least one stationary work station having a supply of binding located adjacent to said conveyor for attaching said binding to said edge of said fabric piece while said fabric piece is being held by said fabric piece fixture; and

(d) a transfer station for placing said fabric piece on said fabric piece fixture, wherein said transfer station includes transport means for transporting said fabric piece and holding means for holding said fabric piece, wherein said holding means is attached to said transport means.





5,687,662

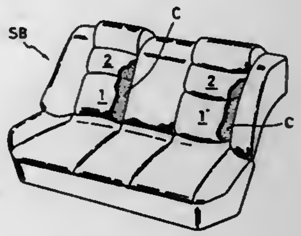
SEWING METHOD FOR FORMING A TRIM COVER ASSEMBLY

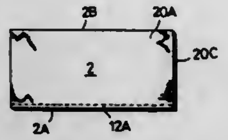
Kiyoshi Kawasaki, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1996, Ser. No. 609,525

Int. Cl.^{6} D05B *11/00*

U.S. Cl. 112—475.08 **15 Claims**





1. A method for sewing a curved edge of a first base material with an edge of a second base material to form a trim cover assembly, said method comprising the steps of:

preforming said first base material from an expansible elastic material;

providing a guide means for securing thereon said first and second base materials and guiding them towards a sewing machine;

deforming said first base material elastically from an original shape thereof in such a manner as to transform the curved edge thereof into a provisional rectilinear edge;

retaining the thus-deformed first base material with said provisional rectilinear edge, upon said guide means;

thereafter, placing said second base material onto said deformed first base material retained on said guide means, such that the edge of said second base material is juxtaposed with said provisional rectilinear edge of said deformed first base material;

causing said guide means, on which said deformed first base material and said second base materials are placed, to be moved towards said sewing machine;

sewing the edge of said second base material with the provisional rectilinear edge of said deformed first base material by means of said sewing machine; and

thereafter, removing said deformed first base material and said second base material from said guide means, whereby said first base material is elastically recovered into said original shape, with said provisional rectilinear edge thereof being returned to said curved edge.

5,687,663

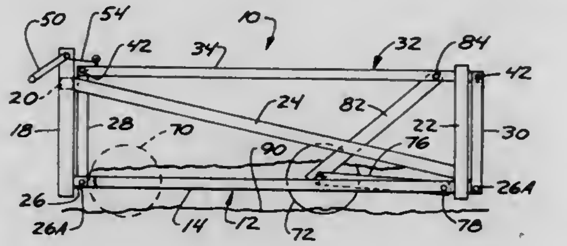
BOAT LIFT TRANSPORT APPARATUS

Noel D. Wahlstrand, 14025 - 140th Ct., Apple Valley, Minn. 55124

Filed Jun. 19, 1996, Ser. No. 666,083

Int. Cl.^{6} B63C *7/00*

U.S. Cl. 114—44 **13 Claims**



1. A boat lift assembly, comprising:

a base;

a boat support frame;

movable supports for mounting the boat support frame to the base and permitting movement of the boat support frame between a lowered position and a raised position spaced upwardly from the lowered position in a vertical direction;

at least one float roller having an axis; and

an operative link for moving the float roller closer to the base as the boat support frame is moved from one of its positions to its other position, comprising a cable having cable portions, pulleys mounted on the base in position to guide the cable portions to opposite ends of the at least one float roller, the cable portions being coupled to opposite ends of the at least one float roller so as to permit rolling of the at least one float roller about its axis when coupled to the cable portions, the cable portions extending through the pulleys and being secured relative to the boat support frame such that as the boat support frame is moved in a selected direction between its lowered and raised positions, the cable portions move through the pulleys to move the at least one float roller downwardly relative to the base.

5,687,664

FOLDABLE INFLATABLE RESCUE PONTOON

Terry N. Sofian, 352 Misty Valley Dr., St. Peters, Mo. 63376

Filed Apr. 10, 1996, Ser. No. 630,370

Int. Cl.^{6} B63B *1/00*

U.S. Cl. 114—61 **24 Claims**

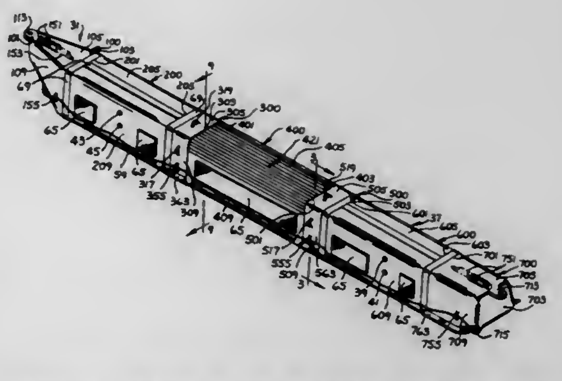
1. An inflatable rescue pontoon for performing multiple water rescue operations, the rescue pontoon comprising an elongate shell having a central longitudinal axis when the pontoon is inflated and a plurality of interconnected sections aligned longitudinally along the central longitudinal axis, the plurality of sections including a bow section, a stern section and at least one folding section

the bow section being the forwardmost section and constructed of a high-impact resistant material to prevent damage to the pontoon,

the stern section being the rearwardmost section,

the folding section being intermediate the bow and stern sections and constructed of a flexible, abrasion resistant material to prevent abrading of the shell, the abrasion resistant material being a different material than the high-impact resistant material of the bow section and being sufficiently limp when the pontoon is deflated so that the folding section is capable of folding over on itself for folding the rescue pontoon into a compact configuration for transport; and

valve means communicating with said shell for selectively inflating and deflating the pontoon.



5,687,665

SHIPS

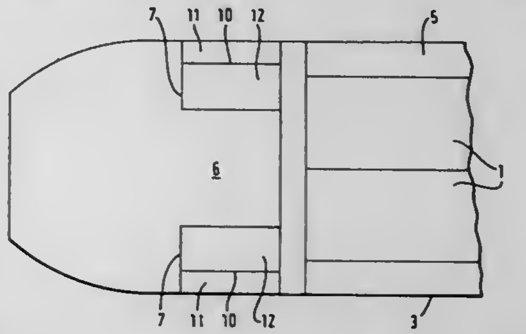
David Charles Warkman, Essex, United Kingdom, assignor to The British Petroleum Company, P.L.C., London, England

Filed Jan. 16, 1996, Ser. No. 585,764

Claims priority, application United Kingdom, Jan. 20, 1995, 9501169

Int. Cl.^{6} B63B *25/08*

U.S. Cl. 114—74 R **8 Claims**



1. A ship having a fuel tank adjacent the hull of the ship, in which said tank is provided with at least one oil-tight bulkhead, longitudinal with respect to the hull, which bulkhead divides the tank into two or more discrete compartments, at least one compartment being adjacent the hull and at least one compartment being remote from the hull, each compartment being provided with pipework such that each of said compartments independently of each other can be filled with fuel and can provide fuel to the engine and/or boiler systems of the ship.

5,687,666

DEVICE FOR THE MAST OF A SAILBOAT

Per-Gunnar Thoresen, P.O. Box 122, N-3061 Svelvik, Norway

PCT No. PCT/NO95/00002, § 371 Date Jun. 28, 1996, § 102(e) Date Jun. 28, 1996, PCT Pub. No. WO95/18744, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 2, 1995, Ser. No. 669,345

Claims priority, application Norway, Jan. 4, 1994, 940016

Int. Cl.^{6} B63B *15/00*

U.S. Cl. 114—90 **20 Claims**

1. A mast and profile combination for a sailboat, the mast being of a substantially round shape, the profile being hollow, aerodynamically designed and supported by the mast, the profile being

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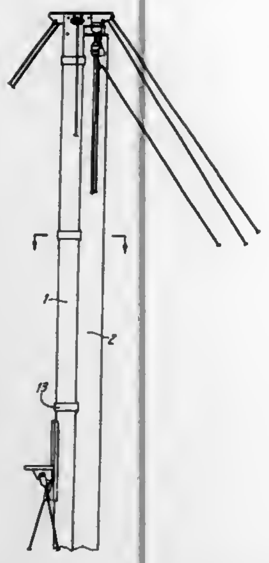
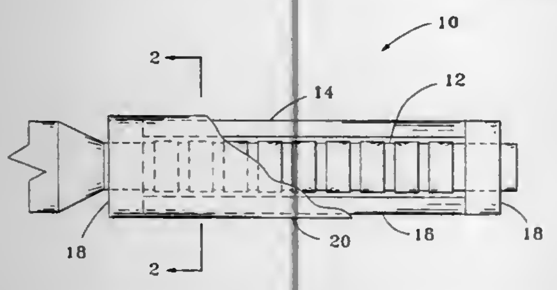


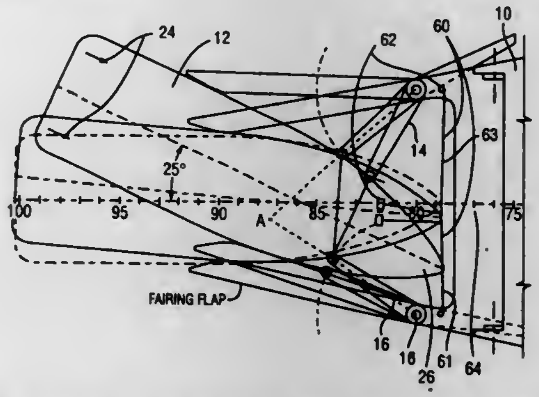
constructed to accommodate a mast rope of at least one sail of the sailboat, the profile comprising:
- two long sides, the two long sides being of substantially equal length, the two long sides being slightly convex and terminating at a distance from each other to form a slot opening, the slot opening being constructed to accommodate at least one sail therethrough; and
- a short side connected to the two long sides, the short side being substantially concave and substantially corresponding to a sector of a circle;
- the combination further comprising at least one ring element connecting the profile to the mast to provide rotation of the profile relative to the mast within a sector of about 180 degrees, such that the profile can be positioned at an angle to provide desired tractive power to the sailboat.

5,687,667
TOWED ARRAY ACOUSTIC PROJECTOR SHADING DEVICE
Thomas D. Barron, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 17, 1996, Ser. No. 682,900
Int. Cl.^{6} F15D *1/10*
U.S. Cl. 114—243 **10 Claims**



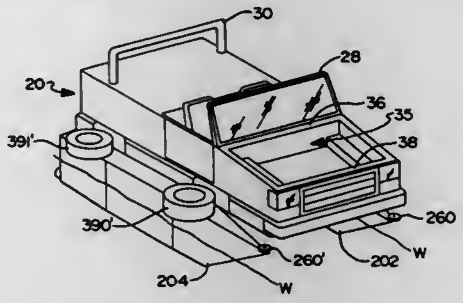
1. A signal shading device for selectively shading at least one portion of a signal emanating from a source, the shading device comprising:
- an outer covering surrounding the source, the outer cover being transparent to the signal;
- at least one attachment assembly for rotatably securing the shading device to the source;
- at least one signal absorbing area affixed to the outer covering; and
- at least one weighted area affixed to the outer covering, the weighted area creating a righting moment to maintain the shading device in a relatively fixed orientation with respect to a medium surrounding the shading device.

5,687,668
STEERABLE TUG-AND-BARGE LINKAGE
Masasuke Kawasaki, 1002 Michigan Ave., Slidell, La. 70458
Filed Oct. 27, 1994, Ser. No. 331,351
Int. Cl.^{6} B63B *21/62*
U.S. Cl. 114—249 **35 Claims**



35. A method for enhancing the lateral flexibility of connected nonsteerable vessels, comprising: pivotally connecting a first nonsteerable vessel to a second nonsteerable vessel such that the first and second nonsteerable vessels can yaw with respect to each other; preventing jackknifing between the first and second nonsteerable vessels; and eliminating undesirable yaw angles between the first and second nonsteerable vessels without the use of external force.

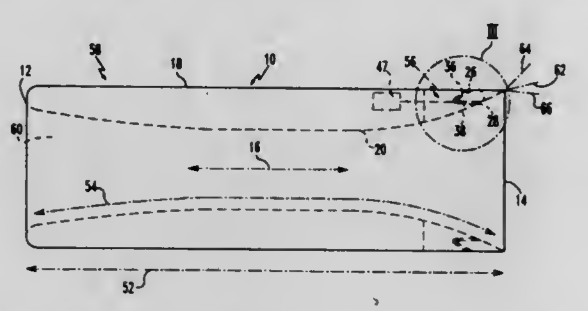
5,687,669
AMPHIBIOUS VEHICLE
Manfred W. Engler, 3201 Conger St., Port Huron, Mich. 48060
Filed Dec. 8, 1995, Ser. No. 569,592
Int. Cl.^{6} B60F *3/00*
U.S. Cl. 114—270 **31 Claims**



1. An amphibious vehicle comprising:
- a frame structure;
- a pontoon assembly including a pair of pontoons;
- a pivot mechanism coupling said pontoon assembly to said frame structure such that said pair of pontoons are pivotally positionable between a raised position wherein said pair of pontoons are stowed and a lowered position wherein said pair of pontoons are deployed;
- a set of wheels supported by said pontoon assembly and extending therefrom such that said set of wheels are operably deployed when said pontoon assembly is positioned in said raised position, and said set of wheels are stowed when said pontoon assembly is in said lowered position;
- an engine mounted on said frame structure;

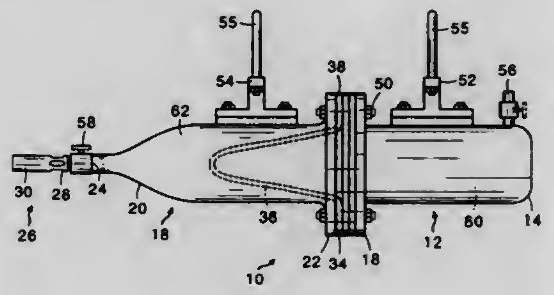
- a marine drive unit; and
- a powertrain for transmitting torque generated by said engine to selectively drive said set of wheels and said marine drive unit.

5,687,670
CIRCUMFERENTIAL CIRCULATION CONTROL SYSTEM
James Q. Rice, IV, Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 7, 1996, Ser. No. 605,315
Int. Cl.^{6} B63G *8/08*
U.S. Cl. 114—312 **19 Claims**



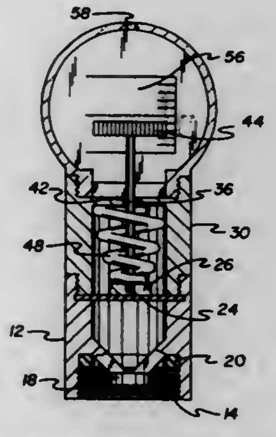
1. A device for maneuvering a vehicle immersed in a fluid medium comprising:
- a tubular body having a longitudinal axis and outer and inner peripheral surfaces;
- a plurality of maneuvering means circumferentially arranged on the tubular body for conveying fluid between said outer and inner peripheral surfaces; and
- a controlling means joined to said maneuvering means for controlling the conveying of fluid between said outer and inner peripheral surfaces to produce pressure on the tubular body which is asymmetrical with respect to the longitudinal axis of the tubular body.

5,687,671
UNDERWATER PROPULSION DEVICE
Alfred A. Gates, Moodus, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 17, 1996, Ser. No. 636,999
Int. Cl.^{6} B63C *11/46*
U.S. Cl. 114—315 **18 Claims**



1. A water jet propulsion device comprising:
- a housing means having a rigid cylindrical form;
- a pressurized gas containing means having pressurized gas therein positioned inside said housing means;
- a liquid containing means having liquid therein positioned inside said housing means behind the pressurized gas containing means;
- a flexible pressure transmission means interposed between the forward pressurized gas containing means and the liquid containing means; and
- an aft liquid release means in communication with the liquid containing means for releasing liquid there from under pressure.

5,687,672
PRESSURE INDICATOR FOR TIRES
Earl W. Gabriel, 445 Fredericks Rd., Johnson City, N.Y. 13790
Filed Jan. 16, 1996, Ser. No. 585,943
Int. Cl.^{6} B60C *23/04;* **G01L** *7/08*
U.S. Cl. 116—34 R **7 Claims**



1. A pressure indicator for tires for indicating pressure of a tire through a housing allowing a user to easily read tire pressure within a given tire comprising, in combination:
- a lower cylindrical housing having an internally threaded open lower end and an internally threaded open upper end, the internally threaded open lower end dimensioned for removable coupling with a valve stem of a tire, the open lower end having an air receiving portion therein, the air receiving portion having an O-ring secured therearound;
- a flexible diaphragm disposed within the internally threaded open upper end of the lower cylindrical housing, the diaphragm having a threaded receiving aperture secured to a central portion thereof;
- an upper cylindrical housing having an externally threaded open lower end and an internally threaded upper end, the upper cylindrical housing having an aperture formed through a central portion thereof, the externally threaded lower end coupled with the internally threaded open upper end of the lower cylindrical housing with the aperture aligned with the threaded receiving aperture of the flexible diaphragm;
- a T-shaped indicating pin having a lower vertical end portion extending through the aperture in the upper cylindrical housing to couple with the threaded receiving aperture of the flexible diaphragm, the T-shaped indicating pin having an upper horizontal end extending upwardly from the upper cylindrical housing;
- a tri-level spring coupled around the lower vertical end of the T-shaped indicating pin and positioned within the open lower end of the upper cylindrical housing, a lower end of the spring abuts a wall portion of the upper cylindrical housing and an upper end of said spring abuts, the threaded receiving aperture to bias the diaphragm downwardly with respect to the lower cylindrical housing;
- a magnifying dome having an externally threaded open lower end adapted for coupling with the internally threaded upper end of the upper cylindrical housing, the magnifying dome receiving the upper horizontal end of the T-shaped indicating pin therein, the magnifying dome having an indicating chart positioned therein, the magnifying dome having an aperture formed through an upper end thereof.

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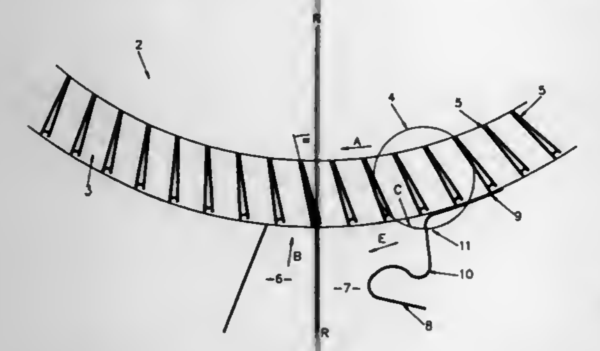
5,687,673
ENTRY AND EXIT CONTROLS FOR ROTARY ANIMAL PLATFORM

John Murray Bowers, Grey Street, Murchison, New Zealand
Filed Dec. 18, 1995, Ser. No. 574,226
Claims priority, application New Zealand, Apr. 10, 1995, 270905
Int. Cl.^{6} A01K *1/12*
U.S. Cl. 119—14.04 **8 Claims**

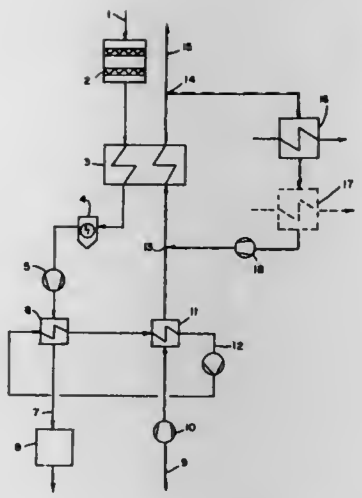


1. A rotary animal platform having an entry means and an exit means, in which said platform comprises a horizontally disposed annular platform mounted for rotational movement about a vertical central axis, the upper side of said platform being evenly divided into a plurality of bails each being sized to receive therein an animal and being open at at least the outer end, each said bail having a restraining rail along each side thereof and each bail being offset on an angle to a radial line through the bail wherein said exit means incorporates a curved restraining rail positioned adjacent the platform against which an animal leaving the platform is backed such that the animal's front feet only are on the platform, wherein the direction of movement of the platform is such that the movement of the platform turns the animal away from the centre of the platform and one of the bail restraining rails, with the curved restraining rail assisting in guiding the animal to the exit means.

5,687,674
STEAM POWER PLANT FOR GENERATING ELECTRIC POWER

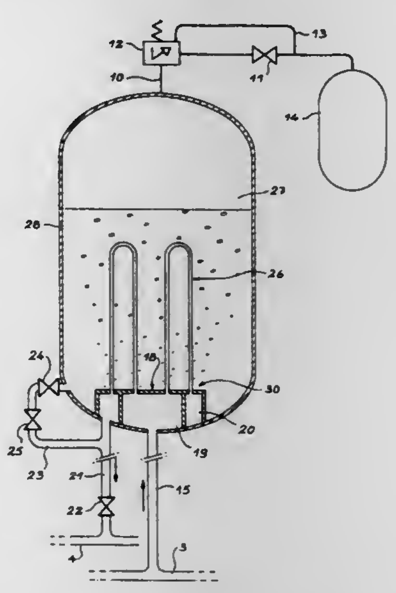
Uwe Johänntgen, Wadgassen, and Franz Josef Marx, St. Wendel, both of Germany, assignors to Saarbergwerke Aktiengesellschaft, Saarbrücken, Germany
PCT No. PCT/DE94/00530, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO94/27089, PCT Pub. Date Nov. 24, 1994
PCT Filed May 9, 1994, Ser. No. 367,163
Claims priority, application Germany, May 10, 1993, 43 15 482.4; Oct. 15, 1993, 43 35 216.2
Int. Cl.^{6} E22B *33/00*
U.S. Cl. 122—1 A **13 Claims**

1. A steam power plant for generating electric power has a fossil-fuelled boiler, a water-steam cycle for generating high-tension superheated steam for a steam turbine, an economizer to transmit heat from flue gas to the feed-water, an air preheater to transmit flue gas heat to fresh air, and devices for removing dust, sulphur and possibly nitrogen from the flue gas and is characterized in that it has a first heat exchanger system (16, 17) with a section through which recirculated air and a heat vehicle medium flow, whereby the section carrying the air is connected on the intake side (14) to the fresh-air outlet of the air preheater (4) and on the outlet side (13) to the fresh-air intake of the air preheater (4).



5,687,675
DEVICE FOR VAPORIZING THE DIPHASIC MIXTURE OF A COOLING CIRCUIT DURING A DEPRESSURIZING PROCEDURE

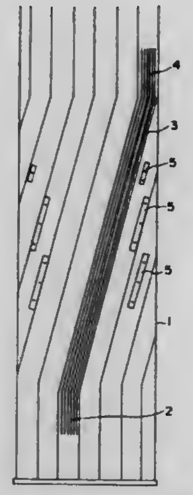
Patrick Aujollet, Pertuis, and Patrice Clement, Saint Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 21, 1995, Ser. No. 576,137
Claims priority, application France, Jan. 18, 1995, 95 00510
Int. Cl.^{6} F22B *1/00*
U.S. Cl. 122—4 D **5 Claims**



1. Vaporization device connected to a cooling circuit, wherein it includes a receptacle connected to a first point of the circuit by a first pipe and to a second point of the circuit, colder than the first one, by a second pipe, the pipes being connected by heat exchange tubes situated in a lower portion of the receptacle, an additional pipe connecting the inside of the receptacle to the second pipe, said additional pipe being fitted with a stop valve and a flow regulating device, a vapor rejection pipe opening into the upper portion of the receptacle.

5,687,676
STEAM GENERATOR

Norichika Kai; Susumu Sato; Tsuneo Fukuda, all of Nagasaki, and Shozou Kaneko, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 3, 1996, Ser. No. 657,302
Int. Cl.^{6} F22B *37/00*
U.S. Cl. 122—6 A **9 Claims**



1. A steam generator operable under both supercritical pressure and subcritical pressure having a plurality of generating tubes forming a furnace wall and comprising:

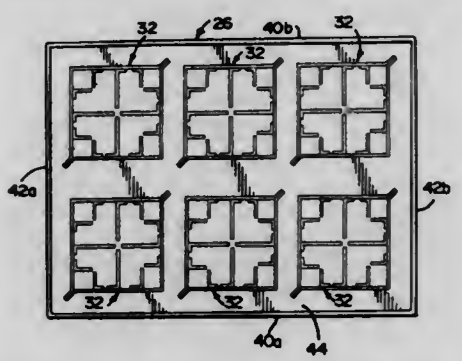
upper and lower generating tubes that extend and are directed parallel to a vertical line; and

central generating tubes interconnecting said upper and lower generating tubes, said central generating tubes being inclined at an angle of inclination of 10 to 35 degrees with respect to said vertical line;

wherein said upper generating tubes, said central generating tubes and said lower generating tubes are all the same in number.

5,687,677
HEAT EXCHANGE TUBE AND METHOD OF MAKING SAME

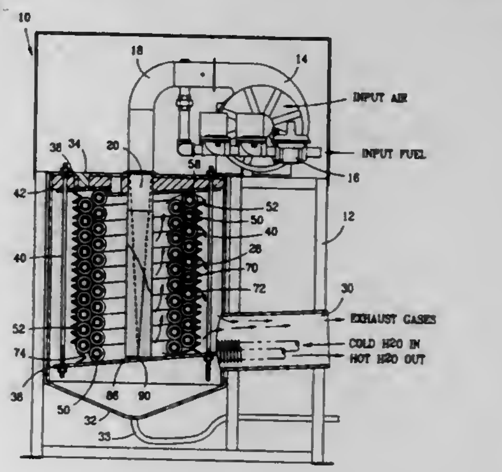
G. Robert Oslin, Chicago, Ill., assignor to Delaware Capital Formation, Inc., Wilmington, Del.
Continuation of Ser. No. 443,414, May 22, 1995, abandoned. This application Jul. 18, 1996, Ser. No. 684,511
Int. Cl.^{6} F22B *9/00*
U.S. Cl. 122—44.2 **14 Claims**



1. A steam generator comprising, in combination, a plurality of substantially identical elongated heat exchange tubes each of which has an outer wall of generally rectangular transverse cross-section, an outer shell extending peripherally about said heat exchange tubes, upper and lower end plates having openings receiving upper and lower ends of said heat exchange tubes in fluid tight relation therewith, said upper and lower end plates maintaining said tubes in parallel spaced relation and being secured to said outer shell so as to establish a fluid chamber about said heat exchange tubes, each of said heat exchange tubes having a plurality of internal generally right-angle fins secured to inner surfaces of said outer wall so as to define a plurality of discrete longitudinal flow passages through which a heated gas may be passed with said internal fins effecting heat transfer to said outer wall so as to convect heat to a fluid disposed within said fluid chamber.

5,687,678
HIGH EFFICIENCY COMMERCIAL WATER HEATER

Frank H. Suchomel, Dallas, and John B. Hankins, Waxahachie, both of Tex., assignors to Weben-Jarco, Inc., Dallas, Tex.
Filed Jan. 26, 1995, Ser. No. 378,784
Int. Cl.^{6} F22B *21/26*
U.S. Cl. 122—250 R **15 Claims**



1. A water heater apparatus comprising:
- (a) a housing;
- (b) a radial-fired burner within said housing;
- (c) a single continuous, multiple loop, finned coil tubing heat exchanger, having inlet and outlet tubing for circulating water around said burner and having at least a first set of inner coils forming a coil trough therebetween and a second set of outer coils nested within said coil trough formed by said inner set of coils, said coils forming a second coil trough around the exterior thereof wherein said single continuous, multiple loop, finned coil tubing is positioned vertically about a central axis so that the inlet and the outlet of the single continuous, multiple loop, finned coil tubing heat exchanger is positioned at the bottom of the inner and outer coils, with said inlet connected at the bottom to the outer coils and the outlet connected at the bottom to the inner coils and having a "U" connector at the top, so that water flows up around the outer coils and is returned in counter flow, with the "U" connector flowing down to the inner coils and out through the outlet, so that the exiting water is closest to the radial-fired burner and the water exits at a maximum temperature; and
- (d) a coil baffle interposed in said second exterior trough for deflecting heat adjacent to said second set of coils.

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5,687,679

MULTIPLE NANOLAYER COATING SYSTEM

Richard S. Mullin, Pomfret Center; William P. Allen, Portland; Maurice L. Gell, Newington, all of Conn.; Richard H. Barkalow, Palm Beach Shores, Fla.; Allan A. Noetzel, Palm Beach Gardens, Fla.; John W. Appleby, Palm Beach Gardens, Fla., and Abdus S. Khan, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 321,052, Oct. 5, 1994, abandoned. This application May 28, 1996, Ser. No. 657,002

Int. Cl.⁶ B32B *18/00*

U.S. Cl. 123—41.79 **5 Claims**

1. An air cooled gas turbine component which comprises:

a. a superalloy substrate having internal cooling passages for the flow of cooling air,

b. a thermal barrier coating on said substrate, comprising:

at least 10 layers of ceramic, each layer being from about 10 angstroms to 10,000 angstroms in thickness, each layer being separated from adjacent layers by a stable interface with the total thickness of the coating being at least 1 mil (25 microns).

5,687,680

VALVE SYSTEM FOR OVERHEAD VALVE INTERNAL COMBUSTION ENGINE

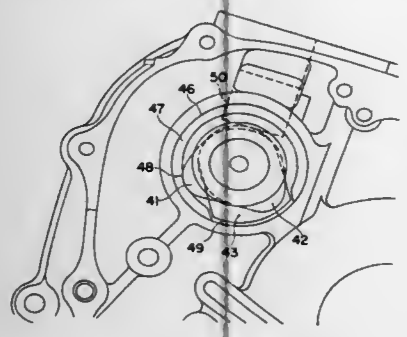
Takashi Shichinohe, and Yukio Ishiuchi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 501,798

Claims priority, application Japan, Jul. 13, 1994, 6-184100

Int. Cl.⁶ F01L *1/14; 13/08;* **F02F** *11/00*

U.S. Cl. 123—90.6 **15 Claims**



8. A valve system for an internal combustion engine having a cam shaft axially removably supported and push rods mounted for reciprocation on an upper surface of said cam shaft through tappets for opening/closing overhead valves comprising:

a crankcase for mounting said cam shaft for rotation;

an opening formed in said crankcase for removing said cam shaft from said crankcase, said opening being of a predetermined size larger relative to size of a cam base circle and smaller in size relative to a size of a cam lobe vertex; and

cutout portions formed in said crankcase being larger in size relative to said cam lobe vertex, said cutout portions being formed to permit said cam shaft to be removed from said crankcase when said cam lobe vertex is aligned with said cutout portions.

5,687,681

PHASE CHANGING MECHANISM FOR CAMSHAFT OF INTERNAL COMBUSTION ENGINE

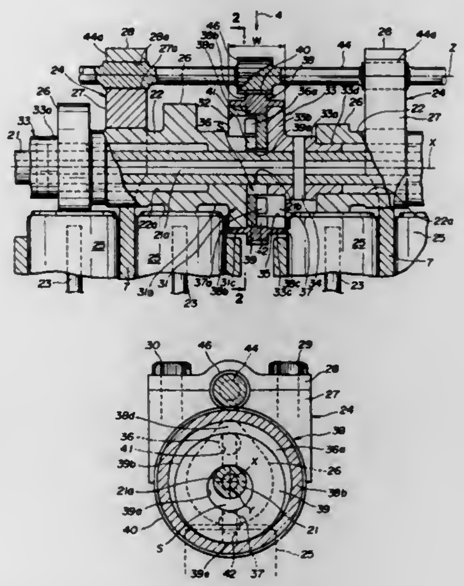
Seinosuke Hara, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Oct. 18, 1996, Ser. No. 734,022

Claims priority, application Japan, Oct. 18, 1995, 7-269596; Nov. 15, 1995, 7-295869; Jun. 6, 1996, 8-143806

Int. Cl.⁶ F01L *13/00*

U.S. Cl. 123—90.17 **24 Claims**



1. A phase changing mechanism comprising:

a driving shaft rotatable about a shaft axis;

a cam rotatable relative to said driving shaft;

a drive member rotatable with said driving shaft;

a driven member rotatable with said cams

a support;

an intermediate member supported in said support for rotation about an axis thereof;

a first coupling coupling said drive member with said intermediate member at a first position spaced from said shaft axis;

a second coupling coupling said driven member with said intermediate member at a second position angularly spaced from said first position with respect to said shaft axis;

said first coupling having a movable connection with said intermediate member to permit variation in a distance of said first position from said axis of rotation of said intermediate member during operation,

said second coupling having a movable connection with said intermediate member to permit variation in a distance of said second position from said axis of rotation of said intermediate member during operation,

an eccentric circular.cam fixed to said support;

said intermediate member being journalled in said eccentric circular cam,

said support being supported by at least one of said drive and driven members for rotation about said shaft axis.

5,687,682

METHOD AND APPARATUS FOR STARTING AN INTERNAL COMBUSTION ENGINE

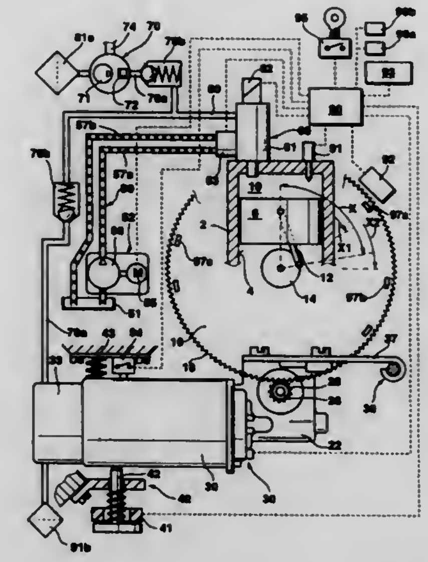
Helmut Rembold, Stuttgart; Gottlob Haag, and Werner-Karl Marquardt, both of Markgroeningen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 8, 1995, Ser. No. 554,305

Claims priority, application Germany, Nov. 8, 1994, 44 39 849.2

Int. Cl.⁶ F02N *17/00*

U.S. Cl. 123—179.3 **29 Claims**



1. An apparatus for starting an internal combustion engine, having at least one piston (6) which is movable in a cylinder space and which bounds a combustion space (10) in the cylinder space, comprising a fuel metering system (50) for metering fuel which is directed into the combustion space (10), an ignition device (91) which extends into said combustion space (10) for initiating ignition of the fuel, and a setting drive (30) is provided which, before ignition, sets the piston (6) in a starting position (X) favorable for achieving a high acceleration of the piston (6) in which starting is initiated by a combustion of the fuel in the combustion chamber.

5,687,683

AUTOMATIC DECOMPRESSOR FOR VALVE-CONTROLLED INTERNAL COMBUSTION ENGINES

Richard Knoblauch, Weissach, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Nov. 12, 1996, Ser. No. 744,149

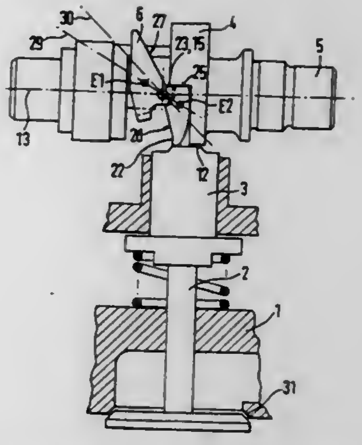
Claims priority, application Germany, Nov. 22, 1995, 195 43 445.5

Int. Cl.⁶ F01L *13/08*

U.S. Cl. 123—182.1 **9 Claims**

1. Automatic decompressor for valve-controlled internal combustion engines with at least one camshaft for actuating charge changing valves comprising:

a decompression lever cooperating with at least one charge changing valve and having at least two lever arms, which decompression lever is mounted on a rotational axis on the camshaft and is rotatable by centrifugal forces that develop as a result of rotational movement of the camshaft from a first switch position into a second switch position, with a camshaft axis and the rotational axis being approximately perpendicular to one another,



wherein the total center of gravity of the decompression lever is located at least approximately on the rotational axis.

5,687,684

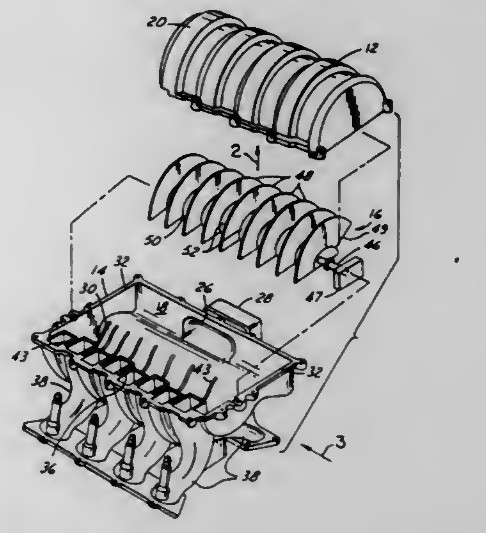
CONTINUOUSLY VARIABLE INTAKE MANIFOLD

Ronald Luce Verkleeren, Dearborn, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Dec. 6, 1996, Ser. No. 761,275

Int. Cl.⁶ F02B *27/02*

U.S. Cl. 123—184.55 **16 Claims**



1. An intake manifold directing air flow into a multi-cylinder internal combustion engine comprising:

a plurality of fixed intake runners, each adapted to align with a respective one of the cylinders;

a manifold housing including an intake passage and a plurality of outlet passages, each outlet passage opening into a different one of the fixed intake runners, with the housing further including a mid-section, located between the intake passage and outlet passages, providing an open chamber; and

a runner beam, mounted within the chamber and rotatable therein, with the runner beam including a runner shaft, extending normal to the general direction of air flow, about which rotation takes place; a plurality of runner blades extending from the runner shaft, generally spaced from one another to allow air flow between them and extending out to an inner surface portion of the manifold housing; and a plurality of base sections mounted to the runner shaft between the runner blades that, together with the corresponding blades and the inner surface portion of the manifold housing, define variable runner passages, one each to a respective one of the

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outlet passages, whereby rotation of the runner shaft will allow the manifold to have selectively variable air flow passages.

5,687,685

VALVE SEAT AND METHOD

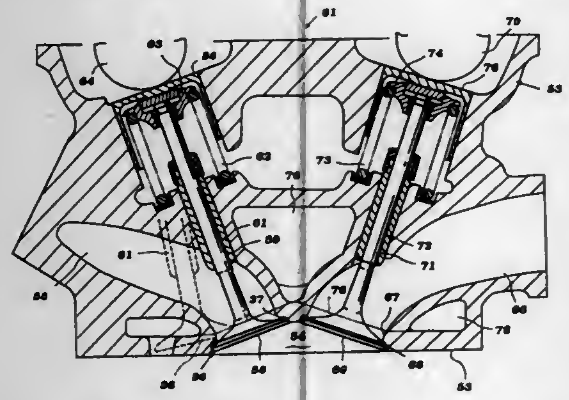
Junkichi Amano, and Masaaki Yoshikawa, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 1, 1996, Ser. No. 625,941

Claims priority, application Japan, Mar. 31, 1995, 7-076624

Int. Cl.^{6} F01L *3/22*

U.S. Cl. 123—188.8 **12 Claims**



1. A cylinder head assembly comprising a main body formed from a first material and defining a recess adapted to cooperate with an associated cylinder bore and piston for forming a combustion chamber, at least one flow passage extending through said main body from said recess, and a valve seat formed at the recess end of said passage by an insert ring formed from a material dissimilar from said first material and metallurgically bonded thereto by applying sufficient pressure and heat to said insert ring and said main body to plastically deform said main body without effecting melting and alloying of said materials, said insert ring having an inclined seating surface adapted to be engaged by a poppet valve for controlling the flow through said passage, said seating surface terminating at its outer periphery adjacent the outer peripheral edge of said insert ring so that the entire surface of said insert ring from its outer periphery to the passage is engaged by the poppet valve.

5,687,686

LUBRICATING SYSTEM FOR FOUR CYCLE OUTBOARD MOTOR

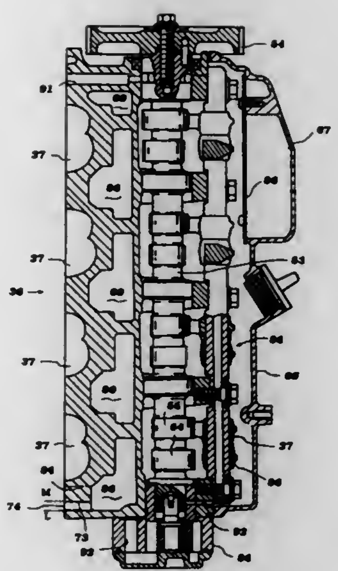
Masanori Takahashi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 7, 1996, Ser. No. 689,301

Claims priority, application Japan, Aug. 7, 1995, 7-201201

Int. Cl.^{6} F02F *7/00*

U.S. Cl. 123—195 P **18 Claims**



1. An outboard motor comprised of a powerhead consisting of a four-cycle internal combustion engine and a surrounding protective cowling, said engine being comprised of a cylinder block having at least two vertically spaced cylinder bores, the axes of all of said cylinder bores all lying in a common vertical plane, a crankcase chamber formed at one end of said cylinder bores and containing a crankshaft rotatably journaled about a vertically extending axis, a drive shaft housing and lower unit depending from said powerhead and containing a drive shaft rotatable about a vertically extending axis and driven by said crankshaft, said crankshaft being driven by pistons reciprocating in said cylinder bores, a cylinder head affixed to said cylinder block and in closing relationship to the ends of cylinder bores opposed from said crankcase chamber, said cylinder block and said cylinder head having a cooling jacket through which liquid coolant is circulated, an oil tank for said engine disposed vertically beneath said engine, and a drain passage for draining lubricant from said cylinder head to said oil tank through said cylinder block, said drain passage being disposed vertically above the lowermost portion of said cylinder head cooling jacket.

5,687,687

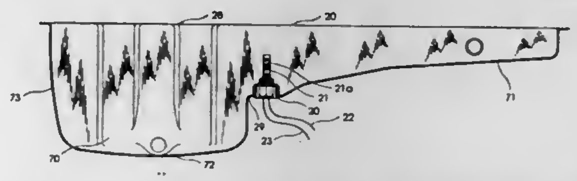
OIL LEVEL SENSOR SYSTEM

Jimmie J. Trueblood, Columbus; Mary L. Till, Indianapolis; Lynn S. Zopff, Columbus, all of Ind., and Bradly G. Duffer, Metamora, Ill., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 7, 1995, Ser. No. 477,294

Int. Cl.^{6} F01M *11/10*

U.S. Cl. 123—196 S **15 Claims**



1. A fluid level sensor system operable to indicate either when the fluid level in a movable reservoir is below a predetermined low level limit or when the fluid level in the reservoir is above a predetermined high level limit, said fluid level sensor system comprising:

a movable fluid reservoir which is constructed and arranged to be oriented in a plurality of different tilt angles, said plurality of different tilt angles defining a plurality of cross over points based upon the fluid level in said reservoir;

a fluid level sensor assembled to said fluid reservoir at a location which is adjacent to said cross over points and having first sensor means responsive to a low fluid level in said fluid reservoir for generating a first level signal and having second sensor means responsive to a high fluid level in said fluid reservoir for generating a second level signal;

an electronic control module electrically connected to said fluid level sensor for receiving and processing said first and second signals; and

a warning indicator electrically connected to said electronic control module for providing a first warning signal corresponding to said first level signal and a second warning signal corresponding to said second level signal, said first warning signal being different from said second warning signal so as to differentiate between a low level fault and a high level fault.

5,687,688

VERTICAL ENGINE

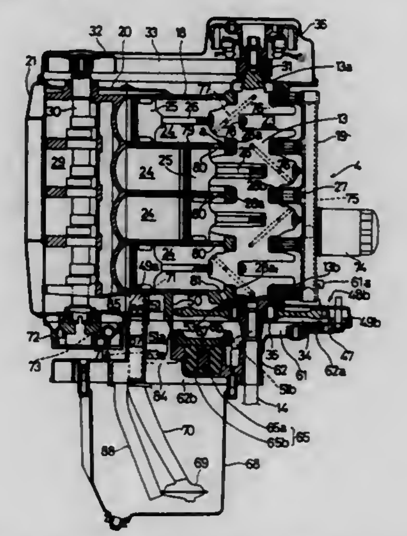
Masaki Tsunoda; Tetsu Wada; Yoshimi Watanabe, and Hiroyuki Yoshida, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1995, Ser. No. 534,969

Claims priority, application Japan, Oct. 3, 1994, 6-263195; Oct. 3, 1994, 6-263196; Oct. 3, 1994, 6-263197

Int. Cl.^{6} F01M *11/02*

U.S. Cl. 123—196 W **8 Claims**



1. A vertical engine having a crankshaft directed in a vertical direction and a flywheel provided on a lower end of the crankshaft projected through a bottom wall of a crank chamber comprising:

a flywheel compartment formed under said bottom wall of the crank chamber for housing said flywheel;

an oil pan provided under said flywheel compartment and containing oil for lubricating said crankshaft, at least a part of said oil pan being positioned at a side opposite to said crank chamber with respect to said flywheel compartment;

an oil return passage for returning said oil from said crank chamber to said oil pan detouring around said flywheel compartment, wherein said oil return passage is formed in a housing covering said flywheel and includes a first vertical passage portion positioned lower than said flywheel and communicating with said oil pan and a second passage portion extending along an outer peripheral part of said flywheel compartment and inclined downward toward said first passage portion.

5,687,689

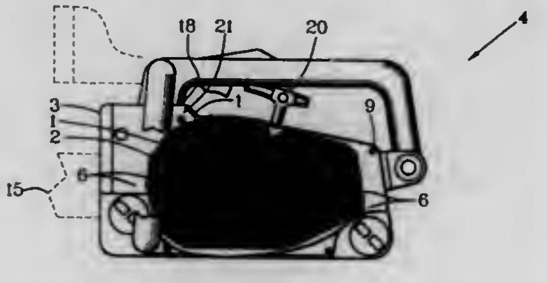
AIR COOLED ENGINE SCREEN AND METHOD

Eligio Santos, 3890 21st Ave. SW., Naples, Fla. 33964

Filed Oct. 15, 1996, Ser. No. 730,082

Int. Cl.^{6} F02B *77/00*

U.S. Cl. 123—198 E **6 Claims**



1. An air-cooled-engine screen for an air-cooled engine within an engine enclosure comprising:

at least one screen that is sized and shaped to cover airflow entrances to the air-cooled engine in the engine enclosure for an engine-powered item;

strands of the screen which have tensile strength, toughness, spaced-apart distances and strand-crossing distances to allow the required airflow through the screen while preventing passage of engine-gumming material through the screen; and

a means for attaching the screen to the engine enclosure in covering position on the airflow entrances wherein the means for attaching the screen to the engine enclosure is high-strength adhesive that is applied to intermediate select attachment-side surfaces of the screen and select outside surfaces of the engine enclosure; and

an outside surface of the screen is free of obstruction for ease of being wiped clean and brushed clean.

5,687,690

MOTOR VEHICLE DRIVE DEVICE

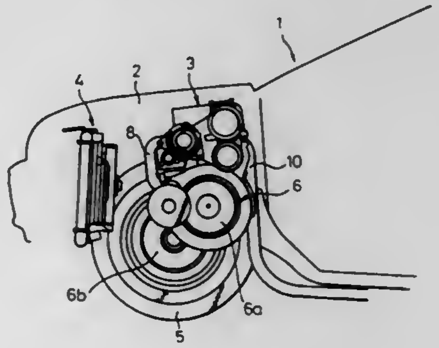
Eiichi Kamiyama, Mishima; Tatehito Ueda; Toshio Itoh, both of Susono; Hiroshi Tada, Mishima; Hideo Nagaosa; Shinichi Sano, both of Susono; Katsuhiko Aoyama, Nukata-gun, and Tetsu Yamada, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 20, 1995, Ser. No. 560,855

Claims priority, application Japan, Nov. 24, 1994, 6-289697; Nov. 25, 1994, 6-291288

Int. Cl.^{6} F02B *77/00*

U.S. Cl. 123—198 R **10 Claims**



1. An engine for use in a motor vehicle, comprising:

an engine body extending from a first end to a second end along a lateral axis, including:
  (a) a plurality of cylinders each having at least one intake valve and at least one exhaust valve,
  (b) a crankshaft,
  (c) an intermediate shaft driven by the crankshaft and arranged in parallel to the crankshaft at a position which is laterally remote from a plane including axes of the cylinders, and
  (d) a camshaft driven by said intermediate shaft to drive at least one of the intake valve and the exhaust valve;

a trans-axle attached to and extending from the first end of the engine body, wherein a forward-most point on the surface of the trans-axle is included in a forward vertical plane and a rearward-most point on the surface of the trans-axle is included in a rear vertical plane; and

at least one auxiliary machine arranged above the trans-axle and driven by said intermediate shaft, wherein the at least one auxiliary machine is located at the first end of the engine body between the forward and rear vertical planes.

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5,687,691

THROTTLE DEVICE AND METHOD FOR PRODUCING A THROTTLE DEVICE

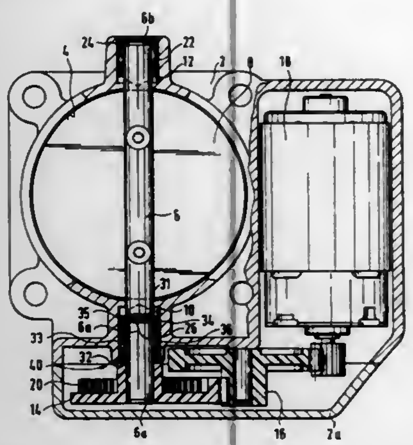
Klaus Kaiser, and Werner-Karl Marquardt, both of Markgroeningen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 22, 1996, Ser. No. 620,238

Claims priority, application Germany, Mar. 23, 1995, 195 10 622.9

Int. Cl.^{6} F02D *9/10;* **F16K** *1/22*

U.S. Cl. 123—337 **12 Claims**



1. A throttle device for an internal combustion engine, comprising a throttle flap housing, a throttle flap connected to a throttle flap shaft, a first stop **31, 31"**, **31""**) and a second stop (**32**, **32"**, **32""**) provided at least indirectly on said throttle flap shaft, the throttle flap shaft being pivotably mounted in a bearing recess provided on the throttle flap housing and being pivotable by means of an actuating device engaging on the throttle flap shaft, wherein there is provided a bearing means (**33**) which is at least indirectly fixed in the axial direction relative to the throttle flap shaft (**6**) and which is pivotable in the circumferential direction relative to the throttle flap shaft (**6**), the bearing means (**33**) being retained at least indirectly in the bearing recess (**10**) in an axial direction between said first and second stops, and a claiming means (**34**) which clamps said bearing means (**33**) against one of said first and second stops.

5,687,692

COMBUSTION STATE DETERMINATION METHOD OF INTERNAL COMBUSTION ENGINE, AS WELL AS COMBUSTION STATE CONTROL METHOD AND COMBUSTION STATE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kazuhide Togai; Osamu Hirako, and Shogo Omori, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP94/02154, § 371 Date Sep. 14, 1995, § 102(e) Date Sep. 14, 1995, PCT Pub. No. WO95/17592, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 20, 1994, Ser. No. 505,248

Claims priority, application Japan, Dec. 21, 1993, 5-322212; Dec. 22, 1993, 5-323546; Apr. 8, 1994, 6-070765

Int. Cl.^{6} F02D *45/00*

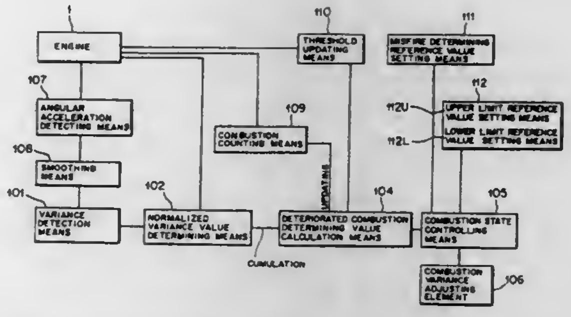
U.S. Cl. 123—436 **16 Claims**

1. A method for a determination of a state of combustion in an internal combustion engine, comprising:

detecting a variance value in angular acceleration of a rotating shaft driven by said internal combustion engine;

normalizing said variance value in accordance with a state of operation of said internal combustion engine to obtain a normalized variance value;

comparing said normalized variance value with a first threshold to determine a state of deterioration in combustion; and


1
ENGINE
107
ANGULAR ACCELERATION DETECTING MEANS
108
SMOOTHING MEANS
101
VARIANCE DETECTION MEANS
102
NORMALIZED VARIANCE VALUE DETERMINING MEANS
CUMULATION
109
COMBUSTION COUNTING MEANS
110
THRESHOLD UPDATING MEANS
UPDATING
111
MISFIRE DETERMINING REFERENCE VALUE SETTING MEANS
112
112U
UPPER LIMIT REFERENCE VALUE SETTING MEANS
112L
LOWER LIMIT REFERENCE VALUE SETTING MEANS
104
DETERIORATED COMBUSTION DETERMINING VALUE CALCULATION MEANS
105
COMBUSTION STATE CONTROLLING MEANS
COMBUSTION VARIANCE ADJUSTING ELEMENT
106

comparing said normalized variance value with a second threshold to detect a misfire said second threshold being set on a more combustion-deteriorated side than said first threshold.

5,687,693

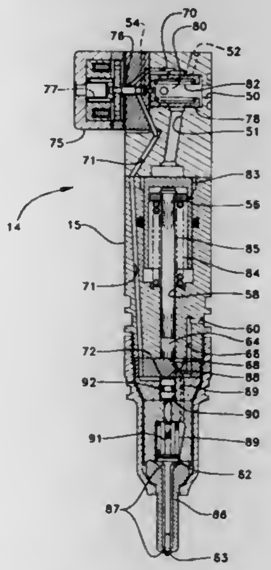
HYDRAULICALLY-ACTUATED FUEL INJECTOR WITH DIRECT CONTROL NEEDLE VALVE

Shikui K. Chen, Peoria, and Gregory W. Hefler, Chillicothe, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 668,552, Jun. 21, 1996, which is a continuation-in-part of Ser. No. 489,660, Jun. 12, 1995, which is a continuation of Ser. No. 283,232, Jul. 29, 1994, Pat. No. 5,463,996. This application Aug. 30, 1996, Ser. No. 707,804

Int. Cl.^{6} F02M *41/00;* **F16K** *31/40*

U.S. Cl. 123—446 **20 Claims**



1. A hydraulically actuated fuel injector comprising:

an injector body having an actuation fluid inlet, an actuation fluid cavity, a nozzle chamber open to a nozzle outlet, and a needle control chamber;

hydraulic means, within said injector body, for pressurizing fuel in said nozzle chamber, said hydraulic means including an actuation fluid control valve having a solenoid and being movable between a first position in which said actuation fluid inlet is open to said actuation fluid cavity and a second position in which said actuation fluid inlet is closed to said actuation fluid cavity;

a needle valve member positioned to reciprocate in said nozzle chamber between an open position in which said nozzle outlet is open and a closed position in which said nozzle outlet is closed, and said needle valve member including a closing hydraulic surface exposed to pressure in said needle control chamber;

a needle control valve having said solenoid and being attached to said injector body and being movable between an off position in which said needle control chamber is opened to a source of high pressure fluid and an on position in which said needle control chamber is opened to a low pressure passage.

5,687,694

ENGINE CONTROL

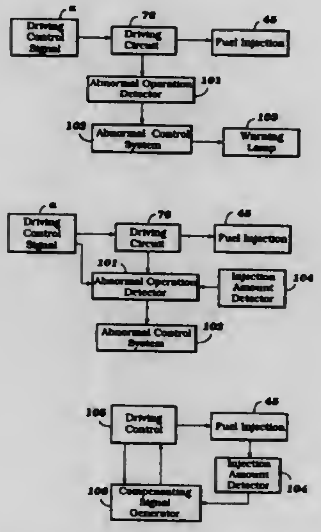
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 1, 1996, Ser. No. 595,229

Claims priority, application Japan, Feb. 2, 1995, 7-015985

Int. Cl.^{6} F02D *41/14;41/22;* **G01M** *15/00*

U.S. Cl. 123—479 **6 Claims**



1. A fuel injection control system comprised of a fuel injector including an injection valve for receiving pressurized fuel and injecting said fuel to an engine when said injection valve is open, an electrically operated device for operating said injection valve, a control circuit for energizing said electrically operated device for predetermined time periods for controlling the amount of fuel injected by said fuel injector, measuring means for measuring the amount of fuel actually injected by said fuel injector during each injection cycle, determining means for determining when the engine is running in a steady state condition, means for comparing the amount of fuel actually injected by said fuel injector as measured by said measuring means and comparing the amount of fuel actually injected with a target value amount, and means for indicating an abnormality in the operation of said injector valve when the amount of fuel actually injected differs from the target amount by more than a certain difference amount.

5,687,695

AIR FLOW RATE CONTROL DEVICE OF ENGINE AND DRAINING OFF METHOD THEREOF

Noboru Tsukamoto, and Shigeo Tamaki, both of Hitachinaka, Japan, assignors to Hitachi, Ltd., and Hitachi Car Engineering Co., Ltd., both of Japan

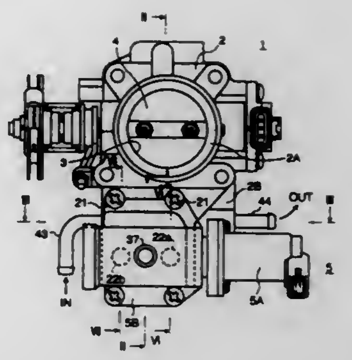
Filed Jul. 15, 1996, Ser. No. 683,536

Claims priority, application Japan, Jul. 25, 1995, 7-189538

Int. Cl.^{6} F02M *3/08;15/02*

U.S. Cl. 123—339.1 **14 Claims**

1. An air flow rate control apparatus of an engine for controlling air flow rate according to condition of said engine comprising an idle revolution speed control apparatus installed under a throttle body and a throttle valve installed in a boa of said throttle body, upper flow side of said throttle body is connected with said boa detouring said throttle valve, characterized by further comprising,



a water pool portion formed in an air passage led from a measuring part of said idle revolution speed control apparatus to the boa, said water pool portion having a closed bottom disposed at a low location than the measuring part and an upper part opened up in an air passage, wherein said air passage part between said measuring part and said water pool portion serves as the drain passage for falling the water in the measuring part into the water pool portion.

5,687,696

ENGINE FUEL SUPPLY DEVICE

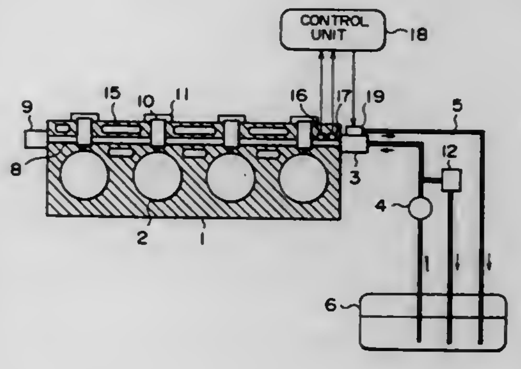
Yasuo Takagi; Tsutomu Nakada, and Ken Naito, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1996, Ser. No. 670,828

Claims priority, application Japan, Jun. 30, 1995, 7-165345

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—516 **10 Claims**



1. A fuel supply device for use with an engine including a fuel tank, cylinder head and combustion chamber having an opening in said cylinder head, said device comprising:

a fuel pump which pressurizes fuel in said fuel tank,

a fuel gallery which guides fuel discharged by said fuel pump, said gallery being formed inside said cylinder head,

a fuel injection valve disposed in a transverse direction to said gallery, said valve comprising an end part which injects fuel from said gallery into said combustion chamber, a base part projecting outside said cylinder head, and a fuel inlet port facing said gallery,

means for detecting a fuel pressure in said gallery after said engine has stopped,

means for detecting a fuel temperature in said gallery after said engine has stopped,

means for setting a predetermined pressure in the vicinity of a saturation vapor pressure of said fuel according to said fuel temperature, and

means for returning fuel in said gallery to said fuel tank when said fuel pressure is less than said predetermined pressure.

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5,687,697
VEHICLE FUEL VAPOR TREATING APPARATUS

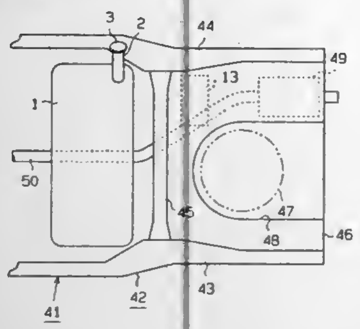
Takashi Ishikawa, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 22, 1996, Ser. No. 605,619

Claims priority, application Japan, Feb. 24, 1995, 7-037280

Int. Cl.⁶ F02M *33/02*

U.S. Cl. 123—520 **4 Claims**



1. An apparatus for treating fuel vapor generated in a fuel tank of a vehicle, the vehicle having an engine with an air intake passage, a fuel tank, a body, and an engine exhaust pipe, said apparatus comprising:

- a canister having a vapor inlet communicating with the tank, a vapor outlet communicating with the engine's air intake passage by way of a purge line, and an adsorbent, wherein fuel vapor generated in the tank is introduced to the canister through the inlet, and wherein fuel components contained in the fuel vapor are collected by the adsorbent, and wherein the fuel components are subsequently separated from the adsorbent and purged into the engine's air intake passage through the purge line during operation of the engine;
- wherein the exhaust pipe is located in a position relatively near to the canister, and wherein the adsorbent is heated by heat from the exhaust pipe to facilitate separation of the fuel components from the adsorbent;
- wherein the canister is located in an air space formed by the body of the vehicle, and wherein the exhaust pipe is located to heat the air space, the canister, and the adsorbent, and is disposed adjacent to and below the canister;
- wherein the body of the vehicle includes a left side frame member, a right side frame member, a cross frame member connecting the right and left side frame members, and wherein the canister is located such that it is in a space surrounded by the side frame members and the cross frame member and the exhaust pipe passes adjacent to the space to heat the space, which causes the adsorbent to be heated; and
- wherein the vehicle includes a housing for a spare tire, and wherein the spare tire housing defines the heated space in which the canister is located.

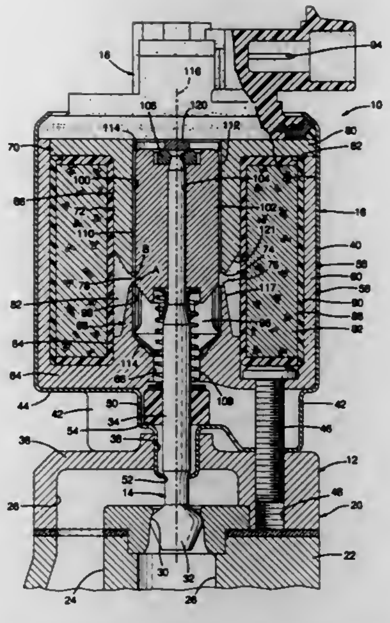
5,687,698
EXHAUST GAS RECIRCULATION VALVE

Noreen Louise Mastro, Rochester, and Jeffrey David Rohe, Caledonia, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1996, Ser. No. 703,149

Int. Cl.⁶ F02M *25/07;* **F16K** *31/06*

U.S. Cl. 123—571 **1 Claim**



1. A valve assembly for metering exhaust gas to the intake of an internal combustion engine comprising an electromagnetic solenoid actuator having a magnetic circuit including primary and secondary poles defining an axial chamber and an armature, associated with a valve member, and moveable in said chamber, said primary pole defined by a center pole member including a cylindrical inner wall, open at a first end for receiving said moveable armature, said armature and said cylindrical inner wall defining a fixed, radially extending primary air gap for flux passage thereacross, and an outer wall extending in an outward taper from said first, open end of said center pole member, said outwardly tapering wall operable to increase the mass of the pole piece through which said magnetic circuit operates as said armature moves from said first, open end of said pole towards a second end, said secondary pole defined by a center pole member including a cylindrical inner wall, open at a first end, for receiving said moveable armature, said first end located in spaced opposing relationship to said first, open end of said primary pole to define a pole-to-pole gap therebetween, said armature and said cylindrical inner wall defining a fixed, radially extending primary air gap for flux passage thereacross, and an outer wall extending in an outward taper from said first, open end of said center pole., said outwardly tapering walls of said primary and said secondary poles operable to minimize the pole-to-pole gap through a minimization in opposing surface area between said first end of said primary pole and said first end of said secondary pole to thereby maximize the length of said secondary pole and the surface area between said secondary pole member and said armature to thereby minimize the reluctance across said radial air gap and maximize the passage of flux through said armature.

5,687,699
CONTROLLER FOR MULTI-CYLINDER ENGINE

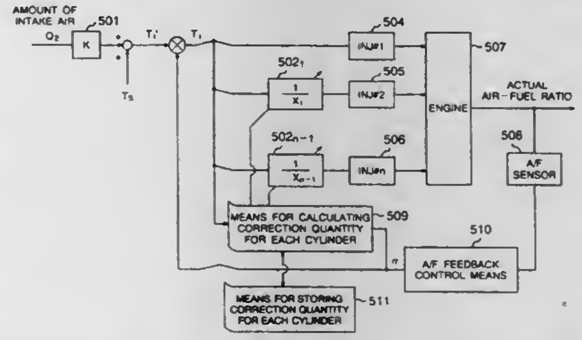
Kousaku Shimada; Takeshi Atago, both of Hitachinaka, and Yoshiyuki Yoshida, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 7, 1996, Ser. No. 698,157

Claims priority, application Japan, Aug. 8, 1995, 7-202326

Int. Cl.⁶ F02D *41/14*

U.S. Cl. 123—673 **8 Claims**


AMOUNT OF INTAKE AIR
Q₂
501
K
Tᵢ'
Tᵢ
Tₛ
504
INJ#1
507
502₁
1/X₁
505
INJ#2
ENGINE
ACTUAL AIR-FUEL RATIO
502ₙ₋₁
1/Xₙ₋₁
506
INJ#n
508
A/F SENSOR
MEANS FOR CALCULATING CORRECTION QUANTITY FOR EACH CYLINDER
509
510
α
A/F FEEDBACK CONTROL MEANS
MEANS FOR STORING CORRECTION QUANTITY FOR EACH CYLINDER
511

1. An engine controller for a multi-cylinder engine including fuel supply means for separately supplying fuel to respective cylinders of the multi-cylinder engine, and air/fuel ratio sensor means for detecting an air/fuel ratio at a location downstream of a manifold of exhaust pipes from the cylinders, wherein air/fuel ratio feedback control is obtained by controlling supply of fuel through said fuel supply means in accordance with an output of said sensor means, said engine controller comprising:

- processing means for detecting, as a correction value for each cylinder, differences between fuel supply characteristics of the fuel supply means for a reference cylinder which is one of said multiple cylinders and fuel supply characteristics of the fuel supply means for each of cylinders other than said reference cylinder; and
- control means for correcting the fuel supply characteristics of the fuel supply means for an associated cylinder with the correction value for each cylinder, whereby
- the air/fuel ratio of each cylinder is controlled to be equal to an averaged air/fuel ratio among said cylinders of the multi-cylinder engine.

5,687,700
ENGINE FEEDBACK CONTROL SYSTEM

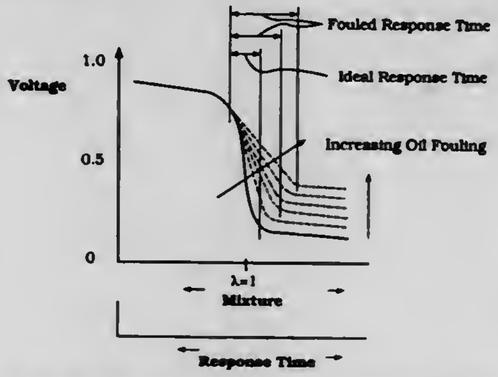
Masahiko Kato, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 19, 1995, Ser. No. 545,359

Claims priority, application Japan, Oct. 21, 1994, 6-256589

Int. Cl.⁶ F02D *41/14;* **G01M** *19/00*

U.S. Cl. 123—688 **8 Claims**



1. An internal combustion engine control system for maintaining a desired fuel-air ratio comprised of a combustion chamber, an air induction system for delivering at least an air charge to said combustion chamber, a charge-forming system for supplying at least a fuel charge to said combustion chamber, an exhaust system for discharging combustion products from said combustion chamber, it combustion condition sensor for sensing the fuel-air ratio in said combustion chamber, a feedback control for receiving the output of said combustion condition sensor and adjusting at least one of said charge-forming and induction systems to maintain the desired fuel-air ratio, and testing means for comparing the output of said combustion condition sensor periodically under all engine running conditions to determine if said combustion condition sensor is providing an accurate signal, said testing means employing one method of testing during one type of running phase of said engine and another method of testing during another type of running phase of the engine.

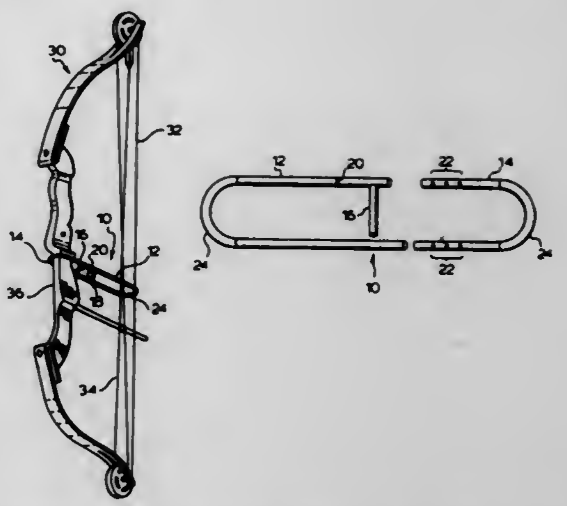
5,687,701
ARCHERY BOW SAFETY LOCK

Charles A. Henry, 4554 Malden Road, Windsor, Ontario, Canada, N9E 3T1

Filed Jun. 17, 1996, Ser. No. 664,910

Int. Cl.⁶ F41B *5/00;* **E05B** *73/00*

U.S. Cl. 124—1 **10 Claims**



4. In combination, an Archery Bow comprising a handle or riser region for gripping of the bow, arms attached at a first end and extending from both ends of the handle or riser region, and a bow string extending between second ends of the arms, and an Archery Bow safety lock releasably attached to the Archery Bow to prevent operation of the bow when the lock is attached, said combination comprising:

- a containment region of the lock containing the bow string and preventing the bow string from being drawn or removed from the containment region,
- a means releasably securing the lock to the handle or riser region of the bow,
- the lock being able to be attached to and released from the bow by allowing the bow string to be inserted into or removed from the containment region and the lock also being able to pass through or around the handle or riser region of the bow and thereafter be secured to the bow to prevent operation of the bow.

5,687,702

Patent Not Issued For This Number

5,687,703
COMPOUND ARCHERY BOW WITH BILATERAL CABLE CAMS

Emil Vyprachticky, 7713 Webster Way, Arvada, Colo. 80003

Filed Apr. 4, 1996, Ser. No. 630,902

Int. Cl.⁶ F41B *5/10*

U.S. Cl. 124—25.6 **5 Claims**

5. A compound archery bow comprising,

- a pair of flexible limbs interconnected by a handle portion,
- first and second rotatable input drive means carried by and disposed on a first lateral side of each of the respective limbs,
- a bow string attached at each of its two ends to the respective first and second input drive means for rotating the input drive means when the bow string is drawn,
- first and second output drive means, carried by and disposed on a second and opposing lateral side of each of the respective limbs, and operatively connected to the respective input drive means,

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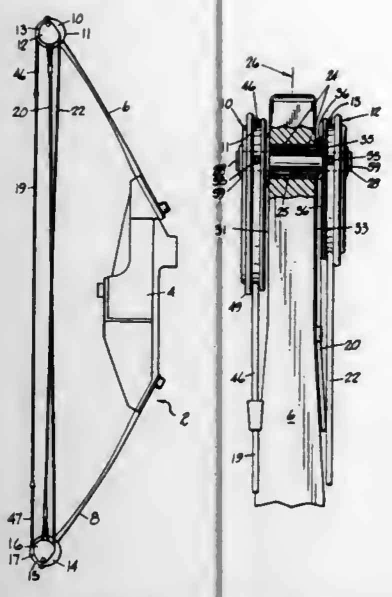


cable means interconnecting each of the output drive means and the opposing limb, for drawing the distal ends of the limbs toward one another when the bow string is drawn.

5,687,704

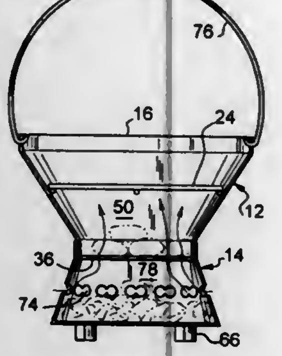
PORTABLE GRILL

Allan C. Lerch; John H. Waugh, both of Louisville; Ernie R. Gillam, Crestwood, all of Ky.; Calvin F. Sprinkle, Borden, Ind., and Richard H. Bird, Louisville, Ky., assignors to Porcelain Metals Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 286,420, Aug. 9, 1994, Pat. No. 5,425,352. This application Jun. 19, 1995, Ser. No. 492,197

Int. Cl.^{6} A47J *37/07*; **F24B** *3/00*

U.S. Cl. 126—25 R **20 Claims**



1. A portable and nestable grill, comprising:
an upper grilling section comprising a generally conical shaped upper housing defining a first heating chamber, said upper housing having an open top end and at least a partially open bottom end of reduced diameter, said upper housing including an upper conical section and a top rim extending around the top of said upper conical section and a cylindrical bottom rim extending around the bottom of said upper conical section joining the lower edge of said upper conical section;
means of supporting food articles within said upper conical section;
a lower charcoal starter/ash catcher base defining a lower housing forming a second heat generation chamber, said lower housing comprising a lower conical section having an open top end of reduced diameter and a closed bottom end, said lower housing having a cylindrical top rim extending around the top of said lower conical section joining the upper edge of said lower conical section, said lower housing including a floor panel joining the bottom edge of said lower conical section forming an ash catcher, said lower housing including a plurality of apertures formed through the wall of said lower conical section creating draft openings of selected size, shape, area, and position serving to optimize the flow of air currents therethrough and providing an access means for lighting the pre-ignition materials, said lower housing being of a different size than said upper housing for inverting and nesting inside of said larger housing during storage and transportation;
said second bottom rim of said upper housing being complementary sized and shaped for removably engaging said first top rim of said lower housing forming a reduced diameter central cylindrical waist section thereinbetween; and
means of supporting solid fuel material within said reduced diameter central cylindrical waist section.

5,687,705

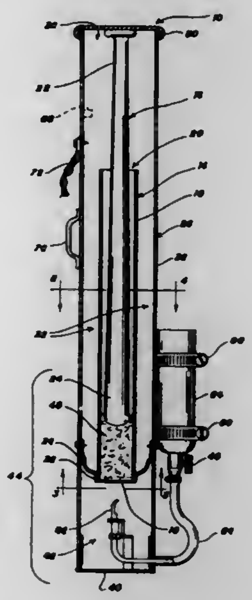
ALUMINUM BASEBALL OR SOFTBALL BAT WARMER

Eddie D. Blair, 717 Nicholson Dr., Potosi, Mo. 63664

Filed Aug. 1, 1996, Ser. No. 691,278

Int. Cl.^{6} F24C *3/00*

U.S. Cl. 126—229 **10 Claims**



1. A warmer for an aluminum baseball or softball bat comprising
an inner elongated container with a restricted bottom, a sidewall and an open top, said container adapted to receive a baseball or softball bat lengthwise,
an outer elongated container with a bottom end, a sidewall and an open top, said outer container surrounding the inner container with a space between the sidewalls of the inner and outer containers forming an air flow passage between said containers, a hanger attached inside the outer container for mounting the inner container at its restricted bottom, said hanger having an aperture and spaced above the bottom end of the outer container forming a compartment, and
a convective heat source in the compartment whereby warmed air from the convective heat source is directed through the aperture in the hanger and circulates through the air flow passage warming the sidewall of the inner container and thereby warming a baseball or softball bat received in said inner container.

5,687,706

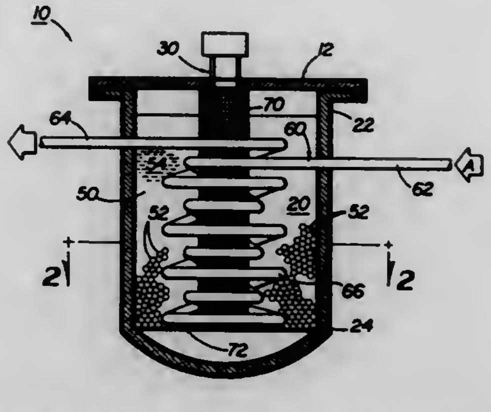
PHASE CHANGE MATERIAL STORAGE HEATER

D. Yogi Goswami; Chung K. Hsieh; Chand K. Jotshi, and James F. Klausner, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Apr. 25, 1995, Ser. No. 428,905

Int. Cl.^{6} F24H *7/00*; **F28D** *20/00*

U.S. Cl. 126—263.01 **17 Claims**



1. A storage heater for storing heat and for heating a fluid, comprising:
a. an enclosure defining a chamber therein having a lower portion and an upper portion;
b. a heating element disposed within the enclosure;
c. a tube through which the fluid flows, having an inlet and an outlet, both being disposed outside of the enclosure, and having an intermediate portion interconnecting the inlet and the outlet that passes through the enclosure;
d. a densely packed bed of phase change material pellets disposed within the enclosure; and
e. a viscous liquid disposed within the enclosure, in thermal communication with the heating element, the phase change material pellets, and the intermediate portion of the tube, for transferring heat from the heating element to the pellets and for transferring heat from the pellets to the intermediate portion of the tube, the viscous fluid having a viscosity whereby the frictional pressure drop of the fluid in contact with the phase change material pellets substantially reduces vertical thermal convection in the fluid and so that as the fluid flows through the tube, heat is transferred from the viscous liquid to the fluid flowing through the intermediate portion of the tube,

wherein the heating element is vertically disposed within the chamber and adapted to transfer heat to the lower portion of the chamber at a greater rate than to the upper portion of the chamber.

5,687,707

COMBINATION COOK STOVE HEAT EXCHANGER AND FILTER

Robert Henry Prasser, Vail, Colo., assignor to Hydro Hoods Corporation, Denver, Colo.

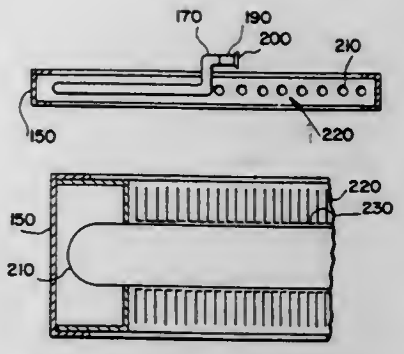
PCT No. PCT/US94/10631, § 371 Date Oct. 24, 1996, § 102(e) Date Oct. 24, 1996, PCT Pub. No. WO95/11410, PCT Pub. Date Apr. 27, 1995

Continuation-in-part of Ser. No. 139,282, Oct. 19, 1993, Pat. No. 5,456,244. This PCT application Sep. 20, 1994, Ser. No. 727,554

Int. Cl.^{6} F24C *15/20*

U.S. Cl. 126—299 D **43 Claims**

1. A device for heating fluid and filtering grease and particulate matter said device comprising:
(a) means for exchanging heat including a conduit capable of carrying a fluid therethrough, said conduit oriented such that hot fumes pass over said conduit and transfers heat to said fluid; and



(b) means for filtering wherein said conduit and a plurality of fins are configured such that at least some of said grease and said particulate matter attach to said means for filtering.

5,687,708

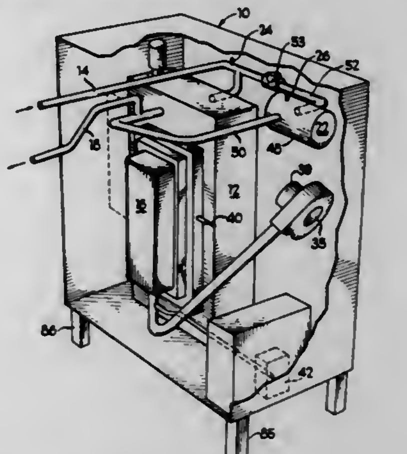
GAS-FIRED BATCH BOOSTER WATER HEATER APPARATUS

Craig Farnsworth, Chagrin Falls; Michael Aronov, Beachwood; Gary Liljenberg, Brooklyn; John Schmidt, Brunswick, all of Ohio, and Buddy J. Austin, Portland, Tenn., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 30, 1995, Ser. No. 550,445

Int. Cl.^{6} F24H *1/22*

U.S. Cl. 126—362 **5 Claims**



1. A gas-fired batch booster water heater apparatus for supplying sanitizing water to a dish washing machine, the gas-fired batch booster water heater comprising:
a chamber member capable of holding water having an inlet, an outlet, an inner heat radiating surface and an outer heat receiving surface;
a gas fired burner positioned in close proximity to the chamber member, the gas fired burner capable of supplying heating the heat receiving surface of the chamber and, in turn, the water;
a first circuit associated with the inlet and the outlet, the first circuit including means for circulating the water within the chamber member;
a second circuit associated with the first circuit, the second circuit being capable of introducing water into the chamber member for heating and removing water from the chamber member to a dish washing machine upon heating of the water;
a check valve associated with the first circuit and the second circuit;
means for sensing the flow of water through the second circuit; and
means associated with the sensing means for controlling the check valve, to, in turn, control the flow of water through either of the first and the second circuits.

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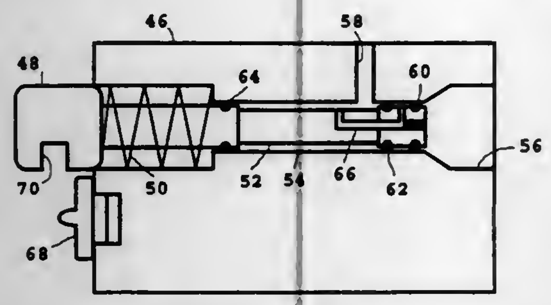
5,687,709
VENTILATOR ANESTHETIC SYSTEM HAVING A MANUALLY OPERATED SAFETY VALVE DEVICE

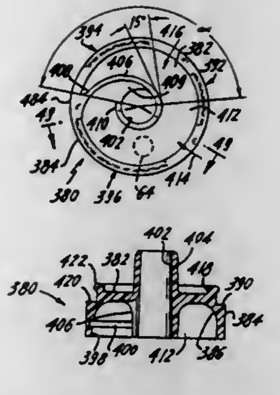
Leif Akerberg, Jaerfaella, Sweden, assignor to Siemens Elema AB, Solna, Sweden
Filed May 12, 1995, Ser. No. 440,477
Claims priority, application Sweden, May 26, 1994, 9401809
Int. Cl.^{6} A61M *15/00*
U.S. Cl. 128—203.12 **11 Claims**



1. In a ventilator/anesthetic system having a gas source and a breathing gas circuit, the improvement of a manually operated safety valve device comprising:
- A valve body having an input adapted for connection to said gas source and an output adapted for connection to said breathing gas circuit with a first flow-through channel in said valve body between said input and said output;
- said first flow-through channel having first flow resistance;
- a valve seat disposed in said valve body in said first flow-through channel;
- a valve element mounted in said valve body so as to be moveable relative to said valve seat between an unactuated, first position relative to said valve seat wherein said valve element does not permit gas to flow through said first flow-through channel and a manually actuated, second position relative to said valve seat wherein said valve element permits a first gas flow through said first flow-through channel, said first gas flow having a magnitude dependent of said first flow impediment;
- said valve body having a second flow-through channel therein between said input and said output;
- said second flow-through channel having a second flow resistance larger than said first flow resistant; and
- said valve element being mounted in said valve body for assuming a manually actuated, third position relative to said second flow-through channel for permitting a second gas flow dependent on said second flow resistance, said second gas flow being less than said first gas flow, to pass through said second flow-through channel.

5,687,710
INHALER FOR POWDERED MEDICATIONS HAVING SPIRAL DEAGGLOMERATION CHAMBER

Thomas J. Ambroslo, Somerville; Alan J. Bilanin, Princeton; Andrew E. Kaufman, Robbinsville; David J. Kenyon, Morristown; Srinivas Manthena, Bricktown, and Tsong-Toh Yang, Warren, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.
Division of Ser. No. 446,804, Jun. 1, 1995, which is a continuation-in-part of Ser. No. 992,959, Dec. 18, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 458,928
Int. Cl.^{6} A61M *15/00;16/00;* **B05D** *7/14;* **B65D** *83/06*
U.S. Cl. 128—203.15 **12 Claims**



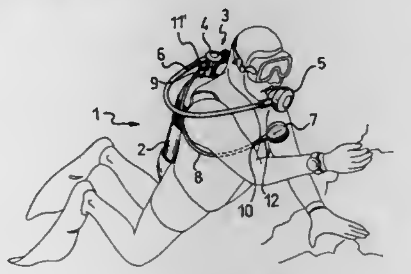
1. A nozzle for reducing particle size of agglomerates of flowing powdered material entering the nozzle in a first plane from a powder inhaler, to form micronized powdered material and for mixing said micronized powdered material with suction air, said nozzle comprising either:
- (a) cavity means for changing the flow of said powdered material from said first plane to a second plane substantially perpendicular to said first plane, and swirl means for substantially continuously changing the direction of flow of said powdered material in said second plane in said cavity means; or
- (b) an outer wall defining a conduit having a shape substantially of an inverted tornado.

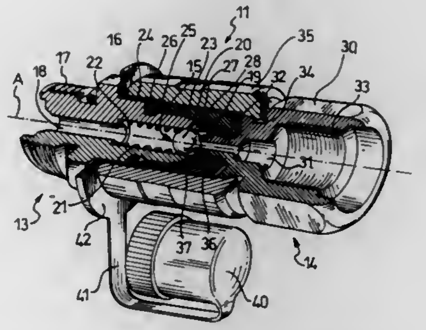
5,687,711

Patent Not Issued For This Number

5,687,712
UNDERWATER BREATHING APPARATUS

Roberto Semeia, Genoa, Italy, assignor to Ścubapro Europe, S.r.l., Genoa, Italy
Filed Apr. 15, 1996, Ser. No. 630,068
Claims priority, application Italy, Dec. 22, 1995, MI950879 U
Int. Cl.^{6} A62B *7/04*
U.S. Cl. 128—205.24 **7 Claims**

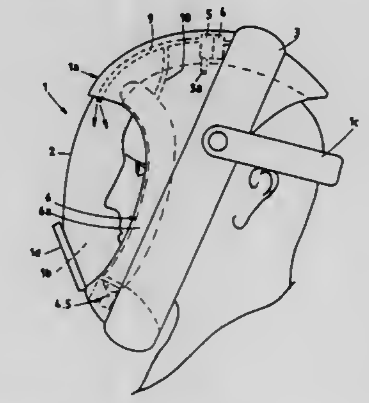




1. An underwater breathing apparatus comprising:
- (a) a cylinder;
- (b) a meter for measuring the pressure inside said cylinder; and
- (c) a coupling means for attaching said cylinder with said meter, the coupling means comprising a first portion attached to said cylinder and a second portion attached to said meter, said first and second portions being capable of engaging with one another directly or indirectly through a hose so as to couple the cylinder and the meter, and either said first portion or said second portion comprising a non-return valve.

5,687,713
BREATHING MASK

Erik W. Bahr, Fugleveien 5, N-1440 Drøbak; Øystein Ljungmann, Elgfaret 15, N-1404 Siggerud; Nils Kvandal, Orreveien 3B, N-1415 Oppegård, and Vigbjørn Matre, Ormerudveien 59A, N-1410 Kolbotn, all of Norway
Continuation of Ser. No. 244,232, May 19, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 558,948
Claims priority, application Norway, Nov. 29, 1991, 914695
Int. Cl.^{6} A62B *18/04*
U.S. Cl. 128—206.21 **13 Claims**

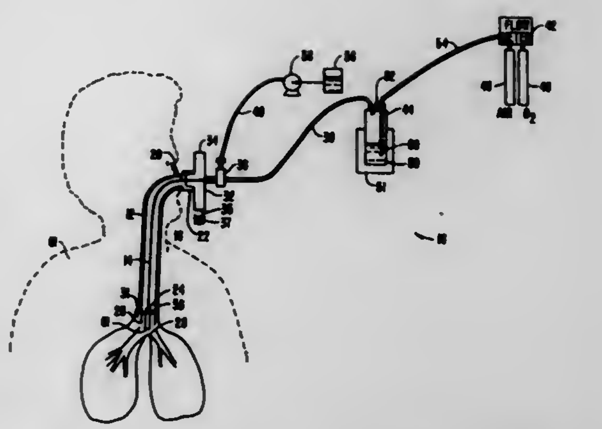


1. A breathing mask, comprising;
- a face piece having a window,
- flexible sealing means operative to seal against a user's face and extending in front of the user's ears to define an airtight chamber,
- a container for pressurized breathing gas,
- and a pressure reduction valve and a release valve for the supply of breathing gas to said airtight chamber,
- said container for pressurized gas comprising a closed tube in the form of a ring adapted to encircle the user's face in front of the user's ears,
- said pressurized gas container being attached to said flexible sealing means at a position entirely within said face piece, and
- said sealing means connected in series with said pressure reduction valve and said airtight chamber of the mask, thus providing automatic inflation of said sealing means on opening of the breathing gas container and through flow to said airtight chamber.

5,687,714
SELF-CLEANING ENDOTRACHEAL TUBE APPARATUS

Theodor Kolobow, Rockville, and Rudolf Trawoger, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Oct. 10, 1995, Ser. No. 541,846
Int. Cl.^{6} A61M *16/00*
U.S. Cl. 128—207.14 **13 Claims**

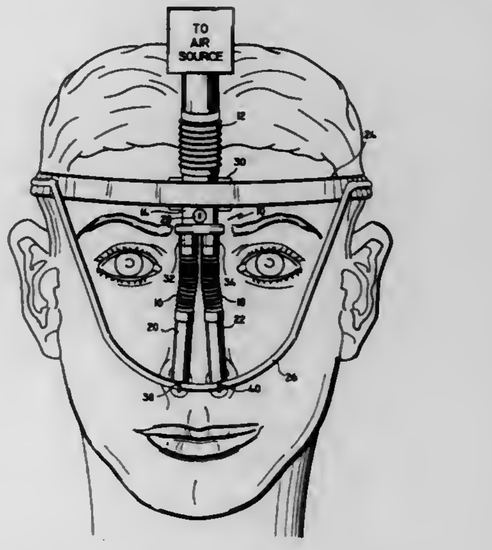
1. An apparatus for intratracheal ventilation of human or animal lungs comprising:
- an endotracheal tube for insertion into a human or animal trachea to a point above a human's or animal's lungs;
- a catheter positioned within said endotracheal tube, having proximal and distal ends;
- a source of humidified air flow connected to the proximal end of said catheter to provide humidified air flow through said catheter;



- means to entrain liquid droplets to said humidified air flow so that the air flow in said catheter consists of humidified air with entrained liquid droplets, said liquid droplets being entrained in an amount sufficient to detectably dissolve mucus deposits on said catheter and within said endotracheal tube while not producing a significant accumulation of water in a human's or animal's lungs; and,
- a flow-reversing catheter tip affixed to the distal end of said catheter having an exit port directed away from a human's or animal's lungs.

5,687,715
NASAL POSITIVE AIRWAY PRESSURE APPARATUS AND METHOD

Robert M. Landis, 1130 Puddingstone Rd., Mountainside, N.J. 07092, and Wayne W. Disanza, 887 Derry Dr., Toms River, N.J. 08753
Continuation-in-part of Ser. No. 155,479, Nov. 19, 1993, Pat. No. 5,477,852, which is a continuation-in-part of Ser. No. 19,993, Feb. 17, 1993, Pat. No. 5,269,296, which is a continuation of Ser. No. 784,371, Oct. 29, 1991, abandoned. This application Dec. 22, 1995, Ser. No. 577,181
The portion of the term of this patent subsequent to Feb. 17, 2013, has been disclaimed.
Int. Cl.^{6} A61M *16/00*
U.S. Cl. 128—207.18 **20 Claims**



1. A device for treatment of sleep apnea comprising:
- a source of pressurized air;
- a plenum chamber in communication with the source of pressurized air;

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a pair of nasal delivery members connected to and in communication with the plenum chamber, the nasal delivery members being configured and dimensioned to delivery pressurized air from the plenum to the nares of a patient;

at least one variable orifice member defining a variable orifice which assumes a first position having a first diameter at a first gas pressure and a second, expanded position having a second diameter greater than said first diameter at a second, increased gas pressure.

5,687,716

SELECTIVE DIFFERENTIATING DIAGNOSTIC PROCESS BASED ON BROAD DATA BASES

Peter Kaufmann, Mossvägen 56, Järna, Sweden, 153 37; Håkan Beving, Linnégatan 33-35, Stockholm, Sweden, 114 47, and Nils U. Olsson, 6829 Acacia Ct., Frederick, Md. 21703

Filed Nov. 15, 1995, Ser. No. 559,032

Int. Cl.^{6} A61B *5/00;* **G06F** *3/00*

U.S. Cl. 128—630 **13 Claims**

1. A process for analyzing for a variety of physical medical disorders, which comprises:

- a) clinical testing by common analyses, samples of patients free of certain physical medical disorders encompassed by said variety of physical medical disorders and samples of patients that possess one or more of such variety of disorders, to obtain clinical testing of such variety of disorders as derived from such samples, which analyses distinguish such disorders thereby obtaining the characterization of a collection of such disorders as numerical data;
- b) scaling the matrix of said numerical data in a computer;
- c) configuring in a computer, an artificial neural network prescribed by the number of variables and the number of disorders, which artificial neural network is electronic data that possesses an input layer, one or more hidden layers and an output layer;
- d) fitting the artificial neural network electronic data in a computer to the numerical data according to adjustable parameters of the artificial neural network;
- e) whereby the artificial neural network is trained in the computer to automatically provide a analytic model;
- f) withdrawing from a new patient that has not been diagnosed for such disorder, a sample or samples of a kind taken from said reference patients and subjecting said diagnostic sample to said clinical testing to obtain new numerical data;
- g) automatically scaling in the computer the new data to the data derived from the reference patients;
- h) feeding the scaled new data to the trained artificial neural network and the analytic model thereof, and
- i) automatically obtaining a diagnosis of the new patient with respect to such disorders.

5,687,717

PATIENT MONITORING SYSTEM WITH CHASSIS MOUNTED OR REMOTELY OPERABLE MODULES AND PORTABLE COMPUTER

Arieh S. Halpern, Tarzana, Calif., and Anthony J. Aldrich, Philadelphia, Pa., assignors to Tremont Medical, Inc., Aston, Pa.

Filed Aug. 6, 1996, Ser. No. 692,110

Int. Cl.^{6} A61B *5/00*

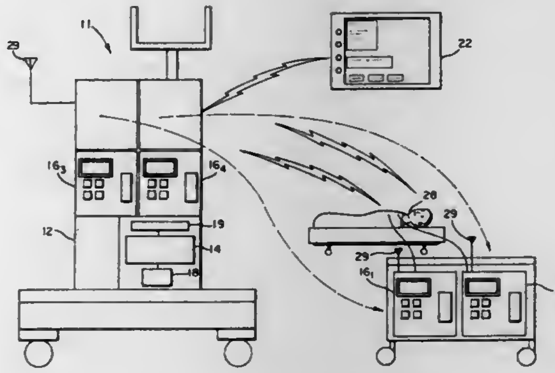
U.S. Cl. 128—630 **26 Claims**

1. A patient monitoring system comprising:

(a) one or more patient care modules, each module being fully operational in either an independent or dependent mode;

(b) a point of care chassis having a chassis computer and a power supply, said chassis adapted to physically receive and communicate with one or more of the modules when operating the one or more modules in the dependent mode, the one or more modules being connected to the chassis computer and the power supply in the dependent mode, said chassis also adapted to remotely communicate with the one or more modules when operated in the independent mode; and

(c) a portable computer for communicating with the one or more modules when the one or more modules are in either the independent or dependent mode.



5,687,718

DEVICE FOR CONTINUOUSLY DETECTING BLOOD PARAMETERS

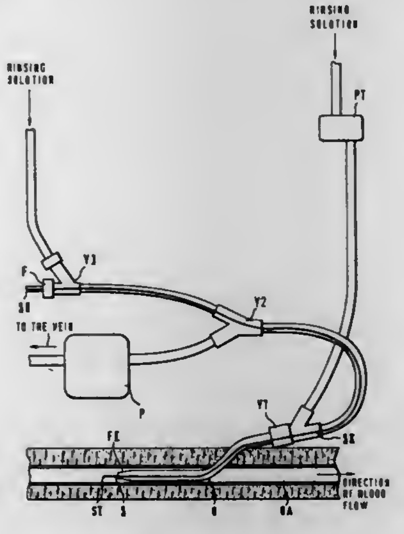
Bernhard Fischer, Leonberg; Martin Zoll, Gechingen; Joachim Wender, Leonberg, and Frank Rochlitzer, Altdorf, all of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 14, 1995, Ser. No. 490,320

Claims priority, application Germany, Jul. 9, 1994, 44 24 267.0

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—632 **26 Claims**



1. A device for continuously detecting blood parameters, comprising:

a catheter adapted to be introduced, with a free end thereof, into an artery of a patient;

a sensor arranged on said catheter for detecting blood parameters;

a tube adapted to be coupled to a vein of the patient and connected to said catheter; and

a device for controllably maintaining blood flow across said sensor, wherein said device is controlled such that blood flow through the catheter is prevented so as long as the detected blood parameters indicate a sufficient amount of fresh arterial blood flowing around said sensor, and

if the detected blood parameters indicate that an insufficient amount of blood flows around said sensor, then blood flow through the catheter to the vein of the patient via said tube is established.

5,687,719

PULSE OXIMETER PROBE

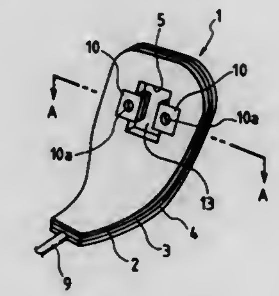
Ikuo Sato, Tochigi, and Keiichi Sugiura, Tokyo, both of Japan, assignors to Ikuo Sato, Tochigi, and Nihon Kohden Corporation, Tokyo, both of Japan

Filed Mar. 25, 1994, Ser. No. 217,716

Claims priority, application Japan, Mar. 25, 1993, 5-014094 U

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—633 **3 Claims**



1. A pulse oximeter probe comprising:

a light emitting element for emitting a light to a head of a fetus;

a light receiving element for receiving from said light emitting element at least one of transmitted light and reflected light to detect the pulsation of blood in the fetus; and

a supporting member with a predetermined curvature, the supporting member having an opening wherein the light emitting element and the light receiving element are positioned in the opening to form a gap between the light emitting element and the light receiving element to receive a portion of the head of the fetus, wherein the supporting member comprises a plurality of laminated silicon sheets wherein one of the silicon sheets has a black rough surface.

5,687,720

Patent Not Issued For This Number

5,687,721

MEASUREMENT DEVICE FOR NON-INVASIVELY DETERMINING THE CONCENTRATION OF POLARISING SUBSTANCES

Burkhard Kuhls, Mitterhoferstrasse 19, 2-80687 München, Germany

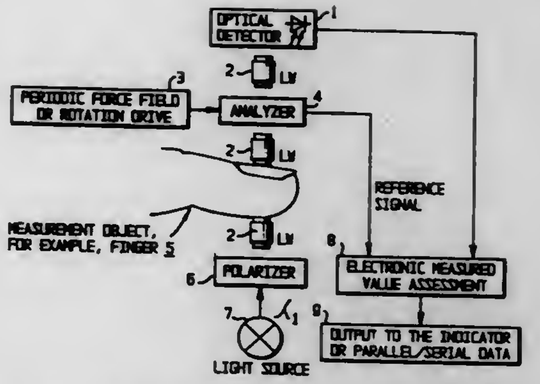
PCT No. PCT/DE93/01193, § 371 Date Jun. 15, 1995, § 102(e) Date Jun. 15, 1995, PCT Pub. No. WO94/13193, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 14, 1994, Ser. No. 464,657

Claims priority, application Germany, Dec. 15, 1992, 42 42 232.9

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—633 **21 Claims**


OPTICAL DETECTOR
1
2
LW
PERIODIC FORCE FIELD OR ROTATION DRIVE
3
ANALYZER
4
2
LW
REFERENCE SIGNAL
MEASUREMENT OBJECT, FOR EXAMPLE, FINGER 5
2
LW
8
ELECTRONIC MEASURED VALUE ASSESSMENT
6
POLARIZER
7
λ1
9
OUTPUT TO THE INDICATOR OR PARALLEL/SERIAL DATA
LIGHT SOURCE

1. A measurement device for noninvasively determining the concentration of polarizing substances in the human body, comprising:

a source of monochromatic light; and

means responsive to light from said source for performing both a static extinction measurement and a dynamic polarization measurement to obtain a measurement of the concentration of a predetermined polarizing substance in a selected member of the body;

said performing means including a detector responsive to light from said source to generate a static excitation measurement signal, a polarizer for receiving monochromatic light from the light source and polarizing the received light, an analyzer responsive to polarized light from the polarizer for producing a dynamic polarization measurement signal indicative of the angle of polarization thereof, at least one of said polarizer and said analyzer being rotatable, means for rotating at least one of the polarizer and analyzer, means for confining light from said polarizer to said analyzer to a distinct light path, means for positioning said selected body member containing said predetermined substance in said light path between the polarizer and the analyzer, angle sensor means for generating a reference signal indicative of influence of the rotating means on angle of polarization without influence of said body member being positioned between the polarizer and the analyzer, means responsive to the dynamic polarization measurement signal and the reference signal for determining the angle of deflection of the polarized signal, and means for determining the concentration from said static excitation measurement signal and said angle of deflection.

5,687,722

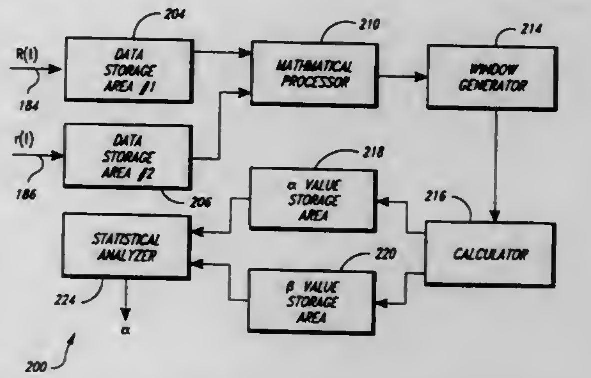
SYSTEM AND METHOD FOR THE ALGEBRAIC DERIVATION OF PHYSIOLOGICAL SIGNALS

Jonathan Tien, Redmond, and David R. Marble, Seattle, both of Wash., assignors to SpaceLabs Medical, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 442,834, May 17, 1995. This application Jul. 26, 1995, Ser. No. 507,754

Int. Cl.^{6} A61B *5/000*

U.S. Cl. 128—633 **28 Claims**



1. A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;

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a light detector positioned to detect first and second light signals after interacting with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference light source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference light source;

a window generator to generate first and second data windows derived from data comprising said first and second generated signals;

a storage location containing a mathematical relationship of said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal; and

a calculator using said mathematical relationship to generate first and second functions using said first and second data windows, respectively, said first and second functions having a point of intersection indicative of said ratio.

5,687,723

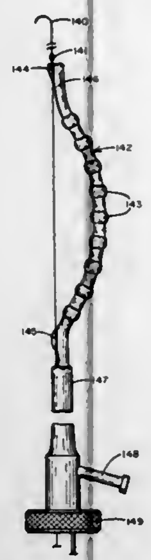
MAPPING AND ABLATION CATHETER SYSTEM

Boaz Avitall, 4868 N. Ardmore Ave., Milwaukee, Wis. 53217

Continuation-in-part of Ser. No. 161,920, Dec. 3, 1993, Pat. No. 5,487,385. This application Jun. 8, 1995, Ser. No. 487,492

Int. Cl.^{6} A61N *1/05;* **A61B** *5/04*

U.S. Cl. 128—642 **43 Claims**



1. A recording and ablation system for accessing a cardiac chamber of interest, mapping, creating linear ablation lesions in said cardiac chamber of interest comprising:

(a) a guide member for aiding the navigation of a catheter or sheath in the vascular system of a patient, and for threading through a guide member eye said guide member comprising a distal stop means for containing the distal travel of a guide member eye, threaded thereover;

(b) a hollow outer catheter or sheath having a distal opening;

(c) an inner catheter member carried by and operable within said outer catheter or sheath and including a flexible distal recording and ablation device having a working electroded section extendable to protrude from a distal opening in said outer catheter or sheath, said working electroded section being axially adjustable relative to said guide member and having at least a distal guide member eye slidably threaded over said guide member to said distal stop means such that the electroded section proximal said distal guide is member eye can be adjustably arcuately flexed outward according to the relative motion of said distal guide member eye and said electroded section protruding from said distal opening to produce a desired shape to address an inner surface of said chamber of interest; and

(d) a plurality of spaced serial electrodes carried by said electroded section of said recording and ablation device.

5,687,724

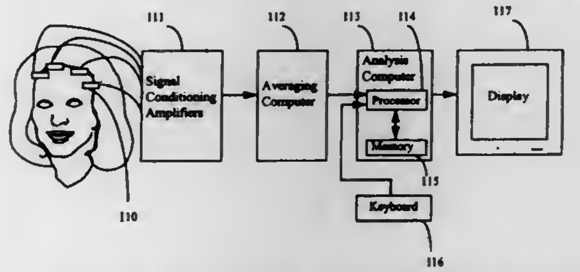
APPARATUS AND METHOD FOR DETERMINING VARIATIONS IN MEASURED PHYSICAL PARAMETERS OF SIGNAL-GENERATORS

Don Lee Jewett, Mill Valley, and Zhi Zhang, San Francisco, both of Calif., assignors to Abratech Corporation, Sausalito, Calif.

Continuation-in-part of Ser. No. 143,461, Oct. 26, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 377,281

Int. Cl.^{6} A61B *5/05*

U.S. Cl. 128—653.1 **34 Claims**



1. An apparatus for determining variations in estimated signal-generator parameters of a plurality of signal-generators, said signal-generators causing signals at a plurality of physical locations, said signals having magnitudes, said signals being sensed at one or more selected points in time, said apparatus comprising:

(a) means for sensing said signals at at least one of said physical locations;

(b) storing means coupled to said sensing means for storing the magnitudes of said signals at least one point in time;

(c) variation means associated with said storing means for generating variation in the estimated signal-generator parameters from said stored magnitudes, wherein variation in estimated signal-generator parameters is determined by variations in E and F factors from an EF-space; and,

(d) outputting means for outputting the estimated signal-generator parameters and the variations in the estimated signal generator parameters.

5,687,725

METHOD FOR MOTION TRACKING OF INTERVENTIONAL INSTRUMENTS WITH MR IMAGING

Michael Wendt, Witten, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 1, 1996, Ser. No. 690,938

Claims priority, application Germany, Aug. 2, 1995, 195 28 436.4

Int. Cl.^{6} A61B *05/055*

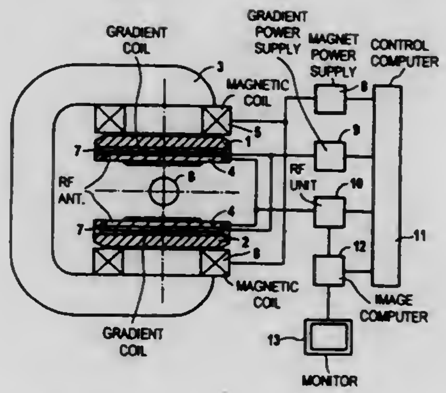
U.S. Cl. 128—653.2 **13 Claims**

1. A method for tracking the motion of an interventional instrument in a patient using magnetic resonance imaging, comprising:

guiding an interventional instrument in a patient along a motion path in a first direction;

acquiring raw datasets from nuclear magnetic resonance signals of an image region in said subject, including at least a part of said motion path, from nuclear magnetic resonance signals which are frequency-encoded in a first direction and wavelet-encoded in a second direction perpendicular to the first direction;

updating the raw datasets with a repetition rate only for wavelet-encoded data allocated to a region of the motion path in said image region; and



generating chronologically-resolved images from the raw data sets.

5,687,726

PROCESS FOR DETERMINING THE VOLUME OF BLOOD IN CIRCULATION

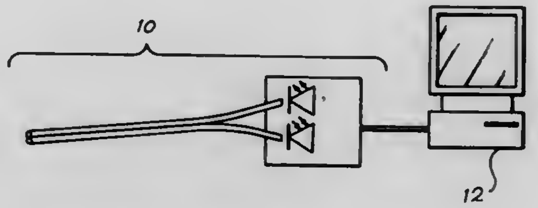
Andreas Hoeft, Planckstrasse 13, D-3400 Gottingen, Germany

Continuation of Ser. No. 50,270, May 7, 1993, abandoned. This application Apr. 3, 1995, Ser. No. 415,583

Claims priority, application Germany, Sep. 13, 1991, 41 30 931.6

Int. Cl.^{6} A61B *6/00*

U.S. Cl. 128—654 **8 Claims**



1. A process for determining circulating blood volume V_d in a patient comprising the steps of:

a) injecting a known amount of indicator dye M_o into the circulating blood whereby the dye circulates with the blood and the concentration of dye in the blood varies with time in an indicator dye dilution curve indicative of a dye concentration time course C(t);

b) optically measuring the dye concentration time course C(t) in the circulating blood immediately after injecting the dye;

c) from the concentration time course C(t), calculating the mean transit time m_{tt} which the indicator dye requires in order to pass through a predetermined portion of the circulation;

d) measuring the blood volume flow V in the patient; and

e) calculating the blood volume V_d using the equation $V_d=V * m_{tt}$.

5,687,727

CATHETER ADAPTOR WITH SLITTING BLADE AND IMPROVED MANUAL CONTROL AND METHOD OF USE

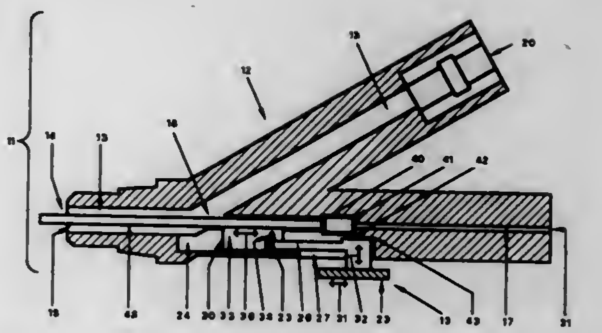
Jeff L. Kraus, San Jose; Joseph R. Shields, Sunnyvale; Nitin P. Matani, and Michael J. Horzewski, both of San Jose, all of Calif., assignors to Danforth Biomedical Incorporated, Santa Clara, Calif.

Filed May 1, 1995, Ser. No. 431,592

Int. Cl.^{6} A61B *6/00*

U.S. Cl. 128—657 **18 Claims**

1. A proximal adaptor for securement to a proximal end of a catheter containing a lumen to receive a guidewire and to permit



longitudinal movement of said catheter relative to said guidewire, said proximal adaptor comprising:

a body containing first, second and third bores, joined at a common juncture region, said first and second bores each being of sufficient cross section to receive said catheter, and said third bore being of sufficient cross section to receive said guidewire;

a cutting member slidably retained inside said body for movement between a cutting position and a retracted position; and

cutting member manipulating means for manually manipulating said cutting member from outside said body.

5,687,728

Patent Not Issued For This Number

5,687,729

SOURCE OF THERAPEUTIC ACOUSTIC WAVES INTRODUCIBLE INTO THE BODY OF A PATIENT

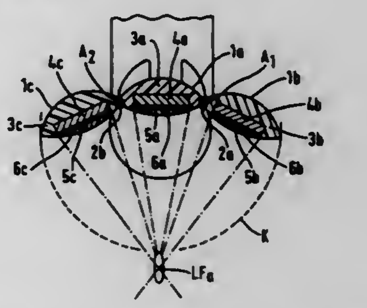
Ulrich Schaetzle, Roettenbach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 20, 1995, Ser. No. 493,218

Claims priority, application Germany, Jun. 22, 1994, 44 21 795.1

Int. Cl.^{6} A61B *8/12*

U.S. Cl. 128—660.003 **34 Claims**



1. A source of therapeutic acoustic waves comprising:

at least two source elements each emitting therapeutic acoustic waves;

an instrument on which said at least two source elements are mounted adapted for introducing said at least two source elements into a body of a patient; and

means for mounting said at least two source elements on said instrument for permitting movement of said at least two source elements between an introduction position wherein said at least two source elements are relatively rotatably folded together in a first configuration and a working position wherein said at least two source elements are relatively rotatably unfolded in a second configuration, and vice versa, said first configuration having cross-sectional dimensions which are smaller than cross-sectional dimensions of said second configuration.

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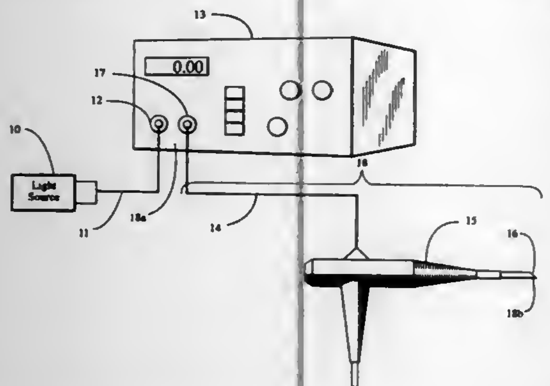
5,687,730
APPARATUS FOR DETECTING THE PRESENCE OF ABNORMAL TISSUE WITHIN A TARGET TISSUE BENEATH THE SKIN OF A PATIENT

Daniel R. Doiron, Santa Ynez, and A. Charles Lytle, Nipomo, both of Calif., assignors to PDT Systems, Inc., Goleta, Calif.
Continuation-in-part of Ser. No. 378,056, Jan. 25, 1995, abandoned, which is a continuation of Ser. No. 189,122, Jan. 27, 1994, abandoned, which is a continuation of Ser. No. 113,711, Aug. 26, 1993, abandoned, which is a continuation of Ser. No. 20,266, Feb. 18, 1993, abandoned, which is a continuation of Ser. No. 644,961, Jan. 22, 1991, abandoned. This application Nov. 14, 1995, Ser. No. 557,903
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 128—665 **1 Claim**



1. An apparatus for detecting the presence of abnormal tissue within a target tissue beneath the skin of a patient comprising:

(a) a light source producing excitation light having a first wavelength;

(b) a fluorescence probe having an excitation light input port operable for receiving said excitation light from said light source, and an output/input port in optical communication with said excitation light input port;

(c) a fiber optic waveguide having a proximal end in optical communication with said output/input port of said fluorescence probe and a distal end, said fiber optic waveguide being operable for conducting said excitation light from said output/input port of said fluorescence probe to said distal end of said fiber optic waveguide, said fiber optic waveguide emitting fiber-derived intrinsic fluorescence light having a second wavelength when said excitation light is conducted therethrough, said excitation light thereafter to emerge from said distal end of said fiber optic waveguide to illuminate the target tissue causing the target tissue to emit target-derived light having said second wavelength and a third wavelength and wherein said fiber optic waveguide conducts combined fluorescence light comprising a portion of said target-derived light having said second and third wavelengths and a portion of said intrinsic fluorescence light having a second wavelength to said output/input port of said fluorescence probe;

(d) light dispersion means in optical communication with said output/input port operable for separating said combined fluorescence light into a portion of said combined fluorescence light having said second wavelength and a portion of said combined fluorescence light having said third wavelength;

(e) calibration means operable for subtracting off fiber fluorescence induced by said excitation light in said fiber optic waveguide from fluorescence measured, the difference being said portion of target-derived light at said second wavelength;

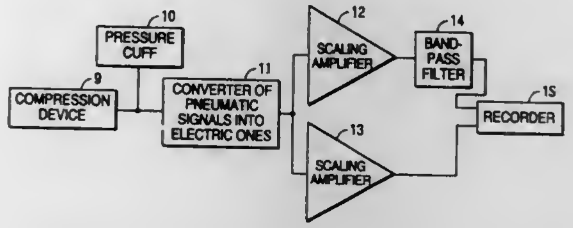
(f) means for converting said portion of target-derived light having said second wavelength to a first electronic signal having a signal strength related to the intensity of said portion of target-derived light having said second wavelength;

(g) means for converting said portion of targat-derived light having said third wavelength to a second electronic signal having a signal strength related to the intensity of said light having said third wavelength; and

(h) means for measuring the ratio of said strength of said first electronic signal to said signal strength of said second electronic signal wherein a change in said ratio indicates a change in the amount of abnormal tissue within the target tissue.

5,687,731
OSCILLOMETRIC METHOD FOR DETERMINING HEMODYNAMIC PARAMETERS OF THE ARTERIAL PORTION OF PATIENT'S CIRCULATORY SYSTEM AND A MEASURING SYSTEM FOR ITS REALIZATION

Viacheslav Nikolaievich Ragozin, and Vladimir Alexandrevitch Degtiarev, both of Moscow, Russian Federation, assignors to MTI, Ltd., Tortola, Virgin Islands (Br.)
Continuation of Ser. No. 115,150, Sep. 2, 1993, abandoned. This application Nov. 8, 1994, Ser. No. 336,020
Claims priority, application Russian Federation, Sep. 10, 1992, 5056329; Sep. 10, 1992, 5056330; Sep. 10, 1992, 5056331
Int. Cl.⁶ A61B *5/022*
U.S. Cl. 128—672 **46 Claims**



1. A method for determining principle hemodynamic parameters of an arterial portion of a circulatory system of a patient using a measuring cuff applied to a major arterial vessel of the patient and a measuring system having a linear conversion characteristic and a linear amplitude-frequency characteristic in a frequency range from approximately 0 to 50 Hz, the method comprising the steps of:

applying a linearly time-varying pressure to the major arterial vessel with the measuring cuff for a predetermined period of time, the linearly time-varying pressure being in a range from approximately 0 to 300 mm Hg;

forming a pressure curve representing the linear time-varying pressure applied to the major arterial vessel;

simultaneously measuring a plurality of amplitude values for a sequence of pulse waves of arterial pressure of the major arterial vessel using the measuring system, the measured amplitude values of the respective pulse waves representing a time-dependent change in a volume of the major arterial vessel and having a linear amplitude-frequency characteristic in a frequency range from approximately 0 to 50 Hz;

forming an oscillometric curve having a diastolic region and a systolic region based on the measured amplitude values of the sequence of pulse waves;

determining a plurality of extreme points of the oscillometric curve in the diastolic and systolic regions;

determining a plurality of lines passing through selected extreme points, the plurality of lines intersecting at points to form a closed contour;

associating the points at which the plurality of lines intersect with points on the pressure curve;

determining an absolute value of diastolic arterial pressure of the major arterial vessel based on the measured amplitude values and the associated points on the pressure curve;

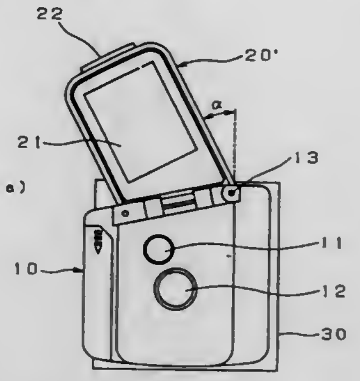
determining an absolute value of a mean dynamic arterial pressure of the major arterial vessel based on the measured amplitude values and the associated points on the pressure curve;

determining an absolute value of a side systolic arterial pressure of the major arterial vessel based on the measured amplitude values and the associated points on the pressure curve; and

determining an absolute value of a maximum systolic arterial pressure of the major arterial vessel based on the measured amplitude values and the associated points on the pressure curve.

5,687,732
BLOOD PRESSURE MONITOR

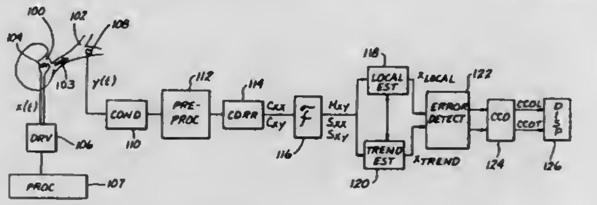
Takashi Inagaki, and Toshiyuki Kobayashi, both of Kyoto, Japan, assignors to Omron Corporation, Kyoto, Japan
Filed Oct. 6, 1995, Ser. No. 539,911
Claims priority, application Japan, Oct. 7, 1994, 6-243926; Jan. 18, 1995, 7-005716
Int. Cl.⁶ A61B *5/02*
U.S. Cl. 128—672 **6 Claims**



1. A blood pressure monitor comprising:
a main body;
an operation switch disposed on an upper wall of the main body;
a cuff attached to a lower wall of the main body;
a cover mounted on the main body in an open-and-close fashion;
a display disposed on a wall of the cover confronting the operation switch for displaying measured data, the operation switch being covered by the cover when the cover is closed; and
in which one end of the cover is so mounted on a shaft disposed on one end of the main body, that the cover is pivotable, wherein the shaft is inclined with respect to an opposite end of said main body to one end thereof and an opposite end of said cover to said one end thereof so that said main body and said cover make a predetermined angle of inclination.

5,687,733
SYSTEM AND METHOD FOR ESTIMATING CARDIAC OUTPUT

Russell McKown, Richardson, Tex., assignor to Baxter International Inc., Deerfield, Ill.
Filed Oct. 26, 1995, Ser. No. 548,937
Int. Cl.⁶ A61B *5/029*
U.S. Cl. 128—692 **24 Claims**



1. A method for estimating blood output through a flow region of a patient's body, comprising the following steps:

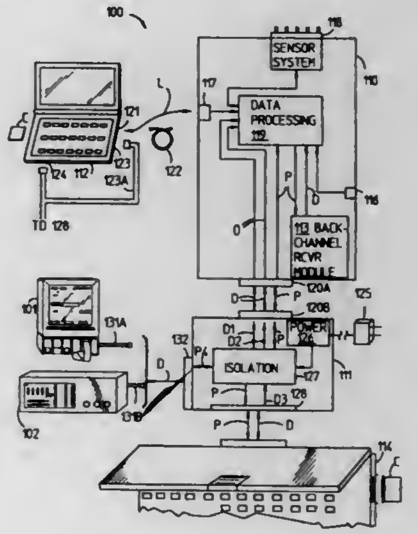
A) injecting an indicator as an indicator input signal having an input signal profile and a period into an upstream position in the flow region;

B) sensing the presence of the indicator at a downstream position in the flow region to determine an indicator output signal;

C) estimating as a predetermined function of the input signal profile and the indicator output signal both a local blood output value over a local estimation time, and a trend blood output value over a trend estimation time, in which the trend estimation time is longer than the local estimation time, thereby providing estimated blood output values corresponding to both relatively fast and slow changes in blood output.

5,687,734
FLEXIBLE PATIENT MONITORING SYSTEM FEATURING A MULTIPORT TRANSMITTER

Michael K. Dempsey, Acton; Mark S. Kotfila, Chelmsford, and Robert J. Snyder, Westford, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 20, 1994, Ser. No. 326,614
Int. Cl.⁶ A61B *5/0402*
U.S. Cl. 128—696 **.17 Claims**



1. A flexible patient monitoring system for use in monitoring a selected plurality of physiological conditions of a patient in a medical care environment, comprising:

a multiport transmitter including as integral components therein:

a sensor system for providing a sense signal representative of the selected plurality of physiological conditions;

a monitoring section connected to the sensor system for receiving the sense signal and providing sense data representative of the plurality of physiological conditions,

a first data port for receiving first data and a second data port for receiving second data;

a data processing and signal transmission section operatively connected to the monitoring section and first and second data ports for processing the sense data and the first and second data so as to provide processed data, and for transmitting the processed data as a telemetry signal; and

a housing for integrating said sensor system, monitoring section, first and second data ports, and data processing and signal transmission section in a portable unit, said multiport transmitter thereby being optionally borne by the patient while said plurality of physiological conditions are monitored.

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5,687,735

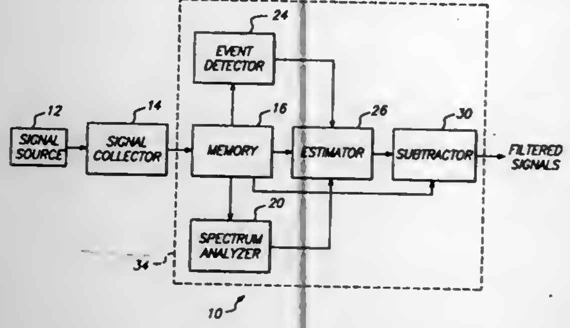
ROBUST TIME-DIVERSITY FILTER AND METHOD FOR REMOVING ELECTROMAGNETIC INTERFERENCE

Alfred Dean Forbes, Palo Alto, and Eric D. Helfenbein, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 28, 1996, Ser. No. 624,194

Int. Cl.^{6} A61B *5/402*; **G06F** *15/20*

U.S. Cl. 128—696 **25 Claims**



1. Apparatus for filtering signals of a series of generally periodic events each having an event episode including an event epoch and a quiet epoch, the apparatus comprising:

(a) means for generating electrical digitized signals of the event episodes;

(b) memory connected for receiving and storing the digitized signals of the event episodes;

(c) event detector connected to determine the event epoch and the quiet epochs of the event episodes for the events in the digitized signals;

(d) spectrum analyzer connected to analyze power spectra of the digitized signals, each spectrum being based on at least one event episode of the events at a time;

(e) estimator connected to estimate electromagnetic interference (EMI) by comparing the digitized signals of a quiet epoch of the at least one event episode with basis function at one or more frequencies identified in a spectrum in the spectral analysis by the spectrum analyzer to obtain an EMI estimate; such that the estimator by said spectra can obtain EMI estimates adapted to a shift in frequency phase or amplitude in the EMI for EMI that varies with time; and

(f) subtractor connected to subtract from the digitized signals of the event epochs the EMI estimates derived from corresponding spectra such that the resulting signals for the event epochs have reduced EMI.

5,687,736

Patent Not Issued For This Number

5,687,737

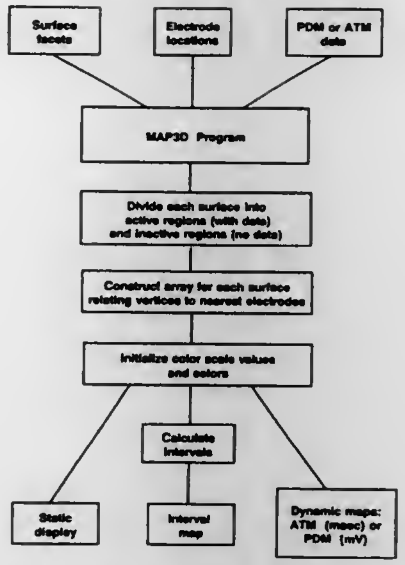
COMPUTERIZED THREE-DIMENSIONAL CARDIAC MAPPING WITH INTERACTIVE VISUAL DISPLAYS

Barry H. Branham, Ballwin; James L. Cox; John P. Bolneau, both of Ladue, and Richard B. Schuessler, Ballwin, all of Mo., assignors to Washington University, St. Louis, Mo.

Continuation of Ser. No. 959,088, Oct. 9, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 331,752

Int. Cl.^{6} A61B *5/044*

U.S. Cl. 128—710 **40 Claims**


Surface facets
Electrode locations
PDM or ATM data
MAP3D Program
Divide each surface into active regions (with data) and inactive regions (no data)
Construct array for each surface relating vertices to nearest electrodes
Initialize color scale values and colors
Calculate intervals
Static display
Interval map
Dynamic maps: ATM (msec) or PDM (mV)

29. A programmed computer for displaying cardiac activation data for a mammalian heart, the programmed computer comprising:

means for generating an anatomically accurate, three-dimensional surface model of at least one surface of a mammalian heart;

means for inputting activation data collected for a heart of a mammalian subject;

means for processing the input activation data; and

means for displaying the processed activation data on the three-dimensional surface model under operator control.

5,687,738

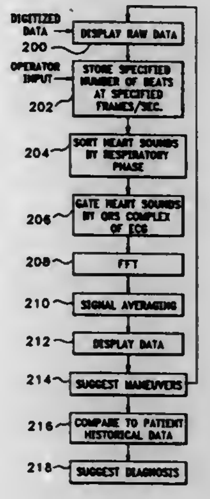
APPARATUS AND METHODS FOR ANALYZING HEART SOUNDS

Joseph Isaac Shapiro, Aurora, and Howard David Weinberger, Denver, both of Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.

Filed Jul. 3, 1995, Ser. No. 498,673

Int. Cl.^{6} A61B *5/02*

U.S. Cl. 128—715 **19 Claims**


DIGITIZED DATA
200
DISPLAY RAW DATA
OPERATOR INPUT
202
STORE SPECIFIED NUMBER OF BEATS AT SPECIFIED FRAMES/SEC.
204
SORT HEART SOUNDS BY RESPIRATORY PHASE
206
GATE HEART SOUNDS BY QRS COMPLEX OF ECG
208
FFT
210
SIGNAL AVERAGING
212
DISPLAY DATA
214
SUGGEST MANEUVERS
216
COMPARE TO PATIENT HISTORICAL DATA
218
SUGGEST DIAGNOSIS

13. A method for analyzing heart sounds utilizing heart sound data and respiration data collected from a patient, said method comprising the steps of:

storing data representing a plurality of heart beat sounds;

sorting said data representing a plurality of heart beat sounds according to respiratory phase;

taking a fast Fourier transform of the data associated with each stored heart beat sound;

signal averaging the fast Fourier transforms; and

providing the averaged fast Fourier transforms to a user, in a format useful for evaluating the patient's heart function.

5,687,739

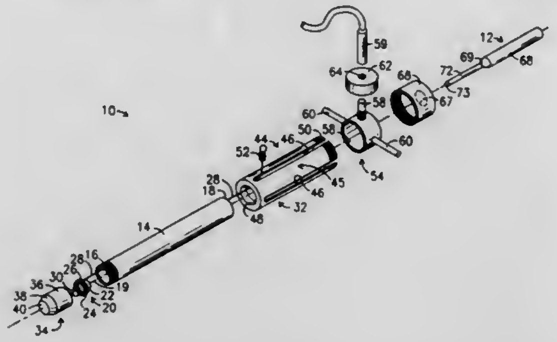
BIOPSY SPECIMEN CUTTER

William E. McPherson, Tampa, and John S. TenBarge, Clearwater, both of Fla., assignors to Interventional Concepts, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 567,936, Dec. 6, 1995, abandoned. This application Apr. 30, 1996, Ser. No. 641,349

Int. Cl.^{6} A61B *10/00*

U.S. Cl. 128—754 **28 Claims**



1. An improved biopsy specimen cutter of the type primarily intended for use in obtaining a tissue sample, said cutter comprising:

a cutter barrel comprising an elongated hollow tube having a central axis, a first end and a second end,

a first wire guide having a first end and a second end with an aperture formed therethrough, said first wire guide attached to said cutter barrel tube first end;

a cutting wire comprising a loop formed on a first end of said wire and at least one wire segment extending from said loop and terminating in a second end of said wire, said loop being positioned adjacent, to said second end of said first wire guide, and said wire segment and said wire second end extending longitudinally through said cutter barrel hollow tube;

a cutter tip removably attached to said tube first end substantially enclosing said first wire guide;

a trigger housing attached to said second end of said cutter barrel tube, said housing comprising a hollow cylinder having an axially extending sidewall with at least one longitudinal slot formed through said sidewall, said wire second end extending through said one slot; and

a trigger mounted inside said housing for axial movement with respect to said housing, said trigger comprising a trigger body and a member attached to said trigger body and extending through said slot, with said wire second end being attachable to said member, such that attaching said wire second end to said member and pulling said trigger away from said cutter barrel tube second end will cause said loop to move across said second end of said first wire guide, whereby the loop movement across the second end cuts the tissue sample.

5,687,740

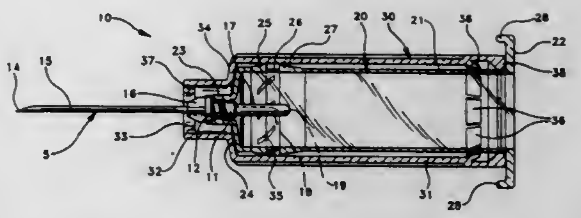
NEEDLE HOLDER ASSEMBLY INCLUDING SLEEVE OF THERMOPLASTIC ELASTOMER

Martin F. Sheridan, Wayne, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 29, 1995, Ser. No. 496,711

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—760 **3 Claims**



1. A needle holder assembly for collection of a body fluid sample using an evacuated tube comprising:

a) a double-ended needle immobilized in a hub, said needle having proximal and distal ends terminating in points;

b) a tubular needle holder having a first open end for receiving an evacuated tube and a second open end for removably immobilizing said hub; said proximal and extending into said tubular holder when said hub is immobilized thereon; and

c) a sleeve over the proximal end of said needle, said sleeve being molded of a resilient and resealable elastomer having a durometer hardness of about 30–60 A, a tensile strength at break of about 300–1,000 psi and an elongation at break of about 200–800% said elastomer being selected from the group consisting of a polyolefin-polyisoprene alloy, styrene-butadiene copolymer, and a vulcanized alloy of polyethylene or polypropylene alloyed with a terpolymer of ethylene-propylene-diene monomer.

5,687,741

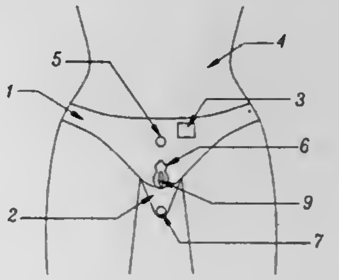
GARMENT FOR RELEASABLY SECURING CONDOMS

Karin S. Torger, 15 Hermann #606, San Francisco, Calif. 94102

Continuation-in-part of Ser. No. 602,001, Feb. 15, 1996, abandoned. This application Oct. 28, 1996, Ser. No. 739,031

Int. Cl.^{6} A61F *6/02*

U.S. Cl. 128—842 **15 Claims**



1. Garment apparatus for releasably securing female condoms including:

a panty made of breathable material, the panty having a crotch, the crotch having an opening; and

a resilient ovoid condom attachment member affixed to the panty at the crotch opening, the ovoid member having

a base panel;

an annular ovoid neck protruding up from the base panel; and

a circumferential head flange on an upper end of the neck projecting radially outward laterally from the neck, the neck and head flange forming a central slit-shaped aperture, the aperture communicating with the opening.

5,687,742

KNEE EXTENSION DEVICE

Lanny L. Johnson, 4528 Hagadorn, East Lansing, Mich. 48823

Continuation of Ser. No. 79,731, Jun. 22, 1993, abandoned. This application Oct. 31, 1995, Ser. No. 551,233

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 128—845 **9 Claims**

1. A knee extension device for enabling a knee to be gradually extended toward a straightened position, said knee extension device comprising:

a substantially L-shaped elongated body member having an upper surface, a lower surface, a first end portion, a second end portion, and an upwardly projecting lower leg support

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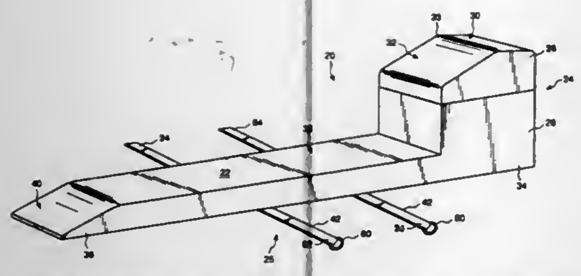


member which is provided at said first end portion, said lower leg support member including:

means for supporting an ankle region of a leg when said leg is positioned to overlie said elongated body member, said supporting means including angularly related first and second upper surfaces each disposed at an angle with respect to said lower surface of the body member and defining an apex therebetween, said angularly related first and second surfaces sloping in opposite directions from said apex;

said L-shaped elongated body member defining a cavity under a knee region of said leg when said ankle region is supported by said supporting means, said cavity being large enough to permit substantial movement of said knee region of said leg into said cavity when a force is applied to an upper surface of said leg; and

pressure applying means adapted to be wrapped around a portion of said leg and operatively related to said body member for selectively displacing said leg so that said knee region advances within said cavity, thereby moving said leg into a straightened position.

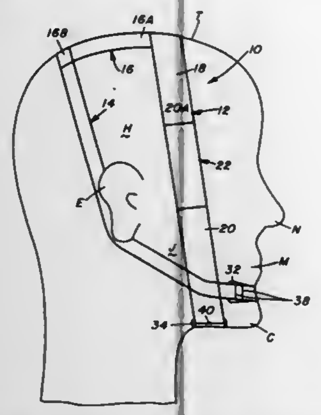
5,687,743
HEAD STRAP ASSEMBLY FOR REDUCING SNORING ACTIVITY

Isabell Goodwin, 1316 Lakeview Ave., #104, Pueblo, Colo. 81004

Filed Oct. 24, 1996, Ser. No. 736,497

Int. Cl.^{6} A61F *5/56*

U.S. Cl. 128—848 **25 Claims**



1. A head strap assembly for reducing snoring activity, said assembly comprising:

(a) a front strap for extending around a head of a user spaced forwardly of ears of the user from a first location over a top of the head downwardly to below a chin of the user;

(b) a rear strap for extending around the head of the user rearwardly of the ears from a second location over the top of the head spaced a short distance rearwardly from said front strap so as to be above the ears of the user downwardly to above the chin of the user spaced above said front strap, said rear strap crossing said front strap between the ears and chin of the user; and

(c) a link strap interconnecting said front and rear straps and being spaced above the ears of the user and disposed on the top of the head of the user, said link strap having front and rear opposite ends attached respectively to said front and rear straps;

(d) said front strap including

(i) an upper portion having a pair of opposite ends and attached at a location between said opposite ends to said front end of said link strap, said opposite ends of said upper portion of said front strap extending in opposite directions away from said front end of said link strap and downwardly toward the chin of the user,

(ii) a lower portion separate from said upper portion of said front strap, said lower portion adapted to extend under and around the chin of the user and having a pair of opposite ends extending upwardly from the chin for meeting and overlapping with the downwardly extending opposite ends of the upper portion of the front strap on opposite sides of the head of the user forwardly of the ears, and

(iii) adjustable fastening means attached to each of said pairs of opposite ends of said upper and lower portions of said front strap for providing overlapping releasable coupling of said pair of opposite ends of said upper portion of said front strap to said pair of opposite ends of said lower portion of said front strap on opposite sides of the head of the user forwardly of the ears, said link strap being substantially shorter in length than either lengths that said opposite ends of said upper portion of said front strap extend in opposite directions from said link strap.

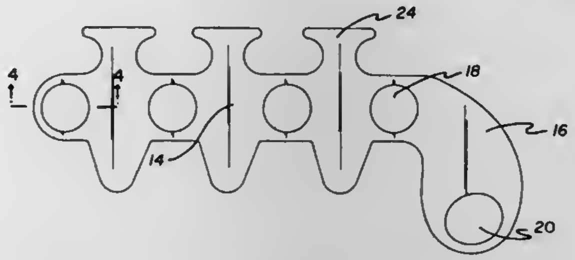
5,687,744
HAND SUPPORT FOR CONTROLLING SCAR TISSUE

Barbara L. Bartley, 749 Scotland Rd. Apt. 6C, Orange, N.J. 07050

Filed Nov. 18, 1996, Ser. No. 751,750

Int. Cl.^{6} A61F *5/37*

U.S. Cl. 128—878 **5 Claims**



1. A hand support for controlling scar tissue for applying pressure to an individual's hand to preclude excessive scar tissue buildup during healing comprising, in combination:

a planar member comprised of a flexible material having a generally J-shaped main portion, the main portion having an elongated upper portion and a generally arcuate lower portion, the elongated upper portion having four spaced apart digit apertures therethrough, the lower portion having a single digit aperture therethrough, the single digit aperture of the lower portion having a diameter greater than a diameter of the four digit apertures of the elongated upper portion, the planar member being dimensioned to be worn on a hand of a user;

three generally T-shaped members each having lower ends integral with a first edge of the elongated upper portion of the planar member;

three arcuate members each having lower ends integral with a second edge of the elongated upper portion of the planar member.

5,687,745
EXHAUST GAS SCRUBBING DEVICE

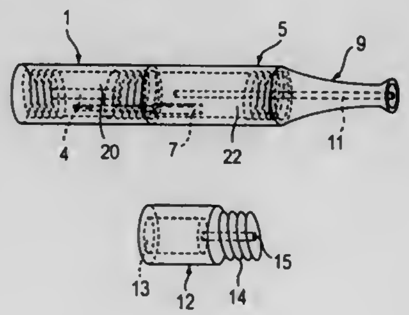
Aslan Nuri Yalcin, Sonnenstr. 57, 48599 Gronau, Germany

Filed Jan. 27, 1995, Ser. No. 378,562

Claims priority, application Germany, Jan. 27, 1994, 44 02 316.2

Int. Cl.^{6} A24F *1/14*

U.S. Cl. 131—173 **4 Claims**



1. A device for scrubbing tobacco smoke to be inhaled by a smoker, said device comprising:

a first chamber having a smoke inlet;

a second chamber having a smoke outlet;

an adapter for receiving a device for smoking tobacco connected to said smoke inlet;

a mouthpiece connected to said smoke outlet;

a partition separating said first and said second chambers;

a liquid contained in said first and second chambers to form a liquid level such that said smoke inlet and said smoke outlet are positioned above said liquid level;

at least one pipe member extending through said partition and positioned so as to be submerged within said liquid in said first and said second chambers, said at least one pipe member having radially extending bores;

said first and second chambers communicating via said at least one pipe member;

wherein the smoke, introduced into said first chamber through said smoke inlet, is guided through said at least one pipe member to said smoke outlet and is scrubbed by passing through said liquid:

a tubular container with a tubular wall having a first and a second end, said first end closed off by a recessed end wall such that an annular projection is formed and said second end being open;

wherein said adapter engages said annular projection;

an intermediate tubular member with a tubular wall having a first and a second end, said first end closed off by a projecting head and said second end being open;

wherein said mouthpiece has a connector and a free end, said connector connected to said open end of said intermediate tubular member;

wherein said projecting head is inserted into said second end of said tubular container;

wherein said projecting head forms said partition and said first chamber is delimited by said tubular wall of said tubular container, said end wall and said projecting head;

wherein said second chamber is the interior of said intermediate tubular member; and

wherein said exhaust gas inlet is formed by a tube extending through said end wall and projecting into said first chamber.

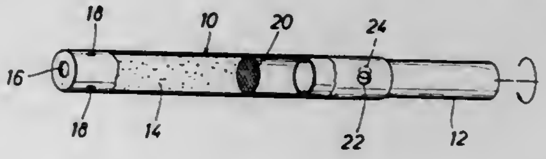
5,687,746
DRY POWDER DELIVERY SYSTEM

Jed E. Rose; Frederique Behm, both of Durham, N.C., and James Turner, Atascosa, Tex., assignors to Advanced Therapeutic Products, Inc., San Antonio, Tex., and Duke University, Durham, N.C.

Continuation of Ser. No. 14,773, Feb. 8, 1993, Pat. No. 5,441,060. This application Jun. 7, 1995, Ser. No. 477,562

Int. Cl.^{6} A61M *15/06;* **A24D** *1/00;* **A24B** *15/16*

U.S. Cl. 131—273 **24 Claims**



1. A dry powder delivery system comprising:

(a) an elongated tubular housing having proximal and distal ends and a passageway for air flow between the ends;

(b) the distal end having at least one inlet opening through which air can be introduced into the passageway;

(c) the proximal end forming a mouth piece with at least one end outlet opening through which air can be withdrawn from the passageway;

(d) a resistance member that creates a controlled pressure drop between the distal and proximal ends and a resistance to the drawing of air at the mouth piece, said resistance being sufficiently great that particles are drawn into the mouth of the user to simulate the action of puffing on a cigarette;

(e) means for introducing a measured mount of particles of a dry powder compound having a therapeutic capability into air flowing in a flow path in the passageway so that said particles will travel downstream from the resistance member whereby suction created at the proximal end causes air to flow in the passageway and into contact with particles of said dry powder for discharge through the outlet at a low velocity;

(f) the particles being sized and coordinated with the controlled pressure drop so the particles can be drawn into the mouth of the user and inhaled;

(g) wherein the means for introducing a measured amount of particles includes a matrix with a plurality of passageways in the flow path, the passageways containing the dry powder.

5,687,747
METHOD OF AND APPARATUS FOR ASSEMBLING ACCUMULATIONS OF PARTICULATE MATERIALS

Christian Schramm, Evry, France, assignor to Chilinov s.a.r.l., Chilly-Mazarin, France

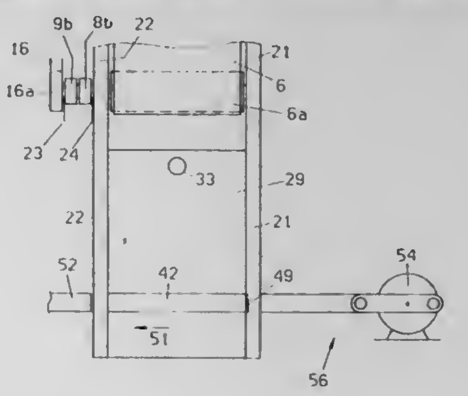
Filed Sep. 14, 1995, Ser. No. 528,240

Claims priority, application Germany, Sep. 22, 1994, 44 33 848.1

Int. Cl.^{6} A24C *5/14*

U.S. Cl. 131—280 **30 Claims**

1. A method of making batches of comminuted material, com-



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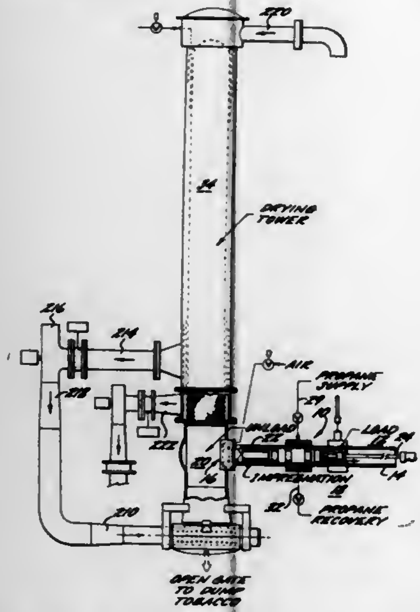
prising the step of transporting comminuted material into a receptacle of a batch gathering unit by a substantially funnel-shaped array of driven endless flexible non-suction elements.

5,687,748
SPOOL AND SHELL WITH PRESSURIZING FLUID ACTIVATED SEAL

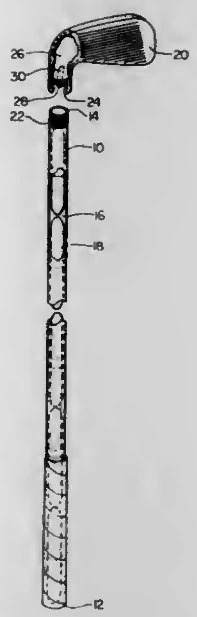
Lucas Jones Conrad; Robert Eugene Grubbs, and James Edward Lovette, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Jul. 1, 1996, Ser. No. 674,001
Int. Cl.^{6} A24B *3/18*
U.S. Cl. 131—291 **25 Claims**



1. A spool and shell assembly for use in tobacco expansion comprising:
  a pressure vessel defined by a tubular shell and a spool assembly moveable between at least a first position outside the shell and a treating position within the shell;
  said spool assembly comprising first and second cylindrical end members and a connecting rod extending therebetween;
  at least one sealing assembly carried by each of said first and second end members for sealing said pressure vessel when said spool is in the treating position;
  each of said sealing assemblies comprising at least one elastically deformable annular sealing member associated with the circumferential exterior of said end member for sealing said spool in the treating position; and
  a pressure applying member operatively associated with at least one axial end of each of said sealing members for releasably imparting axial pressure on said axial end of said sealing member when said spool assembly is in said treating position to cause radial expansion of at least a circumferentially exterior portion of said deformable sealing member.

5,687,749
HUMIDOR

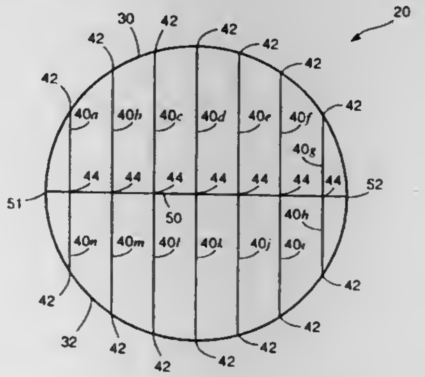
Walter H. Brauer, Jr., 160 Beech St., Roslindale, Mass. 02131
Filed Jun. 22, 1995, Ser. No. 493,653
Int. Cl.^{6} A24F *13/00*
U.S. Cl. 131—329 **12 Claims**



1. A humidor for a plurality of tobacco products, said humidor configured as a golf club, comprising:
  a storage portion defining a tobacco storage area for storing said plurality of tobacco products end-to-end, wherein the shape of said storage portion corresponds to a club shaft; and
  a sealing portion for sealing said tobacco products within said storage portion, wherein the shape of said sealing portion corresponds to a club head.

5,687,750
HAIR SUPPORT STRUCTURE

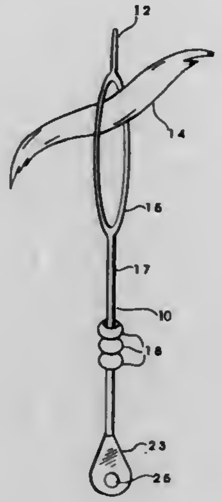
Silvano Belmonte, 4418 Radisson Cres., Mississauga, Ontario, Canada, L5M 1C4; Jacqueline Joan Bray, 2504 Oak Row Cr., Mississauga, Ontario, Canada, L5L 1P6, and Enzo Constantini, 976 Fernandez Dr., Mississauga, Ontario, Canada, L5V 1W9
Filed Jan. 16, 1996, Ser. No. 585,796
Int. Cl.^{6} A41G *5/00*
U.S. Cl. 132—54 **19 Claims**



1. A hair support structure for use in fashioning and maintaining a hairstyle on a woman's head while in place thereon, said hair support structure comprising:
  a pre-formed substantially loop-shaped base portion comprising a thin elongate main body element; and
  at least four resiliently collapsible pre-formed rib members, each having top ends and bottom ends, and being permanently secured at their bottom ends to said base portion and extending upwardly and generally inwardly therefrom so as to be structurally interconnected one to another, adjacent their top ends, at an elevated reinforcing cross-member, and wherein each of said rib members is spaced apart from adjacent rib members by a distance of at least about one centimetre and also is unattached and fully accessible along its length between its top end and its bottom end, and wherein said base portion, each of said rib members, and said reinforcing cross-member exhibit stiffness so that said hair support structure is self supporting.

5,687,751
METHOD FOR BEADING HAIR

Anthony Villani, Rancho Santa Margarta, Calif., assignor to Beadwear, Inc., Rancho Santa Margarita
Filed Jan. 18, 1996, Ser. No. 588,425
Int. Cl.^{6} A45D *2/36*
U.S. Cl. 132—200 **7 Claims**

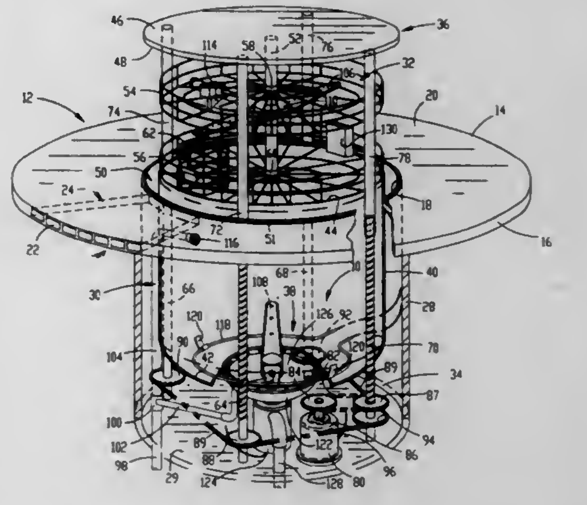


1. A method of mounting beads onto hair with a hair beading tool comprising a shaft having a first end and a second end, said first end adapted for passage of one or more beads thereover, said shaft having an orifice therethrough between said first and second ends, said orifice adapted for passage of a band of hair therethough comprising the steps of:
  passing at least one bead over said first end of said shaft and beyond said portion of said shaft having said orifice therein;
  extending one or more hair strands through said orifice in said shaft;
  pressing at least one bead towards said first end of said shaft over said hair; and
  pulling a free end of said hair back through said orifice.

5,687,752
DINING TABLE HAVING INTEGRAL DISHWASHER

Carroll J. Boylan, 3410 W. 88th, Leawood, Kans. 66206
Filed Nov. 15, 1995, Ser. No. 558,176
Int. Cl.^{6} A47L *15/42*
U.S. Cl. 134—115 R **19 Claims**

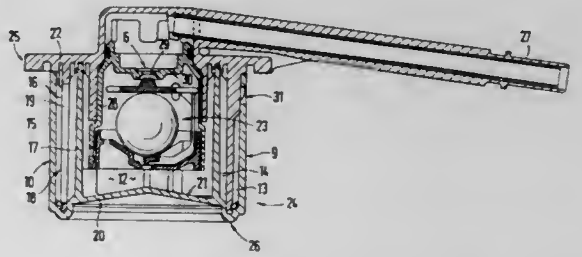
1. A dishwasher comprising:
  a washing basin having side and bottom walls and an open top;
  a rack assembly for carrying dishes, and that is vertically shiftable between a lower cleaning position wherein the rack assembly is disposed within the basin below the open top and an upper loading position wherein the rack assembly is disposed above the open top of the basin;
  a shifting mechanism coupled with the rack assembly for selectively shifting the assembly between the cleaning position and loading position;
  a lid member for covering the open top of the basin when the rack assembly is in the cleaning position; and
  a cleaning means for cleaning the dishes carried in the rack assembly when the assembly is in the cleaning position,
  said lid member being coupled with the shifting mechanism for shifting movement with the rack assembly.



  said lid member having an undersurface and including a bar suspending from the undersurface to support the rack assembly,
  said rack assembly including a pair of vertically spaced wire frames,
  said frames being rotatably supported on the bar.

5,687,753
FUEL TANK FOR VEHICLES, PARTICULARLY MOTOR VEHICLES

Dieter Doll, Magstadt, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed Mar. 13, 1996, Ser. No. 615,600
Claims priority, application Germany, Mar. 24, 1995, 195 10 821.3
Int. Cl.^{6} F16K *24/04*
U.S. Cl. 137—43 **24 Claims**



1. Fuel tank system for vehicles, particularly motor vehicles, comprising:
  an operational ventilating system which is composed essentially of a vent outlet arranged in an area of an upper fuel tank wall,
  an exterior air feeding and air removing pipe connected to the vent outlet, and
  a partitioning device disposed in front of the vent outlet inside the fuel tank which partitions off the vent outlet with respect to a direct action by liquid fuel particles thrown upwards during the driving operation,
  wherein said partitioning device is a receptacle with a plurality of walls spaced from one another and having offset openings thereby forming a labyrinth path from the fuel tank to the vent outlet,
  and wherein said receptacle includes a bottom which slopes downwardly to bottom portions of at least one of said offset openings thereby facilitating flow of any liquid fuel in said receptacle back to the fuel tank.

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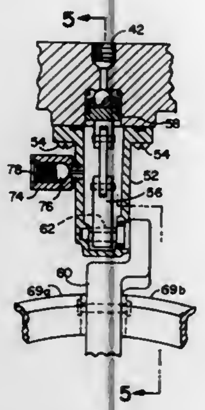
5,687,754
AUTOMATIC DRAIN VALVE WITH INTERNAL PRESSURE BOOSTER VALVE

Leonard R. Nemeth, Northfield; William S. Stumphauzer, Elyria, and Hugh F. Groth, Richfield, all of Ohio, assignors to Precision Pneumatics, LLC, Lorain, Ohio

Filed Aug. 15, 1996, Ser. No. 698,569

Int. Cl.^{6} F16K *31/34*

U.S. Cl. 137—179 **20 Claims**



15. An automatic drain valve system for reservoirs for accumulating liquids in a pneumatic system comprising:
- a reservoir having a top, a bottom and sidewall means extending therebetween, the reservoir having an inlet opening and an outlet opening connected to a pneumatic system and said reservoir having an outlet drain in the bottom thereof;
- a drain valve for the reservoir mounted external of the reservoir and connected to the outlet drain;
- a pneumatic valve operator mounted external to said reservoir and attached to said drain valve for opening and closing the valve;
- a buoyant float positioned within the reservoir responsive to liquid level in the reservoir to move between a high position and a low position within the reservoir;
- a normally closed pilot valve mounted in the top of the reservoir;
- actuation lever means having a first end operatively connected to the pilot valve and extending downwardly inside the reservoir with a second end positioned near the bottom of the reservoir when the float is in a low position within the reservoir;
- the second end of the actuation lever means being connected to the float,
- a first pneumatic means connected between the pilot valve and the valve operator to cause the valve operator to open the drain valve when the pilot valve is opened by the float rising to a high position in the reservoir, and to close the drain valve when the pilot valve is closed by the float sinking to a low position in the reservoir; and
- a second pneumatic means connected between the pilot valve and the interior of the reservoir to provide internal pressure to the reservoir when the pilot valve is opened.

5,687,755
EQUIPMENT COMPRISING A CONDENSATE TRAP

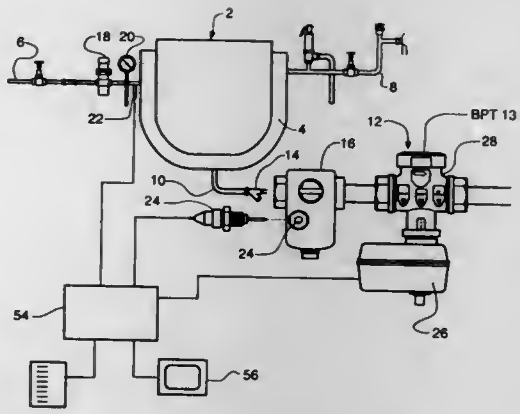
Keith Robert Farquhar, Cheltenham, and Keith Dewhirst, Stroud, both of United Kingdom, assignors to Spirax-Sarco Limited, Gloucestershire, United Kingdom

Filed Jun. 28, 1996, Ser. No. 671,878

Claims priority, application United Kingdom, Jun. 29, 1995, 9513268

Int. Cl.^{6} F16T *1/00*

U.S. Cl. 137—182 **12 Claims**



1. Equipment comprising a condensate trap assembly having a valve body and a condensate trap provided in the valve body, the valve body having an inlet and an outlet and accommodating a valve element which is movable by drive means between three operative positions in which respectively
- (i) the inlet is isolated from the condensate trap and from the outlet,
- (ii) the inlet communicates directly with the outlet, bypassing the condensate trap, and
- (iii) the inlet communicates with the outlet through the condensate trap, control means being provided which is adapted to control the drive means, the control means having at least one input for receiving a signal generated by sensing means which is responsive to an operative condition of the equipment.

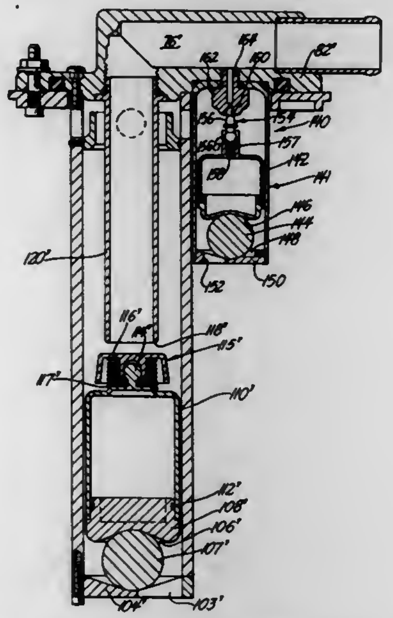
5,687,756
VEHICLE REFUELING VALVE

Larry VanNatta, Mt. Morris; Manuel D. Rosas, Coleta, and Terry L. Miller, Sterling, all of Ill., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Nov. 8, 1995, Ser. No. 555,129

Int. Cl.^{6} F16K *24/04*

U.S. Cl. 137—202 **10 Claims**



1. A fuel vapor assembly adapted to be mounted in the top of a motor vehicle fuel tank, said assembly comprising a body having an entry passage adapted to be open to liquid fuel and fuel vapor and a vapor exit passage adapted to be connected to a fuel vapor storage device and the body being connected to the top of a fuel tank in depending relationship therewith; a valve and said valve including a float and a valving element carried by the float and tiltable with respect to the float for compensating for tilt further characterized by:

- said body further including a vapor inlet passage located above said entry passage;
- a first tubular member supported within said body having one end sealingly connected to the vapor exit passage and having an opposite end defining a valve seat closable by the valving element and located below said vapor inlet passage for separating liquid fuel particles prior to entering said vapor exit passage; and
- a baffle ring connected to said body below said vapor inlet passage and spaced from said first tubular member for trapping liquid fuel particles at said vapor inlet passage for return to the fuel tank through the vapor inlet passage so as to prevent passage thereof through the first tubular member and out said vapor exit passage.

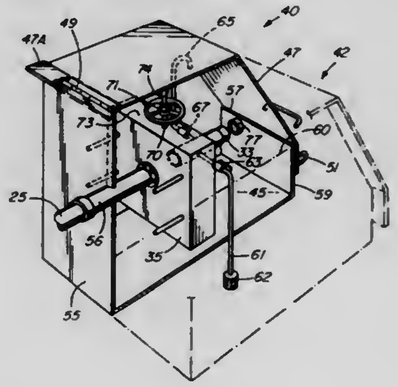
5,687,757
SECURE LOCK AND SPILL PREVENTER FOR FLUID STORAGE FACILITY

Perry C. Heintz, P.O. Box 242, Erskine, Alberta, Canada, TOC 1GO, and Kelly R. Thorkelson, Stettler, Canada, assignors to Perry C. Heintz, Erskine, Canada

Filed May 4, 1995, Ser. No. 435,347

Int. Cl.^{6} F16K *27/08*

U.S. Cl. 137—382 **15 Claims**



1. A fluid storage system comprising:
- (a) a tank for storing fluid;
- (b) a valve having a fluid inlet and a fluid outlet;
- (c) a box enclosing said valve, said box comprising a fluid-impermeable lower receptacle portion and a lid mounted to said lower receptacle portion, said lid having an open position and a closed position;
- (d) an outlet pipe extending from said tank, penetrating a wall of said box and connecting to said fluid inlet of said valve; and
- (e) a coupler in said box, said coupler in fluid communication with said fluid outlet of said valve and above said lower receptacle portion;

wherein said valve comprises a valve housing and a movable member for opening and closing said valve operatively associated with said valve housing, said movable member having a first position wherein said valve is closed and said movable member is entirely inside said box and a second position wherein said valve is not closed and said movable member obstructs said lid from being closed.

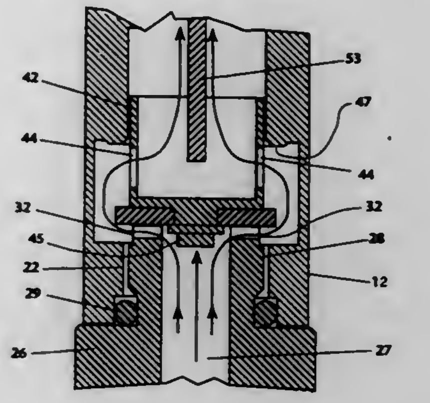
5,687,758
GAS LEAK SENSOR SHUTOFF VALVE AND METHOD FOR INSTALLATION

Yoel Schuster, Holon, Israel, assignor to Gas Guard West, Inc., Oakland, Calif.

Continuation of Ser. No. 445,915, May 22, 1995, Pat. No. 5,494,068. This application Feb. 21, 1996, Ser. No. 604,497

Int. Cl.^{6} F16K *17/28*

U.S. Cl. 137—460 **6 Claims**



1. A gas leak sensor shutoff valve for use in a gas supply line, including;
- a valve body having an internal bore extending therethrough in an axial direction;
- first connector means joined to a first end of said bore and adapted to connect to a pressurized gas supply;
- outlet passage means connected to a second end of said internal bore, and second connector means joined to an outer end of said outlet passage means and adapted to connect to a gas delivery system;
- valve chamber means disposed in a medial portion of said internal bore;
- a valve assembly disposed in said valve chamber, said valve assembly including means to form a seal with an annular shoulder in said valve chamber;
- a gas flow path extending from a pressurized gas supply through said first connector means to said valve chamber, around and through said valve assembly, and through said outlet passage to a gas delivery system
- said valve assembly adapted to translate axially in said valve chamber from a first position in which said flow path is open to a second position in which said flow path is blocked;
- means for defining a threshold gas flow rate below which said valve assembly remains in said first position and above which said valve assembly is driven by said gas flow to translate to said second position and block said gas
- said first connector means including a plug disposed in sealing fashion in said first end, a central opening extending axially through said plug, said opening forming a portion of said gas flow path;
- said valve assembly including a closed end;
- said plug including an inner end extending to said valve chamber, said central opening of said plug including an inner opening proximate to said closed end of said valve assembly; and,
- at least one slot opening extending in said inner end of said plug from said central opening, said at least one slot opening comprising a portion of said gas flow path.

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5,687,759

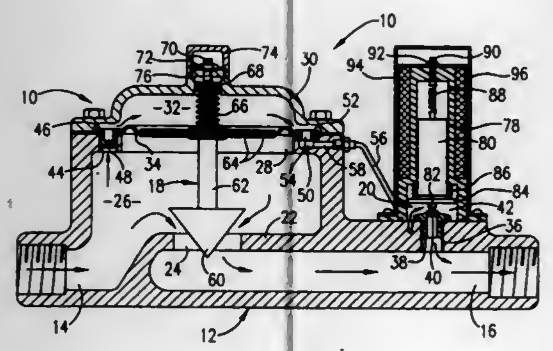
LOW OPERATING POWER, FAST-RESPONSE SERVOVALVE

Jinglu Tan, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Apr. 4, 1996, Ser. No. 628,021

Int. Cl.⁶ F16K *31/12*

U.S. Cl. 137—486 **8 Claims**



1. A servovalve for controlling fluid flow in a fluid handling system, the servovalve comprising:

- a casing presenting an inlet and an outlet, and including a partition having an opening that permits fluid communication between the inlet and outlet;
- a primary valve supported on the casing and including
  - a valve plug movable between a seated position in which the valve plug blocks the opening, and a plurality of open positions in which the valve plug presents a restriction of variable size for varying the flow between the inlet and the outlet, and
  - a diaphragm supporting the valve plug and including a first side remote from the partition and a second side proximal to the partition;
- a means for defining a control chamber on the first side of the diaphragm;
- a pilot inlet passage providing fluid communication between the inlet and the control chamber;
- a pilot outlet passage providing fluid communication between the control chamber and the outlet;
- a pilot valve for controlling the flow of fluid through the pilot outlet passage, the pilot valve including a control plug that is movable between a closed position in which the control plug blocks the pilot outlet passage, and a plurality of open positions in which the control plug presents a restriction of variable size within the pilot outlet passage for varying the flow between the control chamber and the outlet; and
- a positioning means for moving the control plug between the closed and open positions, the positioning means including a solenoid having an electromagnetic coil, an axially shiftable core on which the control plug is supported, and a core biasing means for supporting the core within the coil so that the position of the core relative to the coil is established by the force exerted on the core by the electromagnetic field around the coil acting in opposition to the core biasing means;
- wherein the solenoid includes a stand on which the coil is wound and within which the core is received the core biasing means including a compression spring extending between the core and the stand for biasing the core in a direction opposite to the direction of the force exerted on the core upon energization of the coil, and a tension spring extending between the core and the stand for biasing the core in a direction opposite to the direction of bias of the compression spring, the tension spring defining an adjustment means for adjusting the net spring force exerted on the core, the tension spring being accessible from outside the stand.

5,687,760

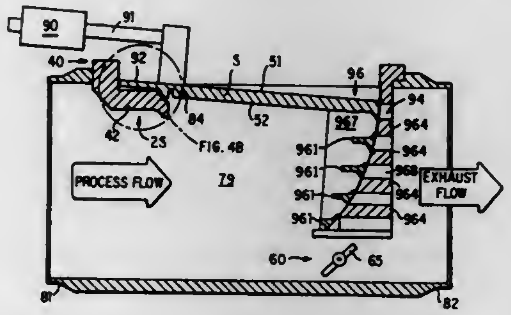
FLOW REGULATOR

David W. Palmer, 200 Berkeley Rd., North Andover, Mass. 01845

Continuation-in-part of Ser. No. 126,151, Sep. 23, 1993, Pat. No. 5,456,280, , which is a continuation-in-part of Ser. No. 141,498, Oct. 22, 1993, Pat. No. 5,450,873, which is a continuation-in-part of Ser. No. 965,909, Oct. 23, 1992, abandoned, and Ser. No. 965,907, Oct. 23, 1992, Pat. No. 5,320,124, said Ser. No. 965,909and Ser. No. 965,907, , each is a continuation-in-part of Ser. No. 850,767, Mar. 13, 1992, Pat. No. 5,251,654, Ser. No. 851,017, Mar. 13, 1992, Pat. No. 5,255,710, Ser. No. 852,084, Mar. 13, 1992, Pat. No. 5,255,709, and Ser. No. 851,016, Mar. 13, 1992, Pat. No. 5,220,940, said Ser. No. 850,767Ser. No. 851,017, Ser. No. 852,084, and Ser. No. 851,016, , each is a continuation-in-part of Ser. No. 669,746, Mar. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 405,835, Sep. 11, 1989, Pat. No. 5,000,221, which is a continuation-in-part of Ser. No. 178,505, Apr. 7, 1988, abandoned. This application Dec. 4, 1995, Ser. No. 566,977

Int. Cl.⁶ G05D *7/01*

U.S. Cl. 137—497 **18 Claims**



1. A device for regulating the flow of fluid through a passageway, the device comprising:

- a conduit having a wall defining the passageway through the device;
- a member having a top face, exposed to a reference pressure, and a bottom face forming a portion of the conduit wail, the member being hingedly mounted about a pivot point;
- a gate, attached to the member at a point downstream from the pivot point, the gate extending into the passageway so as to variably impede fluid flowing through the passageway at a constriction point, the gate's impedance on the fluid flow varying as a function of the pressure differential across the member's top and bottom faces, the gate and the member being mounted so that each moves in a direction transverse to the direction of the fluid through the constriction point; and
- restoring means for exerting a torque on the member around the pivot point so as to tend to cause the gate to lessen the impedance on the fluid flow, and so that when there is no flow through the passageway the amount that the gate impedes the flow is relatively low, the restoring means including the weight of the member upstream of the pivot point.

5,687,761

SEWER BACKUP INDICATOR APPARATUS

Peter Langes, 1113 Oakwood Ave., Vallejo, Calif. 94591

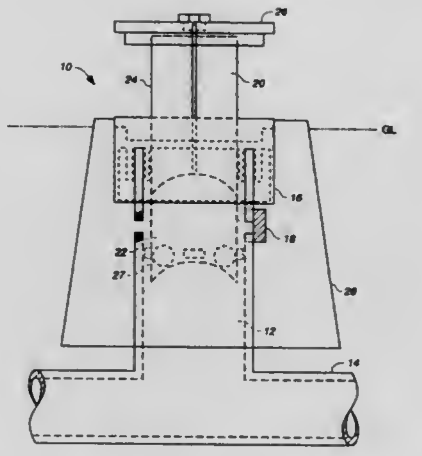
Filed Oct. 8, 1996, Ser. No. 727,057

Int. Cl.⁶ F16K *37/00*

U.S. Cl. 137—558 **5 Claims**

1. A sewer backup indicator apparatus providing visual indication of an impending sewer backup, for installation on the cleanout riser of a sewer lateral, said apparatus comprising:

- a housing portion adapted for attachment to the cleanout riser; and



- a vertically movable piston portion slidably engaged within said housing portion, said piston portion including a float member, a wall member, and a cap member, wherein when sewage is not backed up into the cleanout riser, said piston portion wall member is contained within said housing portion, and when sewage backs up into the cleanout riser, said float member urges said piston portion to move vertically within said housing portion to reveal said wall member.

5,687,762

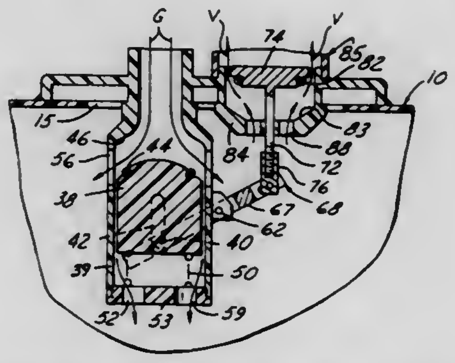
FUEL FILL AND VAPOR VENTING VALUE UNIT FOR FUEL TANKS

Michael R. Teets, Grosse Pointe Park, and Jacquelyn C. Rocca, Madison Heights, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Sep. 21, 1995, Ser. No. 531,504

Int. Cl.⁶ F16K *24/00*

U.S. Cl. 137—588 **4 Claims**



1. A fuel fill and vapor venting valve unit for a tank liquid fuel comprising a base plate directly attached to said tank, said base plate having a first valve housing extending therefrom disposed within the tank, the housing includes a fuel inlet which routes liquid fuel into the tank through said housing, a first valve element operatively mounted within said housing for movement between a closed position in said housing so that said liquid fuel is confined within the tank and an open position in said housing so that liquid fuel can be added into the tank through said fuel inlet and said housing,

- and spring means operatively mounted within said housing for urging said valve element to said closed position and for yielding in response to displacement of the valve element from the closed position to an open position by the force of liquid fuel exerted thereon when routed into the tank through said inlet and said housing, said base plate further having a second valve housing extending therefrom in side-by-side disposition within the tank with respect to said first valve housing, a second valve element mounted within the second housing movable between an open position in which the tank is vented and a closed position in which said tank is closed,
- a linkage lever pivotally mounted within said tank operatively interconnecting said valve elements to one another so that the opening of said first valve element from the force of liquid fluid being routed into said tank effects the opening of said second valve element and the subsequent closure of said first valve element effects the closure of said second valve element.

5,687,763

FLUID FLOW CONTROL DEVICE

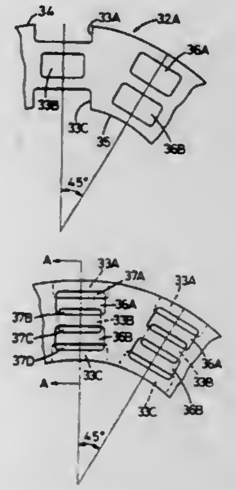
Joseph H. Steinke, Mission Viejo, Calif., assignor to Control Components Inc., Rancho Santa Margarita, Calif.

Filed Feb. 12, 1996, Ser. No. 599,745

Claims priority, application United Kingdom, Feb. 14, 1995, 9502836

Int. Cl.⁶ F16K *47/04*

U.S. Cl. 137—625.33 **10 Claims**



1. A fluid flow control device comprising a plurality of pairs of annular discs forming a rigid structure which incorporates a series of substantially radial passageways running from an inner edge to an outer edge of said annular discs for fluid flow,

- each disc of said pair having two major faces and passageways which extend completely through said disc between said major faces but extend only partially in a radial direction,
- the discs of each pair being substantially identical and being aligned with one another with a major face of one disc in direct abutment with a major face of the other disc such that the passageways in said one disc interconnect with the passageways in the other disc of the pair so as to provide for said fluid flow through the pair of substantially identical discs.

5,687,764

FOUR-PORT VALVE

Ryoichi Tanaka; Mamoru Matsuo, and Makoto Miyata, all of Yokohama, Japan, assignors to Nippon Furnace Kogyo Kabushiki Kaisha, Kanagawa, Japan

PCT No. PCT/JP95/00391, § 371 Date Sep. 4, 1996, § 102(e) Date Sep. 4, 1996, PCT Pub. No. WO95/24577, PCT Pub. Date Sep. 14, 1995

PCT Filed Mar. 9, 1995, Ser. No. 704,634

Claims priority, application Japan, Mar. 9, 1994, 6-064375

Int. Cl.⁶ F16K *11/04*

U.S. Cl. 137—625.43 **4 Claims**

1. A four-port valve which has four ports and in which directions of the flow of fluid passing through the ports provided on the two

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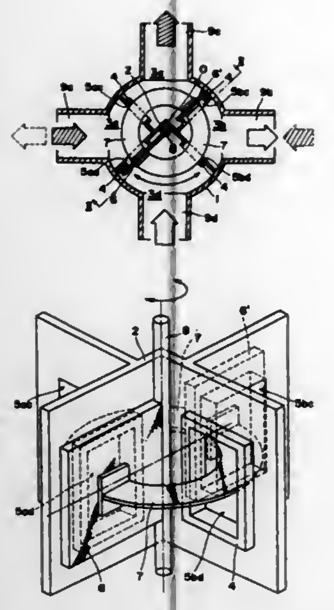


opposed positions are fixed and the other two ports provided between said ports are selectively communicated with either of said two ports in a casing to change over the fluid passing through the ports, the four-port valve characterized in that: the inside of the casing is divided into four chambers by a substantially-X-shaped partition wall; the opposed two of the four chambers are determined as fixing chambers communicating with the ports respectively connected with two types of passages in which directions of the flow of fluid are fixed while the remaining two opposed chambers are determined as change-over chambers communicating with the ports respectively connected with two types of passages in which directions of the flow of fluid are alternately changed over; valve openings for communicating two chambers adjacent to the substantially-X-shaped partition wall with each other are provided; a valve plate for closing the valve openings and a drive shaft for supporting and oscillating the valve plate are provided to one among the four chambers while a valve plate for closing the valve openings is provided to the opposed chamber so as to be connected with the valve plate supported by the drive shaft by a semi-circular or circular connecting ring piercing through the valve openings; and the valve plate oscillating by rotation of the drive shaft is interlocked with the other valve plate to alternately communicate the two fixing chambers with the different change-over chambers.

5,687,765

3-POSITION 3-WAY SOLENOID VALVE

Jang-Yeol You, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 4, 1996, Ser. No. 582,738

Claims priority, application Rep. of Korea, Feb. 9, 1995, 95-2309

Int. Cl.^{6} F16K *11/16;31/10*

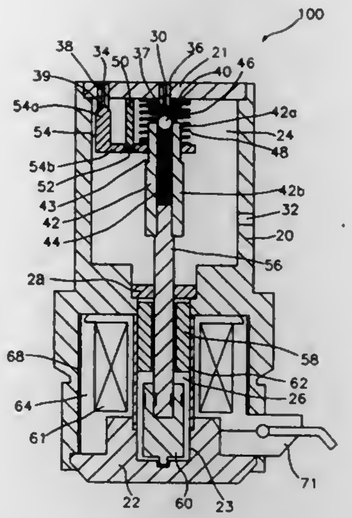
U.S. Cl. 137—627.5 **9 Claims**

1. A solenoid valve comprising:

a valve body having a housing with a first port for receiving fluid from a pressure generating source, a second port for admitting/discharging the fluid and a third port for exhausting the fluid, and first and second covers hermetically coupled to said housing for closing opposite open ends of said housing;

a barrier wall for partitioning a chamber formed by said housing and said first and second covers into first and second chambers, said first chamber being communicated with said first, second and third ports, said barrier wall having a barrier hole;

actuating means extending from said first chamber to said second chamber through said barrier hole for communicating said second port with one of said first and third ports, and interrupting fluid communication between said first to third



ports by closing one of said first and third ports and both of said first and third ports in response to electric signals, said actuating means being located at a first position of opening said first port and closing said third port in a normal state that no electric signal is supplied, at a second position of closing said first and third ports in a first active state that a primary signal having a half of maximum voltage to be applied is supplied, and at a third position of closing said first port and opening said third port in a second active state that a secondary signal having the maximum voltage is supplied; and

a solenoid assembly for moving said actuating means located at said first position in said normal state to said second position in response to supplying of said primary electric signal and to said third position in response to supplying of said secondary electric signal, said solenoid assembly being composed of an annular solenoid coil, a bobbin wound by said solenoid coil and terminals electrically connected to said solenoid coil and exposed to the outside of said valve body and being disposed within said second chamber to surround said actuating means,

wherein said first cover and said barrier wall define said first chamber, said second cover and said barrier wall define said second chamber, said first port is provided at the center of said first cover, said third port is provided at said first cover apart from said first port at a distance, and said second port is provided to said housing.

5,687,766

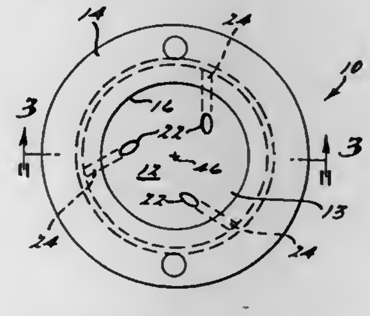
APPARATUS FOR FORMING A VORTEX

Todd S. Weakley, Waterford, Mich., assignor to B. W. Vortex, Inc., Livonia, Mich.

Filed Jan. 18, 1996, Ser. No. 588,460

Int. Cl.^{6} F15C *1/16*

U.S. Cl. 137—812 **20 Claims**



1. An apparatus for forming a vortex comprising:

a member having a cavity therein, said member including an outer surface wherein said cavity communicates with said

outer surface to form an opening, such that said vortex is formed within said cavity and exits said cavity through said opening;

said cavity further defining a surface and said member having a passageway therein, wherein said passageway intersects with said surface to form an inlet port at the intersection of said surface and said passageway;

said surface of said cavity including a diffuser surface and a stabilizer surface, said stabilizer surface positioned adjacent said diffuser surface such that said vortex is formed by contact of a fluid with said diffuser surface and is stabilized by said stabilizer surface prior to exiting the cavity through the opening adjacent said outer surface; and

said cavity having a central axis, said vortex formed about said central axis, a cross-sectional shape of said cavity taken along a plane encompassing said central axis is such that the diffuser surface is arcuate and the stabilizer surface is linear and parallel said central axis.

5,687,767

UNI-DIRECTIONAL FLUID VALVE

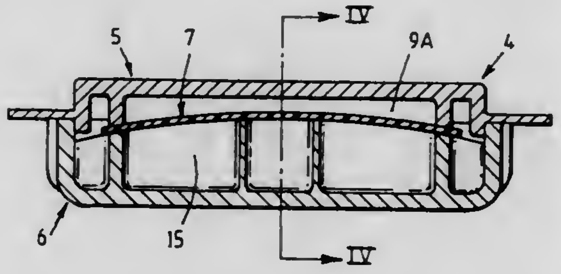
John Lawrence Bowers, Douglas, England, assignor to Racal Health & Safety Limited, England

Filed Jul. 26, 1996, Ser. No. 686,839

Claims priority, application United Kingdom, Aug. 4, 1996, 9515986

Int. Cl.^{6} F16K *15/16*

U.S. Cl. 137—855 **11 Claims**



1. A uni-directional fluid valve comprising a cantilevered flexible flap and a cooperating valve seat surrounding a valve orifice; the cantilevered flexible flap having a planform defining a root end and a free end at opposite ends of a longitudinal axis of the flap, and two peripheral side edges respectively extending between the root end and the free end; the valve seat having sealing surfaces that contact the flap along said root end, free end and peripheral side edges when the fluid valve is closed; the cantilevered flexible flap is attached to the respective sealing surface of the valve seat at said root end and is freely movable to flex away from the respective sealing surfaces of the valve seat at said free end and along at least portions of said peripheral side edges when fluid flows through the fluid valve and the fluid valve is open; and said root end of the cantilevered flexible flap and the respective sealing surface that contacts the cantilevered flexible flap at said root end have a fixed curvature in a direction transverse to said longitudinal axis, said transverse curvature biases the flap and maintains it substantially in contact with all said sealing surfaces of the valve seat in the absence of an opening pressure differential across the flap, in any orientation of the valve.

5,687,768

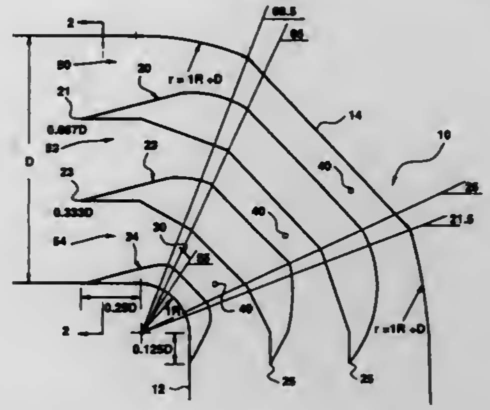
CORNER FOILS FOR HYDRAULIC MEASUREMENT

Ted V. Mull, Jr., Akron; Melvin J. Albrecht, Homeworth; Jeffrey A. LaRose, Stow, and Mitchell W. Hopkins, Uniontown, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 18, 1996, Ser. No. 588,495

Int. Cl.^{6} B21D *39/00;* **G01F** *1/46*

U.S. Cl. 138—39 **8 Claims**



1. A fluid flow pressure measurement system having a corner air foil arrangement for channeling a fluid flow through a bend of a rectangular duct of a furnace, the arrangement for creating a region within the bend, having increased fluid velocity which is suitable for obtaining accurate pressure measurements, the system comprising:

an outer duct bend wall having a flat, straight portion between two arcuate portions, the wall forming a bend;

an inner duct bend wall having an arcuate portion forming a bend, the arcuate portion defining an arc of a circle having a center outside the duct bend;

a pair of flat duct side walls airtightly connecting the outer duct bend and inner duct bend at a constant distance apart;

an inner corner air foil having a bottom surface continuously connected to the inner duct bend wall between the side walls, an outer surface, a leading edge, and a trailing edge;

at least one corner air foil attached to the pair of side walls within the duct bend, oriented substantially parallel to the outer duct bend wall and between the outer duct bend wall and inner duct bend wall, each air foil having a leading edge, a trailing edge, and at least one substantially straight section between the leading edge and the trailing edge forming at least two substantially straight channels between the at least one substantially straight section, the outer duct bend wall and the inner corner air foil within the duct bend; and

means, located within the at least two substantially straight channels, for measuring a static and a dynamic pressure of the fluid flow through the channels.

5,687,769

CONFIGURABLE PORT ASSEMBLY

Robert Meunier, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 16, 1996, Ser. No. 591,182

Int. Cl.^{6} F15D *1/02*

U.S. Cl. 138—40 **17 Claims**

1. A configurable port assembly, for use proximate a structure containing a medium, said configurable port assembly comprising:

at least two configurable port assembly components assembled in at least one predetermined configuration;

a first side of said configurable port assembly having a first opening formed by said at least two configurable port assembly components assembled in said at least one predetermined configuration;

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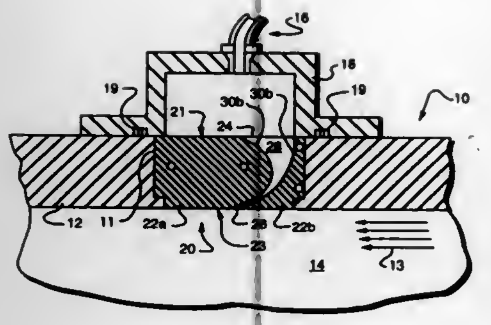


a second side of said configurable port assembly having a second opening formed by said at least two configurable port assembly components assembled in said at least one predetermined configuration; and

a configurable port extending from said first opening to said second opening, said configurable port having at least one predefined shape defined by said at least two configurable port assembly components assembled in said at least one predetermined configuration.

5,687,770
FLOW CONTROL DEVICE

John Sharp, 10 Brighton Avenue, Brighton-Le-Sands, Australia, 2216

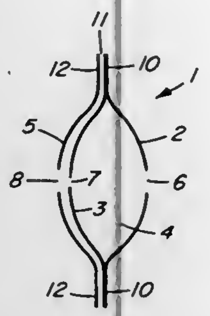
PCT No. PCT/AU94/00006, § 371 Date Sep. 15, 1995, § 102(e) Date Sep. 15, 1995, PCT Pub. No. WO94/16259, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 4, 1994, Ser. No. 481,359

Claims priority, application Australia, Jan. 4, 1993, PL6641

Int. Cl.⁶ F15D *1/02*

U.S. Cl. 138—44 **7 Claims**



1. A flow control device for controlling the flow rate of a fluid flowing through a conduit from an upstream side of said device to a downstream side of said device, said device comprising two opposed dished baffle plates defining a chamber therebetween, each said dished baffle plate having a generally centrally located hole therein, wherein on said downstream side said device further comprises at least one additional dished baffle plate having a generally centrally located hole, said additional dished baffle plate being positioned in a nested configuration with said baffle plate of said downstream side of said device, said baffle plate of said downstream side of said device and said additional baffle plate having a space between said holes of said baffle plate of said downstream side of said device and said additional baffle plate, respectively, whereby positioning said device substantially transverse to the longitudinal extent of said conduit and diverting said fluid through said holes controls the flow rate of said fluid.

5,687,771
TEMPORARILY BLOCKING THE BORE OF A PIPE THROUGH WHICH A FLUID FLOWS WITH A FOAMED PLUG REMOVED BY DISSOLVING

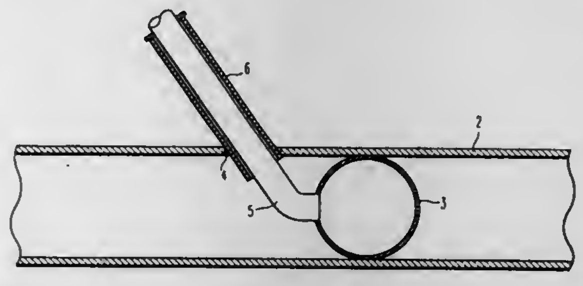
Peter Spence Clough, Stretford, England, assignor to British Gas plc, London, England

Division of Ser. No. 52,288, Apr. 26, 1993, Pat. No. 5,400,826, which is a continuation of Ser. No. 729,905, Jul. 15, 1991, abandoned, which is a continuation of Ser. No. 635,380, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 435,051, Nov. 9, 1989, abandoned. This application Nov. 30, 1994, Ser. No. 351,130

Claims priority, application United Kingdom, Nov. 10, 1988, 8826349; Jan. 5, 1989, 8900205

Int. Cl.⁶ F16L *55/12*

U.S. Cl. 138—89 **1 Claim**



1. A kit for temporarily blocking the bore of a pipe through which a fluid flows, comprising:

an insertion tube forming a gas tight seal at a hole in the wall of a pipe when an end of the insertion tube is temporarily located in the hole;

a single flexible bag having a mouth securable to an end of a supply conduit and insertable, with the supply conduit secured thereto, into the bore of the pipe through the insertion tube located at the hole;

a quantity of materials which will form a foam when mixed, for injection into the bag via the supply conduit so as to inflate the flexible bag to form a seal of the flexible bag directly blocking the bore of the main;

means for injecting the quantity of materials into the bag via the supply conduit;

a quantity of a substance capable of dissolving the foam to such an extent that the bag may be at least partially deflated and removed from the pipe; and

means for injecting through the insertion tube and into the bag, after inflating the bag with the foam, the quantity of the substance capable of dissolving the foam.

5,687,772
PROTECTIVE END CAP

Daniel Charles Underwood, 12 Lewisham Court, Birkdale, Queensland, 4159, Australia

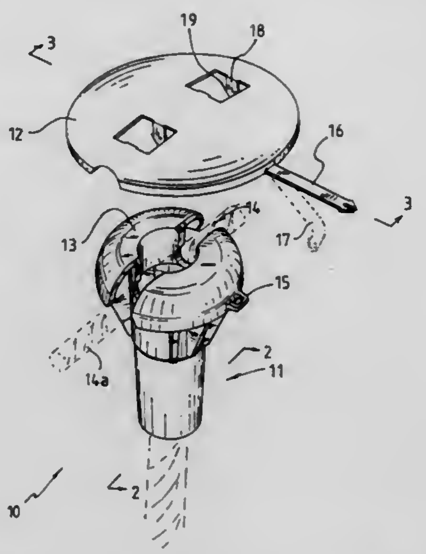
Filed Oct. 25, 1995, Ser. No. 547,803

Claims priority, application Australia, Oct. 28, 1994, PM9115

Int. Cl.⁶ F16L *55/10*

U.S. Cl. 138—96 R **4 Claims**

1. A reinforcement bar end cap comprising an elongate hollow base having a first cap at one end and being open at its opposite end so that the hollow base is slidable over a free end of reinforcement bar and further comprising a separately formed second cap section Which is larger than said first cap section, the second cap section being attachable to said first cap section to cover the first cap section thereof and thereby provide a cap for the hollow base, said second cap section projecting radially outwardly from said hollow base.



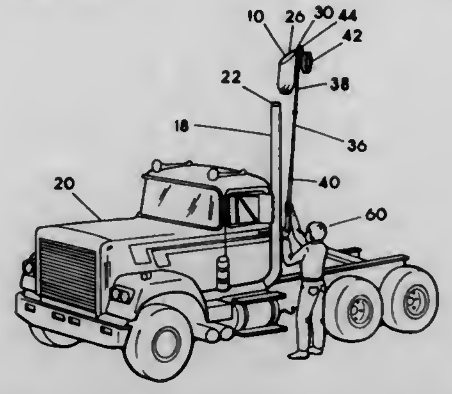
5,687,773
EXHAUST PIPE COVER AND METHOD OF COVERING AN EXHAUST PIPE

Stephen M. Ryan, and Elizabeth C. Ryan, both of 5144 Parkside Dr., Grizzly Flat, Calif. 95636

Filed Jun. 3, 1996, Ser. No. 660,164

Int. Cl.⁶ F16L *57/00*

U.S. Cl. 138—96 R **8 Claims**



1. An elongated pole and cooperative cover combination for use in covering an exhaust pipe terminal end with exhaust opening, for excluding foreign matter from entering the exhaust pipe opening, comprising;

said elongated pole including

a first end of said pole graspable by human hands; and having an oppositely disposed second end of said pole affixed with

component means for engaging and holding said cover for allowing said pole to be held by hand and lifted to elevate the pole second end and said cover;

said cover comprising a tubular water repellant body having a closed end land an oppositely disposed open end, the open end and an interior of said cover sized sufficiently for allowing placement of said cover over an exhaust pipe terminal end and exhaust opening utilizing said pole to manipulate and position said cover relative to the exhaust pipe terminal end and exhaust opening;

said component means on said second end of said pole being disengagable from engaging and holding said cover by way of manual manipulation of said pole for allowing disengagement of said component means from said cover, whereby said pole and said cover can be separated from one another after said cover has been placed over an exhaust pipe terminal end and exhaust opening.

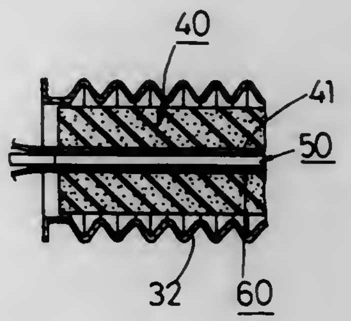
5,687,774
FLEXIBLE LAMP TUBE FOR CONNECTING A LAMP AND A LAMP BASE

Hanh Chlang, No. 162, Chung-Cheng S. Rd., Hsin-Ying Hsiang, Tainan Hsien, Taiwan

Filed Dec. 29, 1995, Ser. No. 581,321

Int. Cl.⁶ F16L *11/11*

U.S. Cl. 138—121 **5 Claims**



1. A lamp comprising:

a lamp head;

a lamp base;

an elongated foam member connected between the lamp head and the lamp base and having a central bore extending through a length thereof;

a metal wire and a pair of electrical wires extending through said central bore of said foam member; and

an accordion plastic pipe sleeved around said foam member.

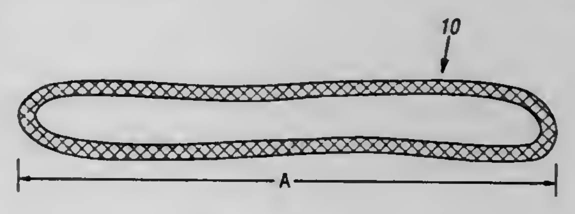
5,687,775
WOVEN FABRIC MADE OF PLASTIC MESH NETTING

Kani Bynum Thompson, and Cheryl Bynum, both of Ransom Canyon, Tex., assignors to Bynum Concepts, Inc., Lubbock, Tex.

Filed May 1, 1996, Ser. No. 640,477

Int. Cl.⁶ D03D *15/00*

U.S. Cl. 139—426 R **24 Claims**



1. A woven fabric of plastic netting comprising:

a first set of substantially parallel strands of netting; and

a second set of substantially parallel strands of netting oriented at an angle to said first set of strands and woven over and under said strands in said first set in a weave pattern sufficient to form a substantially continuous mesh.

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5,687,776

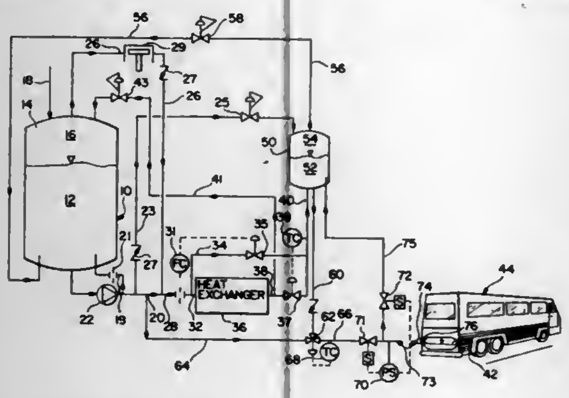
METHOD AND APPARATUS FOR FUELING VEHICLES WITH LIQUEFIED CRYOGENIC FUEL

David John Forgash, Naperville; Raymond Korzonas, Palos Hills, both of Ill.; Bryan Patrick Neuhalfen, Lake Charles, La.; George D. Rhoades, LaGrange; Jack Wayne Sudduth, Clarendon Hills, both of Ill.; Mervyn Ladd Conrad, Oak Harbor, Wash., and Richard John Kooy, Western Springs, Ill., assignors to Chicago Bridge & Iron Technical Services Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 117,355, Sep. 7, 1993, Pat. No. 5,325,894, which is a continuation of Ser. No. 986,997, Dec. 7, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 270,011

Int. Cl.^{6} B65B *31/00;* F17C *9/04*

U.S. Cl. 141—11 **26 Claims**



1. Apparatus comprising:

(a) a primary insulated storage tank containing liquefied cryogenic fuel at a low pressure and at a temperature close to its boiling point;

(b) a heat exchanger;

(c) a first conduit communicating with the primary storage tank and with the heat exchanger, the first conduit including a pump for withdrawing liquefied cryogenic fuel from the primary storage tank, increasing the pressure of the withdrawn liquefied cryogenic fuel and feeding it to the heat exchanger wherein the pressurized liquefied cryogenic fuel is warmer to a subcooled or near saturated condition; and

(d) a second conduit communicating with the heat exchanger and having means for communicating with a vehicle fuel tank, the second conduit for receiving warmed and pressurized liquefied cryogenic fuel from the heat exchanger and feeding it to a vehicle fuel tank for storage as a liquid therein at an approximate saturated condition

(e) a third conduit communicating with the primary tank and having means for communicating with a vehicle fuel tank, the third conduit for receiving fluid from the vehicle fuel tank and feeding it to the primary tank to reduce the internal pressure of the vehicle fuel tank.

5,687,777

ANESTHETIC AGENT FILLER VALVE

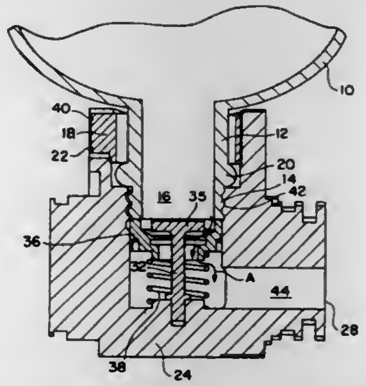
Darwin B. Dobson, Sun Prairie, and Alan A. Pitas, Evansville, both of Wis., assignors to Ohmeda Inc., Liberty Corner, N.J.

Filed Mar. 11, 1996, Ser. No. 613,971

Int. Cl.^{6} B65B *1/04*

U.S. Cl. 141—18 **3 Claims**

1. A filler valve for use with an anesthetic vaporizer and adapted to receive an anesthetic agent bottle having external threads and having a pair of projecting lugs rotatably mounted thereto, said filler valve comprising a housing, said housing having an inlet having internal threads mating with the external threads of an anesthetic agent bottle and an outlet, a valve within said housing intermediate said inlet and said outlet and having a fixed seat and a movable member, bias means to bias said movable valve member toward said fixed seat to close said valve, said inlet having a pair of slots adapted to slidingly receive said pair of lugs when properly aligned to allow the bottle to enter said inlet, said inlet being dimensioned whereby the anesthetic agent bottle moves said movable valve member away from said fixed seat by the action of the anesthetic agent bottle entering said inlet by being screwed to said inlet and the anesthetic agent bottle being prevented from entering said inlet to open said valve when said pair of lugs on the anesthetic agent bottle do not align with said pair of slots in said inlet.



5,687,778

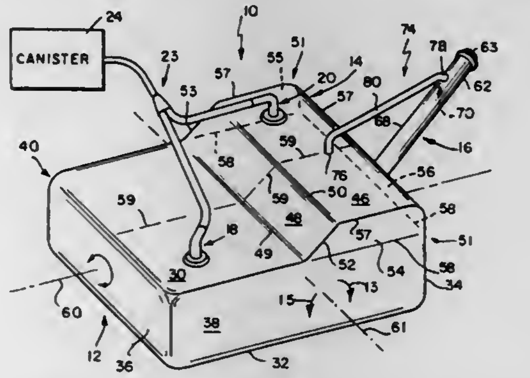
DUAL VALVE TANK VENTING SYSTEM

Robert S. Harris, Connersville, Ind., assignor to Stant Manufacturing Inc., Connersville, Ind.

Filed May 1, 1995, Ser. No. 432,600

Int. Cl.^{6} B65B *1/04*

U.S. Cl. 141—59 **40 Claims**



1. A tank venting system comprising

a tank formed to include an interior region, the tank including a top wall overlying a first portion of the interior region and a bottom wall underlying the top wall and defining a floor of the interior region,

a vapor dome positioned to rise vertically above the top wall of the tank, the vapor dome being formed to include a vapor-receiving space overlying a second portion of the interior region of the tank adjacent to the first portion and communicating with the interior region of the tank to receive fuel vapor generated by liquid fuel contained in the interior region of the tank, the vapor dome including a raised top wall defining a ceiling of the vapor-receiving space and lying at a first elevation vertically above the top wall of the tank so that the top wall of the tank lies at a second elevation vertically above the bottom wall of the tank and vertically below the elevation of the raised top wall of the vapor dome,

a first vent apparatus mounted on the top wall of the tank to vent the interior region of the tank, and

a second vent apparatus mounted on the raised top wall of the vapor dome to vent the vapor-receiving space of the vapor dome and wherein the tank further includes a first end, a filler neck coupled to the first end, an opposite second end lying in spaced-apart relation to the first end, a first side wall extending longitudinally between the first and second ends, and a second side wall extending longitudinally between the first and second ends and lying in spaced-apart relation to the first side wall, the top wall of the tank is bisected longitudinally to define a first half section adjacent to the first side wall and a second half section adjacent to the second side wall, the raised top wall of the vapor dome is bisected longitudinally to define a first half portion in close proximity to the first side wall and a second half portion in close proximity to the second side wall, the first vent apparatus is mounted in an aperture formed in the first half portion of the top wall of the tank, and the second vent apparatus is mounted in an aperture formed in the second half portion of the raised top wall of the vapor dome so that the first and second vent apparatus lie in diagonally spaced-apart relation on opposite sides of a reference line longitudinally bisecting the top wall of the tank and longitudinally bisecting the raised top wall of the vapor dome.

5,687,779

PACKAGING MACHINE SYSTEM FOR FILLING PRIMARY AND SECONDARY PRODUCTS INTO A CONTAINER

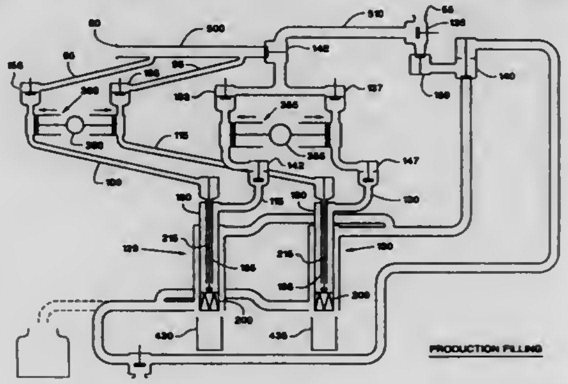
Sven Arne Andersson, Veberöd; Lars Brunndahl, Lund, both of Sweden; Arde Kirka, Algonquin; Michael Wagner, Elmhurst, both of Ill., and Karl-Gunnar Axelsson, Ayios Dometios, Cyprus, assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Continuation of Ser. No. 315,246, Sep. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 392,854, Apr. 13, 1995. This application Dec. 4, 1996, Ser. No. 753,995

Claims priority, application Sweden, Sep. 17, 1992, 9202689

Int. Cl.^{6} A23C *9/14*

U.S. Cl. 141—105 **34 Claims**



1. A fill system in a packaging machine for filling a container with a primary and a secondary product, the fill system comprising:

primary pump means for pumping a predetermined amount of the primary product received at an inlet thereof to an outlet thereof;

a primary fill pipe connected to receive the predetermined amount of primary product from the outlet of the primary pump means, the primary fill pipe having an outlet overlying a container processing path along which the containers are filled and sealed by the packaging machine, the container processing path being generally perpendicular to the orientation of the primary fill pipe;

a nozzle connected at the outlet of the primary fill pipe;

secondary pump means for pumping a predetermined amount of the secondary product received at an inlet thereof to an outlet thereof;

a secondary fill pipe connected to receive the predetermined amount of secondary product from the outlet of the secondary pump means, the secondary fill pipe being concentrically disposed in the primary fill pipe and having an outlet overlying the container processing path; and

valve means including a sealing member disposed at the outlet of the secondary fill pipe for controlling the flow of the secondary product from the secondary fill pipe, the valve means further comprising

an actuator; and

a valve rod disposed concentrically within the secondary fill pipe and connected to the actuator, the sealing member being disposed at an end of the valve rod proximate the outlet of the secondary fill pipe,

the sealing member comprising a sealing ring engaging the valve rod at a flared section of the valve rod, and a nut connected to the valve rod, the nut including a flange engaging the sealing ring, the sealing ring being disposed between the flared section of the valve rod and the flange of the nut.

5,687,780

METHOD OF FEEDING CATALYST AND APPARATUS FOR THE SAME

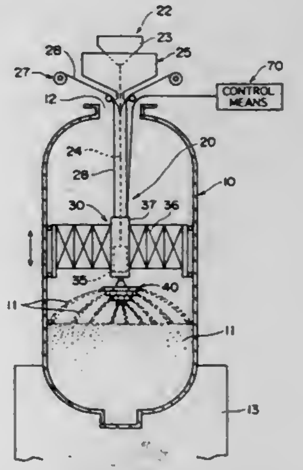
Yoshitaka Minami, Himeji, Japan, assignor to Idemitsu Engineering Co., Ltd, Tokyo, Japan

Filed Nov. 7, 1995, Ser. No. 554,449

Claims priority, application Japan, Feb. 14, 1995, HEI 7-25541

Int. Cl.^{6} B01J *4/00*

U.S. Cl. 141—286 **19 Claims**



1. A method of feeding a catalyst inside a reaction tank by sprinkling with the catalyst from a catalyst releasing device while rotating a sprinkle rotor of the catalyst releasing device hung inside the reaction tank, comprising the steps of:

defining and maintaining a height from the fed catalyst surface to the catalyst releasing device in the reaction tank

selecting a rotation frequency of the catalyst releasing device so that the catalyst which lands onto the fed catalyst surface has a speed constituent $Ux>0$ in a radial direction of the reaction tank when the catalyst is released from the catalyst releasing device at an initial speed; and

periodically changing the rotation frequency of the catalyst releasing device to maintain a uniform fed catalyst surface while feeding the catalyst into the reaction tank.

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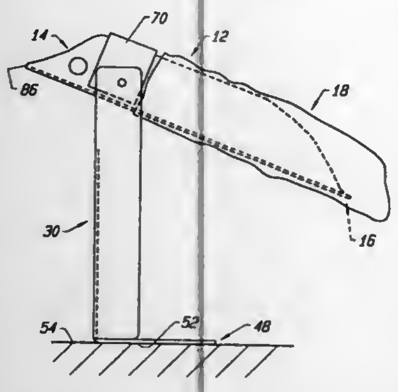
5,687,781
SAND BAG FILLING DEVICE

Anthony J. Grizz, P.O. Box 532, Clearlake Park, Calif. 95424
Filed Mar. 22, 1996, Ser. No. 621,296
Int. Cl.^{6} B65B *67/00*
U.S. Cl. 141—316 **8 Claims**

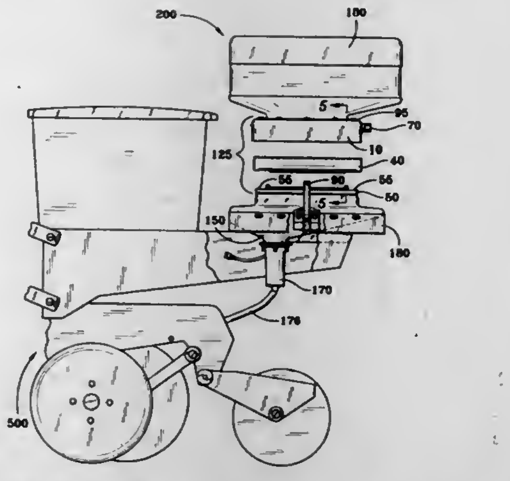


1. A device for filling a bag with material comprising:
  a. a scoop having a first end portion, a second end portion and a channel formed by an intermediate portion between said first and second end portions, said scoop being sized to allow the bag to fit over the scoop and to bear on said intermediate portions; and
  b. a support, said support including a first portion and a second portion connected to and extending from said first portion, said support first portion pivotally engaging said scoop, said support further possessing a flange connected to and extending from said second portion of said support in the vicinity of said channel of said scoop, said pivotal engagement of said support first portion to said scoop permitting said second portion of said support and said connected flange to selectively move from a first position in which said flange extends transversely relative to said channel of said scoop intermediate portion, and to a second position in which said support flange lies apart from said channel formed by said intermediate portion of said scoop, the bag being removable from said scoop when said second portion of said support and said connected flange are in said second position;
  said device being designed to be in a substantially vertical position when in said second position, and when in said first position, said device being designed to be tilted away from said vertical position toward a horizontal position with the first end portion of said scoop being adapted to engage said material and to scoop said material into said bag.

5,687,782
TRANSFER VALVE FOR A GRANULAR MATERIALS DISPENSING SYSTEM

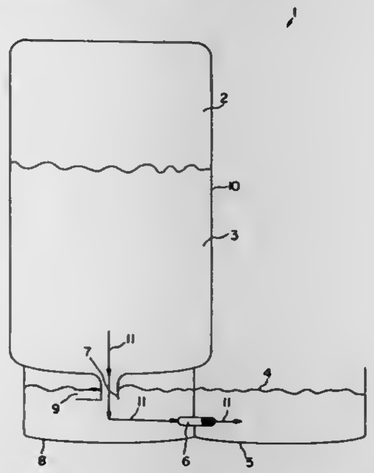
Bruce W. Cleveland, Germantown; Albert M. Benedetti, Jr., Memphis; Richard Simon, Memphis, and Paul A. Nolte, Memphis, all of Tenn., assignors to Ingersoll-Dresser Pump Company, Liberty Corner, N.J.
Filed Apr. 12, 1996, Ser. No. 632,037
Int. Cl.^{6} B65B *1/06*
U.S. Cl. 141—346 **5 Claims**

1. A transfer valve for permitting fluent particulate materials to flow from a closed transport container, said transport container having a bottom wall with an outlet aperture, into a closed base container having a top wall with a sealed inlet aperture adapted for sealed engagement with the bottom wall of said transport container; said transfer valve permitting operation without exposure of an operator to contact with said fluent particulate materials, comprising:
  a transfer valve member having a valve body in sealed attachment to said transport container, said valve body having a plurality of discharge ports controlled by at least one valve rod rotatable between open and closed positions in said discharge ports, and latch means for engaging and disabling said valve rod in said closed position to prevent rotation of said rod from said closed position; and
  means on said sealed base container for enabling said disabled valve rod, when said base container is in sealed engagement with said transport container.



5,687,783
ANIMAL WATERING DEVICE

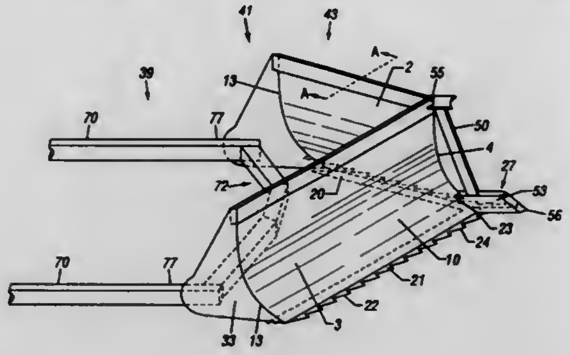
Michael E. Finnegan, 805 Erickson Dr., Kingman, Ariz. 86401-5440
Filed Aug. 15, 1995, Ser. No. 515,297
Int. Cl.^{6} A01K *7/00*
U.S. Cl. 141—364 **12 Claims**



1. A portable apparatus for dispensing fresh water to animals comprising:
  (a) a portable drinking vessel having a rim and a substantially flat base;
  (b) a portable storage vessel adjoining the drinking vessel and having a substantially flat base and a rim configured to support an industry-standard water source bottle;
  (c) a water passage connecting the drinking vessel to the storage vessel;
  (d) wherein the substantially flat bases of the two vessels are substantially coplanar and are configured to support the apparatus on a flat surface; and
  (e) an automatic one-way valve disposed in the water passage and oriented so that water can flow through the valve from the storage vessel to the drinking vessel when pressure in the storage vessel exceeds the pressure in the drinking vessel by a predetermined amount but so that water cannot flow from the drinking vessel to the storage vessel.

5,687,784
V-BLADE FOR ATTACHMENT TO A BULLDOZER

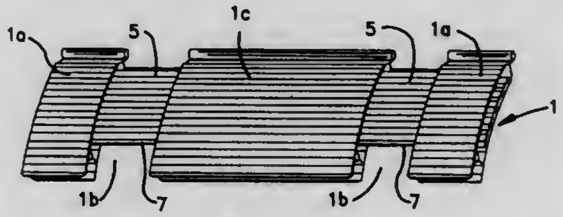
Robert Morgan, Rte. 8, Box 152, Jasper, Tex. 75951
Filed Apr. 4, 1996, Ser. No. 628,015
Int. Cl.^{6} A01G *23/02*
U.S. Cl. 144—34.6 **10 Claims**



1. An attachment for a prime mover, such as a bulldozer, comprising:
  a v-shaped cutting blade comprising:
    a pair of substantially flat sheer blades converging at forward portions thereof to form a v-shaped cutting edge, said cutting edge comprising a plurality of teeth formed therein; and
    a pair of concave blades converging at forward portions thereof and extending upwardly from the cutting edge of said pair of converging sheer blades; and
  mounting means for attaching said v-shaped cutting blade to said prime mover.

5,687,785
VENETIAN BLIND SLAT

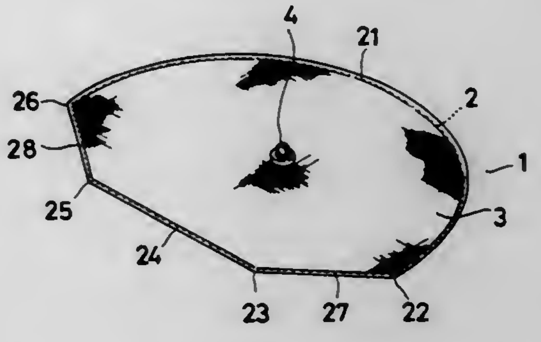
Gunther Erber, Ebental, and Andreas Erber, Feldgasse 31, A-9065 Ebental (Kärnten), both of Austria, assignors to Andreas Erber, Ebental, Austria
PCT No. PCT/AT94/00206, § 371 Date Jun. 27, 1996, § 102(e) Date Jun. 27, 1996, PCT Pub. No. WO95/18285, PCT Pub. Date Jul. 6, 1995
PCT Filed Dec. 29, 1994, Ser. No. 666,510
Claims priority, application Austria, Dec. 30, 1993, 2648/93; May 20, 1994, 1039/94; Dec. 9, 1994, 2289/94
Int. Cl.^{6} E06B *3/12*
U.S. Cl. 160—236 **9 Claims**



1. A venetian blind slat comprising:
  a hollow profiled slat;
  chain links;
  grooves (1*b*) to hold said chain links (**3**, **4**) transversely to its longitudinal extension;
  a hollow chamber, having two parts;
  one joining element (**5**, **6**, **40**, **41**) for joining said two parts (**1***a*, **1***c*) of said hollow profiled slat (**1**), said joining element being insertable into said hollow chamber (**26**);
  said two parts (**1***a*, **1***c*) of said bollow profiled slat (**1**) being spaced away from one another, said two parts and said joining element (**5**, **6**, **40**, **41**) bordering said grooves (**1***b*).

5,687,786
CAR SUNSHADE

Teung-Lin Tsai, No. 54-17, Huan Ya, Huan Ya Li, Yen Shui Chen, Tainan Hsien, Taiwan
Filed Aug. 2, 1996, Ser. No. 691,682
Int. Cl.^{6} B60J *3/00*
U.S. Cl. 160—370.21 **1 Claim**



1. A car sunshade comprising a flexible resilient border portion formed to become a loop and a sunshade cloth attached to said border portion, wherein said border portion is shaped to have substantially a semi-circular curved portion, a first corner on a first end of said semi-circular curved portion, a second corner, a second linear elongated part between said first and second corners, a fourth corner on a second end of said semi-circular curved portion, a third corner, a third linear elongated part between said fourth and third corners, and a first linear elongated part between said second and third corners, wherein the first and fourth corners are each shaped to have an angle approximating 120°, while the second and third corners are each shaped to have an angle approximating 135°.

5,687,787
FIBER REINFORCED CERAMIC MATRIX COMPOSITE INTERNAL COMBUSTION ENGINE EXHAUST MANIFOLD

Steven Donald Atmur, Riverside, and Thomas Edward Strasser, Corona, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Aug. 16, 1995, Ser. No. 515,925
Int. Cl.^{6} B22D *19/08;* **C04B** *35/80;* **B05D** *1/36;* **F01N** *7/10*
U.S. Cl. 164—98 **27 Claims**

1. A method of making a high temperature resistant fiber reinforced ceramic matrix composite exhaust manifold for an engine comprising the steps of:
  a) forming a liner of a cast monolithic ceramic material containing pores;
  b) filling the pores of the cast monolithic ceramic material with a pre-ceramic polymer resin;
  c) coating reinforcing fibers with an interface material to prevent a pre-ceramic polymer resin from adhering strongly to the reinforcing fibers;
  d) forming a mixture of a pre-ceramic polymer resin and reinforcing fibers coated with the interface material;
  e) forming an exhaust manifold shaped structure from the mixture of the pre-ceramic polymer resin and the reinforcing fibers coated with the interface material by placing the mixture on at least a portion of the cast monolithic ceramic material; and,
  f) firing the exhaust component shaped structure at a temperature and a time sufficient to convert the pre-ceramic polymer resin to a ceramic thereby forming a reinforced ceramic composite.

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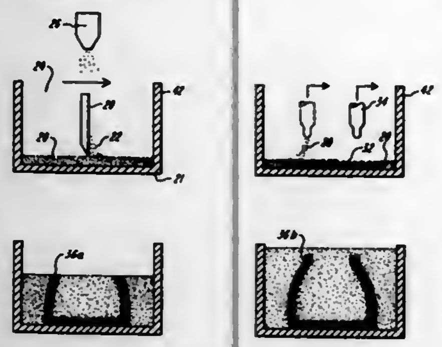
5,687,788
IMPLANTABLE ARTICLES WITH AS-CAST MACROTEXTURED SURFACE REGIONS AND METHOD OF MANUFACTURING THE SAME

Salvatore Caldarise, Hanson; Richard P. Manginelli, Milton, both of Mass.; David L. LaSalle, Woonsocket, R.I., and Timothy M. Flynn, Norton, Mass., assignors to Johnson & Johnson Professional, Inc., Raynham, Mass.

Division of Ser. No. 198,874, Feb. 18, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 457,227

Int. Cl.^{6} B27C *9/00*

U.S. Cl. 164—456 **9 Claims**



1. A method of making a bone prosthesis, comprising the steps of

a) providing a predetermined, computer controlled scan actuation pattern suitable to yield a casting mold having formed therein a macrotextured surface having macropores with undercut edge profiles in selected regions thereof;

b) depositing a layer of a ceramic-forming powder material in a confined region;

c) applying a binder material to the ceramic-forming powder material in selected regions of the layer, according to the predetermined scan actuation pattern, to solidify the ceramic-forming powder material in the selected regions;

d) repeating steps (b) and (c) a predetermined number of times to deposit successive layers of ceramic-forming powder, with variations in regions to which binder material is applied such that a solidified portion of each layer is bonded to a preceding layer, to form a casting mold that defines a negative of the bone prosthesis, at least a portion of the casting mold having a textured surface including macropores with undercut edge profiles corresponding to the variations of said regions;

e) removing loose ceramic-forming powder material from the casting mold;

f) casting a material in contact with the casting mold and hardening the material to form a bone prosthesis; and

g) removing the bone prosthesis from the casting mold, whereby the bone prosthesis has an as-cast macro textured surface characterized by macropores with undercut edge profiles on at least a portion of its exterior.

5,687,789
CASTER WITH IMPROVED COIL CHANGING SYSTEM

Wilhelm F. Lauener, Gerlafingen/SO, Switzerland, assignor to Larex A.G., Solothurn, Switzerland

Filed Dec. 28, 1995, Ser. No. 566,775

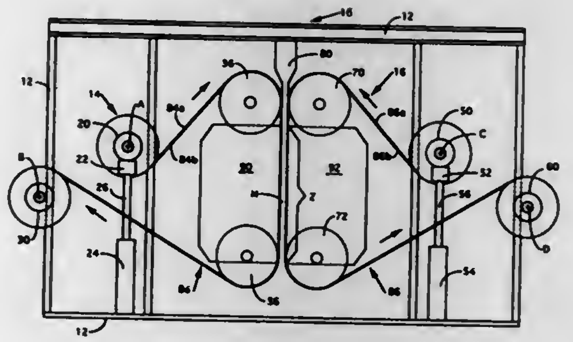
Int. Cl.^{6} B22D *11/06*

U.S. Cl. 164—481 **6 Claims**

1. A method of casting molten metal comprising:

providing a caster defining a mold, said caster including at least one belt driving and guiding system for driving and guiding a first movable belt through a casting zone where said molten metal is cast, said belt driving and guiding system including (i) a first coil having an axis of rotation, said first coil being positioned relative to said caster and having coiled thereon said first movable belt and (ii) a second coil;

uncoiling said first movable belt from said first coil;



passing said first movable belt through said casting zone;

coiling said first movable belt on said second coil;

introducing said molten metal into said mold; discontinuing casting;

restarting casting by uncoiling said first movable belt from said second coil;

passing said first movable belt through said casting zone;

introducing said molten metal into said mold;

solidifying said molten metal in said mold to create a metal product; and

coiling said first movable belt on said first coil, whereby said molten metal can be cast without having to dismount either said first coil or said second coil from said caster.

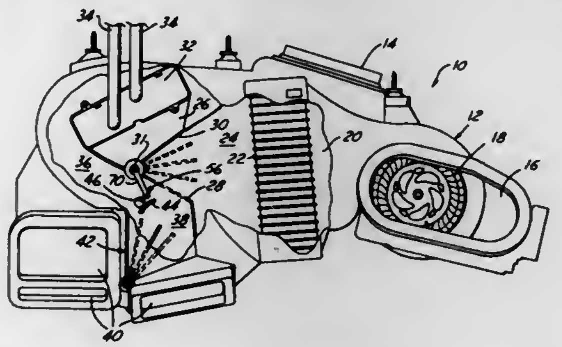
5,687,790
HEATER, VENTILATION AND AIR CONDITIONING ASSEMBLY FOR A MOTOR VEHICLE

John V. Trame, Centerville, Ohio, and Robert P. Hennessee, Rochester Hills, Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 26, 1995, Ser. No. 578,368

Int. Cl.^{6} F25B *29/00*

U.S. Cl. 165—42 **5 Claims**



1. A heater, ventilation and air conditioning assembly for a motor vehicle, said assembly having;

an inlet for receiving incoming air;

an inlet duct in communication with the inlet and housing an air conditioning evaporator for cooling and dehumidifying said air when actuated;

a heater core channel in communication with a downstream end of the inlet duct, said heater core channel housing a heater core for heating air passing through said heater core channel;

an outlet channel in communication with the heater core channel and leading to at least one outlet;

a cold air opening that when open leads from a downstream end of the inlet duct to the outlet channel thereby bypassing the heater core channel;

a pivotal temperature adjustment door mounted for motion between a first position that opens said cold air opening and closes off said heater core channel and a second position that closes said cold air opening and opens said heater core channel, said door being variably adjustable for other positions intermediate said first and second positions for allowing blending of different proportions of air passing through said heater core channel and said cold air opening when recombining in said outlet channel; the improvement characterized by:

a movable vane in one of the inlet channel, heater core channel or said outlet channel;

said vane being movably mounted for motion between a first position that corresponds when said temperature adjustment door is in its first position and a second position that corresponds when said door is in its second position; and

said door and movable vane being operably connected together such that said door and said movable vane are relatively movable with respect to each other;

said door and said vane both being pivotally movable about a respective pivotal axis between the door and vane respective first and second positions, the angular change of the vane when in its respective first and second positions being substantially different than the angular change of the door when in its respective first and second positions;

said door and said vane being mechanically linked together via a cam and pin linkage to provide varied motion of the vane with respect to the door;

said cam provided by an elongated vane lever with a slot extending therethrough;

said slot radially aligned and extending outwardly from said pivotal axis of said vane: and

said vane having a convex side and a concave side and mounted such that said pivotal axis of said vane is in proximity with said vane and on the convex side thereof.

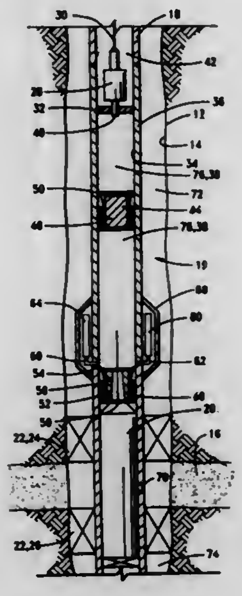
5,687,791
METHOD OF WELL-TESTING BY OBTAINING A NON-FLASHING FLUID SAMPLE

Harold Kent Beck, Canyon, Tex., and Roger Lynn Schultz, Stillwater, Okla., assignors to Halliburton Energy Services, Inc., Dallas, Tex.

Filed Dec. 26, 1995, Ser. No. 578,842

Int. Cl.^{6} E21B *49/00*

U.S. Cl. 166—250.07 **21 Claims**



1. A method of servicing a well, comprising the steps of:

(a) running a tool into the well, said tool comprising:

a housing;

a packer connected to said housing and having a packer element engagable with an inner surface of said well; and

a sampler in communication with said housing;

(b) setting said packer such that said packer element is sealingly engaged with said inner surface of said well adjacent to a zone of interest;

(c) running a pump into the well such that an inlet of said pump is placed in communication with said housing;

(d) actuating said pump to initiate fluid flow from said zone;

(e) controlling said fluid flow and corresponding pressure drop such that flashing of fluid within said housing is presented; and

(f) capturing a sample of said fluid in said sampler.

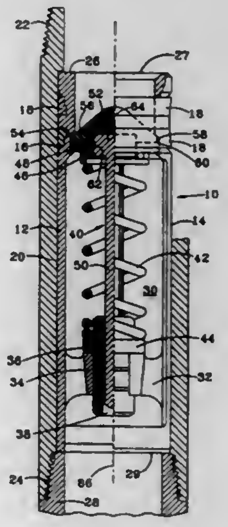
5,687,792
DRILL PIPE FLOAT VALVE AND METHOD OF MANUFACTURE

John E. Rodger, San Antonio, and Randle E. Ford, New Braunfels, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 27, 1995, Ser. No. 534,624

Int. Cl.^{6} E21B *33/12*

U.S. Cl. 166—327 **19 Claims**



1. A float valve for sealing engagement with a float sub positioned downhole within the wellbore, the float sub having upper and lower threads for threaded engagement with an oilfield tubular, the float valve comprising:

the generally sleeve-shaped valve body having an external seal for sealing engagement with the float sub;

the valve body including an internal annular seat formed about a central axis of the float valve;

a valve member axially movable within the valve body for disengaging and engaging the seat in response to fluid pressure during opening and closing of the float valve, the valve member including a stem for guiding axial movement of the valve member within the valve body and a valve cone secured to the stem for sealing engagement with the seat, the valve cone including a cylindrical-shaped recess for receiving a front end of the stem during a shrink-fit operation wherein the valve cone is heated relative to the stem and the front end of the stem is then pressed into the cylindrical-shaped recess; and

a biasing member for biasing the valve member toward engagement with the seat.

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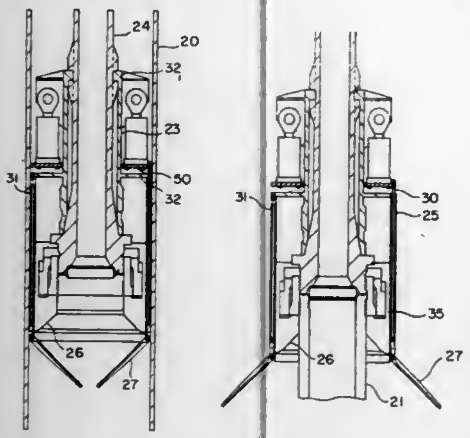
5,687,793

APPARATUS FOR USE IN LOWERING A WELL PIPE INTO ALIGNMENT WITH A SUBSEA CONDUIT

Larry E. Reimert, Spring, and Bruce J. Watkins, Houston, both of Tex., assignors to Dril-Quip, Inc., Houston, Tex.
Filed Mar. 15, 1996, Ser. No. 616,677
Int. Cl.⁶ E21B *33/038*

U.S. Cl. 166—342 **19 Claims**



1. Apparatus for use in lowering an object through a guide tube suspended from the water surface onto the upper end of an upstanding subsea structure located generally beneath the lower end of the guide tube, comprising:

a carrier adapted to be supported from the lower end of the object for lowering closely within the guide tube, and

means on the lower end of the carrier which is expandable outwardly to form a downwardly and outwardly extending shroud, after the lower end of the carrier emerges from the lower end of the guide tube, which is adapted to fit over the upper end of the subsea structure and thus guide the lower end of the object onto the upper end of the structure as the carrier continues to be lowered, wherein said shroud comprising:

arms pivotally connected to the lower end of the carrier for swinging about generally horizontal axis between inner positions in which they are within the guide tube and outer positions in which they are flared outwardly therefrom, and

means for moving the arms from their inner to their outer positions when they are beneath the lower end of the guide tube, wherein the moving means comprises:

rods supported by the carrier for guided vertical movement with respect thereto between upper and lower positions, and

means connecting the lower end of each rod to the upper end of an arm so as to move the arms from their inner to their outer positions in response to movement of the rods from one position to the other.

5,687,794

SUBSEA WELLHEAD APPARATUS

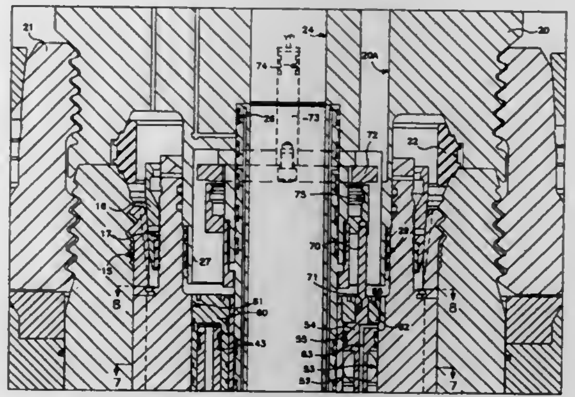
Bruce J. Watkins, Houston, and Larry E. Reimert, Spring, both of Tex., assignors to Dril-Quip, Inc.
Continuation-in-part of Ser. No. 273,407, Jul. 11, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 584,879
Int. Cl.⁶ E21B *33/043*

U.S. Cl. 166—363 **24 Claims**

1. A subsea wellhead, comprising

a wellhead housing adapted to be installed at the head of a well bore to suspend a casing string therefrom and having a bore therethrough,

a tubing hanger supported within the bore of the housing to suspend a tubing string within the casing string, and having passageway means connecting the annulus between the casing and tubing strings beneath the tubing hanger with its upper end,



a first valve including a first valve member in the passageway means,

means for selectively moving said first valve member between opened and closed position,

a second valve including a second valve member in the passageway means in series with the first valve member, and

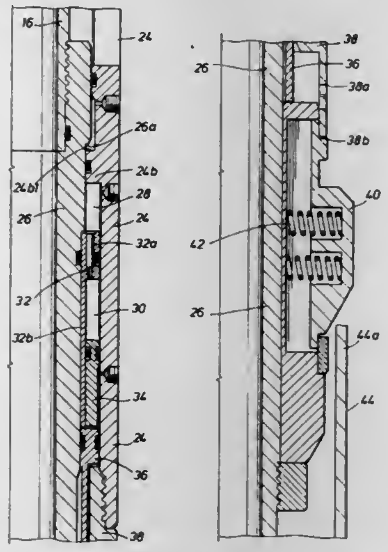
means for moving said second valve member from a normally open to a closed position independently of operation of the first valve member.

5,687,795

PACKER LOCKING APPARATUS INCLUDING A TIME DELAY APPARATUS FOR LOCKING A PACKER AGAINST PREMATURE SETTING WHEN ENTERING A LINER IN A WELLBORE

Dinesh R. Patel, Sugar Land, and Ervin Randermann, Jr., Beasley, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed Dec. 14, 1995, Ser. No. 572,523
Int. Cl.⁶ E21B *23/00*

U.S. Cl. 166—387 **8 Claims**



1. A packer assembly including a packer adapted to be disposed within a liner in a wellbore, comprising:

lock and release means for locking said packer in an unset condition before said packer is disposed within said liner in said wellbore, said lock and release means releasing the lock on said packer and allowing said packer to change from said unset condition to a fully set condition when said packer enters said liner in said wellbore, said lock and release means including lock block means for biasing in one direction and locking said packer in said unset condition before said packer enters said liner, said lock block means biasing in another opposite direction and releasing the lock on said packer in said unset condition and allowing said packer to change to said fully set condition after said packer enters said liner;

time delay means connected to said lock and release means for lapsing a predetermined period of time when said lock and release means releases said lock on said packer and allows said packer to change to said fully set condition; and

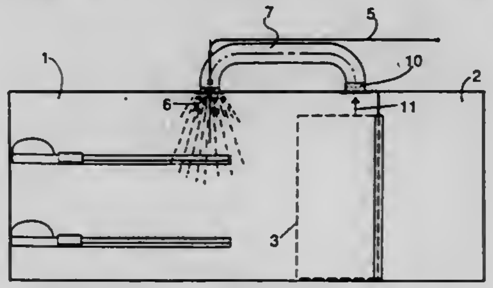
means connected to said time delay means for changing said packer from said unset condition to said fully set condition when said time delay means lapses said predetermined period of time.

5,687,796

INSTALLATION FOR FIGHTING FIRE

Göran Sundholm, Ilmari Kiannon kuja 3, FIN-04310 Tuusula, Finland
PCT No. PCT/FI93/00181, § 371 Date Dec. 6, 1994, § 102(e) Date Dec. 6, 1994, PCT Pub. No. WO93/21997, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 28, 1993, Ser. No. 325,382
Claims priority, application Finland, Apr. 29, 1992, 921937
Int. Cl.⁶ A62C *35/58*

U.S. Cl. 169—54 **6 Claims**



1. Installation for fighting fire, comprising at least one sprinkler or spray head (6;33;55;62;72) in connection with a monitored space (1;30;50;60;70), said at least one sprinkler or spray head being arranged upon activation to create a suction out of the monitored space by spraying liquid from a high drive pressure into the form of small droplets, like a fog, thereby to suck smoke from said monitored space, wherein said at least one sprinkler or spray head is arranged in an opening (8;58) into said monitored space from an air passage (7;12;19;34;57;63;73) which is in communication with at least one further opening (9;35;59;64;65;74;75) into said monitored space so that said at least one sprinkler or spray head, when activated, produces a suction into said air passage and a circulation of said liquid in the form of small droplets in said monitored space.

5,687,797

Patent Not Issued For This Number

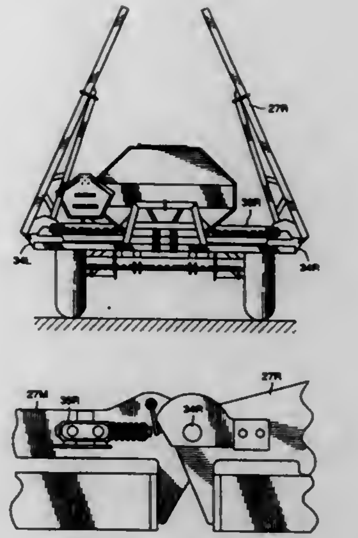
5,687,798

DOWN-PRESSURE SYSTEM FOR AGRICULTURAL IMPLEMENT

James Wayne Henry; David Robert Hundeby, both of Saskatoon, and Mark Anthony Gerein, Martensville, all of Canada, assignors to Flexi-Coil Ltd., Saskatoon, Canada
Filed Nov. 29, 1995, Ser. No. 563,955
Int. Cl.⁶ A01B *73/00*

U.S. Cl. 172—311 **13 Claims**

1. Apparatus for applying down-pressure to a tool-bar of an agricultural implement, wherein:



the tool-bar is in sections, being a main section and a wing-section;

each section of the tool-bar is provided with ground-engaging elements;

the apparatus includes an operable means for raising the wing-section, relative to the main section, to a stowed condition, and for lowering the wing-section to an operational condition in which the wing-section is in co-operative alignment with the main section;

the apparatus includes an operable wing-press-down actuation means, which is effective, when operated, and when the wing is in the operational condition, to apply a wing-press-down-force onto the wing-section in a direction to urge the ground-engaging elements thereon downwards;

the apparatus includes a means for directing at least a potion of the upwards reaction to the aforesaid wing-press-down-force against the main-section;

the apparatus includes a wing-press-down-force-regulator, which is effective, when the wing is in the operational condition, to control and regulate the wing-press-down-force, to a level at which the elements can effectively work the ground, and to do so over an operational range of radical movement;

the aforesaid operational range of vertical movement being a range of movement between the main section and the wing-section, in which the sections remain in co-operative alignment during operational use of the apparatus in working the ground;

and the apparatus includes an operable wing blocking means, which is effective, when operated, to block downwards movement of the wing-section below a predetermined height of the wing-section, being a height intermediate between the stowed condition and the operational condition of the wing-section.

5,687,799

WHEEL ASSEMBLY FOR A COMPACTING MACHINE

Gary L. Greenfield, Palos Heights; Harvey A. Knell, Yorkville; David O. Philips, Metamora, and James M. Retterer, Naperville, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Aug. 12, 1996, Ser. No. 700,598
Int. Cl.⁶ E01D *19/25*

U.S. Cl. 172—540 **10 Claims**

1. A wheel assembly for a compacting machine having a frame and a pair of axle assemblies mounted to the frame, comprising:

a cylindrical drum mountable for rotation on each of an opposing end of at least one of the axle assembly, said cylindrical drums being positioned on opposite sides of the frame, each of said cylindrical drums defining an inner periphery adjacent the frame and an outer periphery;

a plurality of teeth disposed circumferentially about each of the cylindrical drums, said teeth extending outwardly from the

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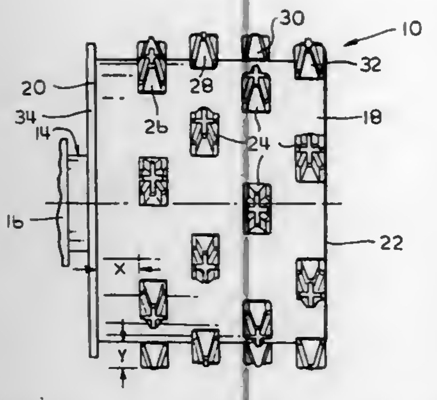


cylindrical drums a preselected distance and being disposed in a plurality of axially spaced rows with the outermost of said rows being positioned immediately adjacent the outer periphery of the each cylindrical drum and the innermost of said rows being spaced from the inner periphery a preselected distance.

5,687,800

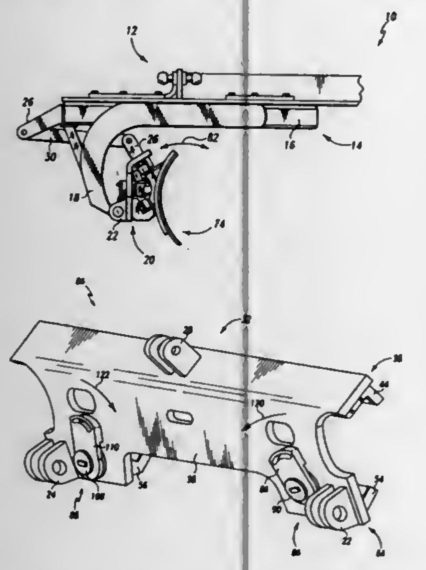
APPARATUS AND METHOD FOR RETAINING A GRADER BLADE

Kevin J. Wilkening, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 11, 1996, Ser. No. 762,689

Int. Cl.^{6} E02F *3/76*

U.S. Cl. 172—811 **19 Claims**



1. An apparatus for retaining a grader blade having upper and lower blade rails, comprising:

support bracket;

a first retainer secured to said support bracket and being positionable in contact with one of said upper and lower blade rails;

a second retainer movable relative to said first retainer and being positionable in contact with the other of said upper and lower blade rails, said first retainer and said second retainer cooperatly to secure said grader blade in fixed relation to said support bracket; and

an adjustment member which contacts said second retainer, said adjustment member having an opening extending therethrough, said opening being eccentrically located relative to a center C of said adjustment member, adjustment member being rotatable in a first direction to cause said second retainer to move towards said first retainer, and in a second direction to cause said second retainer to move away from said first retainer.

5,687,801

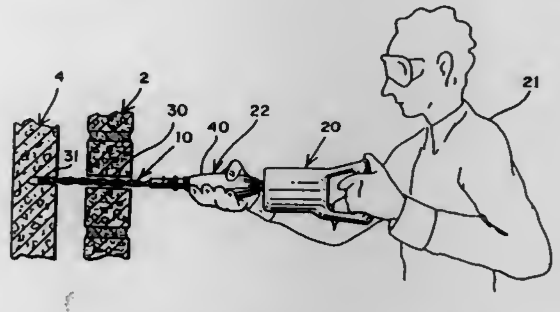
METHOD OF SECURING WALLS WITH A TIE

Robert Ian Paterson, London, and Brian Alan Breeze, Wallsend, both of England, assignors to Helifix Ltd., Buckinghampshire, England

Division of Ser. No. 491,358, Jun. 30, 1995, Pat. No. 5,586,605, which is a continuation-in-part of Ser. No. 204,465, Feb. 28, 1994, abandoned. This application Sep. 27, 1996, Ser. No. 721,827

Int. Cl.^{6} B25C *5/13*

U.S. Cl. 173—1 **1 Claim**



1. A method of securing two or more wythes in a building structure utilizing a helical tie member having longitudinal helical flutes terminating at a cutting end at one end and terminating at a remote end opposite the cutting end comprising the steps of:

drilling a first wythe to a diameter less than than a diameter of the flutes on the tie to be inserted,

drilling a pilot hole in a second wythe to a predetermined depth,

inserting the remote end of the tie into a tool which impactingly drives the tie and rotatably permits the same to rotate as a helical bed is developed in the first wythe due to penetration by the tie,

passing the flutes into the second wythe and continuing to impactingly drive the tie to a base of the pilot hole,

removing the driving tool from the remote end of the tie,

and thereafter finishing the remote end of the tie in accordance with mandates of the site.

5,687,802

POWER HAND TOOL WITH ROTATABLE HANDLE

Jeffrey J. Spooner, West Winfield; William Keith Wallace, Barneveld; Harley Ingersoll, Holland Patent, and Yutaka Kazamaki, New Hartford, all of N.Y., assignors to Chicago Pneumatic Tool Company, Utica, N.Y.

Filed Sep. 21, 1995, Ser. No. 531,623

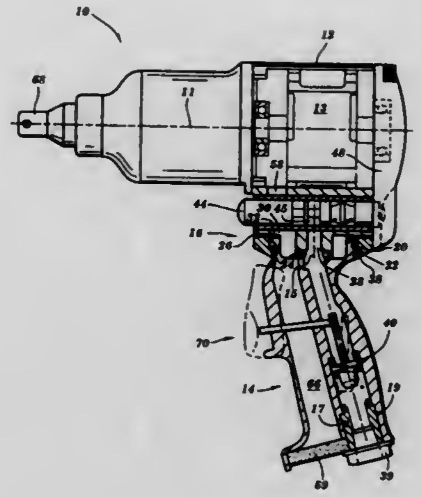
Int. Cl.^{6} B23B *45/04;* **B25D** *17/04*

U.S. Cl. 173—169 **23 Claims**

1. A hand power tool comprising:

a housing including a motor, said motor being rotatable about a longitudinal axis; and

a handle mounted to said housing on an axis perpendicular to and intersecting said longitudinal axis, said handle including a trigger mounted thereto, said handle and said trigger being rotatable about said perpendicular axis.



5,687,803

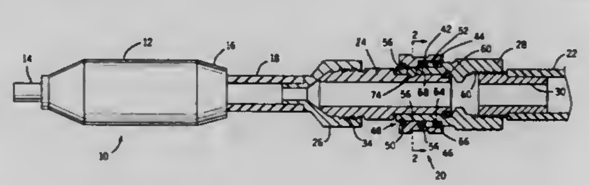
METHOD FOR REVERSING A GROUND PIERCING TOOL

Steven W. Wentworth, Brookfield; Robert Crane, Oconomowoc, and Mark Randa, Muskego, all of Wis., assignors to Earth Tool Company, L.L.C., Oconomowoc, Wis.

Filed Sep. 25, 1995, Ser. No. 533,074

Int. Cl.^{6} E21B *4/14;7/08;* **B25D** *9/00*

U.S. Cl. 175—19 **4 Claims**



1. A method for reversing an impact boring tool of the type having a reversing mechanism actuated by rotation of the compressed air supply hose that enters the tool through a rear end opening thereof, comprising the steps of:

connecting the air supply hose to the tool using a quick-release coupling device including tubular male and female members which are coupled together, one of the members being mounted on the end of the air supply hose and the other mounted on an air inlet conduit of the tool, the coupling device further having a locking sleeve and a ball seated in a first pit in one of the members and configured for insertion into a second pit in the other of the members as the locking sleeve moves over the ball, the locking sleeve being biased to a locked position wherein the ball is seated in both pits thereby preventing rotation of one member relative to the other as well as disengagement of one member from the other;

operating the tool for earth boring; and

reversing the direction of travel of the tool by rotating the air hose, which rotation is transmitted to the air inlet conduit of the tool by the ball of the coupling device.

5,687,804

EQUIPMENT FOR HANDLING DRILL RODS

Juhani Lappalainen, and Juha Piipponen, both of Tampere, Finland, assignors to Tamrock Oy, Tampere, Finland

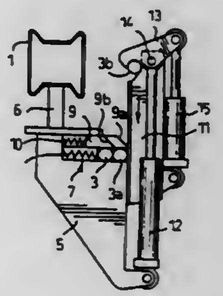
PCT No. PCT/FI94/00245, § 371 Date Dec. 28, 1995, § 102(e) Date Dec. 28, 1995, PCT Pub. No. WO95/00737, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 8, 1994, Ser. No. 564,308

Claims priority, application Finland, Jun. 21, 1993, 932876

Int. Cl.^{6} E21B *19/00*

U.S. Cl. 175—52 **5 Claims**



1. Equipment for handling drill rods including a slot-like storage space intended for drill rods and having an outlet opening; a closing device for closing the outlet opening of the storage space; a displacing arm for displacing the drill rods between the outlet opening of the storage space and a drilling centre of a drilling machine by a linear displacing movement; a power means for displacing the displacing arm; a gripping jaw connected to the displacing arm turnably about a transverse axis for gripping and holding the drill rods; and a power means for turning the gripping jaw between an open position and a gripping position; wherein the closing device and the displacing arm are mounted transversely movably with respect to each other so that when the displacing arm has been moved towards the drilling centre or when the gripping jaw is in the open position, the closing device and the displacing arm together close the outlet opening of the storage space; and wherein the displacing arm has an inclined guide surface on one side of the closing device, the guide surface pushing the closing device at an end thereof in a direction away from the displacing arm when the displacing arm is pushed towards the drilling centre; and wherein the closing device has a first support surface inclined in a direction away from said end of the closing device on the side of the drilling centre, the drill rod to be inserted into the storage space bearing against said support surface, thus pushing the closing device in a direction away from the displacing arm; and further wherein the closing device has a second support surface at a distance from said end on the side of the drilling centre, the gripping jaw when in the gripping position bearing against said second support surface, thus pushing the closing device in a direction away from the displacing arm.

5,687,805

BACK REAMER APPARATUS

Robert G. Perry, 5335 East Terrace Ave., Indianapolis, Ind. 46203

Filed Apr. 29, 1996, Ser. No. 639,969

Int. Cl.^{6} E21B *7/28*

U.S. Cl. 175—53 **20 Claims**

1. A back reamer apparatus configured to be attached to a pipe section of a drilling rig for back reaming and compacting a pilot bore, the back reamer apparatus comprising a body having a front end configured to be coupled to the pipe section, and at least three planar side walls configured to form a pyramid-shaped section which is tapered downwardly toward the front end of the body to compact the soil and form an enlarged bore upon rotation of the body by the drilling rig, the body being formed to include an internal passageway for receiving a drilling fluid, each of the side walls being formed to include at least one aperture in communica-

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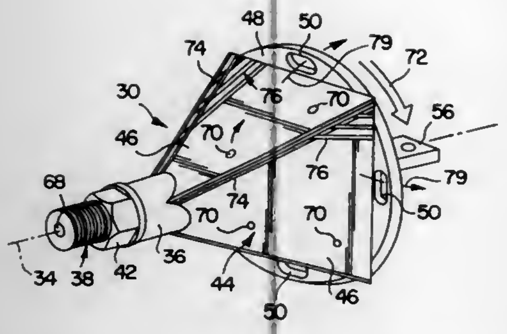


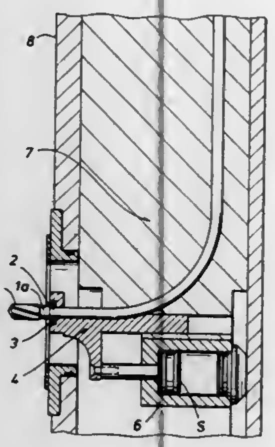
tion with the passageway to permit the drilling fluid to pass through the at least one aperture formed in each side wall.

5,687,806

METHOD AND APPARATUS FOR DRILLING WITH A FLEXIBLE SHAFT WHILE USING HYDRAULIC ASSISTANCE

Alan Sallwasser, Houston; Kenneth Havlinek, Missouri City; Thomas D. MacDougall, Sugar Land; Miles Jaroska, Richmond; Duane LaDue, Sugar Land; Wayne A. Tyler, Pearland; Mario Flores, Houston; Mark L. Hinton, Sugar Land; Thomas D. Svoboda, Pasadena, and Michele Tesciuba, Houston, all of Tex., assignors to Gas Research Institute, Chicago, Ill.

Filed Feb. 20, 1996, Ser. No. 603,307
Int. Cl.^{6} E21B *4/16;7/08;17/20*
U.S. Cl. 175—62 **18 Claims**



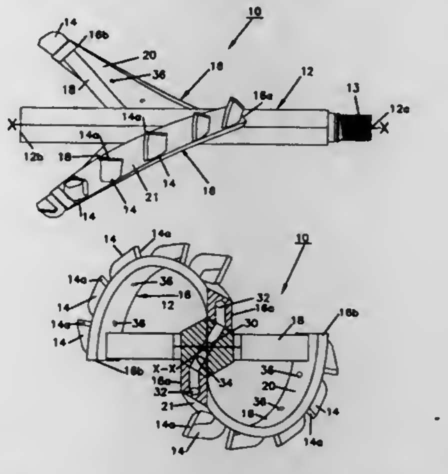
12. A method for drilling through a material adjacent to a formation, using a drill system that includes a drill bit, flexible drilling shaft, and a means for applying force directly to said drill bit, said method comprising the steps of:
- a) turning the drill bit with a rotating means via the flexible drilling shaft;
- b) bringing the drill bit in contact with the material to be drilled;
- c) applying torque to the drill bit using the flexible drilling shaft;
- d) applying the force directly to the drill bit using a piston system to begin cutting the material; and,
- e) drilling through said material with force applied directly to the drill bit.

5,687,807

CUTTER HEAD FOR TRENCHLESS BORING MACHINE

James Akers Woods, Stuart, Va., and Randy Ray Runquist, Lovilia, Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed Apr. 26, 1995, Ser. No. 429,495
Int. Cl.^{6} E21B *10/42;10/44;10/60*
U.S. Cl. 175—393 **5 Claims**



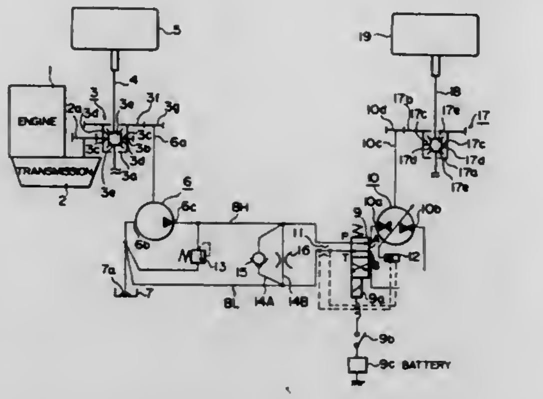
1. A cutter for a trenchless boring apparatus having a length of a drill pipe terminating at a free end and said apparatus further having means for rotating said length of drill pipe, said cutter comprising:
- a mount having a mount first end and a mount second end with means for coupling said first end to said free end of said drill pipe and with said second end extending from said first end in a direction away from said drill pipe and said mount having a longitudinal axis extending axially from said drill pipe;
- at least a first plurality of cutting teeth each having a cutting edge;
- at least a first securing means for securing each of said teeth of said first plurality to said mount with said teeth arranged in at least a first path extending from a first path end adjacent said mount first end to a second path end adjacent said mount second end;
- said first path shaped for said first path end to be circumferentially offset from said second path end;
- said first securing means comprises a rigid support secured to said mount and having a support surface facing away from said axis and extending from said first path end to said second path end;
- said rigid support is a bar having a first end secured to said mount at said first path end with said bar spaced from said mount at a second end of said bar;
- said bar including a fluid pathway in communication with a fluid pathway within said mount, said bar further including a plurality of fluid outlets for ejecting fluid from said bar fluid pathway.

5,687,808

FOUR WHEEL DRIVE MECHANISM

Jun Watanabe; Kenro Takahashi; Yorihito Nakao, all of Yokosuka; Shigeru Kamegaya, Tokyo, and Naohiko Inoue, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1995, Ser. No. 405,673
Claims priority, application Japan, Mar. 18, 1994, 6-049146; Mar. 18, 1994, 6-049147; Mar. 18, 1994, 6-049148; Apr. 28, 1994, 6-092545
Int. Cl.^{6} B60K *17/356*
U.S. Cl. 180—243 **34 Claims**



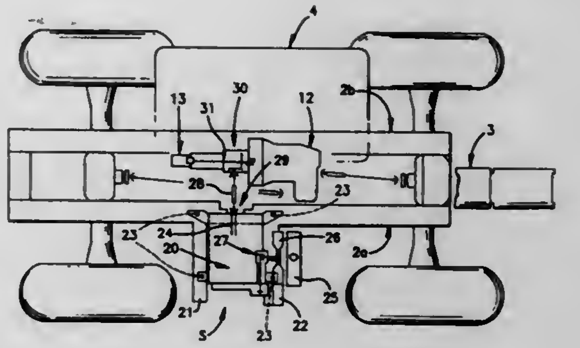
1. A four wheel drive mechanism, comprising:
drive wheels driven by an engine;
driven wheels that rotate due to contact with a road surface;
- fluid pressure pump means driven together with said drive wheels, said pump means being provided with a fluid inlet and outlet, and pressurizing a fluid aspirated from said inlet so as to discharge it from said outlet;
- fluid pressure motor means rotating together with said driven wheels and having two ports for aspirating and discharging said fluid, said motor means driving said driven wheels by supplying a pressurized fluid to one of said ports while on the other hand circulating said fluid from one port to the other port according to an input of rotation torque from said driven wheels and having a larger flow rate than said pump means when a rotation speed of said drive wheels is equal to a rotation speed of said driven wheels;
- a high pressure flowpath connected to said outlet of said pump means;
- a low pressure flowpath connected to said inlet of said pump means;
- means for connecting said high pressure flowpath and low pressure flowpath to said two ports of said motor means, said connecting means reversing a direction of connection when a rotation direction of said drive wheels is reversed;
- means for limiting a torque transmitted from said pump means to said motor means so as not to exceed a predetermined value;
- means for decreasing a fluid discharge volume of said pump means per unit rotation of said pump means according to an increase of the rotation speed of said drive wheels when said rotation speed is higher than a predetermined speed; and
- capacity control means for varying a fluid circulation volume of said motor means per unit rotation of said motor means according to a flowrate of said low pressure flowpath.

5,687,809

LIFT TRUCK WITH TELESCOPIC ARM

Marcel Claude Braud, Champtoceaux, France, assignor to Manitou BF, Ancenis, France

Continuation of Ser. No. 352,154, Dec. 1, 1994, abandoned. This application Aug. 30, 1996, Ser. No. 706,360
Claims priority, application France, Dec. 1, 1993, 93 14367
Int. Cl.^{6} B60K *5/04*
U.S. Cl. 180—297 **27 Claims**



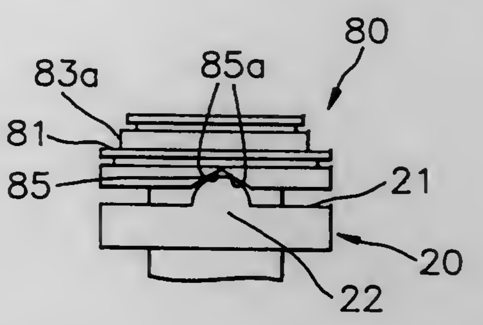
1. In a lift truck with a telescopic arm, comprising a cabin containing a driver's seat and a heat engine located on opposite sides of the telescopic arm; said heat engine having an output shaft oriented transversely relative to the truck and said telescopic arm being articulated at the rear of the chassis; said chassis being supported by a forward axle and a rear axle, and comprising further mechanical transmission means connected to said output shaft for transmitting the movement of said heat engine to at least one of said front and rear axles; the improvement wherein the mechanical transmission means comprises an angled transmission with at least one output for driving an input shaft of a gear box located in a central position on said lift truck, said input shaft being substantially coaxial with a drive shaft of a hydraulic pump for said lift truck.

5,687,810

POWER ASSISTANCE STEERING SYSTEM FOR USE IN A VEHICLE

Byoung-Yoon Choi, In-Cheon; Won-Taek Choi, Kangwon-Do, and Je-Tae Yoo, Seoul, all of Rep. of Korea, assignors to Mando Machinery Corporation, Kyunggi-Do, Rep. of Korea

Filed Oct. 26, 1995, Ser. No. 548,817
Claims priority, application Rep. of Korea, Dec. 12, 1994, 94-33706
Int. Cl.^{6} B62D *5/06*
U.S. Cl. 180—423 **10 Claims**



1. A power assistance steering system for use in a vehicle, including an input shaft connected to a steering wheel, an output shaft connected to a pair of driving wheels, a rotary valve, a reaction pressure control valve for generating a reaction pressure proportional to a vehicle speed and a restricting mechanism for controlling a hydraulic power assistance according to the reaction pressure, characterized in that the restricting mechanism comprises:
- a cylindrical reaction piston having a reaction surface on which the reaction pressure is applied in order to cause the reaction piston to be biased downward, and at least one reversed V-shaped depression formed on a bottom skirt;
- means for supporting the reaction piston on the input shaft in such a way that the reaction piston is allowed to move vertically with respect to the input shaft, while circumferentially locked to the input shaft; and
- at least one semi-spherical protrusion formed on a middle end surface of the output shaft so as to be retained within the reversed V-shaped depression.

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5,687,811

VARIABLE GEAR RATIO STEERING DEVICE

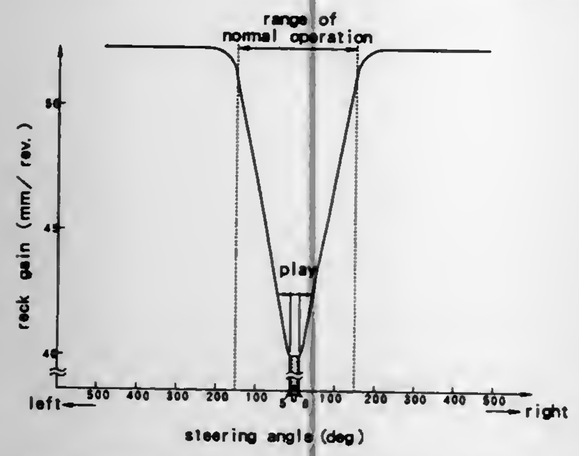
Yasuo Shimizu, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 486,303

Claims priority, application Japan, Jun. 20, 1994, 6-160682

Int. Cl.^{6} B62D *3/00*

U.S. Cl. 180—447 **4 Claims**



1. In combination, a variable gear ratio steering device, and an overall steering system of a vehicle including a steering wheel and a steering input, the variable gear ratio steering device comprising:
- a pinion functionally coupled to the steering wheel; and
- a rack meshing with the pinion, wherein the rack has a tooth pitch distribution for producing a variable rack gain property in relation to the steering input which includes, in each rotational sense, a low fixed rack gain region near a neutral position, a high fixed rack gain region in a large steering input region, and a progressively increasing rack gain region connected to the low fixed rack gain region via a first point of inflection and to the high fixed rack gain region via a second point of inflection, and further wherein the first point of inflection is located within a first angle at the neutral position of an amount within a play in the overall steering system of the vehicle.

5,687,812

AIRCRAFT SAFETY WASH RACK

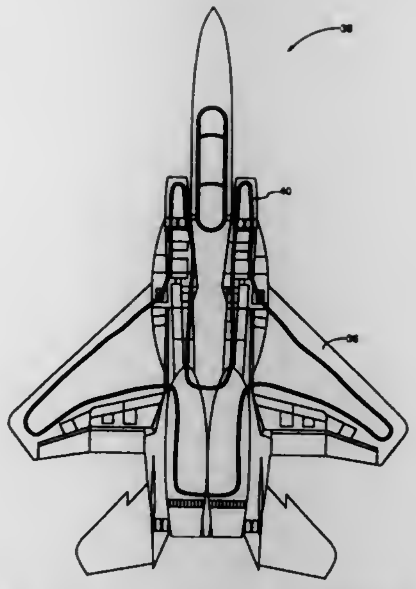
James R. Gervais, Swansea, and Dana Eldredge, Middleboro, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 5, 1995, Ser. No. 462,086

Int. Cl.^{6} A62B *35/00*; E06C *7/18*

U.S. Cl. 182—3 **5 Claims**

1. An aircraft wash rack adapted to substantially follow an outline of an aircraft, said aircraft wash rack comprising:
- a supporting frame, said supporting frame being attached to a hangar ceiling;
- a track, said track being positioned directly over a predetermined line, said predetermined line being approximately several feet to the inside of an outside edge of said outline of said aircraft, said track being a predetermined retical distance from the surface of said aircraft;
- at least one guide, said guide being movably attached to said track;
- a rope, said rope being attached to said guide;
- an adjustable rope control means for preventing the uncontrolled feedout of said rope, said adjustable rope control means being attached to said rope attached to said guide; and
- a harness, said harness being attached to said adjustable rope control means
- whereby a maintenance person having said harness thereon who is washing an aircraft is able to move along a path on said aircraft under said track and wash substantially all of the upper surface of said aircraft while minimizing a risk of injury from falling off said aircraft upper surface.



5,687,813

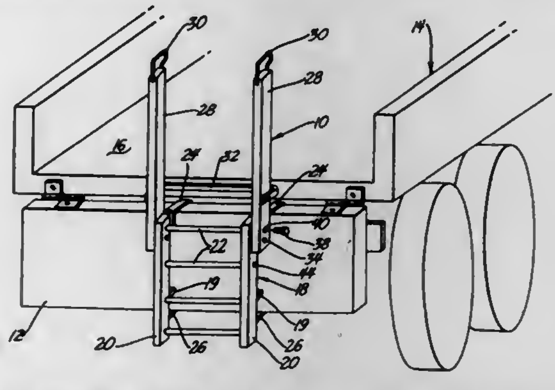
VEHICLE BOARDING DEVICE

Christopher J. Bensch, Livonia, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 540,364, Oct. 6, 1995. This application Dec. 9, 1996, Ser. No. 762,576

Int. Cl.^{6} B60R *3/00;3/02*

U.S. Cl. 182—127 **1 Claim**



1. A removable adjustable gangway ladder structure suitable for attachment to a variety of different vehicles to facilitate ingress and egress of persons including: a first section having a pair of parallel side rails, a plurality of connecting spoke members attached thereto the spoke members being firmly attached to the side rails and serving to hold the side rails in a spaced parallel configuration, a pair of C-shaped bracket members, one C-shaped bracket member being disposed on each side rail, the C-shaped bracket members being located on one end of the side rails, a second pair of adjustable brackets, the adjustable brackets being mounted on the side rails, each adjustable brackets being moveable longitudinally along its associated side rail and being disposed so as to cooperate with the C-shaped bracket member to form a way to retain a portion of the vehicle, the adjustable bracket being mounted to the side rail in a manner which allows the variation of the distance between the brackets to facilitate gripping the vehicle portion to which the structure is attached, the brackets serving to maintain the gangway ladder extending transversely across the tail gate, and a pair of extensions, one extension being rotatably fastened to the outer side near the end of each side rail so as to enclose the side rails between the extensions, each extension having a handle member attached to the end of the extension opposite the end fastened to the side rails, the handle extending inwards towards the vehicle when the extensions are in a deployed position, and a brace attached to and extending transversely between the extensions juxtaposed the rotatable fastening means the brace being juxtaposed a portion of the vehicle in the deployed position and extending transversely to the extensions and side rails when in the undeployed position.

5,687,814

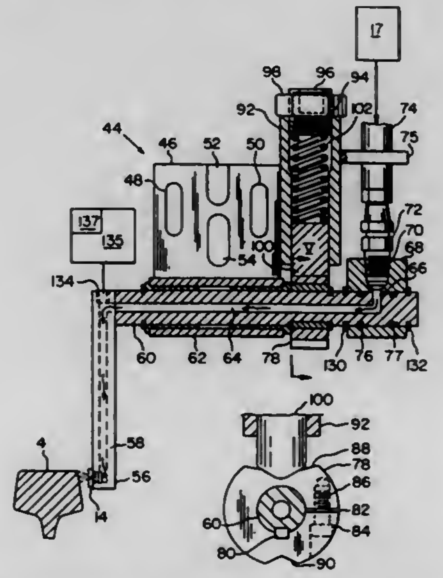
ASSEMBLY FOR APPLYING ONE OR MORE MATERIALS TO A RAIL

Jeffrey P. Craig, Monroeville; William T. Urmson, Jr., Valencia, both of Pa., and Dennis Bell, Steelville, Mo., assignors to Portec Inc., RMP Division, Pittsburgh, Pa.

Filed Jul. 7, 1995, Ser. No. 499,322

Int. Cl.^{6} B61K *3/02*

U.S. Cl. 184—3.2 **33 Claims**



19. An assembly for applying one or more materials to a rail comprising:
- a) a means for mounting said assembly to a vehicle adapted to travel on said rail, said means including a mounting bracket, said mounting bracket including a sleeve;
- b) at least one nozzle arm, said nozzle arm having a first end and a second end, said nozzle arm further including along a longitudinal axis of said nozzle arm a hollow channel disposed therein through which the material can flow;
- c) one or more nozzle arm ports located at said first end of said nozzle arm in fluid communication with said nozzle arm channel through which said material flows and is dispensed on a rail surface;
- d) a connecting arm retained on said mounting bracket within said sleeve, and wherein said connecting arm is permitted to pivot along its longitudinal axis while retained within said sleeve, said connecting arm having a first end and a second end, wherein said first end of said connecting arm is connected to said second end of said nozzle arm with said longitudinal axis of said connecting arm essentially perpendicular to said longitudinal axis of said nozzle arm, and wherein said connecting arm includes a hollow channel therein disposed along said longitudinal axis of said connecting arm through which said material flows, said connecting arm channel being in fluid communication with said nozzle arm channel at said first end of said connecting arm, said connecting arm channel exiting said connecting arm essentially perpendicular to said longitudinal axis of said connecting arm through an exit port located generally at said second end of said connecting arm;
- e) a swivel block associated with said second end of said connecting arm, said swivel block including a through-hole therein, wherein said second end of said connecting arm is disposed within said through-hole whereby said swivel block rotates about said longitudinal axis of said connecting arm including about said exit port of said connecting arm channel, said swivel block further including a threaded hole therein, the longitudinal axis of said threaded hole essentially perpendicular to said longitudinal axis of said through-hole, said longitudinal axis of said threaded hole aligned over said exit port when said swivel block is rotated about said longitudinal axis of said connecting arm to permit such alignment;
- f) a fitting threadably engaged within said threaded hole of said swivel block, said fitting in fluid communication with said connecting arm channel and in turn said nozzle arm channel and in turn said nozzle arm port when said swivel block is rotated about said longitudinal axis of said connecting arm to permit said alignment, said fitting not in fluid communication with said connecting arm channel when said swivel block is rotated about said longitudinal axis of said connecting arm such that said swivel block is not in said alignment, said fitting in fluid communication with a material supply source;
- g) a means for sealing between said swivel block and said connecting arm;
- h) a cam mounted on said connecting arm, said cam being interposed between said sleeve and said swivel block, said cam including a first recess therein and a second recess opposed to said first recess along the periphery of said cam;
- i) a spring guide retained on said mounting bracket, the longitudinal axis of said spring guide positioned directly vertically above said first recess and essentially perpendicular to said longitudinal axis of said connecting arm, said spring guide having a first end and a second end, wherein said second end of said spring guide is closest to said first recess and said first end of said spring guide is furthest from said first recess, said first end of said spring guide having threads contained therein;
- j) a spring tension adjuster, wherein said spring tension adjuster threadably engages said threads in said spring guide;
- k) a detent, said detent in the form of a tapered rod located within said spring guide, the longitudinal axis of said rod being positioned parallel with said longitudinal axis of said spring guide, said rod being disposed to slide within said spring guide along said longitudinal axis of said spring guide and said tapered portion of said rod disposed to engage said first recess as said rod slides within said spring guide; and
- l) a spring located within said spring guide, the longitudinal axis of said spring being parallel to said longitudinal axis of said spring guide, said spring being interposed between said rod and said spring tension adjuster and operating to urge said rod toward said first recess.

5,687,815

APPARATUS FOR SUPPLYING LUBRICANT ALTERNATIVELY TO OPPOSITE SIDES OF A LUBRICANT DISPENSER METERING PISTON

Kari Antila, Korpilahti, and Ismo Lehtinen, Muurame, both of Finland, assignors to Safematic Oy, Muurame, Finland

PCT No. PCT/FI95/00066, § 371 Date Aug. 13, 1996, § 102(e) Date Aug. 13, 1996, PCT Pub. No. WO95/22031, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 14, 1995, Ser. No. 693,135

Claims priority, application Finland, Feb. 14, 1994, 940685

Int. Cl.^{6} F16N *27/00*

U.S. Cl. 184—7.4 **9 Claims**

1. Apparatus for supplying lubricant alternatively to opposite sides of a lubricant dispenser metering piston, comprising;
- a frame containing a metering cylinder, a metering piston axially movably received in said metering cylinder, and means for conducting lubricant alternately to both sides of the metering piston;

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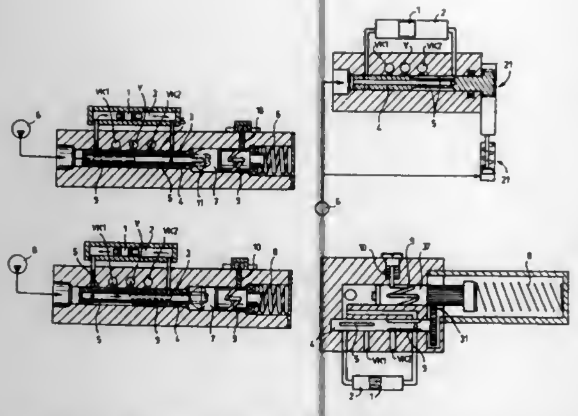


said means for conducting lubricant comprising a second cylinder; a spindle positioned in said second cylinder and provided with passages remaining entirely open during the whole of pressurization;

said spindle being arranged to move in said second cylinder so as to permit flow of lubricant in consequence of a movement of the spindle alternately to one side or the other of the metering piston the spindle being arranged to move only by rotating around its longitudinal symmetry axis; and a separate turning part moving back and forth and rotating influenced by lubricant pressure and spring force for rotating said spindle.

5,687,816
UNDERGROUND STORAGE SPACE

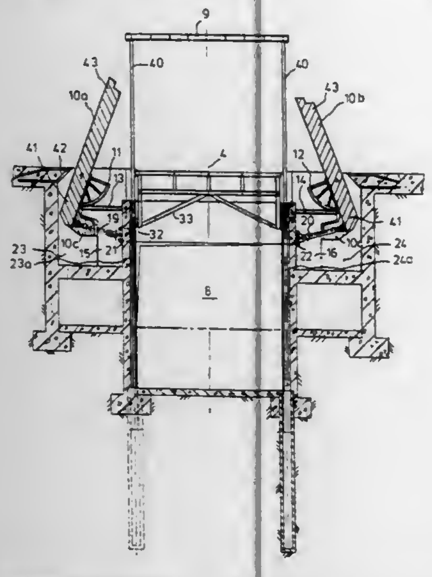
Peter Wüsthof, Lohr/Main, and Erich Wirzberger, Neuhütten, both of Germany, assignors to Mannesmann Rexroth GmbH, Lohr/Main, Germany

Filed Sep. 28, 1995, Ser. No. 535,631

Claims priority, application Germany, Oct. 14, 1994, 44 36 768.6; Feb. 16, 1995, 195 05 130.0

Int. Cl.⁶ B66B *13/24*

U.S. Cl. 187—337 **13 Claims**



1. An underground storage space comprising an entrance with a lift;

wherein the lift has an opening comprising a first cover and a second cover below the first cover, the first cover comprising a swingable flap;

the opening is closable by said first cover, and said second cover closes the entrance below said first cover; and

rolling means supporting said first cover for translating said first cover toward said entrance with rotation of said first cover during a closure of said opening.

5,687,817
DISC BRAKE

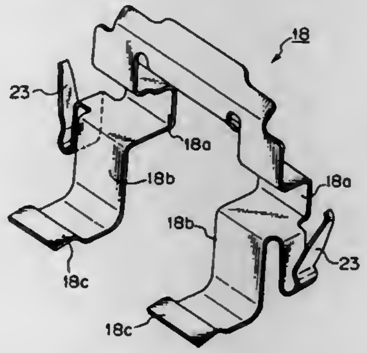
Kinzo Kobayashi; Naganori Koshimizu, and Shinji Suzuki, all of Yamanashi-ken, Japan, assignors to Tokico Ltd., and Nissan Motor Co., Ltd., both of Kanagawa-Ken, Japan

Filed Jan. 26, 1996, Ser. No. 592,674

Claims priority, application Japan, Jan. 27, 1995, 7-031356

Int. Cl.⁶ F16D *55/22*

U.S. Cl. 188—72.3 **9 Claims**



1. A disc brake assembly for applying a braking force to a disc rotor having a pair of brake surfaces, said disc brake assembly comprising:

a pair of friction pads positionable at opposite sides of the disc rotor for pressing against the brake surfaces of the disc rotor during a braking operation, each of said friction pads including a back plate having an end portion, wherein said end portion of one back plate of said pair of back plates faces said end portion of the other back plate of said pair of back plates;

a carrier for guiding said end portions of said back plates;

a pad spring mounted on said carrier for slidably supporting said friction pads relative to said carrier,

said pad spring including a pair of integrally formed spring portions biasing said pair of friction pads, in the vicinity of said end portions of said back plates away from the disc rotor, wherein said spring portions continually bias said friction pads; and

a pair of wear warning elements mounted on said back plates of said pair of friction pads, respectively,

said pair of wear warning elements being disposed in the vicinity of said end portions of said back plates, such that, when a predetermined amount of at least one of said friction pads is worn away, at least one of said wear warning elements directly contacts the brake surface of the disc rotor to generate a warning noise,

wherein said pair of spring portions of said pad spring engage said wear warning elements to bias said friction pads through said wear warning elements away from the disc rotor.

5,687,818
VIBRATION DAMPER FOR USE IN DISK BRAKE

Yukio Nishizawa, and Shiro Nakajima, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 11, 1996, Ser. No. 661,726

Claims priority, application Japan, Jun. 13, 1995, 7-146304; Jul. 6, 1995, 7-170926; Apr. 18, 1996, 8-096856

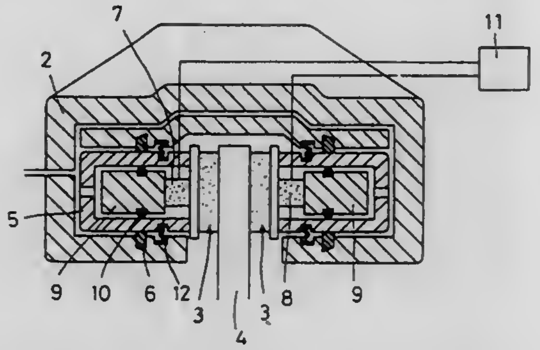
Int. Cl.⁶ F16D *65/38*

U.S. Cl. 188—73.35 **20 Claims**

1. A disc brake arrangement having a vibration damper, comprising:

brake pads arranged so as to be able to engage a brake disc there between;

a vibration detecting means for detecting vibration through said brake pads and generating detection signals in response thereto;



a vibration imparting means for imparting vibration to said brake pads in response to the vibration detected by said vibration detecting means and based on said detection signals; and

at least one pressing piston having a back portion for receiving brake fluid pressure there against for the purpose of pressing at least one of said vibration detecting means and said vibration imparting means against the back of at least one of said brake pads, said at least one said vibration detecting means and said vibration imparting means being disposed between said at least one pressing piston and said at least one of said brake pads.

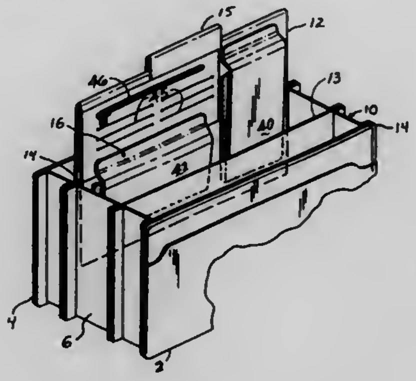
5,687,819
PORTFOLIO WITH SLIDING ORGANIZER PANEL

Glenn R. Lodge, O'Fallon, and Lynne Johnson, St. Louis, both of Mo., assignors to American Trading and Production Corporation, Baltimore, Md.

Filed Jul. 25, 1995, Ser. No. 506,552

Int. Cl.⁶ A45C *3/02*

U.S. Cl. 190—109 **8 Claims**



1. A portfolio assembly comprising:

(a) a fixed panel;

(b) a sliding panel including at least one storage means;

(c) attachment means between said sliding panel and said fixed panel to permit said sliding panel to be moved from a retracted position outwardly relative to said fixed panel yet remain attached to said fixed panel;

(d) said attachment means including a slot in one of said panels, and means attached to the other of said panels and extending through said slot to permit relative movement between said slot and said means extending through said slot;

(e) said slot being disposed in said fixed panel; and

(f) said slot provided with an offset upper holding portion.

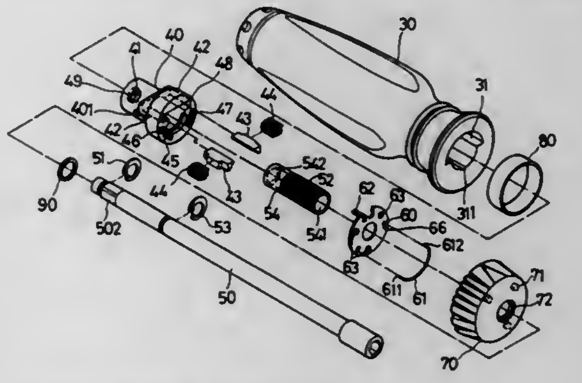
5,687,820
REVERSIBLE RATCHET MECHANISM

Ching-Chou Lin, No. 148, Section 3, Chong San Road, Wu Jih Hsiang, Taichung Hsien, Taiwan

Filed Mar. 29, 1996, Ser. No. 624,167

Int. Cl.⁶ F16D *41/16;* **B25B** *13/46*

U.S. Cl. 192—43.2 **4 Claims**



1. A ratchet mechanism comprising:

a handle including a cavity and a slit formed therein and communicating with each other,

a block secured in said cavity of said handle and including a rib for engaging with said slit so as to prevent said block from rotating relative to said handle, said block including a bore formed therein and including two channels communicating with said bore, said block including a slot and a groove formed therein and including two projections extended inward of said slot so as to define three positions,

a rod including a first end rotatably engaged in said bore of said block,

a sleeve engaged in said bore of said block and secured on said rod so as to be rotated in concert with said rod, said sleeve including a gear formed thereon,

two pawls engaged in said channels,

spring means engaged in said channels for biasing said pawls to engage with said gear,

a disc engaged with said block and including an extension extended inward of said bore for engaging with said pawls and for disengaging said pawls from said gear, said disc including two holes formed therein,

an arm including two legs engaged in said slot and said groove respectively, a first of said legs being engaged with said projections so as to be engaged in at least one of said three positions,

a control ferrule rotatably engaged on said rod and secured to said disc so as to be rotated in concert with said control ferrule, and

means for securing said control ferrule to said rod and said handle,

said extension of said disc being rotated by said control ferrule in order to disengage at least one of said pawls from said gear so as to control an acting direction of said rod, and both of said pawls being engaged with said gear when said extension is engaged between said pawls.

5,687,821
WET CLUTCH ASSEMBLY

Patrick Lorriette, Jaux, France, assignor to Massey-Ferguson SA, France

Filed Dec. 20, 1995, Ser. No. 575,717

Claims priority, application United Kingdom, Jan. 30, 1992, 9501753; Dec. 24, 1994, 9426248

Int. Cl.⁶ F16D *25/063*

U.S. Cl. 192—52.4 **5 Claims**

1. A wet clutch assembly comprising a stack of interleaved, substantially parallel, clutch members and means for applying

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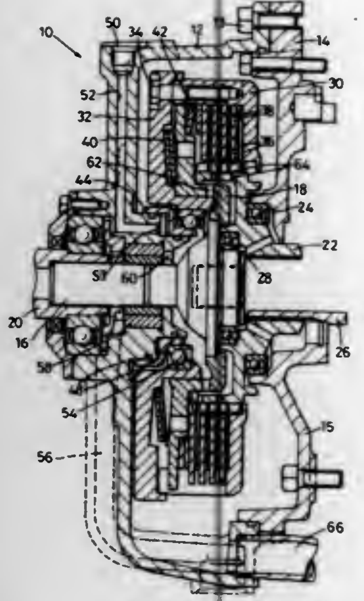
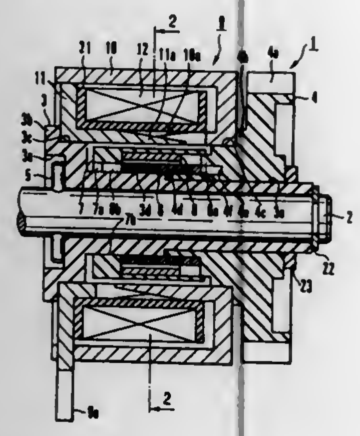


pressure to said stack to engage said clutch members for transmission of torque, said pressure applying means comprising:
- a) an element at each end of said stack, one or both of which are axially movable;
- b) at least one resilient engagement member interposed between a stationary member and one of said elements and biasing said clutch members into engagement; and
- c) at least two resilient progressivity members, each having a different spring characteristic, arranged in series to control the magnitude of pressure transmitted to said stack in dependence on the distance moved by said element or elements, for a predetermined range of movement of said elements.

5,687,822
ELECTROMAGNETIC SPRING CLUTCH

Shigeharu Arai, Gunma, Japan, assignor to Ogura Clutch Co., Ltd., Japan

Filed Mar. 8, 1996, Ser. No. 613,131
Claims priority, application Japan, Mar. 8, 1995, 077308
Int. Cl.^{6} F16D *27/105*
U.S. Cl. 192—84.81 **5 Claims**

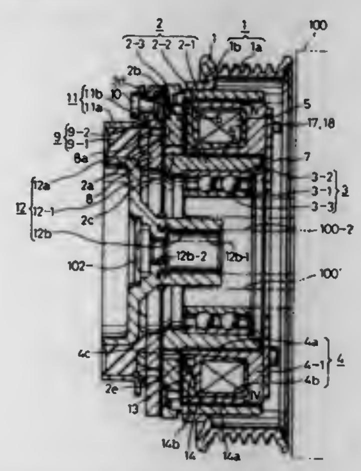


1. An electromagnetic spring clutch comprising:
a stator formed with a central hole having an inner circumferential surface which is formed by a plurality of magnetic pole segments that mesh each other alternately through a gap in circumferential and axial directions;
an excitation coil accommodated in said stator;
an input-side rotating member and an output-side rotating member both made of a non-magnetic member and formed with fitting portions and coil tight-winding surfaces, said fitting portions respectively supporting two open end portions of the central hole of said stator, and said coil tight-winding surfaces having end portions that are in contact opposite to each other in the central hole;
a coil spring wound on said coil tight-winding surfaces of said two rotating members and having one end hooked by said input-side rotating member; and
a rotor by which the other end of said coil spring is hooked, which is disposed in a magnetic field of said stator, and which is made of a hysteresis material.

5,687,823
ELECTROMAGNETIC CLUTCH

Juneichi Nakagawa, Nagoya; Masahiro Kinoshita; Yutaka Ito, both of Kariya; Kimio Suzuma, Toyoake, and Hidetaka Shingai, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 28, 1996, Ser. No. 623,199
Claims priority, application Japan, Mar. 29, 1995, 7-071926; Sep. 27, 1995, 7-249830
Int. Cl.^{6} F16D *27/04*
U.S. Cl. 192—84.961 **12 Claims**



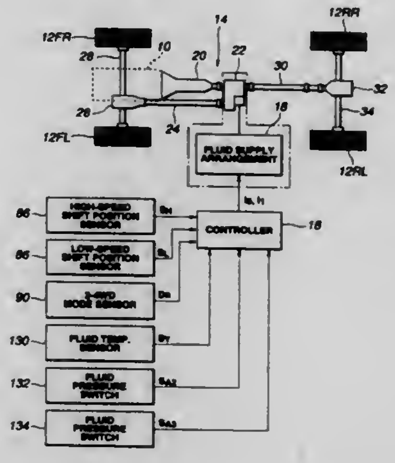
1. An electromagnetic clutch for selective transmission of a rotating movement from a rotating movement source to a rotary apparatus having a rotating shaft comprising:
a first rotating member made of a magnetizing material and adapted to be subjected to a rotating movement from the rotating movement source, said rotating member forming a friction surface;
a second rotating member connected to the rotating shaft of the rotary apparatus;
an electromagnetic coil for generating an electromagnetic attraction force, the electromagnetic coil being located in an electrical circuit for energizing the electromagnetic coil for generating the electromagnetic attraction force when the circuit is closed;
a stationary housing made of a magnetizing material for fixedly storing therein the electromagnetic coil;
an armature made of a magnetizing material arranged so that the armature is attracted to the frictional surface of the first rotating member under the electromagnetic attraction force as generated;
a spring means arranged between the second rotating member and the armature for generating a spring force for causing the armature to be separated from the frictional surface of the first rotating member when the electromagnetic coil is de-energized;

a temperature fuse unit in said circuit, the temperature fuse unit being arranged in the stationary housing at a location adjacent the frictional surface of the first rotating member and also adjacent a wall of the stationary housing, melting of the fuse unit being generated at a temperature higher than a predetermined value, thereby opening the circuit and causing the electromagnetic coil to be de-energized; and
a fuse holder member in the stationary housing for holding the temperature fuse, the fuse holder member holding the temperature fuse at a fixed location in the stationary housing.

5,687,824
MULTI-PLATE FRICTIONAL CLUTCH STRUCTURE

Tomoyuki Hara, Isehara, and Toshiharu Takasaki, Sagamihara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 20, 1995, Ser. No. 530,858
Claims priority, application Japan, Sep. 21, 1994, 6-226466
Int. Cl.^{6} F16D *25/08*
U.S. Cl. 192—85 CA **4 Claims**

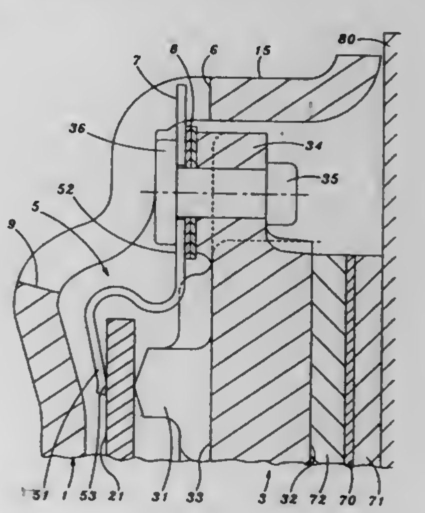


1. A multi-plate type frictional clutch structure comprising:
a casing having an interior wall portion;
a multi-plate clutch assembly within said casing; and
a clutch piston mounted on said interior wall portion for movement along a predetermined axis toward said multi-plate clutch assembly to engage said multi-plate clutch assembly and for return movement along said predetermined axis away from said multi-plate clutch assembly to disengage said multi-plate clutch assembly;
said clutch piston and said casing cooperating with each other to define between said clutch piston and said interior wall of said casing a cylinder chamber;
said clutch piston and said interior wall portion engaging each other to define a rotation restriction portion operative to normally restrict a rotational movement of said clutch piston about said predetermined axis, said rotation restriction portion being operative to allow rotational movement of said clutch piston about said predetermined axis when said clutch piston is subject to a torque greater than a predetermined torque value.

5,687,825
CLUTCH MECHANISM, NOTABLY FOR A MOTOR VEHICLE

Gino Villata, Buttigliera D'Asti, Italy, and Jean-Pierre Giroire, St. Germain En Laye, France, assignors to Valeo, Paris, France

PCT No. PCT/FR95/00390, § 371 Date Nov. 30, 1995, § 102(e) Date Nov. 30, 1995, PCT Pub. No. WO95/27154, PCT Pub. Date Oct. 12, 1995
PCT Filed Mar. 29, 1995, Ser. No. 553,537
Claims priority, application France, Mar. 30, 1994, 94 03748
Int. Cl.^{6} F16D *13/44*
U.S. Cl. 192—89.23 **7 Claims**



1. Diaphragm clutch mechanism, having a cover (1), a diaphragm (2) having broadened orifices (23) of rectangular shape with lateral edges and being mounted on the cover by pivoting means (4) pivotally fixing the diaphragm to the cover, a pressure plate (3) fixed to the cover (1) with respect to it by coupling means (8), in which the cover (1) has a base (11) carrying studs (41) belonging to the pivoting means (4), said studs having a foot (**50**, **150**) for fixing the stud (41) to the base (11), an annular guide portion (**90**, **190**) designed to cooperate with the lateral edges (25) of the broadened orifices (23) of rectangular shape, which the diaphragm (2) has for passage of the studs (41), and a head (42, 142) having a rear face (61) and a top part with a top face (62, 162), said head being profiled so as to offer a support to the peripheral part, in the form of a belleville washer (21), which the diaphragm (2) has, wherein said guide portion (**90**, **190**) is cut to form two lateral edges (91, 191) overall in the form of flats designed to cooperate with the lateral edges (25) of the broadened orifices (23) of the diaphragm (2), and said stud (41) is in two parts and has a rivet (**150**) and a single-piece part (142, **190**) including the guide portion (**190**).

5,687,826
LUBRICATION SYSTEM FOR ONE-WAY CLUTCH

Yoshio Kinoshita, and Toshio Awaji, both of Shizuoka-ken, Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Oct. 24, 1995, Ser. No. 547,597
Claims priority, application Japan, Oct. 25, 1994, 6-297790
Int. Cl.^{6} F16D *13/74*
U.S. Cl. 192—113.32 **6 Claims**

1. A one-way clutch provided with an inner ring, an outer ring, and an end bearing having an inner and outer peripheral walls and disposed between said inner ring and said outer ring, the improvement wherein said end bearing is provided on a side wall thereof with convexities extending in an axial direction from the side wall, and said convexities, form openings on an inner side thereof which catch lube oil flowing from a side of said inner ring toward a side

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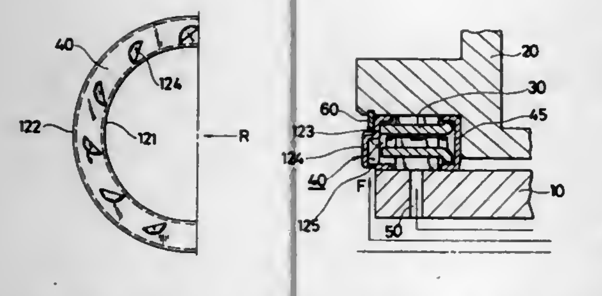


of said outer ring to be introduced into said one-way clutch through the openings forming flow passages.

5,687,827
CLUTCH WITH TANGENTIAL SPRING BODIES

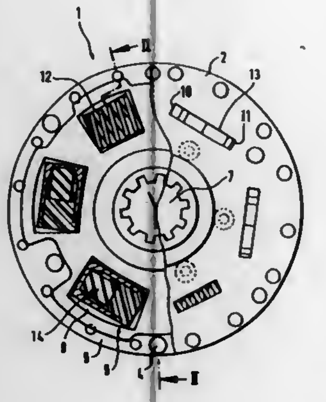
Ulrich Rohs, Düren, Germany, assignor to Patentverwertungsgesellschaft Rohs Voight mbH, Düren, Germany

Filed Dec. 7, 1995, Ser. No. 568,943

Claims priority, application Germany, Dec. 19, 1994, 44 45 257.8

Int. Cl.⁶ F16D *13/64;3/14*

U.S. Cl. 192—211 **10 Claims**



1. A clutch having a primary part and a secondary part for coupling together two coaxial rotating shafts including a driven shaft, wherein the secondary part comprising:

a driving disk, including a first recess with radial edges, for coupling to the primary part;

a trailing disk, including a second recess, partially rotatable relative to said driving disk and adapted to be rigidly connected to the driven shaft; and

a plurality of tangential spring bodies forming a non-positive engaging relationship between said driving disk and said trailing disk, at least one tangential spring body is a clamping body disposed within the second recess and abutting said radial edges of the first recess, said clamping body comprising:

a cylinder having an inside diameter (D);

a piston slidably disposed within said cylinder in an axial direction to form a closed cylinder space; and

a cylindrical body, made of an elastic plastic material, disposed within the cylinder space and having a diameter (d) smaller than the inside diameter (D), wherein said cylindrical body is dimensioned to completely occupy the cylinder space upon initial axial compression of said piston whereby said cylindrical body absorbs further axial forces as an incompressible medium.

5,687,828
FRICTION CLUTCH FOR A DRIVE TRAIN OF A MOTOR VEHICLE AND A TORSIONAL DAMPER FOR A FRICTION CLUTCH

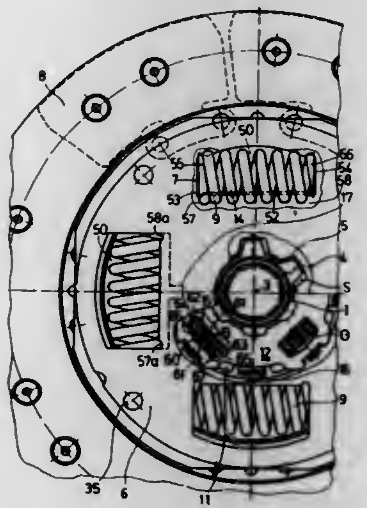
Norbert Ament, Eltingshausen, and Harald Raab, Schweinfurt, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Nov. 30, 1994, Ser. No. 346,790

Claims priority, application Germany, Dec. 1, 1993, 43 40 866.4

Int. Cl.⁶ F16D *13/64*

U.S. Cl. 192—213.2 **20 Claims**



17. A cover plate for a hub disc of a friction clutch for a motor vehicle, said cover plate having an axis of rotation, said cover plate comprising:

means for accommodating a damping device of the hub disc;

said damping device comprising constant diameter, non-chamfered coil spring;

said means for accommodating a damping device comprising:

at least one opening;

said at least one opening extending through said cover plate;

said at least one opening comprising a first edge portion and a second edge portion; and

said first edge portion being spaced apart from said second edge portion in a circumferential direction about the axis of rotation;

said first edge portion comprising a first indentation;

said first indentation comprising means for permitting substantially radial movement of an end of said damping device; and

a portion of said first edge portion having an axial dimension;

said cover plate having an axial dimension; and

the axial dimension of said portion of said first edge portion being substantially greater than the axial dimension of said cover plate substantially adjacent said portion of said first edge portion.

5,687,829
COIN VALIDATORS

James Churchman, Llysworney, Great Britain, assignor to Tetrel Limited, United Kingdom

Continuation of Ser. No. 416,785, Apr. 14, 1995, abandoned. This application Jan. 8, 1997, Ser. No. 780,217

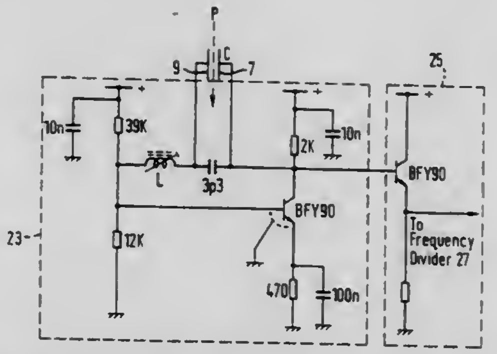
Claims priority, application United Kingdom, Oct. 14, 1992, 9221591; Jul. 13, 1993, 9314508

Int. Cl.⁶ G07D *5/08*

U.S. Cl. 194—317 **54 Claims**

10. Apparatus for determining whether an input coin is acceptable and for distinguishing between a plurality of acceptable coins, comprising:

capacitor means;



guide means to guide an input coin along a coin path past the capacitor means, thereby to affect the capacitance of the capacitor means;

oscillator means for providing an oscillating output signal the frequency of which is affected by the capacitance of the capacitor means; and

decision means for receiving the oscillating output signal and making a decision on the basis of the frequency thereof whether the input coin is acceptable and, if so, which of a plurality of acceptable coins the input coin is,

the decision means comprising compensation means for monitoring the rest frequency of the oscillating output signal in the absence of an input coin and compensating the decision means for changes in the rest frequency over time.

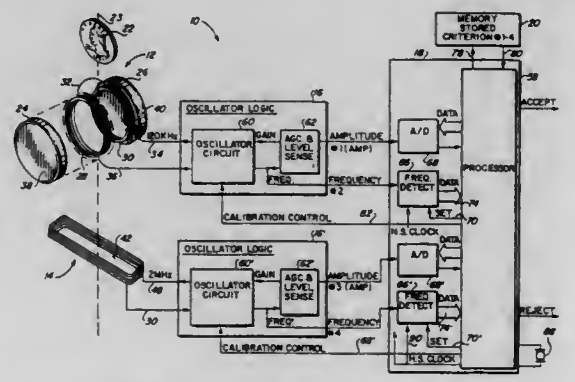
5,687,830
ITEM DISCRIMINATION APPARATUS AND METHOD

Stephen J. Hayes, Swansea, England, and Patrick R. Gorman, Lakeland, Fla., assignors to Protel, Inc., Lakeland, Fla.

Continuation of Ser. No. 317,796, Oct. 4, 1994, Pat. No. 5,568,854, which is a continuation-in-part of Ser. No. 27,363, Mar. 8, 1993, Pat. No. 5,351,798, which is a division of Ser. No. 722,480, Jun. 28, 1991, Pat. No. 5,191,957. This application Apr. 17, 1996, Ser. No. 633,511

Int. Cl.⁶ G07D *5/08*

U.S. Cl. 194—318 **16 Claims**



1. A method for discriminating between an acceptable and unacceptable item, the method comprising the steps of:

determining selected characteristics of an item under test;

determining the difference between at least one scale value of the selected characteristics of the item under test and at least one mean value of the selected characteristics of a plurality of acceptable items;

determining a deviation value between the item under test and predetermined statistical variables for the selected characteristics of the plurality of acceptable items from the determined difference; and

accepting the item under test responsive to the deviation value being within a predetermined range of the predetermined statistical variables.

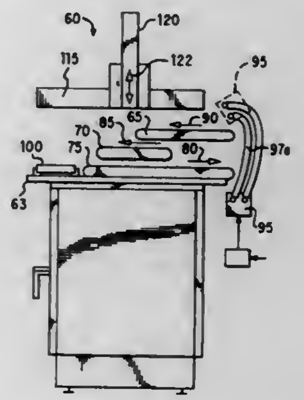
5,687,831
FLEXIBLE PARTS FEEDER

Brian R. Carlisle, Palo Alto, Calif., assignor to Adept Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 124,662, Sep. 22, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 428,679

Int. Cl.⁶ B65G *47/24*

U.S. Cl. 198—395 **22 Claims**



1. A parts feeder, comprising:

a transport system for receiving parts and transporting the parts to a selection zone at which a selector analyzes parts in the selection zone and selects parts according to the analysis; and

a recirculator that receives non-selected parts from the transport system and recirculates the received parts for receipt and subsequent transport by said transport system through said selection zone, said recirculator being operative to induce the recirculated parts to assume different orientations and/or relative positions during transport for subsequent passes through said selection zone;

said recirculator comprising a parts-receptor that moves along a transfer path extending from a location at which the parts-receptor receives non-selected parts from the transport system to a region in which the parts-receptor discharges the received non-selected parts, said transfer path comprising two curved end portions, wherein said parts-receptor is positioned under the transport system when said parts-receptor is at the non-selected parts receiving location.

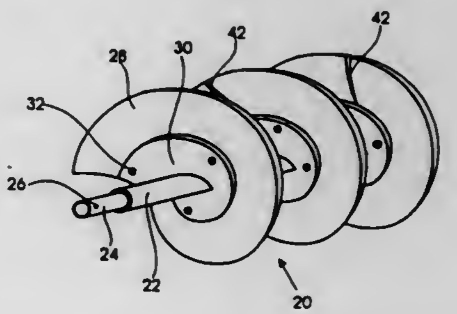
5,687,832
FLEXIBLE BLADED AUGER

Terry Thiessen, Box 2351, Strathmore, Alberta, Canada, T1P 1K3

Filed Feb. 15, 1996, Ser. No. 602,117

Int. Cl.⁶ B65G *33/26*

U.S. Cl. 198—676 **17 Claims**



1. A method of constructing an auger for moving granular material and slurries of granular materials having a flexible outer blade portion comprising the following steps:

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cutting a doughnut shaped disc from flat rubberized and corded belting, said doughnut shaped disc having a split therethrough extending from an inner diameter to an outer diameter thereof; and,

fastening an inside portion of the doughnut shaped disc to a riged blade of a portion of an auger.

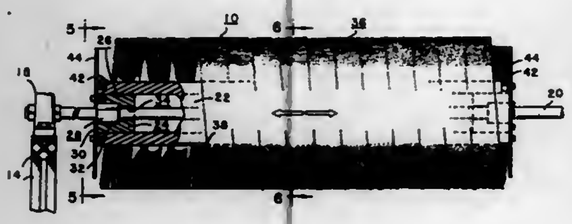
5,687,833
SUPPORT ROLLER AND WORKPIECE CONVEYING SYSTEM

Frederick P. Dalessio, Jr., 127 Morgan Rd., Aston, Pa. 19014, and Frank Simkins, 100 Schoolhouse La., Brook Haven, Pa. 19015

Filed May 25, 1995, Ser. No. 450,681

Int. Cl.^{6} B65G *13/02*

U.S. Cl. 198—786 **27 Claims**



15. A workpiece support and conveying system comprising:

at least two support rollers defining a working plane having a predetermined variable transverse dimension or width, each of said support rollers comprising;

(a) an axle;

(b) a mandrel rotatably supported on said axle and adapted for axial movement along said axis;

(c) a brush assembly comprising a plurality of fibers attached to the mandrel having a fiber density sufficient to generally support the workpiece in the working plane while allowing portions of the workpiece extending angularly to infiltrate the fibers;

(d) the axial length of each said brush assemblies being of a predetermined length so that when two support rollers assemblies are in a side by side relationship, the transverse width of the working plane may be expanded to a dimension greater than the predetermined length of each brush assembly when the assemblies are moved in opposite directions on their respective axles.

5,687,834
SELECTOR SWITCH HAVING AN EASILY REMOVABLE KNOB

Barry S. Simon, Germantown, and Ismael Garcia, St. Francis, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Apr. 25, 1996, Ser. No. 638,064

Int. Cl.^{6} H01H *3/08*

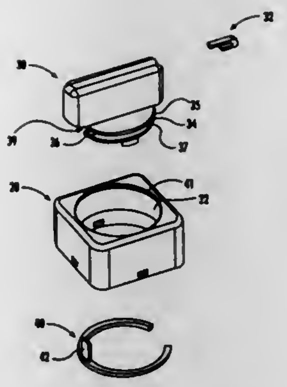
U.S. Cl. 200—336 **20 Claims**

9. A selector switch comprising:

a bezel having an interior cylindrical surface;

a knob mounted on the bezel, the knob having a selection indicator and a lower cylindrical portion, wherein the lower cylindrical portion fits inside the interior cylindrical surface of the bezel when the knob is mounted on the bezel; and

a retaining clip including a C-shaped ring having two ends mounted around the lower cylindrical portion of the knob to secure the knob onto the bezel, and a tab mounted at a middle portion of the C-shaped ring between the two ends, wherein a slot is disposed between the knob and the bezel, the slot being configured to provide access to the tab of the retaining clip.



5,687,835
DRIVE FOR AN ELECTRIC HIGH VOLTAGE CIRCUIT-BREAKER

Klaus Schuler, Berlin, and Hans Niemeler, Noerdlingen, both of Germany, assignors to Siemens Aktiengesellschaft, München, Germany

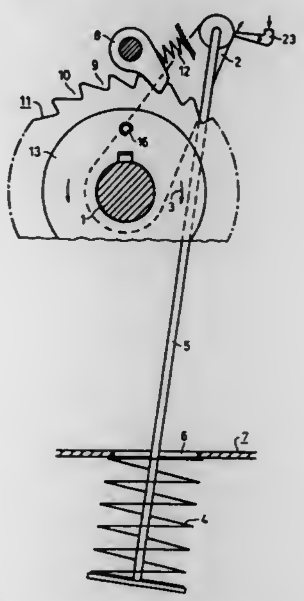
PCT No. PCT/DE94/00944, § 371 Date Apr. 12, 1996, § 102(e) Date Apr. 12, 1996, PCT Pub. No. WO95/05672, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 9, 1994, Ser. No. 596,173

Claims priority, application Germany, Aug. 13, 1993, 43 27 676.8

Int. Cl.^{6} H01H *5/00*

U.S. Cl. 200—400 **5 Claims**



1. A drive for an electric high voltage circuit-breaker, comprising:

a revolving crank that can be driven in a driving direction by an energy storage mechanism between an upper dead center and a bottom dead center position; and

a backstop for preventing the crank from moving backwards for more than a predetermined distance against the driving direction after the crank moves beyond the bottom dead center position, wherein the backstop includes a friction clutch having a first ring that is firmly coupled to the crank, and a second return stop ring that is rotatable relative to the first ring when a releasing force is overcome, and wherein the crank moves against the driving direction until a frictional engagement between the first ring and the second return stop ring prevents the crank from moving against the driving direction for more than the predetermined distance.

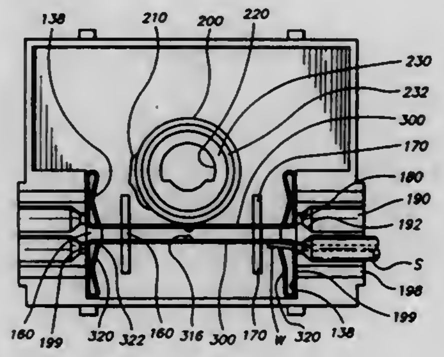
5,687,836
ELECTRICAL SWITCH ASSEMBLY ACTUATABLE BY A ROTATABLE MEMBER

Richard Gjerde, Braceville, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed May 22, 1996, Ser. No. 647,430

Int. Cl.^{6} H01H *19/20*

U.S. Cl. 200—569 **23 Claims**



1. An electrical switch assembly actuatable by a rotatable member, comprising:

a housing having an aperture defined therein;

a hub rotatably disposed within said housing, a peripheral camming surface defined upon said hub, and aperture means defined within said hub and accessible through said bousing aperture for receiving the rotatable member such that said hub is rotatable with respect to said housing when said rotatable member is rotatably engaged within said aperture means of said hub; and

a pair of resilient electrical contact blades disposed within said housing at locations which are in spaced relation with respect to each other, said resilient electrical contact blades having at least one wire engagement portion for engageable connection with an electrical wire and being substantially similar to each other in configuration so as to be interchangeable with each other at said locations within said housing,

said hub being rotatable by said rotatable member so as to cause said peripheral camming surface of said hub to be engaged with one of said resilient electrical contact blades and thereby cause flexure of said engaged one of said resilient electrical contact blades into electrical contact with the other one of said resilient electrical contact blades.

5,687,837
EYEGLASS RETAINER AND PROTECTIVE COVER

Douglas A. Seller, 127 Iolanthus Ave., Novato, Calif. 94947

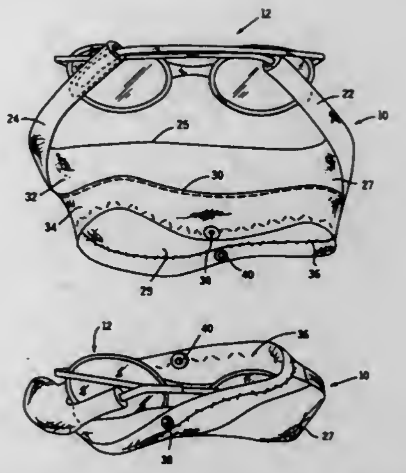
Continuation-in-part of Ser. No. 375,500, Jan. 19, 1995, abandoned. This application Feb. 16, 1996, Ser. No. 602,591

Int. Cl.^{6} A45C *11/04*

U.S. Cl. 206—5 **5 Claims**

1. A device for retaining and covering eyeglasses of the type having a frame for mounting lenses and a pair of stems coupled to the frame for holding the eyeglasses on the head of a user, the device comprising:

a flexible pouch having an aperture along a first edge for receiving the eyeglasses, the pouch including first and second portions, the first portion bordering a closed second edge and the second portion extending from the first portion and surrounding the aperture, the second portion being collapsible into the first portion to form a relatively narrow retainer configuration and removable from the first portion to form an expanded cover configuration for lodging the eyeglasses;



a pair of retaining extensions for coupling to the stems of the eyeglasses; and

closure members disposed on the second portion of the pouch, the closure members mating to retain the second portion within the first portion when the device is placed in the retainer configuration and to positively close the aperture to hold the eyeglasses within the pouch when the device is placed in the cover configuration.

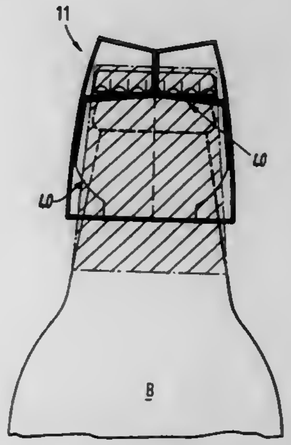
5,687,838
CARRIER

Martinus C. M. Bakx, Goes, Netherlands, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 18, 1996, Ser. No. 665,658

Int. Cl.^{6} B65D *75/00*

U.S. Cl. 206—147 **8 Claims**



1. An article carrier for packaging a plurality of articles each having a top and a neck extending downward from the top, the carrier comprising:

opposed top and bottom walls hingably interconnected by a pair of opposed side walls to form a tubular structure of a generally rectangular cross section, the top wall being adapted to be disposed over the tops of the articles in a row, the bottom wall having neck-receiving apertures for receiving the necks of the articles respectively, the side walls being adapted to be disposed alongside the necks of the articles such that the tops of the articles are hidden from view by the side walls; and

retaining means for retaining the tops of the articles between the top and bottom walls of the carrier, the retaining means comprising a first retention panel hingably connected to one of the side walls at an intermediate position between the top and bottom walls to engage the tops of the articles, and a first support panel for holding the first retention panel inclined to the top wall such that the first retention panel extends

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upwardly and inwardly of the tubular structure from the one side wall, the first support panel extending between the top wall and an upper inner end of the first retention panel to interconnect the top wall and the first retention panel.

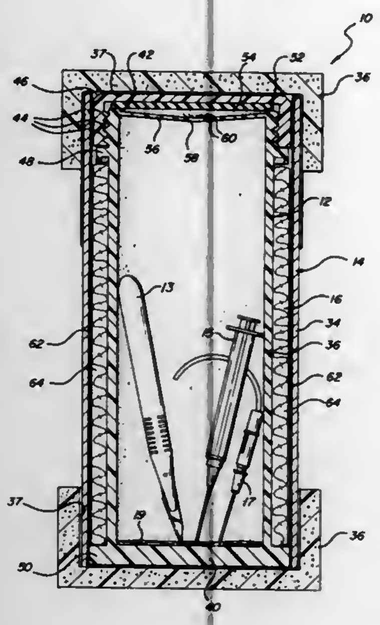
5,687,839
CONTAINER FOR DISPOSING OF HAZARDOUS WASTES

J. Russell Gnau, III, 2404 Starr, Royal Oak, Mich. 48073; Michael P. Gnau, 2215 Third St., Mandeville, La. 70448; Vincent Americo Valvona, 4405 Cranbrook Trail, Orchard Lake, Mich. 48323, and John R. Gnau, Jr., 3894 Peabody Dr., Bloomfield Hills, Mich. 48302

Continuation of Ser. No. 175,635, Dec. 30, 1993, Pat. No. 5,511,657. This application Feb. 27, 1996, Ser. No. 607,581

Int. Cl.⁶ B65D *81/16;85/42*

U.S. Cl. 206—204 **8 Claims**



1. A container for disposing of hazardous waste, said container comprising:

an inner receptacle adapted to receive and contain hazardous waste, said inner receptacle including a body having a closed end and an open end disposed opposite said closed end, said open end of said body defining an upper rim, said body further including threads disposed about a portion of its circumference at its open end and a threadably removable cap adapted to sealingly close said open end of said body, a gasket disposed between said rim and said threaded cap to form a seal therebetween and prevent leakage from said inner receptacle;

an impact resistant outer container, said inner receptacle being disposed within said outer container, said outer container including a sleeve with at least one open end and having at least one removable end cap which defines a socket and which is disposed over said open end of said sleeve to completely enclose said inner receptacle; and

a fluid barrier disposed between said inner receptacle and said outer container, said fluid barrier including a polyethylene liner having an open end, said inner receptacle adapted to be disposed within said liner with said liner being sealable at its open end, said fluid barrier further including an absorbent shield disposed about at least a portion of said inner receptacle and between said liner and said inner receptacle for absorbing any liquid present between said inner container and said liner, said fluid barrier preventing any fluid from passing from said inner receptacle to said outer container.

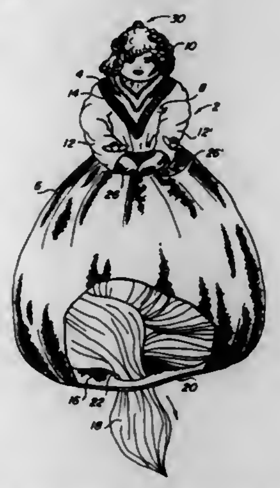
5,687,840
ATTRACTIVE HANGING RECEPTACLE FOR PLASTIC BAGS

Victoria Sherman, 3116 Alhambra Clr., Coral Gables, Fla. 33134

Continuation-in-part of Ser. No. 248,665, May 25, 1994, Pat. No. 5,487,467. This application Oct. 26, 1995, Ser. No. 548,645

Int. Cl.⁶ B65D *83/00*

U.S. Cl. 206—216 **28 Claims**



1. A receptacle for plastic bags and other like articles, comprising:

(a) an upper member having the general configuration and appearance of a doll and including a head, a material on said head having the appearance of hair and a torso;

(b) a lower element structured and disposed for receiving a plurality of plastic bags therein, said lower element having the general shape and configuration of a skirt including a relatively narrow top region and a relatively wide bottom region, said top region of said lower element being attached to said upper member and extending downwardly therefrom, said skirt diverging from said top region to said bottom region, said lower element defining a cavity therein;

(c) said lower element including an opening in communication with said cavity, said opening being smaller than said bottom region such that a material of said bottom region converges to said opening, said plurality of plastic bags being disposed in said cavity, said opening being structured and dimensioned to allow passage therethrough of at least one of the plastic bags and to contain the plastic bags within said cavity;

(d) a suspension member connected to said upper element at a rear exterior surface thereof, and generally corresponding said head,

(e) said suspension member being structured to cooperate with a hook member disposed on a substantially vertical structure so as to suspend said receptacle therefrom with said upper member being prevented from falling forward when said receptacle is disposed in a suspended position.

20. To be disposed on a protruding member disposed on a generally vertical structure, A receptacle for plastic bags and other like articles, comprising:

an upper member, said upper member having a general configuration and appearance of a doll and comprising: a head and a torso;

a lower element, said lower element defining a cavity therein;

said lower element being attached to said upper member and extending downwardly therefrom;

said lower member being structured and disposed to simultaneously define the general shape and configuration of a skirt and to receive and contain in a readily dispensable orientation a plurality of plastic bags in said cavity;

said lower element further including an opening defined entirely within a lower half thereof and disposed in communication with said cavity,

dispensing means disposed at said opening of said lower element, said dispensing means being structured to contain said plurality of plastic bags within said cavity while allowing facilitated dispensing passage through said opening of at least one of the plastic bags upon affirmative removal by a user;

a suspension member coupled to said upper element, and

said suspension member being structured and disposed to cooperate with the protruding member disposed on the substantially vertical structure so as to suspend said upper member and said lower member therefrom in an attractive, generally vertical orientation resembling said general configuration and appearance of said doll.

24. To be disposed on a protruding member disposed on a generally vertical structure, A receptacle for plastic bags and other like articles, comprising:

an upper member, said upper member having a general configuration and appearance of a doll and comprising: a head, and a torso;

a lower element, said lower element defining a cavity therein;

said lower element being attached to said upper member and extending downwardly therefrom;

said lower member being structured and disposed to simultaneously define the general shape and configuration of a skirt and to receive and contain in a readily dispensable orientation a plurality of plastic bags in said cavity;

said lower element further including a downwardly facing opening defined therein and disposed in communication with said cavity,

dispensing means disposed at said opening of said lower element, said dispensing means being structured to contain said plurality of plastic bags within said cavity while allowing facilitated dispensing passage through said opening of at least one of the plastic bags upon affirmative removal by a user;

a suspension member coupled to said upper element, and

said suspension member being structured and disposed to cooperate with the protruding member disposed on the substantially vertical structure so as to suspend said upper member and said lower member therefrom in an attractive, generally vertical orientation resembling said general configuration and appearance of said doll.

25. A receptacle for plastic bags and other like articles, comprising:

(a) an upper member having the general configuration and appearance of a doll and including a head, a material on said head having the appearance of hair and a torso;

(b) a lower element structured and disposed for receiving a plurality of plastic bags therein, said lower element having the general shape and configuration of a skirt including a relatively narrow top region and a relatively wide bottom region, said top region of said lower element being attached to said upper member and extending downwardly therefrom, said skirt diverging from said top region to said bottom region, said lower element defining a cavity therein;

(c) said lower element including an opening in communication with said cavity, said opening being smaller than said bottom region such that a material of said bottom region converges to said opening, a hook and loop fastening material disposed substantially at said opening and structured and dimensioned to allow passage therethrough of at least one of the plastic bags and to contain the plastic bags within said cavity;

(d) a suspension member connected to said upper element at a rear exterior surface thereof, and generally corresponding said head, and

(e) said suspension member being structured to cooperate with a hook member disposed on a substantially vertical structure so as to suspend said receptacle therefrom with said upper member being prevented from falling forward when said receptacle is disposed in a suspended position.

27. A receptacle for plastic bags and other like articles, comprising:

(a) an upper member having the general configuration and appearance of a doll and including a head, a material on said head having the appearance of hair and a torso;

(b) a lower element structured and disposed for receiving a plurality of plastic bags therein, said lower element having the general shape and configuration of a skirt including a relatively narrow top region and a relatively wide bottom region, said top region of said lower element being attached to said upper member and extending downwardly therefrom, said skirt diverging from said top region to said bottom region, said lower element defining a cavity therein;

(c) said lower element including an opening in communication with said cavity, said opening being smaller than said bottom region such that a material of said bottom region converges to said opening, an elastic band disposed substantially at said opening and structured and dimensioned to allow passage therethrough of at least one of the plastic bags and to contain the plastic bags within said cavity;

(d) a suspension member connected to said upper element at a rear exterior surface thereof, and generally corresponding said head, and

(e) said suspension member being structured to cooperate with a hook member disposed on a substantially vertical structure so as to suspend said receptacle therefrom with said upper member being prevented from falling forward when said receptacle is disposed in a suspended position.

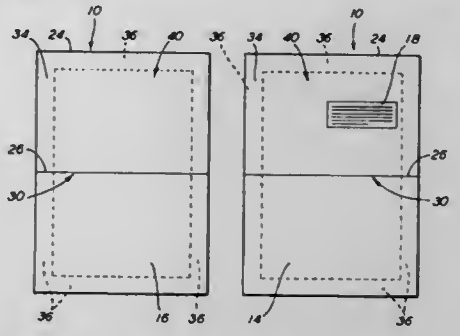
5,687,841
COMBINATION SHIPPING CONTAINER, MIXING AND DRINKING VESSEL

Howard P. Phykitt, Wilson, N.C., assignor to Health Corporation, Rocky Mount, N.C.

Filed Nov. 16, 1995, Ser. No. 559,003

Int. Cl.⁶ B65D *81/00;* **A61K** *31/60*

U.S. Cl. 206—217 **22 Claims**



1. In combination with a medication including a potassium bicarbonate, potassium carbonate and aspirin combination compound specifically formulated for at least temporary relief of minor aches, pains and certain predetermined therapeutic uses, the improvement comprising, a package which serves as both a shipping container for a predetermined individual dosage of such medication and a mixing vessel for mixing such individual dosage of such medication with a predetermined requisite volume of a predetermined liquid solvent and as a drinking cup, said package including:

(a) a back portion formed of a first substantially flat and generally flexible sheet material impervious to such liquid solvent and having each of a first predetermined length and a first predetermined width;

(b) a front portion, formed of a second substantially flat and generally flexible sheet material impervious to such liquid solvent, overlaying said back portion and having each of a second predetermined length and a second predetermined width;

(c) said front portion and said back portion being joined together substantially at a common periphery to form a closed envelope structure with such individual dosage of such medication sealed within said closed envelope structure between said front portion and said back portion; and

(d) said envelope structure being openable at one edge thereof to convert said closed envelope structure to an open-topped envelope structure, and said front portion and said back portion being bowed apart sufficient to effect a predetermined volume within said open-topped envelope structure, said open-topped envelope structure having said predetermined volume therein for receiving such predetermined requisite volume of liquid solvent thereto to be admixed with and dissolve such individual dosage of such medication therein and be retained within said open-topped envelope structure.

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5,687,842
COMPACT DISC LOWER CASE

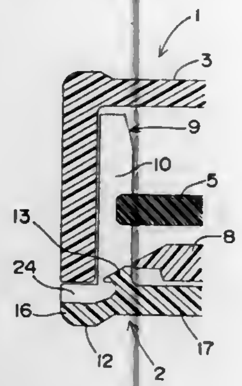
Satoshi Matsumoto, Onsen-gun, Japan, assignor to Fuji Seiki Co., Ltd., Osaka, Japan

Filed Aug. 16, 1996, Ser. No. 689,716

Claims priority, application Japan, Aug. 24, 1995, 7-216323

Int. Cl.^{6} B65D *85/57*

U.S. Cl. 206—308.1 **11 Claims**



1. In a lower case of a compact disc case, which is to be molded by injecting a molten resin through a predetermined gate position and which has an axis of rotation around which an upper case is rotatably supported, the lower case comprising:

a rectangular bottom portion;

a pair of upwardly extending lateral wall portions respectively formed at a pair of sides, out of the four sides of the bottom portion, extending in a direction perpendicular to the axis of rotation;

outwardly projecting lateral edge portions respectively formed at the pair of sides of the bottom portion;

a first recess formed in a predetermined part of each of the lateral wall portions, the first recess receding such that a top end of the first recess thereof substantially reach a top of the bottom portion; and

at least one second recess formed in at least one portion out of base portions of the lateral wall portions and the lateral edge portions,

each of the lateral edge portions including a projecting portion which downwardly projects to a position lower than the bottom portion.

5,687,843
GOLF BAG

Robert Meiklem Yuill, Aberdeen, Scotland, assignor to James Richard Ingleby, United Kingdom, a part interest

Division of Ser. No. 277,940, Jul. 20, 1994, Pat. No. 5,469,960, which is a continuation of Ser. No. 39,024, Mar. 25, 1993, abandoned. This application Aug. 4, 1995, Ser. No. 511,704

Claims priority, application United Kingdom, Sep. 28, 1990, 9021285

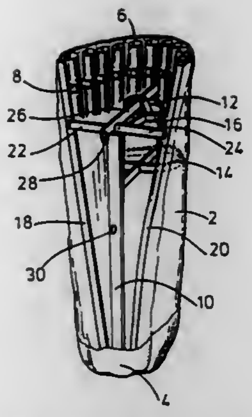
The portion of the term of this patent subsequent to Jul. 20, 2014, has been disclaimed.

Int. Cl.^{6} A63B *55/00;55/06*

U.S. Cl. 206—315.3 **9 Claims**

1. A golf bag for carrying golf clubs, each golf club comprising a handle and a head, which bag comprises:

a generally tubular bag member having a base and a sidewall extending therefrom, the sidewall being divided longitudinally along a front thereof, so as to provide a pair of opposed sidewall edges, a respective edge member being provided along each sidewall edge, each edge member being substantially rigid and having a respective upper end and lower end, each of said edge members being pivotally mounted at its lower end to the base at respective first and second spaced mounting points for pivoting movement relative to one another for moving apart the upper ends of the edge members and opening the bag member from a closed position to an open position;



a series of individual golf club retaining means arranged in locations around the inner circumference of the sidewall, each said individual golf club retaining means being adapted to receive a single golf club, such that opening the bag member to the open position presents the clubs in a serial manner;

said series of individual golf club retaining means comprising a central series of golf club retaining means which are disposed in a generally curved arrangement around the inner circumference of the sidewall, and first and second outer series of golf club retaining means arranged on respective opposite sides of said central series of golf club retaining means and extending up to a respective rigid edge member, said first and second outer series of golf club retaining means being free to open outwardly when the bag is opened;

wherein, in said closed position of the bag, the spacing between respective opposite golf club retaining means of said first and second outer series decreases progressively at the upper end of the bag member from a greater spacing between opposite golf club retaining means disposed adjacent said central series to a lesser spacing between opposite golf club retaining means disposed immediately adjacent said rigid edge members, whereby said first and second series converge in a direction towards said front of the sidewall;

wherein, in said open position of the bag, the spacing between respective opposite golf club retaining means of said first and second outer series increases progressively at the upper end of the bag member from a lesser spacing between opposite golf club retaining means disposed adjacent said central series to a greater spacing between opposite golf club retaining means disposed immediately adjacent said rigid edge members, whereby said first and second series diverge in a direction towards said front of the sidewall;

the arrangement being such that when the bag member is in said open position and is inclined in a direction away from said sidewall front, heads of all golf clubs located in said golf club retaining means lie in a generally parallel disposition in relation to each other.

5,687,844
CASSETTE FOR COMPASS SAW BLADES

Günter H. Budert, Bachhagel, Germany, assignor to Georg Knoblauch, Giengen, Germany

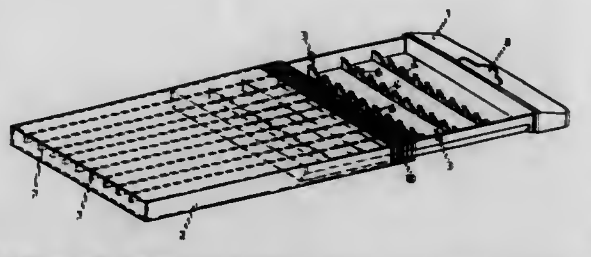
Filed Jan. 12, 1996, Ser. No. 599,993

Claims priority, application Germany, Dec. 1, 1995, 295 19 081 U

Int. Cl.^{6} B65D *85/20*

U.S. Cl. 206—372 **8 Claims**

1. A cassette for compass saw blades, having a base part and a lid part movable in relation to the base part, and having housing devices for the compass saw blades, characterized in that the housing devices for the compass saw blades (5) are constructed as at least two angular support members (3), which are mounted parallel to one another on the base part (1) and transversely to the direction of displacement of the lid part (2) displaceable in relation to the base part (1), with each supporting member (3) containing several supporting faces (6) for the compass saw blades (5) inclined towards the plane of the base part (1) and separated from one another, and said lid part (2) having ribs (7) on its inner side, which are provided at least approximately parallel to the saw blades (5) lying on the supporting faces (6), said ribs being located so as to prevent the compass saw blades from being displaced when said lid part is closed.



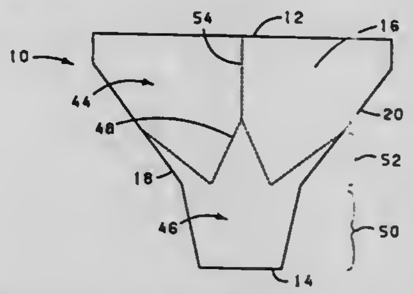
5,687,845
FLORAL SLEEVE WITH UPPER PORTION DETACHABLE VIA ANGULAR PERFORATIONS

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., not individually, but as trustee of The Family Trust U/T/A dated December 8, 1995, Charles A. Codding, Authorized Signatory for Southpac Trust International, Inc. trustee

Continuation of Ser. No. 237,078, May 3, 1994, Pat. No. 5,625,979, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851, said Ser. No. 237,078is a continuation-in-part of Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482, which is a continuation-in-part of Ser. No. 183,010, Jan. 14, 1994, Pat. No. 5,479,758, which is a continuation of Ser. No. 1,001, Jan. 6, 1993, Pat. No. 5,307,606. This application Oct. 4, 1994, Ser. No. 318,062

Int. Cl.^{6} B65D *85/52*

U.S. Cl. 206—423 **24 Claims**



1. A tubular sleeve for containing a pot having a floral grouping, and having a lower end, an upper end, an outer peripheral surface, and an inner peripheral surface surrounding an inner retaining space and the floral grouping having a lower portion and an upper portion, the tubular sleeve, comprising:

a decorative base portion having a closed lower end and an upper end and a retaining space for enclosing the pot, wherein the base is tapered and sized and dimensioned to cover substantially only the outer peripheral surface of the pot,

a skirt portion attached to the base portion and extending beyond the upper end of the base portion, and

a sleeve portion connected to the skirt portion and detachable therefrom via a plurality of angularly oriented perforations and extending a distance therefrom, and sized to substantially surround and encompass the floral grouping, and

wherein when the sleeve portion is detached from the skirt portion, the skirt portion is left with an angular upper edge positioned near the lower portion of the floral grouping and the decorative base portion remains in a position surrounding the pot.

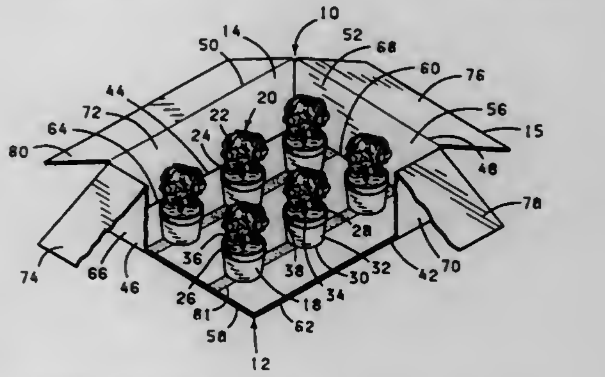
5,687,846
SHIPPING CARTON AND METHOD FOR SHIPPING FLORAL GROUPINGS

Donald E. Weder, Highland, Ill., and Sue Corbett, Edmond, Okla., assignors to Southpac Trust International, Inc.

Continuation of Ser. No. 216,749, Mar. 23, 1994, Pat. No. 5,407,072, which is a continuation-in-part of Ser. No. 93,109, Jul. 16, 1993, Pat. No. 5,311,992, which is a continuation-in-part of Ser. No. 892,441, Jun. 2, 1992, Pat. No. 5,240,109, which is a continuation of Ser. No. 831,767, Feb. 5, 1992, Pat. No. 5,148,918, which is a continuation-in-part of Ser. No. 692,329, Apr. 26, 1991, Pat. No. 5,092,465. This application Jan. 19, 1995, Ser. No. 375,451

Int. Cl.^{6} B65D *85/52*

U.S. Cl. 206—423 **14 Claims**



1. A shipping assembly comprising:

a base having an inner surface and an outer surface and a bonding material disposed on at least a portion of the inner surface of the base; and

a plurality of flower pots, each pot having an upper end and a lower end and having a floral grouping disposed therein, each of the pots being disposed upon the inner surface of the base and positioned whereby the bonding material on the base engages and bondingly connects each of the pots to the base for substantially preventing movement of the pots on the base during movements of the shipping assembly, each of the pots being removable from the base by disconnecting the pots from the bonding material.

5,687,847
CARTON HAVING DIVIDER PANEL FOR TWO-TIER CAN PACKAGE

Will L. Culpepper, Covington, and James R. Oliff, Austell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

PCT No. PCT/US94/04266, § 371 Date Mar. 20, 1996, § 102(e) Date Mar. 20, 1996, PCT Pub. No. WO94/24014, PCT Pub. Date Oct. 27, 1994

Continuation-in-part of Ser. No. 49,787, Nov. 19, 1993, abandoned. This PCT application Apr. 19, 1994, Ser. No. 532,695

Int. Cl.^{6} B65D *75/00*

U.S. Cl. 206—430 **6 Claims**

1. A package comprising:

a plurality of beverage cans arranged into a group of at least two vertically-aligned tiers, each can having a generally cylindrical side wall defining a cylindrical axis, a lower end connected to said side wall along a generally large radius of curvature and defining a lowermost generally circular base of a first diameter, an upper end connected to said side wall and including a generally circular outer flange of a second diameter greater than said first diameter and a top surface recessed inwardly with respect to said flange;

a carton disposed around the exterior of said group of said cans and having side panels disposed substantially adjacent to said side walls of said cans of said group along opposite sides thereof, a top panel disposed substantially adjacent said upper

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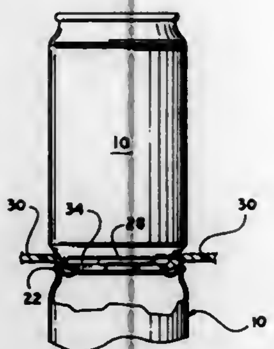


ends of said cans of an uppermost of said tiers and foldably connected to said side panels, and a bottom panel disposed substantially adjacent said lower ends of said cans of a lowermost of said tiers and foldably connected to said side panels; and

a divider panel disposed between and in contact with co-axially aligned ones of said cans of adjacent ones of said tiers, said divider panel defining a plurality of apertures extending through said divider panel, each of said apertures defined by a generally circular edge concentric with said cylindrical axis of upper and lower adjacent ones of said cans and having a diameter smaller than said first diameter, said divider panel further including a first substantially circular embossment concentric with each of said apertures, said first embossment having an outer diameter generally equal to said second diameter and further including a second substantially circular embossment formed into said first embossment to thereby cause said first embossment and said second substantially circular embossment to be depressed toward said lower adjacent one of said cans such that an apertured depressed portion of said divider panel extends below a surface of said divider panel by a predetermined distance.

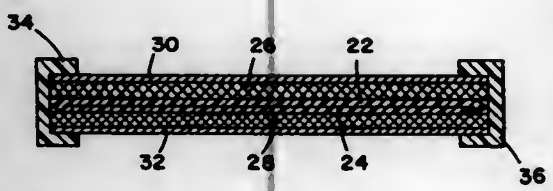
5,687,848
MOISTURE-PROOF RESEALABLE POUCH AND CONTAINER

Matthew T. Scholz, Woodbury, and Jason L. Edgar, Bloomington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 186,004, Jan. 24, 1994, Pat. No. 5,505,305, which is a continuation-in-part of Ser. No. 98,617, Jul. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 964,511, Oct. 21, 1992, abandoned, and a continuation-in-part of Ser. No. 40,624, Mar. 31, 1993, abandoned, Continuation-in-part of Ser. No. 964,511, Oct. 21, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 464,050

Int. Cl.^{6} A61B *17/06*

U.S. Cl. 206—438 **22 Claims**



1. The combination of moisture-curable orthopedic splinting/casting product in a moisture-impervious, hermetically resealable pouch, the combination comprising:

a) a pouch;

b) a moisture-curable orthopedic casting/splinting product in the pouch;

c) an opening in the pouch allowing access to the orthopedic casting/splinting product contained therein, the opening having first and second sides; and

d) magnetic sealing means proximate the opening for hermetically resealing the opening, the magnetic sealing means comprising:

1) a first magnet strip proximate a first side of the package, the first magnet strip having first and second ends;

2) a second magnetic strip proximate a second side of the package, the second magnetic strip having first and second ends and, further, the second magnetic strip being magnetically attracted to the first magnet strip over substantially its entire length to bias the package in a closed position; and

3) non-magnetic means for non-magnetically retaining the first end of the first magnet strip proximate the first end of the second magnetic strip and the second end of the first magnet strip proximate the second end of the second magnetic strip, the non-magnetic means comprising a pair of end caps, each end cap receiving and retaining a pair of ends of the first magnet strip and second magnetic strip in close relationship to each other.

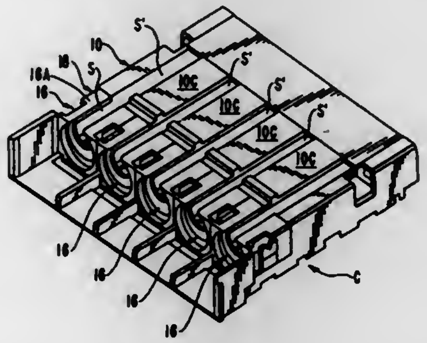
5,687,849
TEST TUBE CASSETTE FOR ACCOMMODATING DIFFERENT TUBE SIZES

David Borenstein, Miami; Kyriakos Christou, Miami Lakes; Nicholas Parker, Sunrise, and John K. Sieh, Miami, all of Fla., assignors to Coulter International Corp., Miami, Fla.

Filed Apr. 23, 1996, Ser. No. 636,429

Int. Cl.^{6} B65D *85/20*

U.S. Cl. 206—446 **10 Claims**



1. A cassette for supporting a plurality of cylindrically-shaped containers of randomly varying diameters in spaced parallel relationship, said cassette comprising:

a frame supporting a plurality of container-centering assemblies in side-by-side relationship, each of said container-centering assemblies being adapted to support a cylindrically-shaped container and to locate the longitudinal axis of such container at a desired location on said frame, each of said assemblies comprising (i) a housing defining a through opening for receiving a container, (ii) a pair of cooperating collar members slidably mounted on said frame for sliding movement toward and away from each other, said collar members having respective arcuate surfaces adapted to contact a side wall of a received container during the sliding movement thereof, and (iii) biasing means for biasing said collar members towards each other and towards engagement with the side wall of said container, whereby the respective arcuate surfaces of said collar members cooperate in supporting a container positioned therebetween.

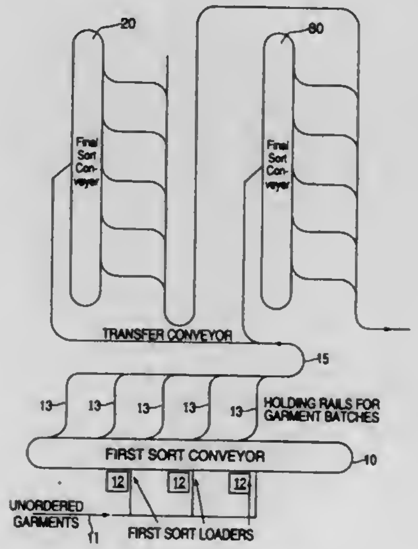
5,687,850
CONVEYOR SYSTEM WITH A COMPUTER CONTROLLED FIRST SORT CONVEYOR

Bernard S. Speckhart, Short Hills; Ramon R. Duterte, Jr., Lodi, both of N.J., and Craig M. Davidson, Cardiff, Calif., assignors to White Conveyors, Inc., Kenilworth, N.J.

Filed Jul. 19, 1995, Ser. No. 504,383

Int. Cl.^{6} B03B *9/00*

U.S. Cl. 209—2 **8 Claims**



1. A sorting conveyor system comprising:

an initial conveyor for receiving unsorted articles;

at least one loader coupled to the initial conveyor;

a first sort conveyor coupled to the at least one loader;

a plurality of holding rails coupled to the first sort conveyor;

a transfer conveyor coupled to the plurality of holding rails; and

at least one final sort conveyor coupled to the transfer conveyor, wherein:

the unsorted articles on the initial conveyor are identified and loaded onto the first sort conveyor by the at least one loader;

the first sort conveyor sorts the unsorted articles into a plurality of groups of articles and routes the groups of articles to the holding rails;

the transfer conveyor transfers the groups of articles from the holding rails to the at least one final sort conveyor; and

identification information for each article transferred to the final sort conveyor is transferred from the at least one loader to the at least one final sort conveyor.

5,687,851
METHOD OF SORTING A PLURALITY OF INDIVIDUALLY CONVEYED ARTICLES INTO GROUPS IN AT LEAST ONE SORTING STEP

Rolf Schönenberger, Landsberg/Lech, Germany, assignor to RSL Logistik GmbH & Co., Germany

Filed Apr. 4, 1996, Ser. No. 627,556

Claims priority, application Germany, Apr. 11, 1995, 195 13 734.5

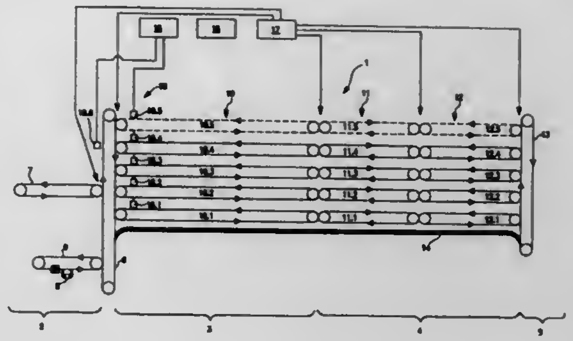
Int. Cl.^{6} B07C *5/00*

U.S. Cl. 209—44.1 **7 Claims**

1. A method of sorting a plurality of individually conveyed articles into groups in at least one sorting step in a suspension-type conveyor means, said method comprising:

introducing said articles into a first conveyor circle by placing said articles in a substantially unsorted manner on said first conveyor circle;

conveying said articles in a row through said first conveyor circle;



identifying each article in said first conveyor circle with respect to a specific group and with respect to its location within said row;

determining the number of identified articles of the same specific group;

providing a signal when a first partial quantity containing a predetermined number of articles of the same specific group has been determined; and

delivering said predetermined number of articles of said first partial quantity selectively from said first conveyor circle to a second conveyor circle independently of the loaded state of said first conveyor circle once the partial quantity of the articles to be sorted in the first sorting step has been identified on said at least one conveyor circle.

5,687,852
TUBULAR FREE-FALL SEPARATOR FOR SEPARATING PLASTIC MIXTURES

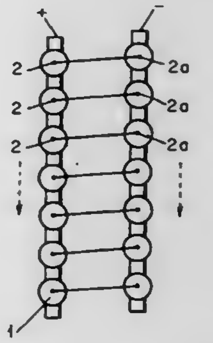
Norbert Raschka, Philippsthal, and Ingo Stahl, Vellmar, both of Germany, assignors to Kali und Salz GmbH, Kassel, Germany

Filed Oct. 27, 1995, Ser. No. 549,102

Claims priority, application Germany, Oct. 29, 1994, 44 38 704.0

Int. Cl.^{6} B03C *7/00*

U.S. Cl. 209—127.4 **3 Claims**



1. Tubular free-fall separator for separating plastic mixtures comprising

two opposite parallel rows of vertical tubes, and each tube having a vertical axis, and each vertical axis having an axis point;

a dc voltage source for maintaining an electrostatic field electrically connected to said tubes;

wherein there are four adjacent axis points of the tubes, and two of said axis points of one row being opposite to two other axis points of another row and are disposed in each case angularly displaced to form corners which form a parallelogram having no right angles.

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5,687,853
SCREEN CONSTRUCTION

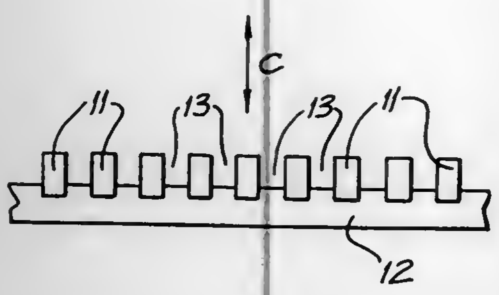
Terry Ronald Askew, Dudley, Australia, assignor to Hunter Wire Products Limited, New South Wales, Australia

Filed Jul. 26, 1995, Ser. No. 525,812

Claims priority, application Australia, Jul. 28, 1994, PM7130

Int. Cl.⁶ B07B *1/49*

U.S. Cl. 209—393 **8 Claims**



1. A screen panel for use in vibrating screening equipment, the panel comprising a plurality of screen surface members running in a first direction and a plurality of underlying supporting members running substantially transversely of and connected to each of the surface members to locate the surface members relative to one another and to provide structural strength, each surface member separated from its adjacent surface members by gaps having a dimension defining the discriminating size of the screen panel, and the surface members protruding above the transverse members to provide a plurality of open slots at the surface of the panel over a substantial part of its length, said screen panel being formed of a resilient plastics material and said surface members being constructed so as to be flexible.

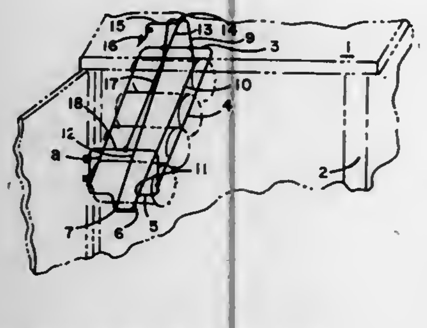
5,687,854
TOILET PAPER STORAGE RACK

Eugene Scott Anderson, 19810 Brookside Way, Perris, Calif. 92570

Filed Dec. 27, 1994, Ser. No. 340,906

Int. Cl.⁶ A47F *7/00*

U.S. Cl. 211—59.2 **1 Claim**



1. A toilet paper storage rack comprised of:

(a) an upper loop;

(b) a lower loop;

(c) at least two rod members connecting the upper loop to the lower loop;

(d) an attachment rod removably attached to the upper loop and permanently attachable to a structure; and

(e) a loop portion which is a part of the lower loop depending downwardly there from and which has a cross-sectional area substantially less than that lower loop.

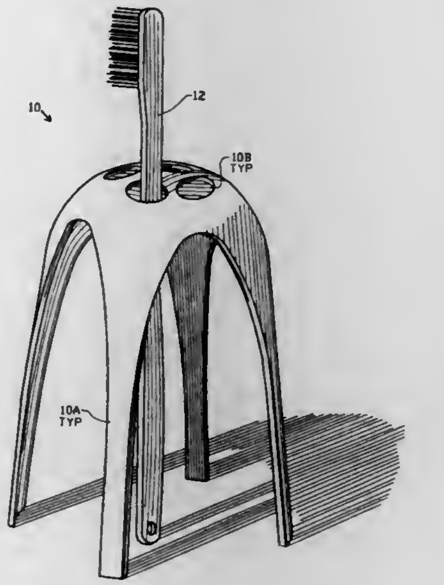
5,687,855
DISPOSABLE TOOTHBRUSH HOLDER

Barry N. Heller, 933 Calle Miramar, Redondo Beach, Calif. 90277

Filed May 10, 1996, Ser. No. 644,128

Int. Cl.⁶ A47B *81/02*

U.S. Cl. 211—65 **9 Claims**



1. A toothbrush holder, intended to be disposable rather than permanent, comprising:

an upwardly-facing top portion constructed and arranged to provide a plurality of upwardly-facing openings shaped and dimensioned to each receive and support a toothbrush having a bristle end and a handle end; and

a plurality of legs, formed integrally with said top portion and extending downwardly therefrom, constructed and arranged to rest on a flat horizontal support surface, and thus support said top portion at a predetermined height above the support surface;

said toothbrush holder being thusly constructed and arranged to support toothbrushes in an upright disposition with the bristle end extending upwardly from said holder and the handle end resting on the support surface; and

said toothbrush holder being configured as a shell, having a substantially uniform wall thickness throughout, shaped internally and externally in a manner that permits a plurality of said holders to be nested compactly for bulk storage and shipping purposes.

5,687,856
TOOL AND IMPLEMENT HANGING SYSTEM

Ken Kendrena, 11124 Donnelly St., Rancho Cucamonga, Calif. 91701

Filed Mar. 26, 1996, Ser. No. 621,891

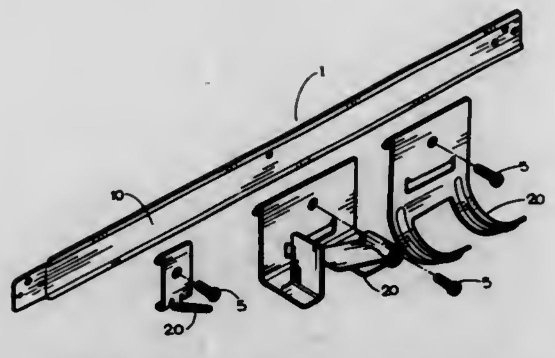
Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—70.6 **23 Claims**

1. A hanging system for supporting tools and implements against a wall surface, comprising:

a plurality of track means attached to said wall surface, each said track means comprising a center body portion having bent top and bottom edges formed as rails and having first and second opposing end edges thereon, said first end edge being shaped to colinearily interlock with the said second end edge of the center body portion of an adjacent track means, and is positioned so as to provide a combined track means of selected length with continuous top and bottom rail edges;

fastening means to attach said track means to said wall surface;



shoe segment means comprising a relatively flat base plate having front and back sides with bottom, top, and end edges, said top and bottom end edges being bent toward the back side in order to form top and bottom clamps having asymmetric angles relative to the back side of said base plate and which are disposed so as to normally snap around and loosely clamp said top and bottom rails on said track means for sliding said shoe segment along said rails; and

a plurality of tool holding means for supporting specialized classes of tools, each said tool holding means having a back plate with said shoe segment mounted on the back side thereon and disposed so that said each tool holding means may be normally snap attached to said rail edges of said track means at any track position and slid to a desired position along said track means.

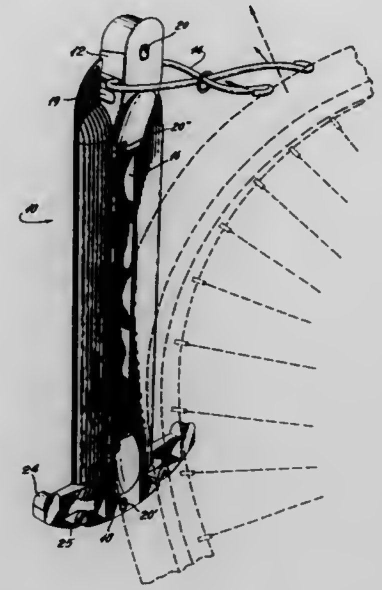
5,687,857
WALL MOUNTED HOLDER FOR ARTICLES

George Friedman, 5840 Shalom Street, Cote St. Luc, Quebec, Canada, HR2 2Z1

Filed Aug. 11, 1995, Ser. No. 514,143

Int. Cl.⁶ A47F *5/08*

U.S. Cl. 211—89 **14 Claims**



1. A wall mounted holder for an article comprising:

a base member comprising an outer member and an inner member, said latter two members each defining one half of a pair of shaft receiving sleeves, whereby when said two members are disassembled shafts can be inserted, and when said two members are assembled shafts can be secured in said sleeves;

a pair of gripping arms comprising suitably shaped gripping ends and base ends mounted in said sleeves, said base ends having a shaft portion and retaining means for preventing removal of said shaft portion from said sleeves, said arms swinging about respective axes oppositely inclined relative to one another and to a horizontal direction, whereby said gripping ends separate when lifted to receive the article, and come together when lowered to grip the article, the article being securely held in said arms as a result of gravity; and

means for fastening at lease wall outer member to a wall support and for securely holding said outer and inner members together.

5,687,858
HIGH-RISE SHELVING

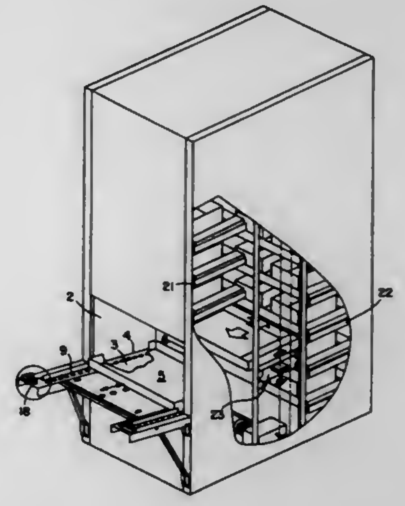
Norbert Bouché, Kuhardt, Germany, assignor to Bellheimer Metallwerk GmbH., Bellheim, Germany

Filed Mar. 27, 1995, Ser. No. 411,339

Claims priority, application Germany, Apr. 19, 1994, 44 16 102.6

Int. Cl.⁶ B65G *1/12*

U.S. Cl. 211—121 **2 Claims**



1. High-rise shelving having two shelving columns exhibiting compartments disposed one above the other, of which at least one shelving column is provided with a feed and removal opening, and between shelving columns there is disposed a vertical conveyor comprising a horizontal conveying mechanism and forming a platform for shelf-racks to be stored in the compartments; said vertical conveyor forming a unit with said shelving columns and serving in connection with the horizontal conveying mechanism to transfer each of said shelf-racks from the region of the feed and removal opening into a compartment selected by the vertical conveyor, or, instead to transfer said shelf-rack from a compartment and into the region of the feed and removal opening; wherein driveable rollers are provided for supporting a shelf-rack in the region of the feed and removal opening; and in front of the feed and removal opening (2), a collapsible table (7) is attached to the shelving; said table (7) being movable from a first folded-up horizontal operating position, in which it forms a supporting surface being in alignment with the supporting surface formed by the drivable rollers of the feed and removal opening, and into a second folded-down vertical non-operational position, in which it opens free access to the feed and removal opening, and wherein the drive of the rollers (4) is interrupted in the folded-down position of the table, but can be switched on in the folded-up position of the table.

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5,687,859

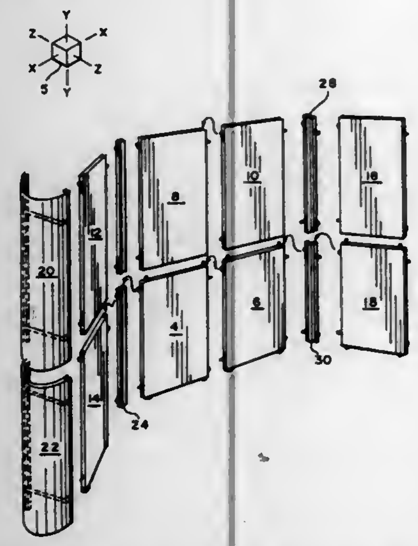
NON-RACKING PANEL DISPLAY DEVICE

Melvin M. Miller, Nashville, Ind., assignor to Channel-KOR Systems, Inc., Bloomington, Ind.

Filed Mar. 6, 1995, Ser. No. 399,236

Int. Cl.^{6} A47B *43/00*

U.S. Cl. 211—189 **18 Claims**



1. A panel display device having a plurality of vertical display panels, with one or more pairs of adjacent vertical panels being attached to each other by a non-racking attachment system which comprises;

- a. at least two guide pins which are integral with the vertical edge of one or more adjacent panels said guide pins guiding said adjacent panels into an abutting relationship with each other;
- b. means for receiving said guide pins which are integral with the vertical edge of the display panel which is opposite said guide pins;
- c. at least two male locking lugs which are located on the vertical edge of one or more display panels approximate the vertical terminal ends thereof;
- d. female apertures which are located on the vertical edge of the display panel opposite said male locking lugs and approximate the vertical terminal ends thereof; and
- e. one of said vertical terminal edges having a resilient biased lock for securing said male locking lugs into said female apertures so that adjacent vertical panels may not move relative to each other without releasing the lock.

5,687,860

LONGITUDINALLY ADJUSTABLE COUPLING ROD

Hans-Hermann Behrens, Salzgitter; Hubert Rathner; Klaus Ksienzyk, both of Wolfenbüttel, and Dieter Schillings, Neuss, all of Germany, assignors to Scharfenbergkupplung GmbH, Salzgitter, Germany

Filed Apr. 4, 1996, Ser. No. 628,583

Claims priority, application Germany, Apr. 8, 1995, 195 13 386.2

Int. Cl.^{6} B61G *5/00*

U.S. Cl. 213—7 **20 Claims**

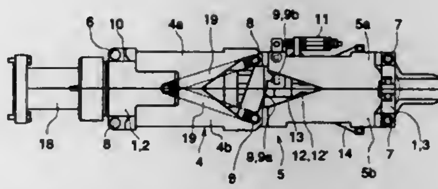
1. A longitudinally adjustable coupling rod for rail-borne vehicles for central buffer couplings of rail-borne vehicles, comprising:

a support body including a front support and a rear support;

a longitudinally adjustable section including only four shear elements, two of said shear elements forming front shears articulated to said front support, said front support extending a distance between said front shears and two of said shear elements forming rear shears articulated to said rear support, wherein said two shear elements of the said rear shears are associated with said two shear elements of said front shears to provide an essentially mirror-symmetrical arrangement; and

a hinge pivotably connecting one of said front shears to one of said rear shears; and

another hinge pivotably connecting another of said front shears to another of said rear shears, said front shears and said rear shears being movable between a retracted position wherein said front support is adjacent to said rear support and an extended position wherein said front support is spaced a distance from said rear support, said another of said front shears and said another of said rear shears extending end to end in a line in said extended position and said one of said front shears and said one of said rear shears extending end to end in a line in said extended position whereby said extended position forms a more highly loadable position.



5,687,861

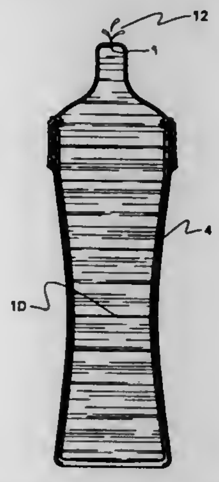
SQUEEZEABLE BABY BOTTLE

Warren Wiedemann, 62 Spring Valley Rd., Paramus, N.J. 07652

Filed Mar. 25, 1996, Ser. No. 616,620

Int. Cl.^{6} A61J *9/00;9/08;* **B65D** *23/02*

U.S. Cl. 215—11.3 **5 Claims**



1. An improved infant nursing device, comprising:

a central container having a central cavity, a transparent circumferential wall surrounding said central cavity and having a bottom edge, and a screw top portion disposed at one end of said central container;

a top cap assembly having a nipple and an opening formed in said nipple, and threads for engaging said screw top portion of said circumferential wall; and

a flexible bag disposed within said central cavity, said flexible bag having a lip for begin secured between said top cap assembly and said circumferential wall when said top cap assembly is threaded to said circumferential wall, said flexible bag thereby being open only to said nipple and to said opening formed in said nipple,

said circumferential wall being radially inwardly compressible and movable between a compressed state and a natural state wherein said circumferential wall has returned to a configuration prevailing in the absence of compressing forces moving said circumferential wall to said compressed state, said circumferential wall having a lip located at said bottom edge, said lip turned inwardly to provide partial support for said bag.

5,687,862

HOLLOW GLASS OBJECTS

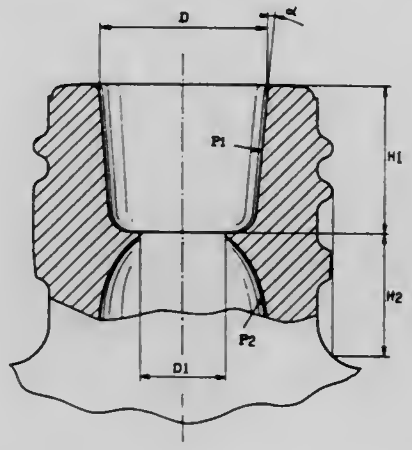
Rene M. Barbier, St Blimont, France, and Michel M. Resse, Eu, France, assignors to Saint-Gobain Emballage, Courbevoie, France

Division of Ser. No. 67,072, May 26, 1993, Pat. No. 5,407,457. This application Jan. 31, 1995, Ser. No. 380,978

Claims priority, application France, May 26, 1992, 92 06396

Int. Cl.^{6} B65D *1/02*

U.S. Cl. 215—40 **12 Claims**



1. A hollow glass object having a neck with exactly two internal profiles and formed by the steps of:

mechanically shaping the internal profile of the neck by puncturing the neck using a movable die and a movable punch to produce a first mechanically shaped internal profile terminating in a cylindrical constriction with a substantially vertical sidewall;

initially blow molding the object in a mold by using a compressed gas to produce a second pneumatically shaped, curved internal profile reaching the constriction, while maintaining the mechanically shaped form of the first internal profile of the neck;

transferring the initially blow molded object to a finishing mold; and

performing a finishing blow molding operation in the finishing mold.

5,687,863

SQUEEZE AND TURN CHILD RESISTANT PACKAGE

Maximillian Kusz, Waterville, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jan. 30, 1996, Ser. No. 594,095

Int. Cl.^{6} B65D *50/08*

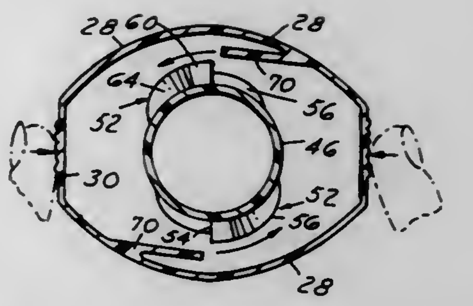
U.S. Cl. 215—216 **15 Claims**

1. A squeeze and turn child resistant package comprising a plastic container having a finish with external threads means,

a plastic closure having a base wall and an outer peripheral flexible wall depending from said base wall,

said peripheral wall of said closure having an internal thread means thereon complementary to said thread means on said finish,

said closure having opposed finger engaging portions on the outer surface of said peripheral flexible wall,



said peripheral flexible wall of said closure having an internal surface with spaced flexible chordal lugs,

each said chordal lug being attached along an axial area of said internal surface of said peripheral flexible wall,

each said chordal lug being spaced circumferentially from each finger engaging portion,

each said chordal lug having a free edge extending circumferentially in the direction of removal of the closure,

each said axial area of each chordal lug being spaced intermediate a finger engaging portion and the free edge of said respective chordal lug,

said container finish having diametrically opposed radially extending abutments spaced below said thread means,

each said abutment having a radially and axially engaging abutting surface,

said abutting surfaces being positioned circumferentially with respect to said finger engaging portions when said closure is fully applied on said finish,

said finish of said container including an integral radial projection adjacent said radial abutting surface of said abutment,

each said radial projection having a lesser radial extent than the associated abutment,

each said radial projection including a chordal surface intersecting said abutting surface at a right angle,

each said radial projection having a circumferential outwardly arcuate surface extending to the chordal surface,

such that when the closure is rotated to apply the closure to the container, the chordal lugs flex past the abutments, and when fully applied, the free end of each said chordal lug is positioned adjacent the intersection of said abutting surface and said chordal surface of said radial projection preventing the closure from being unscrewed, such that when the closure is to be removed, the wall is squeezed at finger engaging portions causing the chordal lugs to be moved outwardly beyond the abutment surfaces so that the closure can be unthreaded, and such if an attempt is made to remove the closure without flexing the wall, the free edges of said chordal lugs will engage the intersection of the axial abutting surfaces on the finish and the chordal surfaces on the radial projections on the finish causing the wall to flex outwardly and causing the chordal lugs to change their angular relationship further forcing the ends of the chordal lugs into the intersection.

5,687,864

Patent Not Issued For This Number

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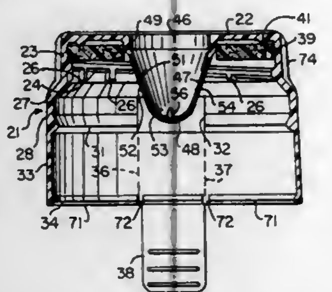
5,687,865
SPILL-REDUCTION CAP FOR FLUID CONTAINER

Brian M. Adams, Newark; Hoa Pham, Mountain View, and Daniel Luch, Morgan Hill, all of Calif., assignors to Portola Packaging, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 436,936, May 8, 1995, and a continuation-in-part of Ser. No. 16,579, Feb. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 772,949, Oct. 8, 1991, Pat. No. 5,232,125. This application May 15, 1995, Ser. No. 441,322

Int. Cl.^{6} B65D *41/34*

U.S. Cl. 215—253 **25 Claims**



1. A cap for use with a container neck having external means for detachably engaging said cap, said cap being shaped to fit over said neck and comprising

a top and a shirt depending from said top to fit outside said neck, internal means on said skirt to engage said external means to hold said cap on said neck, said top being formed with a central well having a side wall and a bottom, a scoreline extending along said side wall and across said bottom, whereby a probe forced into said well splits said well along said scoreline so that said probe may enter said neck.

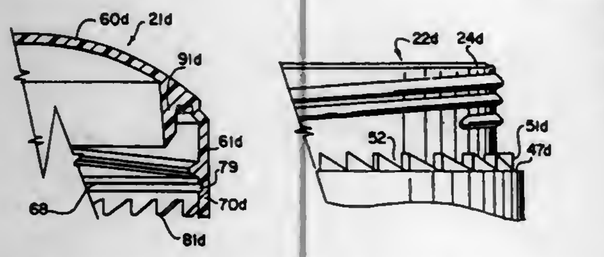
5,687,866
SNAP-ON, SCREW-OFF CAP AND CONTAINER NECK

Daniel Luch, Morgan Hill, and Richard E. Repp, San Jose, both of Calif., assignors to Cap Snap Co., San Jose, Calif.

Continuation of Ser. No. 456,744, Jun. 1, 1995, abandoned, which is a division of Ser. No. 29,177, Mar. 10, 1993, Pat. No. 5,456,376, which is a continuation-in-part of Ser. No. 830,133, Jan. 31, 1992, Pat. No. 5,267,661, which is a continuation-in-part of Ser. No. 772,945, Oct. 8, 1991, Pat. No. 5,213,224, which is a continuation-in-part of Ser. No. 565,638, Aug. 9, 1990, Pat. No. 5,190,178. This application Jun. 28, 1996, Ser. No. 672,688

Int. Cl.^{6} B65D *51/18*

U.S. Cl. 215—256 **25 Claims**



1. In combination, a container having a neck and a container closure,

said neck having an upper opening, a downward extending neck stretch below said opening, said neck stretch having an exterior, a plurality of first helical engagement means formed around said exterior of said neck stretch, and first tamper-evidencing means on said neck,

said closure having a top, a downward extending upper skin portion depending from said top adapted to fit over said neck stretch, said upper skirt portion having an interior, a plurality of second helical engagement means formed around said interior of said upper skirt portion shaped to mate with said at least one first helical engagement means, and second tamper-evidencing means,

said first and second helical engagement means being interengaged to secure said closure in sealing engagement with said neck, said first and second helical engagement means being of sufficient length around said exterior of said neck stretch and said interior of said upper skin portion, respectively, to provide at least 400° of thread engagement,

said first and second helical engagement means being shaped and said closure being resilient so that upon application of force to accomplish direct, axial movement of said closure relative to said container without externally imposed relative rotation of said closure and said neck, said first and second helical engagement means slip past each other and then interengage and said closure seats on and sealingly engages said neck so that said closure cannot be removed from said neck without unscrewing said closure,

said second tamper-evidencing means being frangible, said first tamper-evidencing means having a plurality of first teeth, said second tamper-evidencing means having a plurality of second teeth, at least one of said first teeth and said second teeth having a guiding surface shaped for guiding said teeth into side by side interengagement upon contact with the other of said at least one of said first teeth and said second teeth during said direct axial movement.

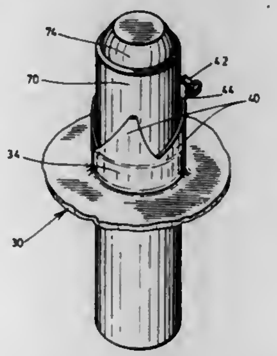
5,687,867
ONE-PIECE CAP FOR LIQUID DISPENSER CONTAINER

Richard Lamoureux, Laval, Canada, assignor to Crealise Packaging Inc., Rawdon, Canada

Filed Jul. 22, 1996, Ser. No. 684,794

Int. Cl.^{6} B65D *51/00*

U.S. Cl. 215—303 **8 Claims**



1. In a one-piece cap for closing a liquid container of the type intended to be installed for supply purpose in upside down position onto a liquid dispenser, said container having a neck on which said cap is sealingly mounted and through which a liquid supply tube passes when the container is installed onto the dispenser, said cap comprising:

a lid having a surface area substantially identical to the one of the neck; and

a skirt integrally projecting from said lid;

said skirt having an internal face on which gripping means are provided for sealing the liquid container neck;

said lid being provided with a central recess including a tubular guiding portion projecting from the lid in the same direction as the skirt, said guiding portion being sized and positioned to receive said supply tube, said central recess also including a bottom portion,

the improvement wherein said bottom portion is in the form of a cone that projects from the guiding portion, said cone being provided with a number of frangible lines extending within meridian planes in such a manner so as to allow splitting of said cone into a corresponding number of petal-shaped segments when the container is installed onto the dispenser and its cap and neck are penetrated by said supply tube.

5,687,868
CONTAINER

Michael Kannegaard, Tinglev, Denmark, assignor to Maersk Container Industri AS, Tinglev, Denmark

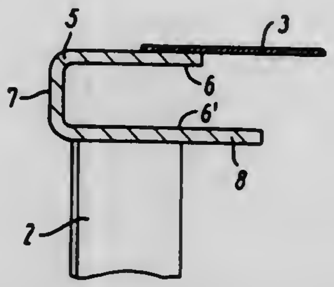
PCT No. PCT/DK94/00330, § 371 Date Apr. 23, 1996, § 102(e) Date Apr. 23, 1996, PCT Pub. No. WO95/06609, PCT Pub. Date Mar. 9, 1995

PCT Filed Sep. 2, 1994, Ser. No. 596,205

Claims priority, application Denmark, Sep. 3, 1993, 0997/93

Int. Cl.^{6} B65D *7/26*

U.S. Cl. 220—1.5 **8 Claims**



1. A container comprising profiled wall and roof panels secured at longitudinal edge joints by profiled longitudinal girders, said container having an interior and further comprising attachment means extending inwardly into the interior of the container for mounting of suspension devices within the interior of the container, each of said longitudinal girders comprising a profiled member having upper and lower flanges connected by a base, said flanges and said base forming an open channel facing inwardly into said interior of the container, said lower flange being integrally formed with a longitudinally inwardly extending flap serving as said attachment means, said wall and roof panels being secured to the longitudinal girders by welding.

5,687,869

Patent Not Issued For This Number

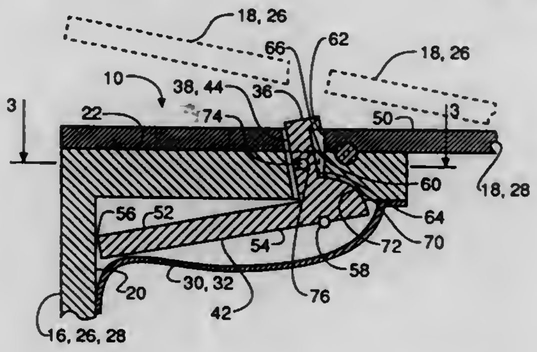
5,687,870
PRESSURE LOCK ASSEMBLY AND PRESSURE VESSEL

Dana Andrew Carlile, Webster; David Edward Foeller, Batavia, and Kenneth Dean Corby, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1996, Ser. No. 610,531

Int. Cl.^{6} B65D *45/00*

U.S. Cl. 220—316 **20 Claims**



1. A pressure lock assembly for use between first and second independently pressurized areas, said pressure lock assembly being actuated when said first area has a substantially higher pressure than said second area, said pressure lock assembly being deactuated when said areas have substantially uniform pressures, said pressure lock assembly comprising:

first and second body members, said first body member having an inner surface bounding said first area and an outer surface bounding said second area, said first body member having a through-opening, having an inner end, extending between said surfaces, said body members being displaceable between an open position wherein said body members are at least partially disengaged and a closed position wherein said body members are closely engaged;

a flexure member disposed adjacent said inner end of said through-opening, said flexure member being disposed in a relaxed configuration wherein said flexure member is unsealed from first body member, when said areas have said substantially uniform pressures, said flexure member being disposed in a pressurized configuration wherein said flexure member is sealed against said first body member, when said first area has said substantially higher pressure than said second area;

a latch disposed on said first body member, said latch having a stem, a catch, and a foot, said stem extending through said through-opening, said catch and said foot being disposed at opposite ends of said stem, said latch being movable by said flexure member, relative to said first body member, from a uniform pressure position wherein said first body member is displaceable from said second body member and said said flexure member is in communication with said through-opening, to a differential pressure position wherein said catch retains said first body member against said second body member in pressure-tight relation and said foot seals said through-opening from said flexure member.

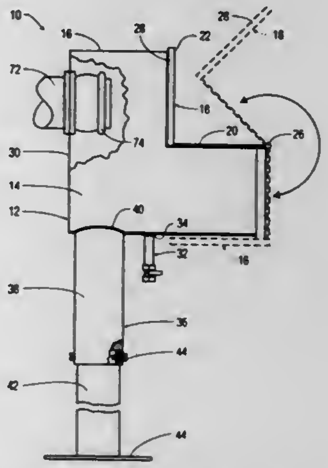
5,687,871
SPILL CONTAINER FOR ABOVE GROUND STORAGE TANKS

Martin C. Pettesch, Crawford, N.J., assignor to Universal Valve Co., Inc., Elizabeth, N.J.

Filed Apr. 16, 1996, Ser. No. 632,901

Int. Cl.^{6} B65D *51/00*

U.S. Cl. 220—565 **20 Claims**



1. A remote above ground coupling and spill containment apparatus comprising:

a housing defining an enclosed chamber,

said housing having a bottom wall portion, said bottom wall portion having a lowest zone, said bottom wall portion being shaped to cause liquid spills within said housing to flow toward said lowest zone, and

a valve assembly communicating with said lowest zone for selectively removing spill liquid accumulated in said lowest zone,

said housing further including a top wall portion and side wall portions integrally formed with said bottom wall portion to

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define a substantially cylindrically shaped housing having a longitudinal axis horizontally arranged, said top wall portion and side wall portions having forward portions for defining an access opening to said enclosed chamber, and

wherein said housing further includes a forward wall connected to said bottom wall portion and side wall portions for closing the forward end of said chamber, and

a rear wall connected to said bottom wall portion, top wall portion and side wall portions for closing the rear end of said chamber, said rear wall comprising a sealable opening at an upper region for mounting a horizontal tank delivery pipe coupling.

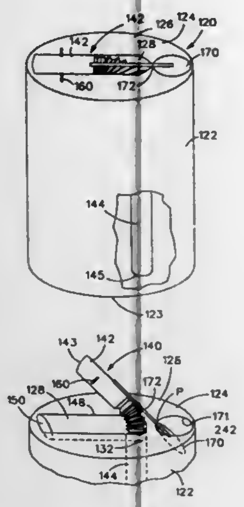
5,687,872
LIQUID CONTAINER INCLUDING AT LEAST ONE INTEGRAL STRAW

Abdulatif M. T. Nmngani, P.O. Box 13925, Jeddah, Saudi Arabia, 21414

Division of Ser. No. 243,706, May 17, 1994, Pat. No. 5,522,524. This application Jun. 3, 1996, Ser. No. 657,201

Int. Cl.^{6} B65D *5/72*

U.S. Cl. 220—710 **8 Claims**



1. A liquid container, comprising:

a) a hollow container having walls defining a top, a bottom, and a side, said walls forming an interior space for containing a liquid;

b) a first aperture formed in one of said walls;

c) a first conduit positioned within said first aperture and having an upper portion extending outside said container and a lower portion terminating proximate said bottom, said first conduit having a first L-shaped configuration;

d) a second aperture formed in said one wall;

e) sealing means for sealing said second aperture;

f) a key operatively connected to said upper portion for causing said first conduit to be shifted from said L-shaped configuration to a second open configuration and for simultaneously breaking said sealing means and opening said second aperture.

g) said top includes a recess, said first aperture being formed in said recess; and

h) said upper portion of said first conduit is disposed within said recess when in said L-shaped configuration, said key being at least partially disposed outside said recess.

5,687,873
BRUSH REST

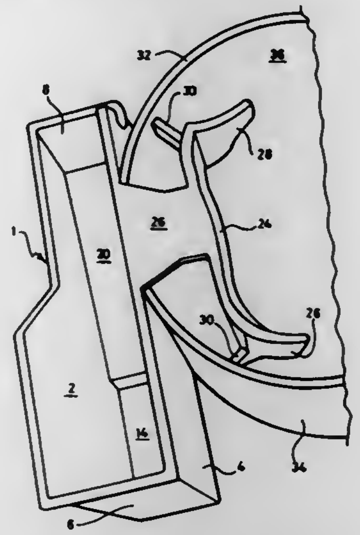
Kevin William Jones, 3 Bluegate Barn, Bluegate Lane, Old London Road, Capel St Mary, Ipswich IP9 2JX, United Kingdom

Filed Jun. 3, 1996, Ser. No. 656,918

Claims priority, application United Kingdom, Jun. 16, 1995, 9512256

Int. Cl.^{6} B65D *25/20*

U.S. Cl. 220—736 **2 Claims**



1. A brush rest for a paint brush, said brush rest comprising a container which is provided with means for securing the container to a paint pot, said container having a floor and said floor having walls defining a well in which a thinner or other liquid may be stored, said container having at least one opening so that when the container is secured to a paint pot it has an open top and a side opening through which a brush may be rested in the container, whereby a paint brush may be rested on the floor of the container without entering the well;

wherein the means for securing the container to a paint pot comprises a resilient member held in a spaced apart relationship with the said container, the said resilient member having a first end and a second end which are adapted to be deployed away from the said container in response to applied force to create an insertion gap into which a wall of a paint pot may be inserted along a generally vertical line of insertion, the said resilient member being disposed transversely to the line of insertion and adapted to grip a wall of a paint pot between the resilient member and the container when the applied force is released; and

wherein a finger grip is provided at each end of the resilient member.

5,687,874
DEVICE FOR HOLDING ARTICLE

Toshiyuki Omori; Kinji Oda; Tamaki Kikuchi, and Takeshi Inose, all of Tokyo, Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Feb. 12, 1996, Ser. No. 600,176

Claims priority, application Japan, Feb. 14, 1995, 7-25559; Oct. 3, 1995, 7-256549

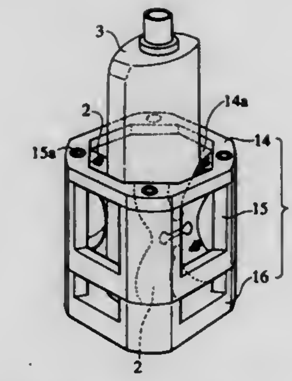
Int. Cl.^{6} B65D *81/02*

U.S. Cl. 220—737 **3 Claims**

1. A device for holding an article comprising:

an external frame member defining a chamber and having an opening at one end thereof; and

a resilient holding member mounted within the chamber and capable of holding an article which has been introduced into the chamber, said resilient holding member having a generally



X-shaped configuration with a slit formed in the central area thereof such that the resilient holding member itself can be readily, resiliently deformed, and

said resilient holding member being mounted on the external frame member of the chamber such that the article is held by the resilient holding member in a desired position at a central portion of the chamber.

5,687,875
DISPENSER FOR WIPES

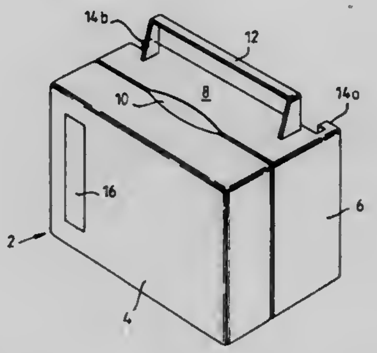
Hugo Paul Watts, Mold, and Evelyn Margaret Murphy, Beaconsifeld, both of Great Britain, assignors to Kimberly-Clark Worldwide, Inc., Neenan, Wis.

PCT No. PCT/GB93/02089, § 371 Date Jan. 3, 1996, § 102(e) Date Jan. 3, 1996, PCT Pub. No. WO94/08500, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 8, 1993, Ser. No. 416,886

Int. Cl.^{6} A47K *10/24*

U.S. Cl. 221—45 **12 Claims**



1. A dispenser for paper wipes and the like comprising:

a first container which is adapted to hold a stack of wipes, the first container having an aperture in one face providing an opening through which wipes may be dispensed and a handle located above the apertured face, the handle being disposed so that access to the aperture is not obstructed by the handle, and

a second container for receiving used or soiled wipes, the second container having an aperture in one face providing an opening through which wipes may be passed and a handle located above the apertured face of the second container wherein the handles are located such that the handles on the two containers are adjacent when the containers are releasably joined together,

wherein a portion of each of the first and of the second containers being movable between a closed position and a released position in which the first container may be filled or emptied or in which the second container may be emptied, and wherein complementary connection means are provided on the first and second containers to enable the two containers to be releasably joined together.

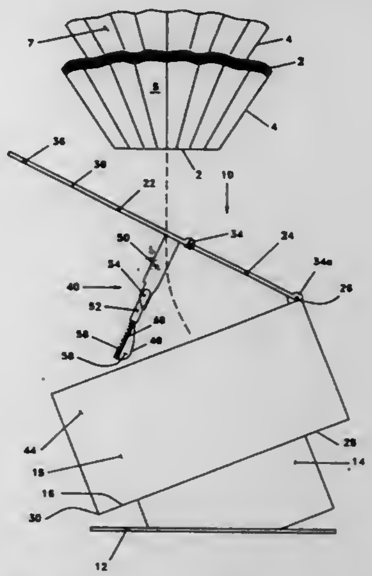
5,687,876
METHOD AND IMPROVED APPARATUS FOR SEPARATING AND DISPENSING COFFEE FILTERS

Orian R. Lucas, Jr., 1102 Sylvan, Apt. 8, Emporia, Kans. 66801

Continuation-in-part of Ser. No. 61,077, May 14, 1993, abandoned. This application Aug. 8, 1994, Ser. No. 287,130

Int. Cl.^{6} B65H *3/02*

U.S. Cl. 221—259 **10 Claims**



1. A coffee filter container for containing at least one coffee filter and for singularly dispensing at least one coffee filter comprising:

a generally cylindrical sidewall member having a sidewall top;

a filter support member secured to said generally cylindrical sidewall member for supporting at least one coffee filter;

a top assembly removably secured to said generally cylindrical sidewall member, said top assembly comprising a structure defining a top planar member, a pair of arms secured to said top planar member in a generally planar relationship, a pair of stop members having a stop member size and secured to said arms, and a lid member pivotally secured to said top planar member and substantially extending across said top planar member and having a structure defining a pair of cut-outs with cut-out openings slightly larger than the stop member size of said stop members;

a means, secured to said lid member, for engaging a filter member; said means for engaging filters comprises a pair of bifurcated stanchion members secured to said lid member, a tube member secured to respective ends of said pair of bifurcated stanchion members and having a pair of tube recesses; and

a gripping assembly pivotally secured to said tube member and defining a gripping body having a structure defining a pair of gripping arms having secured thereto a pair of opposed protruding ear members with ear ends which rotatively reside in said tube recesses, a generally T-shaped flexible arm assembly secured to the gripping body, and a blade secured to the gripping body and having a structure defining teeth having at least one blunted tooth and at least one pointed tooth.

5,687,877
PUMP DISPENSER HAVING MOVEABLE OUTLET CHECK VALVE ELEMENT

Richard J. Smolen, Jr., Woodstock, Ill., assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Nov. 3, 1995, Ser. No. 552,768

Int. Cl.^{6} B67B *7/00*

U.S. Cl. 222—1 **12 Claims**

1. In a hand-operated liquid dispenser comprising

a. a container,

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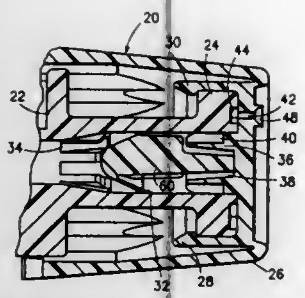


b. a dispenser body secured on the container
c. passage means in the body including
  1) a dip tube extending into the container,
  2) pump means adapted in operation to create negative and positive pressures in the passage means and connected to the dip tube,
  3) an inlet check valve between the pump means and the dip tube,
  4) a discharge orifice,
  5) an outlet check valve between the pump means and the orifice,

the improvement wherein the outlet check valve comprises an enlarged cylindrical portion of the passage means, the enlarged portion bounded by an annular shoulder at the commencement of the enlarged portion and stop means adjacent the orifice, and a unitary frusto-conical valve having a peripheral skirt resiliently directed downstream and engaging the walls of the enlarged cylindrical portion, and a central stem also extending downstream, the length of the enlarged cylindrical portion of the passage means being greater than the length of the frusto-conical valve, whereby the outlet check valve moves toward the stop means under positive pressure from the pump means and is drawn back toward the shoulder under negative pressure from the pump to effect a suck back of liquid between the outlet check valve and orifice.

12. The method of controlling the movement of liquid through an outlet check valve chamber having a cylindrical wall between a discharge orifice and a manually operated liquid pump wherein a valve element in the chamber has a downstream directed frusto-conical skirt engaging the wall and a central downstream stem, the chamber having a greater length than the valve element, the method including the steps of:
  a. pumping the liquid downstream and thereby forcing the valve element to the downstream end of the chamber and
  b. then pumping the liquid upstream and thereby drawing the valve element to the upstream end of the chamber to aspirate liquid downstream from the valve element in an upstream direction to avoid undesired dribbling from the orifice.

5,687,878
FLEXIBLE TUBE WITH PUMP DISPENSER AND METHOD OF MAKING

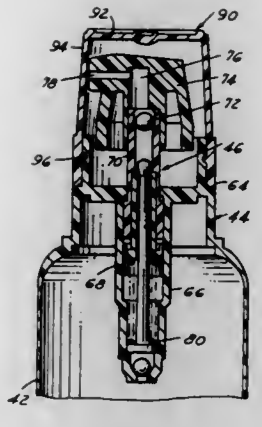
Roger P. Smith, Exeter, N.H.; Kent A. Gearhart, and Earnest E. Bliss, III, both of Perrysburg, Ohio, assignors to Owens-Brockway Plastic Products Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 228,048, Apr. 15, 1994, Pat. No. 5,632,951. This application Jun. 22, 1995, Ser. No. 493,837

Int. Cl.^{6} B65D *35/54*

U.S. Cl. 222—96 **17 Claims**

1. A flexible tube and pump dispenser for lotions and the like comprising
  a flexible plastic tube having a first end and a second end,
  said tube including an integral rigid finish at one end,
  said integral finish having a radial flange and a radially inwardly extending wall,
  said flange having an opening therethrough,
  a pump dispenser having a plunger and an axial body extending through said opening in said sealing flange of said finish,
  said axial body of said pump dispenser having a flange engaging said flange of said finish,



  said flange of said pump mechanism being provided with an integral projection on said flange of the pump mechanism that is fused during the fusion welding to the surface of said radially inwardly extending wall on said finish,
  means for holding said flange on said body in position engaging said wall on said finish by fusion welding said flange on said body of the pump dispenser to said radially extending wall.

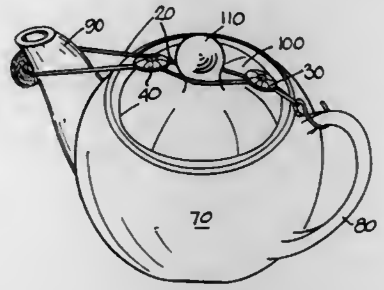
5,687,879
DEVICE TO SECURE LID TO BEVERAGE AND FOOD CONTAINERS AND REDUCE SPILLAGE

William R. King, Lakewood; Barbara A. Karakusis, Englewood, and Liesbeth M. Osa, Littleton, all of Colo., assignors to Fit-To-A-Tea, LLC, Littleton, Colo.

Filed Nov. 13, 1995, Ser. No. 555,679

Int. Cl.^{6} B67D *1/16;* **B65D** *45/02;* **E05C** *19/18*

U.S. Cl. 222—108 **8 Claims**



1. A device to secure a lid to a pot having a handle on one side and a spout on the opposite side and to prevent dripping therefrom, the device comprising:
  an elastic cord formed into a loop, a hook attached to a first end of the loop, and a sponge attached to a second end of the loop opposite the first end; the loop being dimensioned so that it can be stretched over the lid when the hook is hooked to the handle and the sponge is placed over the spout;
  a first retainer having a ring and a button attached to the ring, the loop running through the ring of the first retainer; a second retainer having a ring and a button attached to the ring, the loop running through the ring of the second retainer, both retainers being positioned on the loop between the portion of the loop atttached to the handle and the portion of the loop attached to the spout; and
  a button cover, the button cover being removably attached to the first retainer button.

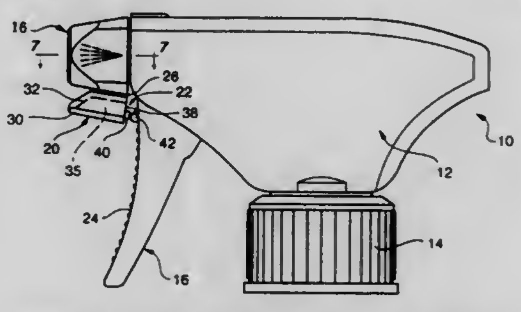
5,687,880
CHILD LOCK NOZZLE CAP ASSEMBLY

Wilhelmus Johannes Joseph Maas, Someren, and Emile Bernard Steijns, Lierop, both of Netherlands, assignors to AFA Products, Inc., Forest City, N.C.

Filed Apr. 24, 1996, Ser. No. 637,200

Int. Cl.^{6} B67D *5/33;5/42*

U.S. Cl. 222—153.14 **11 Claims**



1. A child lock nozzle cap assembly which is mounted at the forward end of a body of a trigger sprayer and which includes: a nozzle cap; first locking structure associated with said nozzle cap; and, second locking structure associated with a trigger of the trigger sprayer and cooperating with said first locking structure to lock said nozzle cap against rotation until and unless either said first locking structure is moved out of engagement with said second locking structure or the trigger is moved to move said second locking structure out of engagement with said first locking structure, said first locking structure including structure depending from said nozzle cap which is movable upwardly toward said nozzle cap to move a detent carried by said structure forwardly away from said trigger, and said second locking structure including a detent receiving recess on the front of said trigger for receiving said detent.

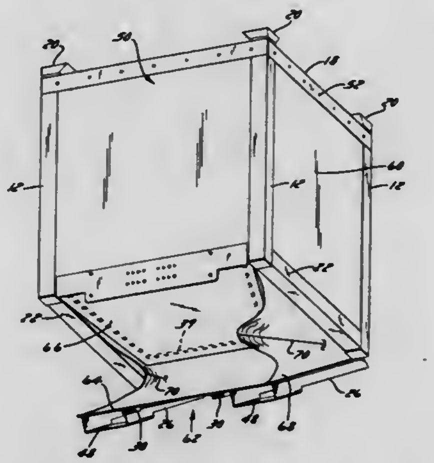
5,687,881
APPARATUS FOR CONVEYING A SOLID PARTICULAR MATERIAL

Michael W. Rouse, Vicksburg, Miss., and Lowell C. Sundermann, Muscatine, Iowa, assignors to Bandag, Incorporated, Muscatine, Iowa

Filed Oct. 18, 1995, Ser. No. 544,697

Int. Cl.^{6} B67D *3/00*

U.S. Cl. 222—185.1 **20 Claims**



1. An improved apparatus for conveying a particulate material; the apparatus including a generally flexible receptacle substantially fixedly situated within a space delimited by a frame; said receptacle having a top, a bottom, and at least one wall connecting said top with said bottom and defining an interior; said receptacle being coupled with said frame at a plurality of coupling loci; said frame having a longitudinal axis substantially perpendicular with said top and with said bottom of said receptacle when said receptacle is substantially fixedly located within said frame; said receptacle having a fill structure at said top for providing filling access to said interior; the improvement comprising:
  a dump structure at said bottom for providing dumping access to said interior; said dump structure comprising
    a dump aperture;
    a first flap; said first flap having a first articulate connection along a first flap width with said at least one wall and with said frame adjacent said dump aperture; said first flap extending a first flap length from said first articulate connection and being swingingly positionable about said first articulate connection from a closed position substantially blocking said dump aperture to an open position, a first plane substantially containing said first flap forming an acute angle with said axis when said first flap is in said open position;
    a second flap; said second flap having a second articulate connection along a second flap width with said at least one wall and with said frame adjacent said dump aperture; said second flap extending a second flap length from said second articulate connection and being swingingly positionable about said second articulate connection from a closed position substantially blocking said dump aperture to an open position, a second plane substantially containing said second flap forming an acute angle with said axis when said second flap is in said open position;
    at least one side flap; each respective side flap of said at least one side flap being articulately connected with said at least one wall substantially adjacent said dump aperture intermediate said first flap and said second flap; each said respective side flap having a third articulate connection along a third flap width with said at least one wall and a fourth articulate connection with said first flap substantially along said first flap length; and
    a first bias means coupled with said second flap; said first bias means urging said second flap toward said closed position.

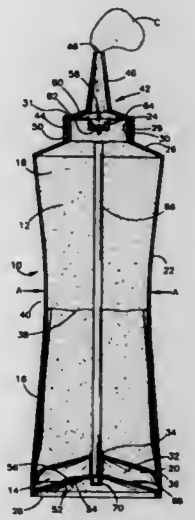
5,687,882
FLEXIBLE DISPENSER WITH BLADDER

John J. Mueller, Chagrin Falls, Ohio, assignor to Containaire Incorporated, Chagrin Falls, Ohio

Filed May 31, 1995, Ser. No. 455,658

Int. Cl.^{6} B65D *37/00*

U.S. Cl. 222—212 **31 Claims**



1. A dispenser for a fluid material, comprising
  a flexible container,
  a piston comprised of a material that enables the piston to be flexed, said piston being movable within the container,
  an expansible bladder connected to said piston,

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first flow restricting means for allowing flow of a displacement fluid only from outside the container into the interior of said bladder, and

second flow restricting means for allowing flow of material only from within an interior portion of the container external to said bladder to outside the container.

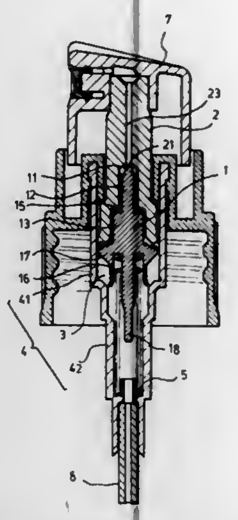
5,687,883
INDUCTOR VALVE OF AN ATOMIZER

Cheng-Yuan Su, P.O. Box 438, Hsinchu City, Taiwan

Filed Nov. 16, 1995, Ser. No. 559,064

Int. Cl.⁶ B65D *88/54*

U.S. Cl. 222—321.2 **1 Claim**



1. An inductor valve for installation in an accumulation chamber of an atomizer for controlling the passage of water therethrough, the inductor valve comprising a hollow cylindrical valve body at a first end, a guide rod suspended downwardly from the inside of said hollow cylindrical valve body at the center thereof, a valve rod at a second opposite end, a collar disposed between said hollow cylindrical valve body and said valve rod, an extension rod extending longitudinally from said valve rod and terminating in a cylindrical tip for stopping the water passage of the atomizer, said valve rod and said extension rod defining a step having a plurality of radial water grooves extending radially from a root of said extension rod, said radial water grooves including a plurality of close-end grooves and a plurality of open-end grooves radially and alternatively extending from the root of said extension rod, and said close-end grooves and said open-end grooves being disposed in communication with one another around the root of said extension rod.

5,687,884
METERING DEVICE FOR DISPENSING CONSTANT UNIT DOSES

Jacques Bodin, Levallois-Perret, and Jean-Philippe Taberlet, Boege, both of France, assignors to Labcatal (societe anonyme), Montrouge, France

PCT No. PCT/FR95/00325, § 371 Date Nov. 21, 1995, § 102(e) Date Nov. 21, 1995, PCT Pub. No. WO95/25945, PCT Pub. Date Sep. 28, 1995

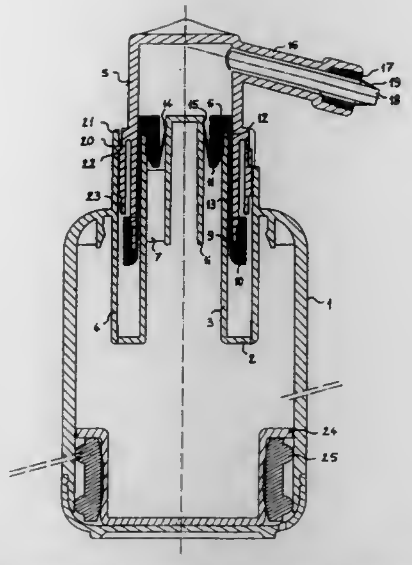
PCT Filed Mar. 17, 1995, Ser. No. 537,945

Claims priority, application France, Mar. 21, 1994, 94/03278

Int. Cl.⁶ G01F *11/06*

U.S. Cl. 222—321.7 **8 Claims**

1. A metering device for dispensing constant unit doses of a fluid contained in a receptacle having an outlet orifice defined around an internal cylinder, the metering device comprising:



a hollow plunger mounted on a receptacle so as to delimit a defined volume communicating with the outlet orifice of the receptacle, the hollow plunger being movably mounted so as to vary the size of the volume;

an elastic member having an elastically deformable cylindrical collar and having an annular valve capable of closing off the annular outlet orifice of the receptacle, the elastic member connects the hollow plunger to the receptacle, the annular valve of the elastic member is fitted around the internal cylinder, the internal cylinder having the same axis as the elastically deformable cylindrical collar; and

the hollow plunger has an outlet orifice and a valve, the volume delimited by the internal wall of the moveable hollow plunger and the elastically deformable cylindrical collar is capable of communicating with the outside through the hollow plunger outlet orifice which is capable of being closed off by the hollow plunger valve.

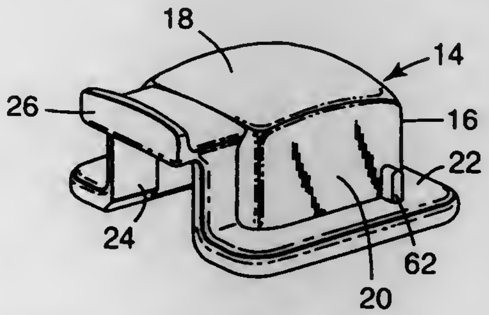
5,687,885
DISPENSING CONTAINER AND SLIDING CAP ASSEMBLY

Frederick J. Turk, St. Paul; Malcolm W. Wilcox, Woodbury, and Thomas W. Martin, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Oct. 24, 1995, Ser. No. 547,595

Int. Cl.⁶ B65D *47/00*

U.S. Cl. 222—512 **15 Claims**



1. A dispensing container assembly comprising:

a dispensing container having a protruding outlet with an outlet opening and an outer surface surrounding said outlet opening; and

a cap for covering said outlet, said container and said cap each including releasable coupling structure for coupling said cap to said container as said cap is moved in a certain direction across said outlet opening toward a closed position, said cap including a body, said cap including a gasket in compression against said outer surface when said cap is in said closed position, said body including a cam portion engagable with said outer surface for retaining said body a first distance from said outer surface in a direction laterally of said certain direction as said cap is moved in said certain direction across said outlet opening, wherein said cam portion includes a ramp portion that enables said body to move closer to said outer surface than said first distance when said cap is in said closed position in order to increase the compression of said gasket against said outer surface, wherein said releasable coupling structure of said cap includes a pair of flange portions that extend outwardly in directions away from each other, and wherein said releasable coupling structure of said container includes a pair of ears for engagement with said flange portions.

5,687,886
HAND-HELD LIQUID DISPENSING APPARATUS

Terence William Bolton, Bothwell, Glasgow, G71 8DR, Scotland

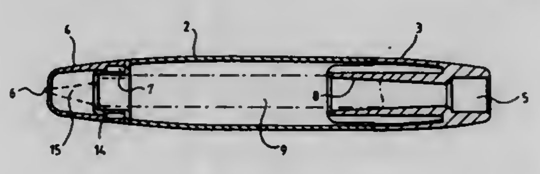
PCT No. PCT/GB94/00959, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/26421, PCT Pub. Date Nov. 24, 1994

PCT Filed May 5, 1994, Ser. No. 557,060

Claims priority, application United Kingdom, May 13, 1993, 9309827

Int. Cl.⁶ B05B *7/00*

U.S. Cl. 222—630 **9 Claims**



1. Apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a hollow tubular housing having an inner wall:

a reservoir pen formed with a nib of absorbent material retained within and spaced from the inner wall of the housing;

a nozzle including an outlet orifice at one end of the tubular housing

a mouthpiece at the other end of the housing through which air can be blown through the tubular housing and over the pen to the outlet orifice of the nozzle;

and means for locating the pen within the housing with its absorbent nib at least partially within the boundary of the outlet orifice of the nozzle.

5,687,887
SIDE SIZER SYSTEM

Steve Bond, St. James, and Gregory Anthony Montalbano, Greatneck, both of N.Y., assignors to Red Wing Products, Inc., Plainview, N.Y.

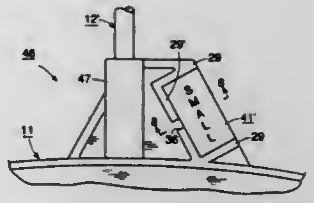
Filed Nov. 9, 1995, Ser. No. 556,219

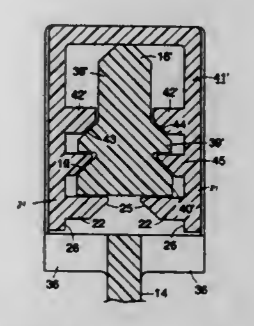
Int. Cl.⁶ A47G *25/14*

U.S. Cl. 223—85 **25 Claims**

1. In combination,

a hanger having a body for suspending a garment therefrom, a hook for suspending said body from a support, and a marker mounting means located at a juncture between said hanger body and said hook, said mounting means including a rib extending angularly between said hook and said body with a gap disposed under a bottom of said rib, said rib having at least one longitudinal groove in each of two opposite sides thereof; and





a size marker mounted in self-locking relation on said rib, said marker including a pair of parallel spaced apart walls receiving said rib therebetween and at least a pair of inwardly directed flanges on each said wall, a lower one of said flanges on each said parallel wall being disposed perpendicularly of said respective wall and slidably disposed under said rib in said gap, and an upper one of said flanges on each said parallel wall being disposed in a respective one of said grooves in said rib.

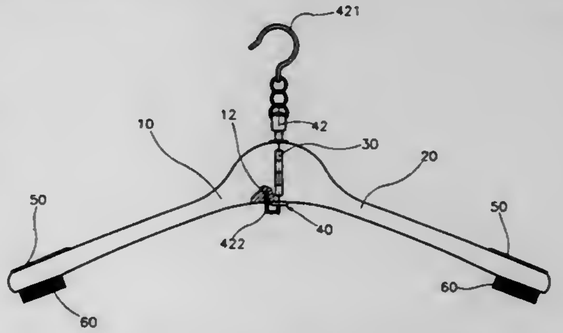
5,687,888
MULTIFUNCTIONAL FOLDABLE HANGER

Ching-Chao Chang, No. 202-1, Tachou RD., Shen Kang Village, Taichung County, Taiwan

Filed Aug. 29, 1996, Ser. No. 705,483

Int. Cl.⁶ A47G *25/40;25/14*

U.S. Cl. 223—94 **5 Claims**



1. A multifunctional foldable hanger, comprising:

two wings, each of said wings having an upper and a lower side and being of elongated shape, with one end having a front surface, the front surfaces of said two wings being connected by a hinge-joint, such that said two wings are foldable to be parallel next to each other and said two wings are unfoldable to form a hanger for clothes, each of said wings on the front surface being provided with a vertical groove, the first of said two wings being provided with a fixing hole on the lower side close to the front surface; and

a fixing device, further comprising
  - a guiding support with an axis, said guiding support being accommodated by said vertical grooves and being attached to the second of said two wings, having a glide hole bored through along the axis,
  - a rod, having an upper and a lower end, said rod being inserted into said glide hole and gliding therein,
  - an upper hook, attached to the upper end of said rod, and

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a lower hook on the lower end of said rod, said lower hook being inserted into said fixing hole, when said two wings are unfolded.

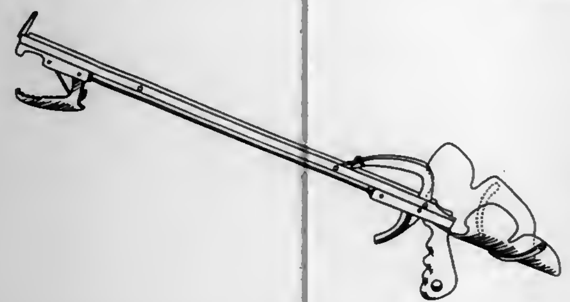
5,687,889

MULTI-PURPOSE REACHER AND DRESSING AID

Douglas T. Liden, 1350 California St. Apt. 306, San Francisco, Calif. 94109

Filed May 18, 1995, Ser. No. 445,471
Int. Cl.^{6} A47G *23/80*

U.S. Cl. 223—111 **17 Claims**



1. A device to assist a user in dressing, comprising in combination:
- a reacher including a movable jaw for clamping an item to be held between the jaw and a jaw mating portion at a jaw end of a generally rigid rod, said jaw of said reacher being manipulated toward and away from said jaw mating portion by operation of a trigger generally disposed at a handle end of said rod; and
- an exposed sock aid also disposed at said handle end of said rod, said sock aid including
  - a flexible sheet material having:
    - (i) a toe portion at one end thereof with two opposite edge formations adapted to flex towards each other upon application of a sock distended thereon, so as to present a cavity between the toe portion and sock for insertion of a foot, and flex away from each other to allow insertion of a foot in said cavity; and
    - (ii) a heel portion at the other end of such sheet material integrally connected to said toe portion, said heel portion being generally fixedly connected to said handle end of said reacher and adapted to be pulled by said rod so as to draw said toe portion with said sock over the foot thereby unraveling said sock from said flexible sheet.

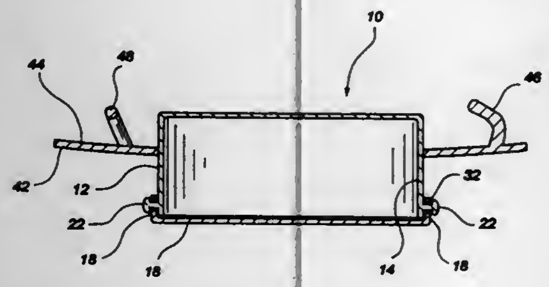
5,687,890

BELT BUCKLE WITH A COMPARTMENT

Randy Lee Wanner, Box 106, Paradise, Utah 84328

Filed Jul. 27, 1995, Ser. No. 508,217
Int. Cl.^{6} A44B *11/00*

U.S. Cl. 224—163 **15 Claims**



1. A belt buckle, comprising:
- a receptacle having an open end;
- a lid configured to releasably engage the open end, such that when the lid engages the open end a chamber within the receptacle is substantially fully enclosed;
- a flange secured about the receptacle; and
- biasing means attached within the receptacle for urging an object contained within the receptacle toward the open end of the receptacle, wherein a plurality of pins are attached to the receptacle adjacent the open end of the receptacle and a corresponding plurality of L-shaped locking grooves are disposed within the lid such that when the lid is positioned for locking engagement with the receptacle, each pin is slidable within one of the respective grooves from a first end of the groove to a locked end of the groove to secure the lid to the receptacle.

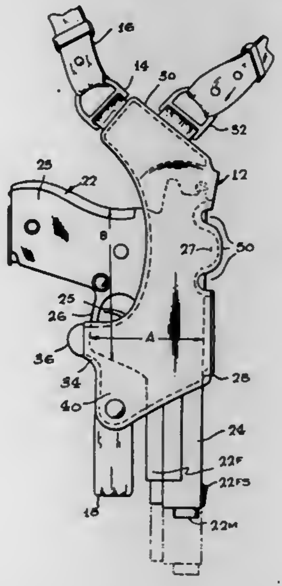
5,687,891

UNIVERSAL SEMI AUTOMATIC HANDGUN HOLSTER

Robert J. Beletsky, Temecula, Calif., assignor to Bianchi International, Temecula, Calif.

Filed Aug. 29, 1995, Ser. No. 521,142
Int. Cl.^{6} F41C *33/02*

U.S. Cl. 224—243 **28 Claims**



1. A holster for handguns having a barrel, a frame having a hammer end, a grip, a trigger and a trigger guard said holster comprising a body of material defining a pocket for holding a handgun including projections for securing said hammer end;
- (a) said body also defining a first opening for the insertion of a handgun with the grip extending out of the pocket;
- (b) said body defining a second opening for the extension of the barrel of the handgun out of said pocket;
- (c) said holster including a first handgun restraining portion extending around the barrel and trigger guard portion of the handgun including fastener means for selectively restraining the handgun in the holster;
- (d) said holster including a second handgun restraining portion extending from the front of said trigger guard to said projections;

whereby the grip and barrel of the handgun may extend respectively out of said first and second openings of said body and the handgun is held by said first and second handgun restraining portions.

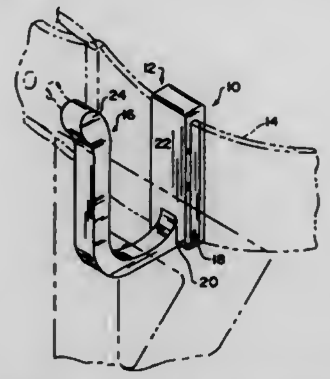
5,687,892

BELT MOUNTED TOOL HANGER

Gary A. Johns, 504 Geneva St., W. Dundee, Ill. 60118

Filed Oct. 19, 1995, Ser. No. 545,324
Int. Cl.^{6} A45F *5/00*

U.S. Cl. 224—268 **6 Claims**



1. A method for mounting tools to a belt engaged about a torso of a workman, the method incorporating use of a belt mounted tool hanger comprising an integral two section unit, one section of which comprises a base member which is narrow and high and has a slot extending therethrough and another section of which comprises a hook which extends from and rises from a surface of the base member which is coplanar with a plane of said slot, the hook extending across the entire height of the base member and terminating in a rounded tip which extends outwardly of the hook, away from the base member, the method comprising the steps of:
- slidingly engaging the tool hanger onto the belt along the length thereof, the belt being received within the slot in the tool hanger base member;
- fixing the belt about the torso of the workman; positioning the tool hanger along a length of the belt at a point which is easily accessible; and
- hanging a tool from the tool hanger by engaging the tool over the hook of the tool hanger.

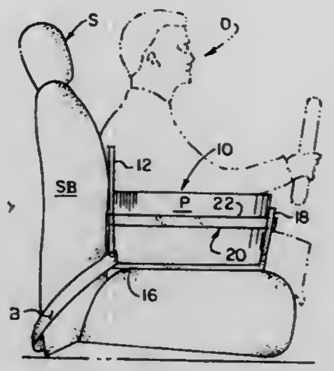
5,687,893

PACKAGE RESTRAINT FOR USE IN AUTOMOTIVE VEHICLES

Donald W. Jacobsmeyer, Jr., 1117 Timberlane Dr., St. Louis, Mo. 63122

Filed Mar. 11, 1996, Ser. No. 613,342
Int. Cl.^{6} B60R *7/00*

U.S. Cl. 224—275 **17 Claims**



1. A package restraint for use in automotive vehicles for securing a package in place and protecting the package and contents of the package while the vehicle is in transit, comprising:
- a rear piece which fits against an upright portion of a passenger seat, said rear piece being secured to said passenger seat by a seat belt otherwise used by an occupant of the vehicle;
- a bottom section connected to said rear piece and providing a seat for said package;
- a front piece connected to an end of said bottom section opposite the end thereof to which said rear piece is connected, said front piece providing support for said package;
- a first belt means extending from said rear piece and about said package to secure said package in place, said front and rear pieces having respective slot openings formed in opposite sides thereof for said first belt means to fit across the back of said rear piece, through the openings in said rear piece, through the openings in the front piece and across the front of said front piece to secure said package to said restraint, and said package, when secured to said rear piece by said belt means being restrained from any movement in response to movements of the vehicle such as turns and abrupt stoppages of the vehicle;
- a top piece fitting over the package; and,
- a second belt means for use in securing the top piece over the package, said rear and front pieces each having respective openings at an upper end thereof for said second belt means to extend therethrough.

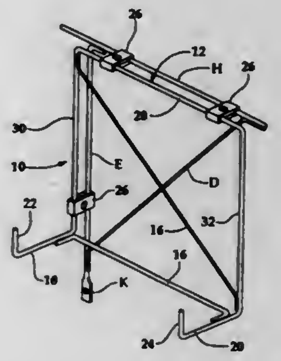
5,687,894

BICYCLE RACK

Cynthia A. Cavallaro, 3857 Camino Real, Sarasota, Fla. 34239

Filed Jul. 7, 1995, Ser. No. 499,732
Int. Cl.^{6} B62J *11/00*

U.S. Cl. 224—457 **1 Claim**



1. For a bicycle having a bicycle frame, a rear portion of which provides a mount for a rear wheel, the bicycle being of the type which includes a rear carrying platform disposed generally horizontally above the rear wheel, a bicycle rack for carrying a folded beach chair comprising:
- an upright rack frame generally lying in a plane and formed of elongated spaced apart slender upper and lower struts and elongated spaced apart slender front and rear side struts, said rack frame positioned against a side of the rear portion of the bicycle frame;
- each said side strut extending laterally at each lower end thereof to define a generally lateral leg depending from said side strut member and then extending upwardly to define an upright leg depending from said lateral leg, said upright leg being substantially shorter than, and spaced from a corresponding said side strut;
- said rack frame also including an elongated diagonal stiffening strut connected to, and extending between an upper end of one said side strut to a lower end of another said side strut;
- said lateral and upright legs spaced apart and cooperating to define a means for supporting and preventing lower lateral movement of the folded beach chair in an upright orientation against said upper strut member;
- clamping means for directly connecting said upper strut, in spaced substantially aligned relation, to a side edge of the rear carrying platform and for directly connecting said front side strut, in spaced generally aligned relation, to a generally upright support of the rear carrying platform.

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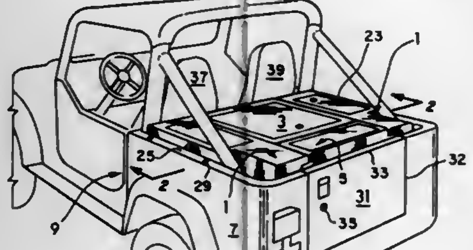
5,687,895
INTERLOCKING ARRANGEMENT OF STORAGE BOXES FOR A SPORT UTILITY VEHICLE

Gregory P. Allison, Keego Harbor, Mich., and Dallas L. Vernon, Louisville, Colo., assignors to Bestop, Inc., Broomfield, Colo.

Filed Oct. 20, 1995, Ser. No. 546,500
Int. Cl.^{6} B60R *9/055;11/00*
U.S. Cl. 224—542 **44 Claims**



1. An interlocking arrangement for storage boxes, said interlocking arrangement including a passenger vehicle having a rear tailgate mounted for movement between open and closed positions and further having a rear section with first and second side walls spaced from each other with a floor extending substantially therebetween to define a central storage area forward of said tailgate when said tailgate is in said closed position, said storage area being upwardly open from said floor to expose said floor from above and to provide a passenger of said vehicle with access from above to said storage area and to said exposed floor,

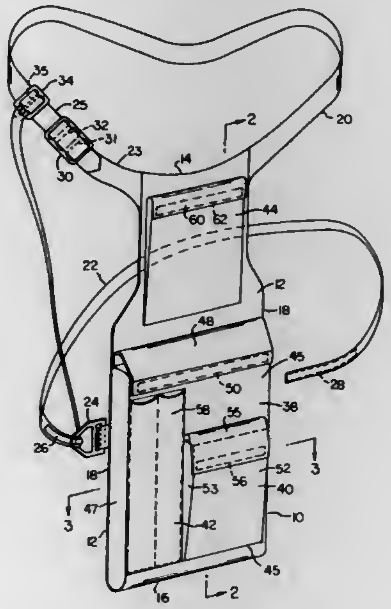
said interlocking arrangement for said storage boxes further including at least first, second, and third distinct storage boxes, means for securing said first storage box to the first side wall of said vehicle and means for securing said second storage box to the second side wall of the vehicle in a position spaced from the first storage box across said floor, said third storage box being manually movable between a remote position removed from the vehicle and in interior position in said upwardly open storage area above the floor inside the rear section of the vehicle between said first and second storage boxes, said third storage box having a top exposed from above and accessible from above to said passenger of said vehicle when said third storage box is in said interior position, said interlocking arrangement further including locking means for selectively locking said third storage box in said interior position in said storage area above the floor between said first and second storage boxes,

said locking means including means for slidably receiving said third storage box in said interior position between said first and second storage boxes, said slidably receiving means including means on said third storage box for respectively engaging said first and second storage boxes to prevent movement of said third storage box from said interior position upwardly between said first and second storage boxes while still providing said passenger with access to the exposed top of said third storage box, said locking means further including means for preventing said third storage box from being moved forwardly beyond said engagement with said first and second storage boxes and means for selectively preventing said third storage box from being moved rearwardly beyond said engagement with said first and second storage boxes, said means for selectively preventing said third storage box from being moved rearwardly beyond said engagement with said first and second storage boxes including said tailgate wherein said third storage box is prevented by said tailgate in said closed position from being moved rearwardly beyond said engagement with said first and second storage boxes and wherein said third storage box can be moved beyond said engagement with said first and second storage boxes to said remote position removed from said vehicle when said tailgate is in said open position.

5,687,896
PERSONAL ARTICLE STORAGE APPARATUS

Kelli A. Clift, P.O. Box 147, Culver City, Calif. 90232

Filed Feb. 26, 1996, Ser. No. 606,607
Int. Cl.^{6} A45F *5/00*
U.S. Cl. 224—587 **1 Claim**

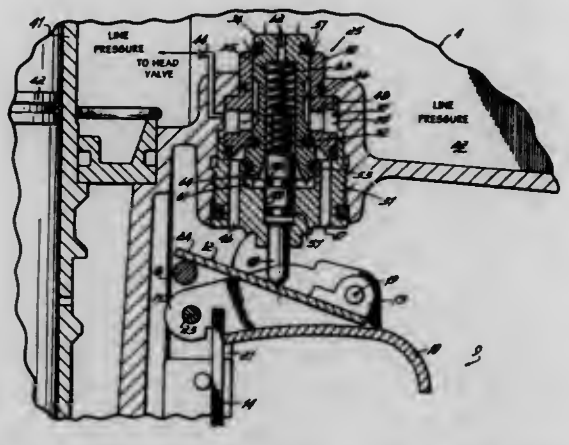


1. An article storage apparatus comprising:
a flexible panel having a front face and a rear face, said rear face being adapted for positionment against a person's upper torso;
a plurality of article-containment pocket structures carried on said panel; each pocket structure having an access opening accesible to the person wearing the article storage apparatus;
a first strap means (**20**) having opposite ends thereof attached to said panel to form a flexible loop adapted to extend around a person's neck; and
a second strap means (**22**) connected to said panel, and adapted to extend in a generally horizontal plane around the upper torso of a person, whereby the panel is retained in position against the person's torso;
said first strap means having a first length adjustment means (**30**);
said second strap means having a second length adjustment means; said second length, adjustment means comprising a buckle structure (**34**) attached to said second strap means for slidable adjusting movement along said first strap means, and an achorage element (**24**) carried by said panel; said second strap means extending from said buckle structure downwardly through said anchorage element for extension around the person's torso; said buckle structure being slidably adjustable on said first strap means to vary the spacing between said buckle structure and said anchorage element, so as to vary the relationship of said second strap means to the anchorage element.

5,687,897
DUAL MODE PNEUMATIC TOOL

Chen Chiu Fa, Ta Li, and Yang Chun Hsien, Chia Yi, both of Taiwan, assignors to Campbell Hausfeld/Scott Fetzer Company, Westlake, Ohio

Filed Jul. 28, 1995, Ser. No. 509,023
Int. Cl.^{6} B25C *1/04*
U.S. Cl. 227—8 **16 Claims**

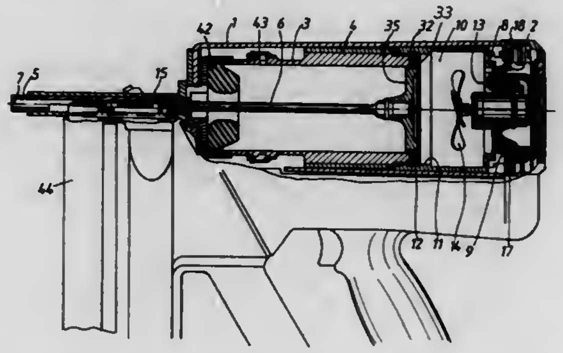


3. A pneumatic tool having a trigger valve and a trigger apparatus for actuating the trigger valve, said trigger apparatus comprising:
a depressible first trigger lever pivotally mounted to the tool;
a secondary trigger lever for engaging an actuator of said trigger valve; and pivotally mounted at a first end to the first trigger lever; and
a pin disposed in said tool in one position for pivotally supporting a second end of said secondary trigger lever in one operational mode of said tool;
said pin being removable from said one position, out of interference with said secondary trigger lever, to permit operation of said tool in another operational mode.

5,687,898
FIXING APPARATUS WITH A COMPRESSED GAS-POWERED PISTON

Bruno Toulouse, Valence, France, assignor to Societe de Prospection et d'Inventions Techniques (SPIT), Bourg Les Valence, France

Filed Jan. 23, 1996, Ser. No. 590,312
Claims priority, application France, Feb. 15, 1995, 95 01712
Int. Cl.^{6} B25C *1/04*
U.S. Cl. 227—8 **24 Claims**

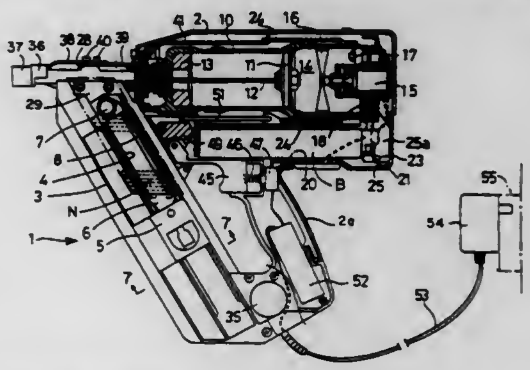


1. Apparatus for securing an element within a substrate, comprising:
a bousing having a longitudinal axis;
a sleeve member disposed within said housing;
a combustion chamber defined within said sleeve member;
a cylinder disposed within said sleeve member;
a guide member, for gliding an element as said element is being driven by said apparatus into a substrate, fixedly attached at one end thereof to said cylinder and having a second end thereof for engaging a substrate; and
a piston axially movable within said cylinder for movement between a first ready position at which said piston is disposed so as to subsequently drive an element, disposed within said guide member, into a substrate, and a second fired position at which said piston drives an element, disposed within said guide member, through said guide member and into a substrate;
said cylinder being axially movable within said sleeve member, as a result of said guide member engaging said substrate, between a first position at which said cylinder cooperates with said sleeve member so as to sealingly close one end of said combustion chamber, and a second position at which said cylinder continues to cooperate with said sleeve member so as to maintain said one end of said combustion chamber sealed closed and reduces the volume of said combustion chamber prior to ignition of a combustible charge within said combustion chamber so as to increase the combustion power developed within said combustion chamber and imparted to said piston, and an element driven thereby, when a combustible charge is ignited within said combustion chamber.

5,687,899
PORTABLE FASTENER DRIVER USING INFLAMMABLE GAS

Yuji Dohi, Osaka, Japan, and Ernest John Wendling, Vernon Hills, Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Apr. 19, 1996, Ser. No. 635,018
Claims priority, application Japan, Apr. 19, 1995, 7-093929
Int. Cl.^{6} B25C *1/08;5/13*
U.S. Cl. 227—10 **20 Claims**



1. A portable fastener driver tool, comprising
a housing having handle means provided thereon;
a combustion chamber provided within said housing
a fuel container disposed within said housing for supplying fuel into said combustion chamber of said housing;
an ignition plug for igniting said fuel conducted into said combustion chamber of said housing;
a driving rod movably disposed within said housing such that said driving rod is driven forward along a drive axis and out of said housing as a result of the combustion of said fuel conducted into and ignited within said combustion chamber of said housing;
fastener magazine means provided in front of said driving rod, when said driving rod is disposed in a fully retracted state, for serially supplying fasteners one by one to said drive axis such that said fasteners can be serially driven as a result of the successive forward movements of said driving rod;
electrical switch means mounted upon said handle means of said housing for movement between ON and OFF states; and
an electric cord having one end thereof operatively connected to a power source which is external of said tool for receiving

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electrical power from said external power source, and an opposite end thereof operatively connected to said housing for supplying said electrical power to said ignition plug through said electrical switch means when said electrical switch means is disposed in said ON state.

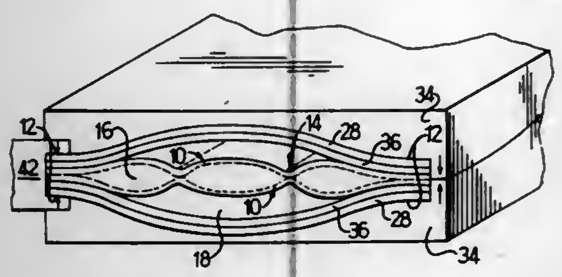
5,687,900
STRUCTURAL PANEL HAVING A PREDETERMINED SHAPE AND AN ASSOCIATED METHOD FOR SUPERPLASTICALLY FORMING AND DIFFUSION BONDING THE STRUCTURAL PANEL

Mark A. Zaccone, and Jeffery D. Russom, both of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 28, 1995, Ser. No. 411,477

Int. Cl.^{6} B23K *20/00;101/02*

U.S. Cl. 228—173.6 **27 Claims**



1. A method of fabricating a structural panel having a predetermined shape, the method comprising the steps of:
- joining first and second metallic core sheets along respective edge portions of said first and second core sheets to thereby form an inflatable envelope assembly;
- superplastically forming the inflatable envelope assembly and a pair of metallic face sheets;
- forming at least one reinforced titanium composite sheet into a shape corresponding to the predetermined shape;
- assembling the pair of face sheets, the at least one reinforced titanium composite sheet and the inflatable envelope assembly following said forming steps such that said at least one reinforced titanium composite sheet and said inflatable envelope assembly are disposed between the pair of face sheets;
- creating a pressure differential between interior and exterior portions of the inflatable envelope assembly; and
- heating the assembled face sheets, the at least one reinforced titanium composite sheet and the inflatable envelope assembly such that the first and second core sheets which form the inflatable envelope assembly superplastically form and diffusion bond to the at least one reinforced titanium composite sheet to thereby integrally form said structural panel having the predetermined shape.

5,687,901
PROCESS AND APPARATUS FOR FORMING BALL BUMPS

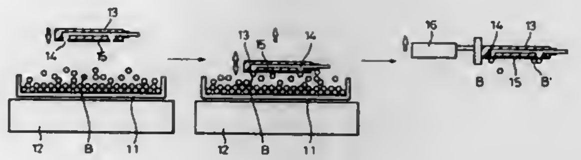
Hiroshi Hoshiba; Kohei Tatsumi, both of Kawasaki; Masashi Konda, and Yoji Kawakami, both of Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 14, 1995, Ser. No. 557,943

Int. Cl.^{6} H01L *21/60*

U.S. Cl. 228—246 **30 Claims**

1. A process of forming ball bumps for electrical connection to an integrated circuit, the process comprising the steps of:
- applying a vibration at a small amplitude to a vessel containing small balls of an electroconductive material to cause the small balls to jump up above the vessel;
- holding and arranging the small balls on an arrangement baseplate by attracting the jumping up small balls to attraction openings provided in the arrangement baseplate in positions corresponding to positions of at least one set of the electrode pads of one semiconductor chip;
- removing excess small balls adhered either to the arrangement baseplate or to the small balls attracted to the openings; and
- simultaneously bonding the small balls held and arranged on the arrangement baseplate to bonding spots arranged in positions corresponding to said positions of said at least one set of the electrode pads.



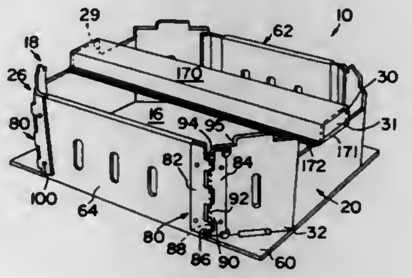
5,687,902
ARTICULABLE, OPEN-TOPPED, STACKABLE, SIDE-OPENING CONTAINER APPARATUS

Michael A. Tusing, Canton, Mich., and Robert B. Leftwich, Bolingbrook, Ill., assignors to Stone Container Corporation, Chicago, Ill.

Continuation of Ser. No. 225,233, Apr. 8, 1994, abandoned. This application Jan. 3, 1996, Ser. No. 581,004

Int. Cl.^{6} B65D *5/20*

U.S. Cl. 229—198.1 **29 Claims**



25. An articulable container apparatus comprising:
- a plurality of side wall members having upper edges, at least one of said side wall members having a first left side edge, a first left side wall portion adjacent said first left side edge, a first right edge, and a first right side wall portion adjacent said first right side edge, said first left and right side edges being separable from other side wall members, at least one other of said side wall members having a second right side edge and second right side wall portion adjacent said second right side edge, and at least another of said side wall members having a second left side edge and a second left side wall portion adjacent said second left side edge, said first left side edge being adjacent said second right side edge and said first right side edge being adjacent said second left side edge;
- a bottom wall member unitary with said side wall members, said side wall members being bent generally orthogonal to said bottom wall member and at least one of said side wall members being collapsible into the plane of said bottom wall member; and
- a pair of engagement members joining said at least one of said side wall members to said at least one other of said side wall members and said at least another of said side wall members, and a removable member being slideably received by the articulable container apparatus,
- the removable member further comprising a locking member, operably insertable into said engagement members so as to maintain said engagement members in said juxtaposed cooperating relation, to, in turn, maintain said at least one of said side wall members in said joined configuration with said at least another of said side wall members, said engagement members further including engagement portions, operably disposed on said engagement members so as to be positionable in a substantially interdigitated configuration, when said at least one of said side wall members is positioned adjacent to said at least another of said side wall members, for enabling said removable member to be inserted, in alternating succession through respective ones of said interdigitated engagement portions of adjacent engagement members of said adjacent side wall members.

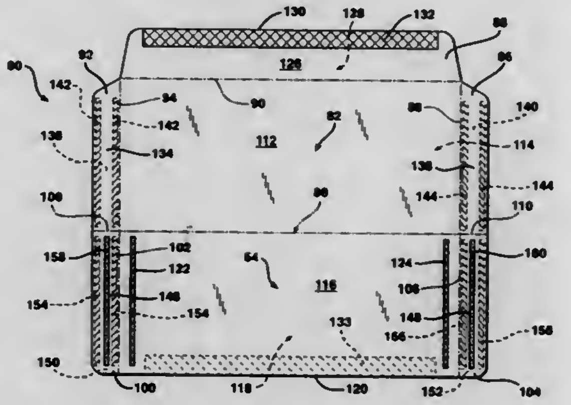
5,687,903
ENVELOPE SHEET AND METHOD OF PROCESSING

Walter M. Akridge, Dayton; David E. Washburn, and John A. Moore, Jr., both of Kettering, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Mar. 31, 1995, Ser. No. 414,935

Int. Cl.^{6} B65D *27/00*

U.S. Cl. 229—75 **9 Claims**



1. An envelope sheet for being automatically fed from a stack and printed by a laser printer and then automatically formed into an envelope having the appearance of a standard #10 envelope, said envelope sheet comprising:
- a front panel having a first upper surface and a first lower surface;
- a back panel connected to said front panel along a bottom fold line and having a second upper surface, a second lower surface, a bottom edge, a first left-side edge, a first right-side edge, a first adhesive area on said second upper surface adjacent said first left-side edge, a second adhesive area on said second upper surface adjacent said first right-side edge, and a third adhesive area on said second lower surface adjacent said bottom edge, said front and back panel having dimensions corresponding to a standard #10 envelope;
- a closing flap connected to said front panel along a top fold line and having a third upper surface, a third lower surface and a top edge, with a fourth adhesive area on said third upper surface adjacent said top edge;
- a first left-side flap connected to said front panel along a first left-side fold line and having a fourth upper surface, a fourth lower surface and a fifth adhesive area on said fourth lower surface;
- a first right-side flap connected to said front panel along a first right-side fold line and having a fifth upper surface, a fifth lower surface and a sixth adhesive area on said fifth lower surface;
- a second left-side flap connected to said first left-side flap along a left-side bottom fold line and connected to said back panel along a second left-side fold line, said second left-side flap having a sixth upper surface and a sixth lower surface, a seventh adhesive area on said sixth lower surface and an eighth adhesive area on said sixth upper surface;
- a second right-side flap connected to said first right-side flap along a right-side bottom fold line and connected to said back panel along a second right-side fold line, said second right-side flap having a seventh upper surface and a seventh lower surface, a ninth adhesive area on said seventh lower surface and a tenth adhesive area on said seventh upper surface; and
- a pressure sensitive self-stick adhesive which is substantially non-adherent to a laser printer fuser roll and not prone to causing blocking, said adhesive being adhered in a pattern to said first, second, fifth, sixth, seventh, eighth, ninth and tenth adhesive areas such that when a plurality of said envelope sheet are stacked, the stack has a sufficiently uniform height to allow sheets to be automatically fed therefrom, and such that when said envelope sheet is formed into an envelope, said first and eighth adhesive areas overlap and adhere said back panel and said second left-side flap, said second and tenth adhesive areas overlap and adhere said back panel and said second right-side flap, said fifth and seventh adhesive areas overlap and adhere said first and second left-side flaps, and said sixth and ninth adhesive areas overlap and adhere said first and second right-side flaps.

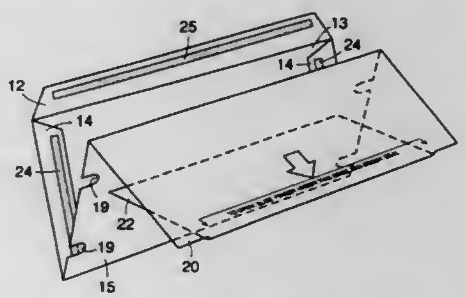
5,687,904
ENVELOPE AND A BLANK FOR MAKING AN ENVELOPE

Richard Potter, 23410 Los Encinos Way, Woodland Hills, Calif. 91367

Filed Apr. 29, 1996, Ser. No. 639,790

Int. Cl.^{6} B65D *27/04;27/06*

U.S. Cl. 229—303 **9 Claims**



1. An envelope comprising
- a front ply;
- glue on each of two parallel longitudinal sides of said front ply;
- a back ply secured to said front ply along a transverse side and said two longitudinal sides to define a pocket therewith, said back ply having at least one opening in each of two longitudinal sides thereof in overlying relation to the glue on each respective said side of said front ply;
- a first panel extending from and disposed over said back ply, said panel being secured to said glue on each side of said front panel; and
- a second panel extending from said first panel and disposed between said first panel and said back ply, said second panel being of less width than said first panel.

5,687,905
ULTRASOUND-MODULATED TWO-FLUID ATOMIZATION

Shirley Cheng Tsai, 5702 Highgate Ter., Irvine, Calif. 92715

Filed Sep. 5, 1995, Ser. No. 523,403

Int. Cl.^{6} B05B *17/04*

U.S. Cl. 239—4 **14 Claims**

1. A process for ultrasound-modulated two-fluid atomization wherein capillary waves are generated by ultrasound within a liquid stream passed from a conduit to an outlet of the conduit comprising:
- (a) a substantially non-atomized liquid stream issuing free of the conduit and outlet, the substantially non-atomized liquid

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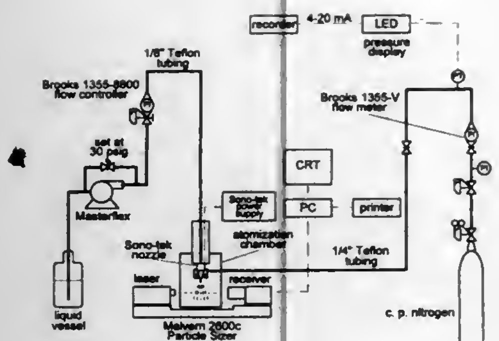


stream with an outer surface having waves at a fundamental frequency and harmonics above about 10 kHz and

(b) flowing a gas stream on the surface of the liquid stream to generate waves in resonance with at least one of the frequencies of the waves in the liquid stream.

5,687,906
ATOMIZATION METHOD AND ATOMIZER

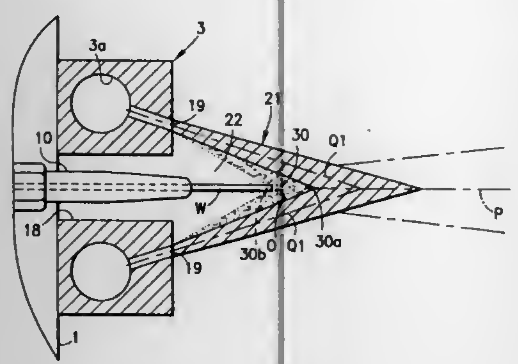
Mitsuyoshi Nakagawa, 1-21 Kasuga, 1-Chome, Suita City, Osaka, Japan

Division of Ser. No. 351,828, Dec. 8, 1994, Pat. No. 5,584,433, which is a continuation of Ser. No. 688,594, Aug. 22, 1991, abandoned. This application Aug. 7, 1996, Ser. No. 692,495

Claims priority, application Japan, Dec. 23, 1988, 63-326730; Apr. 10, 1989, 1-091656; Jun. 27, 1989, 1-164326

Int. Cl.^{6} B05B *5/04;1/28*

U.S. Cl. 259—8 **8 Claims**



1. An arc fusing method comprising:
forming a pair of plane air jets, each said plane air jet having a thickness center line and a width center line;
jetting said pair of plane air jets from a pair of nozzle tips toward a convergent portion on a fusing center axis, said thickness center line converging on said fusing center axis in front of an arc intersecting point, said fusing center axis being interposed between said pair of nozzle tips;
jetting air in a first of said pair of plain air jets along said width center line in an incline with respect to said fusing center axis while jetting air in a second of said pair of plain air jets along said width center line in an opposite incline with respect to said fusing center axis;
forming an air chamber bounded by converging of said thickness center lines of said pair of plane air jets on said fusing center axis; and
generating an arc discharge continuously between a pair of fusible materials at said arc discharge point in a low velocity air flow zone toward a convergent portion within said air chamber.

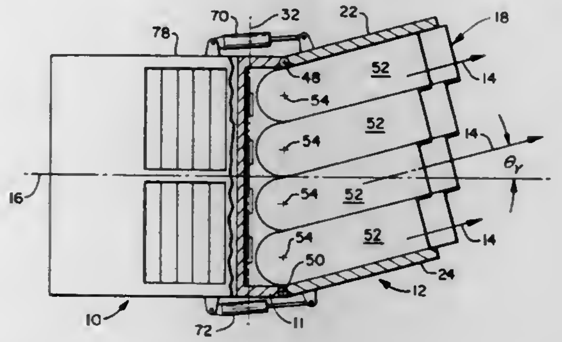
5,687,907
YAW AND PITCH THRUST VECTORING NOZZLE

Davis C. Holden, Pensacola, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 135,130, Dec. 18, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 375,212

Int. Cl.^{6} B64C *9/38*

U.S. Cl. 239—265.35 **3 Claims**



1. A movable outlet duct for a thrust vectoring exhaust nozzle, comprising:
first and second laterally spaced, vertical sidewalls, each sidewall pivotable about a vertical hinge secured to the nozzle and extending downstream therefrom;
an upper flap assembly disposed between the sidewalls, including:
a laterally extending upper stub flap,
a plurality of flap sections each extending parallel to the gas flow and disposed adjacently between the sidewalls, each pair of adjacent flap sections having a linear sliding seal joint therebetween, the flap sections and upper stub flap collectively defining a planar upper gas boundary of the outlet duct,
each flap section further including a vertical pivot joint adjacent the upstream end thereof, each pivot joint being secured downstream of the laterally extending upper stub flap disposed between the flap sections and the nozzle, the upper stub flap further including a lateral hinge at the upstream edge thereof secured to the nozzle, whereby the upper flap assembly is collectively movable about the laterally extending hinge and whereby the individual flap sections are movable in unison about the corresponding vertical pivot joints thereby achieving both vertical and lateral movement of the outlet duct.

5,687,908
NON-CONDENSING DUAL TEMPERATURE COMBINATION SPACE HEATING AND HOT WATER SYSTEM

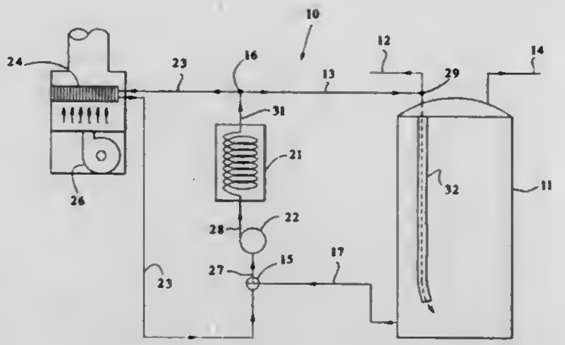
Sherwood G. Talbert, Columbus; Ronald A. Cudnik, Westerville, and Jeffrey J. Crisafulli, Columbus, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 314,033, Sep. 28, 1994, abandoned. This application Feb. 16, 1996, Ser. No. 602,636

Int. Cl.^{6} F24H *3/02*

U.S. Cl. 237—19 **6 Claims**

1. A dual temperature combination space heating and water heating system comprising:
a water heating loop for providing potable domestic hot water at a first water temperature ranging from 120° F. to 140° F.,
a space heating loop for providing potable space heating water at a second water temperature ranging from 150° F. to 180° F.,
the potable domestic hot water and potable space heating water being drawn from a common cold water input line,
a valve having at least two positions including a water heating loop position and space heating loop position,
the water heating loop comprising



the common cold water input line in communication with a non-stratified hot water reservoir,
a hot water return line in communication with a bottom portion of the hot water reservoir,
a warm water supply line providing communication between the hot water reservoir and the valve,
the valve, while in the water heating loop position, providing communication between the hot water reservoir and a first heat exchanger,
the return line delivering water to the first heat exchanger at a temperature exceeding 120° F. when said valve is in said water heating loop position, the first heat exchanger increasing the temperature of water flowing from the valve to the return line by a first predetermined amount ranging from 10° F. to 30° F., the first heat exchanger directly heating water flowing through the first heat exchanger for both the water heating loop and the space heating loop, the first heat exchanger being a non-condensing/mid-efficiency type heat exchanger,
a pump for pumping water in a direction determined by the position of the valve to the first heat exchanger,
the space heating loop comprising
the valve, while in the space heating loop position, providing communication between the second heat exchanger and a first beat exchanger, the valve delivering water to the first heat exchanger at a temperature exceeding 150° F. when said valve is space heating loop position,
the second heat exchanger transferring heat from water passing through the second heat exchanger to room air, the second heat exchanger decreasing the temperature of the water passing through the second heat exchanger by a second predetermined amount ranging from 10° F. to 30° F.,
the second heat exchanger in communication with the valve.

5,687,909
APPARATUS FOR SECURING A LAWN SPRINKLER

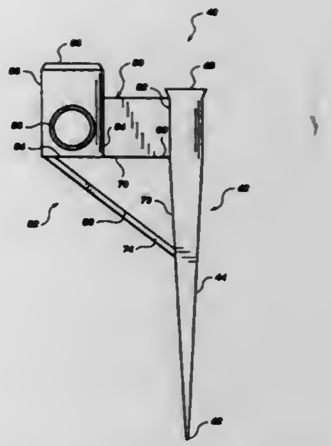
Porter F. Dean, 23 Cove St., Round Mountain, Nev. 89045

Filed Sep. 20, 1995, Ser. No. 530,638

Int. Cl.^{6} B05B *15/00*

U.S. Cl. 239—276 **37 Claims**

1. A lawn sprinkler securing apparatus, comprising:
a spike having a spike head at one end and an elongate tapered spike shaft terminating in a spike tip;
at least one offset having a first end, a second end, and a lower edge, wherein said offset first end is attached to said spike shaft;
a sprinkler coupling attached to said offset second end, wherein said sprinkler coupling including a sprinkler attachment structure capable of engaging a sprinkler head;
hose attachment means attached to said sprinkler coupling for receiving a hose;
a passage for communicating fluid from said hose through said sprinkler coupling, and to said sprinkler head; and
rotation prevention means for preventing the rotation of said spike, said rotation prevention means comprising a web having a first web edge, a second web edge, and a diagonal web edge; said web first edge is attached to said sprinkler coupling and said web second edge is attached to said spike shaft.



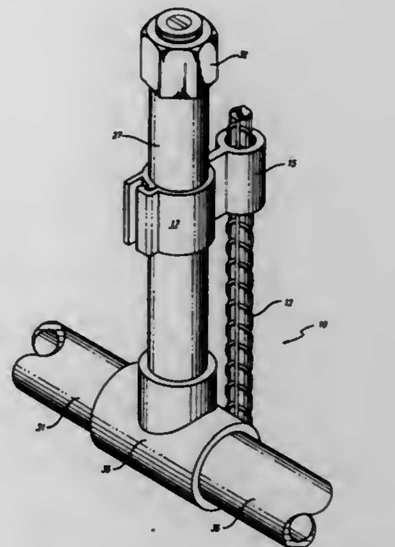
5,687,910
SPRINKLER RISER CONNECTING APPARATUS

Robert King, Newhall, Calif., assignor to King Bros. Industries, Valencia, Calif.

Filed Jan. 30, 1996, Ser. No. 594,353

Int. Cl.^{6} B05B *15/06*

U.S. Cl. 239—276 **15 Claims**



1. Apparatus for maintaining a sprinkler riser pipe in a firm upright position in a sprinkler system comprising:
a stake adapted to be mounted in a generally vertically position in a sprinkler system supporting surface;
a connector including a generally hollow sleeve having a throughbore with a cross-section generally conforming to the cross-section of said stake and slightly greater in diameter thereof whereby said sleeve may be mounted on said stake encircling the same in a close-fitting relationship; and
a pair of generally semi-circular sections coupled to said sleeve by an extension portion, each of said sections having flexible portions interconnecting said sections to said extension portion, each of said section having mating interlocking means at the free ends thereof whereby said sections may be moved from a first open position wherein said free ends are spaced from each other to a second closed position surrounding a sprinkler riser pipe in a tight close fitting relationship with said free ends interlocked in a snap fitting relationship.

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5,687,911
MULTIDIRECTIONAL FOAM AEROSOL DISPENSING

Michael Boakye-Danquah, Hazelwood; John F. Pysz, Crestwood; Floyd R. French, Manchester, and Joseph C. Lott, St. Louis, all of Mo., assignors to Clayton Corporation, Fenton, Mo.

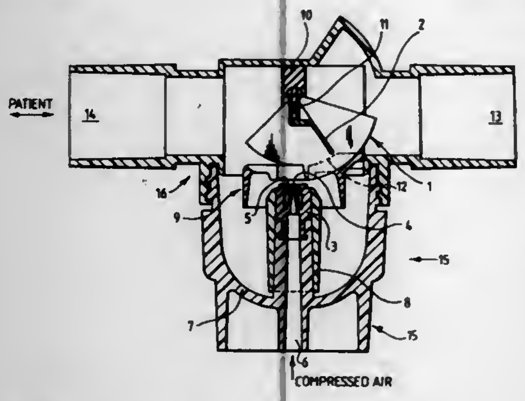
Filed Feb. 18, 1995, Ser. No. 388,209
Int. Cl.^{6} B05B *7/24;7/26;7/32*
U.S. Cl. 239—337 **3 Claims**

1. The method of dispensing from an aerosol container, without a dip tube, a nonaqueous foam under pressure through a toggle actuated foam valve comprising:
   - a) pointing the valve opening upward by positioning the container in an upright position while toggling the valve; and
   - b) initially discharging a burst of gas followed by the discharging of a foam product.

5,687,912
ATOMIZER

J. Denyer, Pagham, United Kingdom, assignor to Medic-Aid Limited, West Sussex, England

Filed Nov. 9, 1995, Ser. No. 556,093
Claims priority, application United Kingdom, Nov. 11, 1994, 9422821
Int. Cl.^{6} A61Z *11/02*
U.S. Cl. 239—343 **25 Claims**



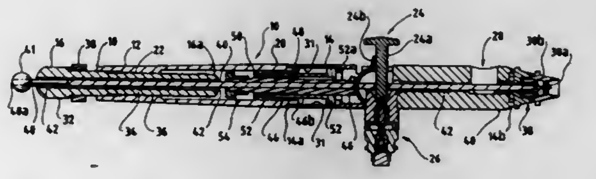
1. An atomizer comprising:
a head having a gas exit and at least one outlet adjacent said gas exit;
a deflector for deflecting gas issuing from said gas exit over at least one of said outlets, for drawing a substance to be atomized out from at least one of said outlets and atomizing the substance in the gas issuing from said gas exit; and
said deflector mounted with respect to said head so that said deflector is movable between a first position in which said deflector is adjacent said gas exit and directly in the path of gas issuing from said gas exit so that atomization of the substance takes place, and a second position spaced from said gas exit so that no atomizing takes place.

5,687,913
AIR BRUSH WITH PAINT FLOW REGULATING

Herman Robisch, Schiller Park, and Kenneth W. Schlotfeldt, Addison, both of Ill., assignors to Badger Air Brush Co., Franklin Park, Ill.

Filed Jun. 6, 1995, Ser. No. 470,931
Int. Cl.^{6} B05B *7/30*
U.S. Cl. 239—346 **14 Claims**

1. An air brush which comprises:
a handle;
a front body;
an adjusting screw;
a paint regulating needle;

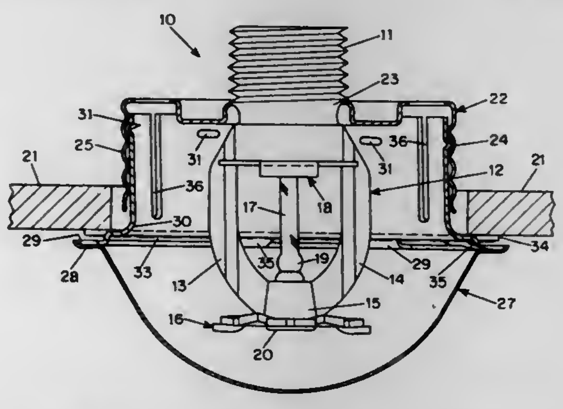


said handle, front body, and adjusting screw defining a tubular cavity, and a longitudinal axis;
said handle having a proximal end and a distal end;
said proximal end of said handle defining an opening about said longitudinal axis;
said front body having a proximal end and a distal end, said distal end having a taper;
said adjusting screw being threaded into said handle through said opening defined in the proximal end of said handle;
said adjusting screw being rotatable so as to extend distally or proximally, as desired, within or out from said handle;
said paint regulating needle having a proximal end and a distal end, said proximal end having a stop;
said paint regulating needle being held within said tubular cavity such that said stop of said paint regulating needle extends proximally from said adjusting screw and said distal end of said paint regulating needle is located within said front body and extends into said taper of said front body;
a spring to bias said paint regulating needle towards said distal end of said front body whereby said adjusting screw may be rotated to extend further proximally from said handle and push against said stop on said paint regulating needle and against said spring to pull said distal end of said paint regulating needle proximally from said distal end of said front body out of said taper and fix said paint regulating needle at a desired paint flow position.

5,687,914
SPRINKLER DEFLECTOR

Claude P. Bosio, Tarrytown, and Thomas F. Wancho, Bronx, both of N.Y., assignors to The Reliable Automatic Sprinkler Co., Inc.

Filed Mar. 5, 1996, Ser. No. 611,245
Int. Cl.^{6} B05B *1/26*
U.S. Cl. 239—498 **13 Claims**

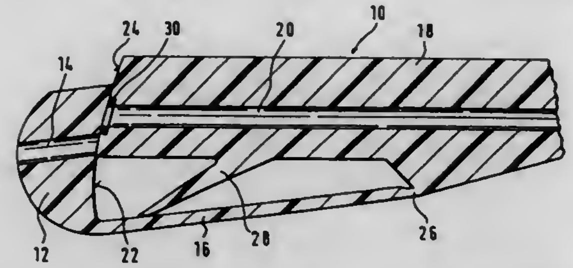


1. A sprinkler comprising a sprinkler body having an axial passage for delivery of fire extinguishing fluid, a pair of arms extending from the sprinkler body in a plane parallel to the sprinkler axis, a deflector supported by the pair of arms and disposed in a plane generally perpendicular to the axis of the sprinkler body and having a central portion and a peripheral array of tines separated by substantially radial slots in which at least two tines spaced from the plane of the sprinkler arms and located on the same side of the plane of the sprinkler arms have outer ends inclined at opposite angles with respect to a plane perpendicular to the axis of the sprinkler body.

5,687,915
OPERATING TRIGGER ASSEMBLY FOR A SPRAY FOR FLUID PRODUCTS

Jean-Claude Schmitz, Heisdorf, and Leon Kerger, Helmdange, both of Luxembourg, assignors to Luxembourg Patent Company, S.A., Luxembourg, Luxembourg

Filed May 19, 1995, Ser. No. 444,434
Claims priority, application Luxembourg, May 31, 1994, 88 489
Int. Cl.^{6} B05B *9/08*
U.S. Cl. 239—530 **10 Claims**

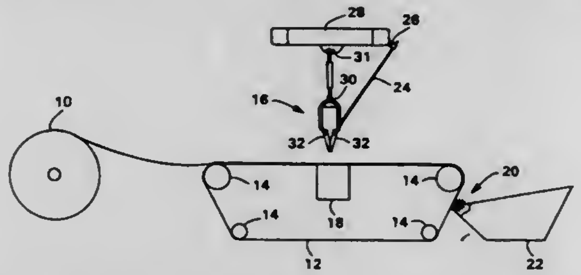


1. A one piece trigger assembly for a spray for fluid products which is intended to be connected to a bottle containing said product, the one piece trigger assembly comprising a handle through which there passes an axial duct communicating with said bottle and a spray mouth through which there passes an outlet passage, the posterior frontal face of the spray mouth and the anterior frontal face of the handle being corresponding concave and convex surfaces, respectively, with cylindrical curvature, the spray mouth and the handle adapted to be pivoted with respect to each other, against the action of elastic means, towards an open position in which the passage of the spray mouth and the duct of the handle are aligned with one another and, under the action of said elastic means, towards a closed position in which said duct and said passage are not aligned with each other, said elastic means comprising a tongue extending from said handle.

5,687,916
METHOD OF NONWOVEN RECLAIM

Lawrence James Romano, III, Marietta, and Stephen Harding Primm, Cumming, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Nov. 6, 1995, Ser. No. 554,177
Int. Cl.^{6} B02C *19/00*
U.S. Cl. 241—1 **17 Claims**

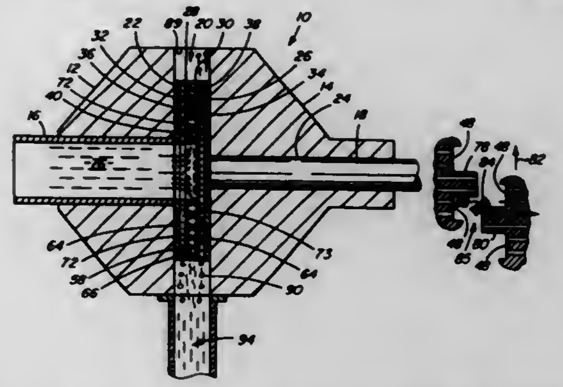


1. A method of reducing a thermoplastic nonwoven web to flakes, comprising:
   - a) providing means for forming a heated fluid jet;
   - b) feeding said nonwoven web onto a transfer belt positioned in the path of said heated fluid jet;
   - c) contacting said nonwoven web with said heated fluid at an angle within about 15° of perpendicular to the web surface to reduce said web to flakes having an average equivalent diameter between about one-sixteenth inch to about one-eighth inch and an average thickness between about $^{1}/_{3000}{}^{\mathrm{th}}$ to about $^{1}/_{10,000}{}^{\mathrm{th}}$ inch; and
   - d) applying vacuum to draw said fluid through said web.

5,687,917
HIGH CONSISTENCY PULP REFINING USING LOW CONSISTENCY PULP REFINING TECHNIQUES

Kim Shing Law, Vancouver, and Suezone Chow, Richmond, both of Canada, assignors to Canadian Forest Products Ltd., Canada

Filed Jan. 5, 1996, Ser. No. 583,570
Int. Cl.^{6} B02C *7/02;7/12*
U.S. Cl. 241—21 **28 Claims**

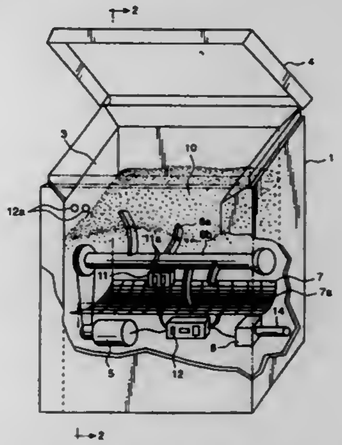


24. A method of refining pulp between facing refiner members of a pulp refiner in which at least one of said facing refiner members is movable relative to the other, the method including the step of:
   - a) draining water from pulp fibers squeezed between said facing refiner members, through at least one drainage conduit in at least one of said refiner members by generally preventing the entry of said pulp fibers into said at least one drainage conduit while generally permitting the entry of water into said at least one drainage conduit.

5,687,918
GARBAGE DISPOSAL

Tohoru Kubota; Yoshimi Ishikawa; Seizo Ishine; Toshio Ohtsuki; Hiroshi Tamura; Syunro Kawaguchi; Kazuhiro Narusaka, all of Kanagawa-ken, and Hidehisa Ide, Osaka-fu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1995, Ser. No. 404,826
Claims priority, application Japan, Mar. 15, 1994, 6-043674; Sep. 30, 1994, 6-260999
Int. Cl.^{6} B02C *18/40*
U.S. Cl. 241—23 **42 Claims**



35. A method of controlling a garbage disposal of a type that decomposes said garbage using microorganisms, comprising steps of:
making a mixture of said garbage and a medium having microorganisms;

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detecting a water content percentage of said mixture; and
controlling a frequency of stirring said mixture based on said water content percentage.

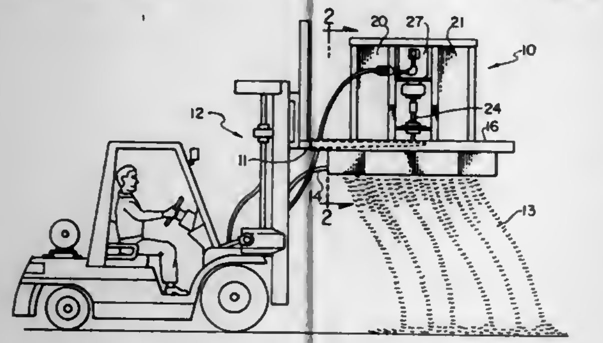
5,687,919
APPARATUS FOR PRODUCING SIMULATED SNOW EFFECTS

Philip C. Cory, 10474 Santa Monica Blvd., Suite 305, Los Angeles, Calif. 90025

Filed Apr. 1, 1996, Ser. No. 625,145

Int. Cl.^{6} B02C *18/08*

U.S. Cl. 241—60 **4 Claims**



1. An apparatus for producing simulated snow effects for theatrical purposes comprising:

(a) a first and second adjacent vertical supply channels having open upper and lower ends, the lower end of each of said first and second supply channels being in a planar relationship with each other;
(b) a rotary power source disposed between and in parallel relation to said first and second supply channels;
(c) a drive shaft having first and second ends, the first end being coupled to said rotary power source, the second end extending beyond the plane of the lower ends of said first and second supply channels;
(d) a disc having upper and lower surfaces axially secured to the second end of said drive shaft and having a plurality of apertures disposed therethrough from the upper surface to the lower surface thereof;
(e) a plurality of planar cutting blades, each being pivotally coupled to the lower surface of said disc and extending upwardly through a respective aperture in said disc
(f) a housing disposed about and secured to said first and second supply channels and having an outer wall extending downwardly about and beyond the lower surface of said disc; and
(g) a pressurized air conduit being coupled through the outer wall of said housing adjacent the lower surface of said disc, said pressureized air conduit being aligned with the drive shaft.

5,687,920
APPARATUS FOR THE CONTINUOUS MILLING OF AEROSOL PHARMACEUTICAL FORMULATIONS IN AEROSOL PROPELLANTS

Akwete L. Adjei, Wadsworth; Dennis Y. Lee, Highland Park, and Anthony J. Hlinak, Lindenhurst, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

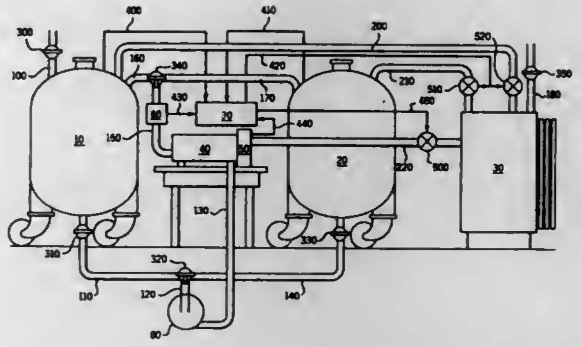
Division of Ser. No. 226,132, Apr. 11, 1994. This application Feb. 23, 1995, Ser. No. 393,612

Int. Cl.^{6} B02B *1/08;5/02*

U.S. Cl. 241—65 **3 Claims**

1. An apparatus for continuous milling of aerosol pharmaceutical formulations in an aerosol propellant comprising

a) a first supply tank having cooling means for holding a supply of aerosol pharmaceutical formulation and magnetic stirrers located inside;



b) a second receiving tank having cooling means and magnetic stirrers located inside;
c) a bead milling apparatus interconnected between said supply and receiving tanks for reducing the solid particle size of said aerosol pharmaceutical formulation;
d) means for continuous in-stream monitoring of solids particle size;
e) pump means for reversibly passing said aerosol pharmaceutical formulation from said first supply tank through said particle size analyzer and said milling apparatus to said second receiving tank and return; and
f) refrigeration means for circulating a coolant through the cooling means of said first supply and said second receiving tank.

5,687,921
REDUCING APPARATUS

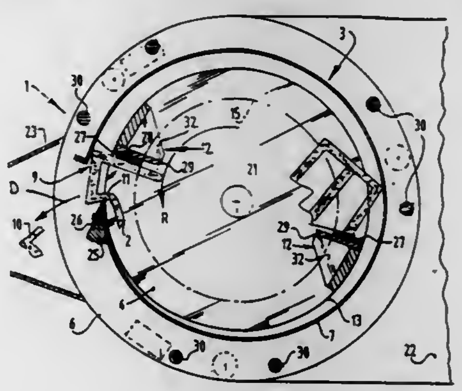
Luc Moreels, Zingem, Belgium, assignor to De Pecker N.V., Gent, Belgium

Filed Jan. 5, 1996, Ser. No. 583,647

Claims priority, application European Pat. Off., Jan. 6, 1995, 9520024

Int. Cl.^{6} B02C *18/00*

U.S. Cl. 241—86.1 **17 Claims**



1. A shredding device for shredding objects, comprising a housing, a carrier member rotatably mounted in the housing, at least one feed opening arranged in one end surface of the housing for feeding objects for shredding and at least one discharge opening arranged in a side wall of the housing for discharging shredded material, wherein:

said discharge opening is bounded by a cutting edge;
said discharge opening extends substantially parallel to a generating line of said side wall over substantially a whole length thereof; and

said housing has a spiral form with a diameter which increases from said cutting edge of the discharge opening in a rotation direction of said carrier member.

5,687,922
PULVERIZER

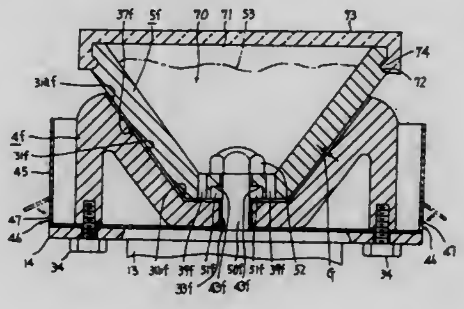
Shoji Takaoka, Nagoya, Japan, assignor to Nipponkoatsudenki Kabushikikaisha, Japan

Filed Oct. 6, 1995, Ser. No. 539,927

Claims priority, application Japan, Oct. 12, 1994, 6-272819; Dec. 2, 1994, 6-329360; Jun. 2, 1995, 7-160115

Int. Cl.^{6} B02C *19/08*

U.S. Cl. 241—259 **7 Claims**



1. A pulverizer comprising:
(a) a base frame;
(b) a lower mortar having a first pulverizing surface on an upper surface thereof and disposed on said base frame;
(c) a ceramic upper mortar having a second pulverizing surface on a lower surface thereof and disposed on said base frame, with said first pulverizing surface facing said second pulverizing surface; and
(d) a drive unit disposed on said base frame for rotating said upper mortar;
(e) said second pulverizing surface having a concave conical shape, an outer peripheral section of which is higher than a central section thereof;
(f) said first pulverizing surface having an inverse conical shape matching said concave conical shape of said lower mortar;
(g) an upper side of said upper mortar having a funnel-like concave shape on an inner peripheral surface thereof providing a storage space for storing material to be pulverized;
(h) a material supply hole for supplying material to be pulverized from said storage space disposed closely adjacent a rotation center shaft at the bottom of said upper mortar;
(i) a plurality of spirally-shaped grooves on both said first and second pulverizing surfaces coupled to said material supply hole for supplying said material and facing opposite to each other extending in an outer peripheral direction to move material to be pulverized to said pulverizing surface in the direction from the central lower section to an upper outer peripheral section of said pulverizing surfaces, the extension directions of said plural grooves on both said pulverizing surfaces intersecting one another while said grooves are facing opposite to one another so that, when material supplied from said material supply hole at the bottom of said upper mortar is pulverized between said pulverizing surfaces, the material enters the lower section of said opposed pulverizing surfaces of said upper and lower mortars, is moved upward along the upward gradient of said pulverizing surfaces, and is discharged from the upper outer peripheral section of said pulverizing surfaces.

5,687,923
GRADUAL PRESSURE APPLYING TYPE DE-INKING DEVICE FOR PAPER MATERIAL

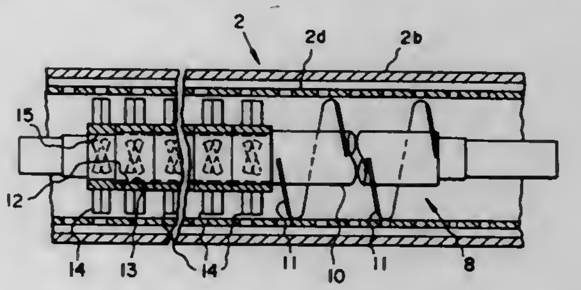
Tetsuo Ide, and Takefumi Ide, both of Fuji, Japan, assignors to Kabushiki Kaisha Taizen, Shizuoka, Japan

Filed Mar. 12, 1996, Ser. No. 614,015

Claims priority, application Japan, Aug. 5, 1995, 7-219631

Int. Cl.^{6} B02C *19/22*

U.S. Cl. 241—260.1 **1 Claim**



1. A gradual pressure applying type paper deinking device in which material for manufacturing paper is fed by cylinder presses the deinking device comprising:

three cylinders arranged in an approximately triangular shape when viewed from a side of said deinking device, a first cylinder being able to gradually lower to a third cylinder despite said first cylinder being connected to said third cylinder, and a raw material inlet being provided at a first end of said first cylinder;
a first connecting member, provided at a second end of said first cylinder;
a second connecting member provided on a side opposed to the first connecting member connected to a second cylinder, said second connecting member being coupled to said third cylinder and a product discharge outlet being provided on a side opposed to said second connecting member;
said three cylinders being coupled such that paper stock flows between said three cylinders from right to the left, then from left to right and then from right to left in a zigzag fashion;
at least one of the cylinders having an inner cylinder in which a plurality of small holes are formed and an outer cylinder covering said inner cylinder;
each of said three cylinders having a rotating shaft having an independent driving device, wherein each of said rotating shafts passes through its corresponding cylinder;
a revolving group of spiral revolving blades being attached to each rotating shaft leaving only a remaining portion of the rotating shaft; and
on said remaining portion of said rotating shaft in a direction that crosses a peripheral direction of said rotating shaft at a slanted angle, crossing crushing blade-equipped kneading blades are provided, wherein adjacent said kneading blades cross each other at a slanted angle, and are attached in blocks with a plurality of freely exchangeable insert blades so that agitation, washing, compression, water removal, heating, crushing and pressurized transfer are carried out by high concentration mixing in which flow of said material for manufacturing paper is reversed.

5,687,924
FLEXIBLE PLASTIC APPARATUS FOR STORING EMBROIDERY FLOSS

Kathryn Louise Reiche, and Gerald Miles Reiche, both of 8521 International Ave. #207, Canoga Park, Calif. 91304

Filed May 17, 1994, Ser. No. 188,710

Int. Cl.^{6} B65H *49/30;54/56;54/46*

U.S. Cl. 242—127 **14 Claims**

1. An apparatus for storing and retaining an embroidery floss skein without modifying the embroidery floss skein, the apparatus comprising:

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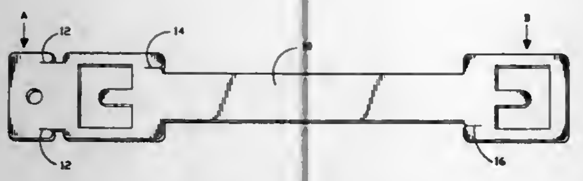


a. an elongated flexible narrow strip member having a top portion with a top end, a middle portion and a bottom portion with a bottom end, the top portion having a square shaped cutout with a projection extending towards the top end and first and second opposite exterior edge slots located adjacent to the top end and the square shaped cutout, the bottom portion having a square shaped cutout with a projection extending towards the bottom end, the top and bottom portions being larger in width than the middle portion;

b. a third exterior edge slot located on said top portion and located adjacent to one end of said middle portion for latching one end of said embroidery floss skein;

c. a fourth exterior edge slot alternatively offset and opposite from said third exterior edge slot and located on said bottom portion and adjacent to the other end of said middle portion for latching the other end of said embroidery floss skein; and

d. said embroidery floss skein looped over said projection of said bottom portion, and said top portion being flexible such that said top portion can be bent forward until the opposite side of said embroidery floss skein is looped over said projection of said top portion, and that said top portion can be released to return to its normal unbent condition for storing and retaining said embroidery floss skein.

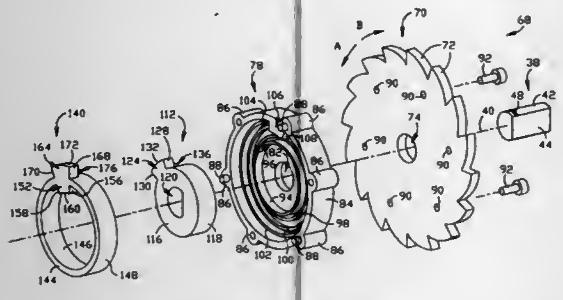
5,687,925
SEAT BELT RETRACTOR WITH ENERGY MANAGEMENT

Robert D. Sayles, Rochester, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jun. 27, 1996, Ser. No. 671,531

Int. Cl.^{6} B60R *22/28*

U.S. Cl. 242—379.1 **21 Claims**



1. A seat belt webbing retractor comprising:

- a spool around which seat belt webbing is wound, said spool being rotatable about an axis in webbing withdrawal and webbing retraction directions;
- a member rotatable in the withdrawal and retraction directions;
- means for blocking rotation of said rotatable member and said spool in the withdrawal direction, said spool being rotatable relative to said rotatable member upon the occurrence of tension in the webbing above a predetermined amount;
- a deformable member for absorbing energy during a plurality of rotations of said spool relative to said rotatable member, said deformable member having a plurality of annular projections which are concentric about the axis; and
- a plurality of deformation members rotatable relative to said deformable member about the axis for deforming said projections of said deformable member during rotation of said spool relative to said rotatable member to absorb energy.

5,687,926
SEAT BELT WEBBING LOCK APPARATUS AND ASSEMBLY THEREFOR

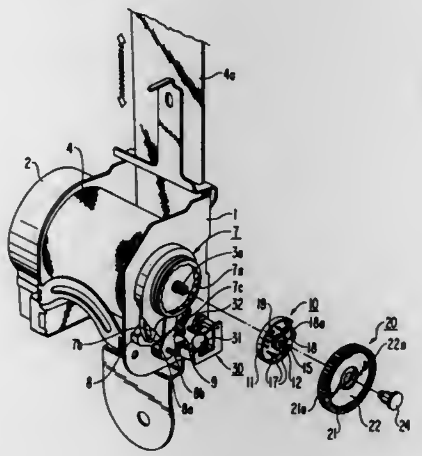
Jang Won Park, and Jong Kak Kim, both of moonmak-ep wonju, Rep. of Korea, assignors to Sungwoo Corporation, Seoul, Rep. of Korea

Filed Nov. 7, 1995, Ser. No. 554,837

Claims priority, application Rep. of Korea, Nov. 7, 1994, 94-29057; Oct. 21, 1995, 95-36548

Int. Cl.^{6} B60R *22/405*

U.S. Cl. 242—383.4 **22 Claims**



1. A webbing lock apparatus for use in a vehicle seat belt system, said apparatus comprising:

- a shaft rotatably mounted to a spool frame;
- a spool interlocked with said shaft for rotation therewith, said spool having an intermediate portion for winding thereon, and unwinding therefrom, a seat belt webbing;
- a ratchet wheel interlocked with said shaft for rotation therewith;
- a hook retainer interlocked with said shaft for rotation therewith;
- a lock ring raced on said shaft adjacent said hook retainer, said lock ring having a ratchet portion;
- a hook movably mounted on said hook retainer for selective locking engagement with said ratchet portion of said lock ring;
- a spring connected between said hook and said hook retainer serving to directly elastically bias said hook out of engagement with said ratchet portion, said spring comprising a coil mounted on an axial boss of said hook retainer, and a pair of arms engaged, respectively, with said hook retainer and said hook for providing a continuous biasing force on said hook;
- a flywheel assembly raced with respect to said shaft and being coupled with said hook for moving said hook into engagement with said ratchet portion, against the bias of said spring, upon relative movement of said flywheel assembly and said hook retainer, whereby said lock ring is temporarily coupled for rotation with said shaft;
- a pawl coupled to said lock ring such that rotation of said lock ring with said shaft causes said pawl to lockingly engage said ratchet wheel, to thereby temporarily inhibit unwinding of said web; and
- a plurality of spaced lock members provided on said book retainer, an arm of said spring being selectively engageable with said lock members in order to vary the spring force biasing the hook out of engagement with said ratchet portion.

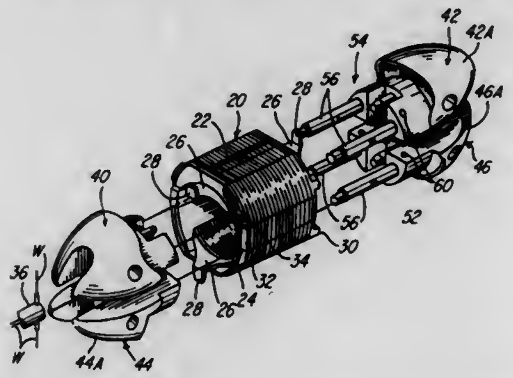
5,687,927
ADJUSTABLE STATOR WINDING FORM

John M. Beakes, Fairborn, and Nathan A. Buckner, Huber Heights, both of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio

Filed Jun. 20, 1996, Ser. No. 667,098

Int. Cl.^{6} H02K *15/095*

U.S. Cl. 242—432.6 **18 Claims**



1. A winding form for use in the manufacture of stators for dynamoelectric devices, comprising:

- a winding form body having at least one longitudinally-extending socket formed therein;
- at least one connector rod projecting from said winding form body, one for each socket, each connector rod having an end portion thereof received within its associated socket;
- means associated with each connector rod for retaining the end portion thereof within its associated socket when said each connector rod is in a first rotary position relative to its associated socket; and
- means associated with each connector rod permitting the removal of said each connector rod from its associated socket when said each connector rod is rotated to a second rotary position relative to its associated socket.

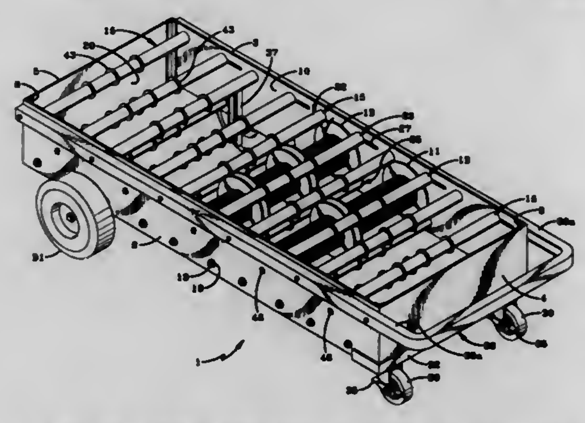
5,687,928
RACK FOR WIRE DISPENSING SPOOLS

Daniel T. Lassiter, 9918 Nichols Rd., Windham, Ohio 44288

Filed Nov. 13, 1995, Ser. No. 555,973

Int. Cl.^{6} B65H *16/02;49/00;18/02*

U.S. Cl. 242—557 **17 Claims**



1. A rack for rotatably supporting one or more spools including:

- a frame which includes at least two spaced side walls;
- a pair of spaced top rollers and at least one bottom roller spaced below said top rollers, said top and bottom rollers extending between the two side walls for holding at least one spool in a storage zone located between said rollers;
- spring means for biasing one of the top rollers towards the other of said top rollers; and
- means mounting the said one top roller for allowing said one top roller to move with respect to said other top roller and overcome the biasing of the spring means to change the spacing between said top rollers for inserting and removing a spool into and from the storage zone.

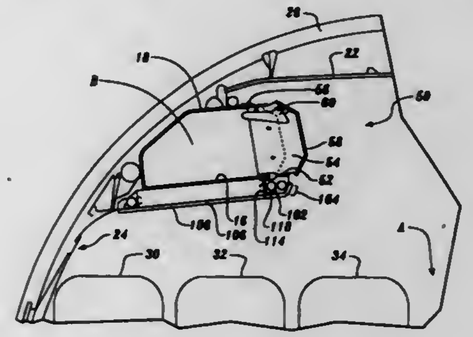
5,687,929
EXTENSIONS FOR STORAGE BINS

Jack E. Hart, Bellevue, and Michael J. Leenhouts, Bellingham, both of Wash., assignors to Hexcel Corporation, Plesanton, Calif.

Filed Jun. 29, 1995, Ser. No. 496,823

Int. Cl.^{6} B64D *11/00*

U.S. Cl. 244—118.1 **15 Claims**



1. An extended luggage bin for aircraft, the extended bin comprising:

- (a) an existing shelf-type luggage bin portion having a storage space therein surrounded by a bin base, opposite bin sides extending upwardly from the base, a bin top extending between upper ends of the bin sides, and a bin rear side extending from a rear portion of the base to a rear portion of the top, the storage space accessible through an opening on a frontal side of the bin for placing luggage in said space; and
- (b) a modular bin extension mounted around the opening on the frontal side of the existing bin portion, the extension comprising:
  - (i) a base portion having a rear edge substantially equal to the length of the base of the existing luggage bin portion, the rear edge of the base portion attached to a from edge of the base of the existing luggage bin portion to form a continuously extending expanded bin base;
  - (ii) spaced sides, extending upward from opposite ends of the bin extension base portion, each of the sides mechanically attached to a nearest side of the existing luggage bin portion; and
  - (iii) a door mounted to cover a frontal opening of the bin extension.

5,687,930
SYSTEM AND COMPONENTS USEFUL IN LANDING AIRBORNE CRAFT

Nicholas Liptay Wagner, and Geoffrey Cunliffe, both of Mississauga, Canada, assignors to Indal Technologies Inc., Mississauga, Canada

Continuation of Ser. No. 701,292, Apr. 29, 1991, Pat. No. 5,123,615, which is a continuation of Ser. No. 305,466, Feb. 2, 1989, abandoned. This application Apr. 10, 1992, Ser. No. 867,311

Int. Cl.^{6} B64F *1/12*

U.S. Cl. 244—116 **10 Claims**

1. An improved securing and traversing system for assisting to land a helicopter and securing a helicopter carrying a probe upon landing on the deck of a ship for subsequently traversing it from its landing position, said system comprising a housing reciprocal from

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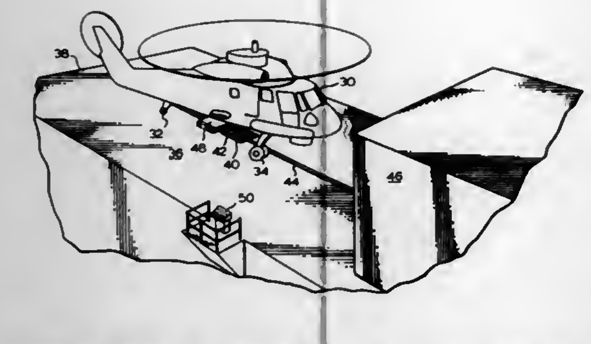


a position remote the landing area to a position adjacent the landing area of the helicopter, the housing carrying an upwardly directed radiation sensor for sensing radiation, a shock absorber and sensing means extending across the housing for contacting a probe or other projection extending from the helicopter on the exterior of the helicopter when the helicopter has landed on the deck of the ship and the housing is brought to engage the probe or other projection, the shock absorber and sensing means for slowing and stopping the movement of the housing when the probe or projection is engaged and for cushioning the engagement and for sensing the position of the probe or projection, means for reciprocating the housing towards and away from the landing area, a carrier on the housing extending across the housing and carrying securing means thereon for securing the housing to the probe or projection on the helicopter, the securing means being normally secured at one side of the housing on the carrier and being moved laterally along the carrier across the housing when the carrier is activated to capture the probe or projection, and means to operate the carrier whereby when the probe or projection engages the shock absorber and sensing means, the impact of the probe is cushioned and the position of the probe or projection is sensed relative to the mouth of the securing means whereby when the sensor receives signals from the emitters on the helicopter and the signals are used to locate the helicopter relative to the shipdeck, the signals are used to assist to determine the landing position of the helicopter, and position the securing and traversing system proximate such landing position whereby when the helicopter has landed the probe on the helicopter is sensed as positioned in line with the mouth of the securing means, the carrier moves the securing means to grasp and secure the probe or projection and when the probe is sensed not to be appropriately positioned, the system is activated to cause the helicopter rapid securing system to be appropriately positioned relative to the probe.

5,687,931

PARACHUTE GROUND DISCONNECTING DEVICES

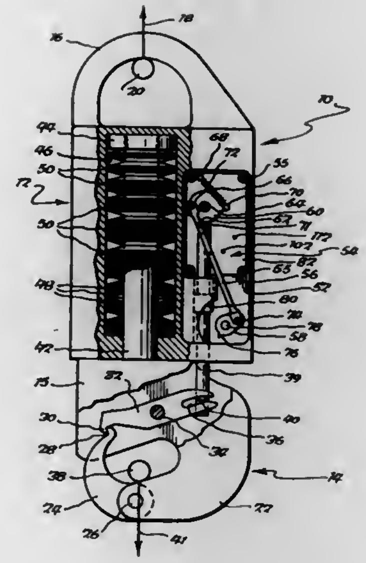
James V. Hogàn, Cassidy, Canada, assignor to Irvin Industries Canada Limited, Fort Erie, Canada

Continuation-in-part of Ser. No. 299,748, Sep. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 126,255, Sep. 23, 1993, abandoned. This application Jul. 20, 1995, Ser. No. 504,525

Int. Cl.^{6} B64D *17/38*

U.S. Cl. 244—151 B **44 Claims**

1. A parachute ground disconnecting device, which comprises a casing with at least one interior compartment, a load suspending assembly located at a first end of said device, means for connecting said device to a parachute located at a second end of said device, latching means for securing a load on said load suspending assembly during more turbulent initial period of descent under force of load, locking means for restricting movement of said latching means during a period of stable steady descent under force of load, timer means for delayed actuation of said locking means for restricting movement of said latching means during said period of stable steady descent, and spring means positioned in the interior compartment of said casing for limiting downward deflection of said load suspending assembly, for retraction of said load suspending assembly on ground contact of said load and for automatically



disengaging said latching means with retraction of said load suspending assembly.

5,687,932

APPARATUS FOR REMOVING HEAT

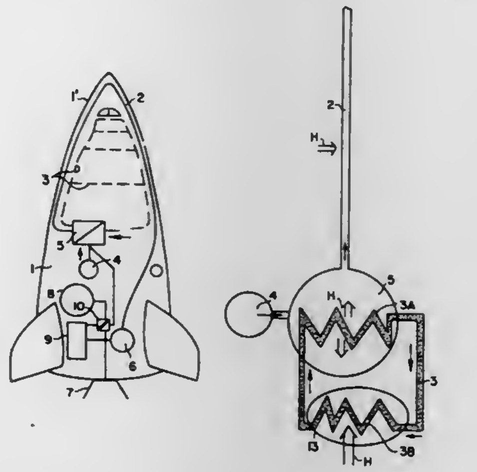
Jose Gomes, Hamburg, Germany, assignor to Daimler-Benz Aerospace AG, Munich, Germany

Filed Mar. 27, 1995, Ser. No. 409,840

Claims priority, application Germany, Mar. 29, 1994, 44 10 914.8

Int. Cl.^{6} B64G *1/50*

U.S. Cl. 244—163 **18 Claims**



1. An apparatus for removing heat from a thermally loaded structure having a heated portion, said apparatus comprising a pipe that is arranged at said heated portion and that has a water steam, inlet into an interior of said pipe, a water steam generator connected to said water steam inlet of said pipe, and a reducing agent provided in said interior of said pipe such that said reducing agent will be in direct contact with water steam-introduced into said interior of said pipe from said steam generator, and such that an endothermic chemical reaction will take place between said water steam and said reducing agent using said heat removed from said thermally loaded structure.

5,687,933

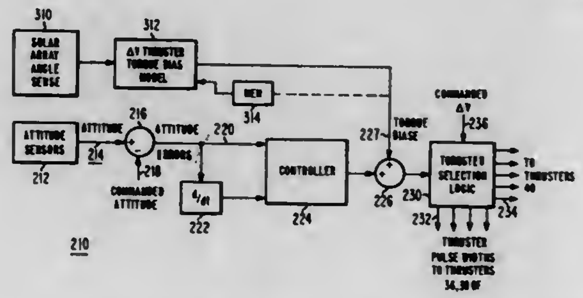
ATTITUDE CONTROL FOR SPACECRAFT WITH MOVABLE APPENDAGES SUCH AS SOLAR PANELS

Neil Evan Goodzeit, Princeton, and Santosh Ratan, Lawrenceville, both of N.J., assignors to Martin Marietta Corporation, East Windsor, N.J.

Filed Oct. 16, 1995, Ser. No. 543,733

Int. Cl.^{6} B64G *1/26;1/36*

U.S. Cl. 244—169 **3 Claims**



3. A spacecraft including an attitude control system, comprising:

attitude sensing means coupled to said spacecraft for generating attitude-representative signals representing the attitude of said spacecraft;

a source of desired-attitude signals representing the desired attitude of said spacecraft;

attitude error signal generating means coupled to said attitude sensing means and to said source of desired-attitude signals, for taking the difference between said attitude-representative signals and said desired-attitude signals to thereby generate attitude error signals;

error signal processing means coupled to said attitude error signal generating means, for processing said attitude error signals with at least a proportional characteristic, for generating torque demand signals representative of the torque required to control said spacecraft toward said desired attitude;

a plurality of attitude control thrusters, for applying torques to said spacecraft in response to energizing signals applied thereto;

thruster selection and drive logic means including an input port, and also including an output port coupled to said attitude control thrusters, for responding to summed torque demand signals applied to said input port of said thruster selection and drive logic means, for selecting the appropriate ones of said thrusters, and for applying energizing signals to said selected ones of said thrusters for generating the torque represented by said summed torque demand signals applied to said input port;

coupling means including a first input port coupled to said error signal processing means and an output port coupled to said input port of said thruster selection and drive logic means, said coupling means comprising a second input port coupled to a source of torque bias signals, for summing torque bias signals applied to said second input port with said torque demand signals to produce said summed torque demand signals, and for applying said summed torque demand signals to said input port of said thruster selection and drive logic means;

a solar array;

solar array position indicating means for generating solar array position signals representative of the angular position of said solar array;

a thruster for changing the velocity of said spacecraft, said thruster, when operated to change said velocity of said spacecraft, creating a plume which impinges upon said solar array, and thereby creates an attitude disturbance torque which tends to perturb said attitude of said spacecraft;

said source of torque bias signals including a first input port coupled to said solar array position indicating means for receiving said solar array position signals, and a second input port for receiving predetermined Fourier coefficients representative of said attitude disturbance torque, for generating a Fourier series approximation of said attitude torque, and for applying signals representative of said Fourier series approximation of said attitude disturbance torque to said second input port of said coupling means.

5,687,934

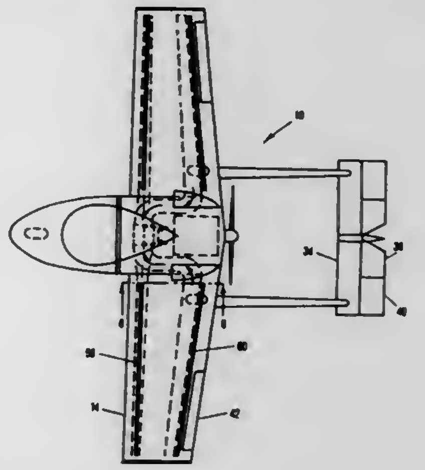
V/STOL AIRCRAFT AND METHOD

Phillip R. Owens, 1417 Kirby St., NE., Albuquerque, N. Mex. 87112

Filed Aug. 2, 1996, Ser. No. 691,471

Int. Cl.^{6} B64C *21/02*

U.S. Cl. 244—208 **10 Claims**



1. An aircraft comprising:

a fuselage;

at least two wings, one wing on the left side of the fuselage and one wing on the right side of the fuselage, each of said wings having a high lift airfoil shape, each of said wings having a first elongate tangentially slotted duct proximate a leading edge of said airfoil and a second elongate tangentially slotted duct proximate a trailing edge of said airfoil;

means for blowing high-pressure, high-velocity air through said first slotted duct along the upper surface of the wing and for sucking boundary layer air through said second slotted duct; and

said means for blowing and sucking air comprising two sections, the intake of a first section in fluid communication with the second slotted duct on the right wing and the output of said first section in fluid communication with the first slotted duct on the left wing, and a second section having its intake in fluid communication with the second slotted duct on the left wing and its output in fluid communication with the first slotted duct on the right wing;

whereby the simultaneous blowing and sucking of high-pressure air on each wing promotes laminar flow and increased lift for the aircraft.

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5,687,935
DEVICE FOR OPERATING SWITCHES

Gerald Durchschlag, Zeltweg, and Herbert Achleitner, Graz, both of Austria, assignors to VAE Aktiengesellschaft, Vienna, Austria

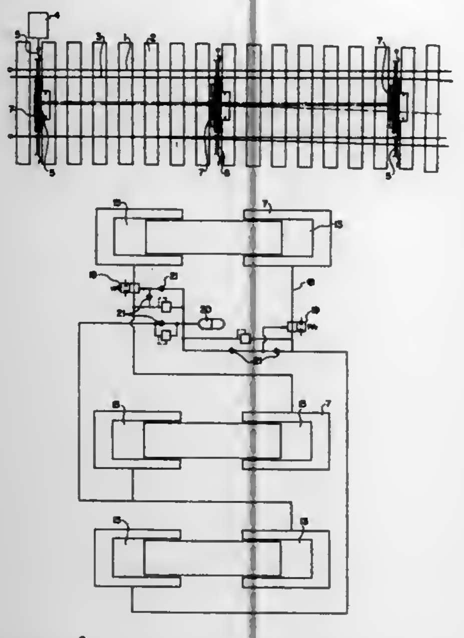
PCT No. PCT/AT95/00125, § 371 Date Feb. 23, 1996, § 102(e) Date Feb. 23, 1996, PCT Pub. No. WO96/00160, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 21, 1995, Ser. No. 601,035

Claims priority, application Austria, Jun. 24, 1994, 140/94; May 3, 1995, 758/95

Int. Cl.⁶ B61L *5/00*

U.S. Cl. 246—257 **9 Claims**



1. An arrangement for operating a rail switch having a mechanical switching device, said arrangement including a plurality of interlinked hydraulic switching devices separated in the longitudinal direction of the rails and each comprising a hydraulic cylinder/piston unit, at least one of said hydraulic switching devices being directly connected with the mechanical switching device, said units each having cylindrical volumes defined by the cylinder and the piston of the respective unit, said volumes of respective units being hydraulically interconnected whereby when a piston of one of said units is displaced relative to its cylinder in response to displacement of the mechanical switching device, thereby pumping fluid from one of the unit's cylindrical volumes in accordance with the piston's displacement, the pistons of the remaining units are displaced in the same direction.

5,687,936
GUTTER BRACKET

Dennis E. Wilson, 240 Desha Rd., Lexington, Ky. 40502

Filed Jun. 7, 1995, Ser. No. 483,751

Int. Cl.⁶ E04D *13/06*

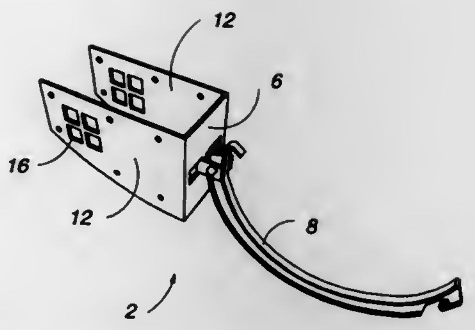
U.S. Cl. 248—48.2 **8 Claims**

1. A gutter bracket for mounting on a rafter extension with two side surfaces and an end surface, comprising:

a gutter support arm having a front end and a back end;

a central web connected to said back end, said web configured to cover a portion of the end surface of the rafter extension; and

two spaced apart flanges extending from said central web, said flanges configured for respective attachment to the two side surfaces of the rafter extension.



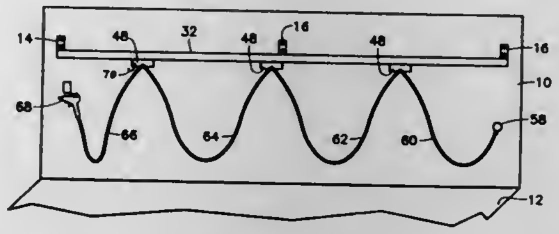
5,687,937
HOSE ORGANIZER

Amin E. Habib, 9036 Owensmouth Ave., Canoga Park, Calif. 91304

Filed Dec. 27, 1995, Ser. No. 578,948

Int. Cl.⁶ F16L *3/00*

U.S. Cl. 248—51 **2 Claims**



1. A hose organizer comprising:

an elongated rail adapted to be horizontally mounted on a wall surface spaced above a floor, said elongated rail having an elongated slot, said elongated slot dividing said elongated rail into a forward track and a rearward track; and

at least one carrier mounted on said elongated rail, said carrier connecting with and protruding exteriorly of said elongated slot, said carrier being capable of low frictional movement on said elongated rail by said carrier including a first pair of spaced-apart rollers mounted for rolling movement in said forward track and a second pair of spaced-apart rollers mounted for rolling movement in said rearward track, said carrier including a first hose connection and a second hose connection, said first hose connection connecting with a first length of hose, said second hose connection connecting with a second length of hose, pressurized air to be conducted though said first length of hose into said first hose connection and then into said second hose connection and into said second length of hose, whereby said first length of hose is to connect with a tool permitting movement of the tool along the wall surface without either said first or second length of hose coming in contact with the floor and said second length of hose to connect with a source of pressurized air.

5,687,938
ADJUSTABLE PIPE BRACE

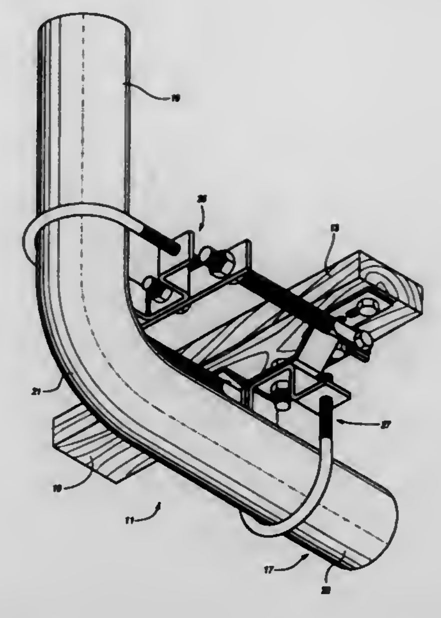
Michael E. Bailey, 1846 Rosemead, #250, Carrollton, Tex. 75007

Continuation-in-part of Ser. No. 452,354, May 26, 1995, Pat. No. 5,566,916. This application Mar. 5, 1996, Ser. No. 611,197

Int. Cl.⁶ F16L *3/22*

U.S. Cl. 248—74.1 **12 Claims**

1. An adjustable pipe brace for securing an antenna to a support surface, comprising:



a pipe having a vertical portion, a curved portion, and a horizontal portion;

a first U-bolt having a bight between a pair of legs;

a first clamp bracket, having a pair of wings, a pair of extension plates, attached to the wings, and a base attached between the extension plates;

a first pair of nuts for securing the first U-bolt to the wings of the first clamp bracket to hold the vertical portion of the pipe between the first U-bolt and the first clamp bracket; a first support plate;

a first nut and bolt combination for attaching the base of the first clamp bracket to the first support plate;

a first pair of screws for connecting the first support plate to the support surface;

a second U-bolt having a bight between a pair of legs;

a second clamp bracket, having a pair of wings, a pair of extension plates, attached to the wings, and a base attached between the extension plates;

a second pair of nuts for securing the second U-bolt to the wings of the second clamp bracket to hold the horizontal portion of the pipe between the second U-bolt and the second clamp bracket;

a second support plate;

a second nut and bolt combination for attaching the base of the second clamp bracket to the second support plate; and

a second pair of screws for connecting the second support plate to the support surface.

5,687,939
DUAL DISPLAY SYSTEM

Jerry Moscovitch, 59 Cowan Avenue, Toronto, Canada, M6K 2N1

Filed Apr. 26, 1996, Ser. No. 638,158

Int. Cl.⁶ F16L *3/00*

U.S. Cl. 248—122.1 **15 Claims**

1. A display system comprising:

a base;

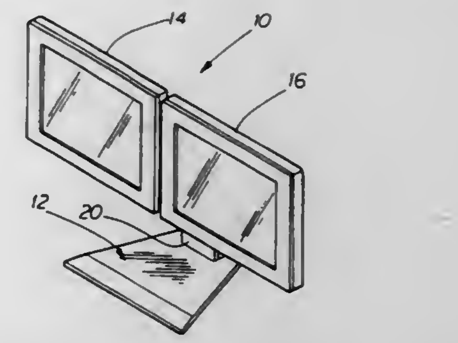
a pair of electronic displays, each of the displays having an operative angular orientation relative to horizontal;

positioning means for positioning the displays selectively in vertically registered relationship and in horizontally registered relationship, the positioning means comprising:

(a) an arm assembly supporting the displays;

(b) support means for supporting the arm assembly from the base selectively in a first orientation relative to the base in which the displays are in their vertically registered relationship and in a second orientation in which the displays are in their horizontally registered relationship; and,

(c) mounting means for mounting the displays to the arm assembly, the mounting means comprising means for adjusting the angular orientation of each of the displays relative to the arm assembly thereby to orient each of the displays in its operative angular orientation when the arm assembly is in either one of its first and second orientations.



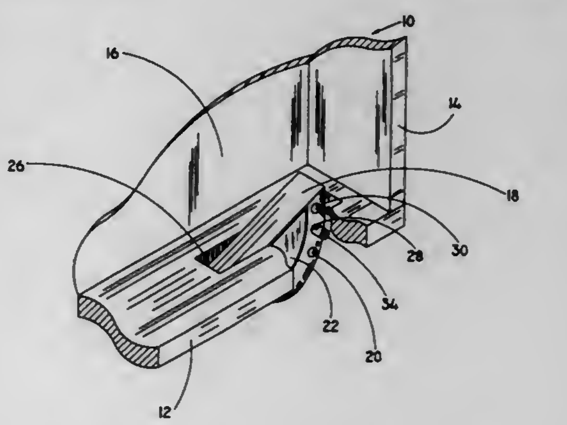
5,687,940
ADJUSTABLE FOOT FOR UPHOLSTERED FURNITURE

Rodney D. England, Tazewell, Tenn., assignor to England Corsair Upholstery Manufacturing Co., Inc., New Tazewell, Tenn.

Filed Jan. 22, 1996, Ser. No. 589,402

Int. Cl.⁶ F16M *11/24*

U.S. Cl. 248—188.2 **20 Claims**



1. A furniture foot for an upholstered seat comprising

a body having

a thickness,

a first end, and

a second end having a lower portion and a plurality of holes, and

a pin having two ends and a length greater than said thickness of said body,

whereby said pin may be inserted into one of said holes so each end protrudes from said body, said body may be located in a slot in a bottom of a frame member of an upholstered seat, with said protruding pin lodged in a groove in said frame member and said first end extending below said frame member outside of said slot, to form a foot on the upholstered seat.

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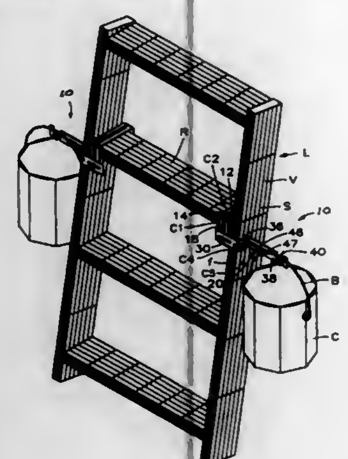
HANGING APPARATUS ADAPTED FOR ATTACHMENT TO A LADDER

Suzanne M. Quintile, 719 Salem La., Brunswick, Ohio 44212
Filed Oct. 23, 1995, Ser. No. 546,911
Int. Cl.^{6} E06C *7/14*
U.S. Cl. 248—210 **2 Claims**



1. A device for hanging a can of paint from a ladder at a point laterally outboard of a vertical member of the ladder, and with a paint can bail oriented generally parallel to rungs of the ladder so that the bail does not obstruct access to the can by a person on the ladder, the device comprising:

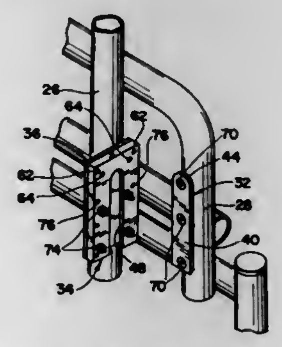
a ladder rung engaging member configured to fit over the top of a ladder rung, the ladder rung engaging member having adjustably interconnected rearward and forward sections, the rearward and forward sections each being generally L-shaped with a horizontal part and a vertical part extending downward and generally perpendicular to the horizontal part, the horizontal part of the forward section having an elongate slot in a central area, and the horizontal part of the rearward section aligned with and at least partially overlapping the horizontal part of the forward section, an adjustable fastener through the horizontal part of the rearward section and through the elongate slot in the horizontal part of the forward section, whereby a total length of the horizontal parts of the rearward and forward sections is selectively adjustable to span a top surface of the ladder rung, whereby the vertical part of the rearward section is positionable against a rear surface of the ladder rung, and the vertical part of the forward section is positionable against a front surface of the ladder rung, the vertical part of the forward section further comprising a structural rib formed in a central longitudinal area of the vertical part, and a flange at a bottom distal end which extends generally perpendicularly forward of the vertical part to form a supporting surface which is generally perpendicular to the vertical part and generally parallel to the horizontal part of the forward section,

a hanger arm having an inboard distal end adjustably attached to the bottom distal end of the vertical part of the forward section of the ladder rung engaging member to extend generally perpendicular from the vertical part of the forward section and laterally from the vertical member of the ladder, a bottom edge of the inbuard distal end of the hanger arm resting upon the flange at the bottom distal end of the vertical part of the forward section of the ladder rung engaging member, the inboard distal end of the hanger arm further comprising an elongate longitudinal slot intersected by a fastener which also intersects the bottom distal end of the vertical part of the forward section of the ladder rung engaging member whereby an extent to which the hanger arm extends laterally from the ladder rung engaging member is adjustable, the hanger arm further having an outboard distal end and an offset between the inboard distal end and the outboard distal end, the offset being generally perpendicular to the inboard and outboard distal ends and generally parallel the vertical member of the ladder on which the ladder rung engaging member is engaged, whereby the offset is positionable against an outside surface of the vertical member of the ladder by adjustment of the fastener through the slot in the inboard distal end of the hanger arm, whereby the vertical member of the ladder is effectively clamped between the ladder rung engaging member and the offset of the hanger arm, top and bottom edges of the outboard distal end of the hanger arm further comprising a paint can bail hook having a single tab offset from a plane of the outboard distal end and a notch on each side of the tab to form a channel for receiving the paint can bail and orienting the bail in a plane parallel with the outboard distal end of the hanger arm so that access to an interior of the can by the person standing on the ladder to which the device is attached is unobstructed by the bail.

5,687,942

SUPPORT SYSTEM

Ruben R. Johnson, 3609 W. Castile Ct., Peoria, Ill. 61615
Filed Jun. 2, 1995, Ser. No. 459,712
Int. Cl.^{6} F16B *3/00*
U.S. Cl. 248—223.41 **19 Claims**



1. A support system for detachably mounting an article on a support structure, comprising:

a bracket plate including a key-way having side walls diverging from a front face of the bracket plate to a rear face thereof, the key-way extending entirely through the bracket plate between said face and including an entry mouth opening at an edge of the bracket plate;

a supporting key adapted to be attached to said article, the supporting key being positionable through the entry mouth of said key-way and having side walls converging from a front face of the key to a rear face thereof for mating proximity to the diverging side walls of the key-way; and

a support plate attached to one of the bracket plate and the supporting key at the rear face thereof.

5,687,943

APPARATUS FOR SUPPORTING A VIDEO CAMERA AND CABLE ABOVE A WORK SURFACE

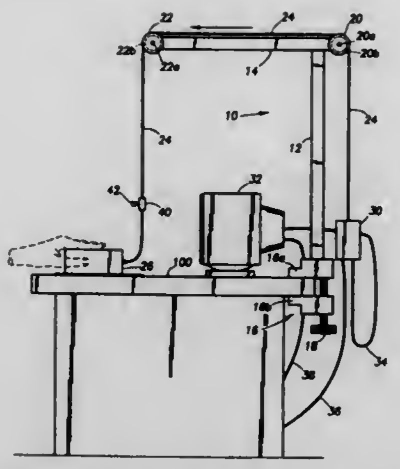
Pleasant W. Campbell, 5050 Ambassador Way, Ste. 215, Houston, Tex. 77056
Filed Jan. 19, 1996, Ser. No. 588,717
Int. Cl.^{6} A47H *1/10;* **G03B** *17/00*
U.S. Cl. 248—331 **4 Claims**

1. For use with a video camera means including a video camera that transmits magnified images of an object or printed text on a work surface elevated above a floor via a cable to a video monitor, an apparatus for supporting the cable above the work surface, comprising:

an elongated leg;

an elongated arm connected at an angle to said leg;

means for mounting said leg to the elevated work surface in a vertically extending position rotatable about its longitudinal axis to pivotally move said arm over the work surface;

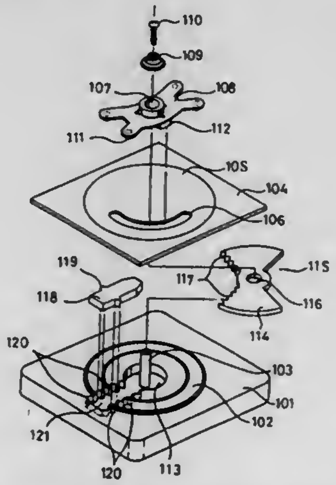


means mounted to said arm for supporting the cable above the work surface and enabling the cable to move along the arm so that the camera may be positioned to scan objects or printed text on the work surface.

5,687,944

ANGLE CONTROLLER FOR IMAGE DISPLAY

Young-ho Shon, Seoul, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea
Filed Aug. 4, 1995, Ser. No. 511,127
Claims priority, applilcation Rep. of Korea, Aug. 6, 1994, 1994-19403
Int. Cl.^{6} A47G *29/00*
U.S. Cl. 248—349.1 **5 Claims**



1. An angle controller for an image display which is controlled to rotate by a predetermined angle as a detaching/attaching device rotates, said controller comprising:

first angle controlling means for controlling the angle of said rotating detaching/attaching device clockwise and counterclockwise about a vertical axis by a rotating piece; and

second angle controlling means for controlling the angle of said first angle controlling means, said first angle controlling means comprising:

a rotating hole formed in a hemispherical support portion;

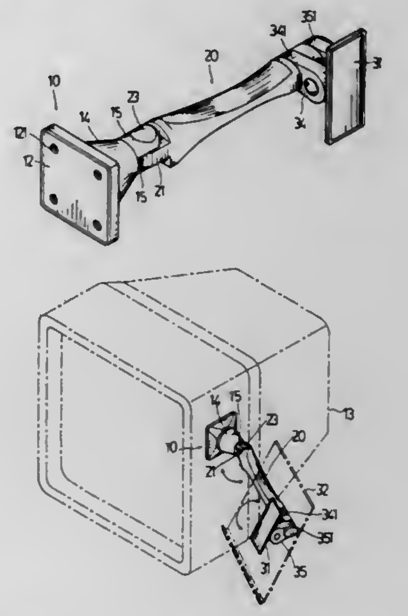
a control hole formed on said rotating piece to be rotatably inserted into said rotating hole and for controlling a rotating protrusion of said detaching/attaching device from rotating above a predetermined angle; and

a rotating means for making said rotating piece rotate wherein rotating the image display is limited when rotating protrusion contacts one side of the control hole formed on the rotating piece.

5,687,945

ADJUSTABLE COPY HOLDER MOUNTING BASE AND SUPPORTING ARM ASSEMBLY

Chi-Hsien Lee, Taichung, Taiwan, assignor to Chi Lung Sheng Industrial Co., Ltd., Taichung, Taiwan
Filed Jul. 16, 1996, Ser. No. 680,818
Int. Cl.^{6} B41J *11/02*
U.S. Cl. 248—442.2 **6 Claims**



1. An adjustable copy holder mounting base and supporting arm assembly comprising:

a mounting base adapted for fastening to a shell of a computer monitor, said mounting base comprises two upright parallel lugs extending from a top thereof, each of said parallel lugs comprising a recess, and a through hole extending through a center of said recess;

a supporting arm baving a first end terminating in a flat coupling block inserted in between the lugs of said mounting base and secured thereto by a male button and a female button, and a second end adapted for coupling to a face plate holder, the flat coupling block of said supporting arm comprising a through hole at a center connected between the through holes of the parallel lugs of said mounting base, a smoothly arched flange extending from one side around the through hole of said flat coupling block and defining a mouth, two pairs of parallel transverse flanges bilaterally extending outwardly from two opposite ends of said smoothly arched flange and defining a receiving chamber, a toothed locating member mounted in said receiving chamber and meshed with said female button, said female button comprising an externally toothed socket inserted into the one recess through hole of said mounting base and meshed with said toothed locating member to hold said supporting arm in position, said male button comprising a stud inserted through the other recess through hole and fitted into the externally toothed socket of said female button; and

a face plate holder secured to the second end of said supporting arm for holding copies, said face plate holder comprising a face plate mount adapted for holding a face plate for holding copies and having a coupling block at a back side, a first fastening device and a second fastening device fastened together and fixed to the second end of said supporting arm to hold said face plate mount, the coupling block of said face plate mount comprising a center through hole, an axial split in communication with the center through hole of the coupling block of said face plate mount, two annular open chambers around two opposite ends of the center through hole of the

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coupling block of said face plate mount, and a plurality of teeth within the center through hole of the coupling block of said face plate mount adjacent to said axial split, said first fastening device having one end fixed to the second end of said supporting arm, and an externally toothed socket perpendicularly disposed at an opposite end inserted into the center through hole of the coupling block of said face plate mount and forced into engagement with the teeth of the coupling block thereof, said second fastening device having one end fixed to the second end of said supporting arm, and a stud perpendicularly disposed at an opposite end and inserted into the center through hole of the coupling block of said face plate mount and fitted into the externally toothed socket of said first fastening device.

5,687,946

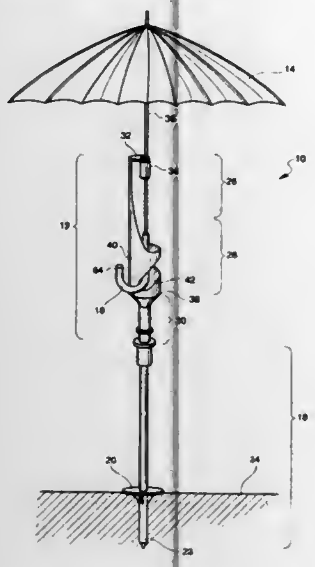
UMBRELLA COUPLER AND ACCESSORIES THERETO

Donald D. Cho, 823 Milton Rd., Inverness, Ill. 60067

Filed Apr. 7, 1995, Ser. No. 418,796

Int. Cl.⁶ F16M *13/00*

U.S. Cl. 248—530 **15 Claims**



1. An umbrella coupler for the support of an umbrella having a shaft and either a J-shaped or vertically orientated handle at a lower end of said shaft, said umbrella coupler comprising:

an umbrella coupler assembly having a lower portion, a seat surface supported by said lower portion, a middle wall portion upon or bordering said seat surface, an upper portion, and an arm extending from said upper portion, said middle wall portion at least partially extending upwardly from said seat surface to said upper portion and further having an opening dimensioned to receive and support a J-shaped umbrella handle,

and a partial ring structure connected to said arm capable of achieving an open and closed position for selective vertical support of said shaft of said umbrella, said partial ring structure forming a receiving C-shaped mouth when in said open position and forming a retention ring when in said closed position.

5,687,947

MOUNTING METHOD

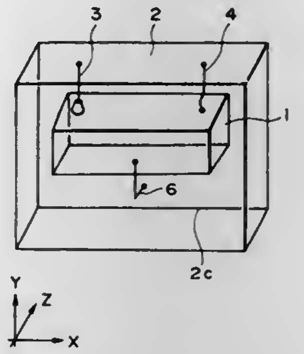
Kazunori Iwamoto, Yokohama; Shunichi Uzawa, Tokyo; Takao Kariya, Hino; Ryuichi Ebinuma, Kawasaki; Hiroshi Chiba, Yamato, and Shinkichi Ohkawa, Ibaraki-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 48,058, Apr. 19, 1993, abandoned, which is a continuation of Ser. No. 841,295, Feb. 28, 1992, abandoned, which is a continuation of Ser. No. 385,363, Jul. 27, 1989, abandoned. This application Apr. 17, 1995, Ser. No. 422,932

Claims priority, application Japan, Aug. 2, 1988, 63-192193; Sep. 30, 1988, 63-246314

Int. Cl.⁶ F16M *13/00*

U.S. Cl. 248—612 **3 Claims**



1. An apparatus comprising:

a container, which is capable of having its inside pressure reduced;

an instrument which is hingedly suspended within said container from an surface of said container by a first supporting member and a second supporting member, and a third supporting member supporting a lower portion of said instrument in said container;

said first supporting member comprising a rod with a reduced diameter portion adjacent a longitudinal central portion thereof, said rod being rotatable relative to said upper surface such that said instrument can rotate relative to said upper surface;

said second supporting member comprising two parallel leaf springs, said leaf springs being movable relative to said upper surface along a linear path such that said instrument can move relative to said upper surface along said linear path; and

said third supporting member comprising a spherical seat mechanism.

5,687,948

VIBRATION ISOLATION SYSTEM INCLUDING A PASSIVE TUNED VIBRATION ABSORBER

Gerald P. Whiteford, Waterford, and Paul T. Herbst, Erie, both of Pa., assignors to Lord Corporation, Cary, N.C.

Filed Sep. 26, 1995, Ser. No. 533,824

Int. Cl.⁶ F16M *13/00*

U.S. Cl. 248—635 **20 Claims**

1. An isolation system for reducing a vibration transmitted from a vibrating member such as an engine into a structure at an operating frequency f_o or within a narrow frequency range about f_o, said isolation system comprising:

(a) an elastomeric mount including:

(i) an outer member with means for attachment to said vibrating member;

(ii) an inner member with means for attachment to said structure;

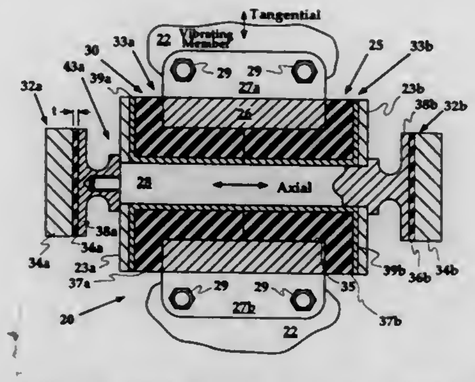
(iii) a flexible elastomer section interconnected between said outer member and said inner member thereby allowing relative movement between said inner member and said outer member and static load carrying therebetween; and

(b) two passive tuned vibration absorbers each exhibiting a same resonant frequency f_r which are attached directly to said inner member of said elastomeric mount, each said passive tuned vibration absorber including:

(i) a free-floating tuning mass;

(ii) a rigid member disposed adjacent said tuning mass and directly attached to said inner member;

(iii) a shear elastomer spring interconnected between said rigid member and said tuning mass, said shear elastomer spring and said tuning mass being selected such that said resonant frequency f_r is less than said operating frequency f_o, said shear elastomer spring stressed in operation to be loaded in substantially pure shear and said resonant frequency f_r of said two passive vibration absorbers being tuned such that a ratio of f_r/f_o is in the range between about 0.90 and 0.99.



5,687,949

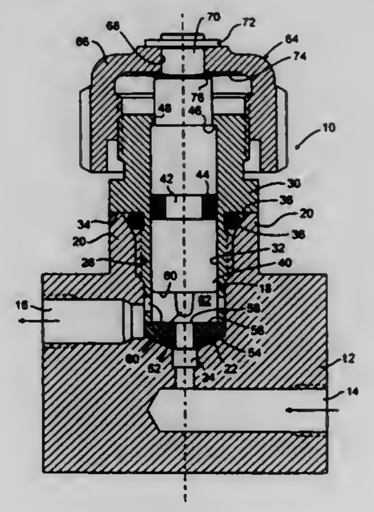
GAS FLOW REGULATOR VALVE

Sander G. Dukas, Virginia Beach; Kevin S. Bailey, Hampton; Robert N. Cooper, and Michael D. Heck, both of Virginia Beach, all of Va., assignors to Controls Corporation of America, Virginia Beach, Va.

Filed Apr. 26, 1996, Ser. No. 638,228

Int. Cl.⁶ F16K *1/38*

U.S. Cl. 251—122 **13 Claims**



1. A fluid control valve assembly comprising

a valve body having a bore formed therein terminating in an end wall and a counterbore coaxial with said bore and having internal threads formed therein,

a valve guide having a cylindrical valve chamber formed therein, said valve guide having first and second external thread means thereon with said first external threads engaging the internal threads in said counterbore for mounting said valve guide on said valve body,

an inlet port in said valve body communicating with said bore,

an outlet port in said valve body,

a fluid passage coaxial with said valve chamber and said bore extending from said end wall and communicating with said outlet port,

a non-rotating valve stem mounted in said valve guide chamber for axial movement therein, said valve stem having an outer end extending outwardly from said valve guide and an inner end having a substantially radial face and a valve needle integrally formed on and projecting axially from said substantially radial face coaxially with said valve chamber and said valve stem,

a valve seat mounted within said valve chamber, said valve seat having a first surface complementary to and engaging said end wall and a second generally radial surface disposed in opposition to said substantially radial face,

a metering orifice formed in and extending through said valve seat in coaxial relation with said valve stem and said valve needle, said metering orifice communicating with said fluid passage and being dimensioned to receive and cooperate with said needle valve to provide flow control through the valve from said inlet port to said outlet port when said valve stem is moved from the closed position and to engage and provide a seal with the valve needle when the valve stem is in the closed position, and

actuator wheel means axially fixed on the outer end of said valve stem for substantially free rotation thereon, said actuator wheel means including internal thread means engaging and cooperating with said second external thread means on said valve guide whereby rotation of the actuator wheel means will produce axial movement of the valve stem to move the valve stem between the open and closed positions.

5,687,950

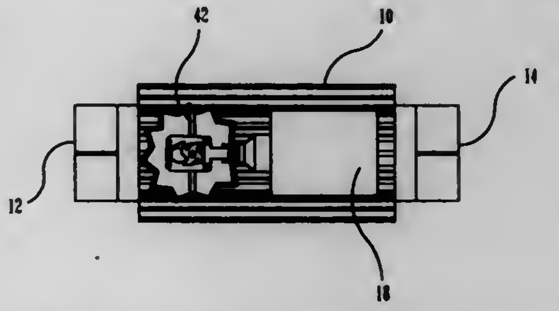
FIBER OPTIC LINKED FLUID BLOCK SYSTEM

Jeffery Woodcock, 50 Penny Rd., Crawfordville, Fla. 32327

Filed Oct. 30, 1995, Ser. No. 550,026

Int. Cl.⁶ F16K *31/04;31/53*

U.S. Cl. 251—129.2 **19 Claims**



1. A fiber-optic linked fluid block apparatus comprising:

a fluid chamber disposed in the fluid flow path of the fluid line;

a block valve means, disposed within the fluid chamber, for permitting fluid flow and blocking fluid flow through the fluid chamber;

a ratchet gear, having four evenly spaced apart teeth, connected to the block valve means;

a solenoid having a shaft and return spring;

a first ratchet arm, having a first end attached to the shaft, a second end, and a tooth located therebetween;

a second ratchet arm, having a first end attached to the shaft, a second end, and a tooth located therebetween;

a spring attached between the second end of the first ratchet arm and the second end of the second ratchet arm;

a control means for electronic control of the solenoid; and

a fiber optic means for electronically linking the solenoid with the control means.

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5,687,951
DRAIN VALVE

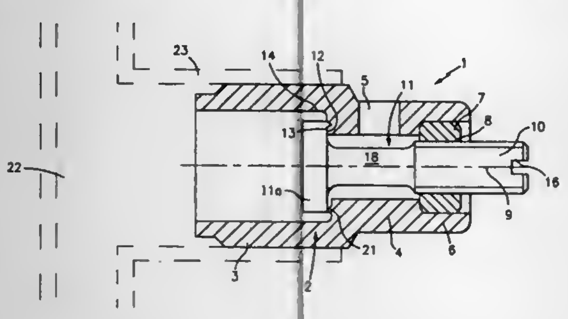
Michael Bamberger, Gailingen, Germany, and Erasmao Porfido, Schaffhausen, Switzerland, assignors to Georg Fischer Management AG, Schaffhausen, Switzerland

Filed Aug. 11, 1995, Ser. No. 514,395

Claims priority, application Germany, Aug. 11, 1994, 44 28 453.5

Int. Cl.^{6} F16K ***51/00***

U.S. Cl. 251—145 **18 Claims**



1. A drain valve for draining a thermoplastic polymer fluid flow line component, said drain valve comprising:

an elongate thermoplastic polymer valve housing including a first end with an opening and an opposed second end with an opening, a conduit connection portion extending from the first end to a point intermediate the length of the valve housing and a valve mounting portion extending from the conduit connection portion to the second end, a longitudinally extending stepped interior passageway extending from the opening in the first end to the opening in the second end having an intermediate step shoulder therein defining a bearing surface facing the first end opening, a drain channel defined in the valve mounting portion of the housing and intersecting the passageway between the intermediate step shoulder and the second end, and a valve member including a piston portion having a sealing surface and a rod portion mounted for reciprocal movement in said passageway and movable between a normally closed position wherein the sealing surface on the piston portion is sealingly engaged against the bearing surface and an open position wherein said sealing surface is spaced from the bearing surface, the conduit connection portion being configured to provide a sealed and fused non-threaded engagement with the thermoplastic fluid flow line component.

5,687,952
WATER FAUCET POPPET VALVE

Don C. Arnold, Buffalo Grove, Ill., and Mario Semchuck, Chatsworth, Calif., assignors to Wave Corporation, Lincolnshire, Ill.

Filed Oct. 11, 1995, Ser. No. 540,644

Int. Cl.^{6} F16K ***31/00***

U.S. Cl. 251—335.3 **9 Claims**

1. A water faucet comprising:

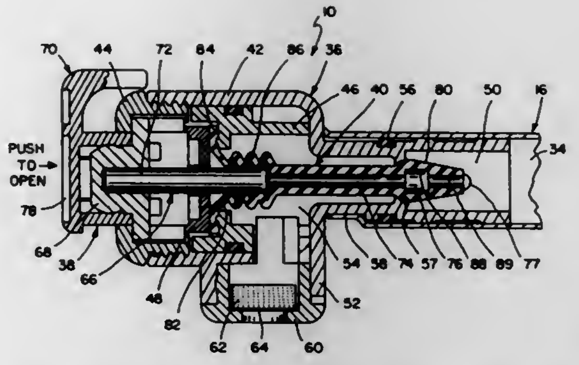
base means for supporting said faucet;

a spout including a lower end supported by said base means and an upper end; and

a poppet valve assembly supported by said upper end of said spout, said poppet valve assembly including:

a housing defining a chamber having an inlet in fluid communication with said spout and an outlet in fluid communication with said inlet, said inlet having a chamber side and an inlet side opposite said chamber side, said inlet defining an inlet valve seat external to said chamber and on said inlet side of said inlet;

a valve stem supported within said housing for reciprocal, linear movement; and



a valve seal fitted over said valve stem and including a base portion supported by and sealed to said housing on said chamber side of said inlet, said valve seal further including a valve portion extending through said inlet from said chamber side to said inlet side and moving with said stem for selective seating on said inlet valve seat, said valve seal being unapertured between said base portion and said valve portion to prevent water within said chamber from engaging said valve stem within said valve seal, said valve seal further including a bellows portion between said base portion and said valve portion for biasing said valve portion toward said base portion to assist in seating said valve portion on said inlet valve seat.

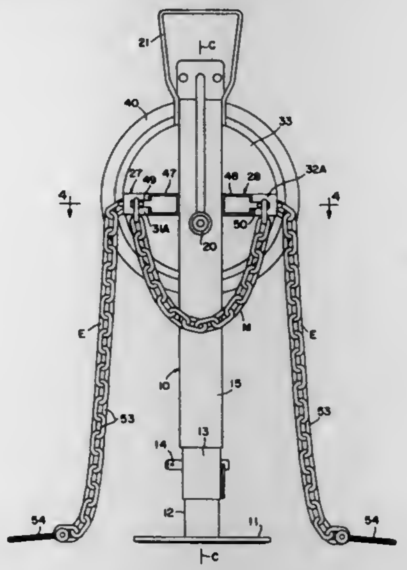
5,687,953
JACK APPARATUS

Anthony R. Huppert, Baldwin, Wis., assignor to Team Oil Inc., Spring Valley, Wis.

Filed Aug. 7, 1996, Ser. No. 692,956

Int. Cl.^{6} B66F ***3/36***

U.S. Cl. 254—133 R **13 Claims**



1. Jack apparatus for vertically elevating an object, the jack apparatus comprising a base, a tubular housing having a top portion, the housing top portion having transversely opposite first and second side portions, a rear portion and a front portion forwardly opposite the rear portion, first means mounted to the base for selectively elevating the tubular housing, a tire mount mounted to the tubular housing front portion, a resilient tire mounted to the tire mount to extend further horizontally more remote from the tubular housing than the tire mount for abutting against the object to be elevated, and second means mounted to the tubular housing and adapted for attachment to the object to be elevated to act in cooperation with the tire to elevate the object.

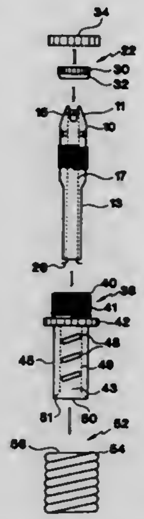
5,687,954
FLEXIBLE CONDUIT INSTALLATION GUIDE APPARATUS

Brad Schroeder, 101 W. Avenida de los Arboles, #101, Thousand Oaks, Calif. 91360

Filed Apr. 17, 1996, Ser. No. 633,895

Int. Cl.^{6} H02G ***1/08***

U.S. Cl. 254—134.3 FT **12 Claims**



1. An apparatus for allowing one person to use a pulling rope to transport and then secure a flexible conduit to a utility box having at least one flexible conduit receiving opening, wherein the flexible conduit is threadingly mated to a flexible conduit connector having a first end and a second end and a center bore, the connector including a male-threaded shank proximately located to the first end, a male-threaded neck for coupling to the flexible conduit and being disposed near the second end, a securing nut adapted to threadingly mate with the male-threaded shank, the apparatus comprising:

an elongated body having a longitudinal axis, a first end and a second end, an exterior shell, and a substantially hollow cavity within the shell;

a substantially u-shaped spring disposed in the hollow cavity, the spring having a base portion near the first end of the body and two depending leg members, each leg member having a hooked end located proximate the second end of the body for hooking the second end of the flexible conduit connector; and

a rope securing member disposed near the first end of the body for coupling to a pulling rope for transporting the apparatus when coupled to the flex conduit connector.

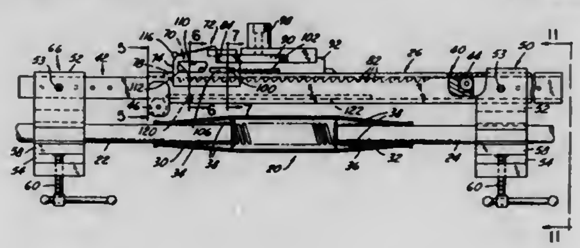
5,687,955
PRETENSIONING DEVICE FOR AUTOMATIC LINE SPLICE

Ralph G. Bonser, Livonia; Mitchell D. Charneski, Southfield; Daniel J. Dunlop, Sterling Heights, and Gerry E. McDonnell, Plymouth, all of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Feb. 12, 1996, Ser. No. 600,201

Int. Cl.^{6} B66F ***3/02***

U.S. Cl. 254—237 **6 Claims**



1. A pretensioning device for causing the jaws of an automatic line splice to exert a strong grip on the ends of two cables inserted in opposite ends of the automatic line splice by pulling outwardly on the cables relative to the automatic line splice, said pretensioning device comprising:

an elongated tube,

a clamp on said tube adapted to grip one of the cables,

an elongated rack within said tube and slidable lengthwise thereof,

a clamp on said rack adapted to grip the other of said cables,

said rack having a series of teeth spaced apart along the length thereof,

a sled mounted on said tube for movement lengthwise thereof and having a dog engageable with any one of the teeth on said rack, and

means on said tube for moving the sled in one direction lengthwise of the tube while the dog engages a tooth of the rack to extend the rack relative to the tube, said means for moving the sled comprising a cam.

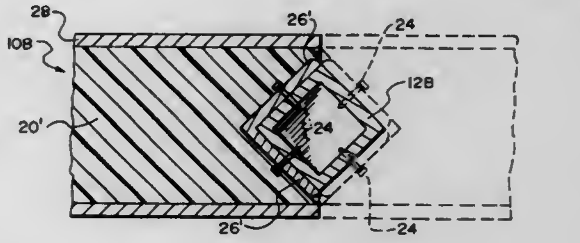
5,687,956
POST-AND-PANEL BUILDING WALLS

Dale E. Vesper, 5654 Oceanic Rd., Holiday, Fla. 34690

Division of Ser. No. 179,848, Jan. 11, 1994, Pat. No. 5,509,640, which is a continuation-in-part of Ser. No. 835,241, Feb. 12, 1992, Ser. No. 912,895, Jul. 13, 1992, abandoned, and Ser. No. 14,640, Feb. 8, 1993, Pat. No. 5,421,558, said Ser. No. 835,241is a continuation-in-part of Ser. No. 178,261, Apr. 6, 1988, Pat. No. 5,184,808, and Ser. No. 455,061, Dec. 22, 1989, Pat. No. 5,129,628. This application Jan. 18, 1996, Ser. No. 588,138

Int. Cl.^{6} E04H ***17/16***

U.S. Cl. 256—31 **7 Claims**



1. Post-and-panel wall structure comprising

upright tubular metal posts having a substantially square transverse cross-section and being arranged in-line and spaced a panel length apart and anchored at their bottom ends, and

in-line wall panels intervening from post to post and having abutting vertical edges recessed to accommodate half the in-line plan extent of adjacent individual posts as viewed in plan, thereby concealing the posts between the level of the top edge to the level of the bottom edge of the abutting panels as viewed in elevation,

wherein the panels include a horizontal reinforcing member extending substantially the entire panel length between vertical side edges thereof and including fastener means securing the ends of the horizontal reinforcing member to the respective adjacent posts, and each end of the horizontal reinforcing member has a lip swaged to conform to the post shape, and the fastening means secures each lip to the respective adjacent post.

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5,687,957

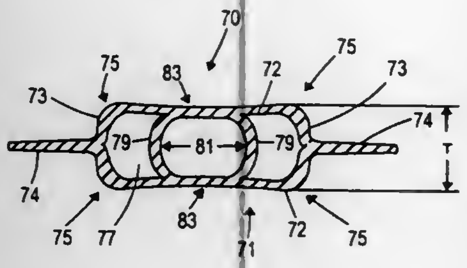
FENCE SLAT INSTALLATION AND CONSTRUCTION

Harvey Finkelstein, Washington Township, N.J., assignor to Tri-Seal International, Inc., Blauvelt, N.Y.

Filed Jun. 19, 1996, Ser. No. 667,034

Int. Cl.^{6} B21F *27/00*

U.S. Cl. 256—34 **17 Claims**



1. Slat apparatus for use with a fence of the type having linking wires which form knuckles and define a plurality of slat receiving channels therebetween, comprising a plurality of slat members for positioning in said slat receiving channels, respectively, each of said slat members including an elongated body member having opposing sides and opposing end portions, an intersection of an end of a respective opposing side and an end of a respective opposing end portion forming a shoulder so that the elongated body member has opposing pairs of said shoulders, each pair of said shoulders having a first thickness, the elongated body member further having a pair of flexible and resilient wing portions of substantially the same width, each wing portion extending from each of said end portions of said elongated body member, wherein outer ends of said wing portions are sufficiently thin so as to enable said wing portions to flex around the fence knuckles and extend beyond said slat receiving channels such that substantially no space remains between the wing portions of the adjacent slat members when positioned in the slat receiving channels of the fence, said elongated body member being hollow and having at least two ribs therein, the ribs being curved in shape such that concave surfaces of the ribs face each other and the ribs extend the length of the elongated body member, and wherein each of said opposing sides is curved in shape so that the first thickness of each of the pairs of said shoulders is greater than a second thickness of said elongated body member at a midpoint thereof.

5,687,958

METALLIC DAMPING BODY

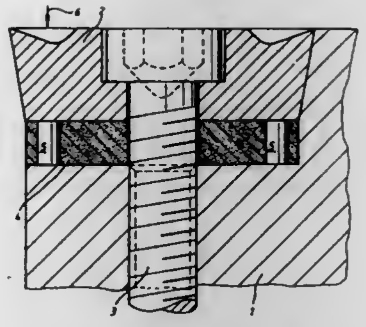
Rainer Renz, Stuttgart, and Johann Krämer, Leonberg, both of Germany, assignors to Mercedes-Benz AG, Germany

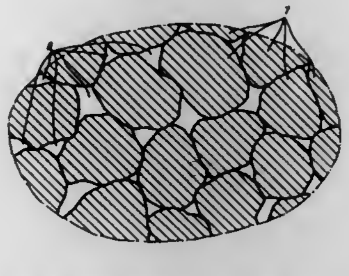
Filed Aug. 28, 1992, Ser. No. 936,296

Claims priority, application Germany, Aug. 28, 1991, 41 28 465.8

Int. Cl.^{6} F16M *1/00;* **C22C** *43/00*

U.S. Cl. 267—136 **8 Claims**





1. A shape-memory alloy metallic damping body for damping periodically alternating loads, comprising a multiplicity of closely adjacent, small and uniformly distributed hollow spaces, which together make up at least about 5% of the total volume of the damping body, arranged in an interior of the damping body.

5,687,959

HYDRAULICALLY DAMPING RUBBER BEARING

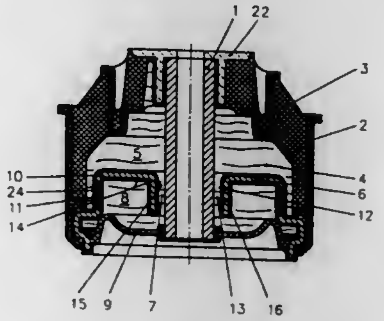
Axel Rudolph, Bensheim, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Filed Apr. 23, 1996, Ser. No. 636,357

Claims priority, application Germany, Apr. 29, 1995, 195 15 838.5

Int. Cl.^{6} F16F *13/00*

U.S. Cl. 267—140.12 **12 Claims**



1. A hydraulically damping rubber bearing comprising:

(a) an inner supporting body;

(b) an outer supporting body surrounding the inner supporting body with radial clearance between the inner supporting body and the outer supporting body;

(c) a resilient elastomeric element positioned between the inner supporting body and the outer supporting body and joining the inner supporting body to the outer supporting body;

(d) a separating wall separating a working chamber from a compensating chamber, the separating wall comprising at least one opening allowing damping fluid to flow between the working chamber and the compensating chamber; and

(e) a compensating membrane sealing the compensating chamber on a side facing away from the separating wall; wherein the opening of the separating wall is a centrally arranged opening which surrounds the inner supporting body with radial clearance thereby forming an annular gap which acts as a damping duct, and wherein the separating wall comprises at least one window with a window membrane made of elastomeric material positioned in the window.

5,687,960

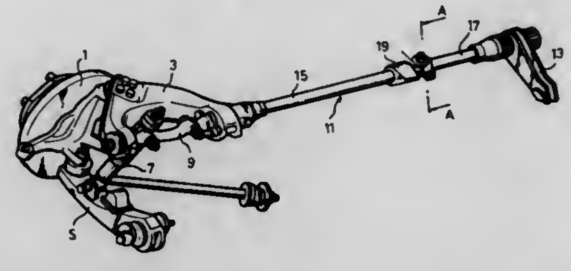
TORSION BAR ASSEMBLY FOR VEHICLE SUSPENSION SYSTEM

Tae Jin Moon, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Apr. 12, 1996, Ser. No. 631,425

Int. Cl.^{6} B60G *11/18;* **F16F** *1/14*

U.S. Cl. 267—273 **1 Claim**



1. A torsion bar assembly for use in a vehicle suspension system, the assembly comprising:

an elongated torsion bar having axially adjacent sections, one section being more rigid than the other;

a protruding bracket fixed to the torsion bar proximate the meeting point between two sections of the torsion bar;

a stop fixed to the vehicle and disposed to engage the protruding bracket when torsional faces acting on the torsion bar exceed a predetermined level;

wherein said stop includes a flange fixed to the vehicle body, a stopper bolt threadably disposed in a bore in the flange, and a clamp fixed to the flange and encircling the torsion bar to retain the protruding bracket in position to engage the bolt without restricting rotation of the torsion bar.

5,687,961

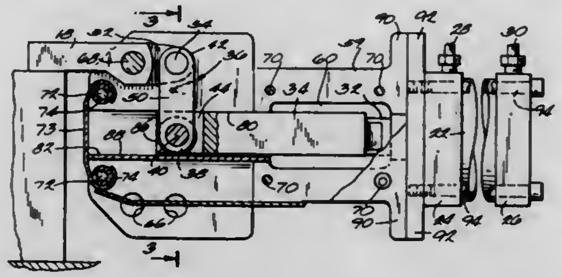
FLUID OPERATED CLAMP INCLUDING INTEGRAL FRAME AND SLIDE MEMBER SUPPORT

Edward R. Horn, Oconomowoc, Wis., assignor to Aladdin Engineering & Manufacturing, Inc., Waukesha, Wis.

Filed Nov. 30, 1995, Ser. No. 572,606

Int. Cl.^{6} B23Q *3/08*

U.S. Cl. 269—32 **1 Claim**



1. A clamp for engaging a portion of a workpiece for holding the workpiece in place, the clamp comprising:

a fluid actuated piston and cylinder assembly including a reciprocating piston having a projecting end movable between a retracted position and an extended position,

a clamp arm supported for pivotal movement and having a moving end for clampingly engaging a workpiece,

a link assembly including spaced apart link members, each link member having opposite ends, one of the opposite ends of each link member pivotally connected to the clamp arm for causing movement of the clamp arm and the other of the opposite ends of each link member being connected to the piston for slideable movement with the piston,

a support for supporting the clamp arm for pivotal movement, the support including a pair of spaced apart tracks, and

means for supporting the other of the opposite ends of each link member for movement between a retracted position wherein the clamp arm is in a first position and an extended position wherein the clamp arm is in a second position, the means for supporting the other of the opposite end of each link member including a roller and a drive member, the drive member fixed to the end of the piston and having spaced apart arms, wherein the other of the opposite ends of each link member is positioned between the arms of the drive member, and wherein the spaced apart tracks slideably support the arms of the drive member therebetween.

5,687,962

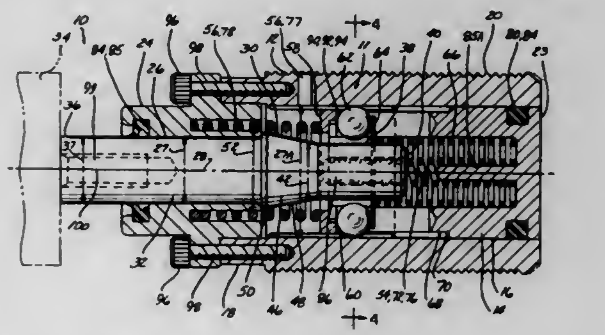
BEARING LOCKING MECHANISM, WORK SUPPORT

Lloyd D. Goodrich, 28111 Shock, St. Clair Shores, Mich. 48081

Filed Jun. 7, 1995, Ser. No. 474,361

Int. Cl.^{6} B23Q *3/00*

U.S. Cl. 269—317 **29 Claims**



1. A work support, comprising:

a body having a first end, a second end, and an inner wall, said inner wall defining a body bore having a diameter, which body bore extends from the first end toward the second end;

a nose cap attached to and partially closing the first end, said nose cap forming a nose cap opening having a diameter smaller than the body bore diameter, wherein the nose cap opening and the body bore are each formed about a longitudinal axis of the body;

a pin assembly, comprising:

  a cylindrical pin for receiving a work piece load, slidably fitting into the body bore, having a first portion with a first portion diameter approximating the nose cap opening diameter, a second portion with a second portion diameter less than the first portion diameter, and a middle portion defining a pin ramp connecting the first and second portions, the pin ramp having a terminal end formed toward the first portion, the terminal end having a diameter larger than the nose cap opening;

  a pin return device, positioned between the second portion of the pin and the second end of the body, for proper longitudinal pin positioning upon resetting of the pin; and

  a reset system, positioned between the nose cap and a cage cap, to reset a bearing assembly; and

a bearing assembly positioned in the body bore, comprising:

  a plurality of roller bearings circumferentially spaced about a cross sectional plane of the body bore, so as to contact the pin ramp and the inner wall of the body, upon rotation of the bearings toward the first end of the body;

  a shim plate positioned between the bearings and the second end of the body;

  a ball retention spring positioned between the shim plate and the second end of the body, to maintain a positive contact between the shim plate and the bearings; and

  a cage assembly for retaining bearings in position for longitudinal movement, comprising:

    a cage engaging the bearings from the second end of the body, which cage includes a barrier that encloses the second end of the body; and

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a cage cap attached to the cage between the bearings and the first end of the body so as to capture the bearings between said cage cap and said shim plate.

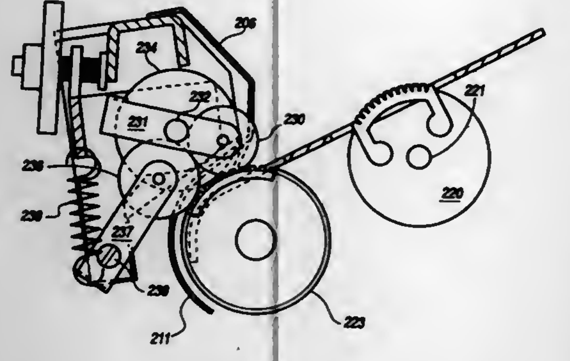
5,687,963
METHOD AND APPARATUS FOR DISCRIMINATING AND COUNTING DOCUMENTS

Douglas U. Mennie, Barrington, Ill., assignor to Cummison-Allison Corp., Mt. Prospect, Ill.

Continuation of Ser. No. 340,031, Nov. 14, 1994. This application May 26, 1995, Ser. No. 450,505

Int. Cl.^{6} B65H *3/06*

U.S. Cl. 271—119 **26 Claims**



1. In a currency handling apparatus wherein an input bin is provided for accepting a stack of bills from which bottom bills are to be successively fed in single file in a given feed direction along a bill transport path, a feed arrangement comprising:

a bill supporting surface for supporting a stack of bills;

a stripping wheel having a circumference, said stripping wheel projecting through said bill supporting surface so as to contact said stack of bills, said stripping wheel having a raised surface along only a portion of its circumference such that during rotation of said stripping wheel said raised portion intermittently engages the lowermost bill of the stack of bills; and

means for ensuring that when the stripping wheel is stopped, the raised portion of its circumference is below the bill supporting surface.

5,687,964
DEVICE FOR CONTACTLESS GUIDANCE OF SHEETLIKE MATERIAL

Günter Stephan, Wiesloch-Baiertal; Richard Mack, Brühl; Peter Thoma; Joachim Herrmann, both of Mannheim; Gerd Raasch, Sandhausen; Michael Szeidl, Bammental, and Jürgen Zeltner, Hirschberg, all of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

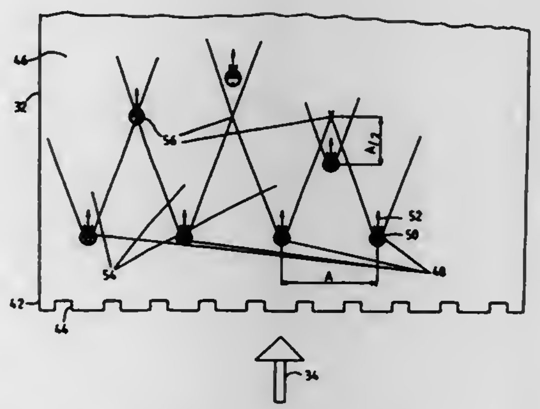
Filed Aug. 3, 1995, Ser. No. 510,977

Claims priority, application Germany, Aug. 3, 1994, 44 27 448.3

Int. Cl.^{6} B65H *29/24*

U.S. Cl. 271—195 **34 Claims**

1. Device for contactless guidance of sheetlike material being dragged along a travel path, comprising a guide surface member extending spaced from the travel path and being provided with air-blowing nozzles, said guide surface member having first and second side edges and a guide zone formed between said first and second side edges the air-blowing nozzles within said guide zone being disposed in a manner that a common flow pattern formed during guidance of the sheetlike material is determined essentially by a first velocity component in a direction of motion of the material along the travel path, by a second velocity component directed towards said first side edge, and a third velocity component directed towards said second side edge.



5,687,965
SHEET SUPPLYING DEVICE

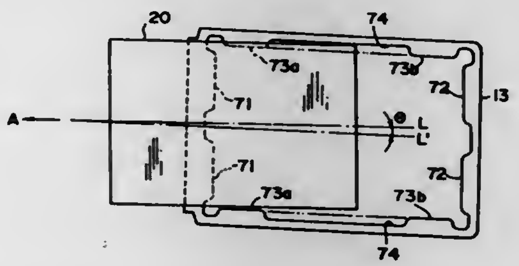
Naoyuki Matsuda; Hajime Takei; Homare Sano, all of Machida, Japan; Richard R. Lemberger, Columbus Township, Anoka County, and Stuart J. Wyman, Minneapolis, both of Minn., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 533,385, Sep. 25, 1995, abandoned, which is a continuation of Ser. No. 218,983, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 144,482, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 734,308, Jul. 19, 1991, abandoned. This application Jul. 3, 1996, Ser. No. 674,975

Claims priority, application Japan, Jul. 20, 1990, 2-193292; Jul. 20, 1990, 2-193293

Int. Cl.^{6} B65H *9/12*

U.S. Cl. 271—241 **10 Claims**



1. A sheet supply device for supplying sheets to an image forming apparatus one by one, said sheet supply device comprising:

storing means including a bottom plate having stacked sheets thereon, a front end, a back end and lateral side walls for storing the stacked sheets;

supply means for supplying the sheets from the storing means to the image forming apparatus one by one;

regulating means provided at said supply means to adjust and regulate the position of a sheet in a sheet width direction when the sheet is supplied to the image forming apparatus by the supply means; and

reinforcing means provided at said lateral side walls to form a convex rib portion relative thereto so as to reinforce the side walls and initially align the position of the sheet in the sheet width direction in said storing means, said convex rib portion being out of engagement with the sheet when the sheet is supplied while being regulated by the regulating means.

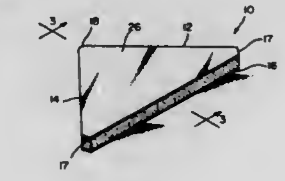
5,687,966
FOOTBALL GAME PIECE

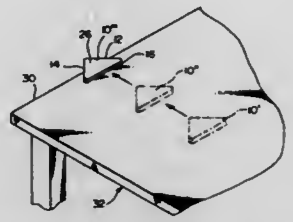
Nicholas W. Barnhart, and Daniel N. Errico, both of Kent, Wash., assignors to Crossbars, Inc., Kent, Wash.

Filed Aug. 16, 1996, Ser. No. 698,962

Int. Cl.^{6} A63F *7/40*

U.S. Cl. 273—108.1 **20 Claims**





1. A football game piece, comprising:

a triangular shaped core section having at least one rounded corner,

first and second triangular shaped veneers sandwiching the core section to form a playing piece with a triangular shaped edge surface, the first and second veneers having at least one rounded corner to match the rounded corner of the core section, and wherein at least one of the corners of the core section is squared-off and the first and second veneers have at least one squared-off corner to match the squared-off corner of the core section, and

the first and second veneers and the core section form a flat edge surface such that the piece can be stood upright on an edge thereof without other support.

5,687,967
ROULETTE EQUIPMENT

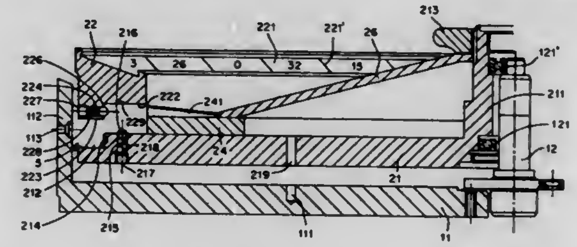
Willi Klaus, Dortmund, Germany, assignor to Anette Klaus, Dortmund, Germany

Filed Sep. 28, 1995, Ser. No. 535,768

Claims priority, application Germany, Sep. 29, 1994, 44 34 817.7

Int. Cl.^{6} A63F *5/02*

U.S. Cl. 273—142 E **17 Claims**



1. A roulette arrangement comprising: a base and a stationary shaft extending up out of said base; a bowl rotating on said shaft, said bowl having an interior divided into first and second rings and a center, said first ring being adjacent to an edge of said bowl and being divided into fields marked with numbers, said second ring being positioned lower inside said first ring and separated by radial frets into canoes, each of said canoes being as wide as an associated one of said fields; a shallow conical pan concealing said center; said first ring being an independent component of components of said bowl and resting on a bottom of said bowl and being angularly displaceable from outside of said roulette arrangement against inherent resistance; a rim around a lower surface of said first ring and fitting into a matching recess in said bottom of said bowl and leaving a gap at a level of said recess in the form of a groove extending around an inner surface of said recess, radial bores extend through said rim; balls accommodated by said bores and forced into said groove by springs; and plugs for maintaining said balls in said bores.

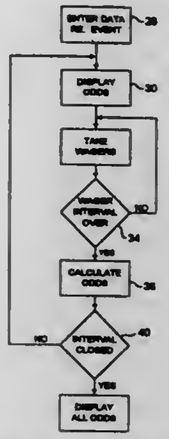
5,687,968
WAGERING SYSTEM

Elia R. Tarantino, Reno, Nev., assignor to Game Data, Inc., Reno, Nev.

Filed Nov. 22, 1995, Ser. No. 561,765

Int. Cl.^{6} A63F *3/06;* **G06G** *7/48*

U.S. Cl. 273—139 **14 Claims**



1. A method of wagering on an competitive event, including the steps of:

providing a value indicative of an outcome of the competitive event;

establishing a time period comprising a number of successive wagering intervals preceding the competitive event;

taking wagers on the outcome of the competitive event during each of the number of successive wagering intervals;

for each of the number of successive wagering intervals, recalculating the value based upon the wagers taken prior to recalculation to obtain a recalculated value;

providing, for each wager placed, a record of such wager, the record including indicia of the one of the number of successive wagering interval during which such wager was taken; and

paying on each wager correctly determining the outcome of the event based upon the recalculated value obtained during the one of the number of successive wagering interval during which the wager was taken.

5,687,969
BATTLE BOARD GAME

Dean X. Logan, 345 Adelaide Avenue W. Apt. #3, Oshawa, Ontario, Canada, LlJ2R7

Filed May 20, 1996, Ser. No. 650,839

Int. Cl.^{6} A63F *3/00*

U.S. Cl. 273—255 **3 Claims**

1. A new and improved battle board game, comprising, in combination:

a plurality of sector cards with sector indicia disposed thereon, the sector cards further having a first plane solar system indicia, a second plane solar system indicia and location markers with a plurality of connecting lines selectively disposed therebetween thereby defining a plurality of paths, the sector cards serving to construct the board game in any shape desired;

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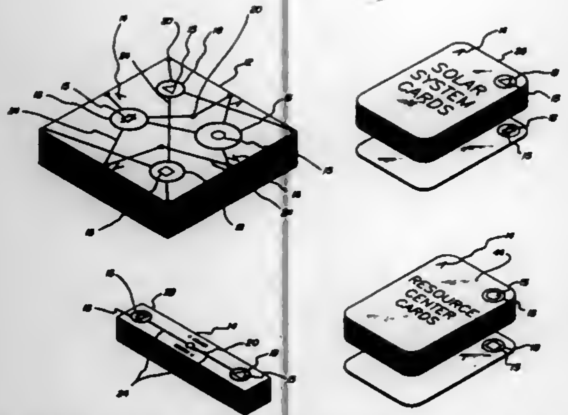
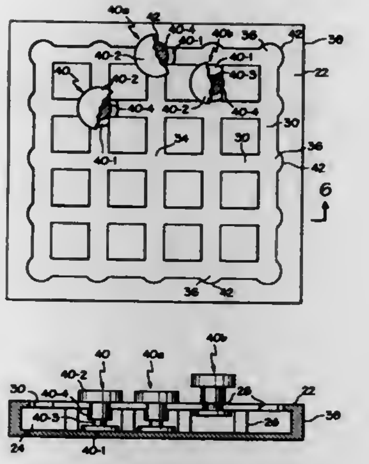


a plurality of solar system cards, each of the solar system cards having sector indicia, solar system indicia with a first color defining a first plane indicia and solar system indicia with a second color defining a second plane indicia selectively disposed thereon;
a plurality of dimensional path cards, each of the dimensional path cards having sector indicia and both first plane solar system indicia and second plane indicia corresponding to the sector cards, the dimensional path cards further having a location marker disposed between the first plane solar system indicia and second plane solar system indicia with connecting lines therebetween thereby defining a path, the dimensional path cards serving to allow movement from first plane solar system indicia to second plane solar system indicia;
a playing die;
a plurality of attack cruiser tokens, each of the attack cruiser token having two peg holes therein and adapted to move along the paths;
a plurality of heavy cruiser tokens, each of the heavy cruiser token having three peg holes therein and adapted to move along the paths;
a plurality of battle cruiser tokens, each of the battle cruiser token having four peg holes therein and adapted to move along the paths;
a plurality of command ship tokens, each of the command ship token having four peg holes therein and adapted to move along the paths;
a plurality of resource center cards, each of the resource center cards having sector indicia, first plane solar system indicia, and second plane solar system indicia selectively disposed thereon;
a plurality of resource center tokens positionable on the first plane solar system indicia and second plane solar system indicia of the sector cards;
a plurality of building material tokens, the building material tokens serving to allow exchanging for the battle cruiser tokens, the attack cruiser tokens, the heavy cruiser tokens, and command ship tokens;
a plurality of red pegs, the red pegs corresponding with the peg holes of the battle cruiser tokens, the attack cruiser tokens, the heavy cruiser tokens, and command ship tokens; and
a counter with peg, the counter having four peg holes therein, the peg holes serving as a round indicator with the peg occupying one of the four peg holes to indicate the round.

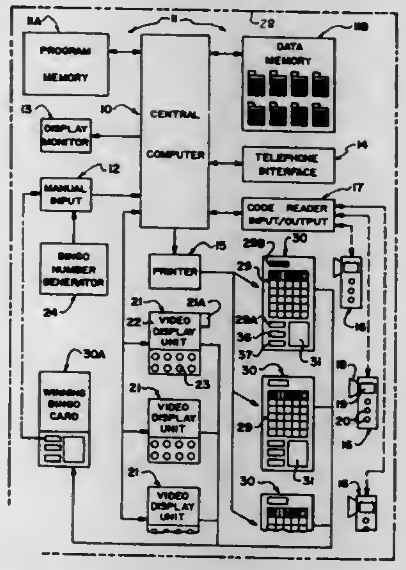
5,687,970
BOARD GAME DEVICE
William H. Clark, 5180 Kingsford Dr., Trotwood, Ohio 45426
Filed Jul. 3, 1996, Ser. No. 678,466
Int. Cl.^{6} A63F *3/00*
U.S. Cl. 273—264 **7 Claims**

1. A game device comprising:
a gameboard having a surface that is machined to provide a grid of recessed channels for movement of a plurality of playing pieces along and between said channels;



each of said channels having a pair of inwardly directed flanges to define a narrowed slot in the surface of said gameboard;
each of said pieces having a head projecting above said surface and a base located within said channel;
said head and base being interconnected by a neck passing through said slot to allow free movement of said piece along said channels and inhibit removal of said piece from the surface of said gameboard;
said slots forming a grid of intersecting tracks on said surface;
each intersection of said slots defining a diameter of the largest cylindrical surface which can be inscribed within said intersection;
said diameter being greater than a width of said slot and smaller than a diameter of said base; and
said neck having a collar so as to expand a diameter of said neck over a portion of a length to allow seating of said collar within said intersection to inhibit lateral movement of said piece out of said intersection.

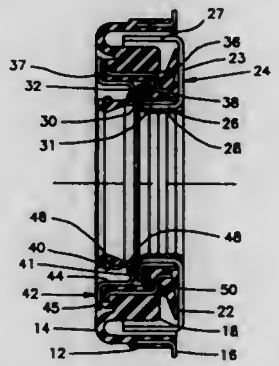
5,687,971
BINGO GAME MANAGEMENT METHOD
Vikas Khaladkar, Regina, Canada, assignor to Wascana Gaming Inc., Regina, Canada
Filed Jul. 7, 1995, Ser. No. 499,418
Int. Cl.^{6} A63F *3/06;* G06F *15/44*
U.S. Cl. 273—269 **13 Claims**



1. A method of playing by a plurality of players a plurality of bingo games in a bingo session comprising:
providing a central computer having a memory;

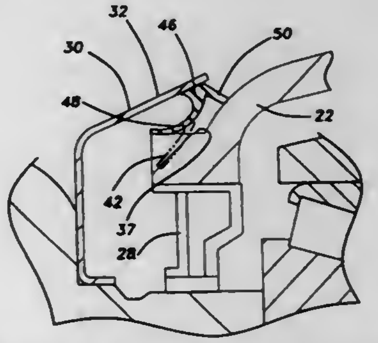
placing in the memory a plurality of unique bingo cards;
providing a plurality of printed bingo papers each having at least one of the plurality of bingo cards printed thereon, each printed bingo paper of the plurality of printed bingo papers having associated therewith and printed thereon a respective one of a plurality of printed machine readable codes, each printed machine readable code identifying the respective bingo paper;
for each bingo game of the plurality of games, selling to the players at least some of the printed bingo papers;
at a time of selling each sold printed bingo paper, using code reader means to read the printed machine readable code associated with said each sold printed bingo paper to input into the central computer information identifying all of the printed bingo papers sold for said each bingo game;
storing in the memory of the central computer information identifying all of the bingo papers and said at least one bingo card thereon sold for each game of the plurality of games;
causing the central computer to determine whether any proposed sale of a bingo paper which is a duplicate of one already sold for said each bingo game and to communicate to the code reader means when the proposed sale of a bingo paper is a duplicate and therefore denied;
playing each bingo game of the plurality of games in turn by continuing to call bingo numbers until a claimed winning bingo card of said each bingo game is identified by a player;
after a claimed winning bingo card is identified, using said code reader means to read said printed machine readable code printed on the bingo paper carrying the claimed winning bingo card;
and causing the code reader means to communicate to the central computer said printed machine readable code for comparison with said identifying information to verify that the claimed winning bingo card is properly one of the bingo cards sold for said each bingo game.

5,687,972
UNITARY OIL SEAL ASSEMBLY
Gregory H. Petrak, 16488 W. 55th Dr., Golden, Colo. 80403
Filed Nov. 26, 1996, Ser. No. 757,745
Int. Cl.^{6} F16J *15/36*
U.S. Cl. 277—38 **13 Claims**



1. In a unitary oil seal assembly interposed between radially inner and outer relatively rotating members wherein said members are movable axially with respect to one another and said assembly includes an annular seal body having a facial excluder seal inclining away from one side of said body together with a flexible wall section extending radially from said seal body and terminating in a circumferential sealing portion at one end of said wall section in radially spaced relation to said body, the improvement comprising:
a counterface having a first radial flange portion engaged by said facial excluder seal;
a retainer portion, said retainer portion including means positioning said excluder seal in sealed engagement with said first radial flange portion whereby said excluder seal and said first radial flange portion are maintained against axial movement relative to one another notwithstanding relative axial shifting between said inner and outer relatively rotating members; and
an annular bearing member interposed between said seal body and said positioning means, and a radial seal disposed in sealed engagement with one of said relatively rotating members in fixed, axially spaced relation to said excluder seal.

5,687,973
DUST SEAL FOR PINION BEARING HOUSING
Malcolm F. Ruppert, Jr., Hebron, Ohio, assignor to Rockwell Heavy Vehicle Systems, Inc., Troy, Mich.
Filed Jun. 24, 1996, Ser. No. 669,077
Int. Cl.^{6} F16J *15/32*
U.S. Cl. 277—67 **18 Claims**



12. A pinion gear and housing arrangement comprising:
a pinion gear having a shaft and gear teeth at an inner end of said shaft;
a bearing housing having an opening at an outer end, said pinion shaft extending into said opening, and said gear teeth being received within said pinion housing;
an oil seal placed between an outer diameter of said pinion shaft and an inner diameter of said housing adjacent said outer end and in said opening;
a slinger positioned axially outwardly of said opening and having a shroud extending over a portion of said housing defining said opening, said slinger secured to rotate with said pinion shaft;
a slinger seal secured to rotate with said slinger and extending radially inwardly from said slinger to contact an outer peripheral surface of said housing; and
said slinger seal extends radially inwardly for a first distance such that an inner portion of said seal defines an inner diameter, said inner diameter being less than an outer diameter of said housing on which said seal is to contact, such that said seal is deformed when received on said housing, said slinger seal contacting said outer peripheral surface of said housing at a contact position spaced from said outer end and an inner lip of said seal being deformed toward said outer end from said contact position.

5,687,974
PACKING MATERIAL HAVING EXPANDED GRAPHITE DISPERSED THROUGHOUT
Mark R. Wilkinson, Huntington, Mass.; Chester S. Hopper, Newton, Conn.; Leslie K. Muir, and Michael S. Muir, both of Corona, Calif., assignors to Calconn, Inc., Newton, Conn.
Filed Mar. 15, 1996, Ser. No. 617,521
Int. Cl.^{6} F16J *15/22*
U.S. Cl. 277—102 **21 Claims**

1. An assembly for packing a seal, comprising:
at least three compressable packing rings, including a first ring, a third ring and a second ring therebetween, the three rings formed with a plurality of carbon yarns, substantially all of

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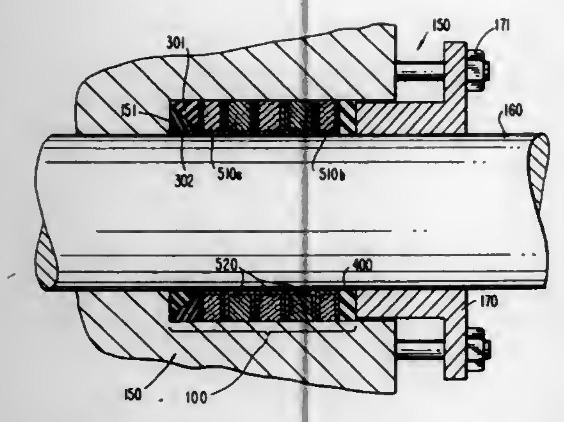
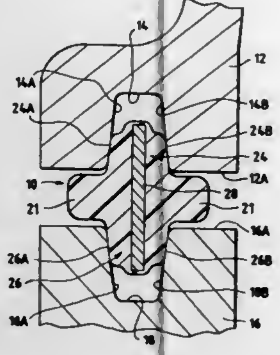


which have expanded graphite particles which are in a compressable state thereon;
each of the at least three rings having an inner surface configured to abut a shaft, side walls extending outwardly from the inner surface and an outer surface connecting the side walls;
the at least three rings being in a compressable state of partial compression from one side wall to the other, having been compressed from a pre-compression height across the side walls to a smaller current distance across the side walls such that the first and third rings are in a greater state of compression than the compression of the second ring.

5,687,975
SEALING ASSEMBLY EMPLOYING OPPOSITELY DIRECTED WEDGES AND COMPLEMENTARY RECESSES

Joe Inciong, Skokie, Ill., assignor to Fel-Pro Incorporated, Skokie, Ill.

Filed Aug. 21, 1996, Ser. No. 701,806
Int. Cl.^{6} F16J *9/00*
U.S. Cl. 277—167.5 **5 Claims**

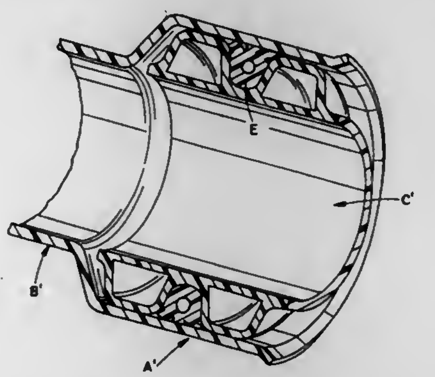


1. A sealing assembly for sealing a pair of flanges together against the passage of liquid therepast, said sealing assembly comprising
a continuous elastomeric gasket comprising a gasket body, said gasket body defining an integral first elastomeric wedge extending outwardly from said gasket body in a first direction and an integral second elastomeric wedge in line with said first wedge and extending outwardly from said gasket body in the opposite direction, each said wedge defining an inclined surface extending at an angle of at least about five degrees from its base,
and a pair of flanges, one of said flanges defining a first recess complementary to said first wedge and the other of said flanges defining a second recess complementary to said second wedge, each of said recesses having an inclined surface extending at an angle of at least about five degrees from its base, and
means for clamping said flanges and said gasket to force said wedge inclined surfaces into sealing engagement with said recess inclined surfaces, thereby to provide sealing contact between said wedges and said recesses only along said inclined surfaces.

5,687,976
SYMMETRICAL GASKET FOR A PIPE JOINT

William C. Andrick, Uniontown, and Salvatore R. Brugnano, Munroe Falls, both of Ohio, assignors to Vertex, Inc., Mogadore, Ohio

Filed May 10, 1996, Ser. No. 644,342
Int. Cl.^{6} F16J *15/10*
U.S. Cl. 277—207 A **23 Claims**



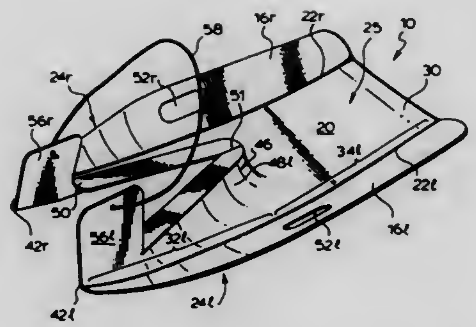
21. A pipe joint which can accommodate both internal pressures and external pressures, said pipe joint comprising:
an outer pipe;
an inner pipe inserted into said outer pipe, wherein one of said outer pipe and said inner pipe comprises an annular groove; and,
a gasket positioned within said annular groove and adapted to provide a seal between said outer pipe and said inner pipe, said gasket comprising:
an annular gasket body formed of a resilient material, said gasket body having a centerline and including a base adapted to sealingly engage said groove,
a projection extending from said gasket body, said projection being so located on said gasket body that it is bisected by said centerline thereof, said projection comprising a first compression point for said gasket body, and
an annular bore extending in said gasket body, said bore being spaced from said projection and being so located on said gasket body that it is bisected by said centerline thereof.

5,687,977
STEERABLE TOBOGGAN

Bruce Cameron Smith, 26 Rowley Avenue, Toronto, Ontario, Canada, M4P 2S8

Filed Feb. 2, 1996, Ser. No. 597,465
Int. Cl.^{6} B62B *13/02*
U.S. Cl. 280—18 **20 Claims**

1. A steerable toboggan comprising,
a rear portion having a planar snow engaging bottom gliding surface extending substantially across the entire width of the rear portion,
the rear portion merging forwardly into two mirror image side-by-side forwardly tapering runner arm members having bottom surfaces which curve upwardly from the gliding surface towards a respective front end tip,
the bottom surface of each runner arm member having a continuous guide rib therealong at a lowermost point along the length of each runner arm member,

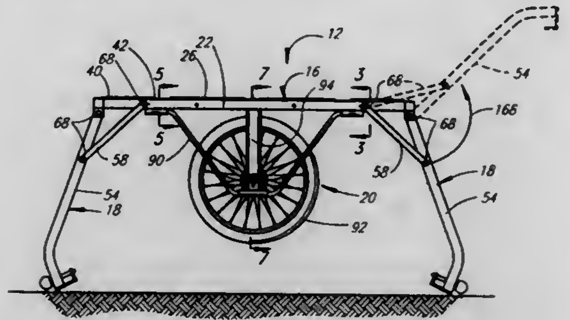


each said guide rib including a forward curved portion curving upwardly and inwardly towards the opposing one of the runner arm members as the guide rib extends towards the respective end tip,
the runner arm members being vertically movable relative to the rear portion and to each other to steer the toboggan by selectively moving at least part of the forward curved portions of the guide ribs against the snow.

5,687,978
FOLDABLE LOAD CONVEYANCE APPARATUS

Ivan W. Rhodes, 2055 Sussex La., Colorado Springs, Colo. 80909, and Vito Giorgio, Jr., 1655 Fawnwood, Monument, Colo. 80132

Filed Sep. 21, 1995, Ser. No. 531,847
Int. Cl.^{6} B62B *1/04*
U.S. Cl. 280—30 **9 Claims**

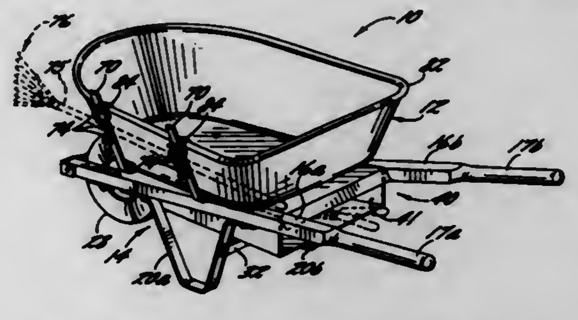


1. A foldable load conveyance apparatus operable to support and move a heavy load over rugged terrain, comprising:
a) a basic support frame assembly having a load beating surface;
b) a handle support assembly connected to a portion of said basic support frame assembly;
c) said handle support assembly includes spaced support arm assemblies, each having a handle grip tube section extended upwardly and generally parallel to said basic support frame assembly for ease of control and movement thereof;
d) a collapsible support wheel assembly including a wheel support assembly releasably connected to said basic support frame assembly and a support wheel assembly connected to said wheel support assembly;
e) said support wheel assembly engagable with a support surface;
f) each of said support arm assemblies having a frame connector section pivotally connected with a respective said portion of said basic support frame assembly; and
g) said frame connector section selectively pivoted and locked by a connector link member in 1) a collapsed, storage, transport condition; 2) an assembled support table condition; and 3) an assembled load transport condition;
h) each of said handle grip sections having an outer end portion with an all terrain vehicle connector member mounted therein; and
i) said all terrain vehicle connector member of L-shape operable to be gasped by a user thereof to pull up an recline and restrain movement on moving down an incline;
whereby said support wheel assembly in conjunction with said handle grip tube sections achieves controlled movement of said foldable load conveyance apparatus over narrow paths and rugged terrain.

5,687,979
STORAGE ATTACHMENTS FOR WHEELBARROWS

Dean A. Plevka, 332 Mill Pond Rd., Lake Wylie, S.C. 29710

Filed Nov. 3, 1995, Ser. No. 552,707
Int. Cl.^{6} B62B *1/18*
U.S. Cl. 280—47.19 **10 Claims**



1. A wheelbarrow having provision for transporting a loose material, and also having provision for carrying a variety of tools in a readily accessible location, and comprising:
a wheelbarrow frame which includes a pair of generally parallel and longitudinally directed posts and which define forward and rearward ends of the frame;
a wheel mounted to the forward end of the frame so that the wheelbarrow may be rolled along the ground in the longitudinal direction by a user gripping and lifting the ends of the posts at the rearward end of the frame;
a tray mounted upon said posts of said frame for supporting a loose material therein;
a pair of L-shaped brackets of like construction, with each of said brackets having first and second legs, and with the first leg of each bracket being mounted between at least one of the posts and the try and so that the brackets extend in a direction transverse to said longitudinal direction and are longitudinally spaced apart from each other, and such that the second legs extend generally upwardly along one side of the tray; and
gripping means secured to the second leg of each of the brackets for releasably supporting a handle of a tool therebetween.

5,687,980
FOLDABLE BICYCLE TRAILER

Lee Eckroth, 8721 Lianna Ct., Stockton, Calif. 95209

Filed Jul. 27, 1995, Ser. No. 508,123
Int. Cl.^{6} B62B *3/02*
U.S. Cl. 280—204 **13 Claims**

1. An improved foldable bicycle trailer comprising:
a) a foldable frame;
b) a pair of wheels permanently mounted in a rotatable manner to said foldable frame, whereby said foldable frame with said wheels can fold up for storage;

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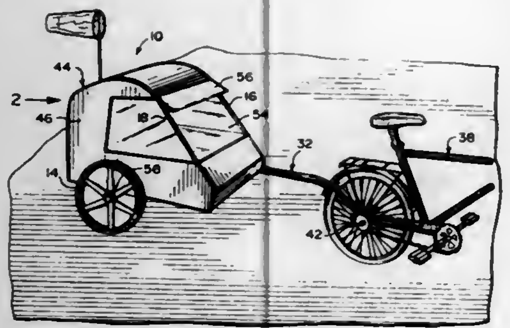


c) a flexible covering to be carried by said foldable frame, said flexible covering including a wraparound clear plastic window that faces forward, so that a seated child can look out of said window, and a removable visor mounted over said window, so as to block any harmful rays of the sun from entering said window; and

d) a pair of removable seats connected to said foldable frame, whereby said seats face forward, so that two children can sit on said seats and be protected by said flexible covering.

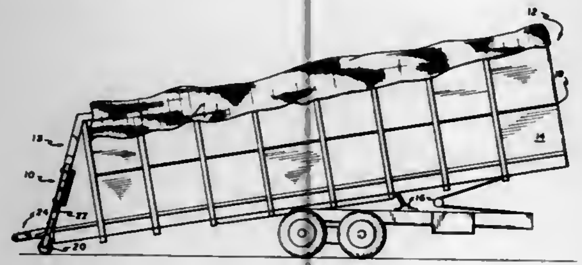
5,687,981
HEIGHT ADJUSTMENT SYSTEM FOR TRUCKS

James L. George, and Fred D. Couch, both of P.O. Box 248, Black Oak, Ark. 72414

Filed May 18, 1995, Ser. No. 444,364

Int. Cl.^{6} B60P *1/04*

U.S. Cl. 280—405.1 **13 Claims**



1. A height adjustment system for use with a truck having a bed, the bed having a tail, the tail of the bed being adjustable in height relative to ground level by a lifting means, said height adjustment system comprising:

a terrain following member, the ground level defining a terrain having a terrain profile, said terrain following member following the terrain profile as the truck traverses the terrain;

a support member movably attaching said terrain following member to the bed of the truck proximate the tail, said support member moving relative to the bed of the truck responsive to the terrain profile, said support member configured to assume a range of positions including a first position and a second position, said support member closing a first electrical contact when in said first position and closing a second electrical contact when in said second position, the lifting means being electrically connected to said first electrical contact and said second electrical contact, closing one of said first electrical contact and said second electrical contact operating the lifting means to adjust the height of the tail thereby causing said support member to assume a position intermediate said first position and said second position.

5,687,982
ELEMENT AND ASSEMBLY FOR RETAINING A BOOT ON A GLIDING BOARD

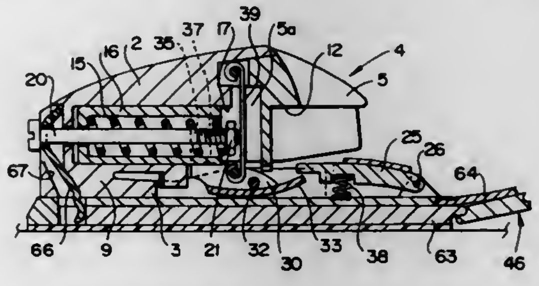
Christian Challande, Cruseilles, and Pierre Desarmaux, Evires, both of France, assignors to Salomon S.A., Metz-Tessy, France

Filed Mar. 28, 1995, Ser. No. 411,317

Claims priority, application France, Mar. 30, 1994, 94 04051

Int. Cl.^{6} A63C *9/08*

U.S. Cl. 280—607 **10 Claims**



1. A retention element adapted to retain an end of a boot on a gliding board, said retention element comprising:

a base adapted to be affixed to the gliding board;

a body mounted to said base;

a retention jaw carried by said body, said jaw adapted to engage the end of the boot, said retention jaw being mounted for movement with respect to the base between a boot retention position and a boot release position;

a retention jaw return mechanism comprising an elastic return spring and a latching member, said elastic return spring being positioned to exert an elastic return force against said latching member, said latching member being positioned to transfer said elastic return force in opposition to movement of said retention jaw to said boot release position;

a sensor adapted to be engaged by at least a portion of a sole of the boot; and

a connection between said sensor and said return mechanism, said connection including an assembly of structural elements positioned between said sensor and said return mechanism to increase said elastic return force exerted on said retention jaw in response to an increased support force exerted on said sensor.

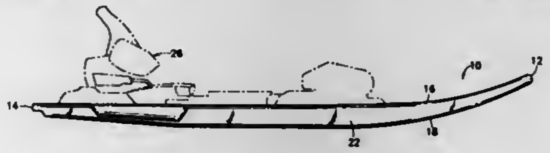
5,687,983
LIGHT WEIGHT BALLET SKIS AND METHOD OF MANUFACTURE

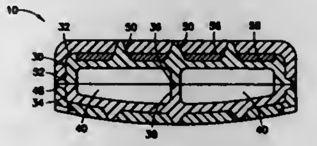
James Feketa, Sparta, and Richard Gauer, Hewitt, both of N.J., assignors to GSI, Inc., N.J.

Continuation-in-part of Ser. No. 330,263, Oct. 27, 1994, Pat. No. 5,560,632. This application Sep. 22, 1995, Ser. No. 526,775

Int. Cl.^{6} A63C *5/025;5/04*

U.S. Cl. 280—609 **10 Claims**





1. A ski comprising: an internal support structure and an outer shell surrounding said internal support structure, said internal support structure comprising upper and lower halves secured together and defining a plurality of internal cavities within said ski, said internal support structure having an outer surface with a plurality of outwardly protecting positioning legs, said outer shell being unitarily formed around said internal support structure and surrounding and engaging said positioning legs.

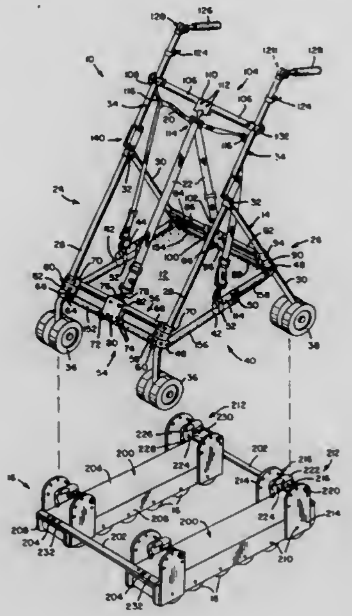
5,687,984
COLLAPSING CART

Violet S. Samuel, P.O. Box 2565, Laguna Hills, Calif. 92654

Filed Aug. 2, 1995, Ser. No. 510,501

Int. Cl.^{6} B62B *3/02*

U.S. Cl. 280—641 **15 Claims**



1. A cart, comprising:

first side member having a first handlebar for grasping by a user;

a second side member having a second handlebar for grasping by a user;

a plurality of wheels carried on said first and second side members;

said first and second side members each including:

a forward leg carrying one of said plurality of wheels;

a rearward leg hingedly connected to said forward leg and carrying another of said plurality of wheels; and,

a longitudinal strut having opposed ends, one of said ends secured to said forward leg and the other of said ends secured to said rearward leg;

a plurality of lateral struts joining said first and second side members together, each of said lateral struts including a first arm and a second arm having inner ends hingedly secured together, said first arm having an outer end hingedly secured to said first side member, and said second arm having an outer end secured to said second side member;

a first strap suspended between said first and second handlebars and connected to each of said lateral struts so that the application of an upward force to said first strap will cause articulated movement of said first and second arms collapsing the cart laterally; and,

a flexible article carrier suspended from two of said plurality of lateral struts and suspended from each of said longitudinal struts.

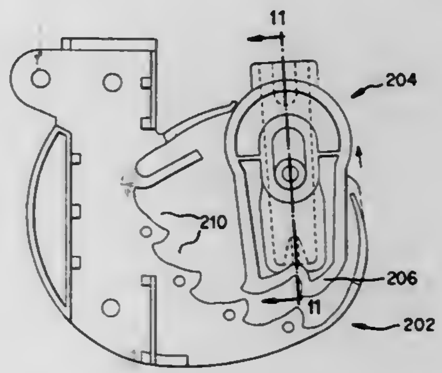
5,687,985
STROLLER, RECLINING AND CANOPY TENSIONING MECHANISMS THEREOF

James Sack, Elverson, Pa., assignor to Graco Children's Products, Inc., Elverson, Pa.

Filed Nov. 4, 1994, Ser. No. 334,086

Int. Cl.^{6} B62B *7/08*

U.S. Cl. 280—650 **19 Claims**



1. A reclining mechanism for reclining a seat backrest of a stroller comprising:

a first pivot member for connecting to a frame of the stroller;

a second pivot member for connecting to the backrest, wherein the second pivot member is pivotably and displaceably connected to the first pivot member to selectively position the backrest relative to the frame;

the second pivot member includes an abutment member adapted to engage one of a plurality of complementary abutment notches on the first pivot member, a portion of the abutment member having a first shape, and a portion of the abutment member having a second shape generally corresponding to the first shape to allow the abutment notch to receive the abutment member;

a spring connected to the first and second pivot members to urge the abutment member toward one of the abutment notches; and

the abutment member including a first forward surface and a second rearward surface, the first forward surface being shaped differently than the second rearward surface, the first and second surfaces enabling the backrest to pivot in a first direction but preventing the backrest from pivoting in the other direction when the abutment member is engaged with one of the abutment notches.

5,687,986
ATTACHMENT DEVICE FOR AN INFLATABLE PROTECTIVE CUSHION

James M. Nelsen, Albuquerque; Daniel A. Luna, Los Lunas, and Kenneth W. Gwinn, Cedar Crest, all of N. Mex., assignors to Precision Fabric Group, Greensboro, N.C.

Filed Dec. 28, 1995, Ser. No. 579,827

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—728.2 **28 Claims**

1. An inflatable cushion assembly for use with an inflator, the assembly comprising:

an inflatable cushion having an inner surface, an outer surface, and at least one seam or gather extending from one of the inner or outer surfaces, the inflatable cushion defining an opening between the inner surface and the outer surface for receiving the inflator; and

an attachment member contacting one of the inner or outer surfaces adjacent the opening and including a groove extending substantially in the radial direction for receiving the seam

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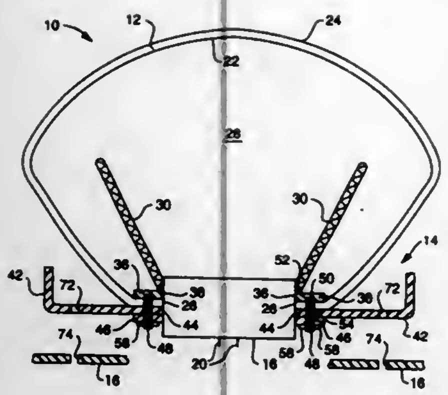


or gather, the attachment member securing the inflator within the opening.

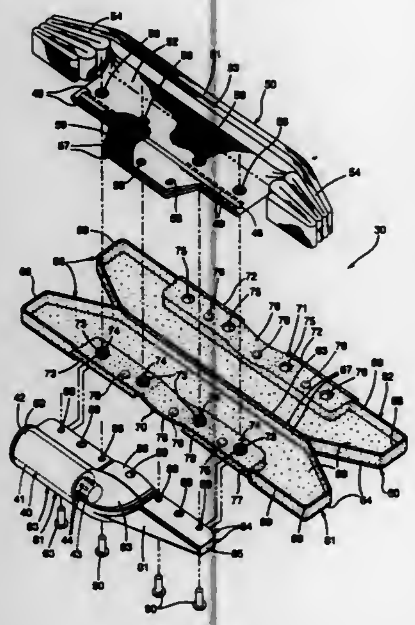
5,687,987
AIR BAG MODULE WITH CLAMSHELL COVER

Graham Thornton Spencer, Tipp City; Margaret Ann Fisher, Dayton; James Lloyd Webber, Centerville, and John Paul Sparkman, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 29, 1996, Ser. No. 609,061

Int. Cl.^{6} B60R *21/20*

U.S. Cl. 280—728.2 **9 Claims**



9. An air bag module comprising:
an inflator for generating gas;
an air bag deployable upon generation of gas by the inflator, the air bag being operatively connected to the inflator for receiving inflator gas therein; and
a clamshell cover housing the air bag therein, the clamshell cover including a first half and a second half, the clamshell cover including a bendable hinge portion pivotally connecting the first half and the second half prior to air bag deployment and the hinge portion being breakable upon deployment of the air bag such that the air bag deploys out through the hinge portion of the clamshell cover.

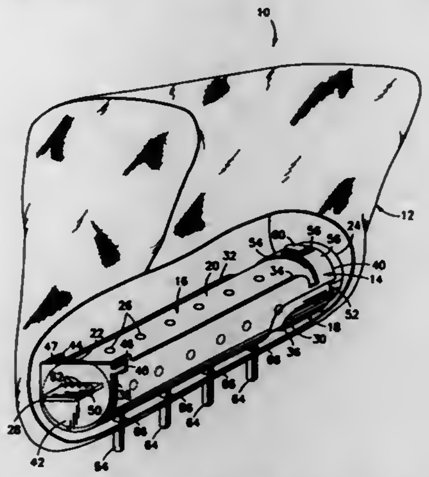
5,687,988
AIRBAG CUSHION AND AIRBAG INFLATOR RETENTION DEVICE

J. Kirk Storey, Farmington; Michael P. Jordan, South Weber, and Brent K. Olson, Clearfield, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jul. 17, 1996, Ser. No. 682,281

Int. Cl.^{6} B60R *21/22;21/26*

U.S. Cl. 280—728.2 **22 Claims**



1. An inflator and cushion retention device for mounting an airbag inflator having an elongated sidewall extending from a first end to a second end with a mounting stud extending from the first end, the inflator and cushion retention device comprising:
an elongated open trough for receiving and supporting the sidewall of the airbag inflator, the open trough having two opposing sides, a bottom, an endwall and an open end opposite the endwall;
an opening defined by the endwall for receiving the mounting stud extending from the first end of the airbag inflator to prevent the first end of the inflator from lifting out of the trough;
a first arm extending from one side of the trough adjacent the open end opposite the endwall and a second arm extending from the other side of the trough generally opposite the first arm adjacent the open end opposite the endwall, the arms sized to bend over the inflator and overlap;
means for locking the first and second arms together to prevent the second end of the inflator from lifting out of the trough;
means for preventing the airbag inflator from sliding out of the open end of the trough; and
at least one mount extending from the trough for mounting the inflator and cushion retention device and the airbag inflator within a motor vehicle as part of an airbag module also including an airbag cushion.

5,687,989
IMPACT PROTECTION DEVICE FOR A MOTOR VEHICLE OCCUPANT

Alfons Maesing, Muehlacker, and Herbert Boegge, Wiernsheim, both of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany

Continuation of Ser. No. 401,687, Mar. 10, 1995, abandoned.

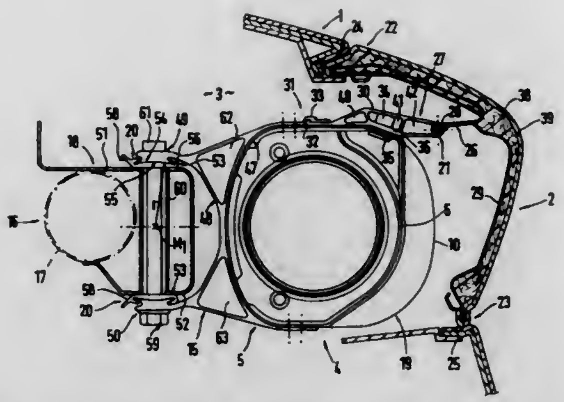
This application Aug. 9, 1996, Ser. No. 694,798

Claims priority, application Germany, Mar. 10, 1994, 44 08 037.9

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—728.2 **22 Claims**

1. Impact protection device for an occupant of a motor vehicle, comprising a prefabricated air bag module configured to be insertable into a recess of a dashboard and having a housing, a folded inflatable air bag and an inflating device for the air bag, holders mounted on the air bag module and having opposed contact surfaces configured to allow the air bag module to be pushed toward and onto a body-side transverse support of the vehicle as the air bag module is inserted into the recess and held in position thereon, and, on a side facing the occupant, a cover closing the recess and being swivellably connected with the air bag module, wherein the air bag module, the cover and the holders mounted on the air bag module are assembled in alignment with each other so as to be aligned between the recess and the transverse support and to form a prefabricated modular unit, the opposed contact surfaces of the holders are operatively associated with spaced movable adjusting elements to compensate for tolerances between the holders and the transverse support, and an edge area of the cover is configured to be received in a groove on the dashboard such that the cover is held in a predetermined installed position upon completion of insertion of the air bag module into the recess.



5,687,990
CLAMPING MEANS FOR AN ADJUSTABLE STEERING COLUMN IN MOTOR VEHICLES

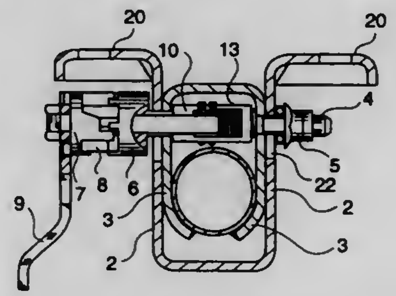
Ludger Uphaus, Neuenkirchen, Germany, assignor to Lemförder Metallwaren AG, Lemförde, Germany

Filed Feb. 20, 1996, Ser. No. 603,540

Claims priority, application Germany, Feb. 23, 1995, 195 06 210.8

Int. Cl.^{6} B62D *1/18*

U.S. Cl. 280—775 **13 Claims**



1. A clamping device for an adjustable steering column in motor vehicles having a vehicle body, the clamping device comprising:
a tubular housing which is adjustable in a direction of a longitudinal axis;
a component rigidly connected to said tubular housing;
two holders rigidly connectable to the vehicle body;
a clamping mechanism for clamping said tubular housing between said two holders and for releasing the clamping for relative movement between said clamping mechanism and said tubular housing, said clamping mechanism including a clamping bolt which passes through said two holders substantially at a right angle with respect to said longitudinal axis of said tubular housing, said clamping mechanism including a handle for actuating the clamping mechanism;
an abutment fixed axially at said clamping bolt; and
a locking member supported by said abutment for movement with said clamping bolt relative to said tubular housing, said locking member including a sword edge directed obliquely downward toward said component to form an angle with a longitudinal axis of said clamping bolt, said sword edge for automatically positively locking said tubular housing rigidly to said two holders upon slippage of said clamping mechanism.

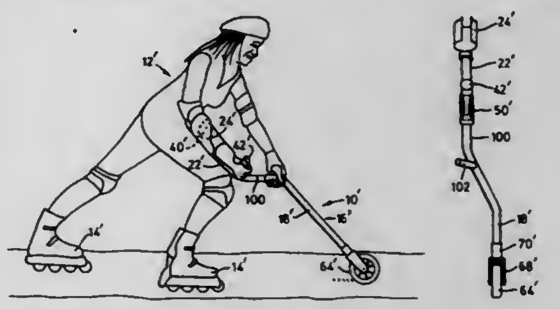
5,687,991
METHOD AND APPARATUS FOR BRAKING SKATES AND THE LIKE

James R. Gairdner, 77 Clarendon Ave., Ste. 501, Toronto, Ontario, Canada, M4V 1J2

Filed Aug. 23, 1995, Ser. No. 518,343

Int. Cl.^{6} A63C *17/28*

U.S. Cl. 280—826 **8 Claims**



1. A device for supporting and braking a skater, said device comprising:
(a) an elongated body having an upper end and a lower end,
(b) a wheel rotatably connected to said lower end,
(c) braking means associated with said wheel for braking said wheel,
(d) arm securing means located adjacent said upper end of said body for securing the skater's arm to said body,
(e) hand grip means located below said arm securing means, and adapted to be gripped by the user's hand,
(f) brake lever means located proximate said hand grip means and operable by said user's hand for activating said braking; and
(g) said body has an upper portion having said upper end, a lower portion having said lower end, and a central portion connecting said upper and lower portions, said upper and lower portions being substantially parallel to each other as viewed from the front and said central portion being inclined with respect to said upper and lower portions and forming an S-shape therewith, so that, when said upper portion is secured to said skater's arm, said inclined central portion extends inwardly toward the center of the skater's body to position said wheel between the sides of the skater's body.

5,687,992
GREETING CARD

Yan Finkelshteyn, 1342 E. 18th St. 2C, Brooklyn, N.Y. 11230

Filed Oct. 27, 1995, Ser. No. 549,389

Int. Cl.^{6} B42D *15/02*

U.S. Cl. 283—117 **10 Claims**

1. A foldable card having on an inner surface thereof a decorative display readily compressed to a flattened position, said display comprising one or more decorative elements which lie compressed flat when the card is in closed position, said elements having sufficient stiffness modulus to more of their own accord, when the card is opened, to positions at acute angles to the card thus providing a self-generated pop-up 3-D structure, the stiffness modulus and ductility of said decorative elements being such as to maintain the positions of said elements through several cycles of

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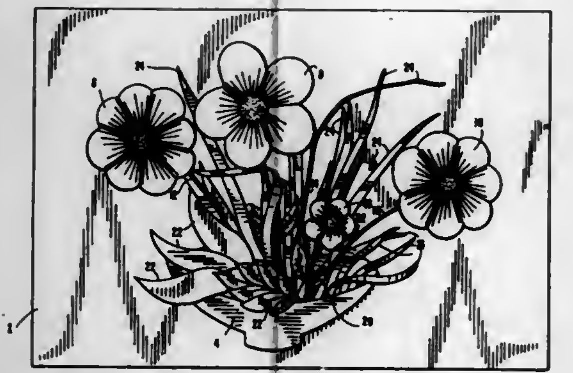


opening and closing, wherein said decorative elements comprise one or more flexible wires anchored at the proximal end and carrying on the distal end a decorative item, said one or more flexible wires having the ability to be bent into any desired shape and to hold that shape, said wires at the distal end being free floating forward of the face of the card when the card is in open position and pressed flat when the card is closed.

5,687,993

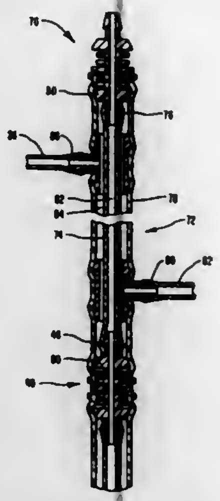
DUAL CONTAINMENT SYSTEM FOR TRANSFERRING STERILE FLUIDS TO AND FROM A CONTAINER

Larry H. Brim, Logan, Utah, assignor to Hyclone Laboratories, Logan, Utah

Filed Oct. 31, 1994, Ser. No. 331,696

Int. Cl.^{6} F16L *39/00;47/00*

U.S. Cl. 285—131 **18 Claims**



1. A fitting for enabling sterile fluid coupling of a first inner tube contained within a first outer tube to a second inner tube contained within a second outer tube, each of the inner tubes and the outer tubes having a lumen extending therethrough, the fitting comprising:

(a) a body having a first end, a second end, and an exterior surface extending therebetween, the body also having an interior surface defining a channel extending between the first end and the second end;

(b) a first small diameter barb encircling and radially projecting out on the exterior surface of the body at the first end thereof, the first small diameter barb being configured to enable a sealed fluid communication with the first inner tube when received within the lumen thereof;

(c) a second small diameter barb encircling and radially projecting out on the exterior surface of the body at the second end thereof, the second small diameter barb being configured to enable a sealed fluid communication with the second inner tube when received within the lumen thereof; and

(d) a first large diameter barb encircling and radially projecting out on the exterior surface of the body between the first small diameter barb and the second small diameter barb, the first large diameter barb having an outside diameter larger than the outside diameter of the first small diameter barb and being configured to enable a sealed fluid communication with the first outer tube when the first inner tube, the first small diameter barb, and the first large diameter barb are contained within the lumen of the first outer tube, the first enlarged barb also being configured so that when the first inner tube is contained within the first outer tube a space is formed therebetween which is sealed closed at the fitting.

5,687,994

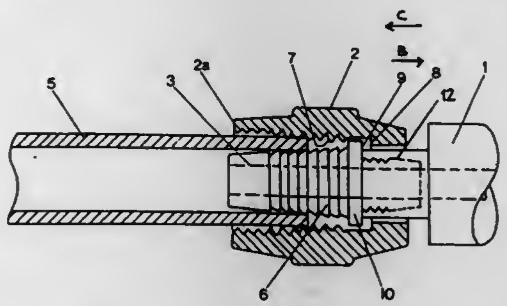
PIPE COUPLING

Albert Frederick Hansen, 156 Lower Dent Street, Whangarei, New Zealand

Filed Jul. 14, 1995, Ser. No. 502,872

Int. Cl.^{6} F16L *25/00*

U.S. Cl. 285—12 **9 Claims**



1. A pipe coupling comprising a body having a hollow interior for fluid flow through the coupling including a tubular tail onto which the end of a pipe can be engaged, a coupling nut captively mounted about the body of the coupling with sliding movement along the body of the coupling and having a screw threaded interior, said tubular tail extending at least partially through the interior of the coupling nut, such that when the end of a pipe has been pushed partly onto the tubular tail the coupling nut may be moved along the body of the coupling towards the tubular tail to threadedly engage the nut onto the exterior of the pipe end, and the coupling nut may be rotated to draw the pipe further onto the tubular tail of the coupling and clamp the pipe end between the threaded interior of the coupling nut and the exterior of the tubular tail of the coupling extending within the pipe end.

5,687,995

SHAPE MEMORY ALLOY PIPE COUPLING AND UNDERWATER PIPES

Takanobu Mori, Hitachi; Yasuo Kondo, Katsuta; Hiroshi Satoh, Hitachi; Shigeo Hattri, Ibaraki-ken; Takahiko Kato, Katsuta, and Yoshimi Yanai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 267,830, Jun. 29, 1994. This application May 10, 1996, Ser. No. 644,566

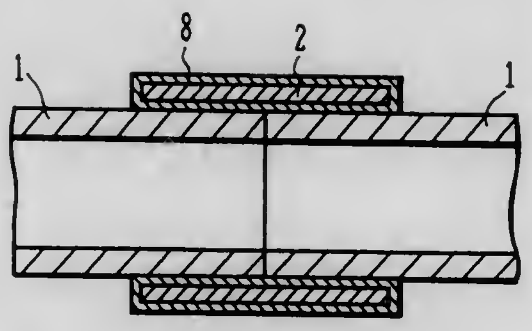
Claims priority, application Japan, Jun. 30, 1993, 5-161561

Int. Cl.^{6} F16L *35/00*

U.S. Cl. 285—21 **15 Claims**

1. A shape memory alloy pipe coupling comprising:

a tube made of a shape memory alloy;



and a cover formed by a coating, molded so as to contact and adhere on the whole surface of said tube wherein said cover prevents contact of a corrosive fluid with said tube;

wherein said cover comprises SUS304L stainless steel.

5,687,996

MOLDED PART MADE OF THERMOPLASTIC MATERIAL

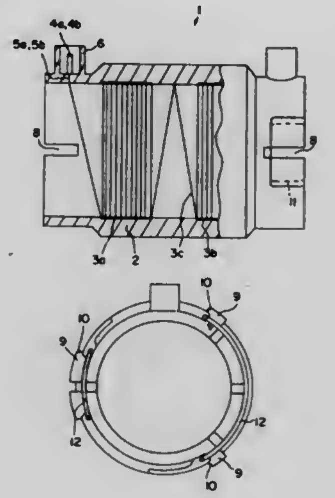
Hans-Werner Steinmetz; Helmut Hilger, both of Schaffhausen, and Dirk Alexander Petry, Feuerthalen, all of Switzerland, assignors to Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland

Filed Jan. 2, 1996, Ser. No. 582,169

Claims priority, application Germany, Jan. 11, 1995, 195 00 579.1

Int. Cl.^{6} F16L *47/02*

U.S. Cl. 285—21.1 **7 Claims**



1. Molded part made of thermoplastic material having at least one welding sleeve part having a plug-in end and an electrical heating coil for connecting the molded part to a tubular part, wherein the plug-in end of the welding sleeve part can be brought into abutment with the tubular part in a fitting manner, the improvement which comprises means for forming a connection between the tubular part and the welding sleeve part, said means comprises at least one tensioning system located on the plug-in end of the welding sleeve part, said tensioning system comprises at least one axially extending slot provided on said plug-in end, a pair of protuberances provided on said plug-in end on either side of said at least one recess and a tensioning element located on said pair of protuberances and bridging said slot.

5,687,997

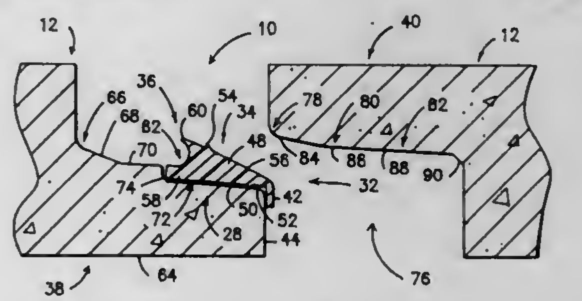
SEALING GASKET WITH LUBRICANT RIB AND RETAINER ELEMENT

Roger Beacom, 241 Sorrento Ranches Dr., Nokomis, Fla. 34275

Continuation of Ser. No. 418,261, Apr. 6, 1996, which is a continuation of Ser. No. 261,756, Jun. 17, 1994, which is a continuation of Ser. No. 83,782, Jun. 28, 1993, which is a continuation of Ser. No. 815,120, Dec. 30, 1991, abandoned. This application Nov. 13, 1995, Ser. No. 590,689

Int. Cl.^{6} F16J *15/12;* **F16L** *21/00*

U.S. Cl. 285—94 **2 Claims**



1. A sealing gasket for use in a pipe line formed by a plurality of concrete pipes wherein each concrete pipe comprises a male joint member formed on one end thereof including a tongue element having an outer longitudinal surface with a sealing gasket recess formed therein to receive a portion of said sealing gasket and a female joint member formed on the opposite end of the concrete pipe including a groove member with an inner longitudinal surface such that when the pipe line is formed the male joint member and the female joint member of adjacent concrete pipes cooperatively form a joint therebetween wherein the outer longitudinal surface of the tongue element and the inner longitudinal surface of the groove member of adjacent concrete pipes cooperatively form a longitudinally disposed space therebetween adjacent the sealing gasket recess, said sealing gasket comprises a base member including an axial inner portion having a lower surface at least partially disposed in said sealing gasket recess having a compressible portion extending upwardly therefrom into the longitudinally disposed space, said compressible portion including an upper surface inclined relative to said lower surface, a sealing element comprising a flexible resilient sealing member including an axial outer end having an upper surface extending outwardly from said compressible portion in spaced relationship relative to said inner portion to cooperatively form a concave recess therewith having an inner surface when uncompressed and to extend into the longitudinally disposed space formed between adjacent concrete pipes when compressed wherein said outer end of said flexible resilient sealing member extends beyond said inner portion exposing a portion of said inner surface wherein said flexible resilient sealing member engages said inner portion of said base member when said flexible resilient sealing member is compressed wherein said inner surface of said recess forms a seam wherein said outer end of said flexible resilient member and said inner portion of said base member each extends beyond said seam to expose opposite ends of said inner surface and a retainer element formed on said base member comprising an annular retainer member configured to engage the end of the male joint member such that any debris or fluid infiltrating between the outer end of the female joint member and the end of the male joint member acts against said exposed inner surface to force said upper surface of said flexible resilient sealing member against the inner longitudinal surface of the female joint member and a portion of said inner end of said inner portion against the inner longitudinal surface of the male joint member to prevent infiltration through the longitudinally disposed space into the interior of adjacent concrete pipes said base member further includes at least one lubricant rib formed on said upper surface to cooperatively form a pocket therebetween disposed adjacent said outer end of said flexible resilient sealing member to retain a lubricant within said pocket such that as adjacent concrete pipes are assembled into a pipe line the lubricant rib is compressed thereby discharging the lubricant from said pocket to aid in the alignment of adjacent concrete pipes during assembly of the pipe line.

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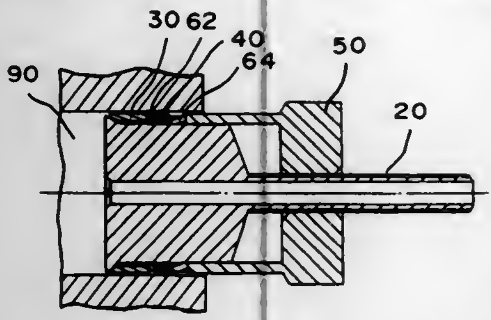
5,687,998
COUPLING DEVICE

Tzung Ting Pan, No. 153, San Ming Road, San Chung City, Taipei Hsien, Taiwan

Filed May 20, 1996, Ser. No. 650,774

Int. Cl.^{6} F16L *55/00*

U.S. Cl. 285—175 **11 Claims**



1. A coupling device configured to be attached to an object having a circular opening extending into the object from an external surface, the circular opening being bounded by an internal surface, the coupling device comprising:
- a coupling body configured to fit into the circular opening and having a substantially cylindrical coupling head and a threaded screw rod extending therefrom, said coupling head having an oblique portion and a receiving portion, said receiving portion located intermediate said oblique portion and said threaded screw rod and a longitudinal slot being disposed within said coupling body and passing therethrough;
- an expandable ring located on said receiving potion of said coupling body, the expandable ring having a surface facing the internal surface of the circular opening;
- a washer located on said receiving portion of said coupling body, intermediate said expandable ring and said threaded screw rod; and
- a guide tube having a head portion threaded onto said threaded screw rod of said coupling body, and a pressing portion extending over at least a portion of the receiving portion of the coupling head, wherein longitudinal movement of the guide tube relative to the coupling body causes the pressing portion to urge the expandable ring against the oblique portion of the coupling head causing the expandable ring to expand so as to frictionally engage the internal surface of the circular opening while the head portion is located outside the object displaced from the external surface.

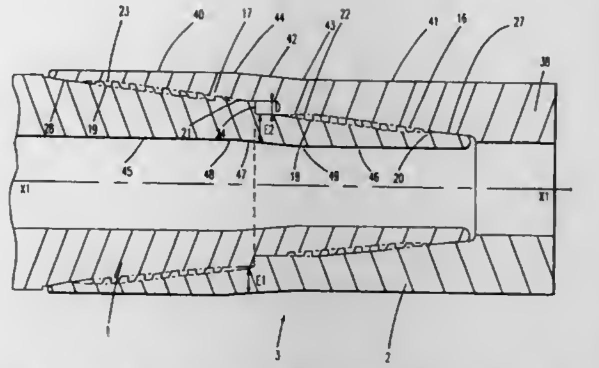
5,687,999
THREADED JOINT FOR TUBES

Alain Lancry, Banchory, United Kingdom, and Michihiko Iwamoto, Wakayama, Japan, assignors to Vallourec Oil & Gas, Aulnoye-Aymeries, France, and Sumitomo Metal Industries, Osaka, Japan

Filed Oct. 3, 1995, Ser. No. 538,436

Int. Cl.^{6} F16L *15/00*

U.S. Cl. 285—333 **13 Claims**



1. A threaded joint for tubes, comprising:
- a male element having a region with external threading comprising two radially shifted frustoconical sections of threadings having load flanks with a negative slope, said two frustoconical sections of said external threading being separated by a first ring-shaped abutment surface, said male element having at opposite axial ends of said region external surfaces forming tightness surfaces, each of said two frustoconical sections of said external threading having vanishing threads at opposite ends thereof; and
- a female element having a region with internal threading comprising two radially shifted frustoconical sections of threadings having load flanks with a negative slope, said two frustoconical sections of said internal threading being separated by a second ring-shaped abutment surface, said female element having at opposite axial ends of said region internal surfaces forming tightness surfaces, each of said two frustoconical sections of said internal threading having vanishing threads at opposite ends thereof,

wherein said male and female elements are mutually configured such that said male and female elements may be united by threading said external and internal threadings until said first and second abutment surfaces abut one another, wherein:
- a) crests and roots of each of said vanishing threads are radially limited by a convergence of a frustoconical surface of one of said male and female elements and a cylindrical surface of the other of said male and female elements,
- b) the abutting first and second abutting surfaces form a central abutment, and
- c) the tightness surfaces of said male and female elements mate in pairs to form two fluid tight seal surfaces having ring shaped contact zones.

5,688,000
SHOOT BOLT MECHANISM

Terence J. Dolman, West Midlands, United Kingdom, assignor to Feneseal Limited, Tipton, United Kingdom

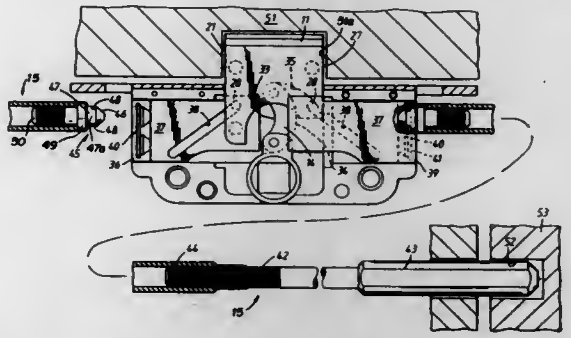
PCT No. PCT/GB94/01601, § 371 Date Jan. 19, 1996, § 102(e) Date Jan. 19, 1996, PCT Pub. No. WO95/03463, PCT Pub. Date Feb. 2, 1995

PCT Filed Jul. 26, 1994, Ser. No. 592,326

Claims priority, application United Kingdom, Jul. 26, 1993, 9315438

Int. Cl.^{6} E05C *9/16*

U.S. Cl. 292—34 **17 Claims**



1. A shoot bolt mechanism comprising a casing having a front wall and a rear wall, the casing containing a shoot bolt having opposed ends and slidable between an inoperative position in which the shoot bolt lies within the casing with one end adjacent the casing rear wall and the other end adjacent the casing front wall and a operative position in which the other end of the shoot bolt projects from the casing front wall, a rotatable drive member mounted in the casing adjacent the casing rear wall and a link pivotally connected at one end to the shoot bolt, and at an end opposite the one end to a point of the drive member, eccentric from an axis of rotation of the drive member, the pivotal connection being adjacent the casing rear wall when the shoot bolt is in the inoperative position, and the pivot axes being parallel to the axis of rotation of the drive member so that rotation of the drive member is translated by the link into movement of the shoot bolt between retracted and extended positions, the pivotal connection of the shoot bolt and the link being adjacent the front wall in the extended position, two drive transfer members being disposed on respective opposite sides of the shoot bolt between opposed ends thereof when the shoot bolt is in the retracted position, rotation of the drive member moving the drive transfer members between respective retracted and extended positions in directions generally normal to the direction of movement of the shoot bolt between its retracted and extended positions.

5,688,001
LOCKING MECHANISM, IN PARTICULAR FOR SUITCASES OR THE LIKE

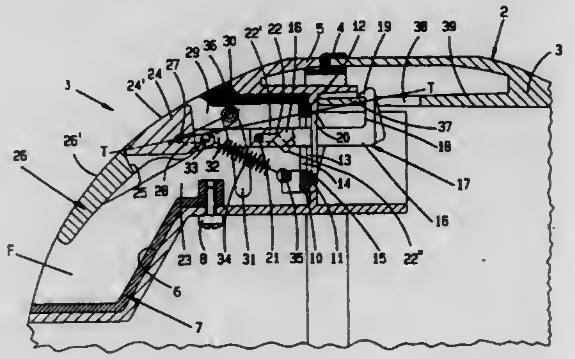
Helmut Klein, Velbert, and Wolfgang Buss, Solingen, both of Germany, assignors to Franzen International, Inc., Franklin Lakes, N.J.

Filed May 25, 1995, Ser. No. 451,053

Claims priority, application Germany, May 27, 1994, 9408707 U

Int. Cl.^{6} E05C *5/00*

U.S. Cl. 292—67 **8 Claims**



1. A locking mechanism comprising a housing, a shaft extending in said housing and having a latch member thereon adjacent to one end portion thereof, an actuating lever adjacent to an opposite end portion of said shaft, said shaft and said actuating lever being interconnected for conjoint translational movement of said shaft and said actuating lever and for pivotal movement of said actuating lever relative to said shaft, and a guiding system that guides movement of said shaft and said actuating lever in said housing for causing conjoint translational movement of said shaft and said actuating lever in said housing in response to a predetermined degree of turning of said actuating lever from a rest position relative to said shaft, whereby said latch member moves from a first position to a second position, and for causing said shaft to tilt relative to said housing in response to further turning of said actuating lever, whereby said latch member is turned away from said second position;
- wherein the interconnection of said actuating lever and said shaft includes a pivot member pivotally connecting said opposite end portion of said shaft to said actuating lever at a point between opposite ends of said actuating lever, and wherein said guiding system guides said pivot member for reciprocation in said housing, guides one end of said actuating lever, adjacent to said shaft, for arcuate movement in said housing transverse to said shaft, and guides said shaft for movement longitudinally of said shaft when said operating lever is turned to said predetermined degree and for movement laterally of said shaft during said further turning of said actuator lever, and wherein said actuating lever has a manually engageable portion for turning said actuator lever.

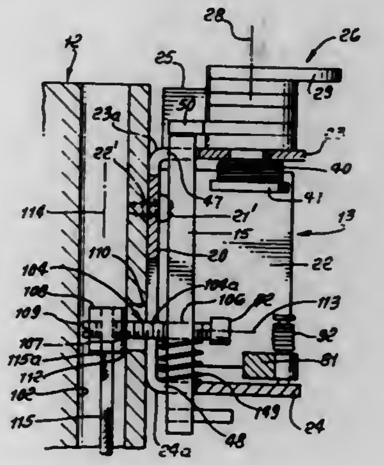
5,688,002
CONCEALED ROD OR CABLE SURFACE LATCHING EXIT DEVICE

Rory M. Riley, Santa Ana, Calif., and Masoud S. Miresmaili, Covina, Calif., assignors to Adams Rite Manufacturing Co., City of Industry, Calif.

Continuation-in-part of Ser. No. 349,744, Dec. 5, 1994, Pat. No. 5,588,686. This application Jan. 16, 1996, Ser. No. 585,705

Int. Cl.^{6} E05B *65/10*

U.S. Cl. 292—92 **20 Claims**



1. In combination with a door, door latching structure including an upper latching structure carried by the door and a lower actuator means carried by the door, said upper latching structure located outside the door, said latching structure further comprising,
- a) a vertically elongated passage concealed within the door and a longitudinally elongated link located within said door passage and extending into proximity to said latching structure, and to said actuator means, said link operatively connected to said actuator means,
- b) and a laterally extending link attached to an upper end portion of said longitudinally elongated link, for bodily movement therewith, said laterally extending link extending laterally of the door from the interior of said door passage to the exterior thereof via a side port in the door for connection to said latching structure to transfer longitudinal movement of the longitudinal link effected by said actuator means to said latching structure, for operating same said latching structure.

5,688,003
RETAINING LATCH FOR A WATER PIT GATE

Arden R. Beale, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 9, 1996, Ser. No. 694,576

Int. Cl.^{6} E05C *3/04*

U.S. Cl. 292—202 **12 Claims**

1. A retaining latch for retaining a water pit gate in a gate frame, said latch comprising:
- latch plate having a first edge portion consisting of a first thickness and second, third, and fourth edge portions consisting of second, third, and forth different thicknesses;
- an attachment means for rotatably attaching said latch plate to one edge of the gate so as to selectively provide rotation of said latch plate to a first position wherein said first edge portion would protrude beyond said edge of the gate and to a second, third or fourth position wherein said second, third, or fourth edge portion would protrude beyond said edge of the gate; and
- a catch means, for location on said gate frame, for engaging said edge portions when said latch plate is in said positions so as to enable different amounts of limited relative movement

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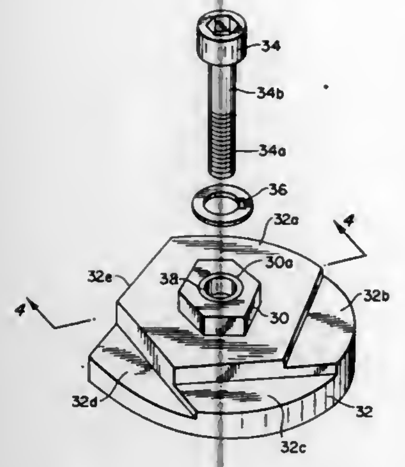


between the gate and the gate frame depending on whether said latch plate is in said first, second, third or fourth positions.

5,688,004
MOTOR VEHICLE DOOR LOCK ARRANGEMENT FOR A DOUBLE REAR HATCH

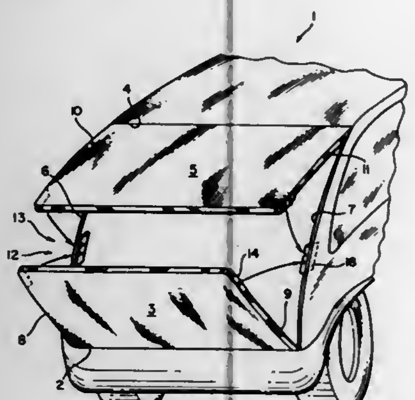
Siegfried Karge, Wuppertal, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 11, 1996, Ser. No. 583,982

Claims priority, application Germany, Jan. 6, 1995, 195 00 284.9

Int. Cl.⁶ C05B *15/02*

U.S. Cl. 292—341.17 **21 Claims**



1. Arrangement of a motor vehicle door lock on a double rear hatch comprising a pair of hatch doors which are swingable about parallel pivot axes located at first at opposite edges of a rear vehicle body opening, two door locks for each of said pair of hatch doors which are located at each of second opposite edges of the rear vehicle body opening, each door lock having a closure block and a lock mechanism with a rotary latch and a detent pawl for securing and releasing the closure block, wherein the lock mechanisms for the doors are disposed on the second opposite edges, and wherein the closure blocks are provided on facing side edges of the doors; wherein the rotary latches and detent pawls of the door locks are provided with separate rotational axes and said rotational axes are oriented parallel to the pivot axes of the hatch doors.

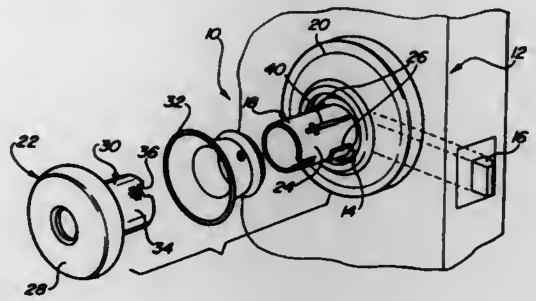
5,688,005
DOOR KNOB SPINDLE WITH SPRING

Philip C. Ellis, Reading, Pa., assignor to Baldwin Hardware Corporation, Reading, Pa.

Filed Jul. 10, 1996, Ser. No. 678,005

Int. Cl.⁶ E05B *3/00*

U.S. Cl. 292—348 **8 Claims**



1. In a lock assembly having a locking mechanism disposed within a door, the locking mechanism including a cylindrical spindle extending therefrom to which an operating member is operably mounted, the improvement comprising:

a biasing member mounted to the spindle and biasingly engaging the operating member, said biasing member including a bow spring mounted to the spindle and having a substantially curved configuration with ends of said bow spring in engagement with a slot in the spindle such that a vertex of said bow spring is disposed beyond an outer periphery of the spindle; and

at least one lug formed on the spindle drivingly engaged by the operating member to translate rotation of the operating member to the spindle.

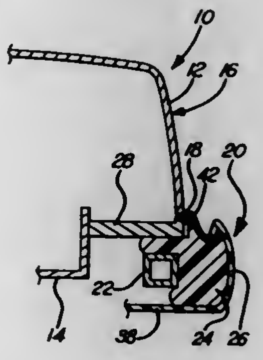
5,688,006
BUMPER ASSEMBLY WITH EXTENSION PANEL

Jeffrey L. Bladow, Novi; Robert E. Kosior, Livonia, and Piyush P. Parikh, West Bloomfield, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Apr. 5, 1995, Ser. No. 417,355

Int. Cl.⁶ B60R *19/02*

U.S. Cl. 293—120 **4 Claims**



1. A rear bumper assembly for an automotive vehicle having a body including a rear portion terminating in a vertically extending finish panel defining an outer planar surface and including a lower edge surface extending laterally of the body, the bumper assembly comprising:

a substantially rigid bumper bar fixedly secured to the body and extending laterally of the body below the vertically extending finish panel lower edge surface;

energy absorbing means mounted on the bumper bar rearwardly of the vertically extending finish panel below the lower edge thereof;

a generally U-shaped molded flexible bumper cover overlying the energy absorbing means and having a horizontal lower wall having a forward end projecting toward the body and a horizontal upper wall having a turned-down stop surface at its forward end defining a laterally extending surface spaced longitudinally rearwardly of the vertical panel outer planar surface; and

a substantially rigid extension panel fixedly secured to the body vertically intermediate the vertical panel and the bumper bar and defining a laterally extending abutting surface complementary to the bumper cover stop surface and longitudinally positioned substantially coplanar with the vertical panel outer surface and abuttingly engaging the bumper cover stop surface whereby longitudinal compression of the energy absorbing means and bending of the bumper cover upper wall is effected rearwardly of said vertical panel outer planar surface upon imposition of forces substantially longitudinal to said bumper assembly.

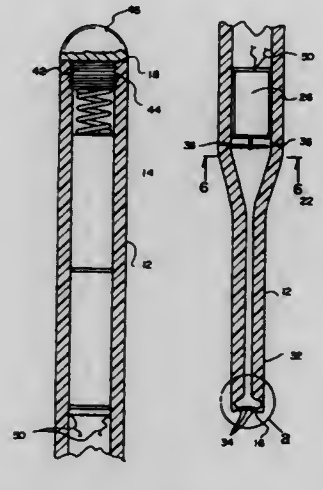
5,688,007
CONTACT LENS INSERTER/REMOVER

Joann F. Jefferson, P.O. Box 6582, Charlottesville, Va. 22906

Filed Oct. 2, 1996, Ser. No. 725,289

Int. Cl.⁶ A61F *9/00*

U.S. Cl. 294—1.2 **5 Claims**



1. A contact lens inserter/remover, comprising, in combination:

a tubular casing having an interior chamber of a cylindrical configuration with a concave lower first end and a planar open second upper end;

a fan within the chamber adapted for rotation about an axis co-extensive with the axis of the casing and an associated motor to rotate the fan in a first direction for drawing a vacuum at the first end of the casing and a second direction for effecting a blowing discharge of air at the first end of the casing with an associated power source adjacent to the motor;

the casing having a reduced diameter cylindrical extension at the lower first end with a plurality of apertures at the concave end for attracting or repelling a contact lens in contact therewith when the motor is energized, the casing also having air flow apertures on the side of the fan remote from the concave end;

a cap at the upper end of the casing with screw threads for coupling with the upper end to allow the addition or removal of the power source from the casing;

a switch adapted to inactivate the motor or to drive the motor in a first direction and a second direction at the discretion of the user; and

a housing formed of a top hollow cylindrical portion with an open bottom end and a bottom hollow cylindrical portion with an open top end, wherein the top hollow portion and the bottom hollow portion are adapted to be screwably coupled together at the open ends thereof for containing the casing therein, the bottom hollow portion further including a battery and a sterilizing agent at a bottom end thereof for heating the concave end of the casing when brought in contact therewith.

5,688,008
SUCTION DEVICE

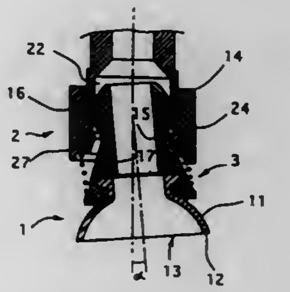
Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jan. 25, 1996, Ser. No. 591,041

Claims priority, application Switzerland, Mar. 31, 1995, 909/95

Int. Cl.⁶ B65G *59/04*

U.S. Cl. 294—64.1 **9 Claims**



1. A suction device comprising the combination of

a suction line;

a sucker at an inlet end of said suction line, said sucker having a suction lip around a suction opening and having an outer surface, said sucker being axially movable between

- a first inner position in which said sucker forms a sealing relationship with said inlet end of said suction line such that air flow around said outer surface of said sucker and into said suction line is substantially prevented, and
- a second outer position in which said sucker is spaced from said inlet end of said suction line such that limited air flow around said outside surface of said sucker and into said suction line is permitted; and

a reset element urging said sucker toward said second outer position, said sucker being movable from said second position to said first position against the urging of said reset element by reduced pressure inside said sucker and said inlet end.

5,688,009
C-HOOK PUSHER ASSEMBLY

David J. Pienta, Lambertville, Mich., assignor to Automatic Handling, Inc., Erie, Mich.

Filed Mar. 18, 1996, Ser. No. 617,320

Int. Cl.⁶ B66C *1/22*

U.S. Cl. 294—67.2 **5 Claims**

1. A C-hook pusher assembly for use with a material handling lift having a movable arm, comprising an upper frame member, a probe mounted parallel to said frame member, an end portion connected between said frame member and said probe, a rotatable screw mounted by said frame member, a motor for driving said

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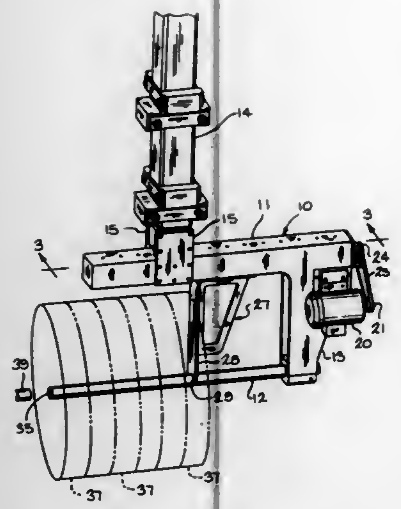


screw, a pusher block mounted for movement along said screw and a pusher arm operatively mounted by said pusher block.

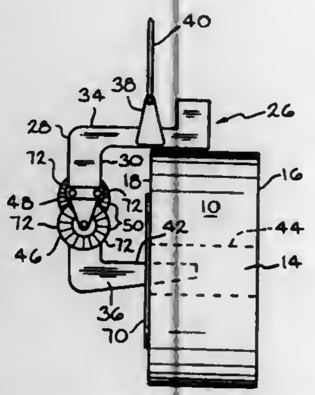
5,688,010
COIL EDGE PROTECTION FROM LIFTING DEVICE

William K. Moyer, Zanesville, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Jun. 10, 1996, Ser. No. 661,282

Int. Cl.^{6} B66C *1/22*

U.S. Cl. 294—67.2 **14 Claims**



1. A lifter for transporting a coil of strip material having a central opening, comprising:

a coil lifter for being suspended from an overhead crane,

the coil lifter including a lifting arm for being inserted into the central opening of the coil and a wheel for preventing damage to a coil edge when the lifting arm is inserted into the central opening,

an annular outer surface of the wheel being a laminated material radiating outwardly from a center of the wheel,

the lifting arm including at least two vertically extending surfaces and a lifting surface,

one of the vertically extending surfaces adjacent to the coil edge,

the wheel being rotatably mounted to the other vertically extending surface of the lifting arm wherein the annular outer surface of the wheel is positioned between the coil edge and the one surface thereby preventing the one surface from making inadvertent contact with the coil edge.

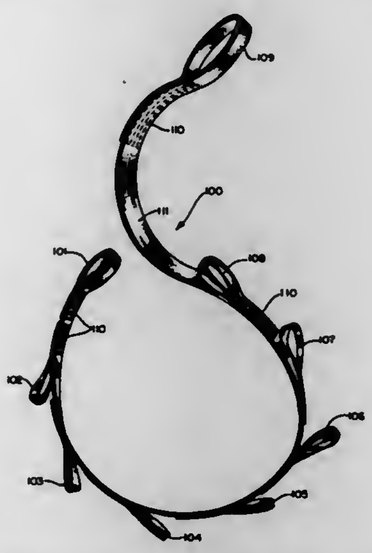
5,688,011
LIFTING SLING SYSTEM HAVING SINGLE STRAP WITH SIZE-VARYING, SPACED, IN-LINE EYE LOOPS

William F. Gulley, Monroe, La., assignor to Kenneth W. Browder, W. Monore, La., a part interest

Filed Jun. 30, 1995, Ser. No. 497,548

Int. Cl.^{6} B66C *1/12*

U.S. Cl. 294—74 **28 Claims**



1. A sling capable of lifting a heavy load and moving the heavy load about in the air while supported by the sling, comprising:

a substantially in-elastic, elongated, single strap of flexible, fabric-like material having a first strap end, a second strap end, a first, flat, outer, strap surface, and a second, flat, inner, strap surface co-extensive with said outer, strap surface; said first strap surface having in connection therewith a plurality of in-line eye-loops of flexible, fabric-like material spaced in line along the length of said single, elongated strap, said first strap end being separately selectively attachable to each one of said plurality of eye-loops forming a closed, in-elastic lifting loop capable of looping about, holding and lifting various sized loads, with the effective diameter of said loop being variable to produce a loop having a comparable inner diameter in comparison to the outer periphery of the particular heavy load being lifted.

5,688,012
LAUNCHING DEVICE

Jan Siesjo, and Anders Wigh, both of Linkoping, Sweden, assignors to Bofors Underwater Systems AB, Linkoping, Sweden

PCT No. PCT/SE94/00764, § 371 Date Apr. 1, 1996, § 102(e) Date Apr. 1, 1996, PCT Pub. No. WO95/05992, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 23, 1994, Ser. No. 601,028

Claims priority, application Sweden, Aug. 24, 1993, 9302720

Int. Cl.^{6} B66C *1/28*

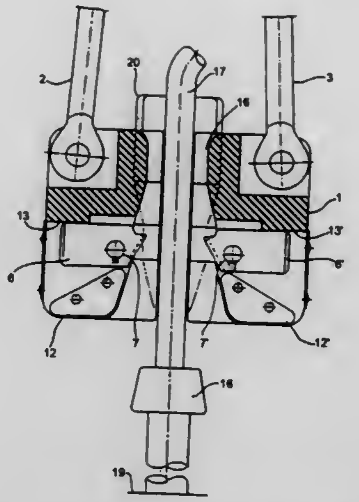
U.S. Cl. 294—82.32 **7 Claims**

1. A device in a lifting crane for releasing and recovering a load provided with a recovery cable, said device comprising:

a lifting yoke having an aperture extending in a lifting direction of said lifting yoke, said recovery cable being slidable through said aperture;

two locking members pivotally journalled in the lifting yoke about tangential axes of rotation, said two locking members jointly capable of recovering and supporting a load while in a first position and, upon pivoting to a second position, releasing a supported load; and

two regulating levers, each for controlling one of the locking members, each regulating lever having a first end journalled



on the axis of rotation of a respective locking member and a second end attached to a single biasing means interconnecting said pair of regulating levers, wherein said pair of regulating levers, in combination with said biasing means, when in an open position, forces the locking members to said second position for releasing a load and when in a closed position, forces the locking members to said first position for recovering and supporting a load.

5,688,013
HANDLING DEVICE WITH MOVABLE PINS FOR GRIPPING AN OBJECT

Friedhelm Sebrt, Riemelsbeck 152, D-45470 Muelheim, Germany

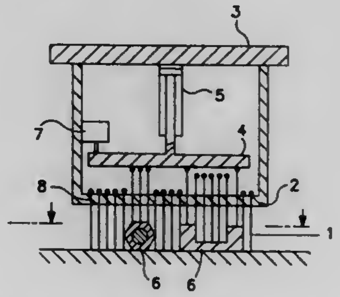
PCT No. PCT/DE93/01102, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO94/12323, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 19, 1993, Ser. No. 446,633

Claims priority, application Germany, Nov. 26, 1992, 42 39 649.2

Int. Cl.^{6} B25J *15/12*

U.S. Cl. 294—99.1 **31 Claims**



1. A handling device for mechanically gripping an object having contour regions, comprising:

a fastening plate;

a holding pin guide plate which is connected to the fastening plate and can be moved toward the object to be gripped in a lowering movement, the holding pin guide plate being provided with a plurality of bores disposed close together;

holding pins which are guided to be axially displaceable in the bores, the holding pins projecting freely downwardly and having lower ends, the lower ends of some of the holding pins being tangential to the object and being engaged against the contour regions of the object by elastic deformation of the holding pins during the lowering movement of the holding pin guide plate to thus clamp the object;

an ejection plate; and

an ejection apparatus disposed above the holding pin guide plate, to lower the ejection plate toward the holding pin guide plate.

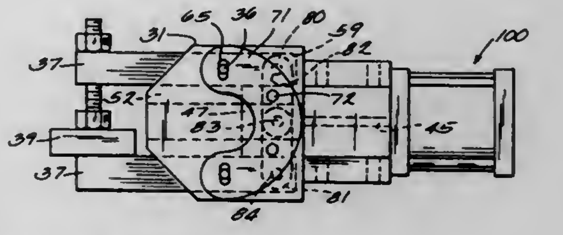
5,688,014
CLAMP HAVING SELF-LIMITING INTERNAL OVERSTRESS RELIEF

Norbert J. Kot, 955 S. Edwards St., Brookfield, Wis. 53005

Filed Nov. 14, 1994, Ser. No. 338,346

Int. Cl.^{6} B25B *5/12;* B25J *15/08*

U.S. Cl. 294—115 **20 Claims**



1. A toggle clamp comprising:

a frame including a hole,

a pin carried within the hole with clearance for movement therein,

a clamping arm carried by the pin for movement between a clamped position to clamp an article and an unclamped position to unclamp an article,

an actuator device controllable to provide a driving force,

a link having one end portion coupled to the actuator device and an opposite end portion pivotally coupled to the clamping arm at a location spaced from the pin to convey the driving force from the actuator device to move the clamping arm between the clamped and unclamped positions,

a spring having one end portion coupled to the pin and an opposite end portion coupled to the frame,

a slider element coupled to the actuator device, and

a track on the base on which the slider element is guided for reciprocating linearly.

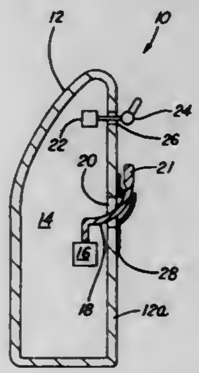
5,688,015
WATER SEAL LINER FOR VEHICLE DOOR

Thomas M. Patterson, Taylor; Richard F. Biermacher, Goodrich, and Gary K. Mannke, Grosse Ile, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Jun. 17, 1996, Ser. No. 664,945

Int. Cl.^{6} B32B *3/28;* B60R *27/00*

U.S. Cl. 296—39.1 **9 Claims**



1. A water sealing device for a vehicle door having an interior and at least one operating mechanism partially disposed in the interior, comprising:

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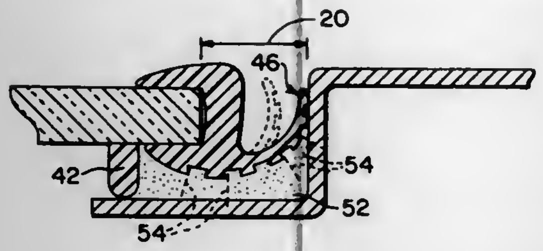
a liner made of waterproof material, the liner being formed with at least one dome-shaped pocket in a manufacturing configuration, wherein the pocket includes a surface and the surface is continuous, the pocket being frangible such that the pocket can assume a seal configuration, wherein the surface of the pocket includes first and second pocket portions for receiving a portion of the operating mechanism therebetween when the liner is disposed next to the door to inhibit the passage of water between the liner and the portion of the operating mechanism.

5,688,016
AUTO GRIPPER MOLDING WITH CROWN MECHANICAL INTERLOCK

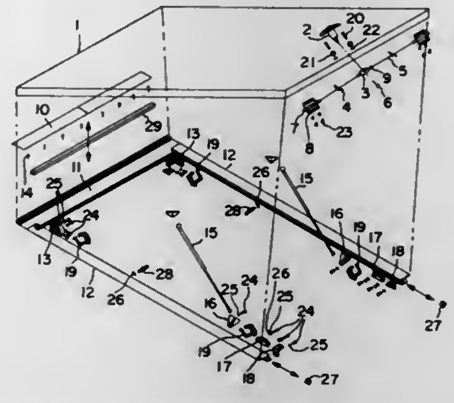
Peter Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570
Filed Apr. 8, 1996, Ser. No. 629,003
Int. Cl.^{6} B60J *1/02*
U.S. Cl. 296—93 **2 Claims**



1. An auto windshield gripper molding with mechanical interlocking utility of a type installed in an auto windshield opening bounded by a flange having an inturned horizontally oriented leg and a vertically oriented leg and a windshield having a peripheral edge and a dam adhesively secured in depending relation inwardly of said peripheral edge, said gripper molding comprising a vertically oriented body having opposite top and bottom ends, a crown in crossing relation formed integral at said body bottom end of a selected size presenting inboard and outboard length portions on opposite sides of said body, a gripper leg in an inturned laterally extending relation integral at said body top end cooperating with said crown inboard length portion to bound therebetween an inwardly facing C-shaped notch adapted to receive in projected relation therein said peripheral edge of said windshield for forming an installation assembly of said windshield and said molding, said installation assembly having an operative position seated in said auto windshield opening such that said dam, said molding, said and said horizontally and vertically oriented flange legs cooperate to bound a urethane-receiving compartment for a deposit of urethane for bonding in place of said windshield, said size of said crown being selected to impart to said crown outboard length portion with an operative position extending in crossing relation over said urethane-receiving compartment so as to serve as an arcuate-shaped closure for said compartment, and plural shaped notches in said arcuate-shaped closure therein for receiving the urethane in a viscous state incident to the deposit thereof in said urethane-receiving compartment, whereby upon a curing of said viscous urethane into a solid condition there results a mechanical interlocking of said molding crown notches located both above said flange horizontally oriented leg and also in facing relation to said flange vertically oriented leg.

5,688,017
METHOD AND APPARATUS FOR MOUNTING FRAMED TONNEAU COVER

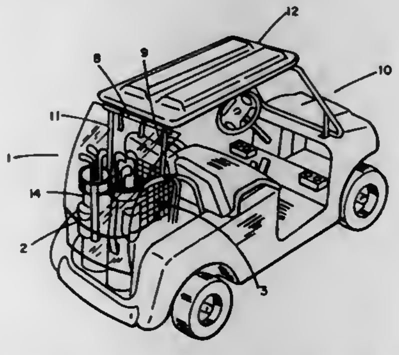
Bruce A. Bennett, 12451 Brick Rd., Granger, Ind. 46530
Filed Jun. 7, 1995, Ser. No. 488,519
Int. Cl.^{6} B60P *7/02*
U.S. Cl. 296—100 **1 Claim**



1. A cover arrangement for the bed of a pick up truck comprising:
a rigid tonneau member,
a frame assembly for removably attaching the tonneau member to the truck,
that frame assembly having at least one rail element to be clamped to a portion of the truck,
that rail element including a "t" shaped slot therein for slidably receiving at least one fastener for retaining the rail element to the portion of the truck, and
wherein the t shaped slot is formed to extend along at least a portion of the length of the rail element, and conventional nut and bolt fasteners are provided for retention of other accessory structures to that rail element by insertion of said fasteners into the t shaped slot.

5,688,018
PROTECTIVE COVER FOR GOLF BAGS ON A GOLF CAR

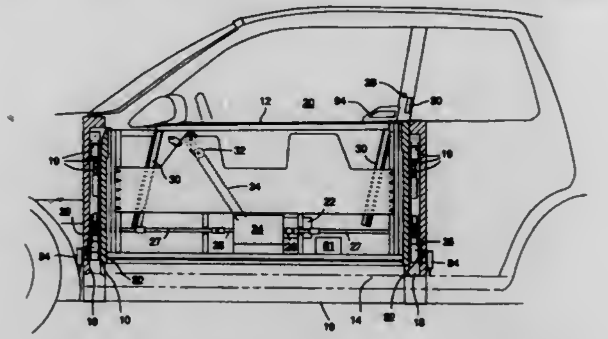
John Albert Simpson, 2104 Mountain View Dr., Birmingham, Ala. 35216
Filed Jan. 30, 1996, Ser. No. 594,013
Int. Cl.^{6} B60J *9/00*
U.S. Cl. 296—138 **27 Claims**



1. A protective cover for protecting golf bags and golf clubs mounted on a rear of a golf car from precipitation, said protective cover comprising:
a sheet having a top edge and a bottom edge;
means, disposed on the top edge of said sheet, for fastening the top edge of said sheet to the rear of the golf car; and
means, disposed on said sheet near the bottom edge of said sheet, for securing said sheet against the golf bags and for attaching said sheet to the rear of the golf car, said means disposed on said sheet near the bottom edge comprising: an elastic cord having two ends and a hook disposed on each said end, said elastic cord being horizontally disposed near the bottom edge of the sheet, and means for attaching said elastic cord to said sheet, said attachment means allowing for lateral displacement between the sheet and the cord.

5,688,019
DOOR AND WINDOW DRIVE CLUTCH ASSEMBLY

John A. Townsend, Troy, Mich., assignor to Joalto Design Inc., Southfield, Mich.
Continuation-in-part of Ser. No. 257,080, Jun. 9, 1994, which is a division of Ser. No. 912,790, Jul. 13, 1992, Pat. No. 5,378,036. This application Apr. 27, 1995, Ser. No. 430,527
Int. Cl.^{6} B60J *5/06*
U.S. Cl. 296—155 **18 Claims**

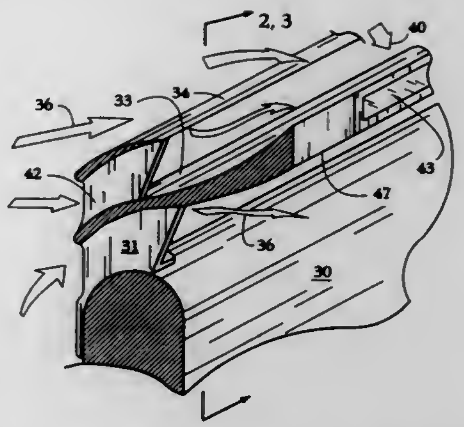


1. A vehicle door moving apparatus for use in driving a vertically sliding door between a closed position covering a portion of a door opening and an open position exposing the door opening in conjunction with driving a window panel relative to the door between an extended position covering a remaining portion of the door opening not covered by the door in the closed position and a retracted position exposing at least part of the remaining portion, the apparatus comprising:
single prime mover means for providing power to move the door between the closed and open positions and to move the window panel between the extended and retracted positions;
door drive means for directing the power from the single prime mover means to move the door;
window drive means for directing the power from the single prime mover means to move the window panel; and
clutch means for selectively coupling and uncoupling the single prime mover means to the door and window drive means such that the door and window panel can be moved simultaneously or independently by the single prime mover means.

5,688,020
TAILGATE MOUNTED DRAG REDUCING AEROSTABILIZER

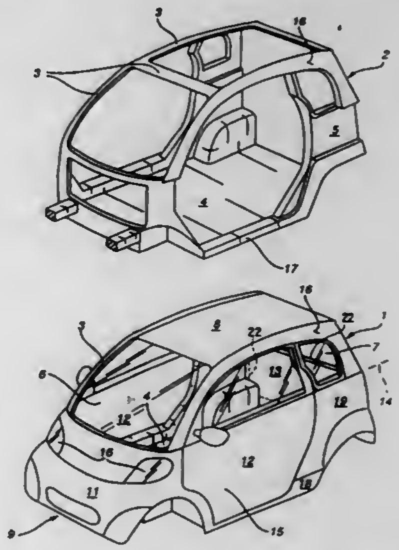
Donald E. Burg, 15840 SW. 84 Ave., Miami, Fla. 33157
Continuation-in-part of Ser. No. 338,255, Nov. 14, 1994, abandoned, and a continuation-in-part of Ser. No. 342,843, Nov. 21, 1994, abandoned, and a continuation-in-part of Ser. No. 584,390, Jan. 8, 1996, abandoned, and a continuation-in-part of Ser. No. 589,351, Jan. 22, 1996, abandoned. This application Apr. 25, 1996, Ser. No. 638,977
Int. Cl.^{6} B62D *35/00*
U.S. Cl. 296—180.1 **25 Claims**

1. In an improved pickup truck including a cargo bed and an opening tailgate positioned proximal an aft end of said cargo bed, the improvement comprising:
a first aerostabilizer in mechanical communication with said tailgate such that said first aerostabilizer moves with the tailgate during opening and closing of said tailgate, said first aerostabilizer positioned, at least in its majority, above and proximal to said tailgate, as seen with the tailgate in its closed or vertical orientation, and also, at least in its majority, aft of a forward portion of said tailgate, as seen with the tailgate in its closed or vertical orientation, whereby there is an air gap between at least a majority of a width of an underside of said first aerostabilizer and an upper portion of said tailgate, and whereby air from a forward portion of said tailgate, when said tailgate is closed in its vertical position and the pickup truck is moving forward, passes freely through said air gap thereby relieving air pressure from a forward portion of the tailgate.



5,688,021
BODY FOR A MOTOR CAR, ESPECIALLY A SMALL CAR

Johann Tomforde; Werner Nowak, both of Sindelfingen; Jens Manske, Weil der Stadt, and Walter Berlinger, Sindelfingen, all of Germany, assignors to Micro Compact Car GmbH, Germany
Filed Jan. 11, 1996, Ser. No. 586,459
Claims priority, application Germany, Jan. 6, 1995, 195 00 361.6
Int. Cl.^{6} B60R *27/00*
U.S. Cl. 296—185 **19 Claims**



1. Body for a motor car comprising a load-bearing structure formed by a three-dimensional framework structure composed of sectional framework bars joined together by way of connecting nodes to form a "space-frame" structure,

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wherein areas between the framework bars in a floor region and in a side region behind vehicle side doors are closed off by surface elements permanently integrated into the framework structure and connected in a sealing manner to the framework bars,

wherein open areas of the framework structure in a region of a windscreen and of fixed side windows behind the side doors and in a region of a roof are closed off respectively by window panes inserted in a sealing manner and by a roof inserted in a sealing manner,

wherein the open areas of the framework structure in the front region are closed off by a leaktight nose module which contains front light units,

wherein open areas of the framework structure in the region of the side doors and of a tailgate are closed off respectively by a side door fitted in a sealing manner and a tailgate, which vehicle doors and tailgate each have, respectively, an external door leaf and a gate outer wall limited to the region below the bottom edge or beltline of the windows,

wherein at least regions of those sectional bars of the framework structure which lie above a bottom edge or vehicle beltline of the windows have respective outward-facing sides exposed and are shaped to match a desired surface profile of the body and directly form external body surface areas,

wherein a panelling component which covers the nose module and leaves gaps for the front light units is connected removably and replaceably to the nose module,

wherein the external door leaves and the gate outer wall of the vehicle doors and the tail gate and limited to the region below the beltline are each directly connected removably and replaceably to a load-bearing door structure and a load-bearing gate structure, respectively, and

wherein the framework structure is covered below the beltline with panelling components without a load-bearing function which are directly connected to the framework structure in a removable and replaceable manner and which determine a shape of the body together with the external door leaves, the gate outer wall and the panelling component of the nose module.

5,688,022

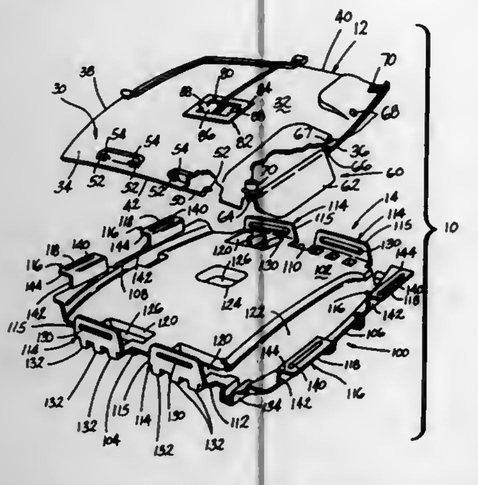
MODULAR PANEL ASSEMBLY

Edward R. Adams, Spring Lake, and Douglas C. Ruch, Zeeland, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Continuation of Ser. No. 312,820, Sep. 27, 1994, abandoned. This application Jul. 22, 1996, Ser. No. 681,316

Int. Cl.^{6} B60R *13/02*

U.S. Cl. 296—214 **19 Claims**



19. A modular panel and support tray assembly comprising:

a modular panel formed of a sheet of deformable material adapted to be mounted to a structural frame, the sheet having an upper surface adapted to face a portion of the structural frame and a lower contoured surface adapted to face away from the portion of the structural frame when the modular panel is mounted to the structural frame, the sheet further has at least one slot to accommodate an accessory fastener;

at least one accessory for mounting to a structural frame; and

a support tray comprising an upper contoured surface shaped to substanially complement and support the lower contoured surface of the sheet for aligning the sheet with respect to the support tray and for protecting the sheet during transport and further having at least one integral recess that is formed continuously as a portion of the upper surface, the recess being shaped to complement the shape of the at accessory;

the modular panel is positioned on the tray and the at least one accessory is positioned in the at least one recess between the modular panel and the tray in the vicinity of the at least one slot in the modular panel; and

whereby the modular panel and the at least one accessory can be mounted to the flame by moving the modular panel, the at least one accessory, and support tray to and against the structural frame as a unit, securing the modular panel and the at least one accessory to the structural frame and subsequently removing the support tray from the structural frame.

5,688,023

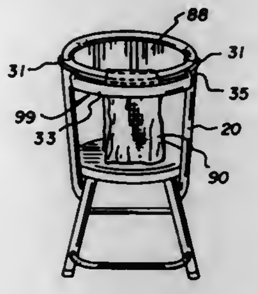
CHAIR FRAME

Alcea Blocker, Jr., 1900 Deerfield Ct., Oxon Hill, Md. 20745

Filed Feb. 5, 1996, Ser. No. 596,565

Int. Cl.^{6} A47C *7/62*

U.S. Cl. 297—188.2 **10 Claims**



1. A detachable towel rack for a folding chair comprising a towel bar and means for removably affixing the towel bar to the back of a chair to hang towels and articles of clothing therefrom, said towel bar further comprising a plurality of support arms attached to said towel bar, and including a first support arm and a second support arm, the first support arm being attached to the first end of the towel bar and the second support arm being attached to the second end of the towel bar, and an advertising plate mounted to and spaced from said towel bar to define an opening therebetween.

5,688,024

FOLDABLE ROTARY HUNTING SEAT

Roberto Arizpe-Gilmore, Av. San Angel 138, Col. Valle de San Angel Sector, Jardines Garza García N.L., Mexico, 66290

Continuation of Ser. No. 204,545, Mar. 2, 1994, abandoned. This application May 14, 1996, Ser. No. 649,943

Int. Cl.^{6} A47C *31/00*

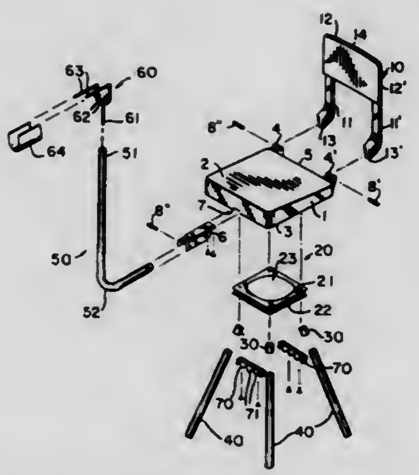
U.S. Cl. 297—217.1 **3 Claims**

1. A foldable rotary hunting seat, comprising:

a seat of a rigid material, having an upper surface, a lower surface, a front edge, a rear edge and lateral edges;

a metallic channel having a hinge end centrally coupled at a bottom of the front edge of the seat;

rotary means comprising upper and lower overlapped square plates and a bearing centrally held therebetween, the upper plate being centrally coupled to the lower surface of the seat;



legs removably coupled to the lower plate of the rotary means, allowing the seat to rotate when it is in an assembled position;

a seat back articulately coupled to the seat and foldable over the seat when the rotary hunting seat is in a folded position;

an "L" shaped weapon support arm said "L" shaped weapon support arm comprising a single rigid "L" shaped member, said "L" shaped weapon support arm being articulately coupled to the hinge end of the metallic channel of the seat, to maintain the weapon support arm in a hunting position, said weapon support arm being folded over the seat and the seat back when the rotary hunting seat is in a folded position;

a variable height weapon retaining fork coupled to an upper vertical end of the support arm; and

a carrier device centrally coupled to the lower plate of the rotary means, said carrier device holding the legs when the legs are removed to fold the rotary hunting seat.

5,688,025

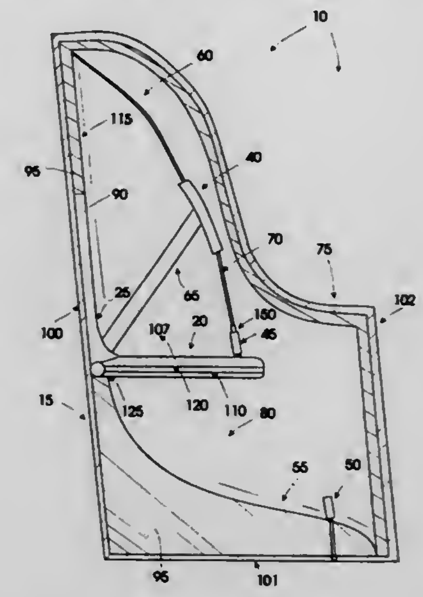
TWO LEVEL CONVERTIBLE CHILD CAR SEAT

Timothy H. Davidson, 200 N. Pine St., Little Rock, Ark. 72205

Continuation-in-part of Ser. No. 373,094, Jan. 17, 1995, abandoned. This application Dec. 11, 1996, Ser. No. 763,746

Int. Cl.^{6} B60N *2/28*

U.S. Cl. 297—238 **8 Claims**



1. A two level convertible child car seat comprising: a frame adapted to be releasably secured to an automobile seat using an existing seat belt, said frame defining a seating area to receive a child, said frame comprising an angled back and a bottom;

a selectively retractable seat hinged to said angled back of said frame, said retractable seat folding into said back and out of said back spaced apart from and above said bottom, said retractable seat including attaching means thereon;

a harness secured to said frame and selectively securable to said seat bottom and said retractable seat, said harness comprising at least one strap extending from a torso plate, said torso plate selectively securing to said seat bottom or to said attaching means of said retractable seat.

5,688,026

SLIDES FOR VEHICLE SEATS, AND TO SEATS FITTED WITH SUCH SLIDES

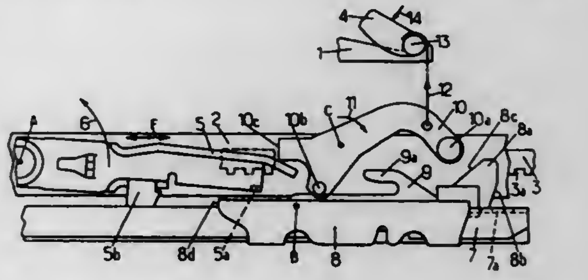
Yann Reubeuze, Landigou, and Jean-Marie Fretel, Ger, both of France, assignors to Bertrand Faure Equipements SA, France

Filed Jan. 29, 1996, Ser. No. 593,245

Claims priority, application France, Jan. 30, 1995, 95 01023

Int. Cl.^{6} A47C *1/02*

U.S. Cl. 297—341 **4 Claims**



1. A vehicle seat slide comprising:

a stationary longitudinal rail;

a moving longitudinal rail slidably mounted on the stationary rail;

a rack of notches carried by the stationary rail;

a latch mounted to pivot about a first transverse horizontal axis tied to the moving rail and suitable for co-operating with the notches of the stationary rail under the control of a member that is easily accessible for a person sitting on the seat;

resilient means for continuously urging the latch towards a notch-engaging locking position;

a longitudinal notched bar secured to the stationary rail;

a shoe slidably mounted to slide along the bar;

a catch for locking the shoe and mounted to pivot about a second transverse horizontal axis tied to the shoe and suitable for optionally co-operating with the notches of the bar so as to optionally lock the shoe relative to the bar, said catch including a top hook open horizontally facing towards the front of the seat;

a rocker pivotally mounted about a third transverse horizontal axis tied to the moving rail, the rocker including a first transverse finger organized to co-operate with a rear end of the shoe, a second transverse finger suitable for co-operating with the hook of the catch, and a heel suitable for co-operating with the latch; and

resilient means for constantly urging the rocker in a first direction towards a first extreme angular position in which firstly the first finger is in a low position for horizontally entraining the shoe, secondly the second finger raises the hook of the locking catch of the shoe into a release position, and finally the heel permits cooperation of the latch with the notches of the stationary rail;

the slide further comprising servo-control means for causing forward folding down of the seat back to urge the rocker angularly in a direction opposite to the first direction, the rear end of the shoe being suitable for co-operating with the first finger of the rocker and having a downwardly-open V-shaped

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profile in a longitudinal vertical plane, the V-shaped profile being rearwardly defined by an edge having a direction chosen between a vertical direction and a direction which slopes downwards in a forwards direction, and being forwardly defined by a sloping ramp extending downwards in a forwards direction.

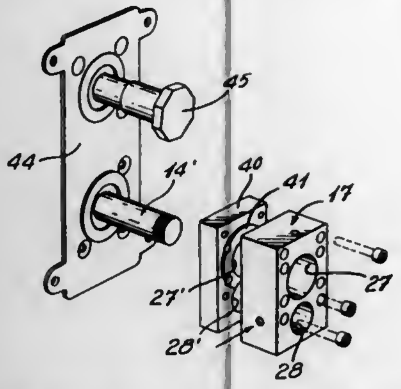
5,688,027
CONTROL VALVE LOCK FOR A VEHICLE AIR BRAKE SYSTEM

James J. Johnson, 365 Blvd. Deguire, Apt. 801, St. Laurent, Quebec, Canada, H4N 2T8, assignor to James J. Johnson, St. Laurent, Canada

Filed Jul. 11, 1996, Ser. No. 678,324

Int. Cl.^{6} B60T *17/16*

U.S. Cl. 303—89 **10 Claims**



1. A control valve lock for a vehicle air brake system to secure air-operated parking brakes in an engaged locked position, said lock comprising a base member having means to secure said base member relative to a valve actuating rod of an air control valve of said air brake system, said base member having a first bore for receiving in sliding fit therein a connecting shaft of an actuating knob, means to secure said connecting shaft to said valve actuating rod, a second bore in said base member spaced adjacent said first bore for receiving in sliding fit therein a portion of a lock cylinder, a passage in said knob disposed for axial alignment with said second bore and permitting free passage of said lock cylinder therethrough and in close sliding fit with at least a portion of said lock cylinder, said base member having a web section between said first and second bore, a locking through bore in said web, a key operable locking dog having a locking end portion spring-biased to extend out of a side wall of said lock cylinder and into said locking through bore, a dog engaging bore in said connecting shaft of said actuating knob, said locking end portion of said locking dog extending into said dog engaging bore when said knob is in a retracted position to enable said parking brakes, said dog being retractable in said lock cylinder by a key whereby to retract said locking end portion of said dog to disconnect said knob to permit said parking brakes to be disabled.

5,688,028
BRAKE PRESSURE CONTROLLER

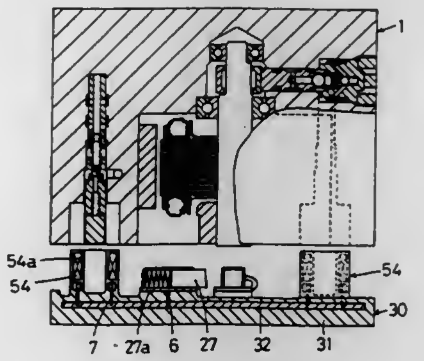
Teruhisa Kohno, and Tarou Segawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1996, Ser. No. 607,765

Claims priority, application Japan, Feb. 27, 1995, 7-038561; Nov. 21, 1995, 7-302857

Int. Cl.^{6} B60T *13/18;8/32*

U.S. Cl. 303—116.4 **5 Claims**



1. A brake pressure controller comprising:
a hydraulic circuit block defining an open side;
a plurality of pumps mounted in said hydraulic circuit block;
a plurality of pressure regulating solenoid valves, mounted in said hydraulic circuit block, wherein each of said solenoid valve for controlling wheel brake pressure by opening and closing a fluid passage through said each solenoid valve;
a direct current electric motor, received in said open side of said hydraulic circuit block, for driving said plurality of pumps,
said direct current electric motor including a rotor shaft having a first end supported in said hydraulic circuit block and an unsupported second end, a rotor mounted on said rotor shaft and having a core carrying a winding, and a commutator mounted on said rotary shaft adjacent said second end of said rotary shaft;
first and second bearings provided on a portion of said rotor shaft adjacent said first end of said rotor shaft, said first and second bearings supporting said rotor on said hydraulic circuit block at two spaced points which are located further away from said second end of said rotor shaft than said core, wherein said plurality of pumps engage said rotary shaft between said first and second bearings;
a control block directly connected to said hydraulic circuit block so as to close said open side of said hydraulic circuit block, said control block including a built-in electronic control circuit for outputting drive signals to said solenoid valves and said motor;
a brush holder secured to said control block; and
a feeding brush inserted in said brush holder, said feeding brush contacting said commutator and being electrically connected to said electronic control circuit by a conductor extending from said brush holder,
wherein said hydraulic circuit block, said electric motor and said control block are joined together as a one-piece unit.

5,688,029
ANTI-SLIP CONTROL

Thomas Bach, Koblenz; Stefan Helbing, Kruft; Josef Knechtges, Mayen, and Hubert Schmitt, Ochtendung, all of Germany, assignors to Lucas Industries public limited company, Great Britain

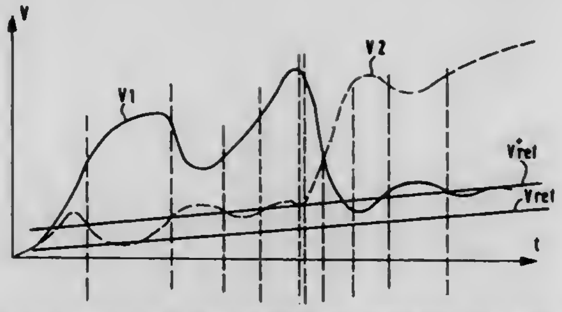
PCT No. PCT/EP94/02260, § 371 Date Jan. 12, 1996, § 102(e) Date Jan. 12, 1996, PCT Pub. No. WO95/02528, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 11, 1994, Ser. No. 591,437

Claims priority, application Germany, Jul. 12, 1993, 43 23 275.2

Int. Cl.^{6} B60T *8/72*

U.S. Cl. 303—139 **2 Claims**



1. A method for preventing the driven wheels of an automotive vehicle from spinning, where whenever a first wheel of two driven wheels of an axle of the vehicle provided with an axle differential has a lower friction coefficient with the road surface than a second wheel of that axle, and the first wheel shows a spinning tendency, but not the second wheel, a brake pressure is built up at the first wheel, and then the rotational behavior of the second wheel which does not show a spinning tendency is measured and evaluated so that whenever the rotational speed of the second wheel exceeds a threshold value ($v^{+}ref$), the brake pressure at the first wheel is temporarily relieved, and whenever the rotational speed of the second wheel drops below the threshold value ($v^{+}ref$), the brake pressure at the first wheel is temporarily built up.

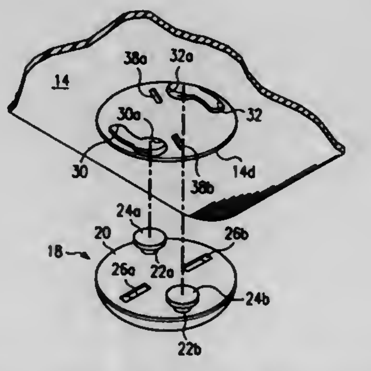
5,688,030
ELECTRONIC EQUIPMENT ENCLOSURE WITH SUPPORT MEMBERS

Andrew McAnally, 4318 E. Cordoba Cir., and Stephen Cook, 310 Fawn Ridge St., both of Georgetown, Tex. 78628

Filed Aug. 9, 1996, Ser. No. 689,512

Int. Cl.^{6} F16M *11/20*

U.S. Cl. 312—223.2 **13 Claims**



1. A computer comprising an enclosure including a bottom plate defining two spaced keyhole slots each of which has an enlarged end portion and a reduced end portion; and a support member comprising a base, one end of which is adapted to engage the surface on which the computer is to be supported, two spaced posts projecting from another end of the base opposite the one end, and a head provided on a terminal end of each post, each enlarged end portion having a dimension greater than the corresponding dimension of each head, and each reduced end portion having a dimension less than the corresponding dimension of each head so that the heads can be inserted in the respective enlarged end portions of the keyhole slots, and the support member rotated, to move the heads and the posts of the support member to the reduced end portion of their respective keyhole slots to mount the support member to the enclosure, first detent means for engaging the heads of the posts and second detent means for engaging the support member.

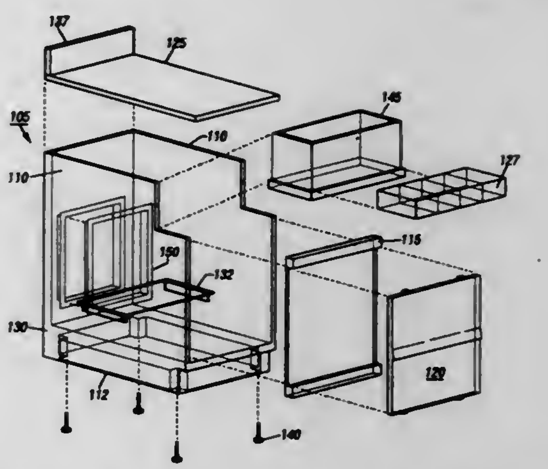
5,688,031
STORAGE CABINET ASSEMBLY HAVING MULTIPLE IDENTICAL CABINET UNITS FORMED BY ROTATIONAL MOLDING

John Frederick Tryon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 8, 1995, Ser. No. 435,052

Int. Cl.^{6} A47B *81/00*

U.S. Cl. 312—257.1 **1 Claim**



1. A cabinet assembly for storage of supplies or retail stock, said cabinet assembly comprising:
a plurality of cabinet units joined side by side, and wherein each of said cabinet units is formed by rotational molding and comprises
a plurality of polymeric surfaces molded in a unitary construction, said plurality of said surfaces consisting of one bottom surface, one back wall and two side walls;
wherein said two side walls of at least one of said cabinet units includes matching L-shaped notches in the top front edges of said two side walls;
wherein said matching L-shaped notches are adapted to engage with a removable plug-in unit; and
wherein said removable plug-m unit comprises L-shaped surfaces which are adapted to engage with said matching L-shaped notches and thereby close the opening formed between said notches.

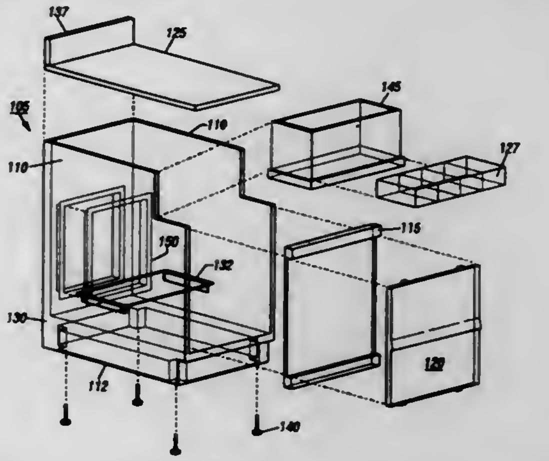
5,688,032
WORK AND STORAGE CABINET ASSEMBLY HAVING MULTIPLE IDENTICAL CABINET UNITS FORMED BY ROTATIONAL MOLDING

John Frederick Tryon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 435,052, May 8, 1995. This application Jun. 7, 1995, Ser. No. 473,686

Int. Cl.^{6} A47B *81/00*

U.S. Cl. 312—257.1 **1 Claim**



1. A work bench comprising:
a plurality of cabinet units joined side by side, and wherein each of said cabinet units is formed by rotational molding and comprises
a plurality of polymeric surfaces molded in a unitary construction, said plurality of said surfaces consisting of one bottom surface, one back wall and two side walls;

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a top panel fixedly attached to the top edges of said back and side walls of at least one of said cabinet units to thereby define a hollow bounded by said top panel and said bottom surface, said back wall, and said two side walls of said cabinet unit;

wherein said two side walls of said at least one of said cabinet units includes matching L-shaped notches in the top front edges of said two side walls and wherein said matching L-shaped notches are adapted to engage with a removable plug-in unit; and

wherein said removable plug-in unit comprises L-shaped flat surfaces which are adapted to engage with said matching L-shaped notches and thereby close the opening formed between said notches.

5,688,033

DEVICE FOR THE ADJUSTABLE ATTACHMENT OF THE FRONT COVER OF A DRAWER ON FRAMES

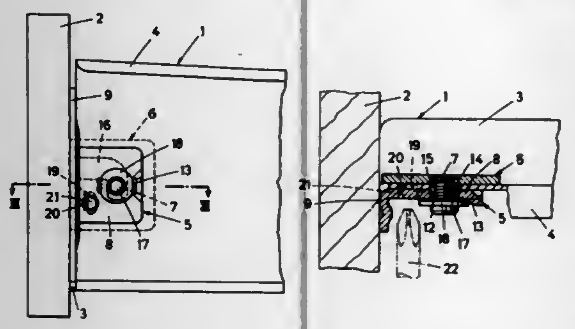
Walter Fleisch, and Jürgen Nachbaur, both of Lustenau, Austria, assignors to Alfit Aktiengesellschaft, Götzis, Austria

Filed Aug. 30, 1996, Ser. No. 708,086

Claims priority, application Austria, Sep. 7, 1995, 1481/95

Int. Cl.^{6} A47B *88/00*

U.S. Cl. 312—348.4 **10 Claims**



1. A drawer comprising a side frame, a front cover and a device for adjustably attaching the front cover to the side frame, the attaching device comprising:

(a) a holding member for the side frame consisting of
  (1) a supporting plate affixed to the front cover and
  (2) a pressure plate defining a gap with the supporting plate, the gap having an adjustable width and an end portion of the side frame being inserted in the gap,
(b) a clamping screw having a head, the clamping screw connecting the pressure plate to the supporting plate of the holding member,
(c) a threaded socket protruding from the pressure plate into, and engaging, a bore in the supporting plate,
  (1) the bore having a rim and the head of the clamping screw being supported on the rim of the bore, and
  (2) the clamping screw being engaged in the threaded socket and tightening of the clamping screw adjusting the width of the gap and clamping the end portion of the side frame between a clamping surface of the supporting plate and a pressure surface of the pressure plate bearing against the end portion of the side frame, and
(d) the end portion of the side frame defining a guide slot for the threaded socket and the threaded socket passing through the guide slot, the guide slot extending inwardly from an end of the end portion of the side frame adjacent the front cover.

5,688,034

REFRIGERATOR SHOW-CASE DISPLAY STAND

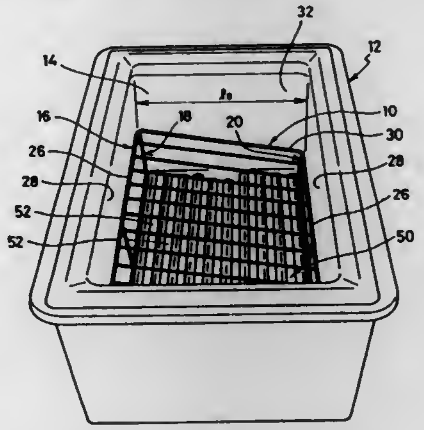
Noboru Kojima, Aichi-ken, Japan, assignor to Kabushiki Kaisha Yunikura Sangyo, Aichi-ken, Japan

Filed Apr. 1, 1996, Ser. No. 625,244

Claims priority, application Japan, Jan. 8, 1996, 8-000284

Int. Cl.^{6} A47B *57/00*

U.S. Cl. 312—408 **4 Claims**



1. In combination with an upwardly open refrigerator repository of rectangular cross-sectional shape with a bottom and with opposing side wall surfaces providing a given width dimension therebetween; a display stand in said repository comprising a loading plate having a width dimension approximately equal to said given width dimension of said repository; and a pair of legs having different height dimensions attached by pivotal attachment means to both edge portions defining the width dimension of said loading plate so as to be pivotally movable about axes parallel to both said edge portions; wherein a plurality of grooves are provided on said repository bottom at intervals, and wherein each said groove can receive part of each said left.

5,688,035

BACKLIGHTING DEVICE FREE OF A BRIGHT LINE

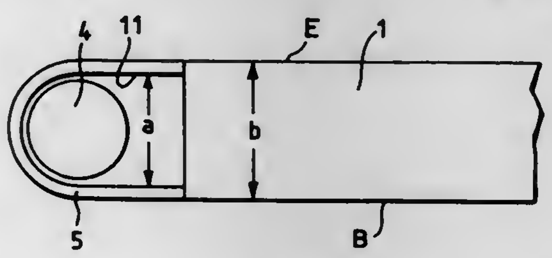
Keiji Kashima, Saitama, and Naoki Yoshida, Kanagawa, both of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Division of Ser. No. 408,285, Mar. 22, 1995, abandoned. This application Sep. 30, 1996, Ser. No. 721,848

Claims priority, application Japan, Mar. 23, 1994, 6-051664; Sep. 22, 1994, 6-227799

Int. Cl.^{6} F21V *33/00*

U.S. Cl. 362—31 **10 Claims**



1. A backlighting device for a panel, comprising:

a light conducting plate made of a transparent material, and having a function of outputting light from a light exit major surface thereof;

a linear light source disposed adjacent to at least one end face of the light conducting plate; and

a light reflector covering the linear light source, an inner surface of a light-exit-side portion of the light reflector located between the linear light source and the end face of the light conducting plate being disposed inside an extension of the light exit major surface of the light conducting plate, and an outer surface of the light-exit-side portion of the light reflector located between the linear light source and the end face of the light conducting plate being disposed substantially at the same level as or outside the light exit major surface of the light conducting plate, wherein an end portion of the light-exit-side portion of the light reflector has a step portion that engages the light conducting plate.

5,688,036

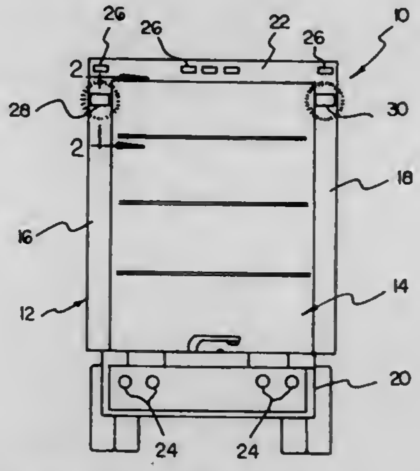
HIGH-MOUNTED TRUCK TAIL LIGHTS

Belvin F. Marshall, and Lucy Marshall, both of 150 Heart Lake Rd., Inglewood, Ontario, Canada, L0N 1K0

Filed Jul. 11, 1996, Ser. No. 676,645

Int. Cl.^{6} B60Q *1/26*

U.S. Cl. 362—80 **1 Claim**



1. High-mounted truck tail lights comprising:

a truck trailer body having a rear door assembly flanked by left and right vertical lateral pillars, a frame extending beneath the door assembly and between lower ends of the vertical lateral pillars, and an upper transverse pillar extending between upper ends of the vertical lateral pillars, the truck trailer body having existing tail lights which indicate braking and turning and are mounted to the frame of the truck trailer body beneath the door assembly thereof;

left and right signal lights mounted to the respective lateral pillars proximal to the transverse pillar and distal from the frame of the truck trailer body, the signal lights being electrically interconnected with the existing tail lights of the truck trailer body, whereby a driver of the truck trailer body can signal braking and turning actions to drivers which are not immediately behind the truck trailer body to reduce accidents resulting from non-viewable highway signals during lane changing procedures;

said lateral pillars each including a medial portion located medially between the upper and the lower ends of the vertical lateral pillars, and wherein the signal lights are positioned above the medial portion of the lateral pillars.

5,688,037

BOOK LIGHT FOR SIMULTANEOUSLY OPENING THE SHADE AND ACTUATING THE SWITCH

Mike Chen, P.O. Box 55-1670, Taipei (10477), Taiwan

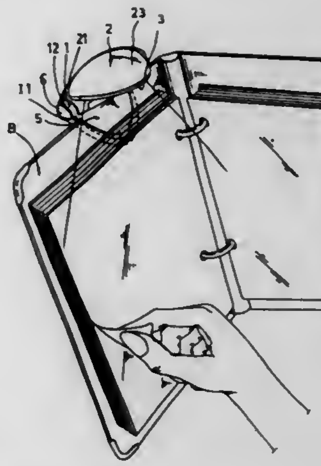
Filed Feb. 12, 1996, Ser. No. 600,072

Int. Cl.^{6} F21V *33/00*

U.S. Cl. 362—98 **7 Claims**

1. A book light comprising:

a base having a clamping means secured to said base to be clamped on a book;



a shade means pivotally secured on said base and having a lamp mounted in said shade means; and

an electrical control circuit mounted in said shade means for powering the lamp, having a push-button switch resiliently held in said shade means and protruding outwardly beyond said shade means for closing the electrical control circuit;

said shade means foldably closed on said base to retract said push-button switch inwardly in said shade means to disconnect the electrical control circuit to turn off said lamp; whereby upon an outward pivotal movement of said shade means to unfold said shade means from said base, said push-button switch is protruded outwardly beyond said shade means to close said electrical control circuit to automatically turn on said lamp for reading use;

said base including: a platform secured with said clamping means and having an upper flat surface formed on the platform, and a pair of bushings bifurcated from the platform as generally U shaped, each said bushing formed with a pivot hole therein; and said shade means including: a shaft portion having a pair of pivots disposed on two opposite ends of the shaft portion each said pivot rotatably engageable with each said pivot hole formed in each said bushing of the base for pivotally mounting the shade means on the base, a shade portion laterally protruded from the shaft portion having a parabolic reflector formed on a back portion of the shade portion and a flat cover formed on a surface portion of the shade portion opposite to the parabolic reflector, and a lens fixed in the flat cover to define a lamp chamber in between the lens and the reflector for securing the lamp within the lamp chamber in said shade means.

5,688,038

PROTECTIVE DEVICE WITH E.L. LIGHT MEANS

Tseng Lu Chien, 8F, No. 29, Alley 73, Lin-Shen Street, Shi-Chi Town, Taipei, Hseng, Taiwan

Filed Apr. 13, 1995, Ser. No. 421,647

Int. Cl.^{6} F21L *15/08*

U.S. Cl. 362—103 **5 Claims**

1. A protective device, comprising:

a protective element consisting of a soft padding material positioned between a backpad and a plastic cover;

an electro-luminescent lighting element attached to the protective element and a power pack electrically connected to the electro-luminescent lighting element by wires;

means including a strap attached to the backpad for fastening the the protective element to a wearer of the protective device,

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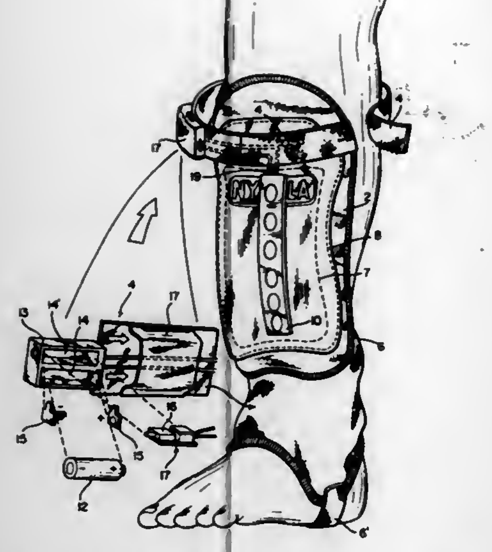
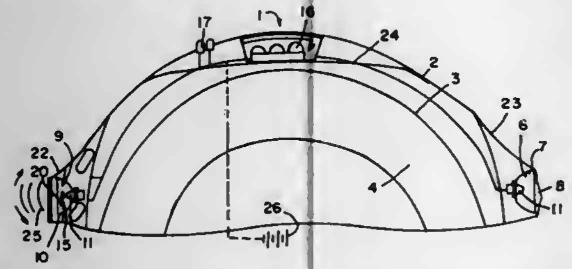


wherein said strap has a pocket formed therein and wherein said power pack is housed within said pocket of said strap.

5,688,039
PIVOTING PROJECTION BEAM SAFETY HELMET

Lyndon F. Johnson, 4439 Brandon Dr., Delray Beach, Fla. 33445

Filed Sep. 10, 1996, Ser. No. 711,777
Int. Cl.⁶ F21L *15/14*
U.S. Cl. 362—106 **18 Claims**



1. An illuminated safety helmet for protecting the head of a user, the helmet comprising:

a hard shell;

resilient head-engaging means for engaging the head of a user and resiliently spacing the shell away from the head to cushion the head from forces applied to the shell, the head-engaging means attached to the shell at the inner surface thereof;

rearwardly directed intermittently electric powered rear light for flashing on and off at predetermined intervals;

forwardly directed electrically powered front light for directing a focused projection beam of light along the path to be taken by the user;

the rear light and front light being attached to the helmet in such a fashion as to maintain the protective integrity of the hard shell;

electric power means for supplying electric power to the front and rear lights connected to the front and rear lights;

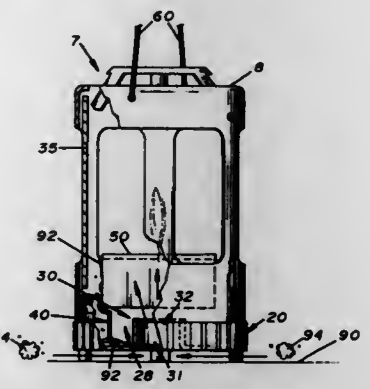
means interposed between the power means and the front and rear lights for switching the front and rear lights on and off; and

means for adjusting the attitude of the projection beam, the means for adjusting attached to the front light and extending outward therefrom to provide a handle for manual adjustment of the attitude of the beam by the user.

5,688,040
PORTABLE, TUB CANDLE LANTERN

Garry W. Klees, 7515 SE. 76th St., Mercer Island, Wash. 98040

Filed Jan. 17, 1996, Ser. No. 587,922
Int. Cl.⁶ F21L *19/00*
U.S. Cl. 362—163 **8 Claims**



1. A portable candle lantern, comprising:

a) an upper cover, said upper cover having a lower opening and plurality of viewing openings formed therein;

b) a lower base, said lower base having a plurality of feet for supporting said lower base in an elevated position on a support surface, said lower base having a longitudinal axis:

c) an air delivery tube formed inside said lower base capable of delivering outside air inside to said lower base and against said candle support assembly and said tub candle, said air delivery tube having a central passageway;

d) a candle support assembly disposed inside said lower base for supporting a tub candle in a longitudinally aligned, elevated position inside said lower base, said candle support means includes a plate with a plurality of legs extending therefrom capable of supporting a tub candle in a centrally aligned, elevated position over said central passageway on said air delivery tube;

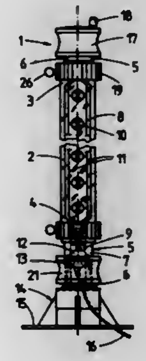
e) a tub candle attached to said candle support assembly; and,

f) a cover attachment means enabling said upper cover to be selectively attached to said lower base.

5,688,041
DEMARCATION LIGHTING SYSTEM

Dieter Arndt, Wohnsitz, Germany, assignor to Georg Robel GmbH & Co., München, Germany

Filed May 22, 1995, Ser. No. 446,497
Claims priority, application Germany, May 26, 1994, 44 18 301.1
Int. Cl.⁶ H01R *33/00*
U.S. Cl. 362—226 **39 Claims**



1. A demarcation lighting system for demarcating and illuminating danger zones and work areas, comprising:

a transparent lamp assembly defining an axis and having opposing ends, said lamp assembly containing a lamp and being made of tubular, flexible material;

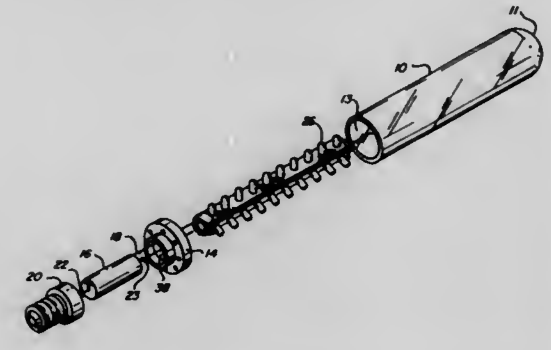
coupling means secured to said lamp assembly for allowing a selective detachable connection to a further lamp assembly, said coupling means including a first coupling arranged on one end of said lamp assembly and a second coupling arranged on the other end of said lamp assembly; and

a pedestal detachably secured to one of said first and second couplings and including a base extending vertically to the axis of said lamp assembly and a cable for supply of electric energy.

5,688,042
LED LAMP

Abolfazl Madadi, Scarborough; Morteza Showleh, Markham, and David J. Rycroft, Unionville, all of Canada, assignors to Lumacell, Inc., Scarborough, Canada

Filed Nov. 17, 1995, Ser. No. 560,440
Int. Cl.⁶ F21V *3/00*
U.S. Cl. 362—240 **17 Claims**



1. LED lamp comprising:

(a) a base having one end configured to seat in an associated electrical socket, said base having an outer surface with conductive elements thereon to effect a power connection to the socket and house current, said base also having internal contacts therein coupled to said conductive elements;

(b) three elongated circuit boards extending from the other end of said base and oriented with respect to each other to form an array of generally equilateral triangular cross section, each of said circuit boards having a multiplicity of light emitting diodes mounted upon the outwardly disposed surface thereof disposed away from the other circuit boards and spaced along substantially the entire length thereof, and conductor means connected to said diodes, said circuit boards defining a triangular cavity therebetween;

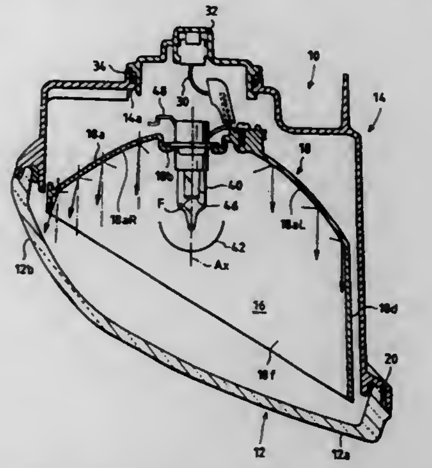
(c) power transfer means disposed substantially within said base and in said cavity for electrically connecting said conductor means of said circuit boards to said contacts to effect modification of house current and to provide electrical power to said diodes; and

(d) a generally tubular housing of light transmitting material mounted upon and extending from said other end of said base in spaced relationship about said diodes, whereby said light emitting diodes are disposed over most of the length of said tubular housing to provide substantially uniform illumination over the length thereof.

5,688,043
VEHICULAR LAMP HAVING REDUCED REGENERATIVE ACTION IN OUTER PORTION OF LENS

Saburo Watanabe, and Takaaki Nishizawa, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1996, Ser. No. 687,912
Claims priority, application Japan, Jul. 31, 1995, 7-214033
Int. Cl.⁶ F21V *7/00*
U.S. Cl. 362—297 **8 Claims**



1. A vehicular lamp, comprising: a light source; a reflector having an optical axis extending in a longitudinal direction of vehicle on which said lamp is mounted for reflecting light from said light source forwardly; and a lens disposed in front of the reflector and having respective portions inclined right and left in such a manner that an outer end portion of the lens in a widthwise direction of a vehicle on which said lamp is mounted is situated rearward of an inner end portion of the lens in said widthwise direction of said vehicle, said reflector having a first reflecting surface area positioned on an inner side in said widthwise direction of said vehicle having the shape of a paraboloid of revolution, and a second reflecting surface area positioned on an outer side in said widthwise direction having the shape of a curved surface formed so as to reflect light from said light source in such a manner that the more distant a reflecting point on said second reflecting area is from said optical axis of said reflector in a lateral direction of said reflector, the larger a reflection angle at said reflecting point is with respect to said optical axis.

5,688,044
VEHICULAR LAMP HAVING IMPROVED LIGHT DISTRIBUTION PATTERN

Saburo Watanabe, and Takaaki Nishizawa, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1996, Ser. No. 689,077
Claims priority, application Japan, Jul. 31, 1995, 7-214034
Int. Cl.⁶ F21V *7/00*
U.S. Cl. 362—309 **6 Claims**

1. A vehicular lamp comprising: a light source; a reflector having an optical axis extending in the longitudinal direction of a vehicle on which said lamp is mounted for reflecting light from said light source forwardly; and a lens disposed in front of said reflector and having portions inclined right and left in such a manner that an outer end portion of said lens in a widthwise direction of said vehicle is situated rearwardly of an inner end portion of said lens in said widthwise direction of said vehicle, at least a portion of said outer end portion being curved and shifted rearwardly from bottom toward top, and said lens further comprising a plurality of horizontally diffusing lens steps formed in parallel to one another, wherein reflected light having a given lateral

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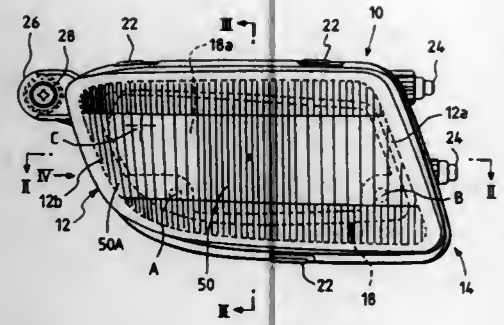
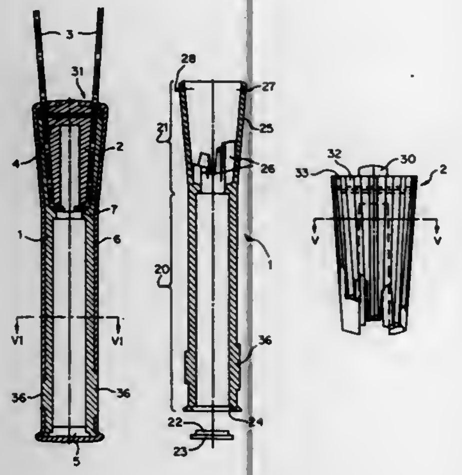


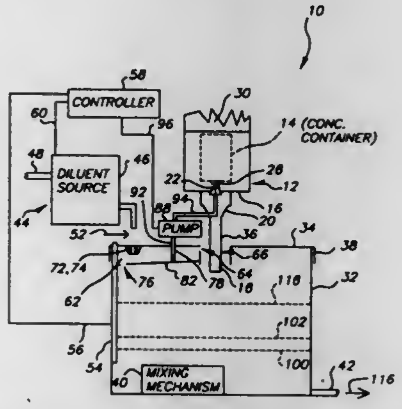
opening angle with respect to said axis enters said vehicle outer end portion of said lens, and also wherein said plurality of horizontally diffusing lens steps are formed in such a manner that, when said lens is viewed from ahead of said lamp, said lens steps appear curved and shifted from bottom toward top inwardly in said widthwise direction while right and left widths of said lens steps appear narrowed.

5,688,045
WHISK HANDLE WITH MOLDED PLASTIC COATING
Patrick Butte, Lyons, France, assignor to Societe des Etablissements Combrichon, France
Filed Jul. 18, 1996, Ser. No. 677,547
Int. Cl.^{6} A47J *43/10*
U.S. Cl. 366—129 **25 Claims**



1. A whisk, comprising:
a hollow handle having a flared portion at one end thereof, a bottom of the flared portion having stepped blades projecting from inner walls of the flared portion;
a frustoconical insert having a shape corresponding to the flared portion, cooperating therewith, and being rigidly affixable thereto, said insert further having a plurality of grooves regularly distributed on an outer surface and parallel to a longitudinal axis thereof, said grooves having stepped lengths symmetric to a longitudinal axis of said handle and cooperating with the stepped blades;
metal loops extending from the flared portion and disposed in the grooves of the insert and along the inner walls of the flared portion, said loops being affixed by bent portions at ends thereof disposed between the cooperating projecting blades and stepped lengths of the grooves; and
a peripheral layer of plastic coated on said handle and insert.

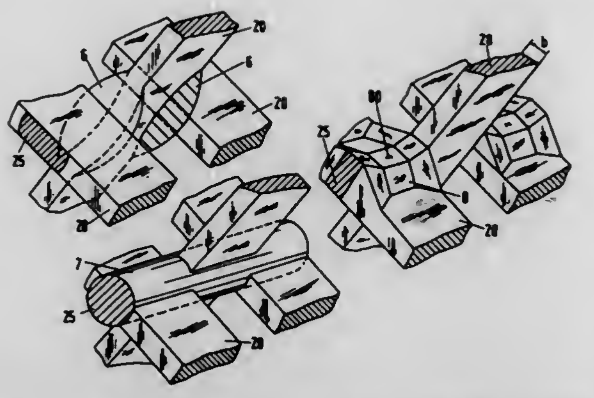
5,688,046
METHOD AND APPARATUS FOR MIXING A CONTAINER OF CONCENTRATE WITH DILUENT FROM SUPPLY SYSTEMS
Richard Paul Triassi, Walworth; Roger Ellsworth, Rochester, and Dennis Earl Sneddon, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 14, 1995, Ser. No. 557,255
Int. Cl.^{6} G05D *11/02*; B01F *15/02*
U.S. Cl. 366—152.2 **12 Claims**



9. An apparatus for mixing a container of concentrate with diluent from a supply system, said apparatus comprising:
a mixing tank;
a container station retaining said concentrate container, said container station having a concentrate outlet delivering said concentrate to said mixing tank;
an opener disposed to open said container within said container station;
a diluent source receiving diluent from said diluent supply system and delivering an aloquot of diluent to said mixing tank, said diluent source being directly coupled to said supply system, said diluent source being separated from said mixing tank by an air gap;
a washer receiving diluent from said diluent source, said washer delivering diluent to said container station through said concentrate outlet to rinse said container; and
a controller actuating said washer at least substantially after said delivering of said concentrate to said mixing tank; and
a detector operatively positioned relative to said mixing tank, said detector providing a signal to said controller in response to said delivering of said concentrate, said signal being responsive to the volume of said concentrate, and wherein said controller in response to said signal actuates said diluent source to deliver said aloquot in a volume proportional to the volume of said concentrate.

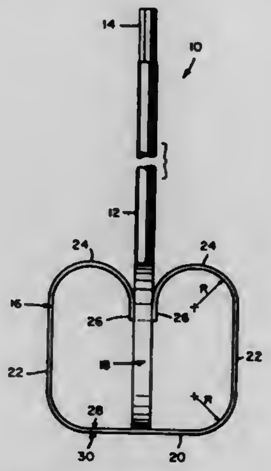
5,688,047
STATIC MIXER WITH MONOLITHIC MIXING ELEMENTS PROVIDING AN INCREASED RESISTANCE FORCE DURING MIXING
Arno Signer, Wiesendangen, Switzerland, assignor to Sulzer Chemtech AG, Winterthur, Switzerland
Filed Aug. 7, 1996, Ser. No. 694,005
Claims priority, application European Pat. Off., Aug. 30, 1995, 95810538.9
Int. Cl.^{6} B01F *5/06*
U.S. Cl. 366—337 **10 Claims**

1. A static mixer for viscous media which comprises a tube and at least one mixing element arranged in the tube, the tube defining a main flow direction of the fluid to be mixed and the mixing element being formed as a monolithic structure with bars crossing and interengaging one another, at various crossing points the bars each having an essentially rectangular cross section with a large and a small side, wherein the crossing points of the bars are



reinforced by local thickened portions thereby defining a common boundary surface between the bars which lies parallel to the main flow direction, the common boundary surface being at least approximately twice as large as the square area formed by the small side.

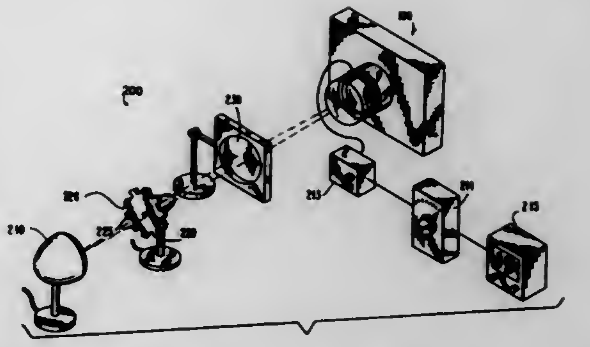
5,688,048
STIRRER
Gary K. Duckworth, 479 Polly Rd., Sunnyvale, Tex. 75182
Continuation-in-part of Ser. No. 533,872, Sep. 26, 1995, abandoned. This application Jul. 5, 1996, Ser. No. 675,941
Int. Cl.^{6} B01F *7/32*
U.S. Cl. 366—343 **12 Claims**



1. A stirrer, comprising:
a shaft having a upper end and a lower end;
a first blade formed from an elongated strip of material having opposed ends, an upper surface and a lower surface;
said lower end of said shaft being secured to said upper surface of said first blade; and,
said lower surface of said first blade, proximate said opposed ends thereof, being secured to said shaft remote from said lower end.

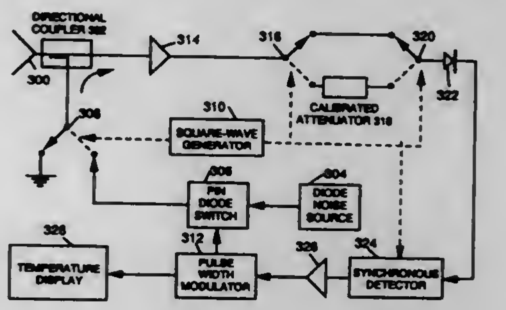
5,688,049
METHOD AND APPARATUS FOR MEASURING THE THERMAL CONDUCTIVITY OF THIN FILMS
Sergei V. Govorkov, Nanuet, N.Y., assignor to Inrad, Northvale, N.J.
Filed Jan. 25, 1996, Ser. No. 591,051
Int. Cl.^{6} G01N *25/18*
U.S. Cl. 374—44 **39 Claims**

1. A method of obtaining data about the thermal resistance of a thin film of a first material on a substrate, comprising:



heating a thin film of a first material on a substrate with a pulse of energy of effective power to cause the thin film to increase in temperature and cause gas near the film to expand due to the increase in temperature of the heated thin film; and measuring the magnitude of the expansion.

5,688,050
TEMPERATURE-MEASURING MICROWAVE RADIOMETER APPARATUS
Fred Sterzer, Princeton, and Daniel D. Mawhinney, Livingston, both of N.J., assignors to MMTC, Inc., Princeton, N.J.
Filed Apr. 3, 1995, Ser. No. 415,302
Int. Cl.^{6} G01J *5/00*
U.S. Cl. 374—122 **15 Claims**



1. In a radiometer for determining the temperature T_s of a specimen in which the temperature T_s is never higher than a certain maximum temperature; wherein microwave noise power emitted by said specimen is applied as an input to said radiometer for a first given time t_s and microwave noise power derived from a reference noise source is applied as an input to said radiometer for a second given time t_r, and a feedback output from said radiometer is employed to minimize the difference between respective microwave noise energies emitted by said specimen and derived from said reference noise source that are applied as inputs to said radiometer; the improvement comprising:
first means for deriving an amount of said microwave noise power from said reference noise source applied as a radiometer input that corresponds to a temperature T_r which is always higher than said certain maximum temperature; and
second means responsive to said feedback output for adjusting at least one of T_r, t_r and t_s to effect said minimization.

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5,688,051
RADIATION PYROMETER ASSEMBLY FOR SENSING THE TEMPERATURE OF AN ELONGATE BODY MOVING LONGITUDINALLY

Roger Ernest King, Wimbourne, and Graham Peter Spurge, Poole, both of England, assignors to Davy McKee (Poole) Limited, Poole, United Kingdom

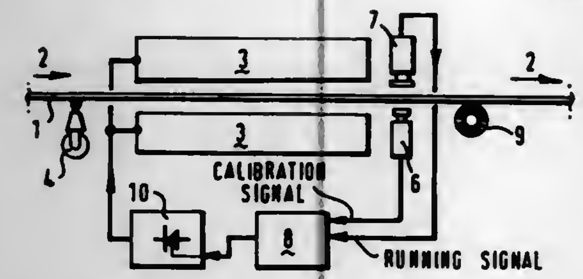
PCT No. PCT/GB93/02162, § 371 Date Apr. 12, 1995, § 102(e) Date Apr. 12, 1995, PCT Pub. No. WO94/09348, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 20, 1993, Ser. No. 416,890

Claims priority, application United Kingdom, Oct. 21, 1992, 9222082

Int. Cl.⁶ G01J *5/00*

U.S. Cl. 374—129 **9 Claims**



1. A radiation pyrometer assembly comprising,

means to coat longitudinally distributed parts of an elongate body, moving longitudinally, with a coating having a substantially uniform emissivity,

a process control pyrometer directed to view uncoated parts of the surface of the body,

a calibration pyrometer disposed to view the coated parts of the body, and

means to correct the reading of the process control pyrometer by reference to signals from the calibration pyrometer.

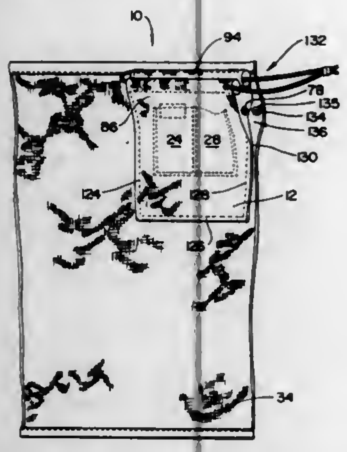
5,688,052
COMBINATION BEACH TOWEL AND TOTE BAG

Barbara Compton, 2991 Morgan Territory Rd., Clayton, Calif. 94517

Filed May 16, 1996, Ser. No. 648,682

Int. Cl.⁶ B65D *30/22*

U.S. Cl. 383—38 **6 Claims**



1. A beach towel and tote bag combination comprising:

a) a towel;

b) a bag having an opening and a means for closing said opening, said bag attached to said towel at a location away from a central area of said towel, said bag having a first half and a second half, wherein said first half of said bag is stitched along a perimeter of said first half to said towel forming an extra pocket between said first half and said towel, said extra pocket having an opening provided by a gap in said stitching along said perimeter;

c) means for closing said extra pocket; and

d) one or more pockets attached to said bag, each having a pocket opening accessible from the inside of said bag with said towel laid out;

whereby when said towel is folded and stuffed inside said bag, facilitated by turning said bag inside out, said pockets are on the outside of said bag.

5,688,053
DYNAMIC PRESSURE BEARING

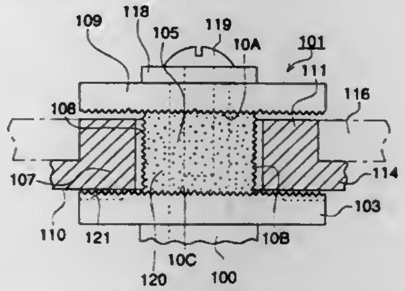
Masao Itoh; Satoshi Shibuya, and Naoji Kamimura, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Aug. 23, 1996, Ser. No. 697,376

Claims priority, application Japan, Aug. 31, 1995, 7-223171

Int. Cl.⁶ F16C *32/06*

U.S. Cl. 384—100 **16 Claims**



1. An apparatus for supporting a rotator having a rotation axis, comprising:

a radial bearing having a radial bearing surface for supporting the rotation axis of the rotator;

a thrust bearing provided at least one side of the radial bearing and having a thrust bearing surface for regulating a movement of the rotator in an axial direction;

the rotator having a supported surface facing the radial bearing surface and a regulated surface facing the thrust bearing surface;

wherein at least one of the radial bearing surface, the supported surface, the thrust bearing surface and the regulated surface is a rough surface having a center-line mean roughness not less than 0.3 and a surface facing the rough surface is a smooth surface having a center-line mean roughens less than 0.3.

16. An apparatus for forming an image, comprising:

a photoreceptor;

a laser beam generator; and

a laser beam deflector for deflecting the laser beam so that the photoreceptor is scanned with the laser beam and the image is formed on the photoreceptor;

the laser beam deflector including

a rotor having a rotation axis, a circumference, a first and second ends;

a polygonal mirror provided around the circumference of the rotor, for deflecting the laser beam;

a magnet provided on at least one of the first and second ends;

a stator coil provided so as to face the magnet; a radial bearing having a radial bearing surface for supporting the rotation axis of the rotator;

a thrust bearing provided at least one side of the radial bearing and having a thrust bearing surface for regulating a movement of the rotator in an axial direction; and

the rotator having a supported surface facing the radial bearing surface and a regulated surface facing the thrust bearing surface;

wherein at least one of the radial bearing surface, the supported surface, the thrust bearing surface and the regulated surface is a rough surface having a center-line mean roughness not less than 0.3 and a surface facing the rough surface is a smooth surface having a center-line mean roughens less than 0.3.

5,688,054
PROCESS FOR THE PRODUCTION OF A SLEEVE-SHAPED FRICTION BEARING AND A FRICTION BEARING PRODUCED ACCORDING TO THIS PROCESS

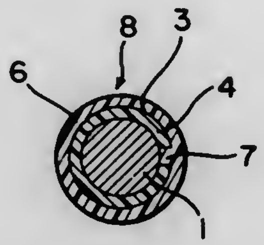
Thore Rabe, D-91315 Höchstadt/Aisch, Germany

Filed Oct. 11, 1994, Ser. No. 318,652

Claims priority, application Germany, Apr. 9, 1992, 42 11 917.0

Int. Cl.⁶ F16C *33/04*

U.S. Cl. 384—295 **16 Claims**



1. Process for the production of a sleeve-shaped friction bearing having a longitudinal axis of rotation and with an inner sliding surface facing toward the axis of rotation, a thin, inner sliding layer made of a polymeric material having good sliding properties, and a support surrounding said sliding layer which is made of a polymeric material, the sliding layer having a depression which faces toward the support, and which is filled with the material of which the support is made, comprising the process steps of:

A) producing the thin, inner sliding layer a first polymeric material that is free of abrasive fillers on a core by a molding process;

B) producing at least one longitudinal interruption in an outer surface of the sliding layer which extends from a first axial end to an opposite axial end of the inner sliding layer with said at least one longitudinal interruption in the outer surface of the sliding layer only partial separating the sliding layer with an underlying web connecting portions of said sliding layer at opposite sides of said longitudinal interruption;

C) sheathing the inner sliding layer with an outside support made of a second polymeric material while said inner sliding layer is on said core and joining the inner sliding layer with the outside support in a manner filling said longitudinal interruption with the second polymeric material of the outside support so as to dimensionally stabilize the sliding layer; and

D) pushing the sheathed and dimensionally stabilized sliding layer off of said core and then discarding the core.

5,688,055
STUD TYPE BEARING WITH GEAR

Akihiro Kondou, Saitama, and Katsuaki Sakou, Gifu, both of Japan, assignors to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1996, Ser. No. 603,893

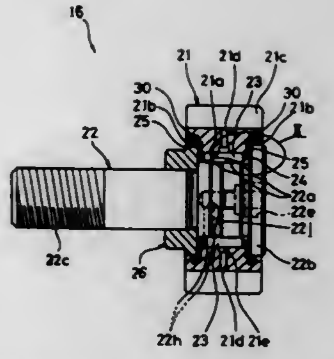
Claims priority, application Japan, Feb. 24, 1995, 7-061868

Int. Cl.⁶ F16C *19/04*

U.S. Cl. 384—449 **15 Claims**

1. A stud type bearing with gear equipped with an outer ring provided with a track on the inside and having a gear portion formed on the outside, a shaft member inserted into said outer ring, having a flange portion that engages with one side of said outer ring formed on one end, and a track formed in the vicinity of said one end so as to correspond with the track of said outer ring, a plurality of rolling elements arranged between said tracks that roll accompanying rotation of said outer ring, and a side plate fit on the outside of said shaft member and provided so as to engage with the other side of said outer ring that operates in concert with said flange portion and holds said outer ring on said shaft member, wherein

a lubricant feed hole is formed in said shaft member from one end of said shaft member to a track or its vicinity, and a connection hole is formed in said outer ring that connects that track and said gear portion.



5,688,056
METHOD FOR CONTROLLING A PRINTER IN ORDER TO OBTAIN POSTAGES

Patrice Peyret, Fuveau, France, assignor to Gemplus Card International, Gemenos, France

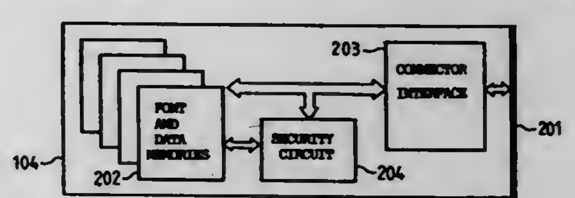
PCT No. PCT/FR94/00704, § 371 Date Dec. 8, 1995, § 102(e) Date Dec. 8, 1995, PCT Pub. No. WO95/00929, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 14, 1994, Ser. No. 564,257

Claims priority, application France, Jun. 17, 1993, 93 07327

Int. Cl.⁶ B41J *5/30*

U.S. Cl. 400—61 **19 Claims**



1. A method of obtaining postal franking through franking marks, the method comprising the steps of:

providing a detachable cartridge for a printer;

storing at least one font of characters in the detachable cartridge, including the step of storing a postal franking mark in the detachable cartridge, the franking mark having the form of graphic elements translated into the format of the characters of the printer,

determining a security mark automatically and in a secured manner, the security mark enabling the franking mark to be authenticated, the security mark having the form of graphic elements translated into the format of the characters of the printer,

loading the security and franking marks into the printer, and then printing the security and franking marks.

5,688,057
METHOD OF PRINTING USING DUAL OPPOSING PRINTHEADS

Christopher B. Wright, San Francisco, and Alan Chris Allison, Pacifica, both of Calif., assignors to Twigs, Inc., Los Angeles, Calif.

Division of Ser. No. 67,291, May 25, 1993, Pat. No. 5,456,539. This application Oct. 6, 1995, Ser. No. 539,846

Int. Cl.⁶ B41J *3/60*

U.S. Cl. 400—82 **6 Claims**

1. A method of printing comprising the steps of:

providing a printer unit having a pair of printheads respectively arranged on opposite sides of a printing plane from each other for printing on paper fed along said printing plane, said pair of

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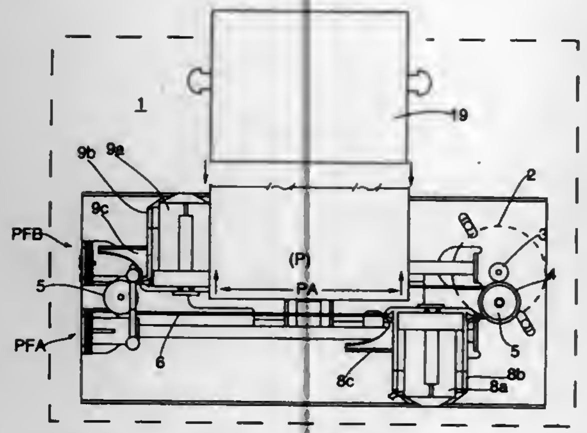


printheads being arranged on printing paths in parallel on opposite sides of said printing plane facing each other and being mounted in respective printhead carriages driven by a drive means reciprocatingly in tandem with each other;

(b) supplying paper in continuous form into the printer unit along said printing plane between said pair of printheads, said continuous form paper comprising a series of units of two-ply paper connected to each other in head-to-tail fashion, wherein two separate plies of paper of each unit are arranged in back-to-back fashion with one side of each ply facing outwardly toward a respective printhead on opposite sides of said printing plane and are connected together at leading edges thereof by a leading edge portion which is connected to a trailing end of at least one of the two plies of paper of a preceeding unit;

(c) controlling the pair of printheads so that each printhead prints on the outwardly facing one side of a respective ply of paper in tandem with each other.

5,688,058

PROCESS AND APPARATUS FOR THE TYPOGRAPHICAL LABELING OF TWO SIDES OF PRINTED PRODUCTS

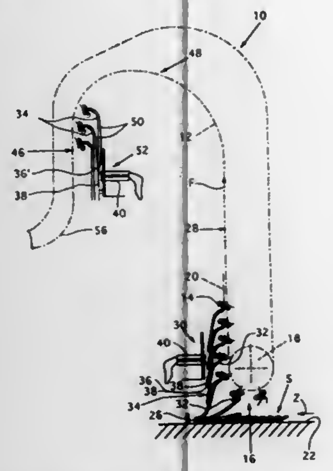
Werner Honegger, Bäch, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 26, 1995, Ser. No. 548,875

Claims priority, application Switzerland, Oct. 27, 1994, 03214/94

Int. Cl.^{6} B41J *3/54*

U.S. Cl. 400—82 **11 Claims**



1. A process for typographically labeling printed products having first and second outer sides comprising the steps of individually clamping the printed products utilizing clamps of a conveying device, transporting the printed products in a conveying direction with imbricated overlapping along a path of travel, while printing typographical labeling on said first outer side at a first printing station located along the path of travel, and while printing typographical labeling on said second outer side at a second printing station located along the path of travel, and including the further step of exposing a region of at least one of the first and second outer sides which previously had been covered over by another printed product, with the exposing step occurring prior to the one outer side being typographically labeled.

5,688,059

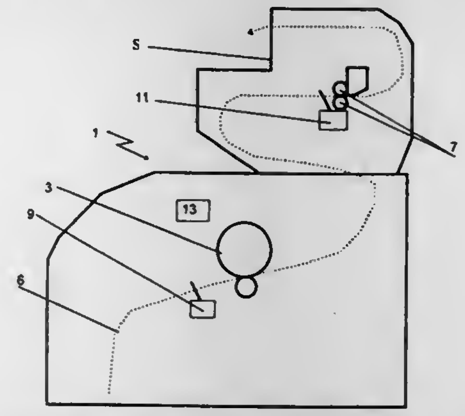
REGISTRATION OF PAPER LOCATION FOR MULTIPLE PRINTING

Cyrus Bradford Clarke; David Brian Langer, both of Lexington; Randall David Mayo, Georgetown, and Gregory John Sherwood, Lexington, all of Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Sep. 20, 1996, Ser. No. 717,392

Int. Cl.^{6} B41J *13/26*

U.S. Cl. 400—578 **7 Claims**



1. A printing system comprising a printer having a cycle of operation separating printing by a first distance, media sensing means at said printer to sense the location of said media with respect to at least two nominal locations for printing of said media by said printer, and data processing apparatus for controlling said printing system to initiate printing by said printer at the closest of said nominal locations for printing based on information from said media sensing means, said data processing apparatus also determining the difference between said sensed location of said media and said closest nominal location, and storing said difference.

5,688,060

THERMAL TRANSFER PRINTER

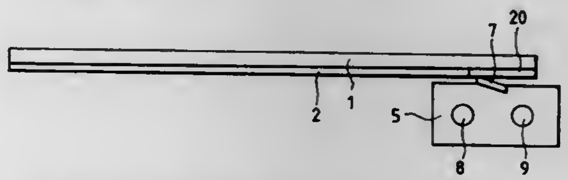
Hirotoshi Terao, Iwate-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1996, Ser. No. 635,127

Claims priority, application Japan, Apr. 25, 1995, 7-101189

Int. Cl.^{6} B41F *35/00*

U.S. Cl. 400—701 **1 Claim**



1. A thermal transfer printer comprising:

a carriage capable of being reciprocated along a platen;

a thermal head mounted on said carriage, the thermal head including a plurality of heat generating elements; and

a ribbon cassette detachably mounted on said carriage, the ribbon cassette housing an ink ribbon;

wherein said heat generating elements are selectively driven while said carriage reciprocates along said platen in a state where said thermal head is placed in pressure contact with the platen through said ink ribbon and a sheet of paper to perform a printing on said paper,

wherein a cleaning pad is disposed at least at a downstream end or an upstream end of said platen and forming a continuous surface with said platen such that said thermal head is movable from the platen into pressure contact with the cleaning pad,

wherein said cleaning pad is formed with a planar surface which contacts said thermal head, and

wherein said thermal transfer printer further comprises means for electrifying said thermal head while the thermal head is in pressure contact with said cleaning pad.

5,688,061

WRITING IMPLEMENT WITH STIRRING MEMBER

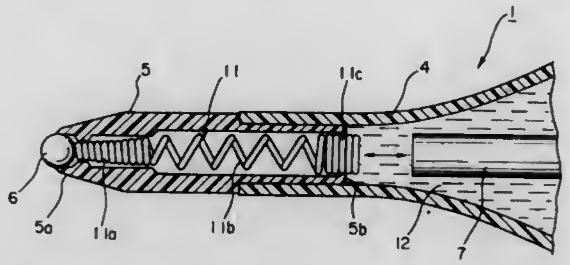
Takashi Aoki, Hino, Japan, assignor to Kabushiki Kaisha Allco, Tokyo-to, Japan

Filed Nov. 17, 1995, Ser. No. 560,342

Claims priority, application Japan, Nov. 18, 1994, 6-285287

Int. Cl.^{6} B43K *7/10*

U.S. Cl. 401—4 **7 Claims**



1. A writing implement comprising:

a tubular barrel containing an ink including a dispersion medium and a dispersoid dispersed in the medium;

a writing element fitted in a tip of the barrel;

an ink stirring member disposed within the barrel for movement therein to stir the ink so that precipitated dispersoid in the ink is dispersed when the barrel is shaken;

a spring disposed within said tip of the barrel at a position adjacent the writing element and having a front end thereof in contact with the writing element to press the element resiliently forward and a back end thereof directed toward the stirring member so that the back end can be hit by the stirring member when the barrel is shaken; and

means for restraining said back end of the spring from movement relative to said tip longitudinally thereof.

5,688,062

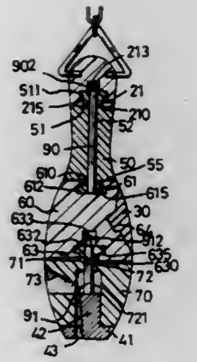
WRITING UTENSIL STRUCTURE

Chung-chen Shih, No. 815, Sec. 2, Changshui Rd., Tachu Li, Hsihu Chen, Changhua Hsien, Taiwan

Filed Jan. 28, 1997, Ser. No. 789,924

Int. Cl.^{6} B43K *27/00;29/00*

U.S. Cl. 401—18 **7 Claims**



1. A writing utensil structure comprising:

a housing (**10**) comprising:

an upper body (**50**) including an upper end portion having a first neck (**51**) with a reduced diameter and extending upwardly, and a lower end portion having a second neck (**55**) with a reduced diameter and extending downwardly, two diametrically opposite first lugs (**511**) each protruding from said first neck (**51**), two diametrically opposite second lugs (**551**) each protruding from said second neck (**55**), a first passage (**52**) longitudinally defined in said upper body (**50**) and extending through said first neck (**51**);

an intermediate body (**60**) including an upper end portion mounted on the lower end portion of said upper body (**50**) and having an inner wall (**61**) with a first socket (**610**) defined in an upper portion thereof for receiving said second neck (**55**), and a second socket (**612**) defined in a lower portion thereof for receiving each of said two second lugs (**551**), and including a lower end portion having an inner wall (**63**) with a first space (**630**) defined in a lower portion thereof, a second space (**632**) defined in a mediate portion thereof, and a third space (**633**) defined in an upper portion thereof;

a lower body (**70**) including an upper end portion having a third neck (**71**) with a reduced diameter and received in said first space (**630**), two diametrically opposite third lugs (**711**) each protruding from said third neck (**71**) and each received in said second space (**632**), a second passage (**72**) longitudinally defined in the upper end portion of said lower body (**70**) and extending through said third neck (**71**);

a cap (**20**) mounted on the upper end portion of said upper body (**50**) and including an inner wall (**21**) having a first recess (**210**) defined in a lower portion thereof for receiving said first neck (**51**), a second recess (**212**) defined in a mediate portion thereof for receiving each of said two first lugs (**511**), and a third recess (**213**) defined in an upper portion thereof;

a first writing utensil (**90**) received in said first passage (**52**) and having an upper end with a tip (**902**) received in said third recess (**213**); and

a second writing utensil (**91**) received in said second passage (**72**) and having an upper end with a tip (**912**) received in said third space (**633**).

5,688,063

WRITING APPARATUS WITH MASSAGER MEANS

Kuo-Yao Yu, No. 3-3, Alley 12, Lane 11, Min-1 Rd., Chung-He City, Taipei County, and Jermo Lin, 2F, No. 180, Sec. 3, Jong Shiaw E. Rd., Taipei, both of Taiwan

Filed Sep. 26, 1996, Ser. No. 721,038

Int. Cl.^{6} B43K *29/00*

U.S. Cl. 401—195 **5 Claims**

1. A writing apparatus with massaging means, comprising an upper barrel, a bottom barrel, a refill, and a massaging unit, said massaging unit comprising a battery, a vibrating motor, a button switch, and a massager head, wherein said massaging unit is mounted inside said upper barrel; said massager head is mounted on said button switch and extending out of said upper barrel, the massager head triggering said button switch to turn on said vibrating motor when it is pressed against a part of the body to be massaged; said button switch is mounted in a mounting device

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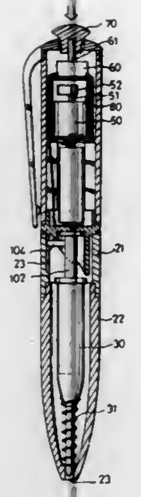


retained above said vibrating motor; said battery is disposed below said vibrating motor.

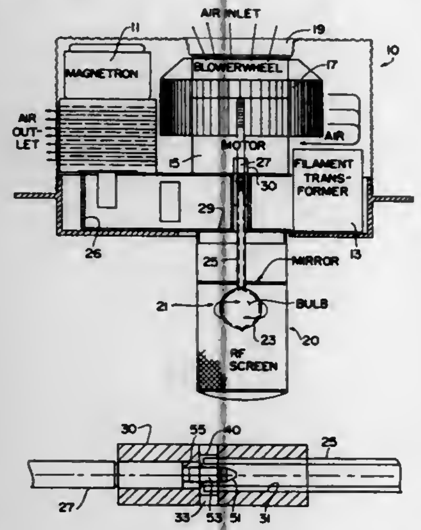
5,688,064
METHOD AND APPARATUS FOR COUPLING BULB STEM TO ROTATABLE MOTOR SHAFT

Bruce Shanks, Gaithersburg, Md., assignor to Fusion Lighting, Inc., Rockville, Md.

Filed Oct. 30, 1996, Ser. No. 738,661

Int. Cl.^{6} F21V *19/00;* **F16B** *7/18*

U.S. Cl. 403—24 **14 Claims**



1. An apparatus for selectively coupling a rotatable lamp bulb to a rotating motor, comprising:
  a rotatable motor shaft having a distal end, said shaft including fastening means;
  a bulb stem having a proximal end;
  a coupler having an open proximal end, an open distal end and a longitudinal throughbore extending from said open proximal end to said open distal end, said coupler having a cross-hole defined diametrically therethrough in intersecting relation with said throughbore;
  wherein said bulb stem proximal end is secured to said coupler within said coupler throughbore and extends externally of said coupler through said coupler distal end;
  a lock nut having a receiving means, said nut being positioned within said cross-hole; and
  wherein said motor shaft extends through said coupler proximal end and is positioned within said coupler longitudinal throughbore, when the distal end of said shaft extends into said locknut to engage said motor shaft fastening means with said lock nut receiving means.

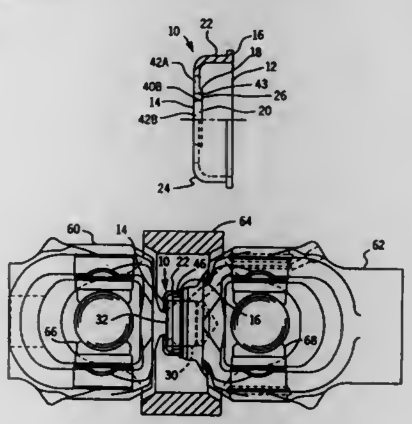
5,688,065
DOUBLE CARDAN UNIVERSAL JOINT BALL AND SOCKET SEAL

Roger D. Mayhew, Fredonia, Wis., assignor to Weasler Engineering, Inc., West Bend, Wis.

Filed Oct. 25, 1995, Ser. No. 548,222

Int. Cl.^{6} F16C *11/06;* **F16D** *3/16*

U.S. Cl. 403—51 **5 Claims**



1. In an elastomeric seal for a ball and socket centering apparatus of a double cardan constant velocity universal joint of the type which has one end secured to said socket and an opposite end adjacent said ball, said opposite end having a wall with a hole formed therein for receiving said ball, the improvement wherein radially extending slits are provided in said wall of said elastomeric seal around said hole extending from said hole for a distance into said seal, said slits defining between them fingers which wipe against said ball.

5,688,066
EXPANSION DOWEL

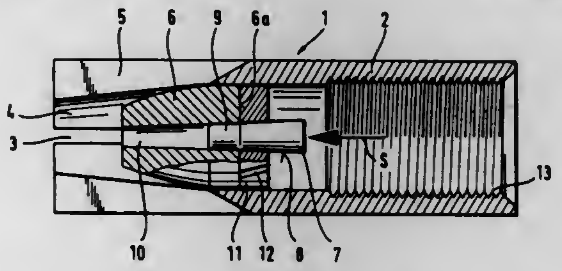
Rainer Loose, Marktoberdorf, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Luxembourg

Filed Mar. 22, 1996, Ser. No. 620,230

Claims priority, application Germany, Mar. 22, 1995, 19510306.8

Int. Cl.^{6} F16B *13/04*

U.S. Cl. 403—297 **20 Claims**



1. An expansion dowel comprises an axially extending cylindrical expansion sleeve (2) having a setting direction (S) with a first end leading in the setting direction (S) and a trailing second end, said sleeve (2) having an expansion region (5) extending axially from the first end toward the second end with at least one of axially extending slots and grooves therein, said sleeve (2) having a central bore (4) therein tapering conically inwardly towards the first end at least in the expansion region (5), an expanding member (6) being located within said central bore (4) for expanding said expansion region (5), said expanding member (6) having a first end face leading in the setting direction and a trailing second end face (6*a*) and a second bore (**10**, **14**) extending from the second end face toward the first end face, first means (**11**) in said central bore (**4**) in contact with said second end face (**6***a*) for preventing axially displacement of said expanding member (**6**) opposite to the setting direction (S), said first means (**11**) having an axially extending opening and a radially outer circumferential surface enlargeable by an axially extending pin-shaped member (**7**) insertable into said opening, said pin-shaped member (**7**) having a leading end, a trailing end and an axially extending conical region spaced from the leading end thereof and being drivable in the setting direction (S) and having a leading end region extending from the leading end thereof and being arranged to engage in the second bore (**10**, **14**) of said expanding member (**6**).

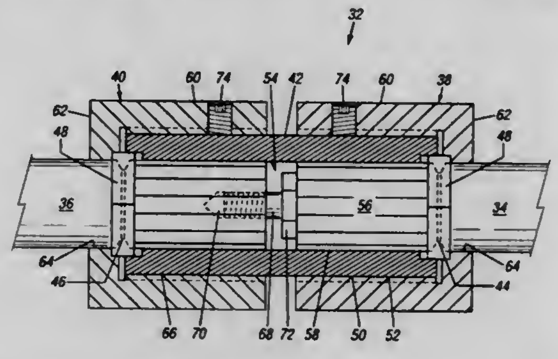
5,688,067
COUPLER ASSEMBLY FOR AXIALLY CONNECTING TWO SHAFTS

Peter H. Straub, Leduc, Canada, assignor to Camco International Inc., Houston, Tex.

Filed Sep. 22, 1995, Ser. No. 532,959

Int. Cl.^{6} F16B *7/18*

U.S. Cl. 403—305 **4 Claims**



1. A coupler assembly comprising:
  a first shaft having longitudinal splines along an end portion thereof;
  a second shaft having longitudinal splines along an end portion thereof, said second shaft being in axial alignment with said first shaft;
  a first stop member attached to said first shaft adjacent the end portion thereof;
  a second stop member attached to said second shaft adjacent the end portion thereof;
  a cylindrical body having an axial bore therethrough sized to permit the end portions of said first and second shafts to be inserted thereinto, said cylindrical body having an interior surface with longitudinal grooves thereon and an exterior surface with threads thereon, said longitudinal grooves being cooperable with said longitudinal splines on said first and second shafts to prevent relative rotation between said first and second shafts;
  a first cap having a cylindrical section and a first end cap, said first end cap having a bore therethrough for receiving thereinto the end portion of said first shaft to a distance where said first end cap contacts said first stop member;
  a second cap having a cylindrical section and a second end cap, said second end cap having a bore therethrough for receiving thereinto the end portion of said second shaft to a distance where said second end cap contacts said second stop member;
  threads on an interior surface of each of said cylindrical sections of said first and second caps for cooperating with said threads of said cylindrical body for axially drawing said first and second shafts together by rotation of said first and second caps with respect to said cylindrical body; and
  an adjustable spacer means being attached to and longitudinally extending from the end portion of said first shaft, said spacer means abutting an end face of said second shaft to permit said first and second shafts to be rigidly connected together while preventing an end face of said first shaft from directly contacting said end face of said second shaft.

5,688,068
PHASE ADJUSTMENT FIXING APPARATUS FOR CAM

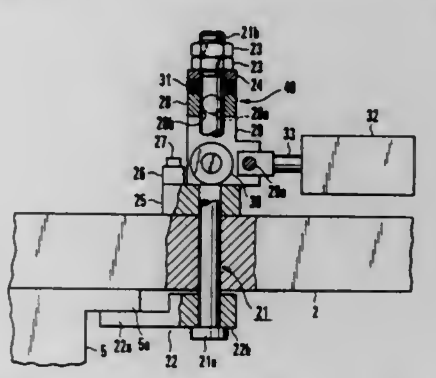
Tomoo Kaneta, Chiba, Japan, assignor to Komori Corporation, Japan

Filed Apr. 26, 1996, Ser. No. 638,338

Claims priority, application Japan, May 2, 1995, 7-108509

Int. Cl.^{6} F16B *2/00;* **B41F** *13/24*

U.S. Cl. 403—325 **10 Claims**



1. A phase adjustment fixing apparatus for a cam, comprising:
  a cam fixing shaft supported by a frame to freely move and having a clamp for clamping the cam at one end portion;
  a pressure unit slidably supported on said cam fixing shaft and having a slidably supported lever;
  a spring member interposed between the other end portion of said cam fixing shaft and said pressure unit;
  a sliding element arranged at a swinging end of said lever to slide on a surface of said frame; and
  an actuator for swinging said lever to move said sliding element between a cam fixing position where said sliding element slightly goes across a dead center and a cam fixed state releasing position where said sliding element largely comes across the dead center, the dead center being a position where said sliding element crosses a center line of said cam fixing shaft,
  wherein, at the cam fixing position of said sliding element, said pressure unit slides toward the other end portion of said cam fixing shaft to bias said cam fixing shaft in a direction to fix said cam through said spring member, and at the cam fixed state releasing position of said sliding element, said pressure unit releases a biasing force from said cam fixing shaft through said spring member.

5,688,069
JOINT STRUCTURE OF STRUCTURAL MEMBERS

Juichi Hoshino, No. 2453-8 Kuragano-cho, Takasaki-shi, Gunma-ken 370-12, Japan

Filed Jul. 5, 1996, Ser. No. 672,223

Int. Cl.^{6} F16B *9/02*

U.S. Cl. 403—340 **2 Claims**

1. A joint structure, comprising:
  a male-side joint,
  a female-side joint,
  said male-side joint has a first contacting surface, a second contacting surface which continues from a back side of the first contacting surface and extends at an angle of less than 90° with respect to the first contacting surface, and a third contacting surface which continues from a front side of the first contacting surface and extends at an angle of 270° or more with respect to the first contacting surface,

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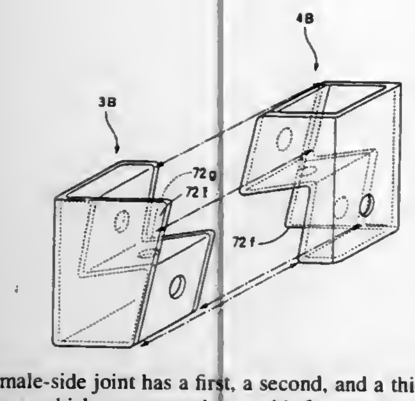


said female-side joint has a first, a second, and a third contacted surface which correspond to said first, second, and third contacting surfaces of the male-side joint, respectively, these contacted surfaces are shaped so as to closely correspond to the first, second, and third contacting surfaces,

a fastener for fastening said male-side joint to said female-side joint when the first, second, and third contacting surfaces of the male-side joint are put close to the first, second, and third contacted surfaces of the female-side joint,

wherein said male-side joint has left and right sidewalls extending perpendicularly from both sides of said first, second, and third contacting surfaces, and a projected wall which projects from at least one of said first, second, and third contacting surfaces,

the female-side joint has left and right sidewalls extending perpendicularly from both sides of the first, second, and third contacted surfaces, and a projected wall which projects from at least one of the first, second, and third contacted surfaces, and

when said female-side joint is put closely on said male-side joint, the projected wall of said male-side joint is engaged with one of the left and right sidewalls of said female-side joint where the female-side joint projected wall is not provided, and the projected wall of said female-side joint is engaged with one of the left and right sidewalls of said male-side joint where the male-side joint projected wall is not provided.

5,688,070
CONNECTING A SHAFT TO A BORE

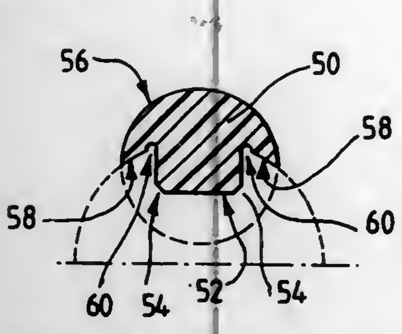
Peter Alan Morelli; Kym Farrand Taylor, and David Makin, all of Huddersfield, Great Britain, assignors to David Brown Engineering Limited, Huddersfield, Great Britain

Continuation of Ser. No. 358,569, Dec. 13, 1994, abandoned, which is a continuation of Ser. No. 59,674, May 12, 1993, abandoned. This application Oct. 27, 1995, Ser. No. 549,221

Claims priority, application United Kingdom, Sep. 9, 1992, 9219091

Int. Cl.^{6} F16B *3/00*

U.S. Cl. 403—356 **12 Claims**



1. An assembly for drivably connecting two members, wherein the two members include a shaft and a member having a bore therein, wherein said shaft is configured to have a non-interference fit in the bore of the member, said shaft having a keyway in a surface thereof, said keyway having a rectangular cross-section, said assembly also including a unitary component for transmitting driving forces between the shaft and the member, said unitary component including a drive portion on an inner surface thereof, said drive portion transmitting the driving forces from said keyway in said shaft to said unitary component, said unitary component also comprising an integral key having a semi-circular outer surface, said semi-circular outer surface engaging a corresponding semi-circular keyway formed in an inner surface of said bore of said member, wherein said semi-circular outer surface of said unitary member meets said inner surface of the unitary member to form a corner which extends longitudinally along said unitary component.

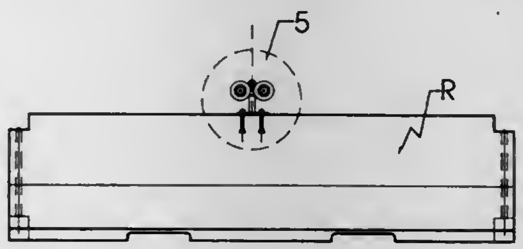
5,688,071
ROAD ELEMENTS, AND METHOD OF AND DEVICE FOR TRANSFERRING SAME

Alfred W. Owen, P.O. Box 99337, Raleigh, N.C. 27624-9337

Filed May 28, 1996, Ser. No. 653,866

Int. Cl.^{6} E01F *13/04*

U.S. Cl. 404—6 **8 Claims**



4. A transferable road structure, comprising a plurality of road elements; a single roller unit spaced from ends arranged on each of said road elements spaced from ends of the road element; and a connecting means for connecting said road elements with one another so that end portions of two adjacent ones of said road elements are connected with one another pivotally, each of said connecting means including two connecting plates each having two spaced ends pivotally connected with the end portions of two adjacent road elements, one of said plates being an upper plate while the other of said plates being a lower plate and said plates are spaced from one another in a vertical direction.

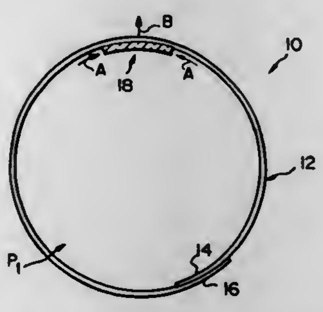
5,688,072
AGRICULTURAL DRIP TAPE

Larry P. Meyer, Walla Walla; Leland A. Perkins, Lowden, and Charles R. Harrold, Walla Walla, all of Wash., assignors to Micro Irrigation Technologies, Inc., Walla Walla, Wash.

Filed Dec. 14, 1995, Ser. No. 570,014

Int. Cl.^{6} E02B *13/00*

U.S. Cl. 405—43 **26 Claims**



1. Drip tape for below or above ground irrigation comprising:

an elongated flexible tubular member forming a primary flow path;

an elongated substantially transparent strip secured to an interior surface of said tubular member, said strip formed to include at least one secondary flow path;

a plurality of inlets in said strip connecting said primary flow path to said secondary flow path; and

an outlet in said tubular member connecting said secondary flow path to atmosphere.

5,688,073
EARTH DRAINS

Joseph Clement Brodeur, Kendal Post Office, Kendal, Ontario, Canada, L0A 1E0; Vicko M. Von Stedingk, 26 Donino Avenue, Toronto, Ontario, Canada, M4N 2W5, and Mark E. Slemonsen, 100 Rideau Street, Unit 102, Oshawa, Ontario, Canada, L1J 6P5

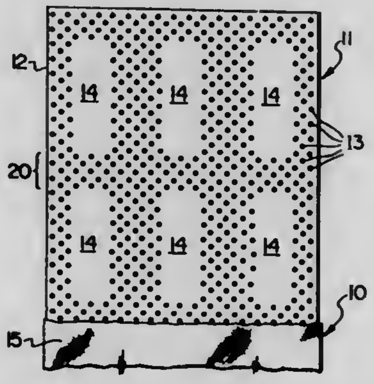
PCT No. PCT/CA94/00281, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO94/29530, PCT Pub. Date Dec. 22, 1994

PCT Filed May 18, 1994, Ser. No. 568,838

Claims priority, application Canada, Jun. 11, 1993, 2098263

Int. Cl.^{6} E02B *11/00*

U.S. Cl. 405—45 **11 Claims**



1. An earth drain comprising a core consisting of an elongated flexible web having on at least one surface thereof an array of spaced projections, each having a base end affixed to said web, and a free end spaced from said web, the projections of said array being evenly spaced in parallel rows extending longitudinally and transversely of said web and a filter of sheet-like water permeable material encasing said at least one surface and adapted to be maintained in spaced relationship to said web by the free ends of said projections, characterized in that said array of projections is interrupted by a plurality of transversely spaced elongated projection free zones extending longitudinally of said web, the dimensions of said projection free zones in the transverse and longitudinal directions of the web being greater than the spacing between adjacent projections.

5,688,074
OIL BARRIER

Helmut Schiwek, Am Waldessaum 3, D-47057 Duisburg, Germany

PCT No. PCT/DE94/00008, § 371 Date Jul. 24, 1995, § 102(e) Date Jul. 24, 1995, PCT Pub. No. WO94/17249, PCT Pub. Date Aug. 4, 1994

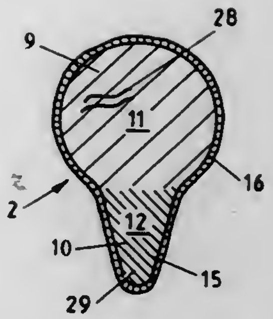
PCT Filed Jan. 8, 1994, Ser. No. 495,478

Claims priority, application Germany, Jan. 23, 1993, 43 01 791.6; Jul. 31, 1993, 43 25 806.9

Int. Cl.^{6} E02B *15/04*

U.S. Cl. 405—63 **20 Claims**

1. A barrier for containing spills comprising an elongated fiber strand having at least two portions forming first and second portions along a length of the strand, the first portion comprising plural hydrophobic mats and the second portion comprising plural hydrophilic mats.



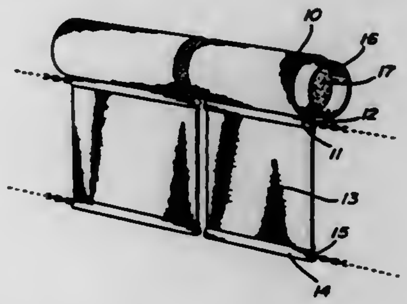
5,688,075
BOOM SYSTEM

Thomas Gradek, 63 des Bocages, Chomedey, Laval Quebec, H7W 4Z1, Canada

Continuation-in-part of Ser. No. 140,921, Oct. 25, 1993, abandoned. This application Sep. 27, 1995, Ser. No. 534,686

Int. Cl.^{6} E02B *15/06*

U.S. Cl. 405—63 **41 Claims**



1. In a boom system for containing a lighter liquid disposed on top of a heavier liquid, said system comprising

flotation containment means for containing lighter liquid disposed on top of heavier liquid,

skirt means,

ballast means,

and reinforcing means,

said flotation containment means comprising buoyancy means for the flotation of the boom system,

said flotation containment means, when the boom system is in use, being able to define an exterior surface comprising a freeboard exterior surface and a submerged exterior surface,

said flotation containment means comprising sorption means for sorbing lighter liquid, said buoyancy means being able to buoy said sorption means,

said sorption means comprising a porous medium for sorbing the lighter liquid and a wall component configured to contain said porous medium,

at least part of said wall component comprising a mesh material pervious to both the lighter and the heavier liquid such that lighter liquid may pass through the mesh material of the wall component for contacting said porous medium,

said skirt means having an upper edge and a lower edge, said upper edge being attached to the flotation containment means such that when the boom system is in use the skirt means depends from the flotation containment means,

said ballast means beings disposed along said lower edge of said skirt means,

the improvement

wherein said skirt means is pervious at least to the heavier liquid and comprises an open mesh wall having mesh openings for

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the passage of the heavier liquid through the skirt means, said open mesh wall extending from said upper edge to said lower edge,

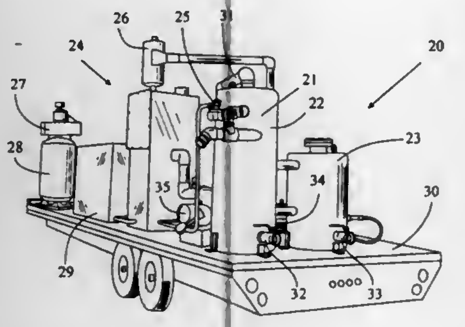
wherein the reinforcing means is disposed along said upper edge of the skirt means,

wherein 35 to 60 percent of the mesh wall of the skirt means comprises said mesh openings,

wherein said mesh openings are from about 5 mm^2 to about 15 mm^2, and wherein the mesh wall of said skirt means comprises an oleophilic mesh material.

5,688,076
HIGH-VACUUM GROUNDWATER AND SOIL REMEDIATION SYSTEM AND RELATED METHOD AND APPARATUS

Parker E. Atkins, 116 N. Plant Ave., Boerne, Tex. 78006
Filed Sep. 9, 1996, Ser. No. 707,858
Int. Cl.⁶ B09C *1/00;* **C02F** *1/40;* **E21B** *43/34*
U.S. Cl. 405—128 **10 Claims**



1. A method for remediating hydrocarbon-contaminated phases, comprising the steps of:

(a) using a liquid ring vacuum pump to draw a flow of contaminated matter;

(b) introducing said flow of contaminated matter into a first portion of a remediation system;

(c) separating non-gaseous phases from said flow of contaminated matter in said first portion of the remediation system, thereby limiting said flow to predominantly gaseous materials;

(d) reducing negative pressure induced by said pump to enable liquid phase portions of said non-gaseous phases to flow from said first portion of the remediation system; and

(e) pumping said liquid phase portions from said first portion of the remediation system using a low-shear pump, thereby minimizing emulsification of said liquid phase portions.

10. A mobile system for remediating three-phase subsurface hydrocarbon contamination, comprising:

a centrifugal separating tank to separate solid, liquid and gaseous phases of subsurface contamination, said tank having a vapor phase outlet, a liquid phase outlet, and a multi-phase inlet, said inlet being connectable to a subsurface formation;

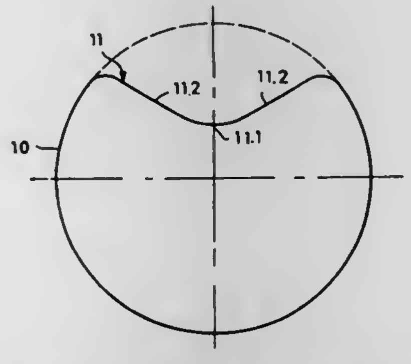
a liquid ring vacuum pump fluidly connectable with the vapor phase outlet of said centrifugal separating tank for drawing a flow of a hydrocarbon-contaminated mixture of solids, liquids and gasses from the subsurface formation, through the centrifugal separating tank;

a fill sensor for sensing the level of liquid within said separating tank;

a solenoid-actuated vent in fluid communication with the separating tank for reducing negative pressure levels within the separating tank, thereby enabling flow of liquid phase from the liquid phase outlet of said tank, said vent being actuated in response to said fill sensor.

5,688,077
ROCK ANCHOR BOLT

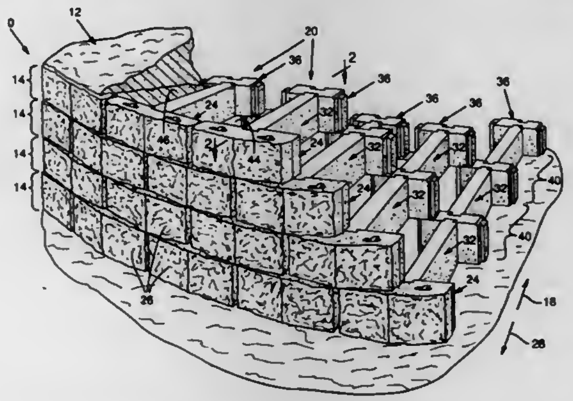
Kenneth Douglas Kynoch, Cape Town, South Africa, assignor to Cape Town Iron and Steel Works (PTY) Limited, South Africa
Filed Aug. 29, 1994, Ser. No. 297,658
Claims priority, application South Africa, Aug. 30, 1993, 93/6353
Int. Cl.⁶ F21D *21/00*
U.S. Cl. 405—259.5 **11 Claims**



1. A rock anchor bolt adapted for use with a settable material which is provided in a preformed hole, said bolt comprising an elongated metal rod which in transverse cross section defines a circle and which is provided over the outer surface with at least one axially extending groove formed therein, the groove providing an extended surface area for cooperating with the settable material in the preformed hole, at least part of the rod bearing the groove being twisted about its longitudinal axis, said outer surface of the elongated rod including at least one circumferential outer section having a curvature corresponding to that of said circle, whereby the insertion of said elongated rod into said preformed hole facilitates the mixing of the settable material in said preformed hole.

5,688,078
INTERLOCKING RETAINING WALLS BLOCKS AND SYSTEM

James Hammer, Fir Crest, Wash., assignor to Westblock Products, Inc., Portland, Oreg.
Continuation of Ser. No. 241,789, May 12, 1994, abandoned, which is a continuation of Ser. No. 798,120, Nov. 26, 1991, Pat. No. 5,350,256. This application Jan. 25, 1996, Ser. No. 590,372
Int. Cl.⁶ E02D *27/00;29/00;5/00*
U.S. Cl. 405—286 **15 Claims**



1. A retaining wall comprising:

a plurality of interconnected blocks, each having a dovetail element connected to a dovetail element of another of the blocks,

the interconnected blocks being arranged in generally horizontal layers including a second layer above a first layer wherein each block has upper and lower surfaces defined by parallel planes entirely containing the block with the upper surfaces of blocks of the first layer supporting the lower surfaces of blocks of the second layer, such that the layers are not vertically interlocked,

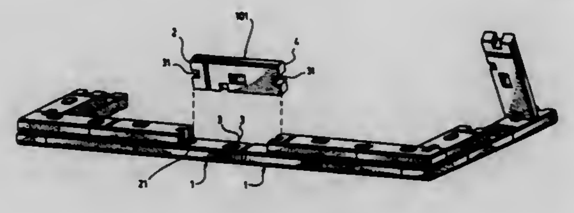
each layer having a predetermined height,

each of the blocks having a height substantially equal to the height of the later in which it resides,

each later having at least one exposed face and extending rearwardly from the face to a predetermined depth, the depth of the first later being greater than the depth of the second layer, such that the wall is stabilized against toppling.

5,688,079
CONSTRUCTION BLOCK FOR BUILDING A RETAINING WALL

Maurice Bolduc, Sainte-Marie-de-Beauce, and Marco Couture, Ste-Marie-de-Beauce, both of Canada, assignors to Béton Bolduc (1982) Inc., Ste-Marie-de-Beauce, Canada
Filed Apr. 10, 1996, Ser. No. 630,448
Int. Cl.⁶ E02D *29/02*
U.S. Cl. 405—286 **19 Claims**



1. A construction block for building a retaining wall, said block having a length L, a width W, a thickness T, two opposite ends, two opposite sides, a top surface, a bottom surface, a longitudinal axis and a center point on said top surface, and comprising:

a projection on said top surface, said projection having a length l, a width w and a thickness t, approximately centered about said center point;

a groove at each of said opposite ends on said bottom surface, said groove having a length l", a width w" and a thickness t", approximately centered about said longitudinal axis;

at least one slot, transverse to said longitudinal axis, on either said top surface or said bottom surface, located approximately halfway between said center point and one of said opposite ends, said at least one slot defining an end piece,

wherein l, w, t, l", w" and t" meet the following equations:

$l'' > \frac{1}{2} l$;

$t'' > t$; and

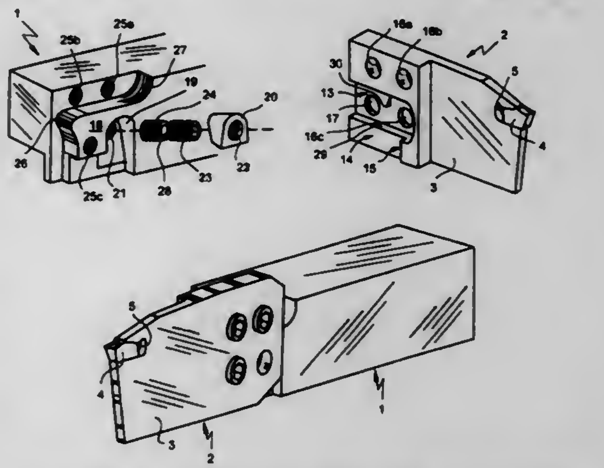
$w'' > w$,

whereby, in use, said block may be stacked on two similar blocks having their opposite ends facing each other, with said block resting on half of each of said two similar blocks, so that said groove at one of said opposite ends of said block is located above half of said projection of one of said similar blocks and said groove at the other of said opposite ends is located above half of said projection of the other similar block, thus staggering said blocks, and

whereby, in use, said at least one slot makes it possible to have said end piece slitted and cut off from said block to be used as an end block for a retaining wall having a straight edge, by having said groove of said end piece located above half of said projection of said block having had its end piece slitted and cut off.

5,688,080
TOOL SHAFT WITH DETACHABLE BLADE HAVING WEDGE GROOVE CONTACTING A MOVABLE WEDGE

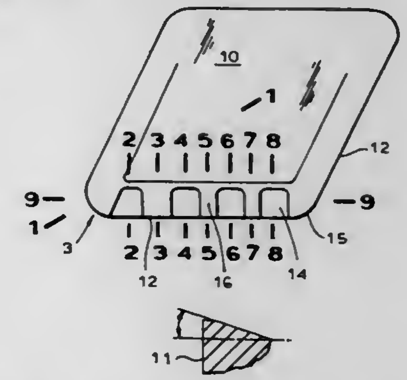
Thomas Hedlund, Gästrike-Hammarby, Sweden, assignor to Sandvik AB, Sandviken, Sweden
Continuation of Ser. No. 206,167, Mar. 7, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 622,930
Claims priority, application Sweden, Mar. 18, 1993, 9300890
Int. Cl.⁶ B23B *27/04*
U.S. Cl. 407—101 **16 Claims**



1. A tool shaft for securement to a blade part to form a cutting tool, the tool shaft comprising a wedge part for interaction with a wedge groove on said blade part, the wedge part to vary a distance between opposite first and second abutment surfaces of the remainder of the wedge part and the movable wedge so that a positive connection can be obtained between the blade part and the tool shaft by contacting the abutment surfaces with the wedge groove, the wedge part and the movable wedge having respective contact surfaces which are continuously in contact with each other while the distance between opposite first and second abutment surfaces is varied.

5,688,081
CUTTING INSERT WITH TRAPEZOIDAL INDENTATIONS ALONG THE CUTTING EDGE

José Agustin Paya, Mühlheim, Germany, assignor to Widia GmbH, Essen, Germany
PCT No. PCT/DE92/01027, § 371 Date Jun. 10, 1994, § 102(e) Date Jun. 10, 1994, PCT Pub. No. WO93/11898, PCT Pub. Date Jun. 14, 1993
PCT Filed Dec. 7, 1992, Ser. No. 244,853
Claims priority, application Germany, Dec. 14, 1991, 41 41 368.7
Int. Cl.⁶ B23B *27/16*
U.S. Cl. 407—115 **20 Claims**



1. In a cutting insert for chip-forming machining having

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a chip surface provided at a cutting edge with a plurality of indentations arranged in a row extending along the cutting edge and each having a generally trapezoidal sectional shape parallel to the cutting edge and perpendicular to the chip surface with trapezoidal sides open toward the chip surface, the improvement wherein

the indentations each have a chip-surface base extending at a substantially negative chip angle to the cutting edge,

the chip surface has in regions between the indentations at the cutting edge a positive chip angle of at least 5°,

the indentations extend to and interrupt the cutting edge, and

transitions from each chip-surface base to the respective trapezoidal sides or from the trapezoidal sides to the respective chip-surface regions between the indentations are rounded to a radius of at least 0.3 mm.

5,688,082

DUST EXTRACTOR

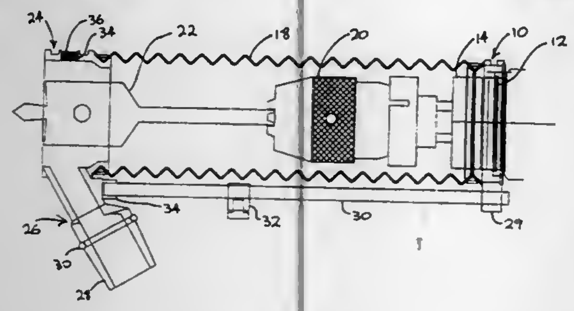
Owen Lewis Richardson, 10 Lentara Road, Bayview NSW 2104, Australia

Filed Jan. 19, 1996, Ser. No. 588,744

Claims priority, application Australia, Jan. 19, 1995, PN 0634; Apr. 10, 1995, PN 2213

Int. Cl.⁶ B23B *45/00*

U.S. Cl. 408—67 **9 Claims**



1. A dust extraction housing for a rotary tool, comprising a collar for removable attachment to a stationary part of the tool, a tubular enclosure extending forwardly of the collar for enclosing a rotary portion of the tool, the tubular enclosure being concertinaed to allow compression when the tool is moved forward to engage and penetrate a workpiece, means for connection of an external vacuum source for removing particles formed by action of the tool on the workpiece, air inlet means to allow ingress of air to said housing, and a filter fitted to said air inlet means.

5,688,083

DRILLING TOOL AND AN INDEXING CUTTING INSERT FOR USE THEREIN

Gideon Boianjiu, Kfar Havradim, Israel, assignor to Iscar Ltd., Migdal Tefen, Israel

PCT No. PCT/EP94/01626, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO94/27772, PCT Pub. Date Dec. 8, 1994

PCT Filed May 19, 1994, Ser. No. 373,326

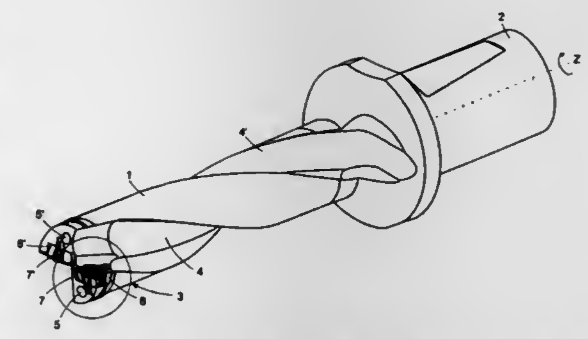
Claims priority, application Israel, May 20, 1993, 105758

Int. Cl.⁶ B23B *51/00*

U.S. Cl. 408—224 **45 Claims**

1. A metal drilling tool having an elongated body with a longitudinal axis and provided with at least one pocket at its working end, at least one indexable cutting insert mounted in the or each pocket for performing drilling action said insert comprising: a rake face, relief flank faces, a base, a plurality of cutting edges, each defined between the rake face and adjacent relief flank face and included between two adjacent cutting corners, each of said cutting edges comprising at least one set of component cutting edges, each set comprising two pairs of component cutting edges, each pair comprising a first and a second component cutting edge, the first component cutting edges of both pairs merging in a common point, said component cutting edges being oriented so that an extremity of the second component cutting edge innermost with respect to said common point is closer to a center of the insert than an extremity of the first component cutting edge which is outermost with respect to said common point, said extremities merging via a bridging section which is directed from said outermost extremity of the first component cutting edge towards

a central line constituting or parallel to a median line of the insert passing through said common point so that said innermost extremity of said second component cutting edge is closer to said central line than said outermost extremity of said first component cutting edge ensuring that during the drilling action a line parallel to said longitudinal axis and passing through said outermost extremity of the first component cutting edge intersects said second component cutting edge and said extremities overlap.



5,688,084

MACHINE TOOL

Hermann Fritz, Mutlangen; Hans Staiger, Goeppingen, and Friedrich Winckler, Schwaebisch-Gmuend, all of Germany, assignors to Max Rhodius GmbH, Weissenburg, Germany

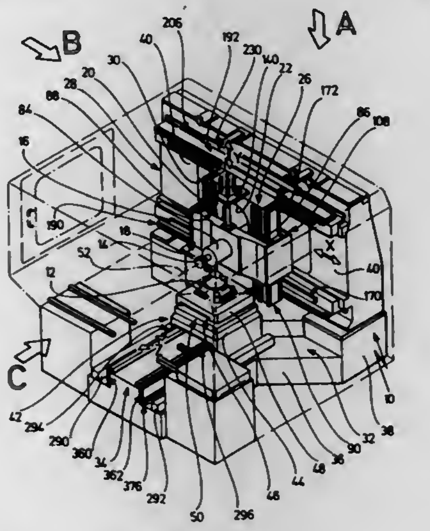
Continuation of Ser. No. 55,686, Apr. 29, 1993, abandoned.

This application May 30, 1995, Ser. No. 454,424

Claims priority, application Germany, Mar. 10, 1993, 43 07 482.0

Int. Cl.⁶ B23C *1/02;* **B23Q** *15/013;* **H02K** *41/02;* **H02P** *5/46*

U.S. Cl. 409—202 **29 Claims**



1. A machine tool comprising:
(a) a frame;
(b) a workpiece holder on said frame for receiving a workpiece to be machined;
(c) at least one slide mounted on said frame for movement with respect to said frame in the direction of at least one axis;

(d) a tool holder mounted on said slide for receiving a tool for machining a workpiece;
(e) a drive for moving said slide along said at least one axis, said drive including a first and second electric linear motor each aligned parallel to said at least one axis and spaced apart with at least part of said slide extending between said linear motors;
(f) a control system for controlling the movement of said slide along said axis;

wherein said control system comprises a first control unit for operating said first linear motor as an independent NC axis and a second control unit for operating said second linear motor as an independent NC axis whereby each motor is capable of being operated independently of the other, but simultaneously and with parallel displacement along said axis; and

(g) a slide support for supporting said slide, said slide support having at least two sides and a front face having a geometric center, and wherein said motors are respectively arranged on said at least two sides of said slide support, so that transverse to the direction of said at least one axis, said motors are in outer regions of said slide and said slide support with respect to said front face center.

5,688,085

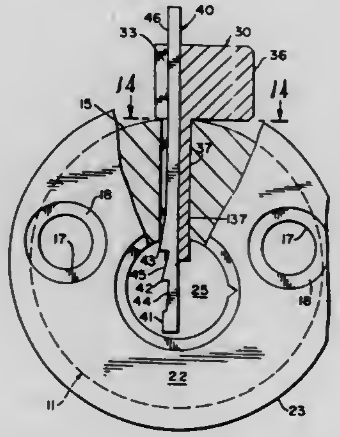
APPARATUS FOR REBROACHING A LOCK ASSEMBLY AND A LOCK ASSEMBLY MADE USING SAID APPARATUS

James A. Watts, 2450 W. 82 St., Unit 201, Hialeah, Fla. 33016

Continuation-in-part of Ser. No. 189,116, Jan. 27, 1994, Pat. No. 5,450,662. This application Jun. 19, 1995, Ser. No. 492,387

Int. Cl.⁶ B23D *37/22*

U.S. Cl. 409—259 **6 Claims**



1. A broach guide for guiding a path of movement for a cutter along a cylindrical pin chamber spaced a common distance from an adjacent cylindrical pin chamber, said broach guide having a central guideway, a pair of aligning pin guides flanking said central guideway and spaced from said central guideway at a distance equal to said common distance between adjacent cylindrical pin chambers of a cylinder shell of a lock to be broached.

5,688,086

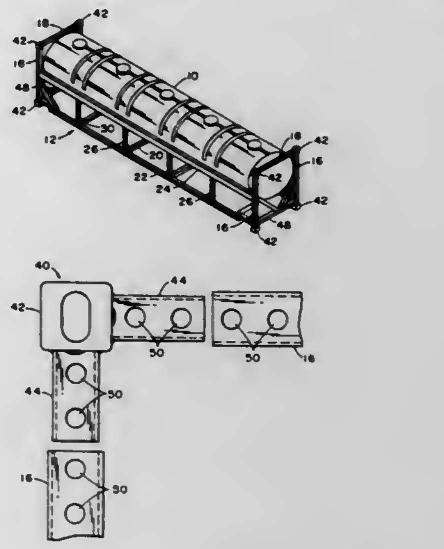
STANDARD CORNER FITTINGS FOR ALUMINUM CONTAINER FRAMES

Craig C. Menzemer, Murrysville; Andrew J. Hinkle, Plum Boro; William C. Herbein, Murrysville, all of Pa.; Daniel D. Roup, Davenport, Iowa; Ross E. Grimm, Tarentum, Pa., and David S. Bennett, Davenport, Iowa, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 16, 1996, Ser. No. 601,312

Int. Cl.⁶ B65D *61/00*

U.S. Cl. 410—68 **10 Claims**



1. A metal frame structure for connecting a container to a vehicle employed to transport the container, said frame comprising a plurality of aluminum alloy tubes connected together at corners of the frame by corner assemblies, each said corner assembly comprising at least one steel member connected to a standard cast iron or steel corner fitting, with said at least one member having surfaces coated with materials that are effective in electrically separating each said steel member from the aluminum tubes when the corner assemblies and aluminum tubes are assembled together, each said member including the electrically separating material and respective said assembled tubes being relatively sized to slip one upon the other at the frame corners.

5,688,087

PICK-UP BED RAIL ASSEMBLY

Craig A. Stapleton, Clarkston, and Stephen Peter Siivola, Fenton, both of Mich., assignors to Advanced Accessory Systems LLC, Sterling Heights, Mich.

Filed Nov. 13, 1995, Ser. No. 556,027

Int. Cl.⁶ B60P *7/15*

U.S. Cl. 410—150 **11 Claims**

6. A rail assembly for a vehicle, comprising:

a pair of elongate rails adapted for attachment to the vehicle, each elongate rail forming a longitudinal internal passageway therein and having a longitudinal slot defining an opening for accessing said internal passageway;

a cross member having first and second ends, and at least one track member operatively connected at each said end for cooperation within each said internal passageway and each said slot;

a first portion of said track member being smaller than said slot to allow said first portion to move longitudinally and axially in said longitudinal slot while a second portion of said track member is located predominantly within said internal passageway and is larger than said slot to prevent said second portion from moving axially through said slot and out of said internal passageway; and

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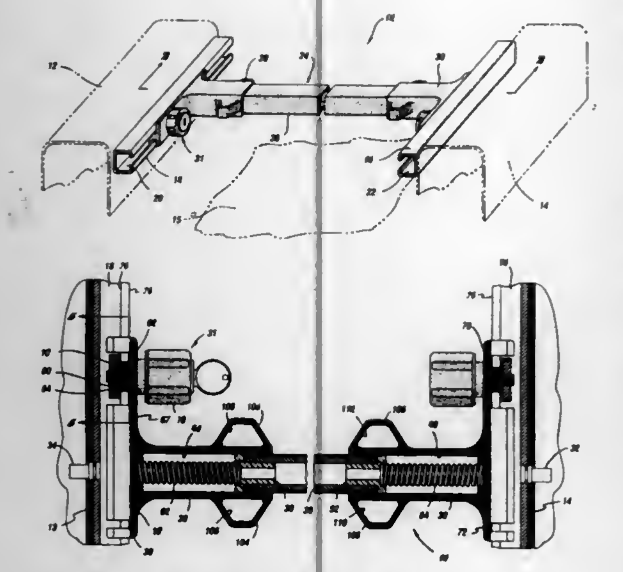


a plurality of roller elements rotatable relative to and carried by said cross member and rolling against said rails to facilitate movement of said cross member along said rails.

5,688,088

DYNAMOMETRIC SCREW OR NUT

Paul Gunnar Wätterbäck, Sköldinge, Sweden, assignor to Excelsior Development Inc., Wilmington, Del.

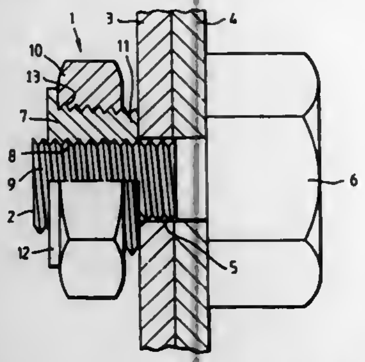
PCT No. PCT/SE92/00519, § 371 Date May 16, 1995, § 102(e) Date May 16, 1995, PCT Pub. No. WO94/02749, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 15, 1992, Ser. No. 362,569

Claims priority, application Sweden, Jan. 16, 1991, 9100131

Int. Cl.^{6} F16B *39/12;39/284;39/30;39/38*

U.S. Cl. 411—3 **5 Claims**



1. A fastening device with fastening threads that include an integral indication means that is released at a predetermined tightening torque, the fastening device comprising an inner fastening member (7) having said fastening threads (8) formed on the inside of the inner fastening member; an outer female member (10) that is rotatable by means of a tool, said female member being connected to the inner fastening member by means of a coupling (13) having a strength to transfer to the inner fastening member a predetermined torque of a magnitude for which the fastening device is designed, and wherein the outer female member (10) is designed to be released and rotated relative to the inner fastening member (7) upon tightening of the coupling to a degree that exceeds the predetermined torque, and wherein the coupling between the outer female member (10) and the inner fastening member comprises a conical screw coupling, and wherein the outer female member comprises a nut having a conically threaded hole that extends from a first side of the nut to a second side of the nut, said inner fastening member extending beyond said second side of the nut, and wherein the predetermined torque is set by a certain tightening of the screw coupling between the outer nut (10) and the inner fastening member (7).

5,688,089

FASTENING ELEMENT FOR FITTING INTO A DRILLED HOLE

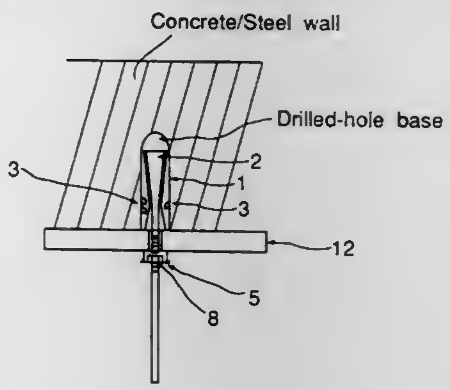
Heinz-Georg Solle, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 15, 1995, Ser. No. 404,437

Claims priority, application Germany, Mar. 17, 1994, 44 09 171.0

Int. Cl.^{6} F16B *13/04;13/06*

U.S. Cl. 411—43 **17 Claims**



1. A fastening element for fitting into a drilled hole, which has: an expandable sleeve (1) and

an axially movable anchor (2), the sleeve inside surface and the anchor outside surface being designed such that the anchor (2), upon its axial relative movement with respect to the sleeve (1) in the direction out of the drilled hole, exerts radial forces on the expandable sleeve (1) in such a way that the sleeve (1) is fixed in the drilled hole;

a flexible drawing means (6), which is receivable in a bearing element (5) with locking means for fixing the drawing means (6) which has on one or more sides means for preventing an axial return movement of the anchor in the direction into the drilled hole.

5,688,090

SCREW ASSEMBLY

Saburo Miyamoto, Osaka, Japan, assignor to Wakai & Co., Ltd., Osaka, Japan

Filed Aug. 16, 1996, Ser. No. 698,737

Claims priority, application Japan, Sep. 11, 1995, 7-232485

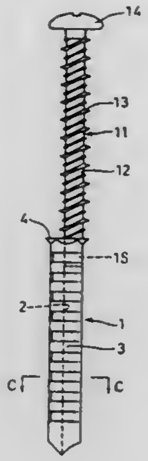
Int. Cl.^{6} F16B *13/06*

U.S. Cl. 411—55 **2 Claims**

1. A screw assembly comprising:

a screw fixing member having a body, said body having a cylindrical section and being formed with an eccentric bore having an opening at one end thereof; and

a screw having a tip inserted in said opening of said bore to couple said screw with said screw fixing member, wherein said screw has a shank with threads thereon and a cylindrical portion provided at one end of said shank and having a diameter smaller than the diameter of said threads on said shank, said screw and said screw fixing member being coupled together by inserting said cylindrical portion into said opening of said bore.



5,688,091

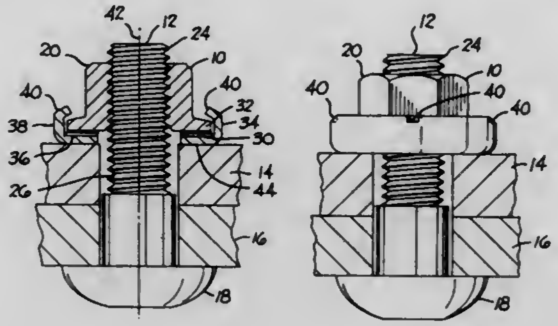
SELF-LOCKING FASTENER WITH CAPTIVE WASHER

Alistair N. McKinlay, Marina Del Rey, Calif., assignor to Hong-Kong Disc Lock Company, Ltd., Wanchai, Hong Kong

Continuation-in-part of Ser. No. 528,857, Sep. 15, 1995. This application Apr. 30, 1996, Ser. No. 640,320

Int. Cl.^{6} F16B *39/02*

U.S. Cl. 411—149 **5 Claims**



1. A self-tightening fastener installable on the threaded shank of a cooperating fastener member (12), comprising:

a nut comprising a one piece body that includes a head and an integral flange;

a threaded opening extending through said head and said flange on a central axis;

said head having a non-circular side surface engageable with a turning tool for rotating the nut around the central axis;

said flange having a peripheral edge spaced a greater distance from the central axis than said non-circular side surface;

a washer that includes a flat radial wall axially aligned with said flange, a continuous annular skirt extending axially from said radial wall beyond said flange, and plural tabs extending inwardly from said skirt to overly said flange and prevent the nut from separating from the washer;

means forming a first annular cam lock surface on the nut body, and means forming a second cooperating annular cam lock surface on the radial wall of the washer;

said tabs having an axial clearance relative to said flange, whereby said first cam lock surface can ratchet on said second cam lock surface when the nut is tightened to generate a tensile locking stress in the threaded shank.

5,688,092

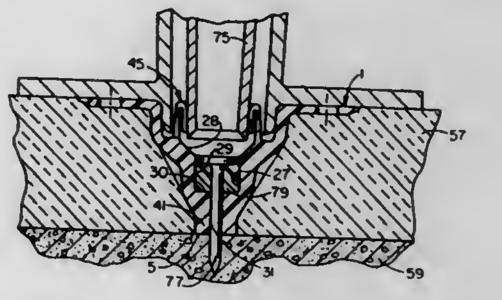
METHOD OF ATTACHING AN INSULATION PANEL TO A BUILDING SUBSTRATE

Gilbert Olvera, Chicago, and Michael C. Dill, Elk Grove Village, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 369,354, Jan. 6, 1995, Pat. No. 5,607,272. This application Sep. 5, 1996, Ser. No. 708,520

Int. Cl.^{6} F16B *43/00;* **E04B** *1/00*

U.S. Cl. 411—533 **20 Claims**



1. A method of attaching an insulation panel to a building substrate, comprising the steps of:

providing a fastener setting tool, having a magazine, and a nosepiece portion, for inserting a fastener into a building substrate so as to secure an insulation panel to said building substrate;

loading said tool magazine with at least one strip of collated fasteners;

providing an attachment plate comprising a washer having a central opening defined therein and which has a predetermined diametrical extent, and a longitudinal axis; a tubular member joined to said washer, extending concentrically along said longitudinal axis, and comprising a first section adjacent to said washer that includes an inner peripheral wall which defines a first inner diametrical extent which is of substantially the same size as said diametrical extent of said washer central opening, said inner peripheral wall of said first section terminating in a first transverse surface; a second section adjacent to said first section and including an inner peripheral wall defining a second inner diametrical extent which is less than said first inner diametrical extent of said first section, said inner peripheral wall of said second section terminating in a second transverse surface that cooperates with said inner peripheral wall of said second section so as to define a recess for accommodating a head portion of a fastener which is adapted to be inserted into said building substrate so as to secure said insulation panel to said building substrate; an end section adjacent to said second section and defining a passage therethrough for accommodating a shank portion of said fastener for securing said insulation panel to said building substrate; and finger means spaced radially inwardly from said inner peripheral wall of said first section and mounted upon said first transverse surface of said first section for defining an annular chamber with said inner peripheral wall of said first section so as to accommodate said nosepiece portion of said fastener setting tool, and for closing a central bore section of said tubular member of said attachment plate so that said head of said fastener is substantially covered;

placing said nosepiece portion of said fastener setting tool into said annular chamber of said attachment plate defined between said finger means and said inner peripheral wall of said first section;

pushing said fastener setting tool toward said building substrate so as to cause said end section of said attachment plate to penetrate said insulation panel; and

firing said fastener setting tool so as to force a fastener into and through said attachment plate and thereby embed said fastener within said building substrate.

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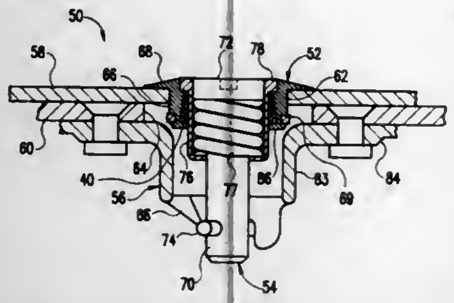
5,688,093
EJECTING QUICK-CONNECT FASTENER

Ned C. Bowers, 7400 Ola Cir., Mt. Dora, Fla. 32757
Filed Jan. 29, 1996, Ser. No. 593,277
Int. Cl.^{6} F16B *21/00*
U.S. Cl. 411—552 **16 Claims**



1. A fastener assembly for holding together first and second elements, wherein each element has an aperture for receiving the fastener, a first side in engagement with the other of said elements, and a second side facing away from the other of said elements, comprising:

a grommet for extending through the aperture of the first element, said grommet having a perimetric wall defining an opening through the grommet;

a stud having opposite ends, a head at one of said ends, and a cross pin adjacent to the other of said ends for connecting the fastener assembly to a receptacle secured to the second element, said stud being received in the opening of the grommet;

a member interposed between said stud and said grommet, said member being moveable relative to said stud; and

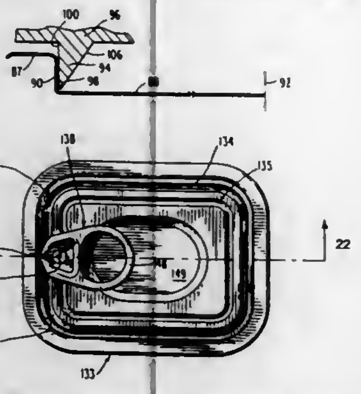
means for ejecting the stud to a point at which said cross pin engages said grommet when the fastener assembly is disconnected from the receptacle.

a receptacle for mounting in the aperture of the second element.

5,688,094
APPARATUS FOR JOINING SHEET METAL CONVENIENCE-FEATURE END CLOSURE TO NON-CYLINDRICAL SIDEWALL OF SHEET METAL CAN BODY

William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corporation, Weirton, W. Va.
Continuation of Ser. No. 224,258, Apr. 7, 1994, Pat. No. 5,462,396, which is a division of Ser. No. 976,188, Nov. 13, 1992, Pat. No. 5,328,313, which is a division of Ser. No. 535,413, Jun. 8, 1990, Pat. No. 5,217,134. This application May 10, 1995, Ser. No. 438,489
The portion of the term of this patent subsequent to Apr. 7, 2014, has been disclaimed.
Int. Cl.^{6} B21D *51/38*
U.S. Cl. 413—67 **3 Claims**

1. Apparatus for use in joining a sheet metal convenience-feature end closure structure to a container body having a non-circular cross-sectional configuration,



said end closure structure including

an endwall panel,

peripheral chime seam metal disposed for joining the end closure structure to the container body,

a unitary chuck wall extending between the chime seam metal and the endwall panel,

the endwall panel being substantially planar and countersunk in relation to the peripheral chime seam metal toward the interior of the container body as the end closure structure is oriented for assembly with the container body, with

such endwall panel being joined to the chime seam metal by the chuck wall,

the chuck wall having a non-circular cross-sectional configuration and dimensional characteristics matching those at the open end of the container body so as to interfit in contiguous relationship within such open end during assembly of the end closure structure with the container body by means of the chime seam metal,

a peripheral scoreline contiguous to the chuck wall and defining the endwall panel as separable from the end closure structure to enable one-piece removal of solid-pack contents,

said non-circular configuration being selected from the group consisting of square, rectangular, oblong, and elliptical shapes so as to have a major dimension centrally-located axis dividing the endwall panel into mirror image halves which are uniformly symmetrical along said centrally-located axis,

a rivet button disposed symmetrically in relation to the centrally-located axis and adjacent to a distal end of the centrally-located axis where said axis intersects the peripheral scoreline,

said rivet button forming rivet means for securing an elongated longitudinally-rigid integral opener to the endwall panel in a position to rupture a starter segment of the peripheral scoreline,

said elongated integral opener, having a working end and a handle end, and being secured to the endwall panel with its longitudinal axis coincident with said centrally-located axis of the endwall panel, with

the working end of the integral opener, as secured by said rivet means to the endwall panel, being contiguous to the starter segment of the peripheral scoreline at one distal end of said centrally-located axis,

a back scoreline, partially circumscribing the rivet means and presenting a leg portion extending on each side of said rivet means forming an arcuate configuration, opening toward said starter segment of the peripheral scoreline at said distal end of the centrally-located axis,

said apparatus comprising:

seaming chuck tooling for coacting with said non-circular configuration end closure structure for chime seam assembly with a container body of corresponding non-circular configuration at an open end of the container body,

said seaming chuck tooling having substantially identical configurational and dimensional characteristics in the plane of the endwall panel as said chuck wall,

said seaming chuck tooling projecting axially toward the endwall panel to interfit in contiguous relationship with said chuck wall so as to provide backing during chime seam assembly of the end closure structure with the container body, in which

a portion of said seaming chuck tooling, as confronting said endwall panel, is partially cut away to provide an access opening between the seaming chuck tooling and the endwall panel in approaching each distal end of said centrally-located axis,

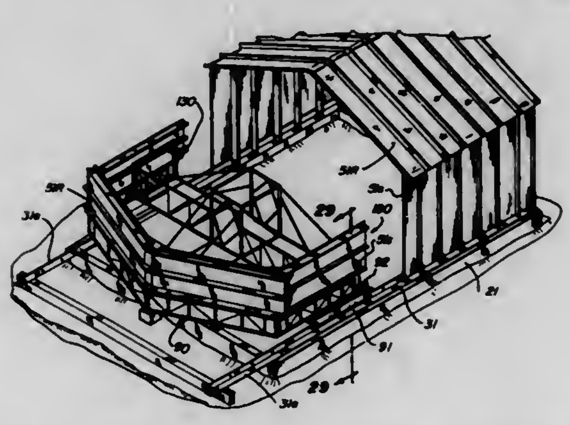
each said access opening being capable of receiving the working end of said integral opener regardless of location of said working end at either distal end of the centrally-located axis, while

said seaming chuck tooling continues to provide substantially continuous backing support peripherally along the interior surface of said chuck wall during chime seam joinder of the end closure structure to said container body, with

said access opening contiguous to each distal end of the major dimension centrally-located axis eliminating registry requirements for said non-circular configuration end closure structure during chime seam joinder to a correspondingly configured container body.

5,688,095
FRAMING JIG AND LIFTING APPARATUS

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401
Division of Ser. No. 209,310, Mar. 14, 1994, Pat. No. 5,526,628, which is a continuation-in-part of Ser. No. 810,218, Dec. 19, 1991, abandoned. This application Mar. 18, 1996, Ser. No. 620,760
Int. Cl.^{6} E04G *11/00*
U.S. Cl. 414—12 **18 Claims**



1. In a framing jig and lifting apparatus for constructing a building, the combination comprising:

framing jig means including a pair of parallel spaced side wall supports, a roof support connected at the upper ends of said side wall supports and a lateral support connected between said pair of side wall supports for positioning and supporting a pair of opposed side wall skin panels a selected distance apart and for positioning and supporting a roof skin panel in a fastening position at the upper ends of said side wall skin panels during the formation of a panel building section,

panel lift means for moving said framing jig means and panel building section from a substantially horizontal building section formation first position to a substantially vertical building section formation second position,

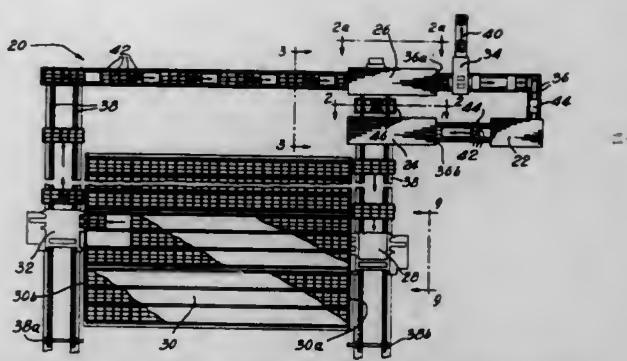
base means for supporting said framing jig means for guided movement along opposite sides of a foundation, and

locating means on said base means for locating said framing jig means at selected positions along said base means and locating said panel building section in said second position at a correct fastening position on said means.

5,688,096
TRAY FOR CARRYING CONCRETE BLOCKS AND SYSTEM FOR HANDLING AND CURING CONCRETE BLOCKS ADAPTED THERETO

Pierre Gagnon, Outremont, and Pierre Laforest, Montréal, both of Canada, assignors to Gestion Laforest Inc., St-Hubert, Canada
Continuation of Ser. No. 312,547, Sep. 26, 1994, abandoned. This application Jun. 27, 1996, Ser. No. 672,695
Int. Cl.^{6} B65G *1/04;* F27B *9/02*
U.S. Cl. 414—152 **15 Claims**

4. In combination, a concrete blocks handling and curing system, a plurality of rectangular article-carrying pallets of equal size adapted to be loaded with concrete blocks and a plurality of trays for carrying said rectangular pallets, each said tray comprising a rectangular frame having a longitudinal axis and defining a bottom load-bearing wall having a flat lower surface and an upper surface, two sides and two ends, end flanges upstanding from said upper surface along said ends with said upper surface being flat between said end flanges, said end flanges defining flat, complementary outer surfaces normal to said longitudinal axis, extending upwardly from said load-bearing wall flat lower surface and being in direct, orthogonal relationship therewith for flat and stable abutment of the outer surface of one end flange of a first said tray against the outer surface of one end flange of a second said tray to prevent accidental overlapping of said first and second trays when said first tray pushes said second tray in the direction of their longitudinal axes, said tray dimensioned to receive on said upper surface a set number of pallets in side by side and contiguous positions, said system comprising:



a) a tray loader, for loading said set number of pallets on each of said trays;

b) a kiln, for curing said concrete blocks;

c) kiln loading means, for loading said trays into said kiln;

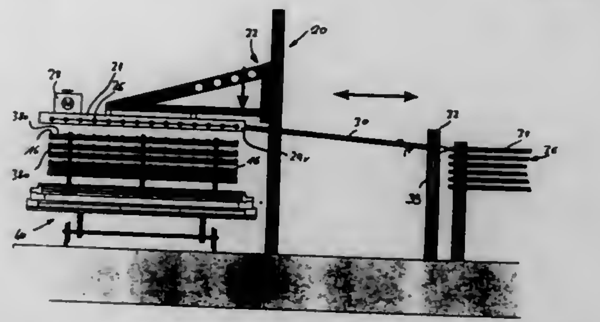
d) kiln unloading means, for unloading said trays from said kiln;

e) a tray stripper, for unloading said pallets from said tray; and

f) conveying means, for carrying said trays sequentially from said kiln unloading means to said tray stripper, to said tray loader and to said kiln loading means.

5,688,097
APPARATUS FOR THE LOADING AND UNLOADING OF A FIRING TABLE ARRANGEMENT WITH PRODUCT FOR FIRING

Friedherz Becker, Wendelstein; Ralf Binninger; Andreas Bottcher, both of Nuremberg; Johannes Figel, Schwaig; Volker Rieck, Nuremberg, and Bernd Stender, Furth, all of Germany, assignors to Riedhammer GmbH Und Co. KG, Nurnberg, Germany
Filed Mar. 30, 1995, Ser. No. 413,964
Claims priority, application Germany, Mar. 31, 1994, 44 11 412.5
Int. Cl.^{6} B65G *1/02*
U.S. Cl. 414—272 **20 Claims**



16. Apparatus for loading and unloading a firing table arrangement with product for firing, wherein the firing table arrangement comprises on at least one horizontal plane a plurality of rollers disposed at a distance from one another for picking up the product for firing, wherein

2.1 the apparatus aligned relative to the firing table arrangement incorporates a supporting structure (**20**) with two horizontally

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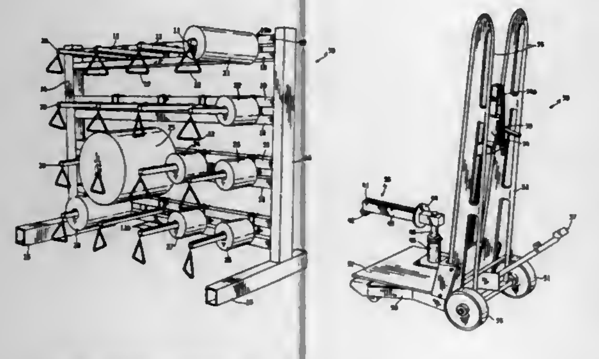
projecting supporting arms (**24**) each of them running traversely relative to the rollers, laterally outside the firing table arrangement which are accommodated on the supporting structure (**20**) so as to be adjustable in height, said supporting arms having inner sides facing one another,

2.2 on the inner side of each supporting arms (**24**) are disposed drive means (**26**) which, after coupling to the rollers of the firing table, set them in a rotating movement.

5,688,098
ROLL TRANSFER SYSTEM

Mark H. Theno, 13040 Woodbridge Trail, Minnetonka, Minn. 55305

Filed Jan. 4, 1996, Ser. No. 583,155
Int. Cl.⁶ B65G ***1/04***
U.S. Cl. 414—277 **10 Claims**



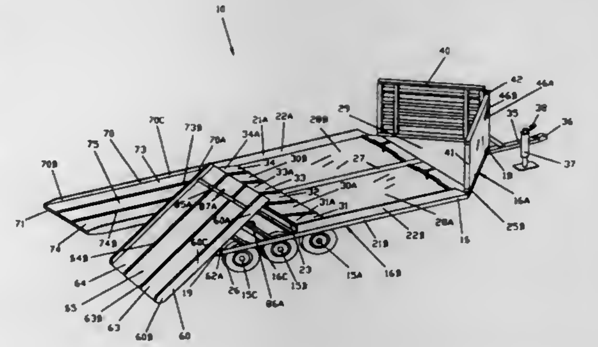
1. A roll holder comprising:
- a frame
- a support member having a first end attached to the frame and a second end extending horizontally outward in a cantilevered fashion from said frame;
- a set of rollers located on a top portion of said support member, said respective set of rollers extending substantially vertically upward from said support member so as to rollably support a roll of material thereon;
- a free-hanging roll stop, said roll stop detachably mounted to said second end of said support member so that when the roll of material is to be placed on the support member the roll stop can be readily detached and removed to permit placing the roll of material on the support member and can be readily reattached to the support member after the roll of material is placed on the support member to prevent the roll of material on the support member from accidentally rolling off the support member; and
- a loop connector for attaching said roll stop thereto.

5,688,099
TILTABLE DUAL BEDS TRAILER

Terry D. Fischer, R.R. 1, Box 155, Harvey, N. Dak. 58341

Filed Dec. 18, 1995, Ser. No. 574,160
Int. Cl.⁶ B60P ***1/28;*** **B65G** ***67/02***
U.S. Cl. 414—537 **15 Claims**

1. A tiltable dual beds trailer comprising:
- a main frame mounted upon at least one wheeled axle and having a plurality of cross members and side members and further having a front end and a rear end;
- a floor disposed upon said main frame;
- a pair of independently tiltable rear frames hingedly attached to said rear end of said main frame and having a plurality of cross members and being disposed side-by-side;
- a pair of removable floors each of which is slidably mounted upon a respective one of said tiltable rear frames;
- a pair of gate/ramps hingedly attached to said front end of said main frame;



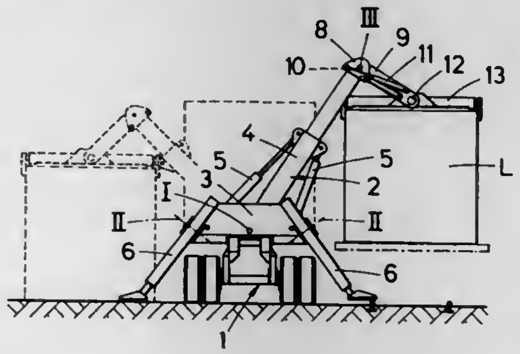
- a post fixedly attached upon said front end of said main frame and extending upward therefrom for latchably securing said gate/ramps in an upright travel position; and
- a tongue attached to and extending forward of said main frame and having a hitching means for hitching said trailer to a prime mover.

5,688,100
LOADING DEVICE FOR CONTAINERS OR THE LIKE

Johannes Wunder, Seestrasse 52a, A-3224 Mitterbach; Udo Winter, Losensteinerstrasse 23, A-4020 Linz; Johann Schabelreiter, Kirchdorf 20, A-8132 Pernegg, and Werner Martin, Simchengasse 2, A-8045 Graz, all of Austria

PCT No. PCT/AT94/00081, § 371 Date Dec. 22, 1995, § 102(e) Date Dec. 22, 1995, PCT Pub. No. WO95/00357, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 22, 1994, Ser. No. 578,576
Claims priority, application Austria, Jun. 23, 1993, 1233/93
Int. Cl.⁶ B60P ***1/64***
U.S. Cl. 414—547 **6 Claims**



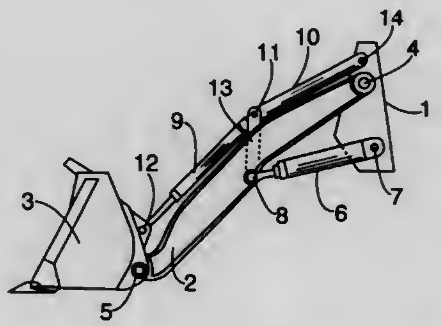
1. A loading device for containers, which comprises a pair of like loading units to be mounted on a vehicle frame having a longitudinally extending center axis, each loading unit comprising
- (a) a bracket,
- (b) a telescopic column supported on the bracket for pivoting about a common swivel axis defined by the longitudinally extending center axis, the telescopic column consisting of
  - (1) a lower leg portion and
  - (2) an extendable head portion,
- (C) an operating cylinder acting on the leg portion of the telescopic column at each side thereof,
- (d) a longitudinally adjustable supporting leg pivotally mounted at each side of the bracket,
- (e) a cantilever arm carried by the head portion of the telescopic column and adapted to perform a swivel movement to both sides of the telescopic column about a swivel axis extending parallel to the swivel axis of the telescopic column, the cantilever arm comprising
  - (1) an abutment for the connection of a load receiving element, and

  - (f) limit stops on the head portion of the telescopic column for the rigid support of respective swivel positions of the cantilever arm on both sides of the telescopic column.

5,688,101
WORKING UNIT OF CONSTRUCTION EQUIPMENT WITH ATTACHMENT SELF LEVELING FUNCTION

Kee Young Kim, Anyang, Rep. of Korea, assignor to Samsung Heavy Industries, Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 30, 1995, Ser. No. 565,264
Claims priority, application Rep. of Korea, Apr. 29, 1995, 95-10519; Apr. 29, 1995, 95-10520
Int. Cl.⁶ E02F ***3/34***
U.S. Cl. 414—713 **4 Claims**



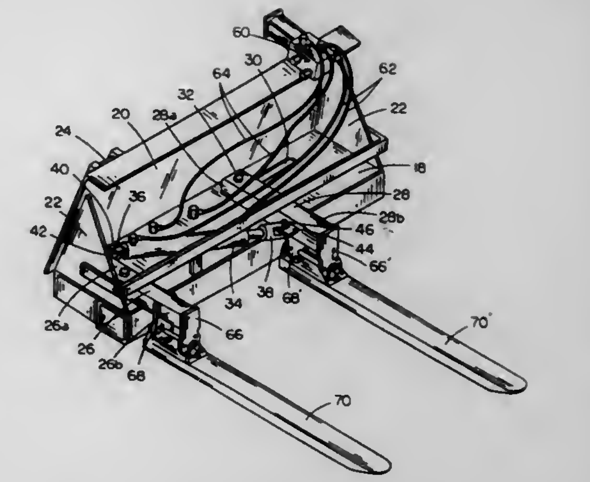
1. A working unit of construction equipment comprising an arm pivoted to an equipment's frame and an attachment pivoted to said arm, further comprising an attachment self leveling linkage including:
- a first telescopic means having two ends, one of said ends pivoted to said frame and the other of said ends pivoted to a predetermined portion of said arm at a first pivot joint;
- a first link having two ends and pivoted to said frame at one of said ends thereof;
- a second telescopic means having two ends and pivoted to the other of said ends of said first link at one of said ends thereof at a second pivot joint and pivoted to said attachment at the other of said ends thereof;
- a second link having two ends and pivoted, at one of said ends thereof, to said second pivot joint between the other of said ends of said first link and the one of said ends of said second telescopic means and pivoted, at the other end thereof, to said first pivot joint between the other of said ends of the first telescopic means and the predetermined portion of said arm, thereby shifting the one of said ends of said second telescopic means in accordance with a telescopic motion of said first telescopic means and allowing the attachment to maintain its initial angle relative to a reference surface during an arm-up or down motion.

5,688,102
TREE MOVING AND PLANTING APPARATUS

Lee R. Vieselmeyer, P.O. Box 36, Davenport, Nebr. 68335

Filed Jul. 19, 1996, Ser. No. 684,151
Int. Cl.⁶ B66C ***1/00***
U.S. Cl. 414—724 **13 Claims**

1. A hydraulic lift attachment for connection to the lift arms of a loading vehicle, comprising:
- a base plate having opposing first and second ends and forward and rearward edges;
- attachment means for attaching said base plate to the lift arms of the loading vehicle;
- a first jaw member connected to said base plate adjacent the first end thereof and projecting beyond the forward edge of said base plate;



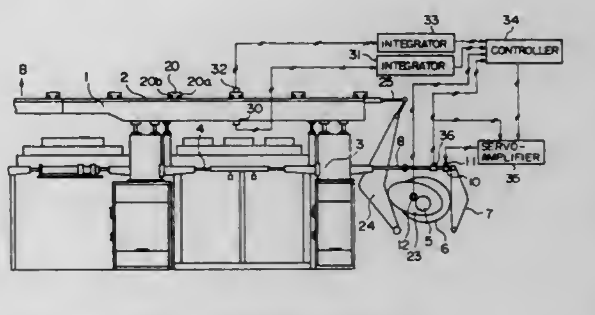
- a second jaw member operably connected to said base plate for selective pivotal movement about a pivot axis, said second jaw member projecting beyond the forward edge of said base plate;
- said second jaw member operably connected to said base plate for selective slidable movement of said pivot axis towards and away from said first jaw member;
- first means for pivoting said second jaw on said pivot axis;
- second means for slidably moving the pivot axis of said second jaw member; and
- an elongated tine removably attached to each said jaw member, with a longitudinal axis of each jaw member parallel to a longitudinal axis of the attached tine, said second jaw member having a pivot pin connected to one end thereof, said pivot pin projecting through a slot in said base plate, said pivot pin forming the pivot axis of said second jaw member.

5,688,103
VIBRATION REDUCER FOR TRANSFER APPARATUSES

Hideki Tsuji, Yamato; Hiroyuki Ito, Yokohama; Shinji Mitsuta, Hiratsuka; Kenji Nishida, Matto, and Naoyuki Kanayama, Kaga, all of Japan, assignors to Komatsu Ltd., Tokyo, Japan

PCT No. PCT/JP94/00467, § 371 Date Sep. 21, 1995, § 102(e) Date Sep. 21, 1995, PCT Pub. No. WO94/21403, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 24, 1994, Ser. No. 522,378
Claims priority, application Japan, Mar. 24, 1993, 5-089366
Int. Cl.⁶ B65G ***43/00***
U.S. Cl. 414—752 **20 Claims**



1. A workpiece transfer apparatus comprising:
- a workpiece holding mechanism;
- a support member for supporting said workpiece holding mechanism;
- a positioning unit for movably positioning said support member;
- a drive unit to effect movement of said support member;

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- a motion transmission mechanism extending from said drive unit to said support member;
- a controllable actuator provided in said motion transmission mechanism;
- at least one sensing means provided on at least one of said workpiece holding mechanism, said support member, said positioning unit, and said drive unit; and
- a controller for receiving measurement signals from said at least one sensing means, said controller being adapted to determine a damping motion control input signal on the basis of said measurement signals from said at least one sensing means, and to apply said damping motion control input signal to said actuator to operate said actuator so that vibration of the transfer apparatus is reduced.

5,688,104

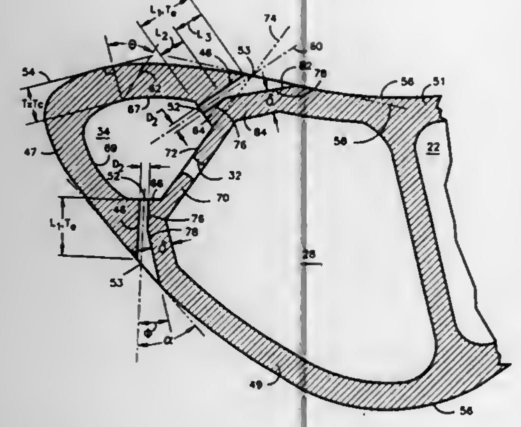
AIRFOIL HAVING EXPANDED WALL PORTIONS TO ACCOMMODATE FILM COOLING HOLES

Brian K. Beabout, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 24, 1993, Ser. No. 158,073

Int. Cl.^{6} F01D *5/18*

U.S. Cl. 415—115 **4 Claims**



1. An airfoil for a gas turbine engine, the airfoil including a wall having an outer surface having a pressure side, a suction side spaced from the pressure side to define a hollow core for flowing cooling fluid therethrough, and, further including a rib disposed between the pressure side and the suction side, the rib separating a forward cavity and an aft cavity, the rib including a front surface facing into the forward cavity and defining a surface plane, and a cooling hole, the cooling hole extending through the wall and including an inlet in the hollow core and an outlet in the outer surface of the wall, the cooling hole having a hole axis extending in a direction forming an angle α with a tangent to the outer surface adjacent to the outlet, the cooling hole having a length (L_1), measured from the inlet to the outlet of the cooling hole, and diameter (D_2), and wherein the wall has an expanded section immediately forward of and chordwise continuous with the rib the expanded section having a thickness (T_e), measured along the hole axis, equal to the length (L_1), wherein the cooling hole extends through said expanded section such that the inlet faces into the forward cavity and the outlet is aft of the surface plane such that the cooling hole passes through the surface plane.

5,688,105

BRUSH SEAL FOR TURBO-ENGINES

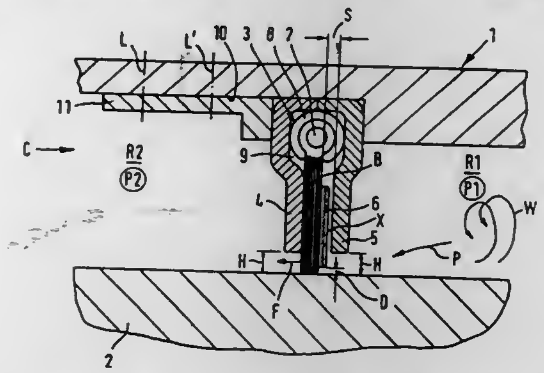
Herbert Hoffelner, Markt-Indersdorf, Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany

Filed Aug. 6, 1996, Ser. No. 693,007

Claims priority, application Germany, Aug. 11, 1995, 195 26 655.9

Int. Cl.^{6} F04D *29/08*

U.S. Cl. 415—170.1 **20 Claims**



1. Brush seal for turbo-engines for sealing off spaces on a circumferential gap which are acted upon by pressure in a different manner, particularly between an engine casing and an engine shaft, a holding device for a bristle bundle being provided on the engine casing, from which holding device the bristle bundle is guided between circumferential webs in a sealing manner against the engine rotor and forms an axial gap in the circumferential direction with respect to the one web facing the high pressure side,

- wherein in the axial gap, a covering ring for the bristle bundle is arranged in an axially and radially movable manner, which covering ring is operated by the differential pressure to be displaceable with respect to the bristle bundle, and
- wherein the covering ring is located between the webs and includes a radial inward portion which projects radially inwardly out of the axial gap with respect to radial inward ends of the webs surrounding the engine shaft at a distance and surrounds the engine shaft by means of a radial sealing gap.

5,688,106

TURBOMOLECULAR PUMP

Roberto Cerruti, and Giampaolo Levi, both of Torino, Italy, assignors to Varian Associates, Inc., Palo Alto, Calif.

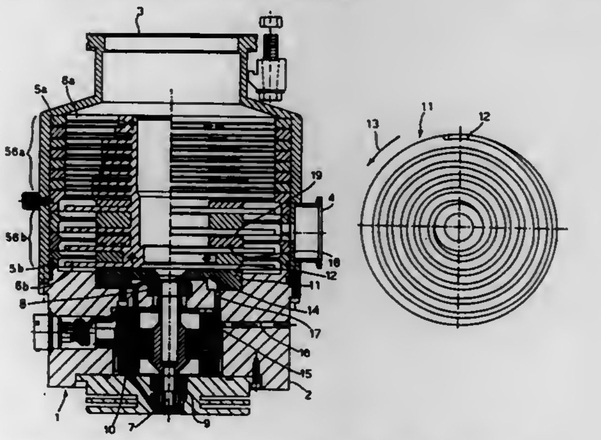
Filed Nov. 8, 1996, Ser. No. 748,526

Claims priority, application Italy, Nov. 10, 1995, T95A00911

Int. Cl.^{6} F01D *1/36;* **F04D** *19/04*

U.S. Cl. 415—90 **16 Claims**

1. A turbomolecular pump comprising:



- a pump body having a gas inlet port and a gas exhaust port;

- a plurality of vacuum pumping stages within said body disposed between said inlet port and exhaust port, each said pumping stage comprising a rotor and a stator, said stator having a pair of opposite faces;
- at least one stator of said plurality of vacuum pumping stages having at least one spiral channel formed on one of said faces of said at least one stator;
- a rotating shaft for securing each rotor of said plurality of vacuum pumping states thereto;
- at least one support means for holding said rotating shaft; and
- a plate which is positioned between said at least one support means for holding said rotating shaft and said pumping stage proximate thereto, said plate has at least one spiral channel formed on a surface facing said proximate pumping stage for pushing and ejecting gases contained in said at least one channel from an area proximal to said shaft to an area distal therefrom.

5,688,107

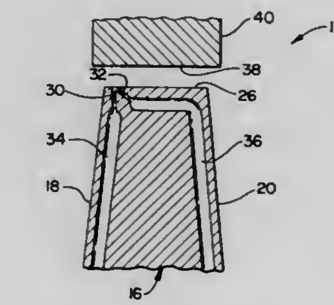
TURBINE BLADE PASSIVE CLEARANCE CONTROL

James P. Downs, Jupiter, and Ronald C. Haigh, Stuart, both of Fla., assignors to United Technologies Corp., Hartford, Conn.

Filed Dec. 28, 1992, Ser. No. 998,000

Int. Cl.^{6} F01D *5/18;5/20*

U.S. Cl. 416—97 R **4 Claims**



1. An internally air cooled airfoil of a turbine blade used in a gas turbine engine having internal passageway adjacent the pressure side of the airfoil and independent internal passageway adjacent the suction side of said airfoil,

- said airfoil having a tip section, an annular shroud surrounding said tip section and defining therewith a gap that changes its radial dimension resulting from the radial positioning of said annular shroud and said tip section relative to each other, the improvement comprising:
- means for obtaining a momentum flow stream in opposition to the flow of engine fluid medium flowing through said gap, said means including at least a pair of intersecting installed passages formed into the tip of said airfoil in proximity to the intersection of the tip surface with the pressure side of said airfoil for discharging air from said internally cooled airfoil, whereby the resultant flow resulting from the momentum and direction of the flow occasioned by the velocity and direction of the flow discharging through said intersecting installed holes provides an aerodynamic seal in said gap to minimize the leakage of engine working medium flowing over the working surfaces of said airfoil.

5,688,108

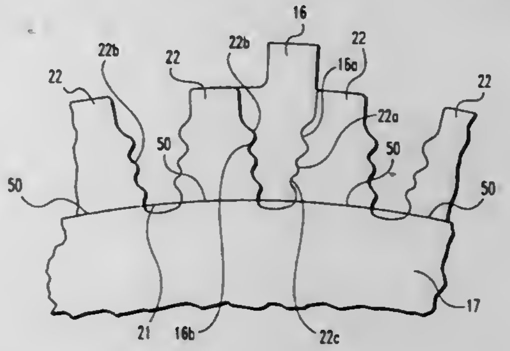
HIGH TEMPERATURE ROTOR BLADE ATTACHMENT

Douglas D. Dierksmeier, Columbus, and Tab M. Heffernan, Indianapolis, both of Ind., assignors to Allison Engine Company, Inc., Indianapolis, Ind.

Filed Aug. 1, 1995, Ser. No. 509,777

Int. Cl.^{6} F04D *29/34*

U.S. Cl. 416—213 R **39 Claims**



1. A rotor system, comprising:
- a disk;
- at least one blade; and
- a plurality of high temperature blade attachment lugs bonded along the periphery of said disk, at least two of said plurality of blade attachment lugs cooperating for connecting said at least one blade to said disk, wherein each of said plurality of blade attachment lugs capable of withstanding higher temperatures than said disk.

5,688,109

OIL-LEVEL CONTROLLER FOR COMPRESSOR

Hideki Matsuura; Hiroshi Kitaura, and Keiji Komori, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Japan

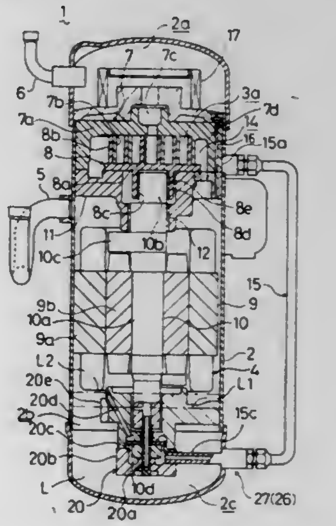
PCT No. PCT/JP95/01232, § 371 Date Feb. 12, 1996, § 102(e) Date Feb. 12, 1996, PCT Pub. No. WO96/00851, PCT Pub. Date Jan. 11, 1996

PCT Filed Jun. 21, 1995, Ser. No. 591,653

Claims priority, application Japan, Jun. 29, 1994, 6-147302; Jan. 31, 1995, 7-013422

Int. Cl.^{6} F04B *39/02;* **F04C** *29/02;* **F01M** *11/12*

U.S. Cl. 417—228 **7 Claims**



1. A compressor having a function of controlling an oil level, comprising:
- a casing (2);

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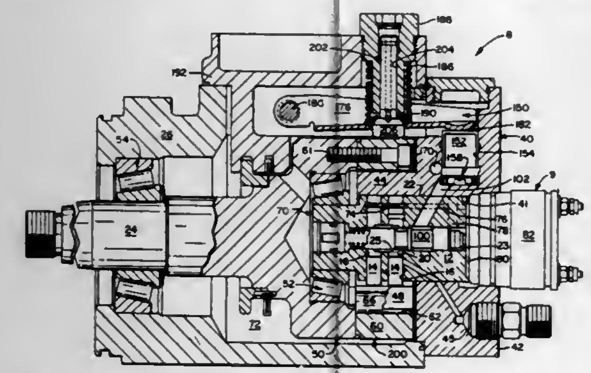
a compression mechanism (3) for compressing a compression gas, which is housed in said casing (2) and includes a low pressure part of which gas pressure is low;
a lubricant reservoir (2c) for storing a lubricant (L), which is provided at the bottom of said casing (2), and in which an upper limit of the oil level of the lubricant (L) is predetermined, the lubricant (L) of said lubricant reservoir (2c) being supplied to said compression mechanism (3);
a drive mechanism (4) for driving said compression mechanism (3), which is housed in said casing (2) and includes a drive shaft (10);
a lubricant takeout pipe (15) for taking out said lubricant (L), an outlet end of which is connected to the low pressure part of said compression mechanism (3); and
pump means provided at said lubricant reservoir (2c), a suction end of which is open at the upper limit of the oil level of said lubricant reservoir (2c) and a discharge end of which is connected to an inflow end of a lubricant takeout pipe (15), said pump means being driven by means of said drive mechanism;
wherein said pump means (20) discharges said lubricant (L) from said lubricant reservoir (2c) to the low pressure part of said compression mechanism (3) when the oil level of said lubricant (L) in said lubricant reservoir (2c) goes beyond the predetermined upper limit of the oil level thereof.

5,688,110
FUEL PUMP ARRANGEMENT HAVING CAM DRIVEN LOW AND HIGH PRESSURE RECIPROCATING PLUNGER PUMP UNITS

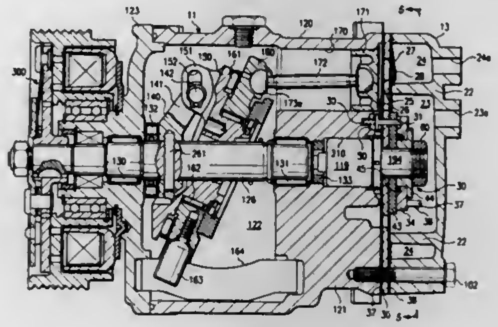
Ilija Djordjevic, East Granby, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.
Filed Jun. 2, 1995, Ser. No. 459,032
Int. Cl.^{6} F02M *41/10*
U.S. Cl. 417—254 **20 Claims**

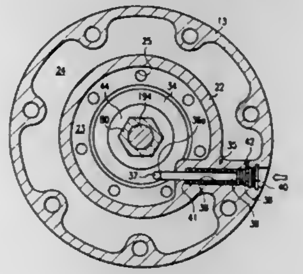


1. In a fuel pump having rotary drive means; a high pressure pump with a pump body with a pumping chamber with an annular arrangement of a plurality of pairs pumping plunger bores extending radially outwardly from a cam axis, a pumping plunger mounted in each pumping plunger bore for reciprocation end first cam means surrounding the pump body and rotatable about said cam axis by the rotary drive means for reciprocating each pumping plunger to provide alternating intake and pumping phases of operation of the high pressure pump, at a frequency determined by the speed of the rotary drive means, for respectively receiving an intake charge of fuel and delivering fuel from the pumping chamber at high pressure; and a transfer pump for transferring fuel under pressure to the pumping chamber; wherein the improvement wherein comprises:
means defining a single transfer plunger bore within the transfer pump, a transfer plunger mounted in the transfer plunger bore for reciprocation to provide alternating intake and transfer phases of operation of the transfer pump,
second cam means, the first cam means and the second cam means being provided by an annular cam ring surrounding the pump body such that the second cam means is rotatable by the rotary drive means for reciprocating the transfer plunger at the same frequency as the high pressure pump and in predetermined synchronism with the high pressure pump to transfer fuel intermittently to the high pressure pump during the intake phase of operation of the high pressure pump and the transfer phase of operation of the transfer pump,
spring means expandable it one direction thereof for actuating the transfer plunger in a transfer direction thereof for transferring fuel under pressure to the high pressure pump, whereby the second cam means periodically retracts the spring means in the opposite direction thereof for loading the spring means for actuation of the transfer plunger, and
a pivotal lever mechanically connected between the spring means and the transfer plunger and biased by the spring means in one pivotal direction thereof to bias the transfer plunger in the transfer direction thereof.

5,688,111
VALVED SUCTION MECHANISM OF A REFRIGERANT COMPRESSOR

Kazuhiko Takai, Gunma, Japan, assignor to Sanden Corporation, Isesaki, Japan
Filed Sep. 6, 1995, Ser. No. 523,921
Claims priority, application Japan, Sep. 6, 1994, 6-238568
Int. Cl.^{6} F04B *39/08;49/22*
U.S. Cl. 417—298 **19 Claims**

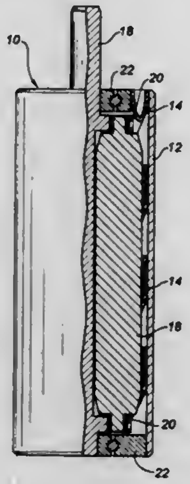




1. A compressor comprising:
a housing;
a valve plate at least partially disposed in said housing and dividing said housing into at least a first chamber and a second chamber, the second chamber including a discharge chamber and a suction chamber;
linking means for linking the first chamber to the second chamber, the linking means including a plurality of discharge conduits communicating the first chamber with the discharge chamber, and a plurality of suction conduits communicating the first chamber with the suction chamber;
a plurality of discharge valve members, each of which is responsive to a difference in pressure between the first chamber and the discharge chamber to bend to open and close the end opening of a corresponding discharge conduit;
a plurality of suction valve members each of which is responsive to a difference in pressure between the first chamber and the suction chamber to bend to open and close the end opening of a corresponding suction conduit; and
a suction valve control mechanism comprising a regulator for regulating the opening of the suction conduits in response to a change in a discharge chamber pressure.

5,688,112
ROTOR AXIS ALIGNED TUBE AND OUTLET FOR A PERISTALTIC PUMP SYSTEM

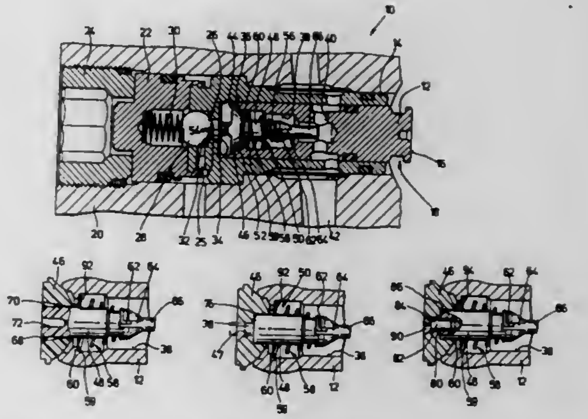
Thomas William Garay, 149 Coventry Place NE., Calgary, Alberta, Canada, T3K 4A6
Filed Feb. 22, 1996, Ser. No. 605,678
Int. Cl.^{6} F04B *43/08*
U.S. Cl. 417—477.1 **19 Claims**



1. A compressible tube pump for pumping fluids comprising an outer cylinder having a first end and a second end and containing at least one compressible tube having a flow entrance portion associated with the first end of said outer cylinder and a flow exit portion associated with a second end surface of said outer cylinder such that the fluids pass out of said tube through the second end surface generally axially, wherein said tube is in contact with a means for compressing the tube that is driven by a rotatably mounted shaft with said tube being arranged helically within said outer cylinder.

5,688,113
PISTON FOR A PISTON PUMP WITH A TWO PART INLET VALVE BODY

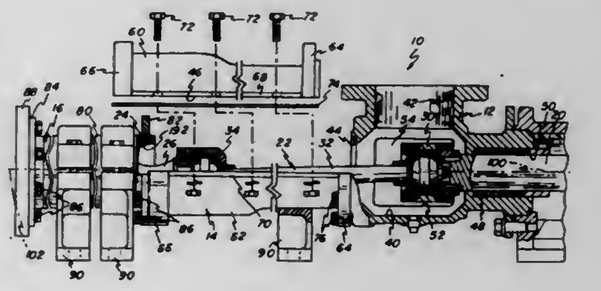
Alexander Bareiss, Goose Creek; Ron Angle, N. Charleston; Brian Johanek, Ladson, all of S.C., and Helmuth Wuest, Leonberg, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Continuation of Ser. No. 492,647, Jun. 20, 1995, abandoned. This application Nov. 22, 1996, Ser. No. 754,832
Claims priority, application Germany, Sep. 1, 1994, 44 31 130.3
Int. Cl.^{6} F04B *21/04*
U.S. Cl. 417—549 **26 Claims**



1. A hydraulic unit including a casing (20), a cylinder (14) in said casing, a piston (12) in said cylinder through which a fluid flows, a piston pump (10) having an inlet valve in the piston (12) along a longitudinal axis of the casing, the piston (12) having a longitudinal blind bore (38) along said axis which is in communication with a fluid inlet (42) in said casing and said cylinder and which leads out at a front end face of the piston via an inlet valve seat (44) and an inlet valve body (50) having an inlet valve stem (48) in the longitudinal blind bore (38) of the piston (12) and has a separate inlet valve disk (46) which is joined to said valve stem (48) and sealingly pressed against the inlet valve seat (44) by a prestressed inlet valve spring (58) which acts on the inlet valve stem (48) and is supported against an annular shoulder (59) in the longitudinal blind bore (38) of the piston (12), wherein the inlet valve stem (48) and the inlet valve disk (46) are joined to one another after the inlet valve spring (58) and the inlet valve stem (48) have been placed within the piston (12).

5,688,114
PROGRESSING CAVITY PUMPS WITH SPLIT EXTENSION TUBES

John A. Millington, Portland, Me., and Alan G. Wild, Woodstock, Ohio, assignors to Robbins & Myers, Inc., Dayton, Ohio
Filed Mar. 20, 1996, Ser. No. 618,926
Int. Cl.^{6} F01C *1/10;* **F03C** *2/00*
U.S. Cl. 418—48 **16 Claims**



1. A pump assembly comprising:
a pump housing;
a rotor located within said pump housing, said rotor being supported for rotating eccentric movement within said pump housing;
a coupling connected to said rotor for actuating the rotor in said rotating movement;
an extension tube surrounding at least a portion of said coupling;
wherein said extension tube comprises first and second sections, said first section being removably jointed to said second section to facilitate access to said coupling; and
including an inlet housing defining a chamber for receiving material to be conveyed to said pump housing, said extension tube defining opposing upstream and downstream extension tube ends wherein said upstream extension tube end is attached to said inlet housing and said downstream extension tube end is attached to said pump housing.

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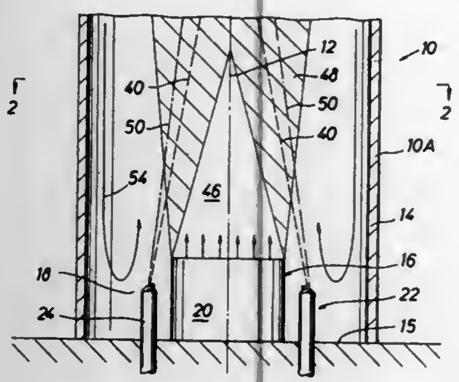
5,688,115
SYSTEM AND METHOD FOR REDUCED NOX COMBUSTION

Gregory Lynn Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 19, 1995, Ser. No. 492,409

Int. Cl.^{6} F23M *3/00*

U.S. Cl. 431—9 **22 Claims**



1. A method for reducing NOx pollutants in the combustion of hydrocarbon fuels in a two fuel stage burner, said method comprising:

establishing and maintaining a first stage of combustion and passing a stream of combustion air and first stage products of combustion down a centerline of the burner to a second stage;

establishing a second stage of combustion downstream from the first stage of combustion and concentrically disposed about and open to the first stage, establishing the second stage further comprising:

arranging an array of fuel tips around the first stage burner, each fuel tip having a fuel jet with a nominal trajectory angled toward the centerline of the burner and an inert gas jet placed between the burner centerline and the fuel jet which is nominally angled to cross the trajectory of the fuel jet;

injecting fuel through the fuel jet into the burner; and

injecting an inert gas through the inert gas jet such that it influences the trajectory of the fuel to a modified fuel trajectory which is moved away from the centerline of the burner.

5,688,116
HEAT TREATMENT PROCESS

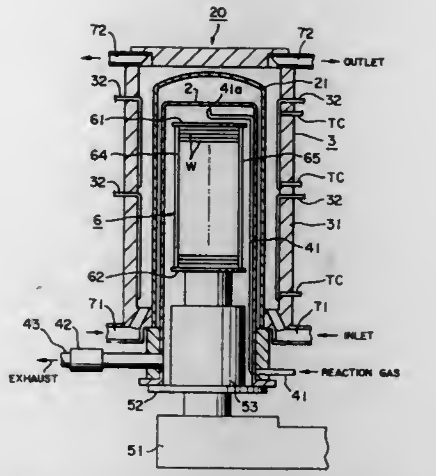
Junichi Kobayashi, Sagamihara, and Eiichiro Takanabe, Shiroyama, both of Japan, assignors to Tokyo Electron Limited, and Tokyo Electron Tohoku Limited, both of Japan

Filed May 15, 1995, Ser. No. 441,048

Claims priority, application Japan, May 17, 1994, 6-128127

Int. Cl.^{6} F27D *13/00*

U.S. Cl. 432—12 **11 Claims**



1. A process for heat treating a plurality of objects supported by a holding means at a vertical interval in a heat treatment furnace, the process comprising:

heating the objects at a first temperature raising rate which is smaller than a preset threshold temperature raising rate associated with occurrence of slips in the objects; and

heating the objects at a second temperature raising rate which is lower than the first temperature raising rate after a heating region in the heat treatment furnace reaches about 900° C.

5,688,117
ROTATABLE HEATING CHAMBER WITH INTERNAL TUBES FOR WASTE

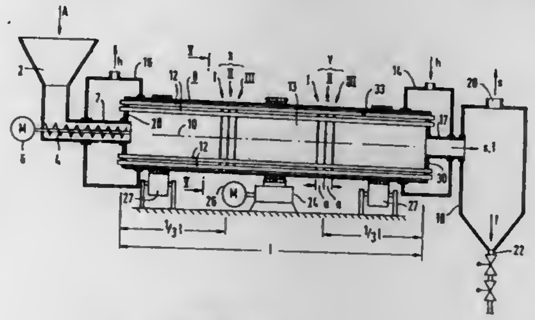
Karl May, Bad Vilbel; Hartmut Herm, Dreieich; Karlheinz Unverzagt, Seligenstadt; Herbert Tratz, Ottensoos, and Helmut Werdinig, Nurenberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

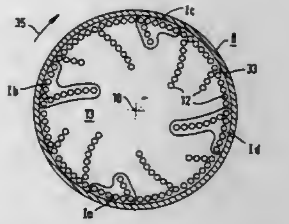
Filed Mar. 4, 1996, Ser. No. 606,482

Claims priority, application Germany, Sep. 3, 1993, 43 29 871.0

Int. Cl.^{6} F27B *7/10;7/04*

U.S. Cl. 432—103 **19 Claims**





1. A heating chamber for solid material, comprising:

a wall having an inner surface defining an interior and a longitudinal direction about which the heating chamber is rotatable;

first and second end plates;

a number of heating tubes being disposed in groups in said interior, each of said heating tubes having one end secured to said first end plate and another end secured to said second end plate;

at least one support location disposed between said end plates for supporting said heating tubes; and

at least two support brackets being spaced apart in the longitudinal direction at said at least one support location, each of said support brackets being secured to said inner wall surface and each supporting a different one of said groups of said heating tubes.

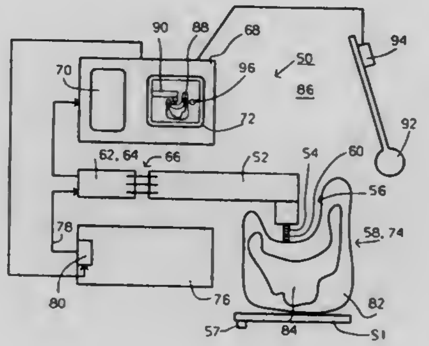
5,688,118
IMAGE SOUND AND FEELING SIMULATION SYSTEM FOR DENTISTRY

Alon Hayka, and Liat Eytan, both of Ora, Israel, assignors to Denx Ltd., Jerusalem, Israel

Continuation-in-part of Ser. No. 579,106, Dec. 27, 1995. This application Jan. 29, 1996, Ser. No. 593,300

Int. Cl.^{6} G09B *23/00*

U.S. Cl. 433—27 **23 Claims**



1. A simulation system for dentistry, comprising:

a hand-held dental handpiece having a drill for drilling a cavity in an artificial tooth having known shape and dimensions and being located at a fixed known location and orientation in space, said drill having a drilling end, said dental handpiece being shaped and dimensioned suitable to be held by the hand of a user:

(b) a first three-dimensional sensor attached to said dental handpiece, said first three-dimensional sensor providing the system with position and orientation in space of at least said drill;

(c) a data processing and display unit for receiving data about said position and orientation in space of at least said drill from said first three dimensional sensor, for simulating said drill;

(d) a compressed gas unit being connected via a gas line to said dental handpiece, said gas unit providing a compressed gas for rotating said drill, said gas having a flow rate; and

(e) first means for controlling said flow rate of said gas;

wherein said data processing and display unit:

(i) includes a set of data, wherein said artificial tooth is simulated as being divided into at least a first simulated region simulating a substance of a first hardness, and a second simulated region simulating a substance of a second hardness, said first hardness is harder than said second hardness; and

(ii) controls said first means for controlling said flow rate of said gas, such that when said drilling end of said drill is at said first simulated region said drill rotates in a first speed, whereas when said drilling end of said drill is at said second simulated region said drill rotates in a second speed, said first speed is slower than said second speed.

5,688,119

Patent Not Issued For This Number

5,688,120
TEMPERATURE GAUGE FOR DRILLS AND METHOD EMPLOYING SAME

Miles J. Yacker, 285 Central Ave., Lawrence, N.Y. 11559, and Michael Klein, 1100 Peninsula Blvd., Hewlett, N.Y. 11557

Continuation of Ser. No. 291,817, Aug. 17, 1994, Pat. No. 5,516,285, which is a continuation of Ser. No. 127,014, Sep. 27, 1993, Pat. No. 5,354,200. This application Mar. 15, 1996, Ser. No. 627,228

Int. Cl.^{6} A61C *19/04;3/02;5/00*

U.S. Cl. 433—72 **7 Claims**

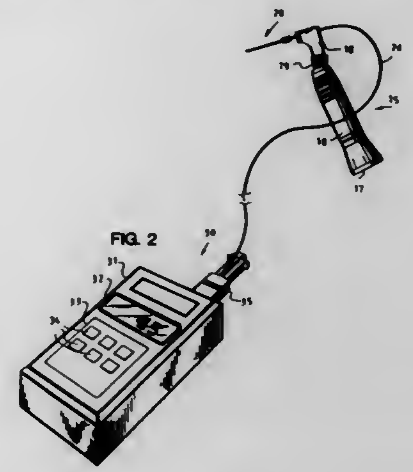


FIG. 2

1. A temperature gauge assembly for drills of the type having a head to which a drill bur is removably mounted comprising:

a drill bur having a throughbore extending to a drill bur tip;

temperature sensor means receivable in the drill bur throughbore for sensing and measuring the temperature at the drill bur tip; and

thermometer means coupled to said temperature sensor means for displaying the temperature at the drill bur tip.

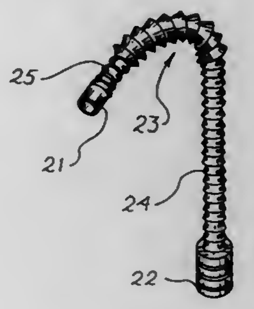
5,688,121
CORRUGATED SALIVA EJECTOR

Ralph L. Davis, Genoa City, Wis., assignor to Filtertek Inc., Hebron, Ill.

Filed Oct. 23, 1995, Ser. No. 547,028

Int. Cl.^{6} A61C *17/06*

U.S. Cl. 433—96 **12 Claims**



1. A saliva ejector comprising:

a hollow tube having a cylindrical wall, a first end for placement within an oral cavity, and a second end for attachment to a suction hose, said tube defining a flowpath therethrough;

a first corrugated portion defined in said cylindrical wall;

a second corrugated portion defined in said cylindrical wall;

a filter element secured across said flowpath;

wherein the bending qualities of said first corrugated portion differ from the bending qualities of said second corrugated portion.

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5,688,122
CHUCKING DEVICE FOR A DENTAL TOOL

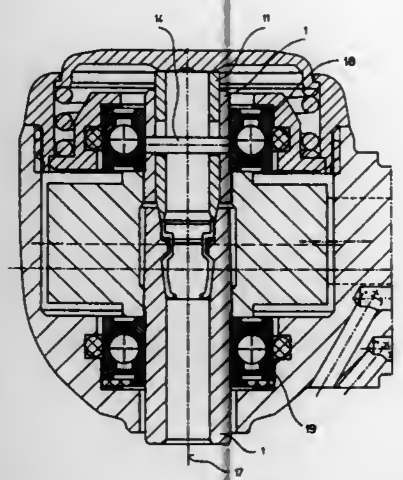
Gunter Teufelberger, Bürmoos, and Rudolf Schwaiger, Ostermiething, both of Austria, assignors to Dentalwerk Bürmoos Gesellschaft m.b.H., Bürmoos, Austria

Filed Jul. 5, 1995, Ser. No. 498,533

Claims priority, application Austria, Aug. 1, 1994, 1514/94

Int. Cl.^{6} A61C *1/14*

U.S. Cl. 433—127 **8 Claims**



1. A chucking device for a dental tool in a dental handpiece or angle head, the dental tool including a shaft having an external diameter, the chucking device comprising a clamping sleeve having end faces and an axis, the clamping sleeve further having slots forming at least one resilient tongue, the at least one resilient tongue being located spaced from the end faces of the clamping sleeve, an essentially tubular actuating member being received in a portion of the clamping sleeve for moving the at least one resilient tongue between an initial position for clamping the tool shaft and a radially outwardly bent portion for releasing the tool shaft, the portion of the clamping sleeve having an internal width and the actuating member having an internal diameter and an external diameter, wherein the width of the portion of the clamping sleeve is greater than the external diameter of the tool shaft, and wherein the external diameter of the actuating member corresponds to the internal width of the portion of the clamping sleeve and the internal diameter of the actuating member corresponds to the external diameter of the tool shaft.

5,688,123
TRANSFER CAP FOR DENTAL IMPLANTS

Willi Meiers, Alzenau; Thomas Lange, Langenselbold, and Werner Groll, Alzenau, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Filed May 4, 1995, Ser. No. 434,688

Claims priority, application Germany, May 4, 1994, 44 15 670.7

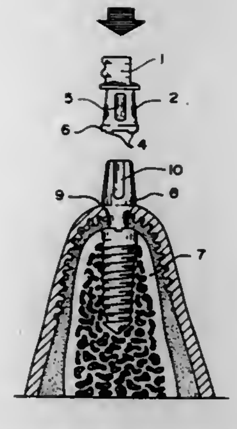
Int. Cl.^{6} A61C *8/00*

U.S. Cl. 433—173 **8 Claims**

1. A transfer cap for dental implants, comprising:

an upper portion and a lower portion, wherein said lower portion further comprises,

a top portion and a bottom portion with a base end, an outer surface and an inner surface, said inner surface being of a tapered conical shape and forming a conical chamber with a conical inner chamber wall open at the base end and wherein said inner chamber wall has protuberance that communicate with corresponding recesses of a dental implant when said lower portion engages the dental implant by receiving the dental implant in said chamber.



5,688,124
METHOD FOR SIMULATING WEAPONS FIRE, AND HIGH-ANGLE TRAJECTORY WEAPONS FIRE SIMULATOR

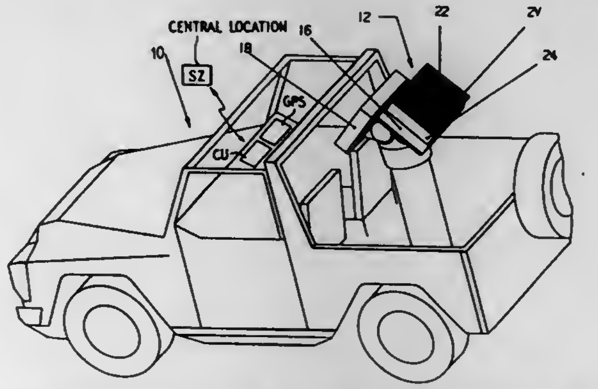
Rudolf Salzeder, Piding, Germany, assignor to Buck Werke GmbH & Co., Bad Ueberkingen, Germany

Filed Feb. 24, 1995, Ser. No. 393,488

Claims priority, application Germany, Mar. 4, 1994, 44 07 294.5

Int. Cl.^{6} F41A *33/00*

U.S. Cl. 434—11 **32 Claims**



1. A method for simulating high-angle combat conditions weapons fire to persons in a selected target zone surrounding a target region, for use with a plurality of combat vehicle-mounted high-angle trajectory weapons fire simulators, comprising the steps of:

dividing a combat exercise field into a plurality of grid squares each having a mid-point;

selecting a size of said grid squares so that, starting from the mid-point of any grid square, a neighboring grid square can be reached in less than a minute by a combat vehicle-mounted high-angle trajectory weapons fire simulator;

positioning respective combat vehicle-mounted high-angle trajectory weapons fire simulators at readiness positions at the respective mid-points of a selected number of said grid squares which is less than said plurality of grid squares;

establishing a communication path between each combat vehicle-mounted high-angle trajectory weapons fire simulator and a central referee location;

providing an identification of the position of each combat vehicle-mounted high-angle trajectory weapons fire simulator to said central referee location;

equipping each combat vehicle-mounted high-angle trajectory weapons fire simulator with means for firing simulation ammunition at a high-angle trajectory;

identifying, at said central referee location, a target region on said combat exercise field, said target region being reachable by simulated fire from at least one firing position on said combat exercise field;

selecting, at said central referee location, one of said combat vehicle-mounted high-angle trajectory weapons fire simulators at a readiness position most favorably located to reach a firing position relative to said target region;

commanding said one of said combat vehicle-mounted high-angle trajectory weapons fire simulators to said firing position from its readiness position from said central referee position via said communication path; and

simulating high-angle trajectory weapons fire by commanding said one of said combat vehicle-mounted high-angle trajectory weapons fire simulators to fire said simulated ammunition at said high-angle trajectory at said target region after said one of said combat mounted high-angle weapons fire simulators reaches said firing position.

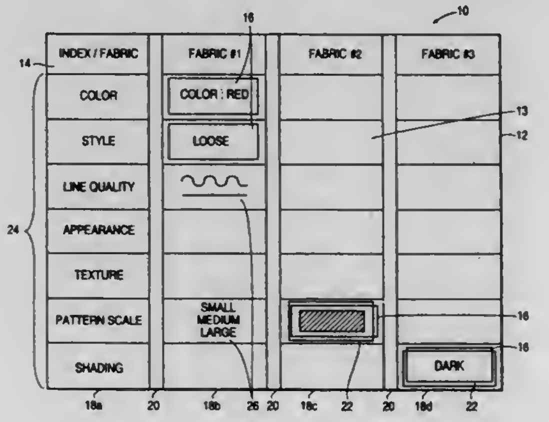
5,688,125
SYSTEM AND METHOD FOR SELECTING FABRICS

Jennifer Birdsong-Raffo, 3466 SE. Cassell La., Stuart, Fla. 34997

Filed Apr. 14, 1995, Ser. No. 421,885

Int. Cl.^{6} G09B *25/00;7/00*

U.S. Cl. 434—72 **32 Claims**



1. A decorative fabric selection system, comprising:

a support member having a display surface;

a display of decorative fabric characteristics provided on the display surface, said decorative fabric characteristics including a plurality of distinctive decorative fabric characteristics for at least two decorative fabrics; and

a means for recording said distinctive decorative fabric characteristics of a first decorative fabric of said at least two decorative fabrics to provide at least one determinative decorative fabric characteristic from a predetermined pattern of decorative fabric characteristics and determining at least one required decorative characteristic of a second decorative fabric of said at least two decorative fabrics from said at least one determinative decorative fabric characteristic.

5,688,126
ARITHMETIC GAME

Matthew W. Merritt, P.O. Box 1534, Gatlinburg, Tenn. 37738

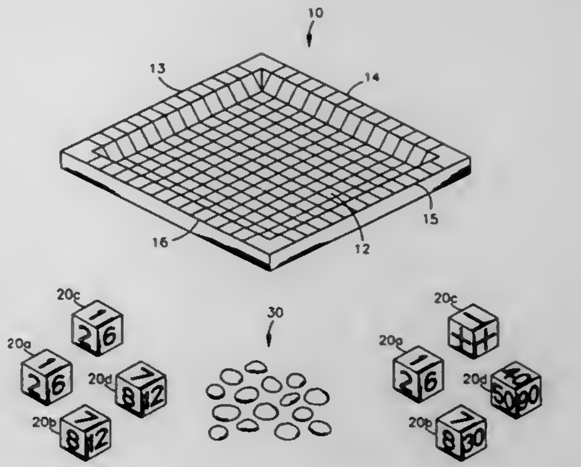
Filed Jan. 3, 1996, Ser. No. 582,275

Int. Cl.^{6} G09B *19/22;19/02;* **A63F** *3/00*

U.S. Cl. 434—128 **10 Claims**

1. An apparatus for playing a game, comprising:

a board having a playing surface bounded by an elevated periphery defined by board indicia and an outer periphery adjacent outer limits of said board indicia;



said board indicia consisting of a plurality of unique regions in which each unique region is different from any other of said unique regions;

wherein said outer periphery defines a border which is elevated from said playing surface;

a plurality of subregions defined within each of said unique regions by said board indicia wherein each subregion is defined by a unique indicium;

a plurality of dice each having a plurality of faces;

dice indicia disposed on each of the faces of said dice capable of producing at least three unique arithmetic combinations of indicia from any two of the dice, each of the three unique arithmetic combinations corresponding to at least one of said unique indicium disposed on two or less of said unique regions of said board, each of said unique arithmetic combinations of indicia corresponding to two or less of said unique indicium; and

a plurality of markers each having a same generic design adapted for placement on any of said board indicium corresponding to the arithmetic combinations of indicia from any two dice.

5,688,127
UNIVERSAL CONTACTOR SYSTEM FOR TESTING BALL GRID ARRAY (BGA) DEVICES ON MULTIPLE HANDLERS AND METHOD THEREFOR

Craig C. Staab, Mesa, and David P. Olson, Tempe, both of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 24, 1995, Ser. No. 505,863

Int. Cl.^{6} H01R *9/09*

U.S. Cl. 439—66 **11 Claims**

1. A universal contactor system for testing BGA (Ball Grid Array) devices of various sizes on multiple handlers comprising, in combination:

a plurality of pogo pins for providing a connection with each BGA device to be tested when said BGA device is placed in said universal contactor system thereby compressing said plurality of pogo pins;

a contactor block having a plurality of apertures therethrough for holding said plurality of pogo pins within said contactor block;

a guide plate coupled to said contactor block and having an aperture therethrough for aligning said BGA device to be tested on said contactor block;

a bottom keeper plate coupled to a bottom portion of said contactor block for holding said pogo pins within said contactor block; and

a top keeper plate coupled to a top portion of said contactor block for holding said pogo pins within said contactor block, said top keeper plate having an array of apertures for receiving all of a plurality of contact elements extending from said BGA device being tested and is of suitable thickness to limit

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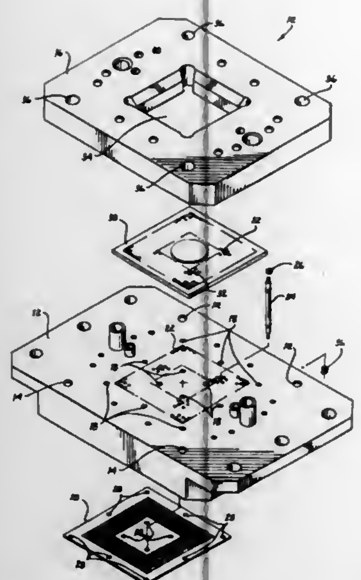
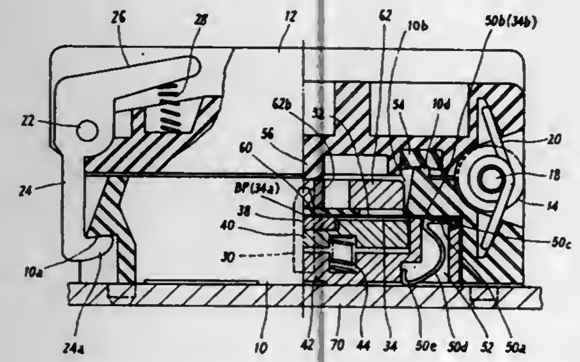


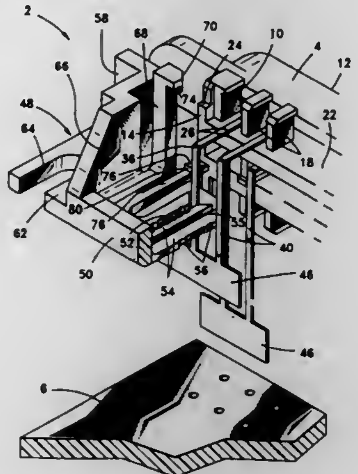
an amount of insertion of said BGA device being tested thereby limiting compression of said pogo pins.

5,688,128
DETACHABLE SOCKET FOR AN IC CHIP
Kiyokazu Ikeya, Shizuoka, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 3, 1995, Ser. No. 367,962
Claims priority, application Japan, Jan. 10, 1994, 6-012213
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—73 **18 Claims**



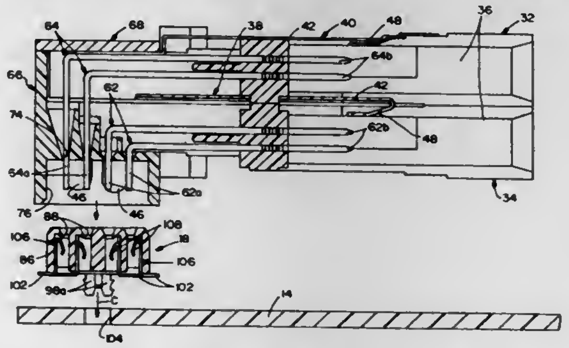
1. A socket for mounting an electrical part in a freely detachable manner in which the electrical part has a body portion with a plurality of connective terminal parts with a prescribed pitch between the parts comprising a main socket body for receiving the electrical part, a socket terminal means fixed in the socket body which is stationary during mounting and dismounting of the electrical part, a plurality of electroconductive parts on an insulating substrate mounted on a spring biased support means in the socket body, each of the electroconductive parts having first and second contact means with said first contact means of said electroconductive parts having the same pitch as the pitch between said connective terminal parts, the first contact means for electrically connecting with one of the connective terminal parts of the electrical part and the second contact means for electrically connecting with the socket terminal means thereby providing electrical connection between the electrical part and the socket and a holding means comprising a cover with a hold member for holding the plurality of connective terminal parts in contact with the first contact means of the plurality of electroconductive parts when the electrical part is mounted on the socket.

5,688,129
ELECTRICAL CONNECTOR WITH LEAD POSITIONING COMB
Roger J. Flaherty, 4507 Tower Rd., Greensboro, N.C. 27410
Filed Nov. 21, 1995, Ser. No. 561,577
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—79 **16 Claims**



1. An electrical connector assembly for use with a printed circuit board comprising:
- a housing including a plurality of cavities located in at least one row between opposite housing faces;
- terminals positioned in the cavities, each terminal extending from a corresponding cavity and then extending at a right angle relative to the corresponding cavity along one face of the housing and including a printed circuit board terminal lead at a distal end; and
- a lead positioning comb attachable to the housing, the comb including a plurality of side by side slots formed by cantilever beams located in a common plane and extending from a base toward the housing, the slots having respective open ends, facing the housing, through which the terminal leads enter as the comb is moved toward the housing for attachment to the housing, adjacent said cantilever beams defining adjacent said slots being spaced apart by relief slots which permit the adjacent beams to outwardly flex, in the common plane, as side by side terminal leads are simultaneously inserted into the side by side slots.

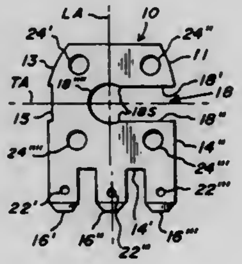
5,688,130
ELECTRICAL CONNECTOR ASSEMBLY FOR PC CARDS
San-Shan Huang, Taipei, Taiwan, assignor to Molex Incorporated, Lisle, Ill.
Filed Apr. 10, 1996, Ser. No. 634,750
Int. Cl.^{6} H01R *13/658;9/09*
U.S. Cl. 439—79 **18 Claims**



1. An electrical connector assembly which provides an interconnection between the contacts of a pc card and the circuit traces of a printed circuit board, comprising:
- a header connector Subassembly including a body adapted for receiving the pc card,
- a plurality of header terminals mounted on the body with pin portions adapted for interconnection with the receptacle contacts of the pc card, and
- a grounding shroud about said header terminals having a downwardly extending grounding tail portion; and
- a board-mounted connector subassembly including a housing adapted for mating with the body of the header connector subassembly,
- a plurality of socket terminals mounted on the housing for mating with the header terminals of the header connector subassembly and having tail portions adapted for interconnection with the circuit traces on the printed circuit board, and
- a ground terminal on the housing for mating with the grounding terminal portion of said shroud and including a solderable portion adapted for interconnection to a ground circuit on the printed circuit board,

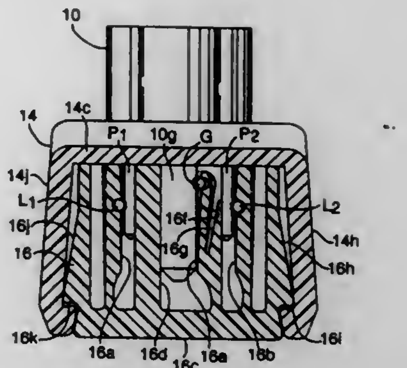
whereby the terminals of the header connector subassembly and the grounding tail portion of the grounding shroud are removably connected to the board-mounted connector subassembly so that the header connector subassembly is electrically and mechanically connected to the printed circuit board without soldering.

5,688,131
MULTI-USE ELECTRICAL CONNECTOR
Dwight Byfield, Jr., Fresno, Calif., assignor to Wirth Co Engineering, Inc., Minneapolis, Minn.
Filed Sep. 3, 1996, Ser. No. 706,872
Int. Cl.^{6} H01R *4/66*
U.S. Cl. 439—92 **11 Claims**



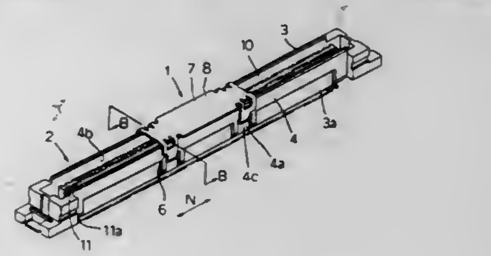
1. An electrical terminal connector comprising:
- (i) a four-sided flat metal base portion having a preselected thickness and longitudinal and transverse axes;
- (ii) at least two male terminal connection tabs depending from one side of said portion, parallel to said longitudinal axis and transversely spaced apart from one another; and
- (iii) a slot in said portion extending from the edge of a second side of said portion parallel to said transverse axis, said slot having a preselected width and connecting with and terminating at a centrally positioned hole formed in said portion.

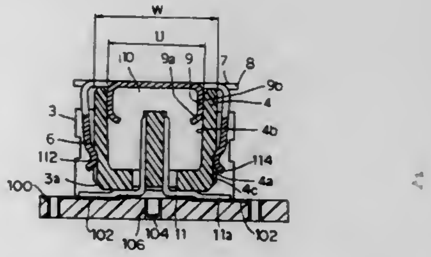
5,688,132
PLUG IN RACEWAY WITH SOCKETLESS RECEPTACLE
Wilfred R. Rogers, Bristol, and Salvatore A. Cancellieri, Plainville, both of Conn., assignors to The Wiremold Company, West Hartford, Conn.
Filed Apr. 19, 1996, Ser. No. 639,837
Int. Cl.^{6} H01R *25/00*
U.S. Cl. 439—120 **36 Claims**



1. In a raceway for use with an electrical male plug having at least two spaced prongs and a grounding plug stud, said raceway comprising an elongated raceway base of non conductive extruded plastic, said base including a back portion and elongated primary leg portions oriented generally parallel to one another said primary elongated leg portions integrally connected to said back portion along elongated resiliently flexible hinge lines, electrical conductors molded into said primary elongated leg portions and arranged between said hinge lines and the free ends of said leg portions, said conductors having elongated exposed segments projecting laterally of said primary leg portions and being spaced from one another so that said primary leg portions flex laterally to assure electrical contact between the plug prongs and said elongated electrical conductors, said elongated raceway base including entegrally formed secondary leg portions oriented parallel to one another and defining an elongated secondary slot between them for receiving the grounding plug stud of the male electrical plug, and an elongated electrical grounding conductor molded into at least one of said secondary leg portions, said electrical grounding conductor having an exposed segment projecting laterally into said secondary slot to provide electrical contact between the grounding plug stud and said elongated electrical grounding conductor.

5,688,133
VACUUM PLACEMENT COVER
Hiroshi Ikesugi, Yokohama, and Shinichirou Maruyama, Ayase, both of Japan, assignors to Molex Incorporated, Lisle, Ill.
Filed Dec. 5, 1995, Ser. No. 567,462
Claims priority, application Japan, Dec. 7, 1994, 6-16186
Int. Cl.^{6} H01R *13/44*
U.S. Cl. 439—135 **19 Claims**





1. An improved electrical connector assembly for mounting to a surface of an electrical apparatus by way of engagement with a pneumatic transfer means, wherein the pneumatic transfer means has an engagement arm which receives a source of negative air pressure so as to effect a vacuum at the engagement arm, the assembly including an elongated connector body having a mount-

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ing base for mounting on the electrical apparatus surface, the connector body including a longitudinal axis and two opposing sidewalls generally parallel to said axis which cooperate to define a slot in said connector body, the sidewalls extending up from said mounting base, and a plurality of electrical terminals having tail portions extending out from said connector body, the improvement comprising:

a pneumatic placement cover positioned on said connector body so as to overlie a portion of said connector slot, said placement cover having a substantially planar, smooth top portion disposed within a perimeter of said cover, the top portion defining an engagement surface for said pneumatic transfer means, said placement cover having two, generally parallel longitudinal edges that are positioned generally parallel to the longitudinal axis of said connector body and four pairs of engagement legs depending downwardly from said placement cover generally adjacent said edges of said cover and into engagement with inner and outer surfaces of said connector body sidewalls, each pair including an outer engagement leg and an inner engagement leg, the outer and inner legs being spaced apart from each other to define a connector body sidewall-receiving space therebetween, said spaces receiving body portions of said opposing sidewalls of said connector body, two of said pairs of engagement arms being positioned along each of said longitudinal edges and each of pair being spaced apart from others of said pairs.

5,688,134
IC CARD CONNECTOR APPARATUS

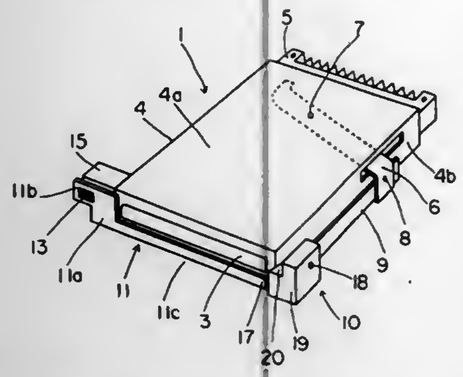
Hideyuki Hirata, Yokohama, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Mar. 28, 1996, Ser. No. 623,268

Claims priority, application Japan, May 18, 1995, 7-005734

Int. Cl.⁶ H01R *13/44*

U.S. Cl. 439—136 **5 Claims**



1. An IC card connector apparatus comprising:

a casing having a card-receiving opening formed at one end thereof for the passage of an IC card therethrough;

an electric connector mounted at the other end of said casing for electrically coupling to an edge of the IC card;

an eject mechanism for removing the IC card from the connector, the eject mechanism including an eject rod disposed generally alongside the casing; and

a shutter plate slidably mounted at the one end of the casing,

wherein said shutter plate is movable between a blocking position wherein a portion of the card-receiving opening is blocked to prevent insertion and ejection of the IC card and an open position wherein the IC card may pass therethrough

and wherein the shutter plate includes a blocking portion which blocks the portion of the card-receiving opening when the shutter is in the blocking position, an operative portion located on one side of the blocking portion, and an elongated sliding portion on the other side of the blocking portion, each of the blocking portion, operative portion and elongated sliding portion being integrally formed with the shutter plate.

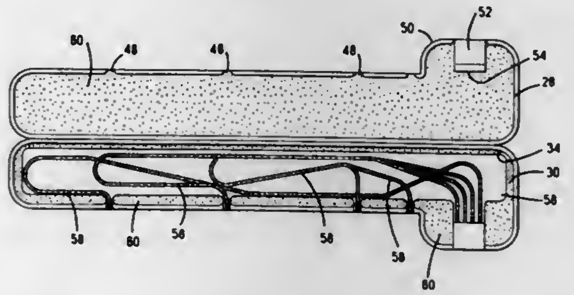
5,688,135
CASE FOR A WIRE HARNESS HAVING COLOR-CODED CABLE ROUTING LINES ON ADHESIVE TAPE

Robert Eugene Gallagher, Sr., Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 15, 1996, Ser. No. 752,456

Int. Cl.⁶ H01R *9/03;9/11*

U.S. Cl. 439—214 **6 Claims**



1. A case in combination with a cable assembly having individual cables, each of which is a precise desired length, wherein the ends of each of said cables are positioned by said case for interconnection with other electrical components outside of said case, and further comprising:

a tape with adhesive on both sides of the tape in adhesive contact with an interior of said case, cable routing lines on said tape, the cable routing lines indicating the desired location for said cables along an interior cavity of the case, said cables being routed along said routing lines and in adhesive contact with said tape, and said ends of each of said cables being connected to corresponding connectors.

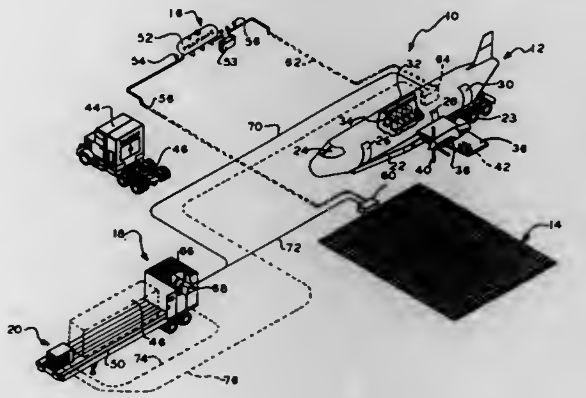
5,688,136
FIRE FIGHTING TRAINER

William Rogers, Hopatcong; Dominick Musto, Middlesex; Steven Luftig, Oakland, and David Joynt, Sparta, all of N.J., assignors to Symtron Systems, Inc., Fair Lawn, N.J.

Filed Dec. 15, 1995, Ser. No. 573,406

Int. Cl.⁶ G09B *9/00*

U.S. Cl. 434—226 **8 Claims**



1. In a fire fighting trainer comprising:

a liquid fuel supply system; a mockup aircraft containing fireplaces for simulating aircraft fires in the aircraft; and

a fire control system, the improvement which comprises a liquid fuel spill module for simulating a fuel spill fire adjacent to the aircraft, a fuel converter for converting some of the liquid fuel to vapor fuel and conduit means for supplying the liquid fuel to the liquid fuel spill module and conduit means for supplying the vapor fuel to the fireplaces.

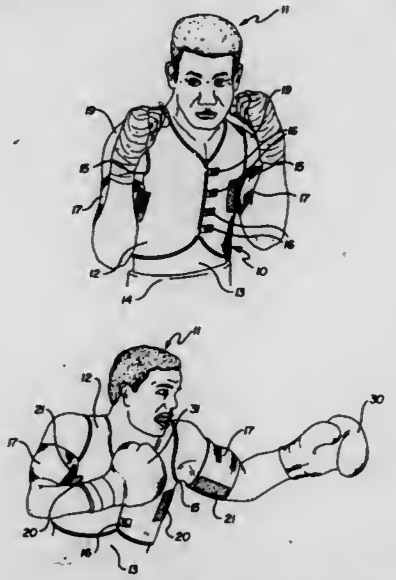
5,688,137
ATHLETIC TRAINING DEVICE

William G. Bustance, 10329 Elk Lake Rd., Williamsburg, Mich. 49690

Filed Jul. 1, 1996, Ser. No. 672,987

Int. Cl.⁶ A63B *69/00*

U.S. Cl. 434—247 **20 Claims**



1. An athletic training device for releaseably holding a user's extremity in a desired position against the user's body comprising:

a plurality of first attachment members;

a first means for affixing said first attachment members at a corresponding plurality of positions on the torso of the user;

a second attachment member;

a second separate means for affixing said second attachment member to an extremity of the user; and

one of said first attachment members is releaseably engageable with said second attachment member.

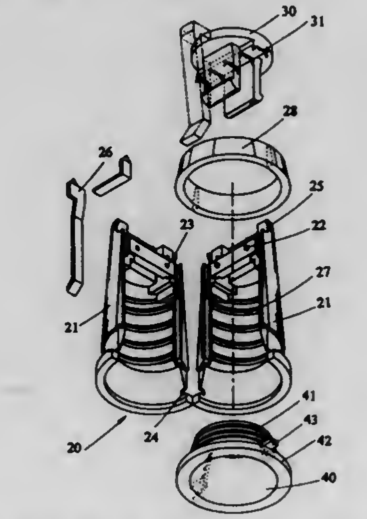
5,688,138
WATER-PROOF LAMP SOCKET STRUCTURE

Te Chun Chuang, Hsinchu Hsien, Taiwan, assignor to King World Enterprise Co., Ltd., Taiwan

Filed Jul. 5, 1996, Ser. No. 677,363

Int. Cl.⁶ H01R *13/52*

U.S. Cl. 439—280 **9 Claims**



1. A water-proof lamp socket structure, comprising:

a lamp socket defined by two interconnected semi-cylinders, the lamp socket having a sharp nickel plate disposed therein and an inner thread defined at a middle interior section for threadably receiving a bulb base cap;

a ring body engaging an exterior surface of the lamp socket;

an upper cover engaged with an upper end of the lamp socket for forcing a wire to be penetrated by the sharp nickel plate to conduct electricity, curved grooves being respectively defined in relative positions at the upper end of the lamp socket and at a bottom end of the upper cover such that when the upper cover is enqaged with the lamp socket, the wire is contained within openings defined by the curved grooves, and

a flexible trapezoidal water-proof ring engaging a bottom of the lamp socket, an upper exterior of the water-proof ring having a plurality of elastic washers and a projection.

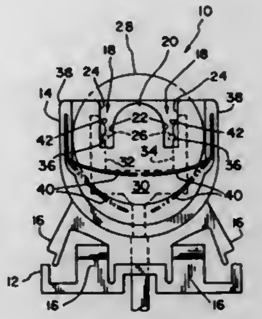
5,688,139
FLUORESCENT LAMP HOLDER

James M. Gust, Wolcottville; John W. Burwell, Rome City, and Roger W. Young, Millersburg, all of Ind., assignors to Lyall Assemblies, Inc., Albion, Ind.

Filed Oct. 23, 1995, Ser. No. 551,897

Int. Cl.⁶ H01R *33/02*

U.S. Cl. 439—239 **13 Claims**



1. A lamp holder for carrying a fluorescent lamp, the flourescent lamp including two contact pins, with each contact pin having a diameter, said lamp holder comprising:

a socket including:

an inner hub;

two slots disposed on opposite sides of said inner hub; and

a conductor associated with each said slot, said conductor including a first contact portion and second contact portion, each of said first contact portion and said second contact portion including an edge with a notch therein for engaging a respective one of the contact pins of the fluorescent lamp, each said edge and said notch disposed within a respective said slot and adjacent to said inner hub, each said edge and said inner hub defining a clearance distance therebetween in a direction transverse to a longitudinal direction of each said slot, said clearance distance at all times, both when the contact pins are engaged and not engaged with said two notches in said conductor, being greater than the diameter of the contact pins.

5,688,140
CHIP CARRIER SOCKET

Robert G. McHugh, Evergreen, Colo.; Ching-ho Lai, Tao-Yuan Hsien, and Cherng-Horng Lin, Taipei Hsien, both of Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei, Taiwan

Filed Dec. 28, 1995, Ser. No. 580,172

Int. Cl.⁶ H01R *4/50*

U.S. Cl. 439—342 **19 Claims**

1. A chip carrier socket for receiving a chip carrier therein comprising:

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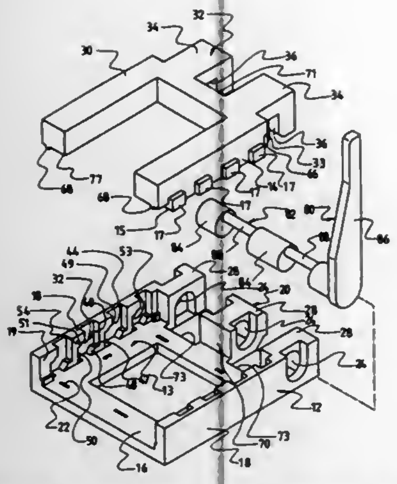
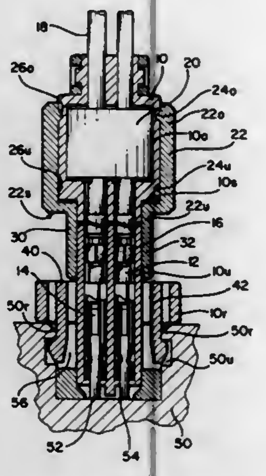


- a base having bottom plate with a plurality of passageways extending therethrough for receiving a corresponding number of contacts therein;
- two side walls disposed on two sides of the bottom plate, and a nest section disposed on a rear portion, said side walls and nest section commonly defining a cavity therein;
- a cover including a pressing portion adapted to be received within said cavity, and a hinge portion coaxial fastened to said nest section of the base; and
- means for guiding the cover to move with regard to the base in both vertical and horizontal directions under a condition that said cover always maintains in a horizontal state during movement of the cover.

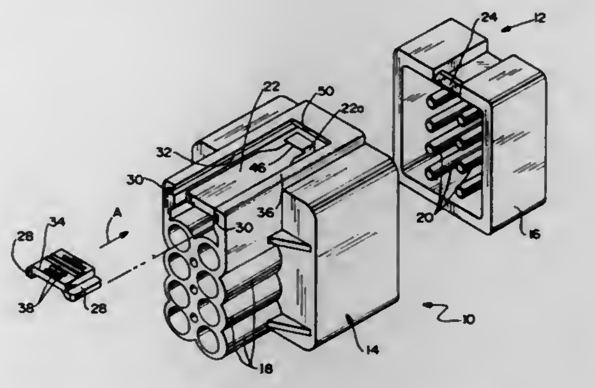
5,688,141
ELECTRICAL CONNECTOR
Claus Dullin, Bad Rappenau, Germany, assignor to Amphenol-Tuchel Electronics GmbH, Heilbronn, Germany
Flied Mar. 29, 1996, Ser. No. 622,875
Claims priority, application Germany, Apr. 8, 1995, 195 13 358.7
Int. Cl.^{6} H01R *13/627*
U.S. Cl. 439—352 **11 Claims**



1. An electrical connector for use in connecting a control cable of a control unit to contact pins of a receptacle for an inflatable restraint system of a motor vehicle, comprising;

- a shell which houses contact springs engageable with said contact pins of the receptacle, said contact springs being for establishing an electrical connection between wires of the cable and said contact pins;
- wherein the shell includes an upper shell portion having a longitudinal axis, and a lower shell portion including an opening, the lower shell portion being arranged to be engaged with the receptacle and including a catch means for insertion into the receptacle lock the shell in the receptacle, and wherein the electrical connector further comprises:
- a locking member formed as a sleeve and including preventing means extending from the sleeve, said sleeve being supported by said upper shell portion and displaceable relative to the shell in a direction of said longitudinal axis from a first position in which the locking is supported by the upper shell portion but not engaged with the catch means, and a second position in which the locking member has been moved toward the receptacle and in which said preventing means has been inserted through the opening in the lower shell portion to prevent disengagement of the catch means from the receptacle and therefore prevent the connector from being accidentally disconnected from the receptacle,
- wherein the catch means comprises at least two catch arms extending from said lower shell portion, the locking member is supported on the upper shell portion in said first position by engagement between a projection and a first recess, and the locking member is held in said second position by engagement between said projection and a second recess, said projection being disposed on one of an inner surface of the sleeve and an outer surface of the upper shell portion, and said first and second recesses being disposed in the other of the inner surface of the sleeve and the outer surface of the upper shell portion.

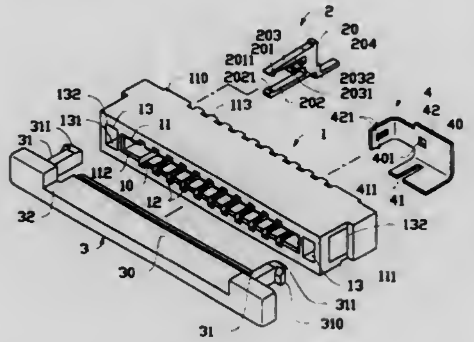
5,688,142
ELETRICAL CONNECTOR POSITION ASSURANCE SYSTEM
Holger Dietz, Karlsbad, and Alexander Popa, Leutenbach, both of Germany, assignors to Molex Incorporated, Lisle, Ill.
Filed Oct. 10, 1995, Ser. No. 541,849
Claims priority, application European Pat. Off., Oct. 10, 1994, 94115922
Int. Cl.^{6} H01R *13/71*
U.S. Cl. 439—487 **6 Claims**



1. A connector position assurance system comprising:

- a first connector having a housing having sidewalls with recesses therein;
- a primary flexible locking arm on the housing, said primary locking arm including a projection for mechanically interlocking with a cooperating latch of a second connector; and
- a locking slider having flanges being mounted above said primary locking arm and in said recess so that said slider being slidable along a path between a first position allowing movement of said locking arm and mating of the first connector with the second connector and a second position blocking movement of the primary locking arm away from said first position; and
- wherein said primary locking arm in said second position blocks movement of the locking slider from said first position to said second position thereby indicating that the first connector and the second connector are not fully mated.

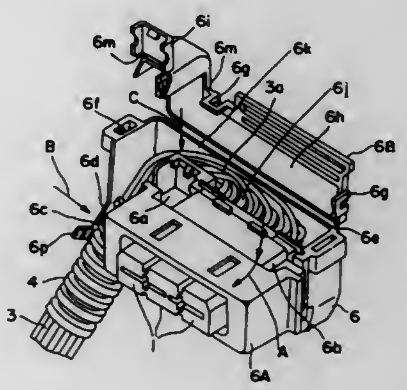
5,688,143
ELECTRICAL CONNECTOR FOR USE WITH FLEXIBLE PRINTED CIRCUIT
Robert G. McHugh, Evergreen, Colo., and Yu-Ming Hon, Taipei Hsieh, Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan
Filed Sep. 26, 1995, Ser. No. 533,927
Int. Cl.^{6} H01R *9/07*
U.S. Cl. 439—495 **8 Claims**



1. An electrical connector adapted to be used with a flexible printed circuit, comprising:

- an insulation casing, having an interior chamber defined by two opposite longitudinal side walls and having an opening formed on a front side of the casing and a bottom formed on an opposite rear side of the casing, a plurality of slots being formed inside the interior chamber, each of said slots having a bottom section extending from the rear side of the casing to partially penetrate into the bottom and a side section defined by a recess formed on each of the longitudinal side walls and extending from the bottom section to the front side of the casing, a central channel being formed on the bottom of the interior chamber to be located between the two side sections and extending from the bottom section to the interior chamber
- a plurality of conductive terminal members, each comprising a base inserted into the bottom section of each of the slots from the rear side of the casing, and a first arm and a second opposite arm respectively extending from the base substantially along the direction as the base inserted into and defining therebetween a spacing, wherein each of said arms received within the side section of the slot, and each of the arms having an inclined outer edge that faces the corresponding longitudinal side wall to define a first gap therebetween so as to allow the first and second arms to be bent away from each other for defining an increased spacing therebetween, a central arm extending from the base to be received within the central channel and retained therein with retaining means;
- driver means, which is retained on the casing by means of retaining means, being inserted movably to the casing from the front side to the rear side of the casing, said driver means comprising a plate movably received within the spacing defined between the arms of the terminal members, and a shallow recession formed on at least one side of said plate for passing the flexible printed circuit, and selectively defining a second gap with the corresponding one of the side walls of the casing for receiving the flexible printed circuit therein;
- said connector being characterized in that:
  - by means that each of that first arm and the second arm is spaced from the corresponding side wall by the first gap, and both of the arms are able to be bent away from each other, the driver means can be inserted into between both of said arms and retained in the casing in two selectable manners of the shallow recession thereof facing respectively either longitudinal side walls of the casing, so that the flexible printed circuit inserted though the shallow recession can contact electrically either the first arm or the second arm of the terminal members.

5,688,144
CONNECTION COVER
Shuji Kosuge, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan
Filed Dec. 22, 1995, Ser. No. 577,828
Claims priority, application Japan, Dec. 27, 1994, 6-325222
Int. Cl.^{6} H01R *13/40*
U.S. Cl. 439—596 **10 Claims**



1. A connection cover for accommodating a connection comprising:

- a main body (**6**A) comprising:
  - a first receptacle means (**6***b*) for accommodating a first portion of the connection,
  - a second receptacle means (**6***d*) for accommodating a second portion of the connection, and
  - a third receptacle means (**6***j*) for accommodating a third portion of the connection; and
- a lid (**6**B) comprising:
  - a first cover means (**6***h*) pivotably connectable with the main body (**6**A) by means of a first hinge joint (**6***e*) for covering at least partly the first and third receptacle means (**6***b*, **6***j*) and
  - a second cover means (**6***i*) pivotably connectable with the first cover means (**6***h*) by means of a second hinge joint (**6***m*) for permitting said second receptacle means (**6***d*) to remain uncovered until after said first cover means (**6***h*) covers said first and third receptacle means (**6***b*, **6***j*), and for subsequently permitting pivotable movement of said second cover means relative to said first cover means for covering at least partly the second receptacle means (**6***d*), said second hinge joint (**6***m*) being substantially parallel to said first hinge joint (**6***e*).

5,688,145
ADAPTER SOCKET STRUCTURE AND METHOD FOR FORMING SAME
Danny Liu, Taipei, Taiwan, assignor to Dan Chief Enterprise Co., Ltd., Taipei, Taiwan
Filed Jan. 29, 1996, Ser. No. 593,662
Int. Cl.^{6} H01R *13/648*
U.S. Cl. 439—607 **8 Claims**

1. An adapter socket structure, comprising:

- an adapter socket for providing an interface between two electrical apparatuses which includes:
  - a molded receptacle comprising a molded receptacle body and a metal receptacle front case connected to said molded receptacle body;
  - a set of terminals installed in said molded receptacle; and
  - a circuit board electrically connected with said terminals; and
- a first metal case member and a second metal case member for enveloping said adapter socket, wherein each of said first metal case member and second metal case member is integrally formed by extruding so that there is no slit thereon for

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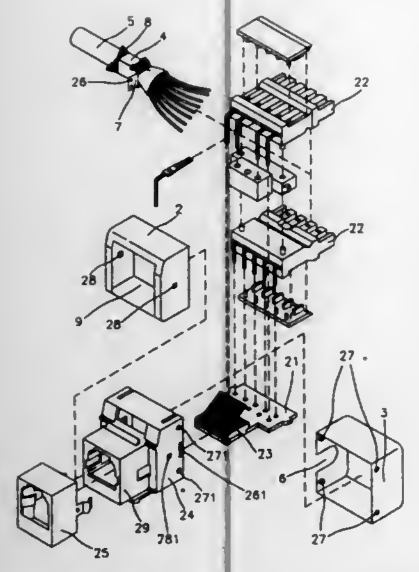


preventing an interference of an external noise and reducing a radiation leakage of a transmitted signal.

5,688,146

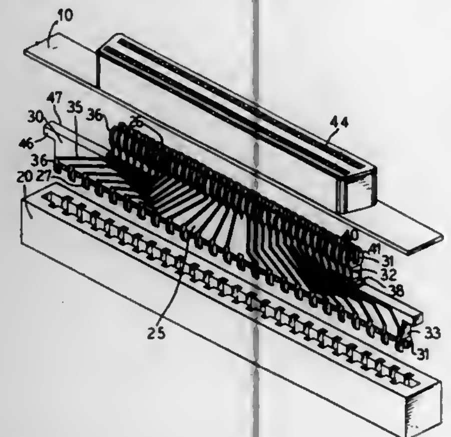
PRINTED PLASTIC CIRCUITS AND CONTRACTS AND METHOD FOR MAKING SAME

William J. McGinley, Barrington Hills; John R. Cannon, Wayne; William J. Green, Lisle, and Richard P. Zanardo, Matteson, all of Ill., assignors to Methode Electronics Inc., Chicago, Ill.

Continuation of Ser. No. 468,235, Jun. 6, 1995, Pat. No. 5,599,595, which is a division of Ser. No. 294,347, Aug. 23, 1994, abandoned, which is a continuation of Ser. No. 164,150, Dec. 9, 1993, abandoned. This application Jul. 25, 1996, Ser. No. 686,982

Int. Cl.^{6} H01R *23/70*

U.S. Cl. 439—637 **10 Claims**



1. An electrical connector comprising:
a unitary, molded thermoplastic circuit board, said circuit board including a base portion having a planar circuitized area having conductive traces adhered to a first side of the circuit board and a first edge having a plurality of contact pads adhered to the circuit board and spaced along the first edge wherein the contact pads have at least one contact surface defined thereon adjacent the first edge, the contact surface having an electrically conductive region thereon defined by a firmly-adherent, electrically conductive coating; and
a housing having a first end and a second end and a cavity formed therebetween and a shroud protruding at the first end and the shroud having a base portion attached to the housing and an opposite terminal portion wherein the circuit board is mounted within the cavity and the first edge protrudes from the first end of the housing and the first edge is adjacent the terminal portion of the shroud.

5,688,147

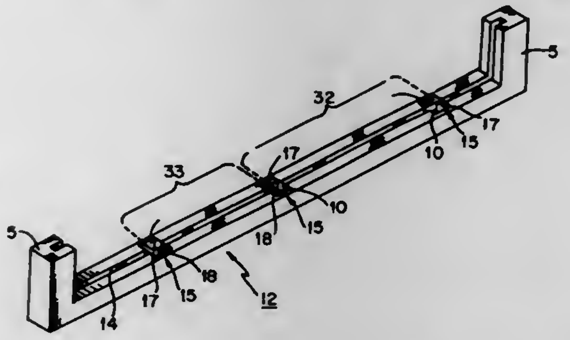
INTERCHANGEABLE KEY CARD EDGE CONNECTING

Paul William Coteus, Yorktown Heights, and Thomas Mario Cipolla, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 371,631, Jan. 12, 1995, abandoned. This application Dec. 5, 1996, Ser. No. 760,728

Int. Cl.^{6} H01R *13/64*

U.S. Cl. 439—681 **2 Claims**



1. An electronic card edge connector having an elongated longitudinal slot in a face thereof, into which a conductor bearing edge of a circuit card is to be inserted,
said connector further having specific shape openings in said face,
at least one substantially rectangular key member,
said key member fitting into a respective one of said openings,
said key member having a plurality of rotational positions and faces for positioning in one of said openings, and,
said key member having in each of said rotational positions a corresponding face with a unique longitudinal slot interruption feature and wherein said unique longitudinal slot interruption feature is the material of said key member bounded by at least one key slot in said key member in each of said faces of said key member,
said longitudinal slot interruption features producing a different specific length for said longitudinal slot when said key member is to be positioned in a different rotated position in one of said openings, and, said circuit card having a notch in said conductor bearing edge thereof engaging with a respective corresponding longitudinal slot interrupting feature when said circuit card is positioned in said longitudinal slot.

5,688,148

CONNECTOR HOUSING AND METHOD OF ASSEMBLING CONNECTOR

Yuji Hatagishi, and Kimihiro Abe, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

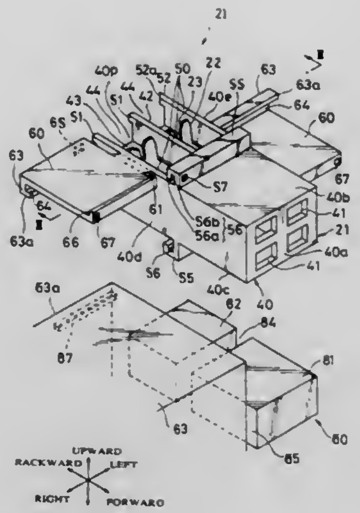
Filed Oct. 4, 1995, Ser. No. 539,268

Claims priority, application Japan, Oct. 7, 1994, 6-244000

Int. Cl.^{6} H01R *13/502*

U.S. Cl. 439—701 **7 Claims**

1. A connector housing molded as one body, said connector housing comprising:
a housing body having an opening through which a wire is to be inserted;
a cover for closing said opening; and
a temporary connecting piece arranged adjacent to said opening of said housing body temporarily connecting said cover with said housing body;



slide guides guiding a sliding movement of said cover, said cover being adapted, after disconnection from said housing body by disconnection of said temporary connecting piece, to slidably engage said slide guides and cover said opening, said slide guides being arranged on one of said housing body and said cover; and
locking means for locking said cover on said housing body when said cover approaches a position where said opening is closed, said locking means being arranged in said housing body and said cover.

5,688,149

ELECTRICAL TERMINAL AND CONNECTOR WITH IMPROVED RETENTION MEANS

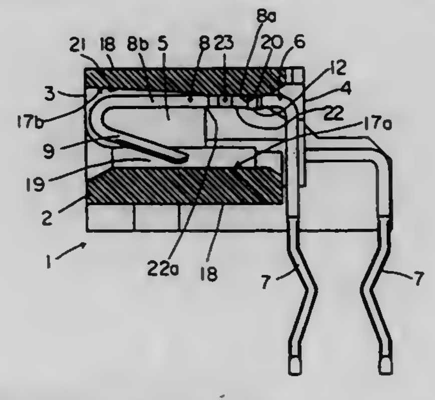
Shinichi Aihara, Ebina, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Mar. 14, 1996, Ser. No. 615,907

Claims priority, application Japan, Mar. 30, 1995, 7-097718

Int. Cl.^{6} H01R *13/40*

U.S. Cl. 439—733.1 **14 Claims**



1. An electrical terminal, comprising:
an elongated planar body portion defining generally parallel opposite sides and opposite edges;
a contact portion extending forwardly of the body portion;
a terminating portion extending rearwardly of the body portion; and
the body portion including a retention section having a retention nib coined out of each edge of the body portion and defining a generally planar surface offset from one side of the body portion and generally parallel thereto,
the body portion adapted so that the planar surfaces of the retention nibs engage one side of a passage in an appropriate housing as the opposite side of the body portion engages the side of the passage opposite the one side.

5,688,150

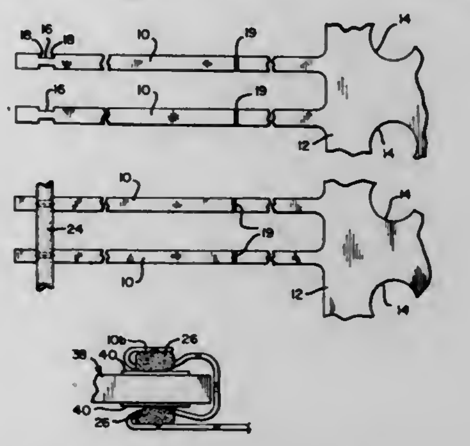
SOLDER BEARING LEAD

Jack Seidler, Flushing, and Leonard J. Pollock, Oceanside, both of N.Y., assignors to North American Specialties Corporation, Flushing, N.Y.

Filed Aug. 8, 1995, Ser. No. 512,508

Int. Cl.^{6} H01R *4/02*

U.S. Cl. 439—876 **9 Claims**



1. A connector arrangement for a substrate having a row of conductive pads, comprising:
a carrier strip of electrically conductive material of substantially uniform thickness,
a plurality of elongated conductive leads extending laterally from said carrier strip, each lead being integrally connected to said carrier strip at one end of the lead, said leads being parallel and spaced corresponding to said pads,
each lead comprising:
a generally flat body portion of substantially uniform width and thickness, with an upper surface and a lower surface,
a longitudinally extending solder-bearing portion at a predetermined position along said lead adjoining said flat body portion,
said solder-bearing portion being narrower than said adjoining body portion and a shoulder between said solder-bearing portion and said flat body portion at an end of said solder-bearing portion, and
a solder mass partially surrounding said solder-bearing portion, while leaving uncovered a portion contiguous to said lower surface such that said solder mass and said solder bearing portion are in contact with said substrate conductive pad,
whereby said solder mass is prevented from longitudinal movement by said shoulder and from transverse movement by said narrower portion, and said lead may be soldered to a corresponding pad by placing said uncovered portion in contact with said pad and reflowing said solder mass.

5,688,151

COLLAPSIBLE BOAT POWERED BY A LAND VEHICLE

George J. Hanz, 254 Thrasher St., Bloomingdale, Ill. 60108

Division of Ser. No. 389,587, Feb. 16, 1995, Pat. No. 5,607,330. This application Jul. 15, 1996, Ser. No. 679,822

Int. Cl.^{6} B63H *21/175*

U.S. Cl. 440—11 **20 Claims**

1. A boat which comprises at least one floatable hull, the improvement comprising, in combination:
a spaced pair of pivoting booms, carried in vertically pivotable relation adjacent one end of the boat on opposite sides thereof, and a stabilizer for movably controlling the downwardly extending pivotal position of each boom and for holding said booms in desired downwardly extending pivotal positions, whereby said booms may point downwardly to stabilize said end of the boat against the shore, and for

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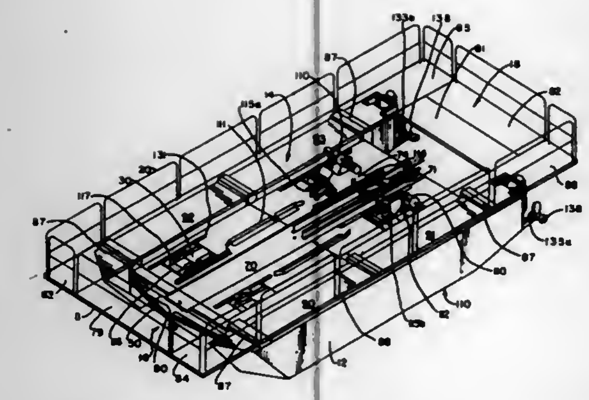


pivotally raising said booms toward the horizontal when their use is not desired, each of said booms being generally straight and substantially unbending.

5,688,152

MARINE DRIVE UNIT WITH THE PRIMARY SHAFT BEARING MOUNTED IN THE ENGINE FLYWHEEL COVER

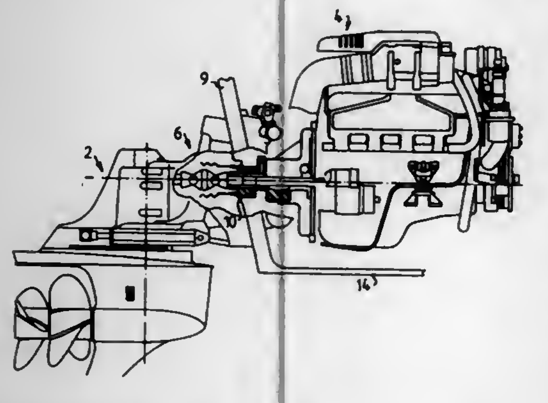
Christian Rodskier, Torslanda, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Sep. 25, 1996, Ser. No. 719,536

Claims priority, application Sweden, Sep. 25, 1995, 9503311-4

Int. Cl.^{6} B63H *23/24*

U.S. Cl. 440—83 **10 Claims**



1. In a marine drive unit with engine mounting in combination with a coupling between an engine and a propeller drive, said unit comprising a bearing holder joined to a flywheel cover, said bearing holder having a seat for a bearing for a shaft extending from the engine, said shaft being a primary shaft in the drive unit, and a resilient element which is disposed between the bearing holder and a bushing means arranged on a boat transom and partially penetrating said boat transom, the improvement wherein the flywheel cover is divided and has a proximal portion joined to the engine and having a connecting portion, and a distal portion joined to the bearing holder and having a supporting portion, shaped to complement the connecting portion, and the engine, when the connecting portion is in precise contact with the supporting portion, is correctly aligned in relation to the bearing mounted in the bearing holder seat.

5,688,153

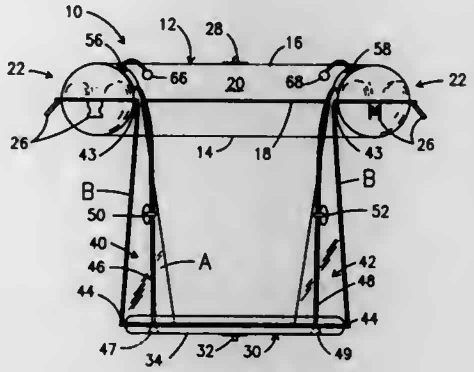
INFLATABLE FLOATING CHAIR

Man Fu Yeung, Rowland Heights, Calif., assignor to Sunco Products, Inc., Industry, Calif.

Continuation-in-part of Ser. No. 492,375, Jun. 19, 1995, Pat. No. 5,570,480. This application Apr. 17, 1996, Ser. No. 633,439

Int. Cl.^{6} B63C *9/08*

U.S. Cl. 441—132 **13 Claims**



1. An inflatable floating chair for recreational use in water comprising in combination:

a floatation means for supporting said inflatable floating chair, said floatation means having a submerged side and a top side;

a seat, said seat being positioned below and in relative alignment with said floatation means; and

an adjustable seat support means for supporting said seat at various positions relative to said floatation means, said adjustable seat support means having an upper portion and a lower portion, a first and second rope means for suspending said seat at various vertical distances from said flotation means, and a first and second rope guide, said upper portion being coupled to said floatation means and said lower portion being coupled to said seat to thereby suspend said seat from said floatation means, said first and second rope means being coupled relative to said flotation means and said seat, said first and second rope guide being coupled to said adjustable seat support means with said first and second rope means passing therethrough respectively,

whereby said adjustable seat support means varies the vertical distance between said floatation means and said seat such that said inflatable floating chair facilitates swimmers of all sizes thereby keeping their shoulders and head above water while the rest of their body is suspended below the water surface supported by said seat.

5,688,154

LIQUID INK COMPOSITION FOR IMPACT PRINTER AND INK RIBBON USING THE SAME

Hitoshi Goda; Masayuki Imanishi, and Shota Yamada, all of Osaka, Japan, assignors to Fujicopian Co., Ltd., Japan

Filed May 9, 1995, Ser. No. 438,651

Claims priority, application Japan, May 10, 1994, 6-096499

Int. Cl.^{6} B41M *5/03*

U.S. Cl. 442—59 **3 Claims**

1. An ink ribbon for an impact printer, comprising a fabric ribbon substrate and a liquid ink composition contained in the fabric ribbon substrate, the liquid ink composition comprising a coloring agent and an oily substance having a small polarity as an essential component, the coloring agent consisting essentially of a dye, the dye being insoluble in the oily substance and dispersed in the oily substance.

5,688,155

CARBON—CARBON COMPOSITES CONTAINING POORLY GRAPHITIZING PITCH AS A BINDER AND/OR IMPREGNANT

Irwin Charles Lewis, Strongsville, and Ronald Albert Howard, Brook Park, both of Ohio, assignors to UCAR Carbon Technology Corporation, Danbury, Conn.

Division of Ser. No. 790,236, Oct. 22, 1985, Pat. No. 5,413,738. This application Jan. 24, 1995, Ser. No. 377,467

Int. Cl.^{6} B32B *9/00;31/20;31/26;* **C04B** *35/532*

U.S. Cl. 442—179 **4 Claims**

1. A process for the production of a unitary composite structure comprising a heterogeneous combination of carbonaceous reinforcing material interbonded with a matrix material comprising:

(a) providing the matrix material by treating a tar or a pitch having aromatic components with a cross-linking agent to polymerize and cross-link the aromatic components to the extent that the pitch becomes poorly graphitizing and forms substantially no mesophase pitch or forms mesophase pitch having a domain size of less than about 30μ;

(b) combining the poorly graphitizing matrix pitch material with reinforcing material; and then

(c) subjecting the combination of reinforcing material and matrix material to carbonization conditions to form the interbonded unitary composite structure, wherein the tar or pitch is polymerized and cross-linked by being contacted with at least one Lewis acid selected from the group consisting of $FeCl_3$, $SnCl_2$, $SnCl_4$, $FeBr_3$, I_2, $ZnCl_2$, $SbCl_3$, $SbCl_5$, $CoCl_2$, BF_3 and combinations thereof.

3. A unitary composite structure comprising a heterogeneous combination of a carbonaceous reinforcing material interbonded with a matrix material, said matrix material being a carbonaceous pitch cross-linked with oxygen containing polymerized and cross-linked aromatic components thereof which have been cross-linked to the extent that the pitch is poorly graphitizing and has formed substantially no mesophase pitch or contains mesophase pitch having a domain size of less than about 30μ.

5,688,156

SHEET FOR PRODUCING PLASTIC FILMS AND A PROCESS FOR PRODUCING THIS SHEET

Gustav Hildebrandt, Auetal; Horst Büscher, Langenhagen; Dirk Leiss, Grossburgwedel; Reiner Taczkowski, Hanover, and Hans-Hinrich Kruse, Barsinghausen, all of Germany, assignors to Benecke-Kaliko AG, Hanover, Germany

Filed Jun. 29, 1995, Ser. No. 496,603

Claims priority, application Germany, Jun. 30, 1994, 44 22 871.6

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 442—180 **18 Claims**

1. Substantially continous sheet for producing plastic films, consisting of a tear-resistant layer with a plastic layer bonded to it, where the surface of the plastic layer facing away from the tear-resistant layer is suitable for applying liquid or pasty plastics for the plastic film to be produced has a structure which is a negative of the structure of the plastic film to be produced, and the improvement wherein the plastic layer with the surface consists at least partially of polypropylene.

5,688,157

NONWOVEN FABRIC LAMINATE WITH ENHANCED BARRIER PROPERTIES

Stephen Stewart Bradley, Roswell; David Craige Strack, Canton; Randall Dee Lowery, Norcross; Deborah Jean Zemlock, and Mary Katherine Lawson, both of Alpharetta, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Irving, Tex.

Continuation of Ser. No. 458,657, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 223,210, Apr. 5, 1994, Pat. No. 5,482,765. This application Nov. 8, 1996, Ser. No. 744,895

Int. Cl.^{6} D04H *5/00;* **B32B** *27/02;27/18;27/32*

U.S. Cl. 442—340 **7 Claims**

1. A nonwoven laminate comprising:

a first layer of a nonwoven web comprising continuous filaments having an average diameter of greater than 10 microns and being prepared from a thermoplastic polymer;

a second layer of a nonwoven web comprising filaments having an average diameter of less than 10 microns and being prepared from a mixture of a thermoplastic polymer, and a fluorocarbon compound in an amount form about 0.1 to 2.0 weight percent of said second layer; and

a third layer of a nonwoven web comprising continuous filaments having an average diameter greater than 10 microns and being prepared from a thermoplastic polymer, wherein said layers are thermally bonded to form a laminate, and wherein said laminate has a ratio of hydrohead to said second layer basis weight of greater than 115 and a BFE which is greater than the laminate having a second layer without said fluorocarbon.

5,688,158

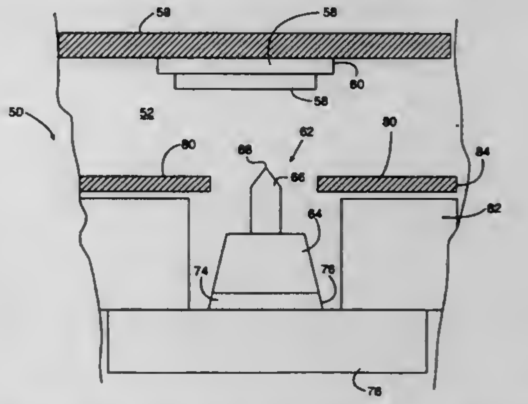
PLANARIZING PROCESS FOR FIELD EMITTER DISPLAYS AND OTHER ELECTRON SOURCE APPLICATIONS

Gary W. Jones, Poughkeepsie; Steven M. Zimmerman, Pleasant Valley; Susan K. Schwartz Jones; Michael J. Costa, both of Poughkeepsie, and Jeffrey A. Silvernail, Kingston, all of N.Y., assignors to Fed Corporation, Hopewell Junction, N.Y.

Filed Aug. 24, 1995, Ser. No. 519,121

Int. Cl.^{6} H01J *9/02*

U.S. Cl. 445—50 **4 Claims**



1. A method for manufacture of a microelectronic field emitter device, comprising:

applying a patterned layer of liftoff profile resist over a substrate to define emitter conductor locations;

employing the patterned resist layer to form trenches in the substrate at the emitter conductor locations;

depositing metal for emitter conductors within the trenches and over the patterned resist layer;

removing the patterned resist layer and lifting off metal over the resist layer, while leaving conductors in the trenches;

depositing a current limiter layer over the conductors and areas of the substrate between trenches;

depositing a layer of emitter material;

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pattern masking and etching the layer of emitter material to form emitter structures;
depositing gate dielectric;
applying a patterned layer of liftoff profile resist over the gate dielectric;
evaporating gate metal; and
removing the patterned resist layer and lifting off metal over the resist layer to define gate electrodes.

5,688,159
METHOD OF AND APPARATUS FOR AUTOMATICALLY POLISHING A MOTHER BLANK OF SHEET COPPER

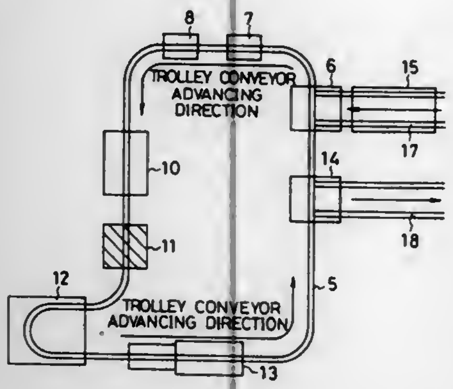
Mineharu Kusano; Kenzou Takabatake, and Yutaka Kataoka, all of Okayama, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,823

Claims priority, application Japan, Feb. 21, 1994, 6-021744

Int. Cl.^{6} B24B *49/00;51/00*

U.S. Cl. 451—1 **3 Claims**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TROLLEY CONVEYOR ADVANCING DIRECTION
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TROLLEY CONVEYOR ADVANCING DIRECTION
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1. A device for automatically polishing a mother blank of sheet copper having a layer of material deposited in sheet form on opposite surfaces thereof, said device comprising a delivery device for carrying in the mother blank of sheet copper; a stripping device for removing the deposited material from the surfaces of the mother blank; a polishing device for polishing the surfaces of the mother blank of sheet copper after the deposited material has been removed therefrom and a removal device for carrying out the polished mother blank; said polishing device comprising two pairs of rotary brush rollers, each pair of rotary brush rollers facing an opposite surface of said mother blank, an upper rotary brush roller in each pair being provided at an intermediate position of said mother blank and a lower rotary brush roller in each pair being provided at a lower position of said mother blank, an operating member for moving the rotary brush rollers to and from the surfaces of the mother blank, a first driving member for driving and rotating the rotary brush rollers, a second driving member for raising and lowering the rotary brush rollers and a control member for controlling the operating member so that said rotary brush rollers move into contact with the opposite surfaces of the mother blank when the mother blank stops at a specified location and move away from the opposite surfaces of said mother blank when the upper and lower rotary brush rollers reach an upper position and an intermediate position on the surface of the mother blank respectively, the second driving member so that the rotary brush rollers move upwardly after they initially come into contact with the surfaces of the mother blank and the first driving member so that the rotational speed of the upper brush rollers increases with respect to the lower brush rollers as the brush rollers move upward.

5,688,160
APPARATUS FOR THE DYNAMIC BALANCING OF A ROTATING BODY

Mario Pozzetti, Bologna, and Domenico Malpezzi, Brisighella, both of Italy, assignors to Marposs Societa' Per Azioni, Italy

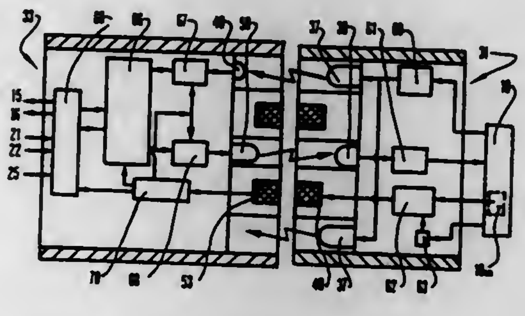
PCT No. PCT/EP94/00789, § 371 Date Sep. 14, 1995, § 102(e) Date Sep. 14, 1995, PCT Pub. No. WO94/21995, PCT Pub. Date Sep. 2, 1994

PCT Filed Mar. 14, 1994, Ser. No. 492,044

Claims priority, application Italy, Mar. 22, 1993, BO93A0097

Int. Cl.^{6} B24B *49/00*

U.S. Cl. 451—5 **17 Claims**



1. An apparatus for the dynamic balancing of a body rotating about a longitudinal axis with respect to a support comprising:
an assembly fixed to and rotating with said body, said assembly comprising
  at least one mass the position of which is adjustable, and
  at least one electric motor connected to adjust the position of the mass;
a control unit;
a power supply source; and
a transceiver unit positioned between said assembly and both the control unit and the power supply source,
said assembly further comprising circuitry electrically connected to said electric motor for providing signals controlling the motor and thus the displacement and position of the mass, said transceiver unit comprising:
  a first contactless transmission channel coupling the power supply source to the rotating assembly to thereby supply the rotating assembly with power, and
  at least a second contactless transmission channel between the control unit and said circuitry,
wherein the first transmission channel comprises an electromagnetic coupling, and the second transmission channel is distinct from the first transmission channel and enables a transmission of signals in both directions between the control unit and the circuitry.

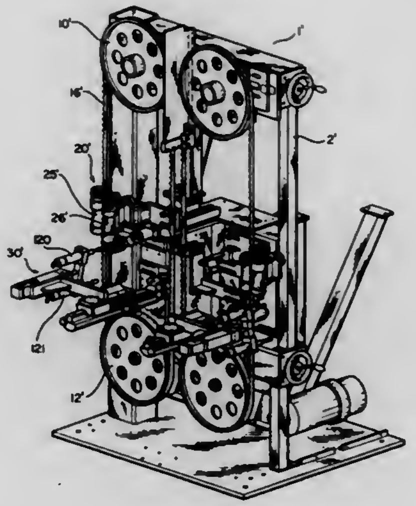
5,688,161
METHOD AND APPARATUS FOR SHARPENING AND CLEANING SCALLOPED-EDGED BLADES

J. Lee Gregory, III, Richmond, and William H. Stevens, II, Deltaville, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 182,443, Jan. 18, 1994, Pat. No. 5,435,771. This application Jul. 24, 1995, Ser. No. 506,290

Int. Cl.^{6} B24B *3/58*

U.S. Cl. 451—45 **30 Claims**



1. A method for cleaning and sharpening a band blade in a slitting machine, comprising the steps of:
moving a band blade in a first direction;
contacting a first and a second side of a band blade with rotating brushes to remove debris from the band blade, said contacting step including the step of moving both said rotating brushes between retracted positions where said brushes are out of contact with said moving blade and operative positions where said brushes are contacting said moving blade, said brush moving step further comprising the step of rotating said brushes throughout movement between said retracted and operative positions;
moving a first rotating hone into contact with the first side of the band blade at a preselected sharpening angle for a cutting edge;
moving a second rotating hone into contact with the second side of the band blade at a preselected sharpening angle for the cutting edge; and
moving the hones in repeated reciprocal movements transverse to the blade direction to stroke the cutting edge as the hones rotate.

5,688,162
BLAST WHEELS AND CAGES FOR BLAST WHEELS

Norman Lewis Williams, 49 Moss Bank Road, St. Helens, Merseyside. WA11 7DE, United Kingdom

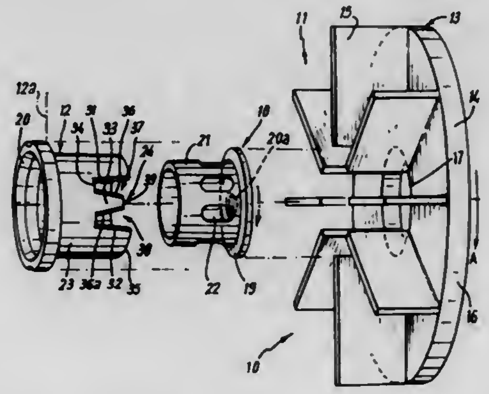
PCT No. PCT/GB94/01164, § 371 Date Jan. 24, 1996, § 102(e) Date Jan. 24, 1996, PCT Pub. No. WO94/27786, PCT Pub. Date Dec. 8, 1994

PCT Filed May 27, 1994, Ser. No. 586,683

Claims priority, application United Kingdom, May 27, 1993, 9311163; Jun. 14, 1993, 9312238

Int. Cl.^{6} B24C *5/06*

U.S. Cl. 451—92 **9 Claims**



1. A cage for a blast wheel, the cage having an axis and comprising a wall extending angularly about and axially with respect to the axis, and means defining an aperture in the wall, the aperture having a non-uniform shape as it extends angularly with respect to the axis, in which the aperture is of less cross-section in a region intermediate the angular end regions of the aperture.

5,688,163
VIBRATION DAMPENING GRINDING CUP AND GRINDING CUP HOLDER FOR HANDHELD GRINDING MACHINES

Jan Sidén, Skellefteå, Sweden, assignor to Uniroc AB, Fagersta, Sweden

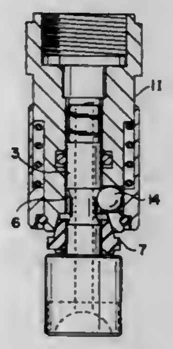
PCT No. PCT/SE93/00509, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO93/25346, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 9, 1993, Ser. No. 347,354

Claims priority, application Sweden, Jun. 15, 1992, 9201835

Int. Cl.^{6} B24B *41/00*

U.S. Cl. 451—342 **4 Claims**



1. Vibration dampening grinding cup (1) for handheld grinding machines for the grinding of hard metal buttons of button bits, comprising a grinding head (2) and a shaft (3) made with a common axial channel (4) for cooling medium, characterized in that the shaft (3) is formed with a driver part (5) at its free end and with an annular groove (6) between this part and the grinding head, that a vibration dampening bushing (7) of rubber is arranged on the shaft adjacent to the grinding head, and that the bushing (7) at its side turned towards the grinding head has a number of bosses (8) and at its side turned away from the grinding head has the form of a truncated cone.

5,688,164
RECTUM SEPARATING

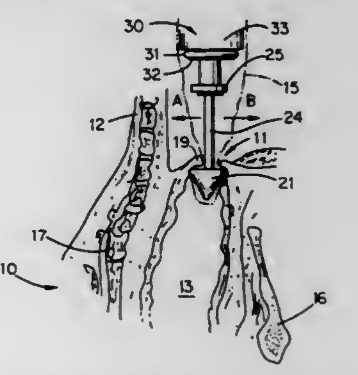
Edward Graham Mills; Andrew Leslie Finney, both of Cannon Hill; Albert James Vick, and Thomas William Prisk, both of Rocklea, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Sydney, Australia

PCT No. PCT/AU95/00637, § 371 Date Jul. 23, 1996, § 102(e) Date Jul. 23, 1996, PCT Pub. No. WO96/09770, PCT Pub. Date Apr. 4, 1996

PCT Filed Sep. 26, 1995, Ser. No. 624,430

Int. Cl.^{6} A22C *21/06;* **A23B** *5/00*

U.S. Cl. 452—122 **16 Claims**



1. A process for separating and closing the rectum (13) of a slaughtered animal carcass (10), the process comprising the steps of:

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locating a closure bag (**15**) over a gripping apparatus (**20**) so that the gripping apparatus is located in the closed end of the bag,

gripping tissues (**19**) in the region of the anus (**11**) of the carcass (**10**) by operation of the gripping apparatus (**20**) acting through the bag (**15**) but without perforating the bag,

cutting tissues around the rectum (**13**) to a depth inside the pelvic cavity of the carcass (**10**) without piercing the rectum,

advancing the closure bag (**15**) so as to surround the rectum (**13**) where the tissues have been cut and constricting the bag around the rectum at a location spaced inwardly of the anus (**11**) so as to constrict the rectum whereby the bag encloses the anus and a terminal end section of the rectum, and

releasing the gripping apparatus (**20**) enabling the bagged anus (**11**) and terminal end section of the rectum (**13**) to enter into the pelvic cavity of the carcass (**10**) for removal together with other viscera without discharge from the anus contaminating the carcass.

5,688,165

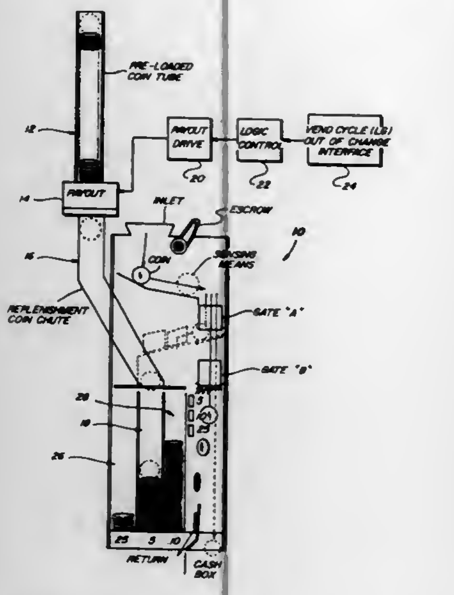
MEANS FOR PRODUCING ENHANCED COIN PAYOUT CAPACITY IN VENDING MACHINE

Joseph L. Levasseur, St. Louis County, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Feb. 29, 1996, Ser. No. 610,114

Int. Cl.^{6} G07D *3/04*

U.S. Cl. 453—9 **10 Claims**



10. A coin handling mechanism for a vending machine including means for receiving deposits of coins, means including payback coin tubes for accumulating deposited coins according to their respective values for paying back amounts deposited in excess of a selected vend price, and means associated with one of said payback coin tubes for replenishing the supply of coins therein when the number falls below a pre-determined number, said last named means including a supplemental coin tube having upper and lower ends and a number of coins of the same denomination positioned therein, said supplemental coin tube having payout means at the lower end energizable to payout coins therefrom when energized, and a conduit communicating the lower end of the supplemental coin tube to the upper end of a payback coin tube of the same denomination coin, said conduit means feeding coins from the lower end of the supplemental coin tube into the portion of the vending device where coins deposited are separated into the payback tubes according to their denomination.

5,688,166

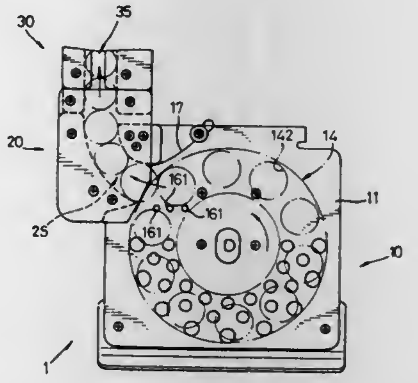
APPARATUS FOR COUNTING COINS

Chih-nan Chen, No. 132, Tinghsin Rd., Sanmin Dist., Kaohsiung, Taiwan

Filed Jul. 10, 1996, Ser. No. 677,835

Int. Cl.^{6} G07D *1/00*

U.S. Cl. 453—57 **5 Claims**



1. An improved apparatus for sorting, counting and dispensing tokens comprising:

a housing;

a holder obliquely mounted on the housing, said holder having a plurality of fingers disposed at an upper portion thereof;

a turntable rotatingly mounted on the holder, said turntable defining a slot at a center thereof for receiving a driving block, a plurality of ducts arranged annularly around the slot for respectively containing a plurality of ball races, and a plurality of recesses spaced and arranged annularly around the ducts for receiving the tokens, said turntable further having a plurality of flanges extending annularly and toward said holder from a surface between each adjacent recess, said flanges being radially spaced so as to form a plurality of channels therebetween for the fingers of the holder to extend thereinto;

a locating member mounted on the holder, said locating member defining a first passage communicated with the turntable for the tokens to pass therethrough;

a guide member mounted above the locating member, said guide member defining a second passage in communication with the first passage;

a hopper for containing tokens mounted to the holder over the turntable, said hopper defining a central hole with a diameter slightly larger than that of the turntable for mating with the turntable, said central hole having a ledge integrally extending from an upper portion of a periphery thereof in order to retain the turntable; and

an electric motor mounted behind the housing to drive the turntable to rotate, whereby the tokens are delivered one by one from the turntable to the locating member.

5,688,167

AUTO LOUVER SYSTEM FOR A VEHICLE

Jin-Suk Kim, Ulsan, Rep. of Korea, assignor to Hyundai Motor Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 13, 1996, Ser. No. 662,499

Claims priority, application Rep. of Korea, Jun. 13, 1995, 95-15538

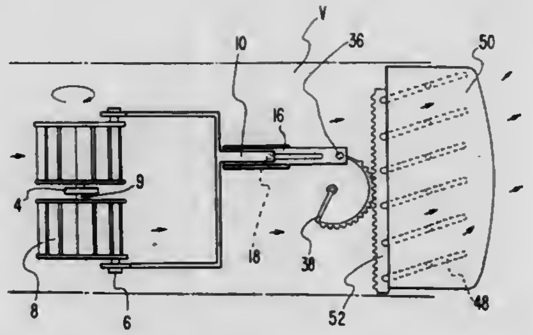
Int. Cl.^{6} B60H *1/34*

U.S. Cl. 454—153 **23 Claims**

1. An automatic louver system for a vehicle having a plurality of wind screens, comprising:

reciprocating means for generating a reciprocation movement;

changing means for rotatably moving according to the reciprocation movement generated by the reciprocating means; and



rack means for movably connecting with the changing means so as to move the plurality of wind screens.

5,688,168

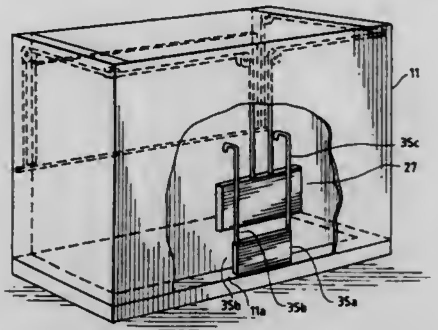
FUME HOOD WITH IMPROVED COUNTERBALANCE SYSTEM

James J. Schlies, Denmark, Wis., assignor to Fisher Hamilton Scientific Inc., Two Rivers, Wis.

Filed Feb. 5, 1996, Ser. No. 596,656

Int. Cl.^{6} B08B *15/02*

U.S. Cl. 454—56 **16 Claims**



14. A fume hood apparatus comprising: a housing with a work chamber, an access opening to the work chamber and a sash member moveable between raised and lowered positions for opening or closing the access opening; a counterweight supported by the housing; a cable for connecting the counterweight to the sash member; an adjusting weight member disposed in the housing with a connecting portion for connecting the adjusting weight member to the counterweight; the adjusting weight member adjusting the magnitude of the counterweight to allow the sash member to drop to a predetermined position after being raised above that predetermined position; the housing including portions for containing the adjusting weight member.

5,688,169

ELECTRICAL EQUIPMENT CABINET COOLING

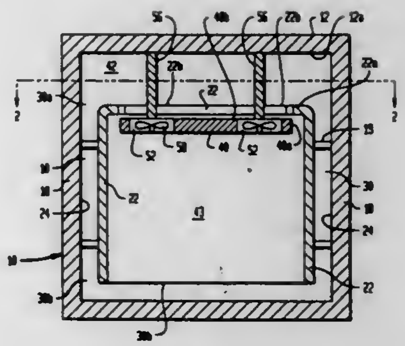
Quang Duong, Denville, and Stephen John Palaszewski, Chester, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 6, 1996, Ser. No. 611,583

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 454—184 **9 Claims**

1. A cabinet comprising vertically extending, first external walls and second and third horizontally extending walls at opposite ends of the cabinet for defining a cabinet interior space, a shelf extending generally parallel to said second wall sub-dividing said interior space into first and second spaces facing towards said second and third walls, respectively, said second space being for housing of heat generating equipment, and said first space being generally



open for free circulation of air therewithin, a fan mounted on said shelf for blowing air from within said second space through an opening through said shelf into said first space and then into a preselected pattern of horizontal air streams directed towards ducts mounted on said first walls for causing flow of said air streams along internal surfaces of said vertical walls and then into said second space.

5,688,170

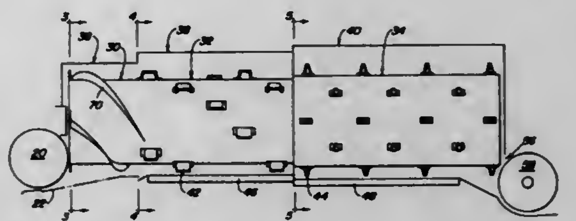
ROTARY COMBINE HAVING A CONCENTRIC INFEED SECTION AND ECCENTRIC THRESHING AND SEPARATING SECTIONS

Dohn William Pfeiffer, Moline, Ill.; Klaus Adam Braunhardt, Zweibruecken, Germany; David Alden Skinner, Moline, and Philip Alan Harden, Colona, both of Ill., assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 397,319, Mar. 2, 1995, Pat. No. 5,445,563, which is a continuation of Ser. No. 86,774, Jul. 1, 1993, abandoned. This application Aug. 28, 1995, Ser. No. 520,277

Int. Cl.^{6} A01F *12/10*

U.S. Cl. 460—69 **7 Claims**



1. A combine for harvesting, threshing and separating crop material comprising:

a supporting structure;

ground engaging means extending from the supporting structure for transporting the supporting structure around a field;

an axial rotor housing located inside the supporting structure, the rotor housing is provided with an infeed section for introducing crop into the housing, a threshing section for threshing harvested crop material and a separating section for separating threshed grain from threshed crop material, the infeed section defining an infeed axis, the threshing section defining a threshing axis and the separating section defining a separating axis;

an axial rotor located in the rotor housing having an axial rotor axis, the rotor is provided with crop engaging assemblies for engaging crop material passing through the rotor housing, the rotor has an infeed portion corresponding to the infeed section of the rotor housing, a threshing portion corresponding to the threshing section of the rotor housing and a separating portion corresponding to the separating section of the rotor housing, whereby the infeed section of the rotor housing is arranged so that the infeed axis is substantially parallel to and in-line with the rotor axis, the threshing axis is parallel to and offset above the rotor axis and the separating section of the rotor housing is

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arranged so that the separating axis is parallel to and offset above the rotor axis, the threshing axis is less offset from the rotor axis than the separating axis.

5,688,171
Patent Not Issued For This Number

5,688,172
GAMING MACHINE REEL MOUNTING ASSEMBLY

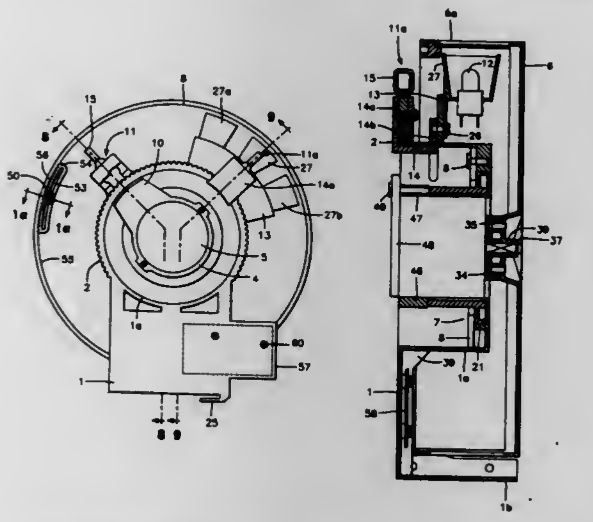
Angel Lorenzo Regidor, Sant Climent de Llobregat, Spain, assignor to Industrias Lorenzo, S.A., Sant Climent de Llobregat, Spain

Filed Nov. 17, 1995, Ser. No. 560,488

Claims priority, application Spain, Nov. 18, 1994, 9402370

Int. Cl.^{6} G07F *17/34*

U.S. Cl. 463—20 **12 Claims**



1. A mounting assembly for reels of gaming machines whose reels bear on their edge around their periphery a translucent strip carrying various symbols and are driven by a driving motor such as a stepper motor which is angularly adjustable with respect to said reel, integrating illumination lamps within said reel which are also positionally adjustable with respect to said reel and are provided to illuminate a given number of symbols, said reel comprising:

a mounting including a hollow cylinder which has its axis in a horizontal position, is concentrically placed within said reel and has its bases at least partially open;

inside said hollow cylinder, a holder housing said motor provided to drive said reel;

first means to angularly adjust the position of said motor holder with respect to said hollow cylinder of said mounting, said means being apt to be clamped on a peripheral toothing of said hollow cylinder, the adjustment to be carried out with said means being independent from that of said illumination lamps;

a lampshade holder to hold lampshades housing said illumination lamps placed within reel, and

second means to adjust the position of said lampshade holder, said adjustment being independent from that of said motor holder, said second means being apt to be clamped on a peripheral toothing of said hollow cylinder.

5,688,173
INFORMATION STORAGE MEDIUM AND ELECTRONIC DEVICE USING THE SAME

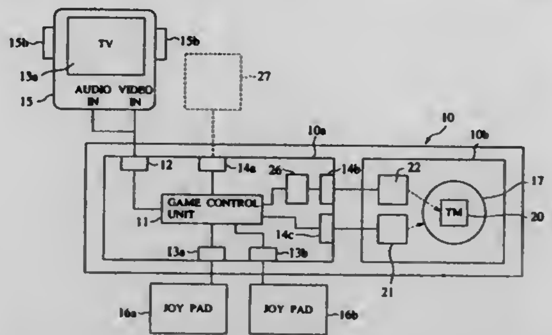
Atsushi Kitahara, and Hidetaka Owaki, both of Tokyo, Japan, assignors to Sega Enterprises, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 220,652, Mar. 31, 1994, Pat. No. 5,460,374, and Ser. No. 374,562, Mar. 30, 1995. This application May 12, 1995, Ser. No. 440,351

Claims priority, application Japan, Jul. 28, 1984, 6-01243; Mar. 31, 1993, 5-74571; Jul. 28, 1993, 5-185740

Int. Cl.^{6} A63F *5/24*

U.S. Cl. 463—29 **3 Claims**



1. A combination comprising a storage means for storing a game-program and an electronic apparatus for executing a game,

said storage means having a predetermined area with a propriety image indication formed thereon so as to be visually recognizable, said storage means being a CD-ROM with said predetermined area being defined within or on a surface of said CD-ROM, and

said electronic apparatus comprising:

a loading portion to which said CD-ROM is detachably loaded,

an optical image detecting means for optically detecting said predetermined area and generating a signal indicative of the optically detected image when said CD-ROM is loaded into said loading portion;

a comparison unit including means which stores a reference signal indicative of said proprietary image indication, means for comparing said signal indicative of the optically detected image with said reference signal, and means for generating an agreement signal when said signal indicative of the optically detected image agrees with said reference signal;

a game control unit for executing a game; and means for transmitting said game program from said storage means to said game control unit in response to said agreement signal.

5,688,174
MULTIPLAYER INTERACTIVE VIDEO GAMING DEVICE

Julian J. Kennedy, 4624 Eyerly St., North Myrtle Beach, S.C.

Filed Oct. 6, 1995, Ser. No. 540,328

Int. Cl.^{6} A63F *9/00*

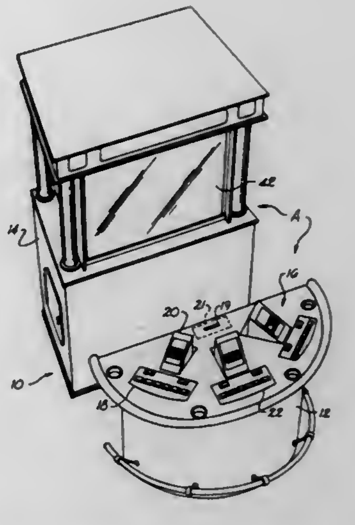
U.S. Cl. 463—37 **6 Claims**

1. A multiplayer interactive video gaming device, said device comprising:

a personal computer assembly including an input/output system, a keyboard port, and a game processor device for executing a video gaming program responsively to input data, said game processor device configured to receive input data via said input/output system from said keyboard port;

a plurality of spatially separate player stations, each said player station including at least one data input device configured to output a player input signal responsive to player activation; and

an interface assembly in operative communication with said keyboard port and with more than one of said player stations, said interface assembly including an interface processor device configured to receive said player input signals and to output interface signals to said keyboard port, said interface signals corresponding to particular said data input devices,



wherein each said player station includes a currency acceptor configured to accept currency from a player at the corresponding player station for wagering purposes and to output a currency input signal corresponding to an amount of currency accepted, wherein said interface assembly is configured to receive said currency input signals and to output corresponding currency output signals, and wherein said game processor device is configured to receive said currency output signals via said keyboard port and said input/output system.

5,688,175
GAME MACHINE

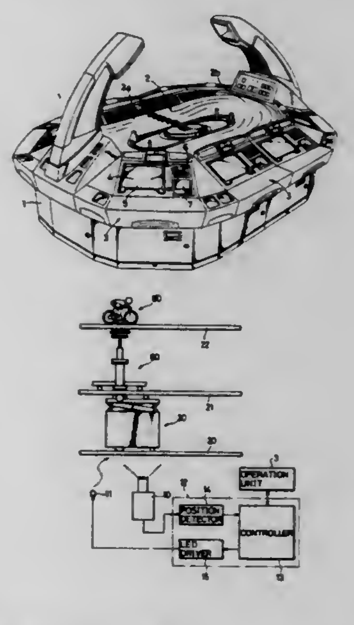
Kazuhito Matsuura, Komae, and Yuichiro Sagawa, Yamato, both of Japan, assignors to Konami Co., Ltd., Hyogo-ken, Japan

Filed Feb. 21, 1996, Ser. No. 604,516

Claims priority, application Japan, Feb. 21, 1995, 7-055227

Int. Cl.^{6} A63H *18/14*

U.S. Cl. 463—61 **32 Claims**



1. A game machine comprising:

a running body which is movable on a support path;

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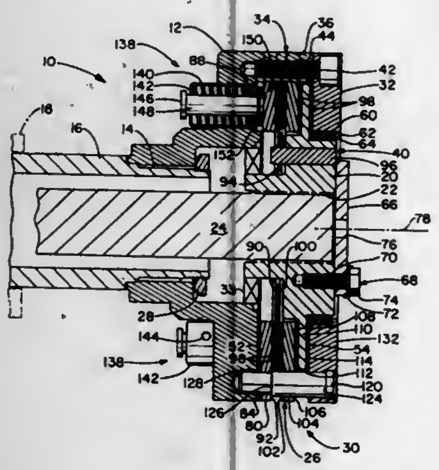
a movable object which is movable as the running body moves and which runs on a running path, the running path overlying the support path and overlying the running body;
one of the movable object and the running body carrying a magnetic force generating member and the other carrying magnetic body;
the running path being so formed as to transmit a magnetic force from the magnetic force generating member;
the magnetic force generating member and the magnetic body being directed to each other with the running path therebetween; and
the running body carrying a position adjustment device which moves the magnetic force generating member of the magnetic body along the running path.

5,688,176
MULTIPLE DISK TORQUE LIMITER FOR HOLLOW SHAFT MOTORS

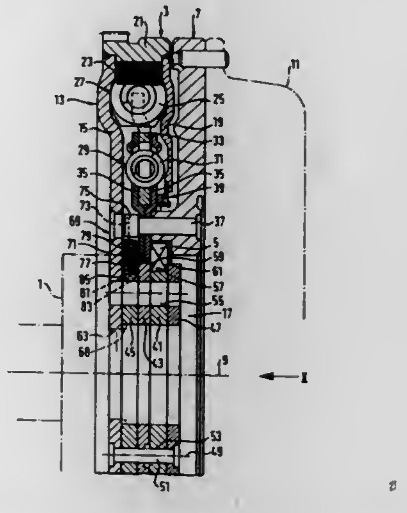
David C. Heidenreich, Akron, and Keith A. Nichols, North Canton, both of Ohio, assignors to Power Transmission Technology, Inc., Sharon Center, Ohio
Filed Jun. 12, 1995, Ser. No. 489,695
Int. Cl.^{6} F16D *7/02*
U.S. Cl. 464—48 **27 Claims**



1. A torque limiting clutch assembly for use with hollow-shafted motors, said clutch assembly: comprising:
an input hub anchored to a hollow-shafted motor;
a back plate maintained in a fixed spaced relationship with said input hub;
a plurality of friction disks interleaved with at least one separator plate between said input hub and said back plate;
a pressure plate interposed between said input hub and said interleaved friction disks and at least one separator plate;
spring means operatively interposed between said input hub and said pressure plate for urging said interleaved friction disks and at least one separator plate into frictional engagement with each other;
an output hub operatively connected to said friction disks; and,
a bearing interposed between said output hub and said back plate.

5,688,177
TRANSMISSION SYSTEM FOR A MOTOR VEHICLE, THE TRANSMISSION SYSTEM HAVING A FLYWHEEL WITH TWO CENTRIFUGAL MASSES

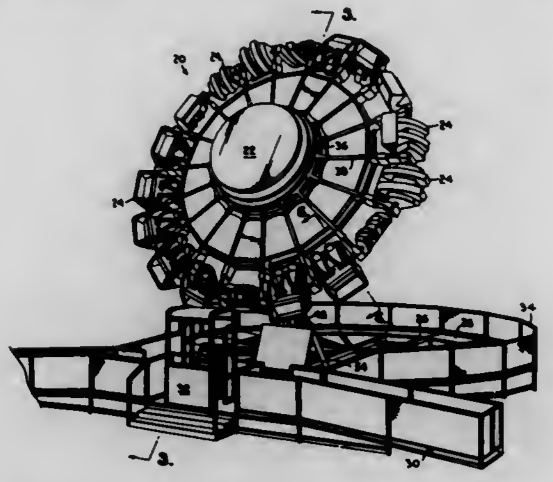
Joachim Lindner, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany
Filed Dec. 6, 1995, Ser. No. 568,414
Claims priority, application Germany, Dec. 7, 1994, 44 43 453.7
Int. Cl.^{6} F16F *15/16*
U.S. Cl. 464—68 **19 Claims**



1. A flywheel assembly for a motor vehicle for transmitting mechanical rotary power from an internal combustion engine to a transmission, said flywheel assembly comprising:
a first flywheel portion, said first flywheel portion having an axis of rotation and defining an axial direction parallel to said axis of rotation;
said first flywheel portion comprising means for fastening said first flywheel portion to a crankshaft of an internal combustion engine;
a second flywheel portion disposed adjacent said first flywheel portion, said second flywheel portion being rotatable with respect to said first flywheel portion;
bearing means for guiding said second flywheel portion with respect to said first flywheel portion;
means for mounting said bearing means;
means for fastening said mounting means to said first flywheel portion;
said mounting means comprising:
a first neck part;
a second neck part disposed adjacent said first neck part, said second neck part comprising a seat surface for said bearing means; and
said first neck part comprising a portion extending radially outwardly beyond said seat surface of said second neck part and forming a stop shoulder for said bearing means;
means for centering said mounting means in a radial direction with respect to said first flywheel portion and for centering said first neck part and said second neck part with respect to one another;
said second neck part having a first side facing said first flywheel portion and a second side facing away from said first side, said first neck part being disposed adjacent said first side of said second neck part;
said mounting means further comprising a third neck part disposed axially between said first flywheel portion and said first neck part; and
said centering means centering said first neck part, said second neck part, and said third neck part with respect to one another.

5,688,178
AMUSEMENT RIDE

Michael W. Emrie, Andover, Kans., assignor to Chance Industries, Inc., Wichita, Kans.
Filed Feb. 6, 1996, Ser. No. 597,141
Int. Cl.^{6} A63G *1/24*
U.S. Cl. 472—31 **7 Claims**

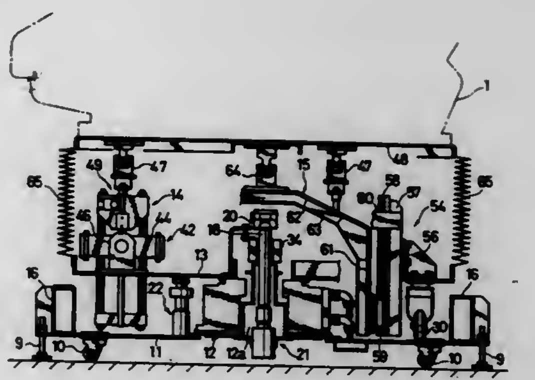


1. An amusement ride comprising:
a base;
a boom coupled with the base at one end and moveable at the other end between a lowered position and an elevated position;
means coupled with the boom for moving the boom between the lowered and elevated positions:
a rotatable top mounted at said other end of the boom, said top being mounted for tilting movement between a generally horizontal position and a position tilted from the horizontal when said boom is in said elevated position;
a drive mechanism for causing rotation of said top;
a tilting mechanism coupled with the boom and the top and operable to maintain the top in said generally horizontal position while the boom is moving between the lowered and elevated positions and for causing said tilting of the top to said position tilted from the horizontal when the boom is in said elevated position; and
a plurality of passenger seats mounted at circumferentially spaced apart positions on said top and rotatable with said top in a closed loop, each of said passenger seats being mounted for rotation about axes which are tangential to and coplanar with the loop.

5,688,179
APPARATUS FOR SIMULATIVELY MOVING A PLAYING BOX OF A SIMULATION GAME MACHINE

Toshimitsu Ohishi, Kobe, Japan, assignor to Konami Co., Ltd., Hyogo-ken, Japan
Filed Aug. 14, 1995, Ser. No. 514,635
Claims priority, application Japan, Aug. 17, 1994, 6-193222
Int. Cl.^{6} A63G *31/16*
U.S. Cl. 472—59 **10 Claims**

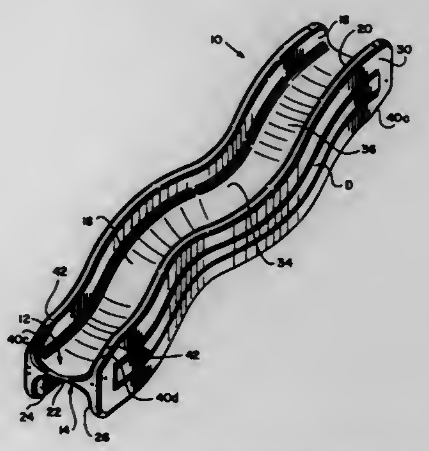
1. A simulative moving apparatus for simulatively moving a playing box of a simulation game machine, comprising:
a supporting frame slidable in a vertical direction and having a connection portion adapted to be swingably connected to a center portion of a horizontal plane member of the playing box:
a plurality of elevating cylinders for moving the playing box up and down, each elevating cylinder having a main body and a piston rod, a free end of the piston rod being adapted to be swingably connected to an end portion of the horizontal plane member of the playing box; and
a cylinder support mechanism including:



a first support member having a first pivotal axis perpendicularly intersecting an axis of the elevating cylinder, the first support member supporting the elevating cylinder in such a manner that the elevating cylinder is swingable about the first pivotal axis; and
a second support member having a second pivotal axis perpendicularly intersecting the first
pivotal axis of the first support member and the axis of the elevating cylinder in such a manner that the first support member is swingable about the second pivotal axis.

5,688,180
TWO-SURFACE, REVERSIBLE SLIDE

Ross D. Siragusa, Jr.; Wesley D. Sutton, both of Fort Payne, and Brian Henry, Rainsville, all of Ala., assignors to Gametime, Inc., Ft. Payne, Ala.
Filed Aug. 14, 1996, Ser. No. 696,613
Int. Cl.^{6} A63G *21/00*
U.S. Cl. 472—116 **10 Claims**



1. A molded, two-surface, reversible slide, comprising:
a first, elongated sliding surface, said first surface having a bottom portion defining a generally, concave cross-sectional shape, and being elongated in a direction transverse to said concave cross-section, said first surface having a pair of side walls extending from said bottom portion; and
a second, elongated sliding surface, said second surface having a bottom portion defining a generally, concave cross-sectional shape, and being elongated in a direction transverse to said concave cross-section, said second surface having a pair of side walls extending from said bottom portion,
wherein said first and second sliding surfaces are in a back-to-back relation with one another, and wherein each of said side walls of said first surface is formed contiguous with a respective one of said side walls of said second sliding surface, defining first and second outer walls.

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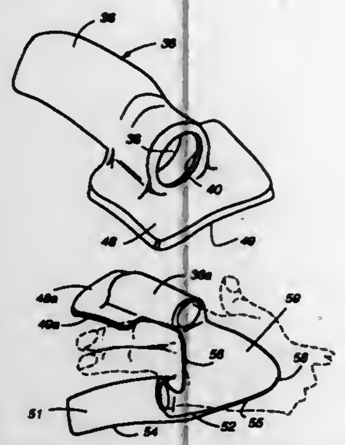
5,688,181
BOWLING AID

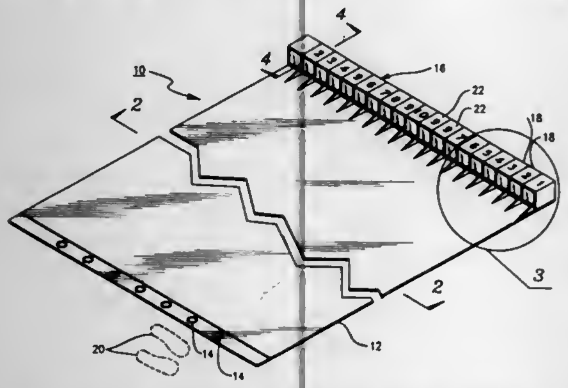
David M. Albert, 8448 Colonial Dr., Littleton, Colo. 80124
Filed Dec. 11, 1995, Ser. No. 571,094
Int. Cl.^{6} A61F *5/04*
U.S. Cl. 473—61 **27 Claims**



1. A bowling aid for placement on a finger of a bowler's hand for enhancing a bowler's control of a bowling ball, a bowling ball having a spherical outer surface, said bowling aid comprising:
- a first sheath defining a bore for snugly receiving a bowler's finger;
- a plate attached to a free end of said sheath and extending outwardly from said sheath, said sheath and said plate having a lower surface shaped to conform to and engage an outer surface of a bowling ball when pressed against the ball by the bowler's finger.

5,688,182
MULTIPLE COMPARTMENT TARGET PUTTING GAME

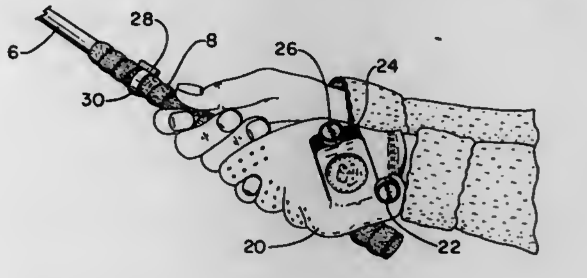
Phillip H. Hill, Sr., 19560 Afton Rd., Detroit, Mich. 48203
Filed Oct. 2, 1996, Ser. No. 725,288
Int. Cl.^{6} A63B *69/36*
U.S. Cl. 473—185 **1 Claim**



1. A multiple compartment target putting game comprising:
- an elongated flexible mat positionable upon a support surface, the mat being fabricated of a synthetic grass, the mat having spaced and parallel front and rear edges, the flexible mat is shaped so as to define a plurality of ball detents integrally directed thereinto extending in a linear array proximal to the front edge of the mat;
- a target mounted to a rear edge of the flexible mat in a spaced relationship relative to the front edge, the target including a plurality of adjacent compartments which extend in a substantially parallel orientation relative to one another, each of the compartments dimensioned for receiving a single golf ball therein, each of the compartments includes numerical indicia printed thereon assigning a predetermined point value to each of the respective compartments, the target comprises an elongated top wall extending in a substantially spaced and parallel orientation relative to the rear edge of the flexible mat; spaced and parallel end walls projecting substantially orthogonally between the flexible mat and opposed transverse end edges of the top wall to support the top wall in a spaced and parallel orientation relative to the flexible mat; a plurality of dividing walls extending substantially orthogonally between the flexible mat and the top wall, the dividing walls being spaced an equal distance apart and oriented so as to extend parallel to one another so as to define a plurality of compartments of the target, the target further comprises a plurality of triangular guide plates having planar side surfaces, each guide plate projecting from an individual one of the dividing walls and extending onto the elongated flexible mat such that a pair of the triangular guide plates resides on opposed sides of each of the compartments, the target further comprises a plurality of retention ramps each extending between the spaced guide plates on opposed sides of an individual one of the compartments, the numerical indicia is of a first value proximal to the end walls of the target, and increases in equal incremental steps to a second value proximal to a center of the target, wherein the second value is substantially greater than the first value.

5,688,183
VELOCITY MONITORING SYSTEM FOR GOLF CLUBS

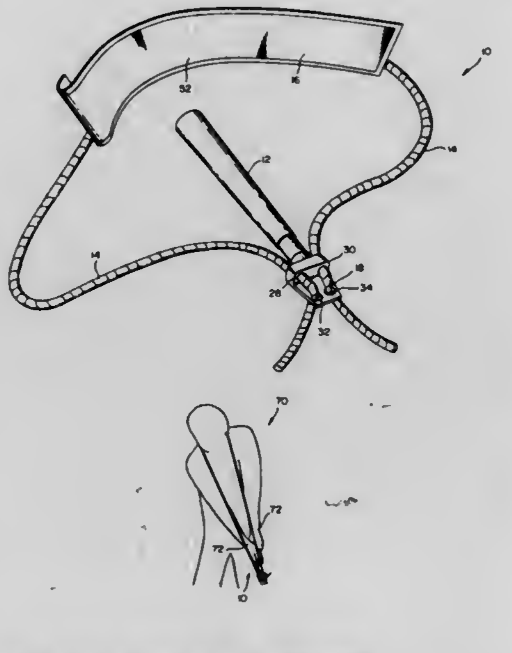
Joseph Sabatino, 1821 Saxon La., Maple Glen, Pa. 19002; Adelbert M. Gillen, 1 Cornwell Dr., Solebury, Pa. 18938, and Amir Makki, 2500 Belmont Ave., Apartment A409, Philadelphia, Pa. 19131
Continuation of Ser. No. 887,020, May 22, 1992, abandoned. This application Mar. 21, 1995, Ser. No. 409,883
Int. Cl.^{6} A63B *69/36*
U.S. Cl. 473—212 **6 Claims**



1. Apparatus for determining the velocity in the Z-plane of a golf club swung by a golfer, said club having a club head and a grip interconnected by a shaft, at the time of club head impact with a golf ball, comprising:
- at least one acceleration sensor having an output responsive to its acceleration, said output being computed by a measurement taken before an impact time of the club head with the golf ball, said impact of said club head with said golf ball generating a noise reading which is used to determine a time of impact,
- a means for detachably securing said sensor to the hands or wrists of said golfer, to a golf gove worn by said golfer, to said grip, or to said shaft adjacent to said grip, and arranged to measure radial acceleration in the Z-plane; and
- a means utilizing the sensor output for computing and displaying an output representing said club head impact velocity based upon said sensor output, said means defining R_h as the radius of the club head from the center of rotation C, defining R_s as the radius of the sensor from C, and A_s as the output from the sensor, whereby the angular velocity of the club head is ω and is determined by the formula $\omega=\sqrt{(A_s/R_s)}$, and the speed of the club head (V_h) is determined by the formula $V_h=\omega R_h=(R_h/\sqrt{R_s})\sqrt{A_s}$, and V_h is displayed as the sensor output.

5,688,184
GOLF SWING TRAINER

Dennis Neal Johnson, Federal Way, Wash., assignor to Trio Johnson, Inc., Federal Way, Wash.
Filed Jul. 16, 1996, Ser. No. 680,861
Int. Cl.^{6} A63B *69/36*
U.S. Cl. 473—229 **7 Claims**



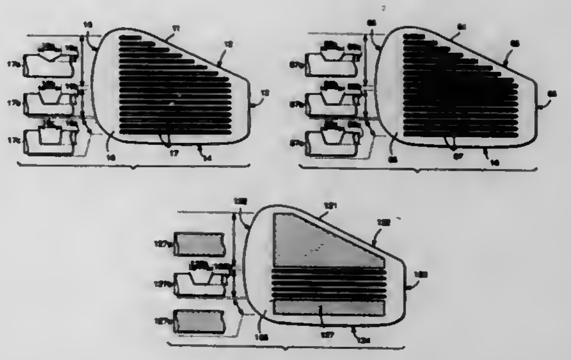
1. A golf swing training device, comprising:
- a grip generally in the form of a golf club grip, and
- an elastic cord loop attached to a lower end of the grip, the elastic cord loop having sufficient flexibility and length to extend around a golfer's neck, while the grip is held by the golfer's hand in an address position with the lower end of the grip pointing downwardly away from the golfer,
- the elastic cord loop also having sufficient tension, which the golfer's hands must overcome as the device is utilized to simulate wrist action during a golf swing.

5,688,185

Patent Not Issued For This Number

5,688,186
GOLF CLUB FACE

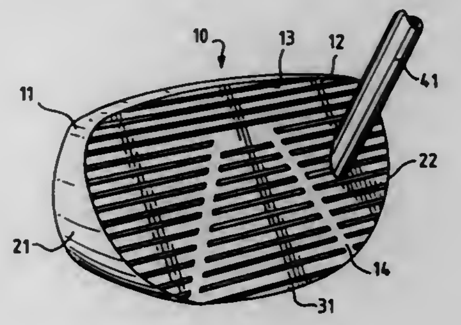
Richard A. Michaels, 1845 Twin Oaks Dr., Girard, Ohio 44420, and John VonSchwartz, 12951 Gladstone Rd., N. Jackson, Ohio 44451
Filed Apr. 2, 1996, Ser. No. 626,680
Int. Cl.^{6} A63B *53/04*
U.S. Cl. 473—290 **66 Claims**



1. A golf club head, comprising:
- a club face having upper, lower and middle regions of grooves, the regions oriented relative to each other in a generally vertical direction of the club head, each of the three regions having grooves with different cross-sectional configurations.

5,688,187
GOLF IRONS

Ross A. Duncan, 17 Hi Luci, Ave., Mount Prospect, Ill. 60056
Filed Jan. 10, 1997, Ser. No. 781,238
Int. Cl.^{6} A63B *53/04;53/02*
U.S. Cl. 473—305 **7 Claims**



1. A golf iron comprising:
- a club head, the club head having a face and a back, the face and the back being bounded by a common periphery, the periphery comprising a heel, a sole, a top line, and a toe, the face being generally in a plane, the plane being at an acute angle relative to a vertical plane when the club head is in normal address position;
- a socket in the club head, the socket opening out of the face, the socket extending toward the back; and
- a shaft, the shaft being attached to the club head directly through the face into the socket, the shaft being generally straight, and the shaft having an axis centered in the shaft and extending fully along the shaft.

5,688,188
GOLF CLUB

Chris Chappell, Westminster, S.C., assignor to Dunlop Maxfli Sports, Corp., Greenville, S.C.
Filed Aug. 29, 1996, Ser. No. 704,969
Int. Cl.^{6} A63B *53/02*
U.S. Cl. 473—309 **12 Claims**

1. A golf club comprising a metal head provided with a hosel having an upper end and an axial bore, said bore having a major diameter comprising a chamfered upper portion and a minor diameter remaining portion, said minor diameter portion being at least three times the length of said major diameter portion;
- a shaft having an end diameter substantially conforming with said minor diameter received in said bore of said hosel along substantially the entire length of said major and minor diameter portions;

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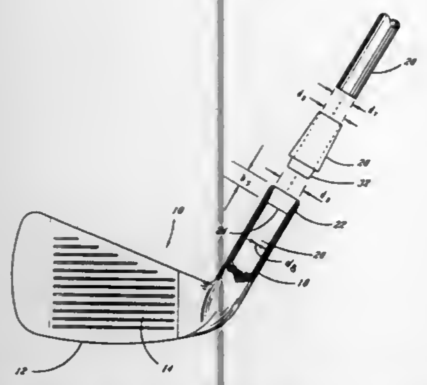


a ferrule having an axial bore, a tapered upper body terminating with a shoulder and a tapered sleeve extending downwardly away from said shoulder with said upper body being at least five times the length of said tapered sleeve, said ferrule being received about said shaft adjacent said end and secured in position with a press fit with said sleeve being mated with said chamfered major portion of said bore and said shoulder being in engagement with said upper end of said hosel, said ferrule being formed of a thermoplastic material having a modulus of elasticity of between 70 and 180 PSI; whereby,

said sleeve and said shoulder of said ferrule along with said chamfered major portion provide an extended cushion and reinforcement area providing a smooth merge between said shaft and said hosel adjacent the upper end of said hosel.

5,688,189

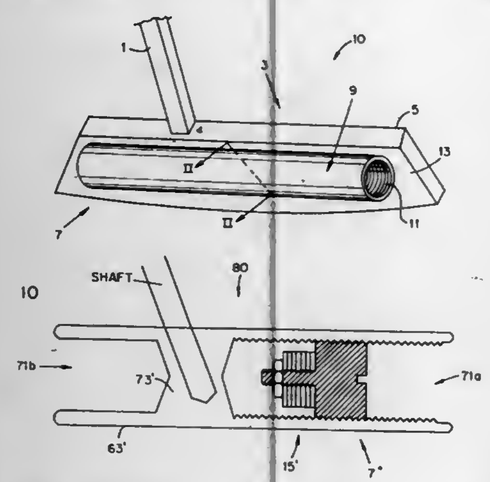
GOLF PUTTER

Bertram Alvin Bland, #24 Ambassadors Ct., Fairways, Maraval, Trinidad/Tobago

Filed Nov. 3, 1995, Ser. No. 552,414

Int. Cl.^{6} A63E ***53/04***

U.S. Cl. 473—314 **2 Claims**



1. A putter comprising
a) a shaft;
b) a putter head attached to one end of the shaft, said putter head having a flat putting surface and a sweet spot adjuster integrally formed with said putter head, said sweet spot adjuster comprising a cylindrical threaded bore extending through a portion of said putter head and being aligned parallel to said flat putting surface and a unitary threaded weight assembly sized to be threaded into said cylindrical threaded bore, said cylindrical threaded bore positioned in said putter head so that an axis of said shaft where said shaft meets said putter head intersects said cylindrical threaded bore, said unitary threaded weight assembly being movable along an axis of said cylindrical threaded bore to fine tune the location of a sweet spot in said putter head and further comprising a slotted and threaded plug having a threaded leg extending from one side thereof, at least one annular weight mounted on said threaded leg and a fastener securing said annular weight to said threaded plug.

5,688,190

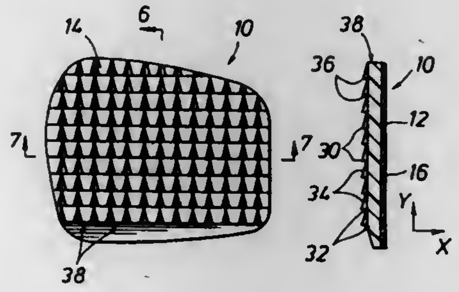
REMOVABLE ADHESIVE BACKED PADS FOR GOLF CLUB STRIKING SURFACES

Michael L. Rowland, and David L. Ballard, both of Kingwood, Tex., assignors to The Spin Doctor, Ltd., Kingwood, Tex.

Filed Feb. 7, 1996, Ser. No. 597,974

Int. Cl.^{6} A63B ***53/04***

U.S. Cl. 473—330 **5 Claims**



1. A device for use on a golf club having a substantially planer club face surface for striking a golf ball comprising a two-sided removable pad, said pad having a ball contact surface on a first side which includes a plurality of ribs to impart back spin to the struck golf ball, each said rib having a multitude of peaks and valleys each said valley connecting to an adjacent peak by an inclined surface and to another adjacent peak by a horizontal surface, and said pad having an adhesive coating on a second side for temporary application to the golf club surface.

5,688,191

MULTILAYER GOLF BALL

Christopher Cavallaro, Attleboro; Murali Rajagopslan, South Darmouth; Herbert C. Boehm, Norwell, and Kevin M. Harris, New Bedford, all of Mass., assignors to Acushnet Company, Fairhaven, Mass.

Filed Jun. 7, 1995, Ser. No. 482,522

Int. Cl.^{6} A63B ***37/12;37/06***

U.S. Cl. 473—373 **10 Claims**

1. A golf ball comprising:
(a) a core;
(b) a cover layer; and
(c) a mantle layer disposed between the core and the cover;
wherein the cover layer consists essentially of one or more ionomer resins, said resin comprising a copolymer of 16 to 35% by weight of an acrylic acid or methacrylic acid and 65 to 84% by weight of ethylene, wherein about 10 to about 90% of the carboxyl groups of the copolymer are neutralized with a metal ion; and
wherein the mantle layer comprises a thermoplastic material, said thermoplastic material consisting essentially of polyetherester block copolymer.

5,688,192

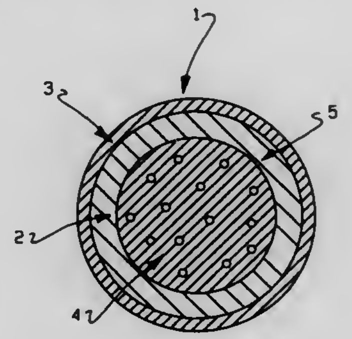
SOLID CONSTRUCTION GOLF BALL INCORPORATING COMPRESSIBLE MATERIALS

Steven Aoyama, Marion, Mass., assignor to Acushnet Company, Fairhaven, Mass.

Filed Jun. 7, 1995, Ser. No. 482,518

Int. Cl.^{6} A63B ***37/06***

U.S. Cl. 473—374 **12 Claims**



1. A finished regulation long range, solid construction, multipiece golf ball comprising a discrete cover and a core, said core comprising an inner and an outer portion, said inner portion having a plurality of gas containing compressible cells dispersed therein.

5,688,193

GOLF BALL AND MOLD THEREFOR

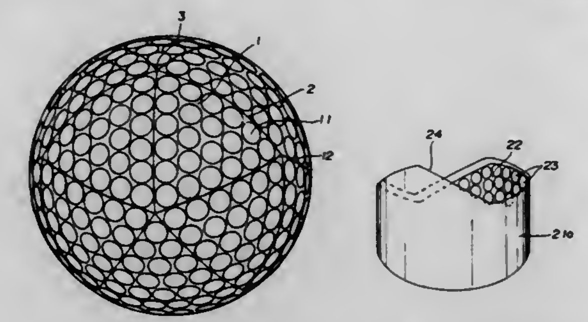
Atuki Kasasima; Keisuke Ihara; Hirotaka Shimosaka, and Michio Inoue, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1996, Ser. No. 680,839

Claims priority, application Japan, Jul. 17, 1995, 7-202816

Int. Cl.^{6} A63B ***37/14***

U.S. Cl. 473—379 **4 Claims**



1. In a golf ball of the icosahedral dimple arrangement pattern having twenty identical phantom regular triangles projected on its spherical surface, the improvement wherein the dimples are arranged within the triangles such that no dimple may intersect the sides of each said triangle and a great circle which does not intersect the dimples at all may not be depicted.

5,688,194

GOLF BALL DIMPLE CONFIGURATION PROCESS

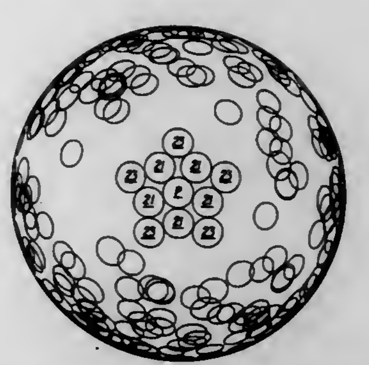
Joseph F. Stiefel, 158 Laurel La., Ludlow, Mass. 01056, and Donald J. Bunger, 38 Dellwood Dr., Waterbury, Conn. 06708

Filed Sep. 13, 1995, Ser. No. 527,392

Int. Cl.^{6} A63B ***37/14***

U.S. Cl. 473—383 **7 Claims**

1. A method of generating a dimple configuration on the surface of a golf ball comprising
placing a predetermined number of dimples in helterskelter locations on the surface of said golf ball;



determining the aggregate overlap for each dimple;
relocating the center of each of said dimples so as to provide reduced dimple overlap of said predetermined number of dimples; and
repeating said determining, and relocating steps until dimple overlap is reduced to a predetermined amount.

5,688,195

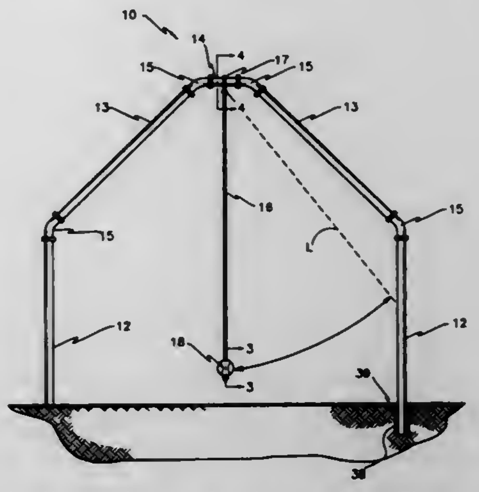
TETHERED BALL AND SUPPORT STRUCTURE

Frank J. Caso, 11 Victor Ave., Eatontown, N.J. 07724

Continuation-in-part of Ser. No. 474,676, Jun. 7, 1995, Pat. No. 5,542,679. This application Jun. 17, 1996, Ser. No. 670,243

Int. Cl.^{6} A63B ***69/00***

U.S. Cl. 473—429 **11 Claims**



1. An outdoor support means for a sporting appliance comprising;
two vertical sleeve means imbedded in the ground at positions horizontally separated from one another;
two vertical support posts having a lower end slidably receivable in said vertical sleeve means;
lower elbow joints fixed on an upper end of said vertical support posts;
two angled support posts attached at their lower ends to said lower elbow joints;
upper elbow joints fixed on an upper end of said angled support posts;
a horizontal support post fixed at each end to said upper elbow joints; wherein
said vertical posts, said angled posts, and said horizontal post lie substantially in a common plane forming an overhead arch and said overhead arch is supported in a vertical position from the ground when said vertical posts are inserted into said sleeves and said overhead arch is lowerable to the ground when said vertical posts are lifted from said sleeves
said outdoor support means, further comprising;

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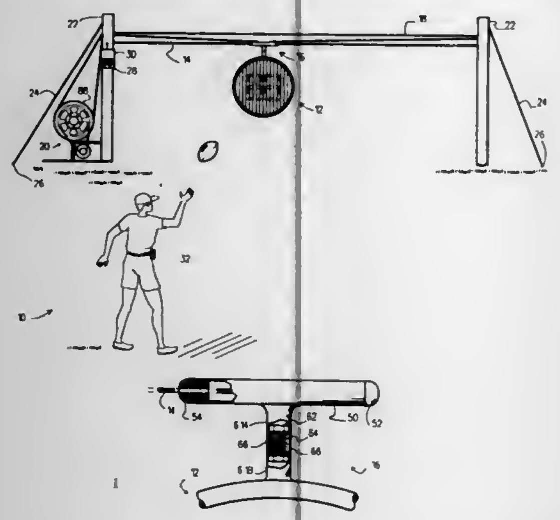
a suspended tether rotatably supported at its upper end on said horizontal post;

a ball attached to a lower end of said tether, wherein

said arch, suspended tether, and ball comprise a batting aid whereby a user may practice batting said ball without retrieving the ball after each time it is batted.

5,688,196
REMOTE CONTROLLED MOVING TARGET FOR PASSING PRACTICE
Kent D. O'Neil, P.O. Box T, Akron, Colo. 80720
Filed Jun. 8, 1995, Ser. No. 482,676
Int. Cl.⁶ A63B *67/00*
U.S. Cl. 473—439 **11 Claims**

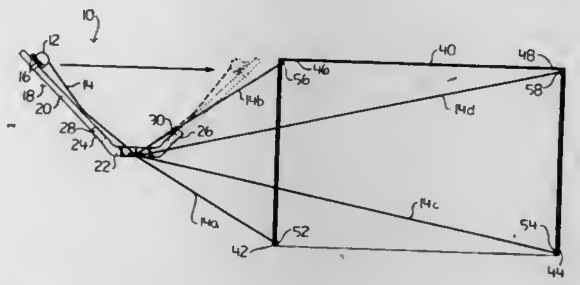


1. A device for moving a target having a surface to be aimed at by an individual throwing an object at the target surface, the device comprising:

a support cable and means attaching a target to said support cable, said means attaching a target being adjustable on said support cable and having means for manual adjustment of said target surface to a desired angle relative to said support cable; means for allowing said means attaching to be pulled along said support cable; said means for manual adjustment comprising a stem portion connecting said target to said means attaching;

said stem comprising: a hollow upper stem portion attached to said support means, and a hollow lower stem portion attached to the target; spring means biasing said hollow lower stem portion against said hollow upper stem portion, so that adjustments of said angle of said target relative to said support cable means can be made by rotating said hollow lower stem portion relative to said hollow upper stem portion and so that said spring means will bias said hollow lower stem portion against said hollow upper stem portion so that a relative position between said lower stem portion and said upper stem portion is maintained when manually set; and means for moving said means attaching along said support cable, so that an individual may adjust said angle of said target relative to said support cable before said target is transported along said support cable, and so that said target surface will be at an orientation normal to a trajectory of an object thrown at said target when said target is at at least one position along the support cable.

5,688,197
METHOD AND APPARATUS FOR TRAINING GOALKEEPERS
Peter Hubertbus Peeters, R.R. #4, Edmonton, Alberta, Canada, T5E 5S7, and Richard St. Croix, 27 Brigantine Bay, Winnipeg, Manitoba, Canada, R3P 1B5
Filed Aug. 9, 1996, Ser. No. 694,662
Int. Cl.⁶ A63B *69/00*
U.S. Cl. 493—446 **11 Claims**



1. An apparatus for training goalkeepers, comprising, in combination:

a reel containing a quantity of line, the reel including means for feeding or retracting line;

a reel support member to which the reel is mounted, a reel support line guide positioned on the reel support, a line anchor positioned on the reel support;

a goal having a first lower corner and a second lower corner, the goal having a first lower corner line guide positioned in the first lower corner and a second lower corner line guide positioned in the second lower corner;

a remote end of the line being fed from the reel through the reel support line guide, the first lower corner line guide and the second lower corner line guide and back to the reel support line guide with the remote end of the line being secured to the line anchor, such that the line provides an outline of a shooting zone, the shooting zone being dynamically changeable during training sessions by feeding or retracting the line from the reel.

5,688,198
DECORATIVE BASEBALL AND METHOD OF MAKING THE SAME
Dana S. Teifert, 10 Leamington Rd., Brighton, Mass. 02135, and Nicholas B. Paffett, 806 Tucker La., Hingham, Mass. 02043, assignors to Dana S. Teifert, Brighton; Nicholas B. Paffett, Hingham, and Edward D. Krent, Sharon, all of Mass.
Continuation of Ser. No. 566,399, Dec. 1, 1995, abandoned.
This application Jan. 30, 1996, Ser. No. 593,586
Int. Cl.⁶ A63B *69/00*
U.S. Cl. 473—598 **16 Claims**

1. A method for forming a decorative baseball comprising the steps of:

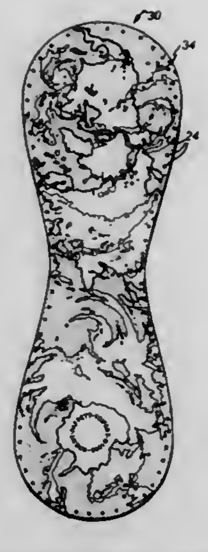
applying a graphic pattern to a conventional baseball having seams and laces at least part of the pattern crossing at least part of the seams;

cutting the laces and separating at least two material covering sections having the decorative pattern applied thereto;

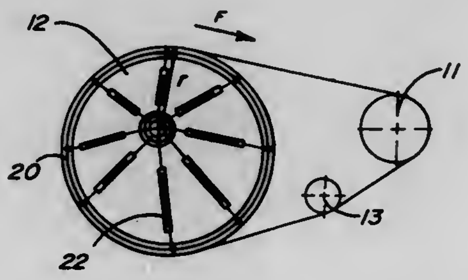
storing a decorative pattern contained on each of the two sections;

reproducing the decorative patterns on further sections; and

applying the further sections having reproduced patterns on the further sections to a core and securing the further sections to the core at seams with laces wherein the reproduced patterns are in substantial alignment with each other across the seams.



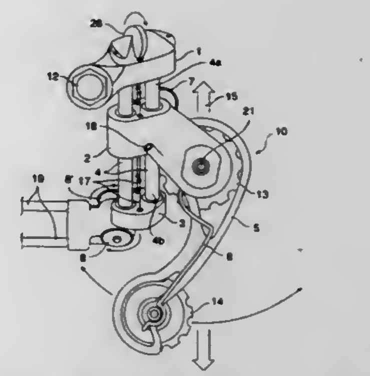
5,688,199
VARIABLE RATIO DRIVE MECHANISM
Ernest Spirig, P.O. Box 1140, CH-8640 Rapperswil, Switzerland
PCT No. PCT/EP95/00045, § 371 Date Sep. 11, 1995, § 102(e) Date Sep. 11, 1995, PCT Pub. No. WO95/18931, PCT Pub. Date Jul. 13, 1995
PCT Filed Jan. 25, 1995, Ser. No. 525,605
Claims priority, application United Kingdom, Jan. 11, 1994, 9400416
Int. Cl.⁶ F16H *9/10*
U.S. Cl. 474—49.1 **19 Claims**



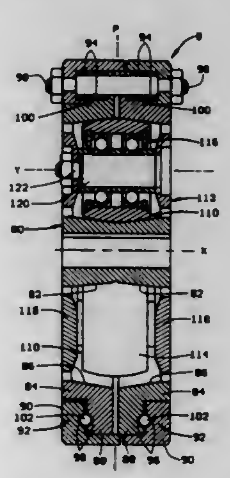
1. A variable ratio drive mechanism including at least one gear in the form of a spiral spring whose effective radius is variable in a stepless manner, wherein torque is applied to or obtained from the gear by means of a belt or chain, the belt or chain having protrusions thereon, and the spiral spring is in the form of a strap having recesses therein arranged to cooperate with said protrusions.

5,688,200
LINEAR BICYCLE DERAILLEUR
Douglas M. White, P.O. Box 395, Point Reyes, Calif. 94956
Filed Aug. 9, 1996, Ser. No. 693,647
Int. Cl.⁶ F16H *59/00*
U.S. Cl. 474—80 **7 Claims**

1. A derailleur for a bicycle for changing the speed of the bicycle, said bicycle being equipped with front and rear wheels, said rear wheel being fixedly attached to a series of parallel drive sprockets, said derailleur being controlled by a shifting mechanism, said shifting mechanism being located remote from said derailleur and being controllably attached to said derailleur by single or multiple looped control wire, said derailleur comprising an upper mount for attaching said derailleur proximate the drive sprockets of said bicycle, a pair of stationary parallel guide rods having first and second ends, said upper mount fixedly supporting said stationary guide rods at an angle between approximately 15° to 75° to horizontal, a cable housing mount fixedly attached to the second end of said guide rods, a pulley wheel assembly rotatably supporting upper and lower pulley wheels over which a drive chain is caused to pass for powering said bicycle, said pulley wheel assembly being rotatable at an axis established by the axis of said upper pulley wheel and being spring biased to take up slack in said drive chain and further being linearly slidable over said stationary guide rods in response to a change in sifter orientation and resulting movement of said looped control wire in either direction such that at any particular shift position a substantially single plane is created by a drive sprocket over which said drive chain passes and said upper and lower pulley wheels.



5,688,201
TRACTION DRIVE
Rao-Sheng Zhou, Canal Fulton, Ohio, assignor to The Timken Company, Canton, Ohio
Filed Aug. 3, 1995, Ser. No. 510,595
Int. Cl.⁶ F16H *15/48*
U.S. Cl. 475—183 **20 Claims**



1. A traction drive comprising: a cone having a pair of raceways which are located around a center axis and taper downwardly toward each other so that the raceways have their least diameters where they are closest; a pair of cups located around the cone and concentric to the cone about the center axis, each cup having a tapered raceway, with the raceway of the one cup being located opposite one raceway of the cone and the raceway of the other cup being located opposite the other raceway of the cone, the raceways of the two cups having their greatest diameters where they are closest; transfer rings located between the cone and cups and

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having peripheral surfaces which are tapered and contact the raceways of the cone and the cups; and a cage having annular end disks located beyond the ends of the transfer rings and are also located between the cone and the cups such that the end disks are exposed at the ends of the traction drive but do not project axially beyond the cone or the cups, the cage also having axles located between and attached to the disks, the axles extending through the transfer rings to establish remote axes about which the rings revolve, the cage further having bearings located within the transfer rings and around the axles to enable the transfer rings to rotate about the remote axes.

5,688,202

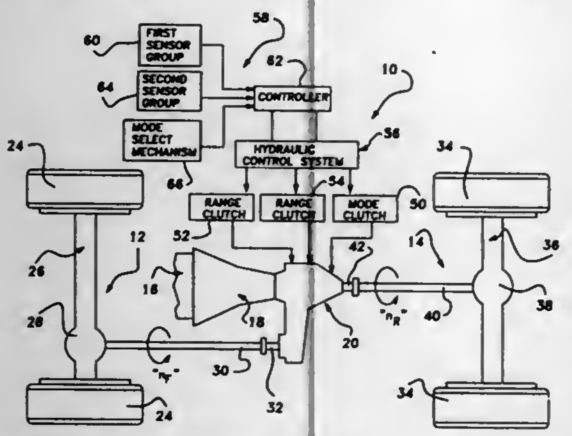
POWERSHIFT TRANSFER CASE

Thomas Bowen, Santa Rosa, Calif., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Jul. 9, 1996, Ser. No. 677,057

Int. Cl.⁶ B60K *17/348*

U.S. Cl. 475—199 **19 Claims**



1. A power transfer system for a four-wheel drive motor vehicle having a power source and front and rear drivelines, comprising:

a transfer case including a housing; an input shaft rotatably supported in said housing and driven by the power source; a front output shaft rotatably supported in said housing and coupled to the front driveline; a rear output shaft rotatably supported in said housing and coupled to the rear driveline; a quill shaft supported on said rear output shaft for rotation relative thereto; a planetary gear reduction unit operable for establishing a high-range drive mode in which said quill shaft is driven at a direct speed ratio relative to said input shaft and a low-range drive mode in which said quill shaft is driven at a reduced speed ratio relative to said input shaft, said planetary gear reduction unit having a first sun gear driven by said input shaft, a second sun gear, and a carrier assembly driving said quill shaft and having planet gears journally supported thereon intermeshed with said first and second sun gears; a first range clutch operable in an actuated mode for coupling said carrier assembly for common rotation with said input shaft and in a non-actuated mode for releasing said carrier assembly from coupled engagement with said input shaft; a second range clutch operable in an actuated mode for coupling said second sun gear to said housing to brake rotation thereof and in a non-actuated mode for releasing said second sun gear from coupled engagement with said housing; an interaxle differential interconnecting said quill shaft to said front and rear output shafts for permitting speed differentiation therebetween, said interaxle differential including a third sun gear fixed for rotation with said rear output shaft, a fourth sun gear fixed for rotation with said front output shaft, and a second carrier assembly fixed for rotation with said quill shaft and having pinion gears journally supported thereon that are meshed with said third and fourth sun gears; a mode clutch operable for controlling speed differentiation between said front and rear output shafts, said mode clutch including a set of first clutch plates supported for rotation with said front output shaft, a set of second clutch plates supported for rotation with said rear output shaft and which are alternately interleaved with said first clutch plates, a thrust mechanism movable between a first position whereat a minimum clutch engagement force is exerted on said clutch plates for permitting unrestricted speed differentiation between said front and rear output shafts and a second position whereat a maximum clutch engagement force is exerted on said clutch plates for inhibiting speed differentiation, and a biasing mechanism for normally biasing said thrust mechanism toward said first position;

sensor means for detecting dynamic and operational characteristics of the motor vehicle and generating sensor input signals indicative thereof;

a mode select mechanism for enabling a vehicle operator to select one of a full-time four-wheel high-range drive mode, a neutral mode, and a part-time four-wheel low-range drive mode, said mode select mechanism further operable for generating a mode signal indicative of the particular mode selected; and

a controller for controlling actuation of each of said first and second range clutches and said mode clutch in response to said mode signal and said sensor input signals, said controller causing said first range clutch to be shifted into its actuated mode and said second range clutch to be shifted into its non-actuated mode and thereafter modulate the position of said thrust mechanism between said first and second positions as a function of said sensor input signals when said mode signal indicates selection of said full-time four-wheel high-range drive mode, wherein said controller causes said first and second range clutches to be shifted into their respective non-actuated modes and move said thrust mechanism to said first position when said mode signal indicates selection of said neutral mode, and wherein said controller causes said first range clutch to be shifted into its non-actuated mode and said second range clutch to be shifted into its actuated mode and move said thrust mechanism to said second position when said mode signal indicates selection of said part-time four-wheel low-range drive mode.

5,688,203

PLANETARY GEAR REDUCTION STARTER

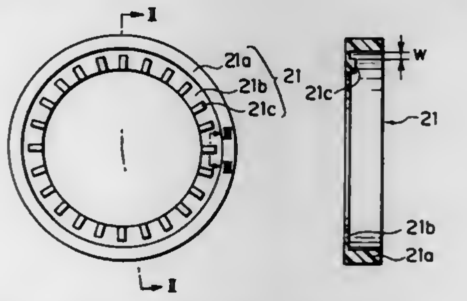
Kyohei Yamamoto; Shuzo Isozumi, and Takashi Yamamoto, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1996, Ser. No. 593,443

Claims priority, application Japan, Apr. 20, 1995, 7-095016

Int. Cl.⁶ F16H *57/08*

U.S. Cl. 475—331 **15 Claims**



1. A planetary gear reduction starter comprising:

a DC motor;

an output rotary shaft with a pinion which meshes with a ring gear of an engine;

a spur gear provided at the front of an armature rotary shaft of said DC motor;

a flange which is formed at the rear end of said output rotary shaft and which pivotally supports the front end of said armature rotary shaft;

an internal gear assembly which is fitted in the groove of a bracket to pivotally support said flange and which is provided with an internal gear on the internal peripheral surface thereof;

a plurality of planetary gears which are pivotally supported on said flange to allow engaging of said planetary gears with both said spur gear and said internal gear;

a plate located at the front end of a yoke of said DC motor; and

packing which has an annular section and a jaw which extends from one end of said annular section and which has a smaller diameter of said annular section, said annular section being fitted around the outer periphery of said internal gear assembly, said jaw being held between the end surface of said internal gear assembly and the side surface of said plate, and said jaw having at least one projection for absorbing the variations in the axial dimensions of said internal gear assembly.

5,688,204

SHIFTING DEVICE FOR A MOTOR VEHICLE CONTINUOUSLY VARIABLE TRANSMISSION

Wolfgang Runge, Ravensburg; Walter Frei, and Anton Welte, both of Friedrichshafen, all of Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

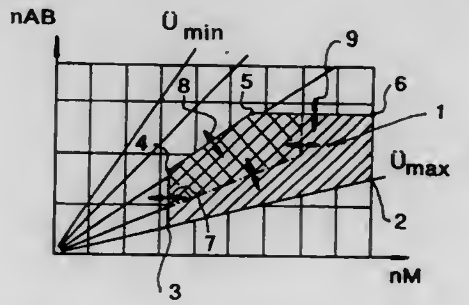
PCT No. PCT/EP94/01188, § 371 Date Oct. 19, 1995, § 102(e) Date Oct. 19, 1995, PCT Pub. No. WO94/24463, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 18, 1994, Ser. No. 537,842

Claims priority, application Germany, Apr. 20, 1993, 43 12 718.5

Int. Cl.⁶ B60K *41/12*

U.S. Cl. 477—46 **8 Claims**



1. A shifting device (**11**) for a continuously variable transmission (**10**) of a motor vehicle, said shifting device (**11**) including a manually actuatable regulating device (**15**) for, during an operating mode, automatically selecting and adjusting a ratio of said continuously variable transmission (**10**), depending on operational parameters of the motor vehicle and, during an additional operating mode, allowing manual actuation of said regulating device (**15**);

wherein said operational parameters of the motor vehicle consist of the engine speed (nM), the transmission ratio (U) and the output speed (n_{AB}) and, during said additional mode of operation, a characteristic field (**1**) is influenceable by a change of at least one individual operational parameter of the motor vehicle, and actuation of said regulating device (**15**) supplies at least one of an analog and a digital output signal to an electronic control unit (**12**) coupled to said regulating device (**15**).

5,688,205

MOTOR VEHICLE DRIVE DEVICE

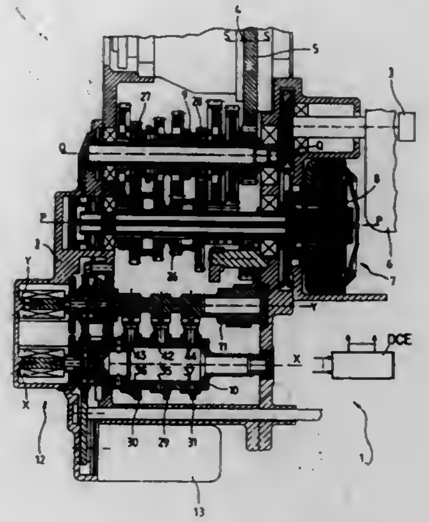
Roger Bühler, Le Locle, Switzerland, assignor to SMH Management Services AG, Biel, Switzerland

Filed Dec. 27, 1995, Ser. No. 580,963

Claims priority, application France, Dec. 28, 1994, 94 15758

Int. Cl.⁶ B60K *41/04*

U.S. Cl. 477—110 **10 Claims**



1. A motor vehicle drive device comprising:

an internal combustion drive engine whose revs can be controlled via an accelerator pedal; and

a transmission, said transmission comprising:

a gearbox,

a torque converter,

a clutch coupled between said engine and said gearbox,

said gearbox being of the type in which the shifts of the gear ratios are carried out without the aid of synchronizers, said gearbox comprising a primary shaft, a secondary shaft, sets of pinions wedged respectively on said shafts so as to be able to be selectively engaged with their respective shaft in order to assure the establishment of the gear ratios, the engaging and disengaging movements of said pinions being assured via a mechanical switching device comprising a gear ratio selector shaft having a plurality of predetermined angular positions comprising alternatively neutral positions, corresponding to disengaged positions of said pinions, and gear ratio positions corresponding to respective engaged positions of said pinions for each establishing a respective gear ratio of said gearbox, the mechanical switching device further comprising a control shaft cooperating with said selector shaft to enable the selection to be made from any previous gear ratio to any subsequent gear ratio,

and an electronic control device for said transmission,

wherein said drive device further comprises:

means for rapidly increasing the revs of said internal combustion engine independently of the control exercised via said accelerator pedal and wherein, for controlling the downshifting of said gearbox, into a lower gear ratio, said electronic control device comprises:

means for placing said selector shaft in a selected one of said neutral positions, said selected neutral position being adjacent to the lower gear ratio position,

means for temporarily actuating said means for rapidly increasing the revs,

means for monitoring said revs, and

means for preventing said selector shaft from shifting to the lower gear ratio position except when said revs reach a value compatible with said lower gear ratio.

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5,688,206

Patent Not Issued For This Number

5,688,207
CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION AND CONTROL METHOD THEREFORE

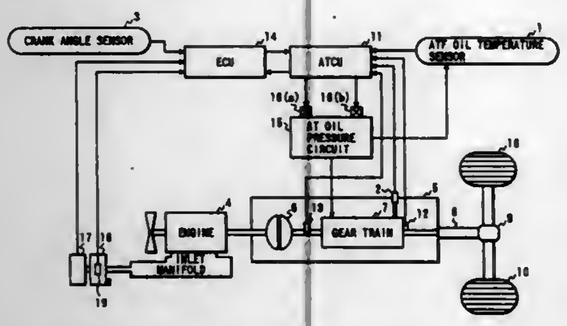
Makoto Uchida; Masahiko Ibamoto, both of Hitachinaka; Kazuhiko Sato, Hitachioota; Hiroshi Kuroiwa, Hitachi; Hiroshi Ohnishi, Hitachinaka, and Toshimichi Minowa, Toukai, all of Japan, assignors to Hitachi, Ltd., and Hitachi Automotive Engineering Co., Ltd., both of Japan

Continuation of Ser. No. 429,909, Apr. 27, 1995, Pat. No. 5,588,936. This application Oct. 2, 1996, Ser. No. 725,052

Claims priority, application Japan, Apr. 27, 1994, 6-089367; Jul. 20, 1994, 6-167704

Int. Cl.^{6} F02D *35/00;* **F16H** *61/00*

U.S. Cl. 477—155 **4 Claims**



1. A control apparatus for an automatic transmission mounted on a vehicle having a vehicle power train comprising an engine, an automatic transmission having a torque converter, and detecting means for detecting an engine rotating speed, an engine load of said vehicle power train and a vehicle speed of the vehicle, which control apparatus comprises:

characteristic memory means for storing an engine output power characteristic, torque converter characteristic and a fuel consumption characteristic; and

means for calculating a fuel consuming rate before a gear shift, and a fuel consuming rate after the gear shift assuming a throttle opening of said engine controlled to maintain an engine torque after the gear shift which is equal to engine torque before the gear shift based on said engine rotating speed, said engine load detected by said detecting means, said engine output power characteristic, said torque converter characteristic and said fuel consumption characteristic stored in said characteristic memory means; and outputting a gear shifting signal to said automatic transmission at a time when said fuel consuming rate before the gear shift becomes larger than said fuel consuming rate after the gear shift.

5,688,208
LIMB EXERCISE/THERAPY APPARATUS

David Plemmons, 19310-K One Norman Blvd., Davidson, N.C. 28036

Filed Nov. 3, 1995, Ser. No. 553,078

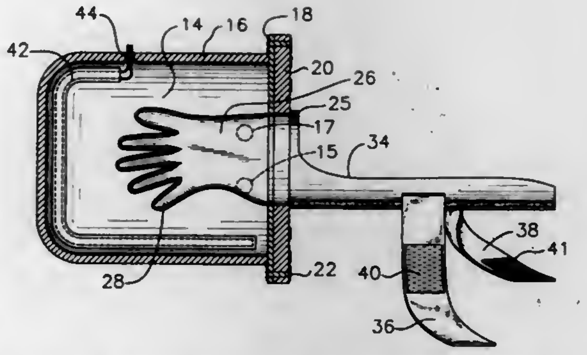
Int. Cl.^{6} A63B *21/00*

U.S. Cl. 482—44 **19 Claims**

19. A hand exercise/therapy apparatus comprising:

a sealed container having an interior space; said container having an opening therein;

a glove attached to said container only near said opening and extending from said opening into said interior space; said gloved forms an enclosed volume adapted to receive a hand; said glove permitting the hand to move freely within said interior space of said container;



a viscous material received in and substantially filling said interior space; said viscous material providing resistance to the movement of hand;

a platform extending from said opening away from said container; said platform adapted to support the user's forearm wherein a user inserts a limb into said glove and performs movements against the resistance of said viscous material while said glove protects the limb from coming into direct contact with said viscous material.

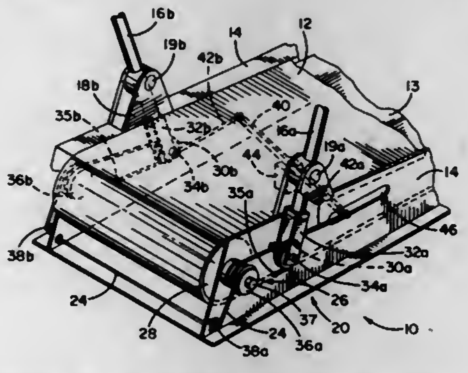
5,688,209
ARM POWERED TREADMILL

Frank R. Trulaske, St. Louis, Mo., and Daniel R. Moon, Riverside, Ill., assignors to True Fitness Technology, Inc., O'Fallon, Mo.

Filed Jan. 25, 1996, Ser. No. 591,768

Int. Cl.^{6} A63B *22/02*

U.S. Cl. 482—54 **18 Claims**



1. A treadmill for exercising the upper body and lower body of a user, comprising, a substantially stationary support frame, an endless belt longitudinally supported on the support frame, a pair of displaceable arm members disposed astride the endless belt, each of the arm members being displaceable forwardly and rearwardly relative to the frame by a reciprocating arm movement of the user, a drive roller coupled to the belt, and a transmission system linking the drive roller to the displaceable arm members such that displacement of the arm members drives the belt to rotate in one direction with respect to the support frame wherein the ratio of arm movement distance to belt movement distance is between 0.6 and 2.0.

5,688,210
SWIM-EXERCISE EQUIPMENT

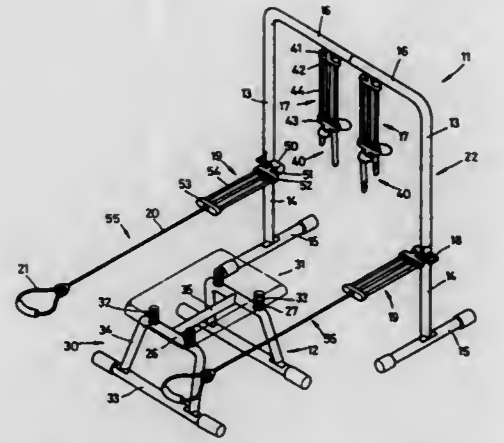
Chi-Hui Chou, P.O. Box 96-405, Taipei 10098, Taiwan

Filed Feb. 2, 1996, Ser. No. 595,622

Int. Cl.^{6} A63B *23/035*

U.S. Cl. 482—56 **15 Claims**

1. An exercise apparatus for simulating a swimming motion comprising:



a U-shaped frame having two vertical legs, each having a lower end and an upper lateral rod;

a pair of bottom rods, one rod connected to a respective lower end of the vertical legs to form feet upon which the frame is supported on a supporting surface;

a pair of connecting members, each connecting member mounted to a respective one of the vertical legs on an inside surface;

two arm dampers, each mounted horizontally to a respective one of the connecting members at a first end, each said arm damper includes a first supporting plate at said first end, a second supporting plate at a second end and elastic elements connected between the two supporting plates;

two pull elements, each element connected at a first end to a respective one of said second supporting plate of said arm dampers;

two grip rings, each ring connected to a second end of a respective one of the pull elements;

two leg dampers, each mounted vertically to said lateral rod at a first end, each said leg damper includes a first supporting plate at said first end, a second supporting plate at a second end and elastic elements connected between the two supporting plates;

two foot supporting assemblies, each foot assembly connected to a respective one of said second supporting plate of said leg dampers, each assembly having means to fit a user's foot; and,

a bench including a supporting frame, a balance pad and a plurality of elastic elements mounted between said supporting frame and said balance pad wherein said bench is positioned in relation to said U-shaped frame so as to allow the user to lie in a prone position on the bench, insert his feet into the foot supporting assemblies, grab the grip rings with his hands and perform exercises simulating swimming motions.

5,688,211
COLLAPSIBLE CHILD EXERCISER DEVICE

Peter J. Myers, Wheaton, Ill., assignor to Kolcraft Enterprises, Inc., Chicago, Ill.

Filed Nov. 13, 1995, Ser. No. 556,309

Int. Cl.^{6} A63B *25/00;* **B62B** *9/12*

U.S. Cl. 482—66 **16 Claims**

1. A child exerciser device comprising:

a seat support having a front and back and an opening therein;

a tray integrally joined to the front of said seat support;

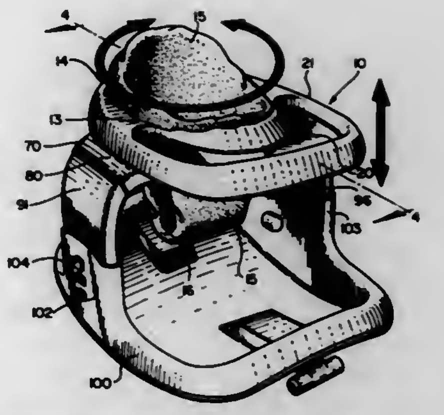
a plurality of spaced post means depending from said seat support;

biasing means disposed on said post means;

a bouncer ring disposed below said seat support, said bouncer ring including an opening therein, a circular shelf having a plurality of spaced openings and an upper race;

each of said posts extending through one of said shelf openings;

means for connecting said seat support to said post at the location of said posts whereby said seat support is biased away from said bouncer rings;



a cross piece member disposed below and connected to said bouncer ring, said cross support member including a lower race;

ball bearings disposed within said lower and upper races whereby said bouncer ring is adapted to rotate relative to said cross piece member;

spaced leg members each pivotally connected to and manually depending from said cross piece member, said leg members including means for pivoting said leg members beneath said cross piece member;

a base support member disposed below and spaced from said cross piece member;

spaced tubular member extending upwardly from said base member; and,

each of said hinged leg members being releasably received within one of said tubular members.

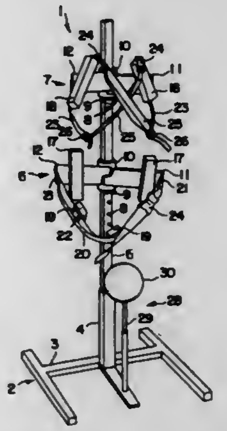
5,688,212
ROTA-FLEX FREESTANDING ROTATIONAL MOTION AND RELATIVE DISPLACEMENT TRAINING APPARATUS

Guy M. Binx Walker, P.O. Box 681, Ocean Springs, Miss. 39566

Filed Sep. 24, 1996, Ser. No. 718,871

Int. Cl.^{6} A63B *69/36*

U.S. Cl. 482—83 **17 Claims**



1. A freestanding rotational motion and relative displacement training apparatus comprising a base assembly, a vertical support post extending upward from said base assembly, a first resistance assembly and a second resistance assembly each independently vertically adjustable along said support post wherein each resistance assembly comprises left and right rotation arms independently rotatable about a cylindrical collar positioned on said post said left and right rotation arm including user engagement means, each rotation arm having a clamp mechanism whereby resistance to rotation by said rotation arms is adjustable; whereby said appa-

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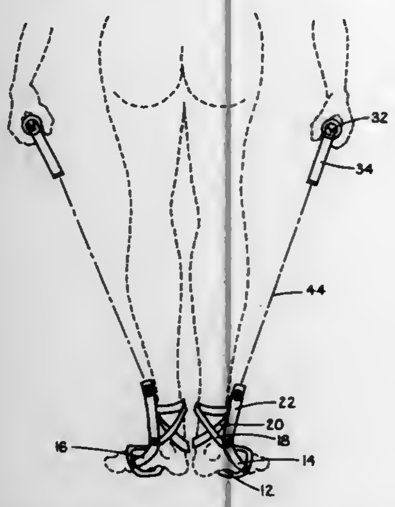
ratus is effective in demonstrating correct rotational motion and relative displacement of a user's upper and lower torso during different sports activities and in training said user's to achieve correct rotational movement and relative displacement of the upper and lower torso.

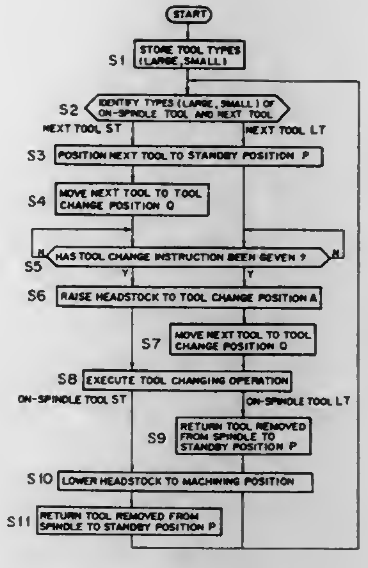
5,688,213
EXERCISE APPARATUS
Mark I. Recker, 7430 W. Jefferson, Fort Wayne, Ind. 46804
Filed Oct. 11, 1996, Ser. No. 731,259
Int. Cl.^{6} A63B *21/02*
U.S. Cl. 482—125 **18 Claims**



1. An exercise apparatus comprising:
substantially parallel lateral and medial ankle straps;
an arch section defined by substantially perpendicularly affixing the lateral and medial straps to the arch section;
a lateral strap collinear to the arch section at the lateral ankle strap;
an inner stirrup strap collinear to the arch section at the medial ankle strap;
an outward stirrup strap substantially perpendicular to the lateral strap and opposite the ankle straps;
a handle; and
an elastic cord fastened between the handle and the lateral strap.

5,688,214
TOOL CHANGING METHOD AND APPARATUS
Yoshiaki Mase, Gifu-ken; Yukihiro Sakakibara, Handa, and Norimitsu Araki, Yokkaichi, all of Japan, assignors to Howa Machinery, Ltd., Nagoya, Japan
Filed Apr. 2, 1996, Ser. No. 631,656
Claims priority, application Japan, Apr. 7, 1995, 7-108127
Int. Cl.^{6} B23Q *3/157*
U.S. Cl. 483—1 **5 Claims**

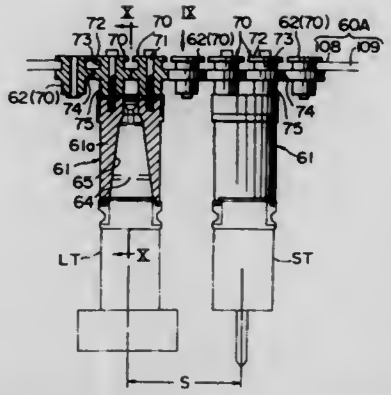
1. A tool changing method for a machining center comprising a column, a tool magazine for storing a plurality of tools and for positioning a desired one of the tools at a standby position and of transferring the tool from the standby position to a tool change position, a headstock slidably supported on the column so as to slide along an axis of a spindle held thereon, and a tool changing head mounted on the headstock so as to be turnable about and to be moved toward and away from the axis of the spindle, said tool changing head being provided with two pairs of grippers respectively extended in opposite directions such that one of the two pairs of grippers is positioned to grip a tool held on the spindle when the headstock is positioned at a position corresponding to the tool change position in response to a tool changing instruction and the other pair of grippers is positioned to grip the next tool positioned at the tool change position, whereby the tool changing head carries out a predetermined tool changing operation, said tool changing method comprising:
classifying the tools into small type tools and large type tools with reference to a predetermined threshold tool diameter determined on the basis of the stroke of the pairs of grippers;
positioning a next tool at the standby position, and moving the same to the tool change position before the headstock of the machining center has been moved to the position corresponding to the tool change position in response to a tool changing instruction, when the next tool is of the small type;
positioning and holding the next tool at the standby position, moving the next tool from the standby position to the tool change position after the headstock has been moved to the position corresponding to the tool change position in response to a tool changing instruction, and carrying out the tool changing operation when the next tool is of the large type;
carrying out the tool changing operation, moving the headstock, immediately after completion of the tool changing operation to a machining position, and then moving the tool removed from the spindle from the tool change position to the standby position, when the tool removed from the spindle is of the small type; and
carrying out the tool changing operation, and moving the headstock to the machining position after moving the tool removed from the spindle from the tool change position to the standby position, when the tool removed from the spindle is of the large type.


START
S1
STORE TOOL TYPES (LARGE, SMALL)
S2
IDENTIFY TYPES (LARGE, SMALL) OF ON-SPINDLE TOOL AND NEXT TOOL
NEXT TOOL ST
NEXT TOOL LT
S3
POSITION NEXT TOOL TO STANDBY POSITION P
S4
MOVE NEXT TOOL TO TOOL CHANGE POSITION Q
S5
N
HAS TOOL CHANGE INSTRUCTION BEEN GIVEN ?
N
Y
Y
S6
RAISE HEADSTOCK TO TOOL CHANGE POSITION A
S7
MOVE NEXT TOOL TO TOOL CHANGE POSITION Q
S8
EXECUTE TOOL CHANGING OPERATION
ON-SPINDLE TOOL ST
ON-SPINDLE TOOL LT
S9
RETURN TOOL REMOVED FROM SPINDLE TO STANDBY POSITION P
S10
LOWER HEADSTOCK TO MACHINING POSITION
S11
RETURN TOOL REMOVED FROM SPINDLE TO STANDBY POSITION P

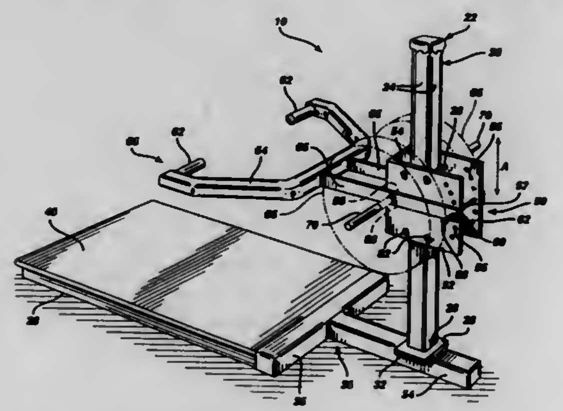
5,688,215
TOOL MAGAZINE FOR MACHINE TOOL
Yoshiaki Mase, Hozumi-Cho; Yukihiro Sakakibara, Handa, and Norimitsu Araki, Yokkaichi, all of Japan, assignors to Howa Machinery, Ltd., Nagoya, Japan
Filed Apr. 2, 1996, Ser. No. 631,657
Claims priority, application Japan, Apr. 7, 1995, 7-108128
Int. Cl.^{6} B23Q *3/157*
U.S. Cl. 483—66 **5 Claims**

1. A tool magazine to be used in combination with a machine tool, said tool magazine comprising:
a magazine body provided with an endless guide groove;
a plurality of tool pots each for holding a tool, fixedly provided with guide members engaging the endless guide groove for sliding movement along the guide groove;
idlers disposed between and in contact with the guide members of the adjacent tool pots, respectively, and supported in the endless guide groove so as to move along the endless guide groove; and

a feed mechanism for moving the tool pots and the idlers along the endless guide groove with the idlers in contact with the guide members of the adjacent tool pots, respectively.



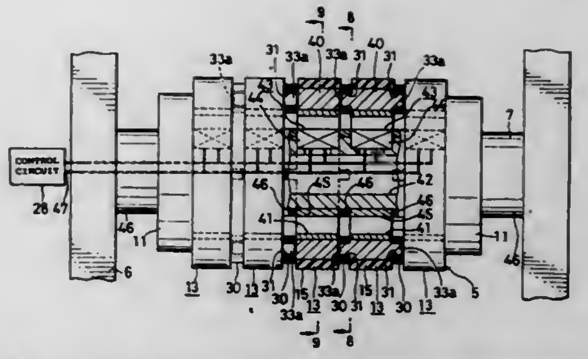
5,688,216
WEIGHT CARRIAGE ASSEMBLY
Anthony Mauriello, 288 N. Walnut St., Ridgewood, N.J. 07450
Filed Jun. 12, 1995, Ser. No. 489,993
Int. Cl.^{6} A63B *21/06*
U.S. Cl. 482—135 **13 Claims**



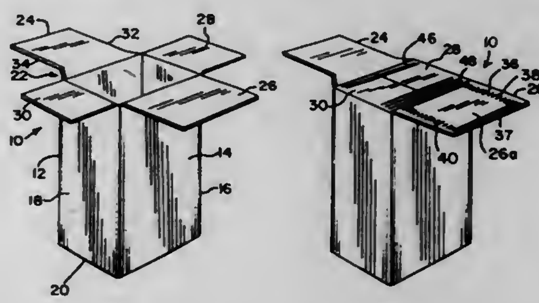
1. An exercise apparatus comprising:
a single vertical guide rail;
support means for supporting the vertical guide rail;
a carriage for riding with the vertical guide rail;
a handle pivotally interconnected with the carriage and extending from a first side of the carriage for moving the carriage along the vertical guide rail, the handle including a grip, the grip positioned on the first side of the carriage;
means for locking the position of the handle at a desired angle with respect to the carriage; and
weight support means positioned on the first side of the carriage for supporting weight on the carriage.

5,688,217
ROLLERS
Masayuki Izume, Kyoto, Japan, assignor to I.Mar Planning, Inc., Kyoto, Japan
Filed Oct. 20, 1995, Ser. No. 546,569
Claims priority, application Japan, Oct. 25, 1994, 6-260047
Int. Cl.^{6} B23P *15/00*
U.S. Cl. 492—39 **9 Claims**

1. A roller comprising a straight support member, a plurality of hollow cylindrical roller members arranged axially thereof and having the support member inserted therethrough, and a position change-over device provided for each of the roller members, each of the roller members being provided around the support member so as to be rotatable relative to the support member and movable relative thereto in a plane orthogonal to the axial direction, the position change-over device being adapted to shift the roller members respectively each in the plane orthogonal to the axial direction of the roller member, the roller being characterized in that a connecting member is interposed between opposed end faces of each two adjacent roller members for preventing the two adjacent roller members from moving circumferentially thereof relative to each other while permitting relative movement of the two adjacent roller members in the plane orthogonal to the axial direction.



5,688,218
METHOD OF MAKING SIFT PROOF CARTON
Paul M. Jenkins, Yorba Linda, Calif., assignor to Illinois Tool Works Inc., Glenview, Ill.
Division of Ser. No. 273,120, Jul. 11, 1994, Pat. No. 5,472,137.
This application Jun. 7, 1995, Ser. No. 486,672
Int. Cl.^{6} B31B *1/62*
U.S. Cl. 493—151 **11 Claims**



1. A method of folding and sealing the major and minor flaps of an open-ended carton so as to provide a sift proof container, comprising the steps of:
providing a carton having at least one open end comprising a first inside major flap, a second outside major flap, and a pair of opposed minor flaps, each one of said flaps including a first proximal end connected along a fold line to a body portion of said carton for pivotal movement with respect to said at least one open end of said carton for closing said at least one open end of said carton when folded inwardly, a second distal end, and opposite sides, said pair of opposed minor flaps comprising a first closure surface with respect to said open end of said carton when folded inwardly, said first inside major flap comprising a second closure surface with respect to said open end of said carton by being disposed upon said pair of opposed minor flaps when folded inwardly and including first mitered portions along said opposite sides thereof, said second outside major flap comprising a third closure surface when folded inwardly with respect to said open end of said carton by being disposed upon both said first inside major flap and portions of said pair of opposed minor flaps, extending along said first proximal ends thereof, as a result of said portions of said pair of opposed minor flaps, extending along

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said first proximal ends thereof, being exposed and accessible to said second outside major flap by said mitered portions of said first inside major flap, and at least one of said pair of opposed minor flaps and said second outside major flap having embossed means formed along at least one of said exposed and accessible portions of said pair of opposed minor flaps extending along said first proximal ends of said pair of opposed minor flaps, and said opposite sides of said second outside major flap, so as to extend toward the other one of said pair of opposed minor flaps and said second outside major flap;

folding said pair of opposed minor flaps inwardly so as to cover said at least one open end of said carton;

positioning said first and second inside and outside major flaps in predetermined open positions with respect to said at least one open end of said carton;

applying adhesive to an inside surface of said second outside major flap and upon outside surfaces of said pair of opposed minor flaps in accordance with a predetermined pattern by means of a nozzle member during relative movement of said carton with respect to said nozzle member so as to provide seals between said pair of opposed minor flaps and said first and second inside and outside major flaps, and between said first and second inside and outside major flaps, said predetermined pattern comprising a first adhesive strip provided upon said outside surfaces of said pair of opposed minor flaps so as to extend across both of said minor flaps and substantially from one side of said carton to the other side of said carton, and along one of said opposite sides of said pair of opposed minor flaps, so as to be disposed adjacent to said fold line of said first proximal end of said first inside major flap such that edge and corner sealing is achieved between said pair of opposed minor flaps and said first inside major flap when said first inside major flap is folded inwardly with respect to said pair of opposed minor flaps and said carton; a second adhesive strip provided upon said outside surfaces of said pair of opposed minor flaps so as to extend across both of said minor flaps and substantially from said one side of said carton to said other side of said carton, and along the other one of said opposite sides of said pair of opposed minor flaps, so as to be disposed adjacent to said fold line of said first proximal end of said second outside major flap such that said second distal end of said first inside major flap is sealed to said pair of opposed minor flaps along said other one of said opposite sides of said pair of opposed minor flaps when said first inside major flap is folded inwardly with respect to said pair of opposed minor flaps and said carton body; a third adhesive strip provided upon said inside surface of said second outside major flap so as to extend across said second outside major flap substantially from said one side of said carton to said other side of said carton, and along said second distal end of said second outside major flap, such that said second distal end of said second outside major flap is sealed to said first proximal end of said first inside major flap when said first and second inside and outside major flaps are folded inwardly with respect to said carton; and a pair of fourth adhesive strips provided upon said inside surface of said second outside major flap and extending respectively along said opposite sides of said second outside major flap substantially between said first proximal end of said second outside major flap and said third adhesive strip extending along said second distal end of said second outside major flap for direct engagement with said portions of said pair of opposed minor flaps, exposed by said mitered portions of said first inside major flap and extending along said first proximal ends of said pair of opposed minor flaps, as a result of said embossed means formed upon at least one of said exposed and accessible portions of said pair of opposed minor flaps and said second outside major flap, and extending toward the other one of said pair of opposed minor flaps and said second outside major flap, upon folding of said first and second inside and outside major flaps inwardly with respect to said carton so as to provide a seal between said opposite sides of said second outside major flap and said first proximal ends of said pair of opposed minor flaps;

folding said first inside major flap into engagement with said pair of opposed minor flaps and said first and second adhesive strips thereon; and

folding said second outside major flap into direct engagement with said first inside major flap and said exposed and accessible portions of said pair of opposed minor flaps so as to provide sealing contact between all of said flaps of said carton and about the entire periphery of said at least one open end of said carton such that said carton is rendered sift proof.

5,688,219
DEVICE FOR TRANSPORTING COPIES INSIDE A FOLDER EQUIPPED WITH A CUTTING CYLINDER

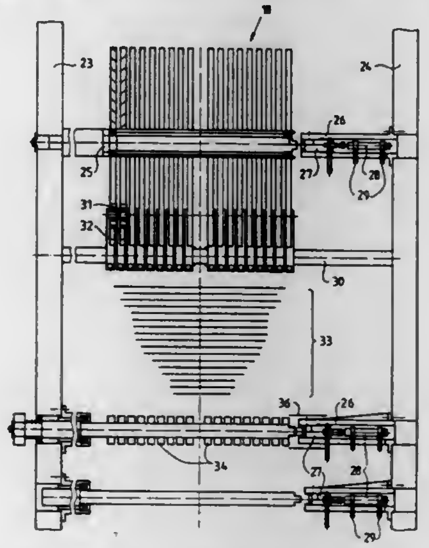
René Renard, Montigny les Cormeilles; Guy Loquet, Liancourt, and Frank Bausela, Creil, all of France, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris SA, Montataire Cedex, France

Filed Mar. 7, 1996, Ser. No. 608,777

Claims priority, application France, Mar. 7, 1995, 95 02626

Int. Cl.^{6} B65H *5/02;* B31B *1/14*

U.S. Cl. 493—357 **9 Claims**



1. In combination with a folder which is equipped with at least one cutting cylinder for cutting individual copies from a web, the copies being transportable from the cutting cylinder to at least one copy-guiding component, and groups of tapes for transporting the copies being associated with the cutting cylinder and the copy-guiding component, a device for transporting copies inside the folder, comprising deflector members for the groups of tapes and the at least one copy-guiding component, said deflector members having opposite ends at which said deflector members are supportingly engaged, and adjusting members having adjusting pins movable by said adjusting members in an axial direction for engaging and disengaging one of said ends of the respective deflector members to facilitate a replacement of the groups of tapes.

5,688,220
MEDICAL APPLIANCE FOR TREATMENT BY IONIZING RADIATION

Vitali Verin, and Youri Popowski, both of Geneva, Switzerland, assignors to Schneider (Europe) A.G., Bulach, Switzerland

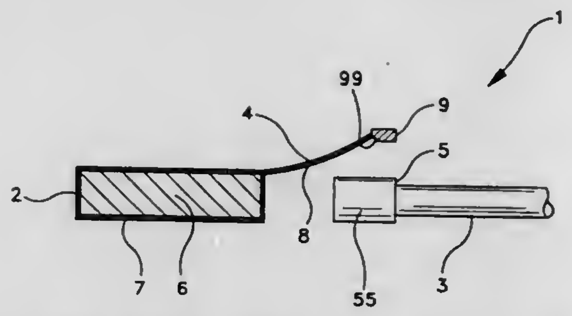
Filed Jun. 12, 1995, Ser. No. 489,464

Claims priority, application European Pat. Off., Jun. 10, 1994, 94108913

Int. Cl.^{6} A61N *5/00*

U.S. Cl. 600—1 **18 Claims**

1. A medical appliance for the endoluminal treatment of a portion of a body vessel by ionizing radiation, comprising radioactive radiation means, a catheter for insertion into the lumen of the body vessel, the catheter having a longitudinal lumen extending therethrough, a manipulation wire for advancing and removing the radioactive radiation means into and from the longitudinal lumen of the catheter, and detachable interlocking engagement means disposed within the catheter lumen, wherein the engagement means secures a detachable interlocking engagement between at least a part of the radioactive radiation means and the manipulation wire.



5,688,221
ENDOSCOPE COVER FOR ENDOSCOPE SYSTEM HAVING UNIFORM FLEXIBILITY

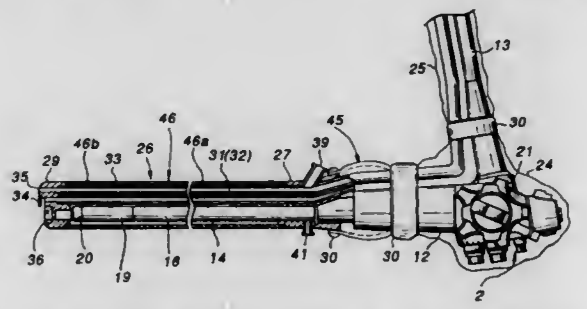
Hisao Yabe, Hachioji; Yoshihiro Iida, Tama; Akira Suzuki, Hachioji; Hideo Ito, Hachioji; Yoshio Tashiro, Hino; Minoru Yamazaki, Hachioji; Osamu Tamada, Hachioji, and Tatsuya Furukawa, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1993, Ser. No. 37,282

Claims priority, application Japan, Feb. 12, 1993, 5-004271 U; Feb. 12, 1993, 5-024548

Int. Cl.^{6} A61B *1/04*

U.S. Cl. 600—121 **4 Claims**



1. An endoscope apparatus including a cover-type endoscope and an endoscope cover, wherein said cover-type endoscope comprises an insertion portion including a leading portion, a bending portion connected to the leading portion, and a flexible portion connected to the bending portion,

wherein said endoscope cover comprises an insertion-portion cover for covering the insertion portion of the cover-type endoscope, said insertion-portion cover including a cover leading portion and an insertion-portion cover outer sheath connected to the cover leading portion,

wherein a first portion of the insertion-portion cover outer sheath substantially fits the flexible portion of the insertion portion of the cover-type endoscope when the insertion portion of the cover-type endoscope is positioned within the insertion-portion cover, the first portion of the insertion-portion cover outer sheath having a first degree of uniform flexibility, and

wherein a second portion of the insertion-portion cover outer sheath substantially fits the bending portion of the insertion portion of the cover-type endoscope when the insertion portion of the cover-type endoscope is positioned within the insertion-portion cover, the second portion of the insertion-portion cover outer sheath having a second degree of uniform flexibility which differs from the first degree of flexibility.

5,688,222
ENDOSCOPIC INSTRUMENT

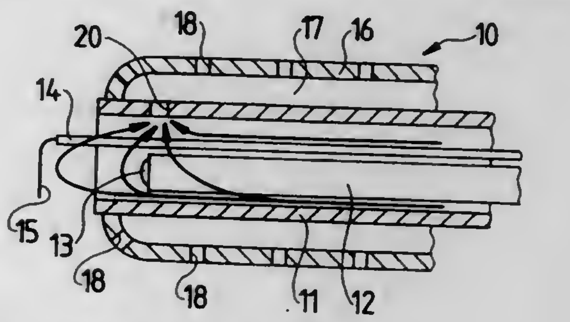
Heinz Hluchy, Hamburg, and Thomas Prescher, Halstenbek, both of Germany, assignors to Olympus Winter & Ibe GmbH, Hamburg, Germany

Filed May 28, 1996, Ser. No. 654,247

Claims priority, application Germany, Jun. 2, 1995, 195 20277.5

Int. Cl.^{6} A61B *1/12*

U.S. Cl. 600—156 **3 Claims**



1. An endoscopic instrument comprising

an inner sheath containing instrument optics;

an outer sheath enclosing said inner sheath;

means separating an outer wall of said inner sheath and an inner wall of said outer sheath to form a gap therebetween;

a plurality of apertures (**18**) through a distal end zone of said outer sheath to provide fluid communication between surroundings of said outer sheath and said gap;

means for supplying rinsing fluid into said inner sheath so that said inner sheath acts as a supply duct and said gap between said inner and outer sheaths acts as a rinsing fluid evacuation duct; and

at least one hole (**20**) through a distal end zone of said inner sheath (**11**) to provide communication between said inner sheath (**11**) and said gap (**17**), said hole (**20**) having a cross-sectional area substantially less than the sum of cross-sectional areas of said apertures (**18**) through said distal zone of said outer sheath (**16**).

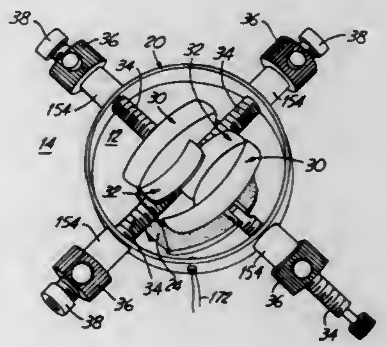
5,688,223
RETRACTOR SUPPORT WITH ADJUSTABLE RETRACTOR BLADES

Peter R. Rosendahl, Minneapolis, Minn., assignor to Minnesota Scientific, Inc., Minneapolis, Minn.

Filed Nov. 8, 1995, Ser. No. 555,265

Int. Cl.^{6} A61B *11/02*

U.S. Cl. 600—215 **32 Claims**



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14. A retractor apparatus for use in conducting surgical operations through an incision in a patient, the retractor apparatus comprising:

a retractor support;

a first pair of surgical retractors mounted to the retractor support for radial movement within the retractor support, wherein the first pair of surgical retractors each comprise:

a first threaded rod mounted to the retractor support; and

a first retractor blade mounted to the first threaded rod; and

a second pair of surgical retractors mounted to the retractor support for radial movement within the retractor support, wherein the second pair of surgical retractors each comprise:

a second threaded rod mounted to the retractor support; and

a second retractor blade pivotally mounted to the second threaded rod so that the second retractor blades are pivotable side to side with respect to the second threaded rod to which the second retractor blade is mounted, wherein pivoting the second retractor blades permits the second retractor blades to nest between the first retractor blades when the first and second retractor blades are radially moved toward a central axis of the retractor support and thereby reduces a profile of the first and second retractor blades when the first and second retractor blades are in a nested position.

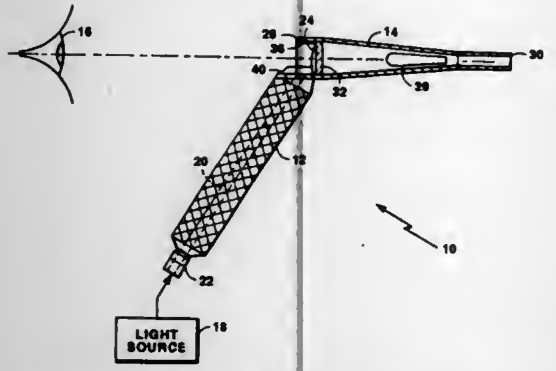
5,688,224
MEDICAL VISUALIZATION DEVICE

Richard E. Forkey, Westminster; David M. Tremblay, Charlton, and Christopher B. Smith, Gardner, all of Mass., assignors to Precision Optics Corporation, Gardner, Mass.

Filed Oct. 16, 1995, Ser. No. 541,200

Int. Cl.^{6} A61B *1/26*

U.S. Cl. 600—200 **16 Claims**



1. A medical visualization device comprising:

handle means for facilitating use of said visualization device, said handle means comprises means for transferring light through said handle means;

distal tip means attached to said handle means for insertion into an orifice, said distal tip means comprises a lens means, arranged at a proximal end of said distal tip means, for viewing an area at a distal end of said tip means illuminated by said light from said handle means; and

said distal tip means comprises an access port means in a wall of said distal tip means located a predetermined distance from said distal end for enabling insertion of a needle means for providing therapeutic treatment.

5,688,225
THERAPEUTIC FOOTWEAR

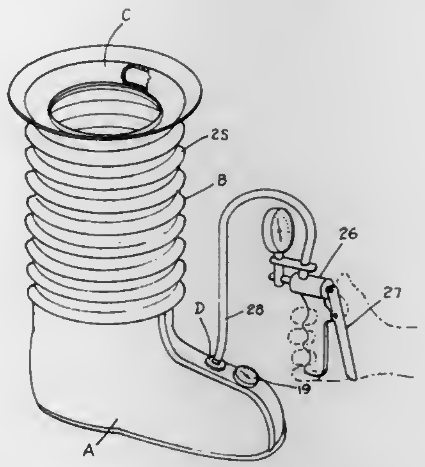
John W. Walker, 1088 Hilton Sound Dr., Chapin, S.C. 29036

Filed Jul. 31, 1995, Ser. No. 509,051

Int. Cl.^{6} A61H *7/00*

U.S. Cl. 601—11 **10 Claims**

1. A therapeutic device for receiving a lower human extremity of a wearer having poor blood circulation in the feet comprising:



a lower member for receiving a foot of the wearer;

the lower member has a substantially imperforate sole providing support for the foot when walking;

an upper member for extending above an ankle of the wearer and connected to said lower member in substantially air tight relation thereto;

said upper and lower members forming a substantially air tight receptacle with walls having sufficient flexibility to permit the wearer to walk while wearing the device about said extremity while maintaining a substantially constant partial vacuum;

a sealing member carried adjacent an open top of said upper member for forming a substantially air tight zone between said upper member and said lower human extremity when received in said therapeutic device;

a connection carried by said therapeutic device for attaching a vacuum pump communicating with a space between said therapeutic device and said lower human extremity below said sealing member;

walls comprising said lower member and said upper member having sufficient rigidity to withstand the force of a substantially uniform partial vacuum in said space sufficient to adequately increase blood circulation in said foot without excessive deformation while permitting the wearer to walk; and

whereby a pump and said walls apply and maintain a reduced pressure about a portion of said lower human extremity within said therapeutic device to increase the flow of blood thereto maintaining said extremity subjected to a substantially uniform partial vacuum in said receptacle for a period of time to achieve increased blood flow and a sufficiently elevated temperature in said extremity to effect a prescribed treatment.

5,688,226

Patent Not Issued For This Number

5,688,227

Patent Not Issued For This Number

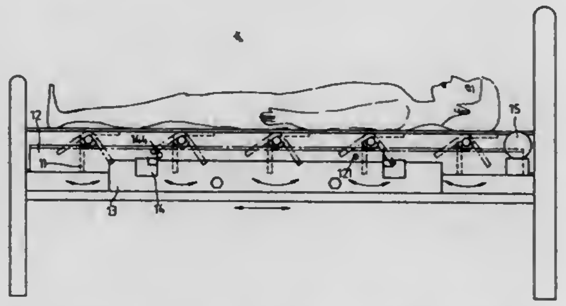
5,688,228
AUXILIARY REHABILITATION MACHINE

Bin-Zong Lin, and Chuan-Hua Lin, both of No. 318 8th Flr., Fushbng, Sec. 3, Taichung, Taiwan

Filed Aug. 3, 1995, Ser. No. 511,058

Int. Cl.^{6} A61H *7/00*

U.S. Cl. 601—92 **1 Claim**



1. A massaging bed for adjusting different pressure points, increasing blood circulation, thus eliminating the possibility of bedsores and other infection comprising:

a main frame with the same width as a bed, said main frame including a plurality of movable plates (**11**) disposed with equal space in between,

each movable plate (**11**) connected to said main frame (**10**) at both ends thereof, a shaft rod (**111**) disposed under the movable plate (**11**), said shaft rod (**111**) being connected to both sides of the main frame (**10**),

a plurality of gear wheels (**112**) disposed on the outside of the shaft rod (**111**), under each gear wheel (**112**), a gear chain (**12**) is disposedly engaged,

as the gear chain (**12**) moves horizontally the gear wheel (**112**) rotates to cause the movable plate (**11**) to turn and oscillate,

a regulating set (**13**) is disposed under the gear chain (**12**), the regulating set (**13**) is fixedly disposed on the main frame (**10**) to form an integral part,

a driving-control set (**14**) disposed on the regulating set (**13**), said driving-control set (**14**) including a driving-control switch (**14**),

a spring (**144**) disposed on the driving-control switch (**140**), the gear chain (**12**) having two contact rods (**121**) disposed on opposite ends thereof, the distance between the contact rod (**121**) and the spring (**144**) changes with the regulating set (**14**) moving left and right, therefore, the moving distance of the gear wheel (**12**) changes,

the turning angle of the movable plate (**11**) is determined by the driving-control set (**14**) moving along the regulating set (**13**).

5,688,229
CERVICAL COLLAR

Eric Bauer, P.O. Box 9150, Reno, Nev. 89507

Filed May 17, 1996, Ser. No. 651,037

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—18 **3 Claims**

1. A cervical collar comprising:

a. a flexible plastic shell which can be formed into approximately a circular shape, wherein the shell has an inner surface and an outer surface as well as front and back portions;

b. a ventilation opening at the back portion of the shell;

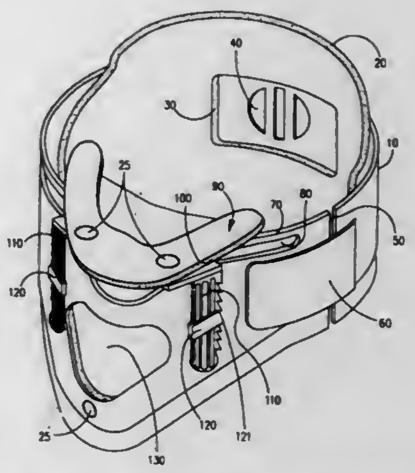
c. an opening at the front portion of the shell suitable for providing access to a neck of a person wearing the collar;

d. a closed-cell foam lining which fits along the inner surface of the shell, with openings in the lining corresponding to the openings in the shell;

e. flexible members disposed at a top edge of the front portion of the shell;

f. channels on the outer surface of the front portion of the shell;

g. two adjustable posts, wherein each post has an inner edge and an outer edge, where each post is inserted into a channel and



where the inner edge of each post is smooth and the outer edge of each post has a saw-tooth pattern which is suitable for detachably engaging the channel;

h. a slot in each adjustable post to allow the user of the collar to squeeze the inner and outer edge of each post together by use of finger pressure thus allowing the outer edge of each post to disengage from the channel;

i. a chin support attached to the posts and to the flexible members.

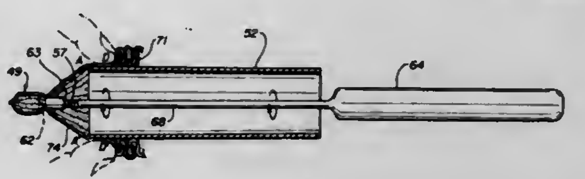
5,688,230
ENDODISSECTOR

George Christoudias, New Milford, N.J., assignor to Surgical Inventions & Innovations, Inc., New Milford, N.J.

Filed Apr. 5, 1995, Ser. No. 417,242

Int. Cl.^{6} A61M *35/00*

U.S. Cl. 604—1 **6 Claims**



2. The method of producing a dissector for an endodissector comprising the steps of:

providing a cylindrical tube open at a first and second end and a manipulating instrument having a frame of a predetermined configuration at one end and a handle at the outer end;

providing a length of tubular gauze; placing a portion of said tubular gauze over said tube;

insertion the frame through the tube to engage a portion of the tubular gauze; and,

rotating the handle to wrap one or more layers of the gauze on the frame.

5,688,231
IONTOPHORESIS ASSEMBLY INCLUDING CLEANABLE ELECTRICAL CONTACTS

Ronald J. Flower, Vernon, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 30, 1994, Ser. No. 315,533

Int. Cl.^{6} A61N *1/30*

U.S. Cl. 604—20 **19 Claims**

1. In an iontophoresis drug delivery system, an assembly for providing electrical interconnection between a drug containing patch and an electrical controller, said assembly comprising:

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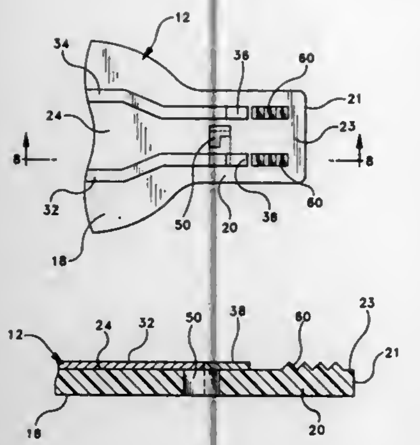


electrical controller contacts mounted on the controller, said controller contacts receiving an electrical current from the controller;

electrical conductive pads positioned on the patch, said conductive pads being matable with said controller contacts to provide electrical interconnection between the controller and the patch; and

abrasive wiping means affixed to the patch and positioned for wiping engagement with said controller contacts upon said interconnection, whereby said controller contacts are wiped clean of contaminants and debris immediately prior to said electrical interconnection.

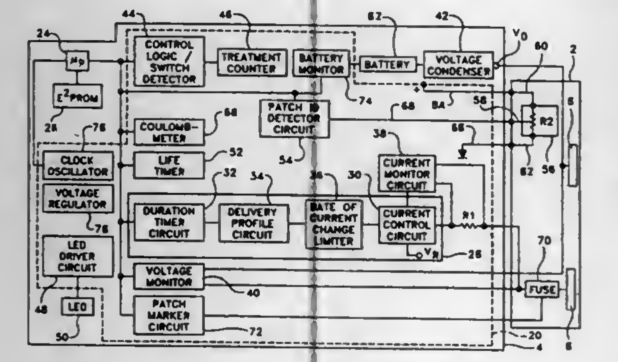
5,688,232
IONTOPHORETIC DRUG DELIVERY DEVICE HAVING AN IMPROVED CONTROLLER

Ronald J. Flower, Vernon, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 28, 1995, Ser. No. 535,447

Int. Cl.^{6} A61N *1/30*

U.S. Cl. 604—20 **21 Claims**



1. An iontophoretic drug delivery system comprising:

a medicament containing patch removably attachable to the skin of a user for transdermal delivery of a medicament, the patch having at least a first electrode and a second electrode, the medicament including a plurality of drug molecules;

a reusable controller removably electrically coupled to the patch, the controller providing sufficient energy to the patch to deliver the medicament from the patch into the skin of a patient; and

a current delivery safety circuit operatively coupled to the controller for assuring the substantially safe delivery of the medicament from the patch into the skin of the patient, the current delivery safety circuit including:

a coulombmeter electrically coupled to at least one of the first electrodes and second electrodes for monitoring a total number of electrons delivered through the patch, the coulombmeter providing an output signal if the total number of electrons is at most substantially equal to the plurality of drug molecules;

a current monitor circuit operatively coupled to at least one of the first electrode and second electrode for monitoring a rate of current flow through the patch, the current monitor circuit providing an output signal if the rate of current flow is at least equal to a first preselected value and at most equal to a second preselected value;

a patch identification detector electrically coupled to the patch, the patch identification detector providing an indication as to whether the patch and the controller are deemed incompatible, patch identification detector preventing a supply of energy to the patch sufficient to deliver the medicament from the patch into the skin of the patient if the patch and controller are deemed incompatible;

a patch marker circuit electrically coupled to at least one of the first electrode and second electrode of the patch, the patch marker circuit substantially permanently disabling the patch when substantially all of the medicament has been delivered from the patch to the skin of the patient; and

a voltage monitor circuit electrically coupled to the first electrode and the second electrode for monitoring a voltage therebetween, the voltage monitor providing an indication if the voltage potential between the first and second electrodes is at least greater than a first predetermined value and at most equal to a second predetermined value.

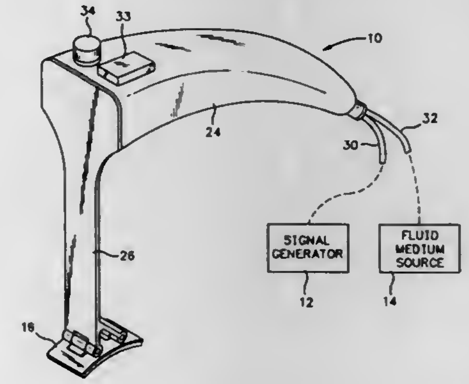
5,688,233
ELECTRONINCORPORATION ENHANCED TRANSDERMAL DELIVERY OF MOLECULES

Gunter A. Hofmann, and Lei Zhang, both of San Diego, Calif., assignors to Genetronics, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 310,647, Sep. 22, 1994, Pat. No. 5,464,386, which is a continuation-in-part of Ser. No. 219,970, Mar. 30, 1994, Pat. No. 5,462,520, which is a continuation-in-part of Ser. No. 931,061, Aug. 17, 1992, Pat. No. 5,318,514. This application Nov. 2, 1995, Ser. No. 552,200

Int. Cl.^{6} A61N *1/30;* A61K *38/00*

U.S. Cl. 604—20 **28 Claims**



1. A method of transdermal molecular delivery comprising the steps of:

providing molecules to be delivered through a stratum corneum;

providing a solution containing particles and said molecules;

contacting a selected surface area of the stratum corneum with said solution;

applying a pulsed electric field of sufficient amplitude to induce pores in the stratum corneum; and

applying a force to said molecules sufficient to induce transport of said molecules through the induced pores in the stratum corneum.

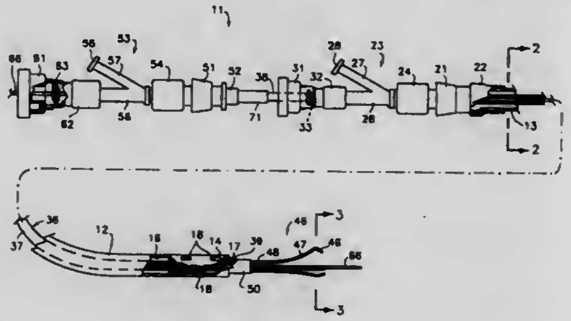
5,688,234
APPARATUS AND METHOD FOR THE TREATMENT OF THROMBOTIC OCCLUSIONS IN VESSELS

Jeffrey S. Frisbie, San Jose, Calif., assignor to Cardiometrics Inc., Mountain View, Calif.

Filed Jan. 26, 1996, Ser. No. 592,001

Int. Cl.^{6} A61B *17/22*

U.S. Cl. 604—22 **10 Claims**



10. Apparatus for use with a guide wire for the treatment of a thrombotic occlusion in a patient having a vessel with thrombus and plaque therein and capable of being advanced to said thrombotic occlusion comprising a flexible elongate tubular sheath having proximal and distal extremities and having a relatively large lumen extending from the proximal extremity to the distal extremity so that the distal extremity is open and the lumen is defined by a thin flexible wall, a thrombotic occlusion disruption device slidably and rotatably disposed in the lumen in the tubular sheath, said thrombotic occlusion disruption device including a flexible elongate torsionally rigid shaft having a length greater than the length of the tubular sheath and having proximal and distal extremities, the shaft having a guide wire lumen extending from the proximal extremity to the distal extremity of the shaft and sized to receive the guide wire, said shaft being sufficiently flexible so that it can be advanced over and follow said guide wire to the thrombotic occlusion in a vessel, a plurality of distally extending prong shaped disruption elements secured to the distal extremity of the shaft, means coupled to the proximal extremity of the shaft for rotating the shaft and the disruption elements carried thereby, said disruption elements being rigid enough so that during rotation the thrombotic occlusion in the vessel is disrupted by causing it to break into smaller pieces, said disruption elements also being flexible enough so that during rotation the plaque in the vessel is left intact and means coupled to the proximal extremity of the tubular sheath for aspirating into the large lumen of the tubular sheath pieces of the thrombotic occlusion and removing them from the vessel of the patient.

5,688,235
ULTRASONIC TREATMENT APPARATUS

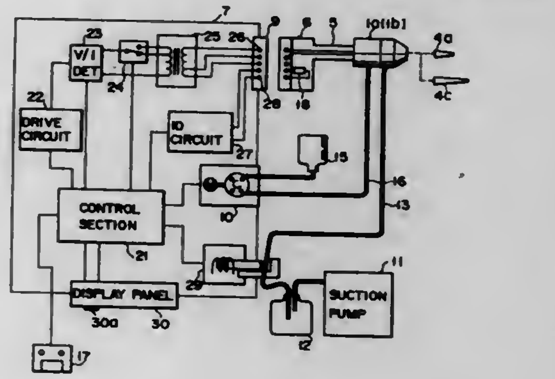
Tomohisa Sakurai; Hideo Nagazumi; Kazuya Hijii; Toshihiko Suzuta; Masahiro Kudo, all of Hachioji; Kenji Yoshino, Tama; Tetsumaru Kubota, Hachioji; Tatsuya Kubota, Sagamihara; Hiroaki Kagawa, Hachioji; Yuichi Ikeda, Hachioji; Mitsumasa Okada, Hachioji; Hitoshi Karasawa, Hachioji, and Tadao Hagino, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 377,133, Jan. 20, 1995, abandoned, which is a continuation of Ser. No. 94,910, Jul. 20, 1993, Pat. No. 5,391,144, which is a continuation of Ser. No. 680,099, Apr. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 628,650, Dec. 14, 1990, abandoned. This application Aug. 27, 1996, Ser. No. 703,583

Claims priority, application Japan, Feb. 2, 1990, 2-22241; Feb. 13, 1990, 2-32099; Mar. 27, 1990, 2-77375; Mar. 28, 1990, 2-79716; Mar. 29, 1990, 2-78918; Mar. 29, 1990, 2-78919; Apr. 3, 1990, 2-89685; Jun. 15, 1990, 2-155522; Jun. 29, 1990, 2-170232; Jul. 24, 1990, 2-193802; Jul. 31, 1990, 2-201132; Oct. 23, 1990, 2-283322; Oct. 26, 1990, 2-286976

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 604—22 **10 Claims**



1. An ultrasonic treatment apparatus, comprising:

a hand piece of a particular type, including an ultrasonic oscillator;

a probe detachably attached to said hand piece;

a connector including a set of first contacts and two second contacts, and a two-terminal identifying element coupled between said two second contacts and having a value of an electrical characteristic unique to said hand piece;

a driving device including drive means for supplying a selected value of power to said ultrasonic oscillator, means for identifying the particular type of said hand piece based upon the electrical characteristic of said two-terminal identifying element to output an identifying signal corresponding to the particular type of said hand piece, and a socket having a set of first contacts connected to the drive means and two second contacts connected to the identifying means;

means for setting a selected value of power supplied from the drive means corresponding to the particular type of said hand piece, based on said identifying signal; and

means, responsive to said selected value of power being set by said setting means, for displaying a message that the selected value of power has been set;

wherein said connector is connected to the socket, so that the hand piece is connected to the drive means and the identifying means, with the first set of contacts of the socket and said first set of contacts of the connector being electrically connected to each other, and said two second contacts of the socket and said two second contacts of the connector being electrically connected to each other.

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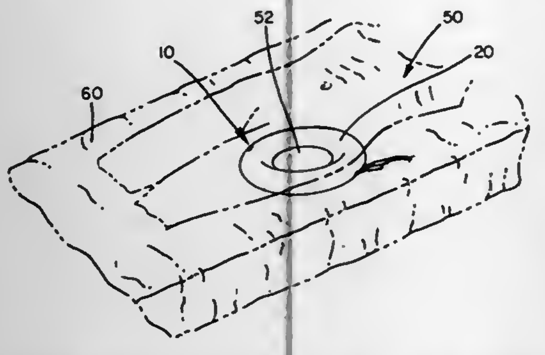
5,688,236
TOPICAL HYPERBARIC DEVICE FOR TREATING SKIN DISORDERS

Stephen R. Gragg, Northbrook, Ill., assignor to Stephen's Medical, Inc., Glenview, Ill.

Filed May 17, 1996, Ser. No. 649,804
Int. Cl.^{6} A61M *37/00*
U.S. Cl. 604—23 **20 Claims**



1. A self-sealing topical hyperbaric therapy device for administering hyperbaric gas to a region of a patient's skin, said device comprising, in combination:

an inflatable tube adapted to be inflated with air and having a top portion and a bottom portion, the tube assuming a collapsed configuration wherein the top and bottom portions are substantially adjacent when deflated and assuming an expanded configuration wherein the top and bottom portions are substantially separated when inflated, the expanded configuration of the tube including an open interior space;

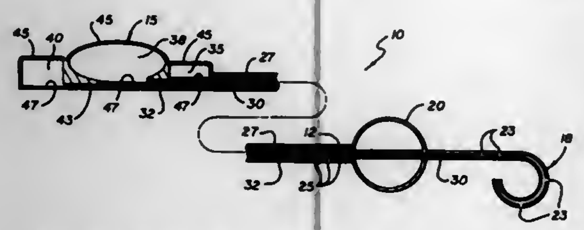
a pliable pad member joined to the bottom portion of the inflatable tube, the pliable pad member and the open interior space of the tube defining an enclosed chamber when the tube is in the expanded configuration and the top portion of the tube is sealably constrained against the patient's skin; and

an inlet port connected to the inflatable tube for supplying hyperbaric gas to the enclosed chamber.

5,688,237
IMPLANTABLE CATHETER AND METHOD OF USE

Jacek Rozga, Westlake Village, and Achilles A. Demetriou, Bel Air, both of Calif., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Filed May 4, 1995, Ser. No. 434,460
Int. Cl.^{6} A61M *31/00*
U.S. Cl. 604—53 **9 Claims**



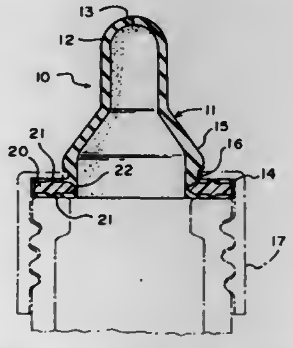
1. A method of using an implantable catheter to treat a localized region within the body of a patient, the catheter including a flexible elongated catheter body and an inflatable balloon located on the catheter body between the proximal and distal ends of the catheter body, the catheter body having a balloon inflation lumen and first and second delivery lumens, and an implantable integrated port assembly having a balloon inflation port, a distal injection port, and a proximal injection port, each of these ports having an upper surface made of flexible, self-sealing material configured for penetration by the syringe after implantation of the catheter into the body, the method comprising:

(a) inserting the balloon and the catheter body from its distal end into a region of interest in the body;
(b) inserting the port assembly under the skin of the body;
(c) inflating the balloon by injecting fluid into the balloon inflation port;
(d) conducting hepatocytes into the region of interest through the distal delivery port; and
(e) conducting an anticoagulant into the region of interest through the proximal delivery port.

5,688,238
MULTI-USE INFANT-FEEDING NIPPLE SYSTEM

Ramon Moser, Winter Springs, Fla.; Gustavo Moser, Caracas, Venezuela; Antonio Valery, Longwood, Fla.; Campo Maya, and John Maya, both of Kissimmee, Fla., assignors to EZ Drink Baby Products, L.C., Winter Springs, Fla.

Continuation-in-part of Ser. No. 399,539, Mar. 7, 1995, Pat. No. 5,573,507. This application Mar. 7, 1996, Ser. No. 613,386
Int. Cl.^{6} A61J *11/00*
U.S. Cl. 604—77 **34 Claims**



1. A nipple adapted to be connected with a source of liquid for feeding infants, comprising:

a flexible tubular body having a tip end and a base end;

opening means in said tip end for flow of liquid through said nipple from said source in response to a sucking action on the nipple;

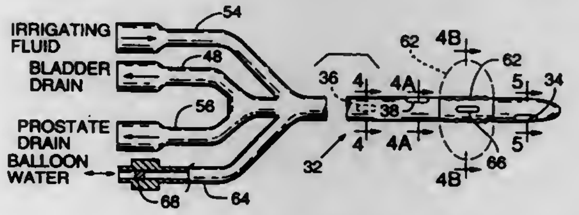
a radially enlarged flange means on the base end for attaching the nipple to an open end of a bottle, wherein the flange means may be clamped between the end of the bottle and a retaining ring engaged on the end of the bottle; and

separate means inserted in said flange means making the flange means less flexible to prevent the flange means from being pulled from under a retaining ring when used to secure the nipple to a bottle.

5,688,239
URINARY TRACT TREATING ASSEMBLY WITH PROSTATE FLUSHING

Frank J. Walker, 403 Lily Flagg Rd., Huntsville, Ala. 35802

Filed Jul. 10, 1995, Ser. No. 500,473
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 604—96 **15 Claims**



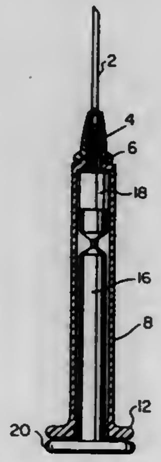
1. A urinary tract irrigating assembly for flushing a TURP-treated prostate gland having a surgically-created central prostatic cavity, comprising:

a) an elongated catheter having a proximal segment and a distal end and including first, second and third longitudinally arranged conduits,
b) upon insertion of the catheter into the urethra the proximal segment of the first conduit being positionable in the bladder and having a drain port for draining the bladder contents, the distal end being connectable to a urine-receiving receptacle,
c) The proximal segment of the second conduit being positionable in said prostatic cavity and having a discharge port for discharging prostate-irrigating fluid into the cavity, the distal end being connectable to a source of such fluid,
d) The proximal segment of the third conduit being positionable in said prostatic cavity and having a drain port spaced from said discharge port of the second conduit for draining spent prostate-irrigating fluid and its surgical debris contents from the prostatic cavity, the distal end being connectable to a spent irrigating fluid receiving receptacle,
e) Catheter positioning means mounted on the catheter for positioning the same with the first conduit port located in the bladder and the second and third conduit ports located within the said prostatic cavity,
f) a source of prostate-irrigating fluid under pressure,
g) connecting conduit means connecting the said source to the distal end of the said second conduit, and
h) valve means in the said connecting conduit means for transmitting to the said second conduit a predetermined amount of treating fluid at predetermined time intervals.

5,688,240
SAFETY SYRINGE NEEDLE DEVICE WITH INTERCHANGEABLE AND RETRACTABLE NEEDLE PLATFORM

Laurel A. Novacek; Fraser R. Sharp, and Donald A. McLean, all of Vancouver, Canada, assignors to Inviro Medical Devices Ltd., Barbados

Division of Ser. No. 470,026, Jun. 6, 1995, Pat. No. 5,520,649, which is a division of Ser. No. 361,227, Dec. 21, 1994, Pat. No. 5,462,531, which is a continuation-in-part of Ser. No. 128,694, Sep. 30, 1993, Pat. No. 5,415,638, which is a continuation-in-part of Ser. No. 909,385, Jul. 9, 1992, Pat. No. 5,263,933, which is a continuation-in-part of Ser. No. 800,849, Nov. 29, 1991, Pat. No. 5,205,827, which is a division of Ser. No. 687,108, Apr. 18, 1991, Pat. No. 5,112,318, which is a continuation-in-part of Ser. No. 607,127, Oct. 3, 1990, Pat. No. 5,122,124, which is a continuation-in-part of Ser. No. 410,318, Sep. 21, 1989, Pat. No. 5,030,208, which is a continuation-in-part of Ser. No. 327,344, Mar. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 285,012, Dec. 14, 1988, abandoned. This application Feb. 22, 1996, Ser. No. 603,868
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—110 **14 Claims**



1. A syringe comprising:

a hollow, axially elongated barrel having distal and proximal ends;

a hub carried by said barrel at its distal end;

a hollow needle releasably carried by said hub and having an end in communication with the interior of said barrel;

a plunger axially slidably received in said barrel through said proximal end thereof and having a thumb press at one end external to said barrel and a bung at an opposite end within the barrel engaging interior wall portions of the barrel;

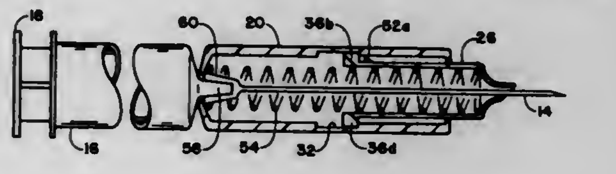
an element carried by said opposite end of said plunger and engageable with said needle upon axial sliding movement of said plunger toward said distal end of the barrel;

said element in engagement with said needle effecting release of said needle from said hub and withdrawal of said needle into the barrel in response to axial sliding movement of said plunger away from the distal end of the barrel.

5,688,241
AUTOMATIC NON-REUSABLE NEEDLE GUARD

Hooman Ali Asbaghi, 3956 Nobel Dr., #104, San Diego, Calif. 92122

Filed Apr. 15, 1996, Ser. No. 632,010
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—110 **21 Claims**



1. An automatic non-reusable needle guard comprising:

a first cylinder adaptable to a needle retaining device, said needle retaining device having a needle extending therefrom for inserting into a receiving body;

a second cylinder operable with said first cylinder for movement of said second cylinder from a first resting position wherein said needle has an exposed needle portion to a second position wherein said second cylinder is retracted from said first position to further increase said exposed needle portion and further to a third position wherein said second cylinder is extended to fully cover said exposed needle portion; and

a mechanism for retracting said second cylinder from said first resting position and automatically releasing said second cylinder from said second position during insertion of said needle into said receiving body for movement of said second cylinder to said third position as said needle is withdrawn from said body.

5,688,242

Patent Not Issued For This Number

5,688,243
APPARATUS AND METHOD FOR TROCAR SURGICAL PROCEDURE

David H. Rammler, 30 Oak Hill Dr., Woodside, Calif. 94062

Division of Ser. No. 142,192, Oct. 22, 1993, Pat. No. 5,472,427. This application Aug. 23, 1995, Ser. No. 518,561
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—115 **17 Claims**

1. A method for inserting a trocar into an internal body cavity through both the exterior and interior body wall surfaces of a patient without insufflation of said internal body cavity, said method comprising the steps of:

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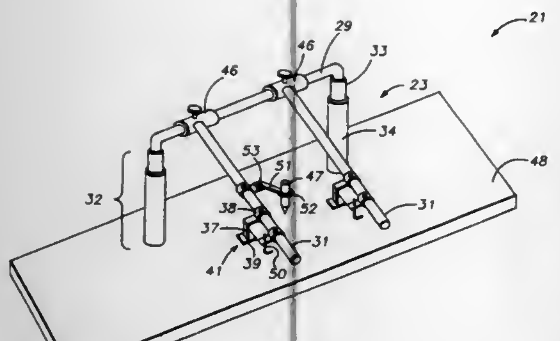
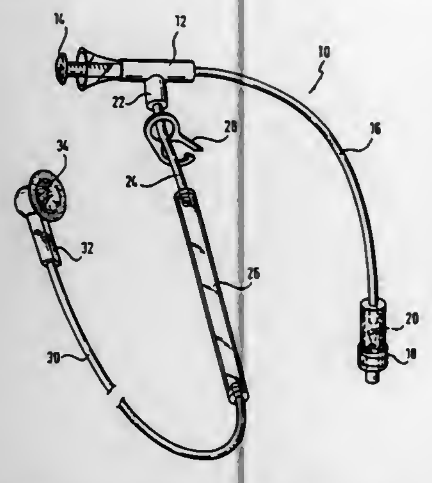


attaching the external skin surface adjacent said internal body cavity to a movable support disposed external to said body wall and body cavity;
lifting said movable support away from said internal body cavity to open a void between said body wall and internal body structures within said body cavity; and
inserting said trocar through said body wall into said void space.

5,688,244

APPARATUS FOR MONITORING INFUSION

Volker Lang, Zugspitzstrasse 52 82131, Gauting, Germany
PCT No. PCT/EP94/01004, § 371 Date Apr. 28, 1995, § 102(e) Date Apr. 28, 1995, PCT Pub. No. WO95/03079, PCT Pub. Date Feb. 2, 1995
PCT Filed Mar. 30, 1994, Ser. No. 403,791
Claims priority, application Germany, Jul. 20, 1993, 43 24 230.8; Oct. 29, 1993, 43 37 017.9; Nov. 29, 1993, 43 40 536.3
Int. Cl.⁶ A61M *1/00*
U.S. Cl. 604—118 19 Claims

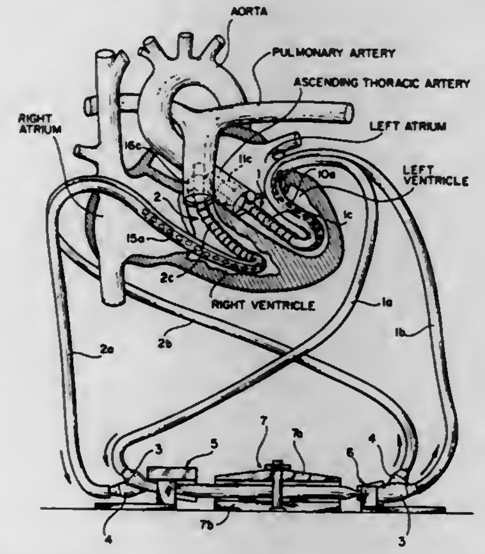


1. An apparatus for infusion monitoring comprising
an infusion hose for accepting infusion flow from a single infusion flow source,
a diaphragm,
a pressure transmission line extending between said infusion hose and said diaphragm, said diaphragm indicating blockage in infusion flow through said infusion line from the single infusion flow source, and
a one-way valve located in said infusion hose for placement adjacent to a patient so as to permit infusion flow only in a direction to the patient,
said pressure transmission line including a narrow-lumen pressure transmission hose and an intermediately placed air chamber having a free end thereof connected with a pressure transmission capsule which includes said diaphragm,
said air chamber including a piece of transparent, thick-walled hose having a wider lumen than said narrow lumen, thick walled hose of said pressure transmission line.

5,688,245

CANNULA SYSTEM FOR A BIVENTRICULAR CARDIAC SUPPORT SYSTEM OR A CARDIOPULMONARY BYPASS SYSTEM

Thomas M. Runge, P.O. Box 50045, Austin, Tex. 78763
Filed May 2, 1996, Ser. No. 641,756
Int. Cl.⁶ A61M *1/00*
U.S. Cl. 604—151 9 Claims

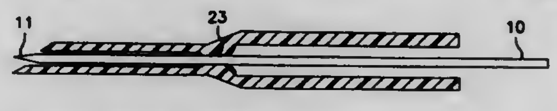


1. In combination, a cannula for use in a biventricular cardiac support system or a cardiopulmonary bypass system and a pulsatile flow cardiopulmonary bypass pump, said pump having an inlet and an outlet and a compression chamber intermediate the inlet and outlet of said pump, said compression chamber including a moveable compression plate, a pair of side-by-side externally valved, compressible conduits extending through said compression chamber and under said compression plate, each conduit having an inlet and an outlet, a passive exterior valve positioned at the pump inlet and outlet, said pair of side-by-side conduits extending through said valves, said compressible conduits having portions extending between the inlet and outlet valves forming sacks, the valve at the pump inlet being positioned downstream from the inlets of said conduits, the valve at the pump outlet being positioned upstream from the outlets of said conduits; said cannula comprising first cannula means having a pair of side-by-side first and second lumens adapted to communicate with the left atrium, left ventricle, and aorta of a patient, and second cannula means having a pair of side-by-side first and second lumens adapted to communicate with the right atrium, right ventricle, and pulmonary artery of the patient, a first tube connecting said first lumen of the first cannula means to the inlet of one of said compressible conduits, a second tube connecting the second lumen of said first cannula means to the outlet of said one compressible conduit, a third tube connecting the first lumen in said second cannula means to the inlet of the other of said compressible conduits, a fourth tube connecting the second lumen in said second cannula means to the outlet of other of said compressible conduits, whereby when the inlet valve is open and the outlet valve is closed blood flows from the left atrium, left ventricle, right atrium, and right ventricle through the inlets of the side-by-side conduits into the sack portions of the conduits underneath the pump compression plate, to thereby push the compression plate upwardly until at least one of the sacks is filled, whereupon the compression plate descends to compress the sacks, thereby pumping the blood out of the conduits simultaneously while the inlet valve moves to the closed position and the outlet valve moves to the open position, whereby the pumping rate is automatically varied as a function of the filling pressure, to thereby substantially balance the volume of blood passing from the right atrium and right ventricle to the pulmonary artery with the volume of blood passing from the left atrium and left ventricle to the aorta.

5,688,246

MICROCANNULA

Harold D. Waitz; Hal Sternberg; Paul E. Segall, all of Berkeley, and Bruce Cohen, Albany, all of Calif., assignors to BioTime, Inc., Berkeley, Calif.
Continuation-in-part of Ser. No. 348,743, Nov. 30, 1994, Pat. No. 5,484,417, which is a continuation of Ser. No. 237,826, May 4, 1994, abandoned, which is a continuation of Ser. No. 25,158, Mar. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 687,843, Apr. 19, 1991, abandoned. This application Oct. 24, 1995, Ser. No. 547,618
Int. Cl.⁶ A61M *5/178*
U.S. Cl. 604—165 12 Claims

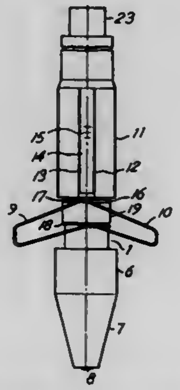


1. A microcannula, comprising:
a first hollow tube having a beveled tip; wherein said tube has a segment distal to the tip having an expanded outside diameter;
a second hollow tube joined to said first hollow tube at a point distal to the tip of said first tube;
an area of reduced inside diameter at said point of joinder; and
a solid conically pointed trochar tightly but removably fitted in the lumen of said first tube, said trochar sufficiently long to protrude beyond the leading edge of said beveled tip, wherein said trochar is removably immobilized by friction contact provided at said area of reduced inside diameter.

5,688,247

PORT CATHETER

Hans Haindl, Hauptstr. 39, 30972 Wennigsen, and Stephan Langenfeld, Osnabruck, both of Germany, assignors to Hans Haindl, Wenningsen, Germany
PCT No. PCT/EP93/01441, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/00177, PCT Pub. Date Jan. 6, 1994
PCT Filed Jun. 8, 1993, Ser. No. 356,385
Claims priority, application Germany, Jun. 30, 1992, 42 21 390.8
Int. Cl.⁶ A61M *5/00*
U.S. Cl. 604—175 19 Claims

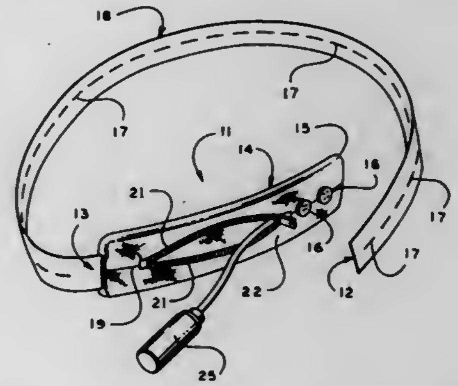


1. A port catheter for implantation in a body comprising a casing (1) having a generally cylindrical wall and having a chamber (22) therein, which is sealed on one side by a needle-pierceable membrane (4) and which is connected at (the) an end of the casing opposite from said (on the) membrane (4) with a tube catheter (8), and a cone (7) on the casing (1) that allows the implantation of the port catheter by puncture, and two anchoring loops (9,10) that protrude from the casing wall and can be bent together, the anchoring lops (9,10) comprising a spring wire which embraces the casing (1) over one position, protrudes from this position in two opposing directions taking the form of said two anchoring loops (9,10) and which (meet) meets again to embrace the casing (1), at a second position axially separated from the first position.

5,688,248

ADULT AND PEDIATRIC PERITONEAL DIALYSIS CATHETER BELT PACK

Kennith C. Lessing, Jr., 1344 Laverte Cir., Mableton, Ga. 30059
Filed May 2, 1996, Ser. No. 641,826
Int. Cl.⁶ A61M *25/02*
U.S. Cl. 604—179. 2 Claims



1. A peritoneal dialysis catheter apparatus containment device comprising:
a belt having a first end and a second end, the first end comprising an integral pouch, the pouch having a front face, a back face, front opening and a back opening, the front face and the back face defining a cavity within the pouch, a first releasable attaching means attached to the front face, the front opening having a zipper for selectively opening and closing the pouch, a second releasable attaching means for releasably attaching the second end to the first and, the first releasable attaching means being at least one button and the second releasably attaching means being at least one button hole located in the belt, the pouch being elongated in length and having a defined fold line along the length, the zipper being disposed along the fold line.

5,688,249

TELESCOPING MEMBERS FOR CATHETER INTRODUCER ASSEMBLY

Joseph Jawshin Chang, Avon; Dennis Bialecki, Oxford; Mark Panzera, and Philip D. Schmidt, both of Bristol, all of Conn., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.
Filed Mar. 28, 1995, Ser. No. 412,482
Int. Cl.⁶ A61M *5/32*
U.S. Cl. 604—198 20 Claims

1. A catheter introducer assembly comprising:
a) a body;
b) a cannula having a sharpened tip extending from said body;
c) a pair of telescoping members received in sliding engagement in an opening defined by a portion of said body;
d) a tip protector extending from a first of said telescoping members for covering said sharpened tip after introduction of a catheter;

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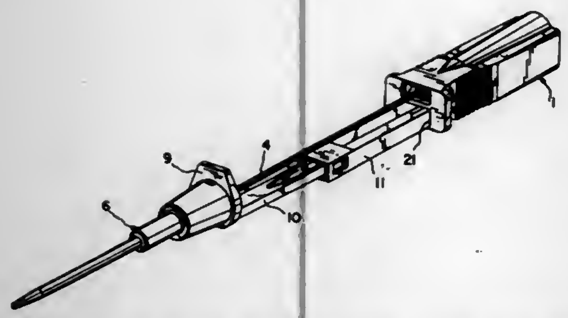
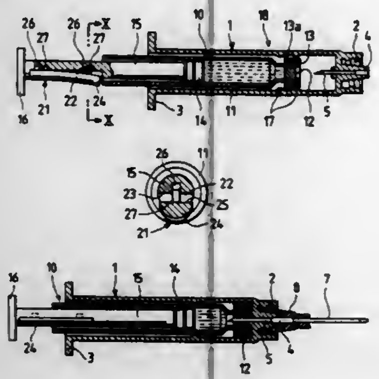


- e) first latch means for latching a second of said telescoping members in a position extending from said body when said second member is moved from a retracted position to a position extending from said body; and,
- f) second latch means for latching said first member in a position extending from said second member when said first member is moved from a first retracted position to a second position extending from said second member; said first latch means comprises at least one resilient arm on one of said body or said second member; and
- g) at least one pawl on said arm and at least one slot positioned opposite said arm such that when said second member moves to said position extending from said body said resilient arm biases said pawl into latched engagement with said slot.

5,688,250
SYRINGE

Masateru Naganuma, Kanagawa, Japan, assignor to Seikagaku Kogyo Kabushiki Kaisha (Seikagaku Corporation), Tokyo, Japan

Continuation of Ser. No. 966,199, Jan. 27, 1993, Pat. No. 5,468,232. This application Jun. 7, 1995, Ser. No. 482,856
Claims priority, application Japan, Jul. 26, 1991, 3-209862
Int. Cl.^{6} A61M *5/24;5/28*
U.S. Cl. 604—200 **5 Claims**



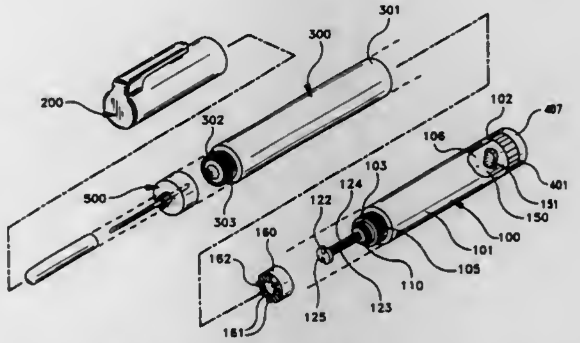
1. A syringe comprising a tubular holder defining an interior and having an injection needle-mounting portion provided at a distal end thereof; a discharge needle fixedly mounted on said mounting portion with its pointed end extended into the interior of said holder; and a cartridge including a tubular body of a predetermined length, a closure member which is mounted on an open distal end of said tubular body, and is pierceable by said discharge needle, a piston inserted to a predetermined position from an open proximal end, and a liquid sealed by said tubular body, said closure member and said piston, said cartridge being fitted in said holder so as to move back and forth within the interior of said holder, and being disposed at a position where said closure member is spaced apart from said discharge needle;

wherein said piston includes a piston rod; and said tubular body is of such a length that when said tubular body is inserted a maximum depth into said holder, the proximal end thereof is not completely received in said holder; and further comprising means for releasably locking said piston rod and in turn said piston with respect to said tubular body of said cartridge such that said piston advances together with said tubular body when said cartridge is advanced so as to pierce said closure member with said discharge needle, said means for releasably locking comprising an engagement member axially-movably fitted on that portion of said piston rod projected from said tubular body, and a releasable connection portion for fixing said engagement member to said piston rod at a position where said engagement member is held against a proximal end face of said tubular body, such that said engagement member is in a locked state during piercing of said closure member with said discharge needle, and is in a released state during injection of the liquid.

5,688,251
CARTRIDGE LOADING AND PRIMING MECHANISM FOR A PEN INJECTOR

Lawrence H. Chanoch, Mahwah, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 19, 1995, Ser. No. 530,527
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—208 **9 Claims**

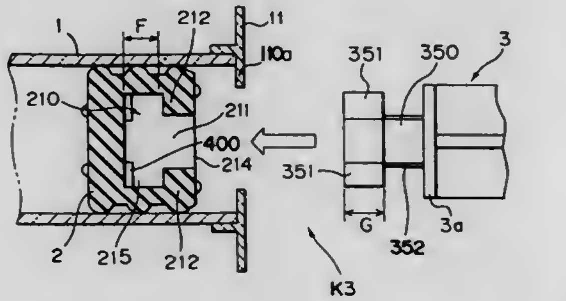


1. A medication delivery pen comprising:
- a cartridge holder assembly for holding a cartridge having a plunger, said cartridge holder assembly having a plurality of threads at a proximal end; and
- a pen body assembly releasably mountable on said cartridge holder assembly of said medication delivery pen for moving said plunger within said cartridge, said pen body assembly comprising:
  - a plurality of threads at a distal end for threading with said plurality of threads in said cartridge holder assembly;
  - a lead screw extending from the distal end for engaging the plunger in the cartridge in said cartridge holder;
  - means in said pen body assembly for driving said lead screw into said cartridge to move the plunger in the distal direction;
  - means in said pen body assembly for disengaging said driving means from said lead screw to permit said lead screw to automatically and easily retract into said pen body assembly as said pen body assembly approaches and is being threaded to said cartridge holder assembly; and
  - means in said pen body assembly for engaging said driving means to said lead screw to prime said medication delivery pen, when said pen body assembly is fully threaded onto said cartridge holder assembly,
- wherein said means for disengagin and means for engaging include:
  - an anti-rotation ring slidably mounted on said lead screw to prevent said lead screw from rotating with respect thereto, said anti-rotation ring having a spline extending in the distal direction into said cartridge holder assembly; and
- a spline located within said cartridge holder assembly for mating with said spline on said anti-rotation ring to prevent said lead screw from rotating with respect to said cartridge holder assembly and engage said lead screw to said driving means, when said pen body assembly is fully threaded onto said cartridge holder assembly.

5,688,252
SYRINGE

Terumi Matsuda, Nishinomiya, and Nobuo Tanaka, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 28, 1995, Ser. No. 535,915
Claims priority, application Japan, Sep. 30, 1994, 6-236787
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—218 **23 Claims**

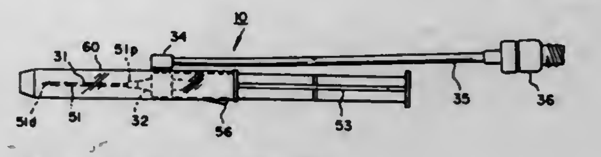


1. A syringe comprising:
- a tubular body which is provided, at its front end portion, with a portion for mounting an injection needle thereon and opens at its rear end portion so as to have a rear end opening;
- a gasket for sealing the rear end opening of the tubular body, which is slidably inserted into the tubular body; and
- a plunger rod which is detachably coupled with a rear end portion of the gasket through the rear end opening of the tubular body;
- wherein said plunger comprises a rod portion having a front end, a small-diameter rod portion extending forwardly from said front end of said rod portion along an axis of said rod portion, said small-diameter rod portion having a diameter smaller than the diameter of said rod portion, and a pair of opposite engagement projections that extend radially outward at a front end portion of said small-diameter rod portion, whereby an elongate front end portion of said plunger rod is defined by said front end portion of said small-diameter rod portion and said engagement projections;
- wherein said gasket is slidably inserted into and seals said rear end opening of said tubular body, said gasket having a rear end portion that is capable of having said plunger rod detachably coupled therewith, said rear end portion having a circular hollow therein for receiving said elongated front end portion of said plunger rod, said circular hollow having a mouth having a periphery from which a pair of opposed flanges project inward and have a central through hole therebetween for receiving said front end portion of said small-diameter rod portion therethrough and a pair of opposite recesses for receiving said engagement projections therethrough, whereby said central through hole and said pair of opposite recesses define an elongate rear end opening for receiving said front end portion of said plunger rod; and
- a rotational stopping means for stopping rotation of said plunger rod in said gasket;
- wherein when said plunger rod is rotated in said gasket to a predetermined position established by said rotational stopping means after said front end portion of said plunger rod has been inserted into said circular hollow through said elongate rear end opening of said gasket, said flanges can retain said engagement projections in said circular hollow.

5,688,253
NEEDLE LOCKING SYSTEM

Joseph R. Paradis, P.O. Box 22238, Hltn Hd Is., S.C. 29925

Filed May 31, 1995, Ser. No. 456,051
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—263 **19 Claims**

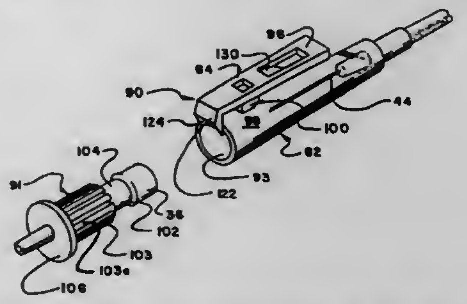


1. A catheter assembly comprising:
- a needle mount with a needle thereon and extending therefrom;
- a hub with a catheter surrounding said needle;
- a needle guard slidably disposable over said needle mount and engageable with said needle mount to cover said needle before insertion into a patient, and is retractable and slidably disengageable from said hub to expose said needle and permit insertion of said needle and said catheter into said patient, and thereafter is separable from said hub while receiving and guarding said needle during its withdrawal from said patient, completely covering said needle after withdrawal while allowing said catheter to remain inserted.

5,688,254
MEDICAL CONNECTOR

George A. Lopez, Huntington Beach, and Virgil R. Laul, Dana Point, both of Calif., assignors to ICU Medical, Inc., San Clemente, Calif.

Continuation of Ser. No. 424,237, Apr. 19, 1995, abandoned, which is a continuation of Ser. No. 279,247, Jul. 21, 1994, abandoned, which is a continuation of Ser. No. 20,098, Feb. 19, 1993, Pat. No. 5,344,414, which is a continuation of Ser. No. 346,193, Jan. 9, 1987, abandoned, which is a division of Ser. No. 606,679, May 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 543,248, Oct. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 460,585, Jan. 24, 1983, abandoned. This application Jun. 7, 1995, Ser. No. 472,787
Int. Cl.^{6} A61M *37/00*
U.S. Cl. 604—283 **10 Claims**



1. A safety connector system which permits the repeated connection and disconnection of an end of a first conduit to an end of a second conduit for permitting the flow of fluid between said first and second conduits in a medical environment, said end of said first conduit being sealed by a nonremovable septum, comprising:
- a hollow tube connected to said end of said second conduit, said tube having a diameter which is small enough in comparison with the diameter of said septum that said septum is capable of repeatedly resealing said end of said first conduit through resilient closure after said tube has penetrated said septum and been removed therefrom, said tube having sufficient rigidity to penetrate said septum when said end of said first conduit is advanced toward said end of said second conduit;
- a first latching member on said end of said first conduit; and
- a second latching member on said end of said second conduit, said first and second latching members cooperating to hold

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said tube in a position penetrating said septum, thereby preventing unintentional disconnection of said ends of said first and second conduits and preventing the disruption of fluid traveling between said first and second conduits when said first conduit is engaged with said second conduit.

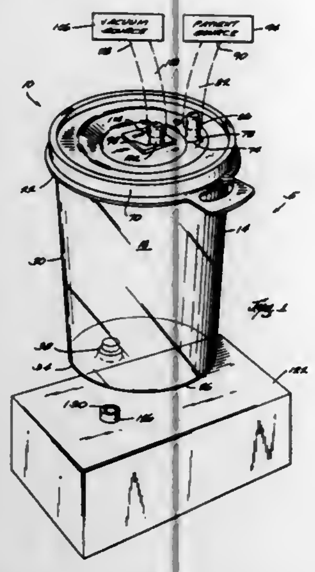
5,688,255
METHOD AND APPARATUS FOR REMOVING AND DISPOSING OF BODY FLUIDS

Joseph M. Hand, Sheboygan Falls, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Continuation-in-part of Ser. No. 547,759, Oct. 24, 1995, which is a continuation-in-part of Ser. No. 365,695, Dec. 29, 1994, Pat. No. 5,620,428. This application Jan. 5, 1996, Ser. No. 582,358

Int. Cl.^{6} A61M *1/00*

U.S. Cl. 604—317 **18 Claims**



1. A suction canister comprising

a container defining a chamber for collecting body fluids, said chamber being at least partially defined by a wall including a frangible wall portion having increased frangibility relative to the remainder of said wall such that said frangible wall portion can be broken to provide communication with said chamber, said container, including said wall and said frangible wall portion, being injection molded,

a patient port communicating with said chamber for communication with a patient cavity, and

a vacuum port communicating with said chamber for communication with a vacuum source such that application of a vacuum to said vacuum port creates a vacuum in said chamber and thereby draws body fluids into said chamber via said patient port.

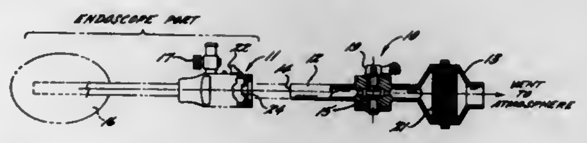
5,688,256
EVACUATION UNIT AND METHOD FOR CONTROLLING THE RELEASE OF GAS FROM A BODY CAVITY FOLLOWING SURGERY

W. Farris Surratt, Lawndale, and Steven K. Brockman, Shelby, both of N.C., assignors to Lap-Cap Associates, Shelby, N.C.

Continuation of Ser. No. 205,622, Mar. 3, 1994, abandoned. This application Aug. 16, 1995, Ser. No. 515,623

Int. Cl.^{6} A61F *5/44;* A61M *1/00;31/00*

U.S. Cl. 604—355 **3 Claims**



2. An evacuation system for removing gas present in a body cavity during a surgical procedure and cleansing blood and body fluids in aerosolized form and other contaminants from the removed gas comprising in combination:

a trocar having a first end adapted for fluid communication with said body cavity, and an outer end;

an evacuation connector having a first end adapted for insertion into said outer end of said trocar, a second end, and a flow control valve located between said first end and said second end, said outer end of said trocar having a flexible ring fitting for forming a sealing relationship with said evacuation connector; and

an aerosol trap having a first end in direct communication with said second end of said evacuation connector, an outlet end of said aerosol trap for gas exiting said evacuation unit, and a filter located between said first end and said outlet end, said filter having a pore size to trap aerosolized particles in said gas.

5,688,257
MENSTRUATION TAMPON AND A METHOD OF MANUFACTURING THE SAME

Clas Olsen, Vestskogen, Norway, assignor to Mölnlycke AB, Gothenburg, Sweden

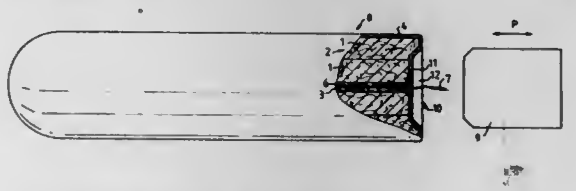
PCT No. PCT/SE93/01108, § 371 Date Aug. 16, 1995, § 102(e) Date Aug. 16, 1995, PCT Pub. No. WO94/15565, PCT Pub. Date Jul. 21, 1994

PCT Filed Dec. 27, 1993, Ser. No. 448,484

Claims priority, application Sweden, Dec. 30, 1992, 9203942

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—363 **13 Claims**



1. A menstruation tampon comprising:

a generally cylindrical, fibrous absorbent body;

a withdrawal string which is connected to the tampon and which exits from the tampon at a first tampon end thereof;

a liquid-permeable casing which comprises thermoplastic material and encloses the absorbent body;

the absorbent body having an axial end surface at said first tampon end;

the casing at the first tampon end is in contact with said axial end surface of the absorbent body;

the casing having been heat treated at a heat treated region to melt the casing material in said heat treated region to form an essentially liquid-impervious film at least over a central part of said axial end surface; and

fibres of the absorbent body are bonded to the casing within the heat treated region of the casing.

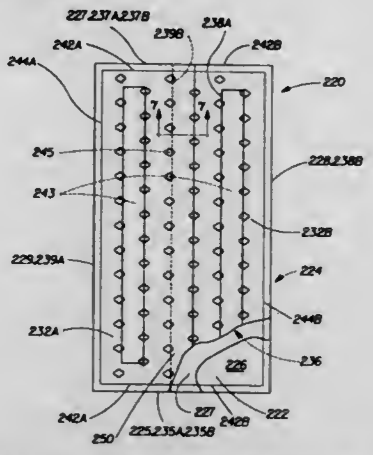
5,688,258
DISPOSABLE COVER FOR AN ABSORBENT MATERIALS

Digvijay Rawat, Kobe, Japan; Carlos Jose Barroso, Maineville, Ohio; Letha Margie Hines, Cincinnati, Ohio; Peter Morris, Cincinnati, Ohio; Robb Eric Olsen, Cincinnati, Ohio; J. Alvaro Restrepo, Caracas, Panama; Nona Jane Redwine, Mason, Ohio; Mark Donovan Seymour, and Hiroaki Shikata, both of Kobe, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 432,659, May 2, 1995. This application Jul. 20, 1995, Ser. No. 504,870

Int. Cl.^{6} A61F *13/15;13/20*

U.S. Cl. 604—385.1 **25 Claims**



1. A disposable cover for wrapping an absorbent material, said disposable cover comprising:

a liquid impervious anti-stain barrier which prevents liquids from penetrating its thickness, said anti-stain barrier having a first surface, at least a portion of said first surface contacting said absorbent material when said cover is wrapped about said absorbent material, an opposed second surface, and first and second longitudinally oriented side edges;

absorbent securement means disposed on said first surface, said absorbent securement means comprising an adhesive material with a release liner disposed thereon; and

garment securement means disposed on said second surface along said first and second longitudinally oriented side edges.

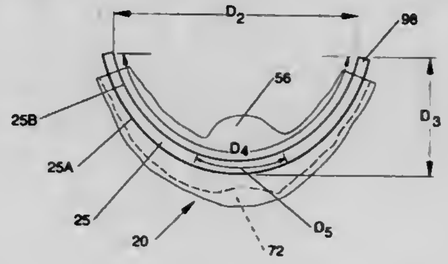
5,688,259
ABSORBENT ARTICLE HAVING RESILIENT CENTER

Thomas W. Osborn, III; Theresa L. Johnson; Letha M. Hines, and Robb E. Olsen, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 238,191, May 4, 1994, abandoned, which is a continuation of Ser. No. 915,202, Jul. 23, 1992, abandoned. This application Feb. 6, 1996, Ser. No. 596,061

Int. Cl.^{6} A61F *13/15;13/20*

U.S. Cl. 604—385.1 **11 Claims**



1. An absorbent article comprising a main body portion having longitudinal sides and transverse ends, a body-facing surface and a garment-facing surface, said article comprising:

a liquid pervious topsheet on said body-facing surface;

a liquid impervious backsheet on said garment-facing surface joined to said to said topsheet;

an absorbent core positioned between said liquid pervious topsheet and said liquid impervious backsheet, said absorbent core having a central portion located

inward of said transverse ends and a center said raised center having a pair of transverse end portions;

said absorbent core further comprising at least one bending axis located longitudinally outboard of the transverse end portions of the raised center, at least a portion of said absorbent core comprising a material arranged in a structure that is resistant to wet collapse; and

a pair of flaps joined to said main body portion and extending outward along each longitudinal side thereof;

wherein said absorbent article preferentially bends at said bending axis.

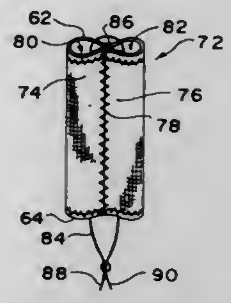
5,688,260
REUSABLE FABRIC FEMININE HYGIENE DEVICE

Catherine Carroll Blanton, 176 Genung Rd., Ithaca, N.Y. 14850

Filed Nov. 3, 1995, Ser. No. 552,385

Int. Cl.^{6} A61F *13/20*

U.S. Cl. 604—904 **14 Claims**



1. A catamenial device, comprising:

a single-piece washable, biodegradable fabric base member having a front surface, a first central axis and a second transverse axis perpendicular to said central axis;

first and second opposed fabric-side panels folded inwardly along said transverse axis toward said central axis and overlying said front surface to produce corresponding first and second said side edges on said base member;

first and second flaps each incorporating a corresponding one of said first and second panel side edges and being inwardly folded in transverse directions toward and overlapping said central axis;

means securing said flaps to said base member along said central axis to form first and second elongated, multilayer, side-by-side fabric tubes on said base member; and

a withdrawal string looped through said tubes.

5,688,261
TRANSPARENT LASER SURGICAL PROBE

Varouj D. Amirkhanian, Glendale, and Colette Cozean, El Toro, both of Calif., assignors to Premier Laser Systems, Inc., Irvine, Calif.

Continuation of Ser. No. 307,474, Sep. 16, 1994, abandoned, which is a continuation of Ser. No. 135,309, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 999,676, Dec. 30, 1992, abandoned, which is a continuation of Ser. No. 81,318, Mar. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 610,155, Nov. 7, 1990, abandoned. This application Apr. 7, 1995, Ser. No. 419,511

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—17 **24 Claims**

1. A laser surgery apparatus, comprising:

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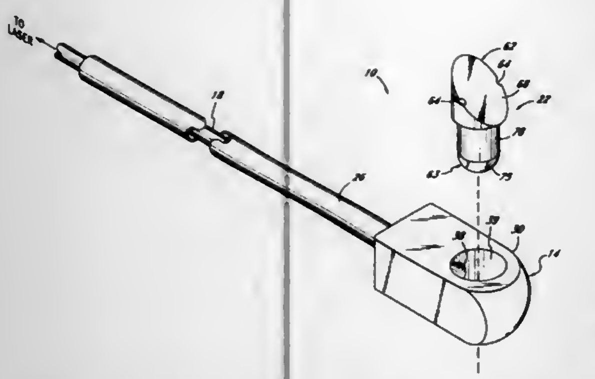


a probe that is adapted to deliver a beam of laser light, said probe comprising an elongate rod substantially transparent to said light and having a longitudinal axis, said rod having a reflecting surface adapted to reflect said beam of laser light from said rod towards a selected spot on tissue that is located generally transverse to said longitudinal axis, said reflecting surface being transparent to visible light and being disposed to reflect said beam of laser light such that substantially the entire reflected beam of laser light is directed along a single output path that extends generally transversely to said longitudinal axis, from said reflecting surface to said spot on said tissue, wherein visible light propagating from said spot on said tissue towards said reflecting surface along said output path propagates through said reflecting surface so as to be visible through said reflecting surface, and wherein said probe has an end portion configured for tissue manipulation, said end portion having an apex offset from the longitudinal axis of the probe.

5,688,262
LASER MICROSCOPE ADAPTOR APPARATUS WITH AUTO-FOCUS

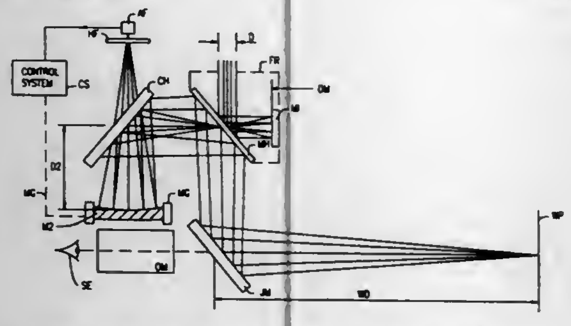
Martin David Abraham, Hod Hasharon, Israel, assignor to Laser Industries Ltd., Tel Aviv, Israel

Filed Jan. 5, 1995, Ser. No. 368,994

Claims priority, application Israel, Jan. 14, 1994, 108335

Int. Cl.^{6} A61N *5/06*

U.S. Cl. 606—18 **1 Claim**



1. A mirror-based laser micromanipulator comprising:
- a laser source outputting both a CO_2 treatment laser beam and a HeNe visible aiming laser beam;
- a planar reflector having first and second silvered sides, with a conical hole drilled in the center of said planar reflector;
- said planar reflector positioned to receive the treatment and aiming beams, and reflect said beams from said first silvered side to reach a concave hyperbolic focussing mirror;
- said concave hyperbolic focusing mirror receiving, reflecting, and focusing the treatment and aiming beams such that said beams pass through said conical hole in said planar reflector to reach a concave spherical focusing mirror;
- said concave spherical focusing mirror reflecting said treatment and aiming beams to reach said second silvered side of said planar reflector;
- said planar reflector receiving said treatment and aiming beams, and reflecting said treatment and aiming beams from said second silvered side to reach a manipulable mirror,
- said manipulable mirror receiving said treatment and aiming beams, and reflecting said laser beams to reach a working plane.

5,688,263
LASER SURGERY APPLICATOR

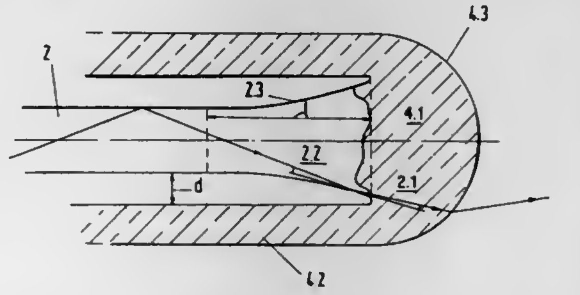
Gerhard Hauptmann, München, and Werner Rother, Weiterstadt, both of Germany, assignors to Dornier Medizintechnik GmbH, Germany

Filed Dec. 22, 1995, Ser. No. 577,102

Claims priority, application Germany, Dec. 22, 1994, 44 45 908.4

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—13 **8 Claims**



1. Laser surgical apparatus for contact vaporization of tissue comprising:
- a light guide with a quartz glass core;
- a contact tip comprising a quartz glass sheath, said contact tip being arranged at a distal end of the light guide, with a distal end of the quartz glass core being fused with a distal end of the quartz glass sheath to form an optically transparent tip, wherein:
  - the quartz glass core of the light guide runs coaxially with and is separated from an inside wall of the quartz glass sheath, by an axially extending gap; and
  - a transition region of the quartz glass core at a distal end thereof has a diameter which increases, thereby decreasing a width of said gap, with increasing proximity to said optically transparent tip.

5,688,264
LASER TREATMENT FOR RETINAL DETACHMENT

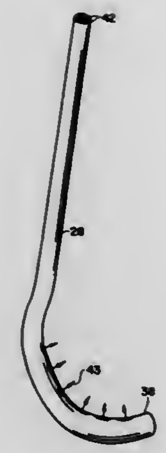
Qiushi Ren; Gabriel Simon, and Jean-Marie Parel, all of Miami, Fla., assignors to The University of Miami, Miami, Fla.

Division of Ser. No. 124,553, Sep. 22, 1993, Pat. No. 5,423,800, which is a division of Ser. No. 962,730, Oct. 19, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,157

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—15 **5 Claims**

1. An endoprobe comprising:
- a tubular element having a proximal end and a distal end;
- at least one optical fiber element disposed within said tubular element; and
- a plurality of laser light outlets defined through a side wall of said tubular element, said at least one optical fiber element being adapted to conduct laser light from said proximal end of said tubular element to said plurality of laser light outlets, thereby to direct laser light radially of the tubular element,
- wherein said tubular element is arcuately curved along portion of its length, adjacent its distal end, said laser light outlets being defined along a radially inner portion of said curved portion.



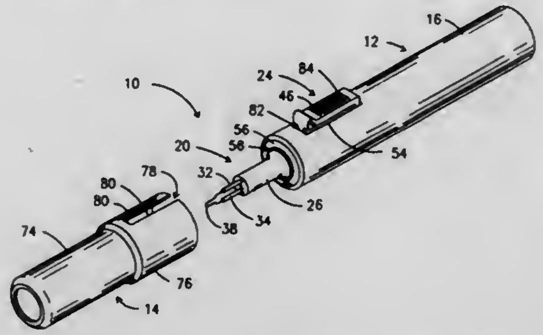
5,688,265
BATTERY POWERED CAUTERY ASSEMBLY

Moshe Citronowicz, St. Petersburg, Fla., assignor to Aaron Medical Industries, Inc., St. Petersburg, Fla.

Filed Aug. 30, 1995, Ser. No. 521,569

Int. Cl.^{6} A61B *17/38*

U.S. Cl. 606—30 **23 Claims**



1. A battery operated cautery comprising an outer housing having a switch actuator aperture including a distal end and a proximal end formed therein and configured to retain a battery voltage source including a first terminal and a second terminal, said outer enclosure having a distal end portion and a proximal end portion, a cautery element mounted on said distal end portion of said outer housing, a conductor including a first contact element movable between a first position and a second position formed on one end thereof and a second contact element formed on the opposite end thereof, said conductor being operatively housed within said outer housing, a switch actuator having a proximal end and a distal end hingedly attached to said outer housing and movable between a first position and a second position and at least partially disposed within said switch actuator aperture, said switch actuator being disposed adjacent said first contact element, said cautery element comprises a cautery heating holder supporting a first electrode and a second electrode at least partially disposed within said outer housing and cooperatively supporting a heating tip extending outwardly from said outer housing, said first electrode and said second electrode each including a distal end portion and a proximal end portion, said first contact element being normally biased in said first position in spaced relation relative to said first electrode, said second electrode being adapted to be electrically connected to said second terminal of said battery voltage source such that said first contact element is moved from said first position to said second position by depression of said switch actuator to engage said first electrode to complete the electrical circuit thereto to actuate said battery operated cautery, said cautery heating holder comprises an electrode support member to support said first electrode and said second electrode and an inner housing to house said proximal end portions of said first electrode and said second electrode and to operatively support a portion of said conductor thereon.

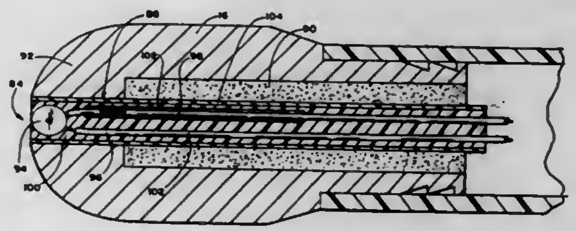
5,688,266
ELECTRODE AND ASSOCIATED SYSTEMS USING THERMALLY INSULATED TEMPERATURE SENSING ELEMENTS

Stuart D. Edwards, Los Altos, and Roger A. Stern, Cupertino, both of Calif., assignors to EP Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 371,601, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 72,322, Jun. 3, 1993, abandoned, which is a division of Ser. No. 37,740, Mar. 26, 1993, abandoned, which is a continuation of Ser. No. 790,578, Nov. 8, 1991, abandoned. This application Oct. 3, 1995, Ser. No. 538,618

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—31 **5 Claims**



3. An apparatus for transmitting energy to ablate tissue within the heart, the apparatus comprising
- an electrode element for contacting tissue while transmitting energy from a source to ablate the tissue, the electrode element having a thermal mass,
- a temperature sensing element carried in the electrode element, the temperature sensing element including a sensor having a region for making thermal conductive contact with tissue to sense tissue temperature conditions, and
- thermal insulating material in the electrode element between the sensor and the thermal mass of the electrode element, except for the sensor region, for thermally insulating the sensor from the thermal mass of the electrode element to make the sensor region more responsive to sensed tissue temperature conditions than to the thermal mass of the electrode element.

5,688,267
SYSTEMS AND METHODS FOR SENSING MULTIPLE TEMPERATURE CONDITIONS DURING TISSUE ABLATION

Dorin Panescu, Sunnyvale; David K. Swanson, Mountain View; Sidney D. Fleischman, Menlo Park, and Thomas M. Bourne, Mountain View, all of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.

Filed May 1, 1995, Ser. No. 432,091

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—41 **28 Claims**

1. A system for ablating body tissue comprising
- an electrode for contacting tissue to form a tissue-electrode interface, the electrode adapted to be connected to a source of ablation energy to conduct ablation energy for transmission by the electrode into tissue at the tissue-electrode interface,
- a tissue temperature sensing element,
- a carrier on the electrode holding the tissue temperature sensing element in thermal conductive contact with tissue, the carrier being substantially isolated from thermal conductive contact with the electrode, and

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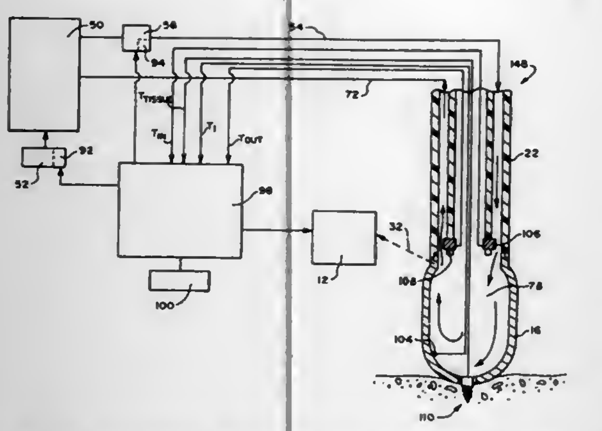


a second temperature sensing element in thermal conductive contact with the electrode.

5,688,268

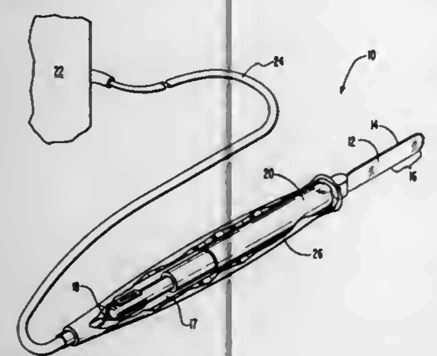
ELECTROSURGICAL CUTTING DEVICE

R. Gail Billings, Holladay, Utah, assignor to Utah Medical Products, Inc., Midvale, Utah

Filed Jan. 30, 1996, Ser. No. 593,618

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—45 **25 Claims**



1. An electrosurgical cutting device for communicating electrically with an electrosurgical generator comprising:

a non-conductive support member having a peripheral edge; and

a conducting member, distinct from said support member, disposed along at least a portion of the peripheral edge of said support member, said conducting member configured to communicate electrically with the electrosurgical generator thereby allowing the electrosurgical generator to transmit sufficiently high frequency electrical energy to said conducting member to enable said conducting member to cut body tissue, wherein said conducting member forms a wire loop electrode with said support member filling the center of the loop.

5,688,269

ELECTROSURGICAL APPARATUS FOR LAPAROSCOPIC AND LIKE PROCEDURES

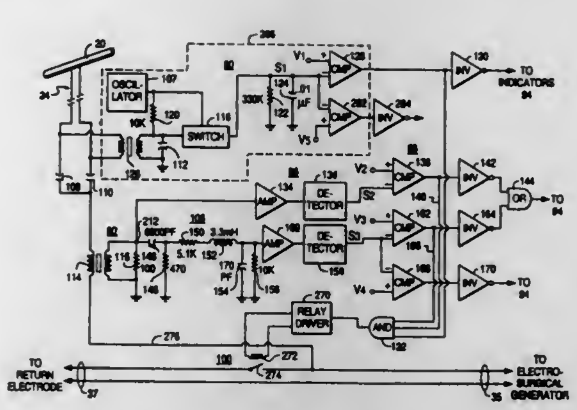
David W. Newton, Boulder; Roger C. Odell, Louisville; Don R. Boyle, Boulder, all of Colo.; James Richard Gannoe, Southbridge, and John J. Laviolette, Palmer, both of Mass., assignors to Electroscope, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 727,946, Jul. 10, 1991, Pat. No. 5,312,401. This application Mar. 30, 1993, Ser. No. 38,104

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—46 **61 Claims**

1. Laparoscopic electrosurgical apparatus for use with an electrosurgical generator comprising:



a trocar cannula having a tubular passage for providing a conduit through a patient's skin to a peritoneal cavity of the patient, the trocar cannula having a proximal end and a distal end;

a tubular conductive shield having an inner surface and an outer surface and being removably insertable to an inserted position through the trocar cannula conduit, said shield having a distal end and a proximal end;

an active electrode probe having a tip and being adapted for connection to an electrosurgical generator and extending through the tubular conductive shield for effecting at the tip thereof an electrosurgical procedure within the peritoneal cavity where, when the tubular shield is in the inserted position thereof, the shield surrounds the active probe from at least (a) a proximal point prior to the distal end of the trocar cannula to (b) a distal point distal to the distal end of the trocar cannula and in proximity to the tip of the active probe;

at least one layer of electrical insulation disposed between the active probe and the inner surface of the tubular conductive shield;

an electrical terminal connected to the shield and adapted for connecting the shield to a reference potential;

whereby any abnormal condition which causes current to flow in said shield from said active probe is conducted to said reference potential to thus lessen a risk of patient injury; and

monitor circuitry connected between said electrical terminal and said reference potential where the impedance between said electrical terminal and said reference potential is not more than about twenty ohms, said monitor circuitry being responsive to current in the shield to determine whether said abnormal condition exists.

5,688,270

ELECTROSURGICAL HEMOSTATIC DEVICE WITH RECESSED AND/OR OFFSET ELECTRODES

David C. Yates, West Chester, and James Voegele, Cincinnati, both of Ohio, assignors to Ethicon Endo-Surgery,Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 95,797, Jul. 22, 1993, Pat. No. 5,403,312, and a continuation-in-part of Ser. No. 96,154, Jul. 22, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 374,012

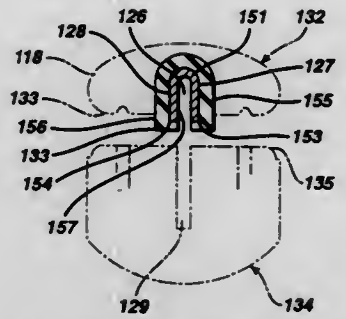
Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—51 **32 Claims**

1. An electrosurgical device having an end effector capable of receiving electrosurgical energy therein, said end effector comprising:

first and second opposing interfacing surfaces, said interfacing surfaces capable of engaging tissue therebetween, at least one of said first and second interfacing surfaces being electrically insulating and including a recessed portion;

electrically isolated first and second poles comprised of electrically different electrodes capable of conducting electrosurgical energy therethrough, said first pole comprised of a first electrode of a first electrical potential and said second pole comprised of a second electrode of a second electrical potential different from said first potential; and



wherein said first electrode is located on one of said interfacing surfaces and said second electrode is located on at least one of said interfacing surfaces, and a tissue contacting portion of at least one of said electrodes is located below said interfacing surface on a said recessed portion, said electrodes being arranged so that electrosurgical energy may be communicated between said poles through the tissue.

5,688,271

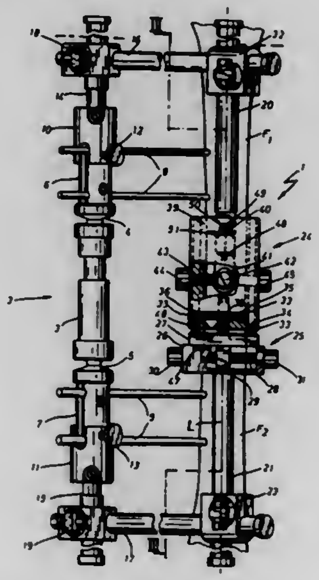
ORTHOPAEDIC DEVICE, ESPECIALLY FOR THE GRADUAL CORRECTION OF FRACTURES

Giovanni Faccioli, Monzambano; Daniele Venturini, Veronese, and Guilio Zampieri, Torinese, all of Italy, assignors to Orthofix S.r.l., Bussolengo, Italy

Filed Nov. 1, 1995, Ser. No. 551,627

Int. Cl.^{6} A61B *17/60*

U.S. Cl. 606—54 **15 Claims**



1. An orthopaedic device and external fixation unit, in combination, for the gradual external correction of fractures which have already been set in the operating theatre, comprising an elongate structure defining a longitudinal axis which can be positioned parallel to a fractured limb, in which the structure has a pair of end supports releasably anchored to corresponding bolt-holding clamps of the external fixation unit adapted to being implanted onto fractured pieces, a central body connected to the supports by adjustable connection means which comprise longitudinal adjustment means to correct the longitudinal distance between the supports, transverse adjustment means to correct transverse offsets between the supports, angular adjustment means to correct the relative inclination of at least one of the supports with respect to the longitudinal axis by rotation about a lateral axis, and centering means to align the transverse axis with the centre of the fracture, in which the lateral axis is perpendicular to the plane of action of the longitudinal and transverse adjustment means, the central body comprising a block of radio-transparent material having a central cavity, the longitudinal and transverse adjustment means being located at one of the longitudinal ends of the body, and the angular adjustment means being located at the other longitudinal end.

5,688,272

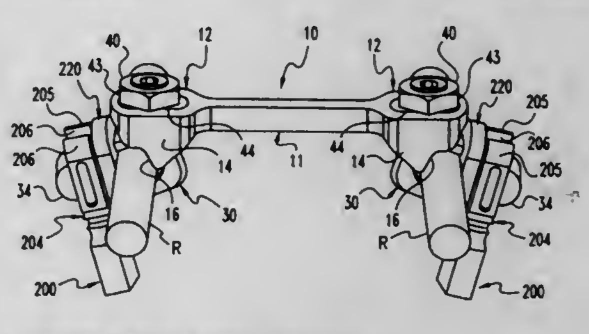
TOP-TIGHTENING TRANSVERSE CONNECTOR FOR A SPINAL FIXATION SYSTEM

Leslie A. Montague, Cordova; Michael C. Sherman, Memphis, and Eddie Ray, III, Cordova, all of Tenn., assignors to Danek Medical, Inc., Memphis, Tenn.

Filed Mar. 30, 1995, Ser. No. 413,387

Int. Cl.^{6} A61B *17/70*

U.S. Cl. 606—61 **26 Claims**



5. A spinal fixation system, comprising:

a) a first longitudinal member configured for placement adjacent the spine of a patient;

b) a vertebral fixation element including:
  a vertebra engaging portion;
  a connection portion;

c) a first clamp assembly including:
  a first clamp body defining a passage therethrough configured to receive said first longitudinal member;
  a first means for attaching said connection portion of said vertebral fixation element to said first clamp body;

d) a transverse connector including:
  an elongate body defining a longitudinal axis along its length;
  a first engagement portion formed on a portion of said elongate body having a first surface configured to engage said first longitudinal member and an upper surface defining an engagement portion opening therethrough; and

e) a first fastener attaching said first clamp body to said first engagement portion of said transverse connector with said first surface engaging said longitudinal member, said first fastener extending through said engagement portion opening, said first fastener including:
  a threaded stem, having opposite ends, one end being attached to said first clamp body and said opposing end passing through said engagement portion opening;
  a nut configured for threading on said threaded stem, said nut having a bottom surface for engaging said upper surface of said first engagement portion when said stem passes through said engagement portion opening.

5,688,273

SPINAL IMPLANT APPARATUS HAVING A SINGLE CENTRAL ROD AND PLOW HOOKS

Joseph P. Errico, Far Hills; Thomas J. Errico, Summit, and James D. Ralph, Oakland, all of N.J., assignors to Fastenetix, LLC., Summit, N.J.

Filed Oct. 23, 1995, Ser. No. 547,105

Int. Cl.^{6} A61B *17/70*

U.S. Cl. 606—61 **6 Claims**

4. An orthopaedic hook for use with central vertical axis orthopaedic rod implantation apparatus, comprising:

a blade portion, including

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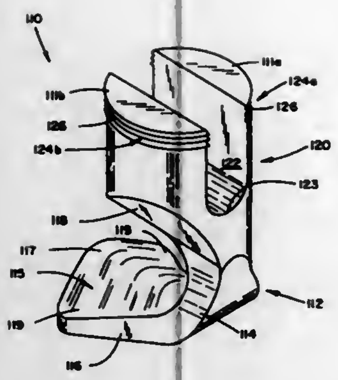


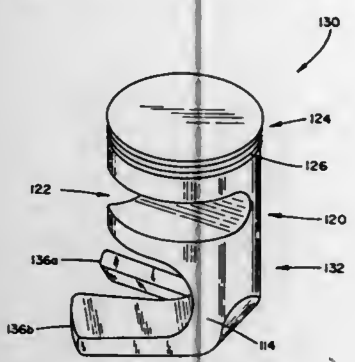
a curved section which is nestable against the lateral surface of a human lamina at the central vertical axis thereof, a lower extending member, and
an upper section which is positionable above the lamina along the central axis thereof, said upper section including at least one channel for receiving therein a support rod, said at least one channel defining a longitudinal axis,
said lower extending member having an arched upper surface defining a surface maximum which extends along a line which is coplanar with said longitudinal axis defined by the support rod, and
means for locking said at least one channel in said at least one channel.

5,688,274

SPINAL IMPLANT DEVICE HAVING A SINGLE CENTRAL ROD AND CLAW HOOKS

Joseph P. Errico, Far Hills; Thomas J. Errico, Summit, and James D. Ralph, Oakland, all of N.J., assignors to Fastenetix LLC., Summit, N.J.

Filed Oct. 23, 1995, Ser. No. 547,106
Int. Cl.^{6} A61B *17/70*
U.S. Cl. 606—61 **6 Claims**



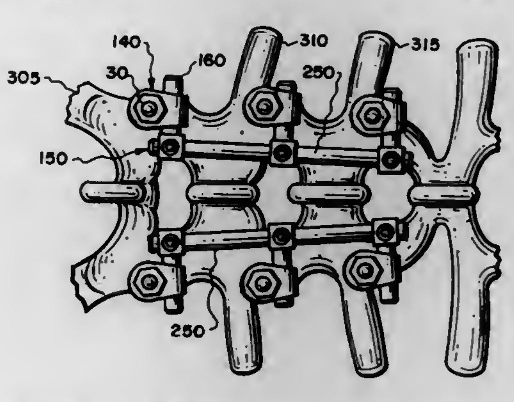
4. An orthopaedic hook for use with central vertical axis orthopaedic rod implantation apparatus, comprising:
a blade portion, including a curved section which is nestable against the lateral surface of a human lamina at the central vertical axis thereof, a lower extending section, said section including bifurcated planar portions which each have upper and lateral surfaces which are angularly offset relative to the corresponding surfaces of the other portion so as to permit the bifurcated planar portions to be conformally nestable against respective arched undersurface regions of the human lamina at the central vertical axis thereof, which arched undersurface regions are equivalently angularly offset, and an upper section which is positionable above the lamina along the central vertical axis thereof,
said upper section including at least one channel for receiving therein a support rod and
means for locking said support rod in said at least one channel.

5,688,275

SPINAL COLUMN ROD FIXATION SYSTEM

Tibor Koros, and Gabriel Koros, both of 610 Flinn Ave., Moorpark, Calif. 93021

Filed Feb. 9, 1996, Ser. No. 598,924
Int. Cl.^{6} A61B *17/70*
U.S. Cl. 606—61 **6 Claims**



1. A spinal fixation apparatus for permanently holding a spinal rod in place, comprising:
a cortical screw having a lower screw portion, a medial head, and a threaded upper stem, said medial head having a top surface and a bottom surface:
a cylindrical plug having a circular-to-oval-shaped axial bore cooperating with said upper stem and resting on said medial head of said cortical screw, said plug having an indentation in an outer wall;
an adjustable cap having a vertical cylindrical chamber open at the bottom for holding said cylindrical plug and an oval slot at the top for allowing said upper stem of said cortical screw to extend upwardly through said oval slot, said cap having a bore perpendicular to said cylindrical chamber;
a block having a transverse arm, a bore, and an internally threaded hole perpendicular to and cooperating with said bore in said block; and
a retaining nut for cooperating with the threaded upper stem so that said retaining nut, said cap, said plug, and said cortical screw form a clamping assembly for said transverse arm;
wherein said bore in said cad and said indentation in `said plug are alignable so that said transverse arm can slide into and through said bore in said cap and fix said plug in a position to superimpose said circular-to-oval-shaped axial bore in said plug with said oval slot in said cap, and wherein tightening of said retaining nut against said cap clamps said transverse arm and prevents rotational and longitudinal movement of said transverse arm relative to said clamping assembly.

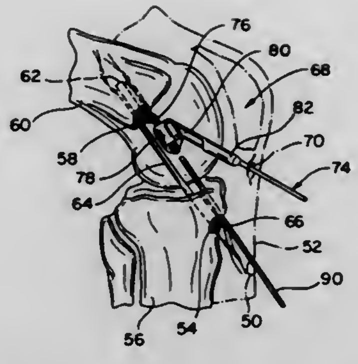
5,688,276

ADJUSTABLE IMPLANT HOLDER INSTRUMENT

Benjamin Shaffer, 2111 Wisconsin Ave. NW., Apt. 305, Washington, D.C. 20007

Continuation of Ser. No. 83,753, Jun. 23, 1993, abandoned. This application Jul. 13, 1995, Ser. No. 502,103
Int. Cl.^{6} A61B *17/56*
U.S. Cl. 606—73 **16 Claims**

1. An adjustable holder instrument comprising:
a proximal handle having a moveable actuating member;
an elongated shaft having a proximal end connected to said proximal handle and having a distal end;
threaded holding means for removably carrying a surgical interference screw, said holding means including a collar defining a threaded opening through which the screw is spirally insertable;
pivot means for pivotably interconnecting said holding means with said distal end of said shaft;
means, connecting said actuating member to said holding means, for transferring force, applied to said actuating member, to said holding means to enable selective orientation of said holding means relative to said shaft; and
wherein said shaft is hollow and said means for transferring force travels within said shaft.



5,688,277

Patent Not Issued For This Number

5,688,278

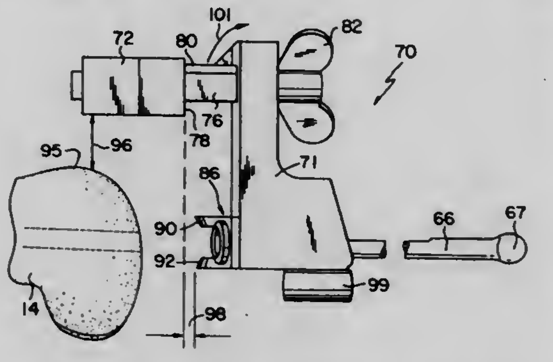
Patent Not Issued For This Number

5,688,279

ALIGNMENT GUIDE FOR A BONE CUTTING BLOCK

Donald E. McNulty, Warsaw; David C. Kelman, Winona Lake, both of Ind.; John R. Moreland, Pacific Palisades, Calif., and John E. Hamm, Warsaw, Ind., assignors to DePuy Orthopedics, Inc., Warsaw, Ind.

Division of Ser. No. 437,848, May 9, 1995, Pat. No. 5,562,675, which is a division of Ser. No. 937,704, Sep. 1, 1992, Pat. No. 5,445,642. This application Jan. 11, 1996, Ser. No. 584,896
Int. Cl.^{6} A61B *17/56*
U.S. Cl. 606—88 **7 Claims**



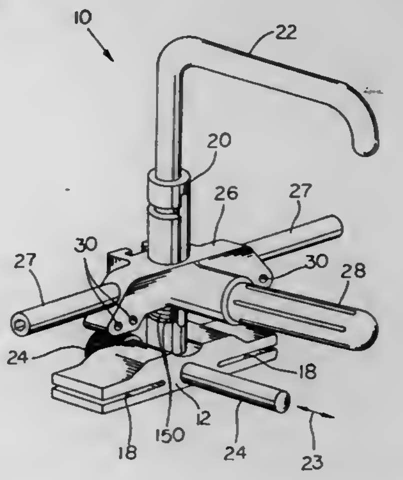
1. An alignment guide for positioning a saw guide surface of a cutting block at a predetermined position proximally from an intercondylar notch of a femur having an intermedullary rod extending along its anatomical axis, the alignment guide comprising:
a body portion formed to include an aperture for receiving the rod therethrough;
an arm coupled to the body for receiving the cutting block thereon;
means for securing the cutting block to the arm at a predetermined position relative to the body; and
an intercondylar saddle coupled to the body portion of the alignment guide, the saddle being configured to engage the intercondylar notch of the femur to align the cutting block coupled to the arm of the alignment guide at said predetermined position proximal to the intercondylar notch.

5,688,280

INSTRUMENTATION FOR USE IN ORTHOPAEDIC SURGERY

Robert E. Booth, Jr., Philadelphia, Pa.; Gregory C. Stalcup, Columbia City, Ind.; Rodney Bays, Pierceton, Ind.; Billy N. Sisk, Claypool, Ind.; Steven E. Dietzel, Peru, Ind., and Timothy R. Miller, Austin, Tex., assignors to Bristol-Myers Squibb Co., New York, N.Y.

Continuation-in-part of Ser. No. 369,226, Jan. 6, 1995, Pat. No. 5,540,696. This application Jul. 26, 1996, Ser. No. 686,894
Int. Cl.^{6} A61B *17/15*
U.S. Cl. 606—88 **5 Claims**



1. An orthopaedic instrument for use in orthopaedic surgery, comprising:
a body having a first opening and a second opening, said second opening being in communication with said first opening and extending transverse to said first opening;
a first elongate member being slidingly disposed within said first opening and defining a longitudinal axis; and
a second elongate member being threadingly engaged within said second opening, said second elongate member being offset relative to said longitudinal axis of said first elongate member and having a tip configured to engage said first elongate member and apply both a radial and tangential force to said first elongate member, thereby inhibiting movement of said first elongate member within said first opening.

5,688,281

INTRAMEDULLARY ALIGNMENT GUIDE

Phil Cripe, Warsaw, Ind., and Cary M. Mauldin, Lake City, Fla., assignors to Exactech, Inc., Gainesville, Fla.

Continuation of Ser. No. 357,430, Dec. 16, 1994, abandoned. This application Oct. 9, 1996, Ser. No. 727,281
Int. Cl.^{6} A61B *17/56*
U.S. Cl. 606—88 **16 Claims**

1. A femoral alignment guide for positioning a distal femoral cutting guide at an angle which is perpendicular to a patient's mechanical axis, including:
(a) a base having a plurality of securement holes formed therethrough for securing the base to a distal femur end of a patient, wherein the base includes an attachment rod shaped to receive a distal femoral cutting guide; and
(b) an angular adjustment means having a longitudinal axis, pivotally and rotationally secured to the base, wherein rotation of the adjustment means pivots the base, and wherein rotation of the adjustment means about the axis deflects the

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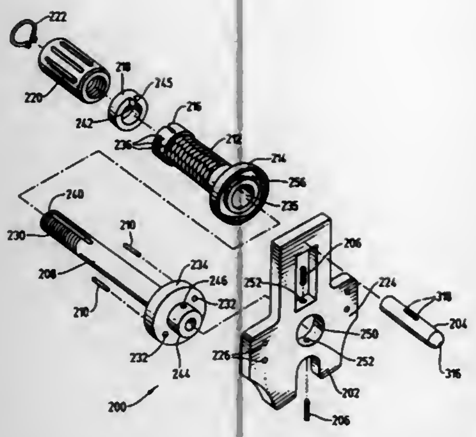
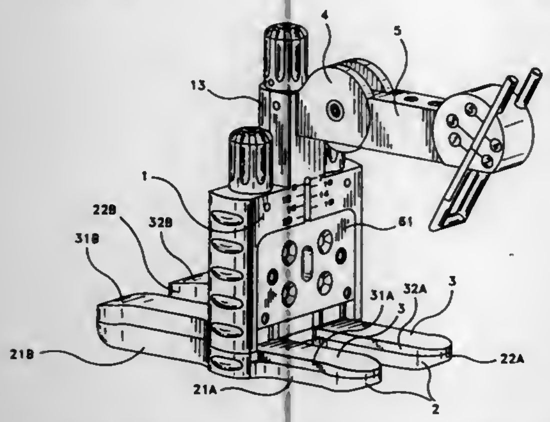


base in accordance with the rotational position of the angular adjustment means to adjust the angle between the base and the axis.

5,688,282
DISTRACTION APPARATUS FOR A KNEE

Lionel Baron, Oistreham; Patrick Schifrine, Veyrier du Lac; Denis Van de Velde, Valenciennes; Nicolas Moncade, Echau; Louis Setiey, Gleize; Philippe Segal, Cormontreuil; Marc Raguet, Chalons S/Marne; Claude Vielpeau, Hérouville-Saint-Clair; Bruno Balay, Saint Bernard; Jean-Marie François, Marienthal; Philippe Stahl, Sainghain en Melantois; Michel Serrault, Flers; Paul Rivat, Saint Peray; Didier Mailhe, Castelnau le Lez, all of France; Vittorio Monteleone, Napoli, Italy, and Jean-Marie Verleyen, Grigny, France, assignors to Benois & Girard & Cie, Hérouville-Saint-Clair, France

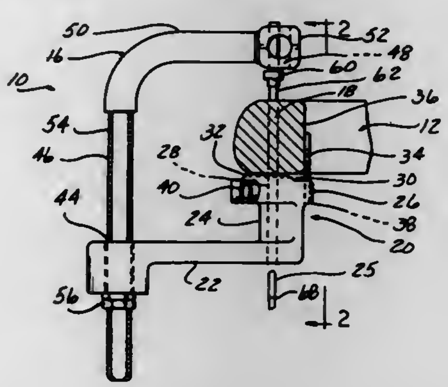
Filed Aug. 16, 1996, Ser. No. 689,976
Claims priority, application France, Aug. 24, 1995, 95 10055
Int. Cl.^{6} A61B *17/60;* **A61F** *5/00*
U.S. Cl. 606—90 **16 Claims**



1. A distraction apparatus for a knee prosthesis, comprising;
a body having a top pair and a bottom pair of runners arranged one below the other, all parallel to each other and extending in a plane perpendicular to said body so as to form rear extensions on one side of the body, and front extensions on the other side;
the front extensions and the rear extensions of the lower pair of runners are integral and can be moved simultaneously in relation to the body;
the front extensions and rear extensions of the upper pair of runners are independent of one another;
the front extensions of the upper pair of runners can be moved individually in relation to the body; and
the rear extensions of the upper pair of runners are both integral with the body.

5,688,283
DRILL GUIDE FOR MANDIBULAR STAPLE TRANSOSSEOUS IMPLANTS

John G. Knapp, 19928 Farmington Rd., Livonia, Mich. 48152
Filed Nov. 17, 1995, Ser. No. 560,541
Int. Cl.^{6} A61B *17/56*
U.S. Cl. 606—96 **27 Claims**

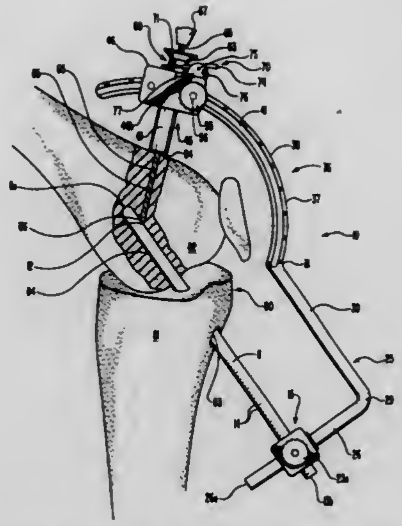


20. In an apparatus for guiding a drill during a drilling procedure to produce at least one aperture in an accurately located position through a jaw bone of a patient for implantation of a mandibular staple therethrough, said apparatus including a first member having a plurality of drill-guiding apertures extending therethrough, and a second member opposing said first member, said first member moveable with respect to said second member along a fixed path into a clamping position with said first and second members clampingly engaging opposite faces of said jaw bone with said jaw bone interposed between said first and second members, the improvement comprising:
lateral locator means supported by said first member and extending outwardly toward said second member, said lateral locator means engageable with an external surface of said jaw bone extending transversely between said opposite faces for laterally locating said first and second members with respect to said jaw bone so that said drill-guiding apertures are spaced a predetermined distance from an edge of said jaw bone for ensuring sufficient jaw bone material in a lateral direction to drill apertures for receiving said mandibular staple and for anchoring said mandibular staple in said apertures after said drilling procedure.

5,688,284
VARIABLE ANGLE DRILL GUIDE AND LIGAMENT FIXATION METHOD

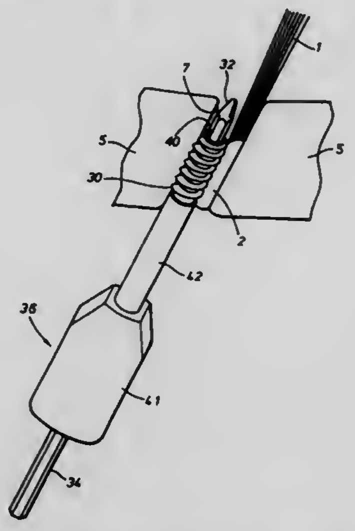
Alan Chervitz, and E. Marlowe Goble, both of Logan, Utah, assignors to MedicineLodge, Inc., Logan, Utah
Filed Sep. 20, 1996, Ser. No. 717,012
Int. Cl.^{6} A61B *17/17*
U.S. Cl. 606—96 **15 Claims**

1. A variable angle drill guide comprising;
a straight reference rod having a first end for sliding engagement with a ligament tunnel in a bone and an opposite second end that is arranged to be fitted into a first passage formed through a slide block means;
a slide block means that includes straight first and second passages therethrough, with said second passage spaced from said first passage;
a straight base leg rod section of a drill guide brace that is arranged to be fitted into said second passage and includes a straight drill guide mounting leg section connected at a first end to said base leg rod section and further connected at an opposite second end to a slide track means;
a slide track means formed with a uniform arcuate shape for mounting a drill guide slide fitted with a drill guide barrel thereon, said slide track means having spaced apart markings for identifying a range of selected angular orientations formed between a longitudinal axis of said drill guide barrel and a longitudinal axis of said reference rod, said range including angular orientations of both less than and greater than a right angle;
a drill guide slide that is fitted to receive a drill guide barrel and that is arranged for sliding engagement with said slide track means; and
a drill guide barrel having a straight longitudinal passage formed therethrough and including means for releasable mounting to said drill guide slide.



5,688,285
GRAFT BONE FIXATION TOOL

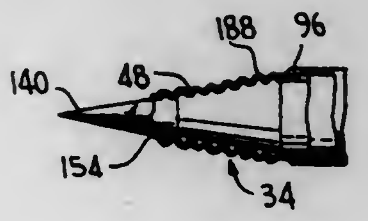
Ikufumi Yamada, Kumagaikata, 2-1-16, Ogawa, Machida-city, Tokyo, Japan
Continuation-in-part of Ser. No. 520,371, Aug. 29, 1995. This application Dec. 21, 1995, Ser. No. 576,867
Int. Cl.^{6} A61F *2/08*
U.S. Cl. 606—104 **5 Claims**



1. A graft bone fixation tool for securing a bone piece, which is attached to one end of a length of tendon, in a bore formed in a bone part, comprising:
a transmission shaft including a forward tip and an intermediate section provided with engagement means for torque transmission, said transmission shaft being adapted to be slidingly fitted into and through an axial bore of a screw member, said transmission shaft being of a length such that said forward tip extends from the screw member axial bore, the screw member being provided with associated engagement means for cooperation with said engagement means of said transmission shaft, the screw member being provided with a screw thread around an outer circumference thereof for insertion into a gap between the bone piece and the bore;
a rotary drive unit provided at a base end of said transmission shaft for manually rotating said transmission shaft so as to apply a torque to the screw member fitted on said intermediate section of said transmission shaft;
wherein said forward tip of said transmission shaft is provided with a tapered or otherwise pointed tip which guides the screw member in a desired direction into the gap; and
wherein said rotary drive unit comprises a handle grip, a rotary tube integrally attached to said handle grip, and an axial bore passing through said handle grip and said rotary tube for receiving said intermediate section of said transmission shaft in an axially slidable but rotatively engaged manner, a free end of said rotary tube being adapted to support an opposing axial end of the screw member.

5,688,286
SAFETY TROCAR PENETRATING INSTRUMENT WITH SAFETY SHIELD HAVING RESILIENT DISTAL END

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131
Division of Ser. No. 313,655, Sep. 26, 1994, Pat. No. 5,591,190, which is a continuation of Ser. No. 817,113, Jan. 6, 1992, Pat. No. 5,350,393. This application Dec. 4, 1996, Ser. No. 760,232
Int. Cl.^{6} A61B *17/34*
U.S. Cl. 606—185 **4 Claims**



1. A safety trocar penetrating instrument comprising
an elongate, tubular portal sleeve having a distal end and a proximal end;
a housing coupled with said proximal end of said portal sleeve and having a valve therein for controlling fluid flow through said housing and said portal sleeve and for allowing passage of instruments therethrough;
a trocar disposed within said portal sleeve and having a longitudinal axis, a proximal end and a solid distal end terminating at a sharp tip beyond said distal end of said portal sleeve for penetrating tissue;
a safety shield disposed between said portal sleeve and said trocar and having a proximal end and a distal end and being movable between an extended position with said safety shield distal end protruding distally of said trocar tip and a retracted position with said safety shield distal end disposed proximally of said trocar tip to expose said trocar tip;
a hub abutting said housing for receiving said proximal end of said trocar said trocar passing through said valve in said housing;
bias means for biasing said safety shield toward said extended position and for permitting said safety shield to move proximally to said retracted position in response to a proximally directed force applied to said safety shield distal end, said bias means returning said safety shield to said extended position when the force applied to said safety shield distal end is removed; and
stop means for limiting proximal movement of said safety shield;
wherein said safety shield distal end is resilient to permit said safety shield distal end to be moved to said retracted position in response to forces from contact of said safety shield distal end with tissue and to permit said safety shield distal end to resiliently return to said extended position upon removal of the forces from tissue contact.

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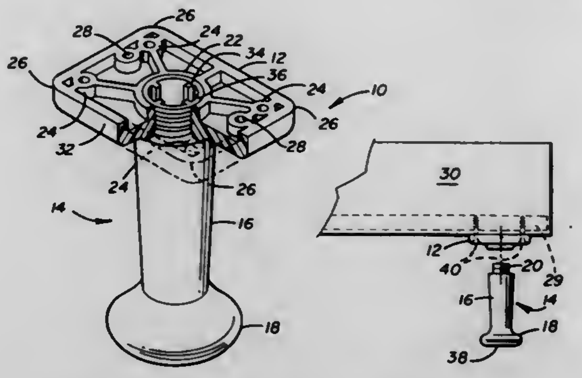
5,688,287
LEG FOR BOX SPRINGS

David Cline, Kentfield, Calif., assignor to Rid-Gid Products, Inc., San Francisco, Calif.

Flied Jul. 25, 1996, Ser. No. 687,254

Int. Cl.^{6} A47C *19/00;23/00*

U.S. Cl. 5—310 **12 Claims**



1. A support for the box springs of a bed comprising:
a rectangular plate member defining a central threaded bore;
a leg;
fastening means for fixing said plate member to said box springs;
said rectangular plate member defining four corners, six holes, a first edge, and an opposing second edge, each of four of said six holes adjacent one of said corners of said rectangular plate member, such that two of said four holes are adjacent said first edge and the other two of said four holes are adjacent said opposing second edge, the remaining two of said six holes positioned a predetermined distance in from said first edge of said rectangular plate member;
said leg defining a foot end and an integral threaded opposite end, said threaded end adapted to be threadably received in said central threaded bore of said plate member.

5,688,288
DISPERSE DYE COMPOSITION AND METHOD FOR DYEING HYDROPHOBIC FIBER MATERIAL THEREWITH

Yoshiki Akatani, Tokyo; Yasuo Murakami, Kawaguchi; Hiroyuki Matsumoto, and Kiyoko Tanaka, both of Omiya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 423,503, Apr. 17, 1995, abandoned.

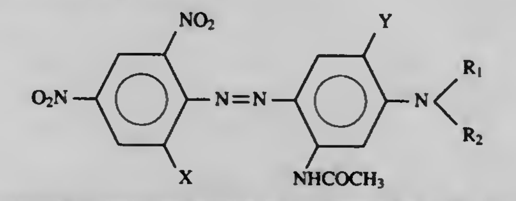
This application Dec. 17, 1996, Ser. No. 768,192

Claims priority, application Japan, Apr. 19, 1994, 103196

Int. Cl.^{6} D06P *1/18*

U.S. Cl. 8—639 **12 Claims**

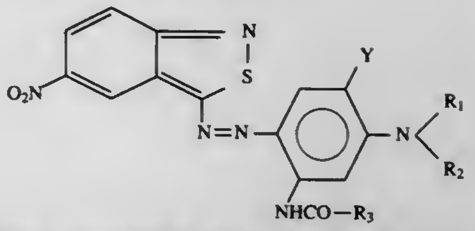
1. A disperse dye composition comprising one or more dyes represented by the formula:



(1)

wherein X represents a chlorine or bromine atom; Y a hydrogen atom or an alkoxy or alkoxyalkoxy group; and each of R_1 and R_2 independently a hydrogen atom, a linear or branched unsubstituted or substituted alkyl group (provided that the substituent is selected from among chlorine and bromine atoms and cyano, alkoxy, hydroxy, aryl, aryloxy, alkoxycarbonyl, alkoxycarbonyloxy, acyloxy and allyloxy groups), an allyl group or a cycloalkyl group, provided that each of the alkyl and alkoxy groups has 1 to 4 carbon atoms, and

a dye represented by the formula:



(2)

wherein Y represents an alkoxy or alkoxyalkoxy group; each of R_1 and R_2 independently a hydrogen atom, a linear or branched unsubstituted or substituted alkyl group (provided that the substituent is selected from among cyano, hydroxy, alkoxy, aryl, aryloxy, alkoxycarbonyl, alkoxycarbonyloxy, acyloxy and allyloxy groups), an allyl group or a cycloalkyl group, and R_3 an alkyl group, provided that each of the alkyl and alkoxy groups has 1 to 4 carbon atoms.

5,688,289
METHOD OF LAUNDERING CLOTHES AND TEXTILES

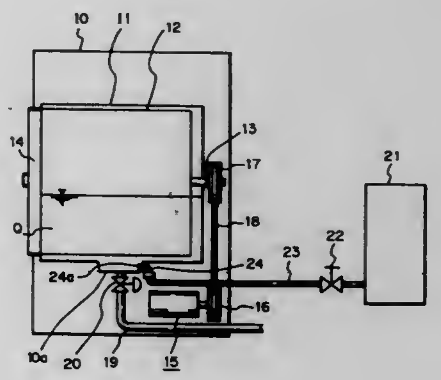
Yukiko Nishioka; Ryoichi Shinjo; Yoshihiro Ishii, all of Kanagawa-ken, and Tadao Yamanaka, Chiba-ken, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Apr. 25, 1996, Ser. No. 637,342

Claims priority, application Japan, Apr. 28, 1995, 7-129614

Int. Cl.^{6} D06F *17/12;* **D06L** *3/04*

U.S. Cl. 8—137 **15 Claims**



1. A method of laundering clothes and textiles comprising the steps of:
providing a washing machine having:
a fixed outer shell;
an inner cylinder provided within said fixed outer shell, the inner cylinder having a peripheral wall with a plurality of orifices capable of passing a washing solution therethrough, the fixed outer shell and the inner cylinder forming a tub,
a horizontal rotating shaft rotatably supporting the inner cylinder;
putting at least one of clothes and textiles into the inner cylinder;
charging the fixed outer shell and the inner cylinder with a washing solution having a polyelectrolyte-containing detergent dissolved therein; the washing solution being in an alkaline condition; and
rotating the horizontal shaft and the inner cylinder so as to launder at least one of the clothes and textiles in the washing solution at a temperature from about 40° C. to less than 50° C. while an ozone gas is directly introduced into the washing solution through a supply port located between the fixed outer shell and the inner cylinder.

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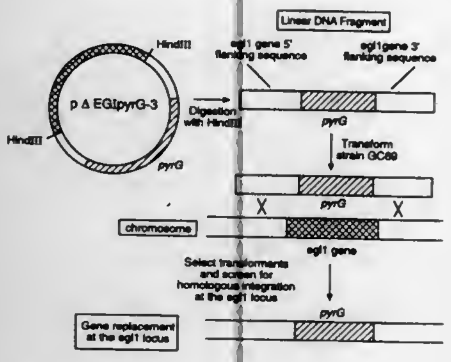
5,688,290
DEGRADATION RESISTANT DETERGENT COMPOSITIONS BASED ON CELLULASE ENZYMES

Nancy Bjork; Kathleen A. Clarkson, both of San Francisco; Pushkaraj J. Lad, San Mateo, and Geoffrey L. Weiss, San Francisco, all of Calif., assignors to Genencor International, Inc., Palo Alto, Calif.

Continuation of Ser. No. 876,927, May 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 686,265, Apr. 15, 1991, Pat. No. 5,120,463, which is a continuation of Ser. No. 422,814, Oct. 19, 1989. This application Jun. 20, 1994, Ser. No. 262,390

Int. Cl.^{6} C11D *3/386;* **D06M** *15/00*

U.S. Cl. 8—401 **27 Claims**


Linear DNA Fragment
HindIII
egl1 gene 5' flanking sequence
egl1gene 3' flanking sequence
p Δ EGlpyrG-3
HindIII
Digestion with HindIII
pyrG
pyrG
Transform strain GC69
pyrG
chromosome
egl1 gene
Select transformants and screen for homologous integration at the egl1 locus
pyrG
Gene replacement at the egl1 locus

1. A detergent composition comprising at least one surface active agent and a cleaning effective amount of a cellulase composition wherein said cellulase composition contains a weight ratio of exo-cellobiohydrolase I cellulase components to endoglucanase components of greater than about 10:1 to 400:1.

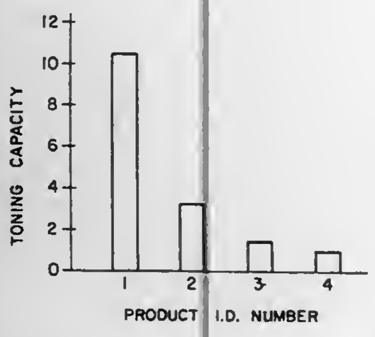
5,688,291
COMPOSITION FOR SIMULTANEOUSLY LIGHTENING AND COLORING HAIR

Hayel Said, and Hian Said, both of Simi Valley, Calif., assignors to L'Avante Garde, Inc., Simi Valley, Calif.

Filed Jun. 27, 1996, Ser. No. 671,213

Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—431 **12 Claims**



1. A composition for simultaneously lightening and coloring hair which comprises:

a Category-2 bleach which comprises a persulfate salt, wherein said bleach is present in an amount sufficient to lighten the color of the hair, and wherein said bleach is sufficient to lighten the color of the hair by up to seven levels; and

an oxidatively stable Disperse dye selected from the group consisting of azo and anthraquinone dyes.

5,688,292
METHOD OF MANUFACTURING CATHODES FOR FUEL CELLS

Ermete Antolini, Genoa, Italy, assignor to Finmeccanica S.p.A. Azienda Ansaldo, Genoa, Italy

Filed Apr. 6, 1995, Ser. No. 417,590

Claims priority, application Italy, Apr. 19, 1994, MI94A0753

Int. Cl.^{6} H01M *4/04*

U.S. Cl. 29—623.1 **14 Claims**

1. A method of manufacturing lithiated nickel oxide based cathodes for molten carbonate fuel cells having matrices of ceramic material prepared with an organic binding agent, the method comprising the steps:

(a) preparing a mixture comprising:
  nickel powder,
  lithium carbonate,
  an organic binding agent which is the same as that used for the matrices of ceramic material,
  a low-boiling organic solvent;
(b) tape casting the mixture in a strip;
(c) evaporating the solvent;
(d) cutting the mixture into cathode form;
(e) introducing the mixture into the molten carbonate fuel cell; and
(f) heating the cell to its working temperature, whereby said nickel is oxidated and lithiated and said organic binding agent is driven off.

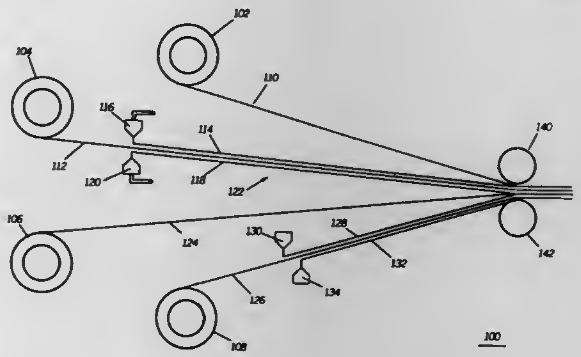
5,688,293
METHOD OF MAKING A GEL ELECTROLYTE BONDED RECHARGEABLE ELECTROCHEMICAL CELL

Manuel Oliver, Norcross; Paul J. Gies, Atlanta; Shekhar L. Pendalwar, Lawrenceville; Christen E. Coalson, Atlanta, and Florence O. Eschbach, Duluth, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 15, 1996, Ser. No. 647,548

Int. Cl.^{6} H01M *6/00*

U.S. Cl. 29—623.1 **12 Claims**



1. A method of making a rechargeable electrochemical cell including first and second electrodes, and a porous separator element having first and second major sides, said method comprising the steps of:

coating at least one of said electrodes or said separator with a layer of a bonding paste comprising a gelling polymer having an electrolyte active species dispersed therein;

bonding said first and second electrodes to opposite sides of said separator element; and curing said bonding paste.

5,688,294
METHOD FOR MANUFACTURING A CYLINDRICAL NICKEL-HYDROGEN RECHARGEABLE BATTERY

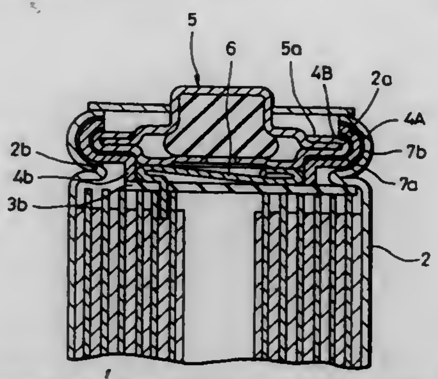
Takashi Mizuno; Yukinari Kondo, and Masanori Suzuki, all of Iwaki, Japan, assignors to Furukawa Denchi Kabushiki Kaisha, Yokohama, Japan

Filed Nov. 4, 1996, Ser. No. 740,854

Claims priority, application Japan, Nov. 10, 1995, 7-293032

Int. Cl.^{6} H01M *10/38*

U.S. Cl. 29—623.2 **4 Claims**



1. A method for manufacturing a cylindrical nickel-hydrogen rechargeable battery, comprising the steps of:

inserting a stepped insulating ring having a large-diameter upper portion, a small-diameter foot portion, and a step portion formed on the inside from a top opening of a bottomed cylindrical can containing a plate group member and electrolyte and setting said small-diameter foot portion onto said plate group member;

setting a peripheral portion of a cover in which a safety valve is incorporated onto said step portion of said stepped insulating ring, and forming areas to be sealed where an inside wall of said top opening of said bottomed cylindrical can faces an outside wall of said large-diameter upper portion of said stepped insulating ring and an inside wall of said large-diameter upper portion faces a peripheral portion of said cover;

performing a crimping operation on said areas to be sealed from the outside of the upper part of said bottomed cylindrical can to form a closed construction;

applying a sealing compound consisting essentially of an oily bitumen, an organic solvent, and a paraffin base oil to said areas where an inside wall of said top opening of said bottomed cylindrical can faces an outside wall of said large-diameter upper portion of said stepped insulating ring and an inside wall of said large-diameter upper portion faces a peripheral portion of said cover before said areas to be sealed are formed, said sealing compound being prepared by mixing 10 to 200 parts by weight of said organic solvent and 1 to 10 parts by weight of said paraffin base oil with 100 by weight of said oily bitumen, and

drying said sealing compound.

5,688,295
GASOLINE FUEL ADDITIVE

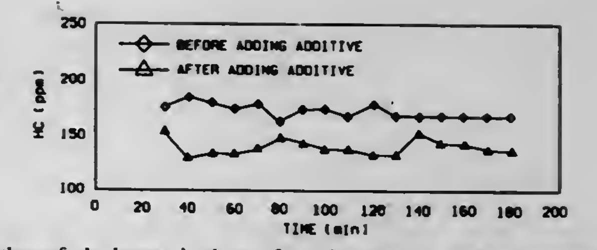
Chung-Hsien Yang, Hsintien, Taiwan, assignor to H. E. W. D. Enterprises-America, Inc., St. Louis, Mo.

Filed May 8, 1996, Ser. No. 646,659

Int. Cl.^{6} C10L *1/18;1/28*

U.S. Cl. 44—320 **10 Claims**

1. An alcohol based fuel additive which is added to gasoline for use in improving the performance of gasoline powered internal combustion engines without the need to modify standard gasoline engines, the fuel additive comprising about 20%–70.35% alcohol, about 2.5%–20% ketone and ether, about 0.03%–20% aliphatic and silicon compounds, about 5%–20% toluene, and about 4%–45% mineral spirits; wherein the alcohol is chosen from the group consisting essentially of methanol, ethanol, and combinations thereof; the ketone is chosen from the group consisting essentially of acetone, butanone, cyclohexanone, and combinations thereof; the aliphatic compound is chosen from the group consisting essentially of dihydric alcohol, tribasic alcohol, and combinations thereof; and the silicon compound is chosen from the group consisting essentially of silicon oil, ethyl silicate, and combinations thereof.



6. A fuel composition comprising about 30%–85% by volume gasoline and about 15%–70.35% by volume of an alcohol based fuel additive, the fuel additive comprising about 20%–70% alcohol, about 2.5%–20% ketone and ether, about 0.03%–20% aliphatic and silicon compounds, about 5%–20% toluene, and about 4%–45% mineral spirits; wherein the alcohol is chosen from the group consisting essentially of methanol, ethanol, and combinations thereof; the ketone is chosen from the group consisting essentially of acetone, butanone, cyclohexanone and combinations thereof; the aliphatic compound is chosen from the group consisting essentially of dihydric alcohol, tribasic alcohol, and combinations thereof; and the silicon compound is chosen from the group consisting essentially of silicon oil, ethyl silicate, and combinations thereof.

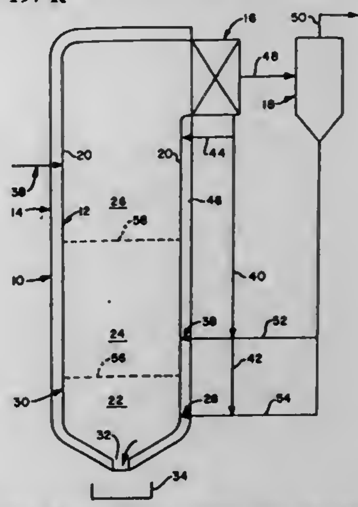
5,688,296
CONTROL SYSTEM FOR IGCC'S

Herbert Elliott Andrus, Jr., Granby, and Paul Robert Thibeault, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 998,223, Dec. 30, 1992, abandoned. This application Dec. 27, 1994, Ser. No. 425,001

Int. Cl.^{6} C10J *1/00*

U.S. Cl. 48—197 R **2 Claims**



1. In a method for exercising control over an integrated gasification combined cycle system having a gasifier operative to gasify therewithin fuel supplied thereto in order to thereby produce a product gas therefrom, a fuel feed supply system connected to the gasifier system for supplying fuel thereto, a gas cleanup system connected to the gasifier system for receiving product gas therefrom and operative to cleanse the product gas during the passage thereof through the gas cleanup system, a combustor chamber connected to the gas cleanup system for receiving cleansed product gas therefrom and operative to effect the combustion therewithin of the cleansed product gas, a compressor connected to the combustor chamber for supplying combustion supporting air thereto, a booster

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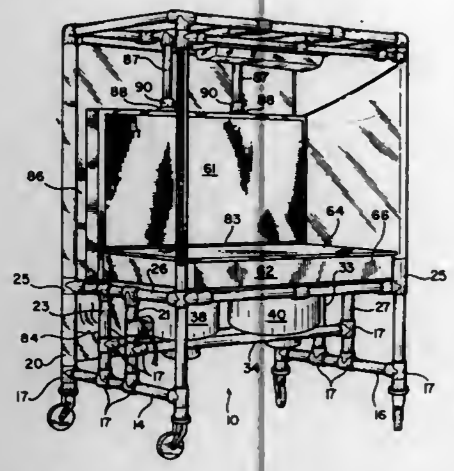
compressor connected to the compressor for receiving bleed air therefrom, a gas turbine connected to the combustor chamber for receiving therefrom the gases generated from the combustion of cleansed product gas within the combustor chamber and operative to produce a driving force therefrom, a generator connected to and driven by the gas turbine so as to be operative to generate an electrical load including the steps of providing between the compressor and the booster compressor in connected relation thereto a bleed air control valve operative to control the amount of bleed air supplied from the compressor to the booster compressor, providing in bypass relation around the booster compressor a booster compressor bypass valve operative to effect the bypass of bleed air around the booster compressor, providing between the fuel feed system and the gasifier system in connected relation thereto a fuel feed control valve operative to control the amount of fuel supplied from the fuel feed system to the gasifier system, the improvement in the method for exercising control over an integrated gasification combined cycle system wherein load changes for cycling duty are effected therewith at a rate of approximately five percent per minute in order to thereby permit stable state operation of the gas turbine comprising the steps of:

a. generating within the integrated gasification combined cycle system a signal representative of the load demand on the gas turbine;
b. providing the signal representative of the load demand on the gas turbine to the bleed air control valve and providing the same signal representative of the load demand on the gas turbine also to the fuel feed control valve;
c. actuating the bleed air control valve in response to the receipt thereby of the signal representative of the load demand on the gas turbine in order to thereby effectuate control over the amount of bleed air supplied to the booster compressor; and
d. simultaneous with the actuation of the bleed air control valve actuating the fuel feed control valve in response to the receipt thereby of the signal representative of the load demand on the gas turbine in order to thereby effectuate control over the amount of fuel supplied to the gasifier system.

5,688,297
PORTABLE CLEAN AIR FACILITY

Charles W. Spengler, 3024 W. Prospect Rd., Fort Collins, Colo. 80526

Filed May 31, 1996, Ser. No. 656,509
Int. Cl.⁶ B01D *46/10*
U.S. Cl. 55—356 **5 Claims**



1. A clean air facility comprising an assemblage of horizontal and vertical pipes interconnected together at their ends to form a supporting structure,

said supporting structure including first (18, 42), second (20, 44), third (22, 46) and fourth (24, 48) spaced parallel, elongated, vertical extending supporting pipe means of equal length, each supporting pipe means having an upper end with the upper ends in a same horizontal plane, each supporting pipe means having a lower end with the lower ends in a same horizontal plane,

a first parallel horizontal supporting means including a first supporting pipe (14) between said first and second elongated vertical supporting pipe means and a second supporting pipe (16), between said third and fourth elongated supporting pipe means, said first parallel horizontal supporting means adjustably secured near the lower end of said elongated vertical supporting means,

a second horizontal supporting means adjustably supported by said elongated vertical support pipe means upwardly from said first supporting means, said second horizontal supporting means including a first pipe means (26) between said first and second elongated vertical support pipe means, a second pipe means (28) between said third and fourth elongated vertical support means, a third horizontal support means (30) between said first and third elongated vertical support pipe means and a fourth supporting pipe means (32) between said second and fourth elongated vertical supporting means, each supporting pipe of said second support means being in a same horizontal plane;

a third horizontal supporting means fixedly secured to the upper ends and between each of said first, second, third, and fourth elongated vertical supporting pipe means,

a first pair (21, 23) of spaced short, vertically extending supporting pipe means adjustably secured between said first parallel supporting pipe of said first horizontal supporting means and said first pipe means of said second horizontal supporting means, a second pair (27, 33) of spaced short vertically extending pipe means adjustably secured between said second supporting pipe means of said first parallel supporting means and said second horizontal support means of said second horizontal supporting means, said first and second pair of short vertical supporting pipe means being equally spaced from a center line between said first and second elongated vertically extending supporting pipe means and between said third and fourth elongated vertically extending supporting pipe means,

a fourth horizontal supporting pipe means, said fourth horizontal supporting pipe means including a pair of supporting pipe means (34, 36) secured between said first and second pair of short vertically extending support means with one each supporting pipe of said pair secured on opposite sides of said center line,

at least one blower (38, 40) mounted on said fourth horizontal supporting pipe means;

said at least one blower having an inlet and an outlet, said inlet formed by an upper end of said blower;

a HEPA filter mounted on a fifth horizontal supporting pipe means (31, 35) with the HEPA filter in a vertical position, said HEPA filter including a bottom side mounted on said fifth horizontal supporting pipe means on a level higher than said inlet end of said at least one blower and an upper side of said HEPA filter is supported by downwardly extending spaced short vertical pipe means (87) secured at their upper ends, said HEPA filter having a front side that forms an outlet and a back side that forms an inlet, said outlet and inlet extending from said bottom side to said upper side;

a closed hinge duct (84, 85) connected to said outlet of said at least one blower, said closed duct extending from said outlet of said at least one blower and connected to a closed air conducting cover (86) secured along a back side of said HEPA filter which directs air from said at least one blower along and through said inlet of said HEPA filter,

a pan element (62) secured over said at least one blower, said pan element having at least one aperture (78, 80) that fits over said inlet to said at least one blower,

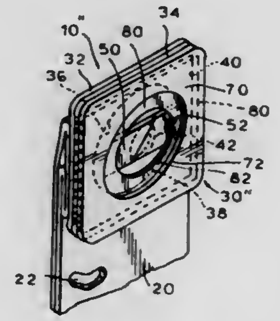
a cover (64) for said pan, said cover including slots (65) along a front edge of said cover through which air is drawn by said at least one blower, to said inlet,

said facility including a side panel, a top panel and a front panel, each of said panels being secured to said supporting structure so as to form an air tight chamber.

5,688,298
SELF-ALIGNING, SELF-SEALING VACUUM BAG

Mark D. Bosses, Montvale, N.J., assignor to Home Care Industries, Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 541,418, Oct. 10, 1995, Pat. No. 5,613,989. This application May 6, 1996, Ser. No. 642,885
Int. Cl.⁶ B01D *46/00*
U.S. Cl. 55—367 **10 Claims**



1. In a vacuum bag for use with a vacuum device having a dirty air vacuum inlet, said bag comprising:

(A) porous bag means for trapping dirt, dust and particles therein while allowing air to pass therethrough under the influence of a vacuum thereabout, said bag means defining a bag interior and a channel through said bag means thereinto; and

(B) a self-sealing collar secured to said bag means and communicating with said bag interior via said channel, said collar including:

(i) a pair of parallel planar panels defining aligned respective apertures therethrough configured and dimensioned for receipt of a vacuum inlet therethrough,

(ii) a first resilient membrane disposed intermediate said pair of panels, said first membrane defining a first membrane aperture therethrough aligned with but smaller than said panel apertures, and

(iii) at least one finger means on the outer of said pair of panels normally extending inwardly in the plane of said outer panel at least partially across the outer panel aperture prior to placement of said collar on a vacuum inlet, extending through said first membrane aperture and past the inner of said pair of said panels when said collar is disposed on a vacuum inlet, and extending substantially parallel to and partially behind said first membrane and across said first membrane aperture to effectively close said first membrane aperture when said collar is removed from a vacuum inlet; the improvement wherein said collar is self-aligning and more efficiently self-sealing with a vacuum inlet and includes:

(a) a third planar panel disposed parallel to and outwardly of said pair of panels, said third panel defining a respective third aperture therethrough configured and dimensioned for receipt of a vacuum inlet therethrough and aligned with said apertures of said pair of panels, said third aperture being of a thickness to facilitate blind placement of said collar on a vacuum inlet, said third aperture being configured and dimensioned to cooperate with a vacuum inlet extending therethrough to block further relative lateral movement of said collar and the vacuum inlet; and

(b) a second resilient membrane disposed intermediate said third panel and said pair of panels, said second membrane defining a second membrane aperture therethrough aligned with but smaller than said panel apertures, and aligned with said first membrane aperture, said second membrane forming an uninterrupted 360° seal with a vacuum inlet when said collar is disposed thereon.

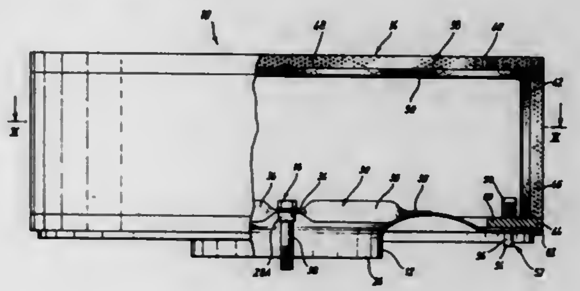
5,688,299
AIR FILTERS

Thomas Ivor Goodwin, 71 Loughborough Road, Haven, Loughborough, Leicestershire. LE12 5HY, United Kingdom

Filed Aug. 14, 1995, Ser. No. 514,992

Claims priority, application United Kingdom, Aug. 16, 1994, 9416487

Int. Cl.⁶ B01D *27/08*
U.S. Cl. 55—385.3 **18 Claims**



1. An air filter adapted for being mounted adjacent to a carburetor of an internal-combustion engine, said air filter comprising:

(a) a base defining a central air-inlet opening therein for communicating with the carburetor, and including base attachment means for permanently attaching the base to the engine without substantially obstructing the air-inlet opening to the carburetor;

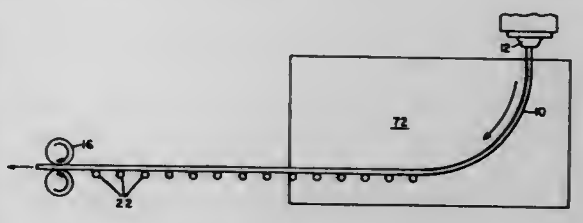
(b) a removable filter element comprising a filter support frame positioned on the base, and a filter medium carried by the support frame and surrounding the air-inlet opening to the carburetor for filtering an air stream passing through the air filter to the carburetor; and

(c) a plurality of releasable securing means spaced-apart along respective engaging surfaces of the filter support frame and the base, and cooperating to releasibly secure the filter element to the base, said releasable securing means operating independent of the base attachment means such that the filter medium is readily removable and replaceable without detaching the base from the engine.

5,688,300
CONVEYING GLASS TUBING

David L. Ashley; John M. Dafin, both of Painted Post; Michael R. Heslin, Elmira; Jason S. Watts, Horseheads, and Paul A. Williams, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Feb. 9, 1996, Ser. No. 598,936
Int. Cl.⁶ C03B *15/14;15/18;21/00*
U.S. Cl. 65—86 **9 Claims**



1. A method of drawing glass tubing which comprises passing the tubing through an enclosure into which air and water are introduced to provide a humid atmosphere that is continuously circulated through the enclosure, drawing the tubing over a tube draw within the enclosure, the enclosure extending to a point on the tube draw where the glass has cooled sufficiently to avoid frictive damage.

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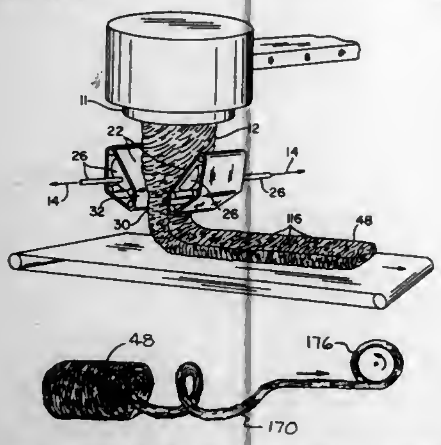
5,688,301
METHOD FOR PRODUCING NON-WOVEN MATERIAL FROM IRREGULARLY SHAPED GLASS FIBERS

Ralph E. Brandon, Newark; Larry J. Grant, Westerville; Todd Green, Somerset, and Kimberley A. Householder, Pickerington, all of Ohio, assignors to Owens-Corning Fiberglas Technology Inc, Summit, Ill.

Division of Ser. No. 310,183, Sep. 21, 1994. This application Jun. 7, 1995, Ser. No. 478,136

Int. Cl.^{6} C03B *37/075;37/04*

U.S. Cl. 65—438 **6 Claims**



1. A method for producing non-woven material from irregularly shaped glass fibers comprising the steps of:

fiberizing irregularly shaped glass fibers by a rotary method;

collecting said glass fibers by a direct forming method to form a wool pack; and

drawing a tow from said wool pack as a continuous open yarn.

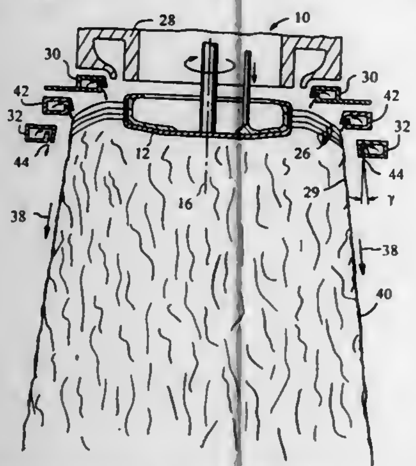
5,688,302
CENTRIFUGING PROCESS FOR FORMING FIBERS

James G. Snyder, Newark, Ohio, assignor to Owens-Corning Fiberglas Technology Inc., Summit, Ill.

Filed Jul. 12, 1995, Ser. No. 502,038

Int. Cl.^{6} C03B *37/04*

U.S. Cl. 65—461 **15 Claims**



1. A method of forming fibers, comprising:

introducing molten material into a spinner rotating about an axis, the spinner having a peripheral wall having a plurality of orifices;

centrifuging the molten material through the orifices to create fibers;

discharging gases from an opening in a first annular blower, the gases converging radially inwardly with respect to the spinner axis to partially attenuate the fibers and influence the flow path of the fibers towards a direction parallel to the spinner axis; and

discharging gases from an opening in a second annular blower which is positioned radially outwardly from the first blower, the gases diverging radially outwardly with respect to the spinner axis to complete the attenuation of the fibers and influence the flow path of the fibers.

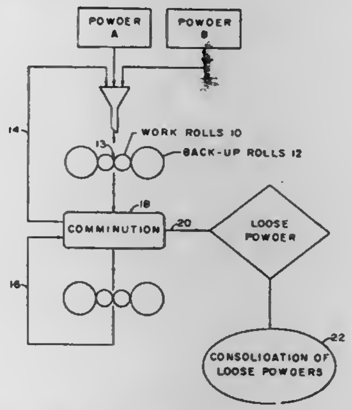
5,688,303
MECHANICAL ALLOYING PROCESS

John S. Benjamin, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 989,013, Feb. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 574,905, Aug. 30, 1990, abandoned, and Ser. No. 847,855, Mar. 9, 1992, abandoned. This application Dec. 9, 1994, Ser. No. 352,940

Int. Cl.^{6} B22F *1/00*

U.S. Cl. 75—352 **49 Claims**



1. A mechanical alloying method comprising the steps of:

(a) feeding mechanically alloyable feedstock material comprising particulate material containing different alloy ingredients through a roll bite of opposing rollers for producing a rolled compact comprising welded particulate,

(b) comminuting said rolled compact to form a comminuted particulate product, and

(c) repeating (a) and (b) a plurality of times until the homogeneity of the material is increased and mechanical alloying is achieved.

5,688,304
METHOD FOR IMPROVING THE HEAP BIOOXIDATION RATE OF REFRACTORY SULFIDE ORE PARTICLES THAT ARE BIOOXIDIZED USING RECYCLED BIOLEACHATE SOLUTION

William J. Kohr, San Mateo; Chris Johansson, San Francisco; John Shield, and Vandy Shrader, both of San Mateo, all of Calif., assignors to Geobiotics, Inc., Hayward, Calif.

Continuation of Ser. No. 329,002, Oct. 25, 1994, abandoned. This application May 24, 1996, Ser. No. 652,993

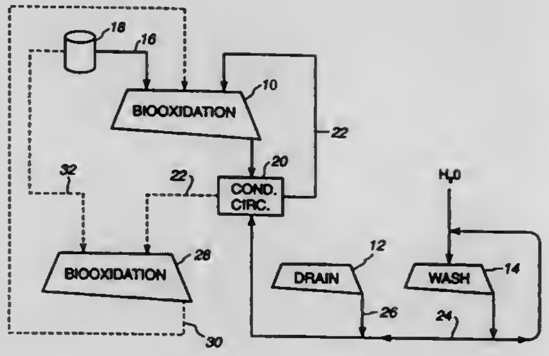
Int. Cl.^{6} C22B *3/18*

U.S. Cl. 75—712 **52 Claims**

1. A method for improving the heap biooxidation rate of refractory sulfide ore particles that are at least partially biooxidized using a recycled bioleachate off solution, the process comprising:

a. biooxidizing a heap comprised of refractory sulfide ore particles with a bioleachate solution and thereby producing a bioleachate off solution that includes a plurality of inhibitory materials dissolved therein, wherein the concentration of each individual inhibitory material in the bioleachate off solution is below its individual inhibitory concentration and the combined concentration of at least two of the inhibitory materials is sufficient to inhibit the biooxidation rate of the refractory sulfide ore particles in the ore;

b. collecting the bioleachate off solution from the heap;



c. conditioning the bioleachate off solution to reduce the inhibitory effect caused by the combined concentration of the at least two inhibitory materials;

d. recycling the bioleachate off solution to the heap;and

e. biooxidizing the refractory sulfide ore particles in the heap with the recycled bioleachate off solution.

5,688,305
METHOD AND DEVICE FOR DRYING OF MOIST GASES

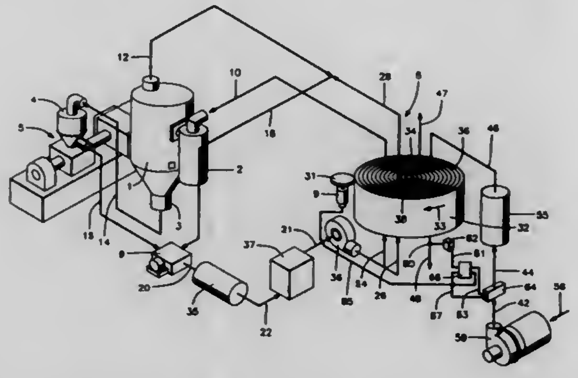
Roderich Wilhelm Graeff, Kollwitzweg 19, 62291 Darmstadt, Germany

Filed Oct. 20, 1995, Ser. No. 546,115

Claims priority, application Germany, Oct. 20, 1994, 44 37 494.1

Int. Cl.^{6} B01D *53/06;53/26*

U.S. Cl. 95—14 **21 Claims**



1. A process for drying a moist gas by first removing moisture from the gas by passing the moist gas through a desiccant, and then freeing said moisture picked up by the desiccant from the moist gas by passing a hot regeneration gas through the desiccant, the process comprising,

heating the regeneration gas to a predetermined input temperature and inputting the heated regeneration gas to and through the desiccant;

measuring the temperature of the exhaust regeneration gas that afflues from the desiccant during a last phase of regeneration;

adjusting the amount of regeneration gas that is input to the desiccant while maintaining the temperature of the inputted regeneration gas at said predetermined input temperature until the temperature of the exhaust regeneration gas reaches a predetermined exhaust gas temperature and continuing the adjusting so as to maintain the temperature of the exhaust regeneration gas at said predetermined exhaust gas temperature.

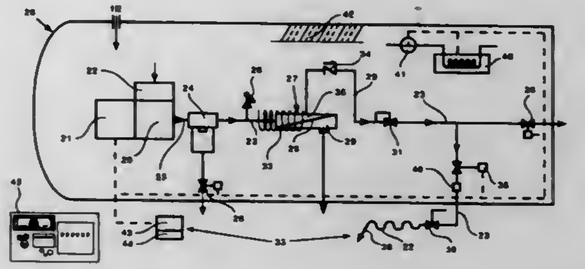
5,688,306
APPARATUS AND METHOD TO INTERMITTENTLY MANUFACTURE AND DISPENSE NITROGEN GAS

Nicholas A. Verini, 404 Lone Eagle Point, Lafayette, Colo. 80026

Continuation-in-part of Ser. No. 503,596, Jul. 18, 1995, Pat. No. 5,588,984. This application May 8, 1996, Ser. No. 646,505

Int. Cl.^{6} B01D *53/22*

U.S. Cl. 95—15 **12 Claims**



1. A method for intermittent and automatic separating nitrogen from air comprising the steps of:

(a) compressing and introducing said air into a module containing a permeable membrane means for separating said nitrogen from said air,

(b) said permeable membrane means separating said nitrogen from said air permitting oxygen, carbon dioxide, moisture and other gases to pass through said membrane means while enriching said nitrogen to a desired purity by removing other air components,

(c) providing a means for automatic controlling nitrogen pressure in said module,

(d) providing means for automatic controlling temperature in said module,

(e) providing conduit to contain said air and nitrogen in said apparatus when necessary until discharge and,

(f) providing a means for automatically controlling and dispensing desired amounts of said nitrogen.

5,688,307
SEPARATION OF LOW-BOILING GASES USING SUPER-GLASSY MEMBRANES

Ingo Pinnau, Palo Alto; Kaaeid Lokhandwala, Menlo Park; Phuong Nguyen, Fremont, and Scott Segelke, Mountain View, all of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Filed Feb. 29, 1996, Ser. No. 608,706

Int. Cl.^{6} B01D *53/22*

U.S. Cl. 95—50 **20 Claims**

1. A gas-separation process comprising:

(a) providing a membrane having a feed side and a permeate side; said membrane comprising a polymer material characterized by:

(i) a glass transition temperature, T_g, of at least about 100° C.,

(ii) a free volume V_F of at least about 10% and

(iii) a methane permeability at room temperature of at least about 1,000 Barrer;

(b) contacting said feed side with a gas mixture comprising:

(i) a hydrocarbon gas chosen from the group consisting of methane and ethylene,

(ii) nitrogen; and

(iii) a condensable gas that has a boiling point at least about 40° C. above the boiling point of said hydrocarbon gas at atmospheric pressure;

(c) withdrawing from said permeate side a permeate stream enriched in said hydrocarbon gas and said condensable gas compared with said gas mixture;

(d) withdrawing from said feed side a residue stream enriched in said nitrogen compared with said gas mixture.

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5,688,308

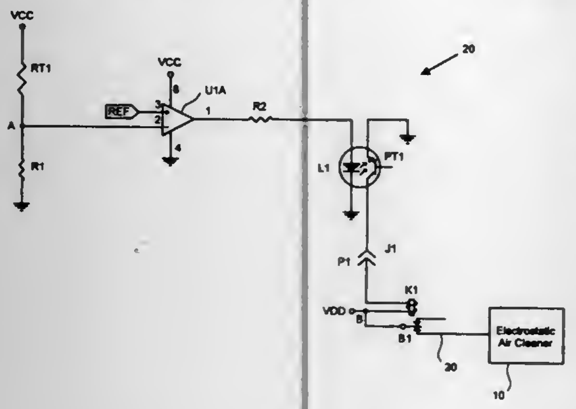
ELECTROSTATIC AIR CLEANING SYSTEM WITH AIR FLOW SENSOR

Ronald D. Voigts, Cary, N.C., assignor to Trion, Inc., Sandford, N.C.

Filed May 30, 1995, Ser. No. 452,715

Int. Cl.^{6} B03C *3/68*

U.S. Cl. 96—18 **18 Claims**



1. An air cleaning system comprising:

an air cleaner for use in an air duct;

an air flow sensor circuit including an air flow sensor, said circuit connected to the air cleaner and having means for connecting the sensor to a power supply, said sensor providing a signal in response to airflow through the air duct; and

switching means connected to the air flow sensor circuit and the air cleaner for controlling the power supply to the air cleaner in response to the signal provided by the sensor, the switching means supplying power to the air cleaner from the power supply when either the sensor or the circuit is disabled.

5,688,309

WATER AND OIL REPELLENT COMPOSITION, TREATING METHOD THEREWITH AND COPOLYMER

Toyomichi Shimada; Yuichi Ohmori, and Takashige Maekawa, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Toyko, Japan

Filed Jul. 25, 1996, Ser. No. 686,710

Claims priority, application Japan, Jul. 27, 1995, 7-191824

Int. Cl.^{6} C09K *3/18;* **C08F** *220/00;* **D06M** *15/19*

U.S. Cl. 106—2 **20 Claims**

1. A water and oil repellent composition consisting essentially of a copolymer comprising the following polymeric units A, B, C and D, and an organic solvent:

Polymeric units A: Polymeric units derived from an acrylate containing a polyfluoroalkyl group, and/or a methacrylate containing a polyfluoroalkyl group;

Polymeric units B: Polymeric units derived from an acrylate containing a hydrocarbon group, and/or a methacrylate containing a hydrocarbon group;

Polymeric units C: Polymeric units derived from an acid anhydride having an unsaturated group; and

Polymeric units D: Polymeric units derived from triallyl cyanurate.

5,688,310

CORROSION PROTECTION MATERIAL AND METHOD, AND USE THEREOF FOR ALUMINUMALLOYS

Pierre Mauret, 4 allée Roland Garros, 31520 Ramonville Saint Agne, and Louis Gaches, 13 rue Montplaisir, 31400 Toulouse, both of France

PCT No. PCT/FR93/00685, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/01501, PCT Pub. Date Jan. 20, 1994

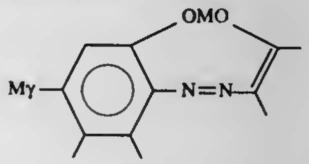
PCT Filed Jul. 2, 1993, Ser. No. 373,235

Claims priority, application France, Jul. 6, 1992, 92 08419

Int. Cl.^{6} C23F *11/00;11/14*

U.S. Cl. 106—14.42 **12 Claims**

9. A product for protecting non-ferrous metallic materials against corrosion, comprising a mixture of a binder and a corrosion inhibitor consisting of at least one dihydroxyazoic salt with a solubility in water of between 0.01 g/l and 3 g/l, having the following structural unit:



where γ is a salifiable anion, and M a bivalent metal, selected from the group consisting of zinc, tin and alkaline earth metals.

5,688,311

INK JET INKS CONTAINING LONG CHAIN ALCOHOLS

Raymond J. Adamic, Corvallis, Oreg., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1997, Ser. No. 791,370

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—20 R **15 Claims**

1. An aqueous ink jet ink comprising:
(a) an aqueous carrier medium;
(b) a colorant; and
(c) at least one long chain alcohol having at least 8 carbon atoms present in the amount of 0.05 to 5% by weight, based on the total weight of the ink.

5,688,312

INK COMPOSITIONS

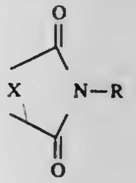
Guerino G. Sacripante, Oakville; Fatima M. Pontes, Mississauga; Stephan V. Drappel, Toronto; Gregory J. Kovacs, and Anthony J. Paine, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1996, Ser. No. 624,154

Int. Cl.^{6} C09D *11/02*

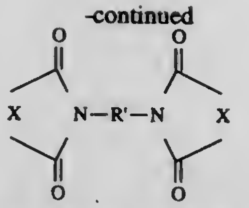
U.S. Cl. 106—31.49 **20 Claims**

1. An ink composition comprised of a colorant and an imide or bisimide and which ink possesses a viscosity of from about 1 centipoise to about 10 centipoise at a temperature of from about 125° C. to about 180° C., and which imide or bisimide is of the Formulas I or II, respectively:



I

-continued



II

wherein R is a hydrocarbon of from about 2 to about 50 carbon atoms; R' is an alkylene hydrocarbon or a polyalkyleneoxide, each with from about 2 to about 30 carbon atoms; and X is an arylene of from 6 to about 24 carbon atoms, or an alkylene of from about 2 to about 10 carbon atoms, and wherein said ink is a solid at room temperature, about 20° C. to about 40° C.

5,688,313

ACTIVATED CARBON FOUNDRY SAND ADDITIVES AND METHOD OF CASTING METAL FOR REDUCED VOC EMISSIONS

Charles R. Landis, Lake in the Hills, Ill., assignor to AMCOL International Corporation, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 668,245, Jun. 21, 1996. This application Nov. 29, 1996, Ser. No. 759,087

Int. Cl.^{6} B22C *1/00;9/00;9/02*

U.S. Cl. 106—38.2 **23 Claims**

1. A foundry sand additive comprising sand, activated carbon and/or activated graphite; a ground ore containing a compound selected from humic acid, a metal salt of humic acid, or mixtures thereof; and a carbon source selected from the group consisting of carbon, graphite, and mixtures thereof in weight proportions of ground ore/carbon source of 20–95% by weight ground ore and 80–5% by weight carbon source.

5,688,314

PHOSPHORIC ACID METAL COMPOUND-CONTAINING PEARL PIGMENT

Atuko Nishimagi, Iwaki; Masahiko Yazawai, Tokyo-to, and Katuhisa Nitta, Iwaki, all of Japan, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

Filed Aug. 2, 1996, Ser. No. 691,231

Claims priority, application Japan, Aug. 4, 1995, 7-218303

Int. Cl.^{6} C09C *1/36*

U.S. Cl. 106—443 **21 Claims**

1. A pearlescent pigment comprising a flaky substrate having thereon a titanium oxide and a phosphoric acid metal compound.

5,688,315

COLORED TITANIFEROUS COATING PIGMENT OBTAINED AS A FLOCCULATED BY-PRODUCT IN A KAOLIN PURIFICATION PROCESS

Sanjay Behl; Mitchell J. Willis, and Raymond H. Young, all of Macon, Ga., assignors to Engelhard Corporation, Iselin, N.J.

Division of Ser. No. 404,772, Mar. 15, 1995, Pat. No. 5,584,394. This application Jul. 31, 1996, Ser. No. 688,571

Int. Cl.^{6} C09C *1/36;1/42*

U.S. Cl. 106—446 **7 Claims**

1. A dun-colored pigment comprising a clay dispersant, particles of kaolin clay, 5–25% by weight titania, minor amounts of fatty acid and an anionic polymer, said pigment being 65–80% by weight finer than 2 micrometers and have an average particle size of 0.45 to 1.25 micrometers.

5,688,316

PIGMENTED SUBSTRATES COMPRISING TERBIUM COMPOUND COLORANTS

Fabienne Pettini, Paris, and Thierry Seguelong, Puteaux, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Mar. 20, 1996, Ser. No. 618,562

Claims priority, application France, Mar. 28, 1995, 95 03600

Int. Cl.^{6} C09C *1/00;1/02*

U.S. Cl. 106—461 **14 Claims**

1. In a colored/pigmented substrate, the improvement which comprises, as the colorant therefor, an effective coloration-imparting amount of at least one colorant terbium compound having the formula $ATbO_3$ and/or $ATbMO_3$, wherein $\underline{A}$ is at least one alkaline earth metal and $\underline{M}$ is cerium, zirconium, praseodymium, or combination thereof.

5,688,317

CARBON BLACKS

Bruce E. Mackay, Framingham; Mark A. Wilkinson, and Barrie J. Yates, both of Lexington, all of Mass., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 202,244, Feb. 25, 1994, Pat. No. 5,456,750, which is a continuation-in-part of Ser. No. 81,881, Jun. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 935,794, Aug. 27, 1992, abandoned. This application Jan. 19, 1995, Ser. No. 375,015

Int. Cl.^{6} C09C *1/48*

U.S. Cl. 106—476 **6 Claims**

5. A carbon black having an I_2No. of 8–32 mg/g; a DBP of 71–150 cc/100 g and an M-Ratio of the carbon black aggregate of 1.25–2.00.

5,688,318

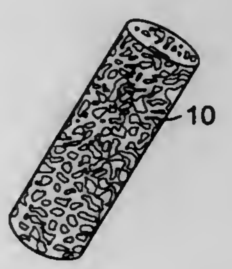
PHOTONIC BAND GAP MATERIALS AND METHOD OF PREPARATION THEREOF

Joseph B. Milstein, 134 Foster St., Brighton, Mass. 02135, and Ronald G. Roy, 15 Guile Ave., Tewksbury, Mass. 01876

Division of Ser. No. 266,146, Jun. 27, 1994, which is a division of Ser. No. 986,848, Dec. 4, 1992, Pat. No. 5,385,114. This application Jun. 6, 1995, Ser. No. 468,971

Int. Cl.^{6} C30B *33/06*

U.S. Cl. 117—1 **1 Claim**



1. Modification of a photonic band gap behavior of a photonic band gap material by modification of a physical periodicity or a dielectric constant or both of the said photonic band gap material by application of one or more of the excitations chosen from the group comprising:
a. a thermal excitation,
b. a physical compression or extension,
c. an electric field excitation, and
d. a magnetic field excitation, or by the addition of the same or other photonic band gap material so as to modify the physical periodicity of the said photonic band gap material.

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5,688,319

METHOD FOR TESTING ELECTRICAL PROPERTIES OF SILICON SINGLE CRYSTAL

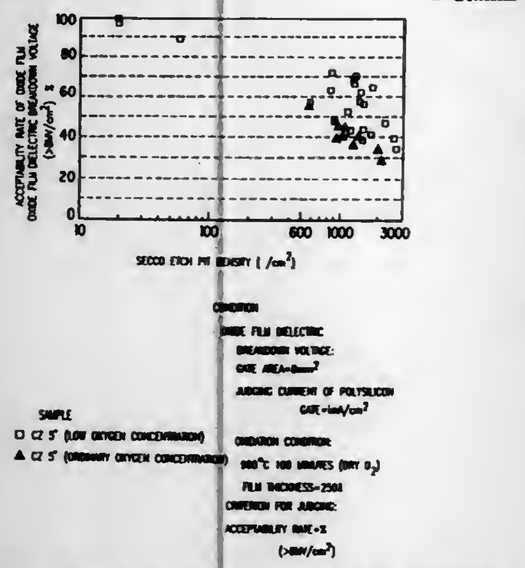
Izumi Fusegawa; Hirotoshi Yamagishi; Nobuyoshi Fujimaki, and Yukio Karasawa, all of Gunma-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,385

Claims priority, application Japan, Nov. 22, 1990, 2-320467

Int. Cl.^{6} C30B *15/00*

U.S. Cl. 117—13 **2 Claims**



1. A method of testing electrical properties of a silicon crystal, characterized by the following steps carried out after pulling up a silicon semiconductor single crystal by the Czochralski method or the floating zone pulling method, said steps comprising:

cutting a wafer of a first thickness from said single crystal;

etching the surface of the wafer with a mixed solution of hydrofluoric acid and nitric acid, thereby relieving said wafer of strain;

supporting the wafer with the surface in a vertical direction;

selectively etching the vertical surface of the wafer in a mixed solution of $K_2Cr_2O_7$, hydrofluoric acid, and water;

counting the number of scale-like patterns, per unit area, appearing on the surface of the wafer;

obtaining a correlation of the number of scale-like patterns to the acceptability rate of oxide film dielectric breakdown voltage, wherein the number of scale-like patterns is obtained by said selective etching step with respect to a plurality of wafers; and

evaluating the acceptability of oxide film dielectric breakdown voltage from the number of scale-like patterns counted in said counting step on the basis of said correlation obtained in said obtaining step.

5,688,320

PROCESS FOR MANUFACTURING ALUMINUM NITRIDE WHISKERS

Vladimir Nikolaevich Gribkov; Boris Vladimirovich Shchetanov; Eric Loguinovitch Umantsev, all of Moscow; Vladimir Alexandrovich Silaev, Tverskaja Obl; Yurii Alexeevich Gorelov, Tverskaja Obl., and Piotr Phiodorovich Lyasota, Tverskaja Obl., all of Russian Federation, assignors to Soclete Nationale Industrielle et Aerospatiale, Paris, France, and VIAM-ALL Russian Institut of Aviation Materials, Moscow, Russian Federation

Filed Jun. 17, 1996, Ser. No. 665,368

Claims priority, application France, Jun. 19, 1995, 95 07278

Int. Cl.^{6} C30B *9/00*

U.S. Cl. 117—75 **4 Claims**

1. A process for producing aluminum nitride whiskers by reducing alumina with carbon in a nitrogen atmosphere, at a temperature of 1800° to 2000° C., in the presence of a growth activator containing a solvent element, which process comprises the step of periodically feeding, through a working area of a horizontal furnace equipped with a graphite heating device, counter to a flow of nitrogen, a graphite container charged with a mixture of alumina, carbon and carbonyl iron, as the growth activator, which is present in an amount capable of implementing a VLS mechanism, and wherein the time taken by the container to pass through the working zone ranges from 20 to 120 minutes.

5,688,321

APPARATUS FOR PRODUCING A SILICON SINGLE CRYSTAL BY A FLOAT-ZONE METHOD

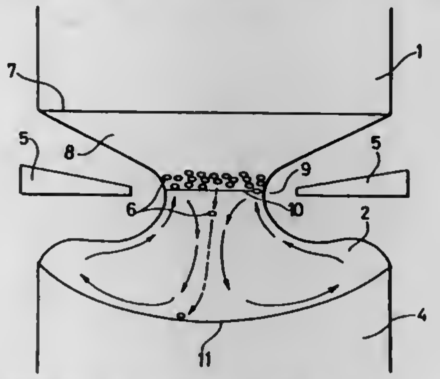
Masanori Kimura, and Hirotoshi Yamagishi, both of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Division of Ser. No. 260,919, Jun. 15, 1994, Pat. No. 5,556,461. This application Apr. 23, 1996, Ser. No. 636,348

Claims priority, application Japan, Jun. 18, 1993, 5-147231

Int. Cl.^{6} C30B *35/00*

U.S. Cl. 117—200 **9 Claims**



1. An apparatus for producing a silicon single crystal by a floating-zone method from a polysilicon rod having an average grain length of 10 to 1000 μm, said apparatus comprising:

means for heating a portion of the polysilicon rod to form a molten zone;

reflector means disposed around the silicon crystal ingot being grown and located near the molten zone for post-heating the growing silicon single crystal ingot;

means for applying a magnetic field of 300 to 1000 gauss to the molten zone; and

means for passing the molten zone through the length of the polysilicon rod, thereby converting the polysilicon rod into a silicon single crystal ingot through a one-pass zoning of the floating zone method.

5,688,322

APPARATUS FOR COATING RESIST ON SUBSTRATE

Kimio Motoda; Kiyohisa Tateyama, both of Kumamoto, and Noriyuki Anai, Kumamoto-ken, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,341

Claims priority, application Japan, May 24, 1995, 7-149624

Int. Cl.^{6} B05C *5/00*

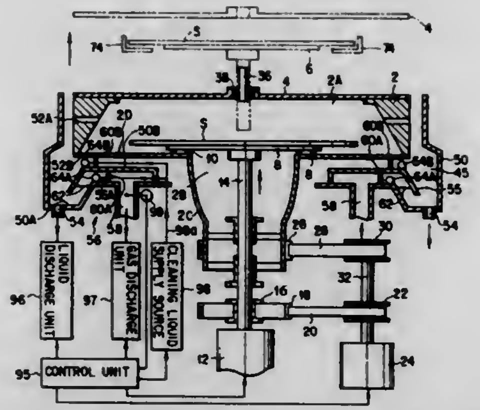
U.S. Cl. 118—52 **16 Claims**

1. An apparatus for coating resist comprising:

a spin-chuck which is vertically movable, said spin-chuck holding a substrate received and rotating together with said substrate,

resist solution supplying means for supplying a resist solution onto said substrate held on the spin-chuck;

a rotating cup surrounding the substrate held on said spin-chuck and being rotated in synchronism with said spin-chuck, for receiving said resist solution centrifugally separated from said substrate;



a drain cup provided around said rotating cup, for receiving a waste material discharged from said rotating cup, said drain cup having a collecting space for collecting said waste material received;

a drainage passage having a drainage port opening into said collecting space for discharging a liquid component of said waste material collected in said collecting space therefrom;

an exhaust passage having an exhaust port communicating with said collecting space, for discharging a gas component of said waste material collected in said collecting space therefrom;

an exhaust gas guiding passage provided at a level higher than at least said drainage port, for guiding said gas component from said collecting space to said exhaust passage; and

a gas-liquid separating member provided in said exhaust gas guiding passage, for condensing a liquid component contained in an air flow containing said gas component by striking it against said gas-liquid separating member, thereby preventing said liquid component from going around said exhaust passage.

5,688,323

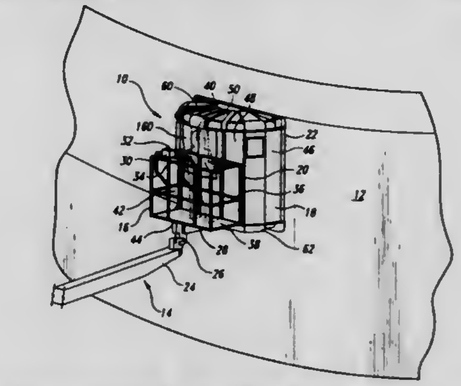
SPRAY CONTAINMENT AND ENCLOSURE ASSEMBLY

Mari Kane, Auburn; Clay Jorgensen, Stanwood, and Don Sybil, Kent, all of Wash., assignors to Interstate Coatings, Inc., Seattle, Wash.

Filed Nov. 13, 1995, Ser. No. 555,683

Int. Cl.^{6} B05B *15/00;* **B24C** *9/00*

U.S. Cl. 118—326 **29 Claims**



1. A spray containment enclosure assembly for use in a spraying operation on a work surface, comprising:

a support member;

a personnel basket supported by said support member, said personnel basket having a work area therein sized to receive a worker, said work area having a forward portion and a rearward portion, said forward portion being closer to the work surface than said rearward portion during the spraying operation, said work area having a shape and size that allows the worker to move between said forward and rearward portions;

an enclosure attached to said personnel basket, said enclosure defining an interior area, said enclosure being positioned with respect to said personnel basket such that when the worker is in said forward portion of said work area at least an upper torso of the worker is within said interior area, said enclosure having a cross member having an edge portion with a recess shaped and sized to receive therein at least a front portion of the upper torso of the worker during the spraying operation when the worker is in said forward portion of said work area, said rearward portion of said work area being exterior of said interior area such that the worker is substantially exterior of said interior area when the worker is in said rearward portion of said work area, said enclosure having an open front side to provide the worker with direct access to the work surface from said interior area, said open front side of said enclosure being positioned adjacent to the work surface during the spraying operation to define an airway gap between said enclosure and the work surface, said enclosure having an entry opening therein shaped and sized to allow the worker to move into and out of said interior area upon the worker moving between said forward and rearward portions of said work area, said enclosure having an air exhaust portion for exhausting air from said enclosure;

an air filter coupled to said enclosure;

an air moving device connected to said enclosure and coupled to said air exhaust portion to draw air into said interior area of said enclosure through said airway gap to prevent airborne particulates that are sprayed within said interior area during the spraying operation from exiting said interior area through said airway gap, said air moving device drawing air out of said interior area through said air exhaust portion, said exhausted air being passed through said air filter;

a yieldable skirt seal extending across said recess, said skirt seal being positioned to elastically deflect forwardly and sealably engage the front portion of the upper torso of the worker when the worker moves to said forward portion of said work area to substantially block airflow between the upper torso of the worker and said cross member such that a portion of the worker below said skirt seal is exterior of said interior area; and

a flexible cover member attached to said enclosure and positioned to substantially cover said entry opening, said cover member being movable relative to said enclosure to allow the worker to move through said entry opening between said forward and rearward portions of said work area, said cover member being positioned to sealably engage said enclosure around said opening to form a seal therebetween, said cover member being sufficiently flexible to engage a rear portion of the upper torso of the worker upon activation of said air moving device and when the worker is in said forward portion of said work area to sealably engage the worker to substantially block air from being drawn by said air moving device into said interior area through said entry opening, such that the air drawn into said interior area substantially enters through said airway gap.

5,688,324

APPARATUS FOR COATING SUBSTRATE

Takayuki Umaba, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 5, 1995, Ser. No. 464,080

Claims priority, application Japan, Jul. 15, 1994, 6-186255; Sep. 14, 1994, 6-247331; Oct. 5, 1994, 6-270337; Nov. 24, 1994, 6-315973; Dec. 2, 1994, 6-329565

Int. Cl.^{6} B05C *9/00*

U.S. Cl. 118—401 **150 Claims**

1. An apparatus for applying a coating liquid to a substrate a discrete sheet and having a surface to be coated and a length, the surface to be coated having an upper portion and a lower portion, the apparatus comprising:

substrate holding means for holding the substrate such that the surface to be coated is positioned vertically or inclined;

a coating liquid tank for storing the coating liquid therein, said coating liquid tank having:

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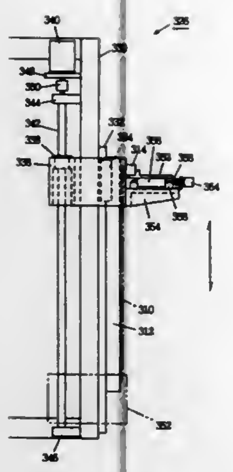


a hollow body with opposing ends closed;
a front end surface having a lower edge and an upper edge, said front end surface being adapted to face the surface to be coated of the substrate held by said substrate holding means and to extend over at least a prescribed range of width of the surface to be coated;
a coating liquid outlet disposed on said front end surface and having an outlet opening;
a coating liquid inlet having an inlet opening disposed at a level below a level of said outlet opening; and
a coating liquid outlet path extending between said outlet and said inlet, the coating liquid rising to reach said outlet at least by capillary action through said outlet path; and
moving means for holding said coating liquid tank with its front end surface facing the surface to be coated of the substrate held by said substrate holding means with a gap of a prescribed size therebetween, and for linearly moving said substrate holding means and said coating liquid tank relative to each other, while maintaining said gap of the prescribed size, with linear movement of said substrate holding means and said coating liquid tank relative to each other bringing about relative movement of said tank and said substrate holding means from a first position corresponding to said upper portion where coating of said surface to be coated of the substrate starts and to a second position corresponding to the lower portion where coating of the surface to be coated of the substrate is terminated, wherein

said lower edge of said front end surface of said coating liquid tank is disposed at a level between said outlet and said inlet of said coating liquid tank when said coating liquid tank is held by said moving means, and said upper edge is disposed between said outlet and a maximum height reached by said coating liquid rising in the gap of said prescribed size at least by capillary action which coating liquid flows from said outlet to said gap when said coating liquid tank is held by said moving means, both said front end surface of said coating liquid tank and said surface to be coated of said substrate being projected upward infinitely to define said gap of said prescribed size therebetween; and wherein

when the coating liquid is introduced to said coating liquid tank with said coating liquid tank being held by said moving means, the coating liquid inside of said hollow body is bounded by an upper surface that is positioned at a level between a level of said inlet opening and said lower edge of said front end surface of said coating liquid tank, and the coating liquid introduced to said gap through said coating liquid outlet path forms a pool in which flow is regulated by said upper and lower edges of said front end surface.

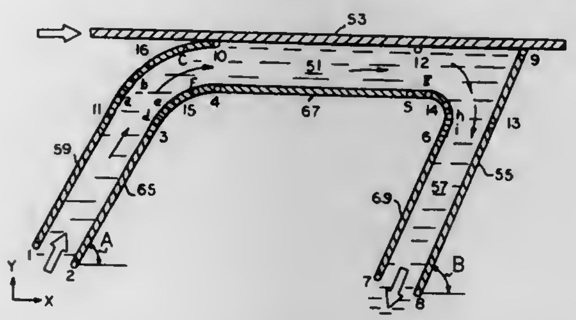
5,688,325
COATING DEVICE FOR TRAVELING WEBS

Cyrus K. Aldun, Marietta, Ga., assignor to Institute of Paper Science and Technology, Inc., Atlanta, Ga.

Continuation of Ser. No. 291,144, Aug. 16, 1994, abandoned, which is a division of Ser. No. 881,512, May 12, 1992, Pat. No. 5,366,551, which is a continuation-in-part of Ser. No. 849,530, Mar. 11, 1992, abandoned. This application Jul. 18, 1996, Ser. No. 683,136

Int. Cl.^{6} B05C *3/02*

U.S. Cl. 118—410 **9 Claims**



1. A coating device for applying a liquid coating composition on a web of material as the web travels along a path through the device from an upstream direction to a downstream direction, the device comprising:
a doctor element spaced from the web for spreading and defining the thickness of the liquid coating composition on the web, the doctor element extending across the path of the web;
a coating composition application chamber adapted for receiving a liquid flow of the liquid coating composition from the upstream direction to the downstream direction, the application chamber extending across the path of the web, the application chamber having upstream and downstream sides with the web adapted to travel from the upstream side to the downstream side of the application chamber,
the coating application chamber comprising in cross-section, an upstream interior side wall, an upstream boundary wall, a top interior wall, a downstream interior wall and the doctor element, the upstream boundary wall and the upstream interior wall being substantially parallel to the other and each having terminating curvilinear sections which are substantially parallel to the other, the upstream boundary wall having a terminal end adapted to terminate in tangential relation with the path of the web and adapted to prevent coating composition from being forced between the terminal end of the upstream end of the upstream boundary wall and the path of the web, the top interior wall being spaced from and substantially parallel to the path of the web and abutting the upstream interior wall, the downstream interior wall being substantially parallel to the doctor element and abutting the top interior wall; the upstream walls, the top interior wall, the path of the web, the downstream interior wall and the doctor element defining a geometry for the coating device having a path for a flowing stream of the liquid coating composition which flows downstream relative to the direction of travel of the web and which path is for the elimination of the formation of recirculating eddies and vortices in the coating composition and for the elimination of the formation of air pockets in the liquid coating composition.

5,688,326
APPARATUS FOR COATING ELONGATED MATERIAL WITH PHOTORESIST

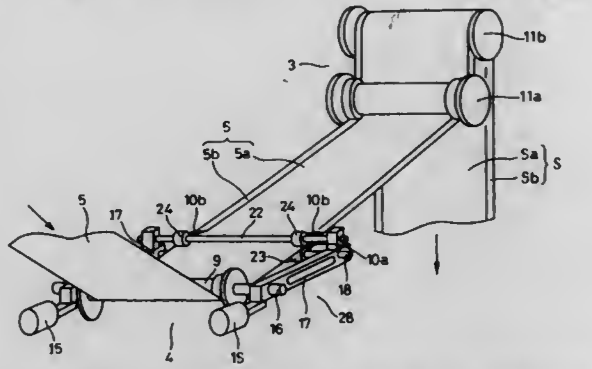
Takefumi Kandori; Jyouitsu Sawa, and Toshimasa Takeuchi, all of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Oct. 18, 1995, Ser. No. 544,731

Claims priority, application Japan, Nov. 18, 1994, 6-309913

Int. Cl.^{6} B05C *3/12*

U.S. Cl. 118—419 **18 Claims**



1. An elongated material treatment apparatus for treating an elongated material having a principal surface comprising a main region and a transport support region, said apparatus cleaning said principal surface to produce a cleaned principal surface and then coating said main region of said cleaned principal surface with a photoresist while transporting said elongated material in its longitudinal direction, said elongated material treatment apparatus comprising:
a coating device for coating said cleaned principal surface with a photoresist by immersing said elongated material in a photoresist bath and then drawing up said elongated material from said bath;
a cleaning device disposed lust upstream of said coating device in a transport direction of said elongated material for applying a cleaning fluid to the whole of said principal surface to clean said principal surface to be coated with said photoresist by said coating device;
a conveying device disposed between said cleaning device and said coating device for transporting said elongated material from said cleaning device to said coating device while supporting said transport support region of said principal surface; and
a cleaning fluid removing device disposed between said cleaning device and said conveying device for removing said cleaning fluid deposited on said transport support region without removing cleaning fluid that has been deposited on said main region.

5,688,327
CHUCK ASSEMBLY HAVING A CONTROLLED VENT

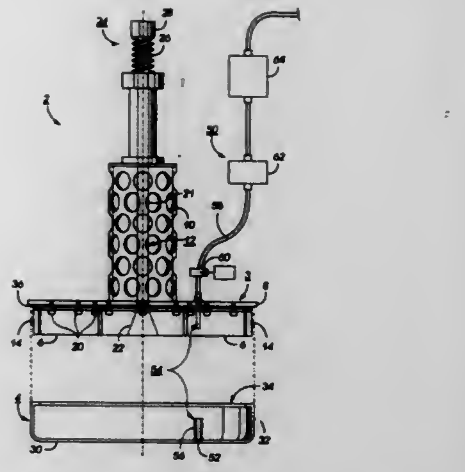
Eugene A. Swain, Webster, and Peter J. Schmitt, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1996, Ser. No. 607,064

Int. Cl.^{6} B05C *13/00*

U.S. Cl. 118—500 **11 Claims**

1. A chuck assembly for engaging the inner surface of a hollow substrate having a first end engaged to the chuck assembly and an open second end, wherein during lowering of the open second end of the substrate into a liquid there is air present in the interior of the substrate between the chuck assembly and the liquid, the chuck assembly comprising:
(a) a body defining a hole, wherein the body includes a chuck, wherein the hole is positioned to be in communication with the air inside the substrate; and
(b) a gas pressure regulating apparatus coupled to the hole defined by the body for regulating the gas pressure inside the substrate by allowing a portion of the air inside the substrate between the chuck assembly and the liquid to flow through the hole into the chuck assembly or by adding gas into the substrate interior through the hole.



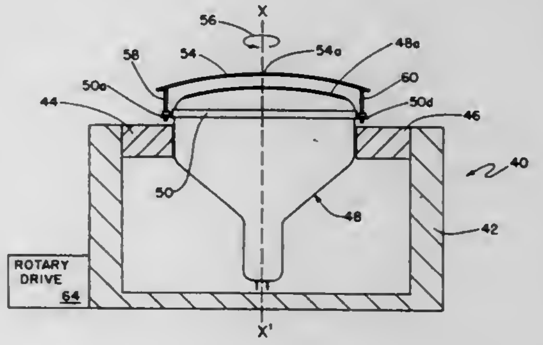
5,688,328
APPARATUS FOR IMPROVED COATING OF A CRT DISPLAY SCREEN

Hua-Sou Tong, Arlington Heights, Ill., and Chun-Min Hu, Keelung, Taiwan, assignors to Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan

Filed Sep. 13, 1995, Ser. No. 527,420

Int. Cl.^{6} B05C *11/11*

U.S. Cl. 118—505 **6 Claims**



1. Apparatus for applying an antistatic and/or antireflective coating of uniform thickness to the outer surface of a curvilinear glass display screen of a CRT following deposit of a solution of the antistatic and/or antireflective coating on a center portion of the display screen, said CRT including an implosion protection band disposed about the periphery thereof, said apparatus comprising:
rotary support means for engaging and rotationally displacing the CRT about its longitudinal axis with the display screen directed upwardly;
a curvilinear shield having a larger surface area than the display screen and substantially the same curvature as the display screen; and
mounting means for attaching said shield to the CRT's implosion protection band and maintaining said shield in closely spaced relation to and above the display screen to avoid air turbulence above the display screen as the CRT is rotationally displaced for forming the coating with a substantially uniform thickness.

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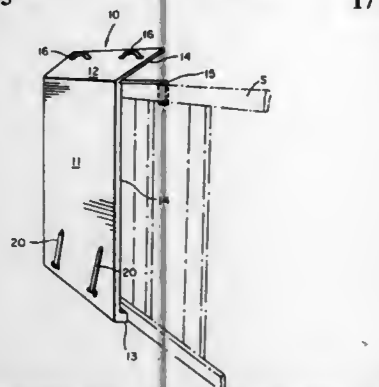
5,688,329
SPRAY SHIELD WITH TROUGH

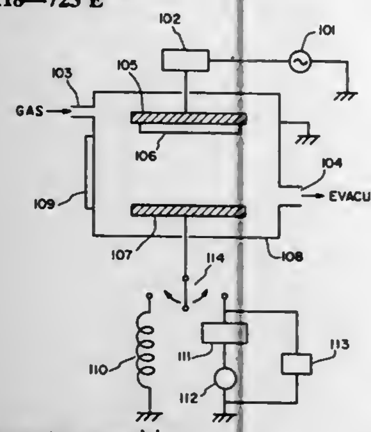
David Poague, P.O. Box 2038, Manasses, Va. 22110
Filed Dec. 29, 1995, Ser. No. 581,216
Int. Cl.^{6} B05C *11/00;11/10*
U.S. Cl. 118—505 **17 Claims**



1. A shield for confining and collecting excess spray comprised generally of a sheet of material defining a peripheral edge, trough means disposed on a lower edge thereof, a peripheral guard means disposed around the remaining edges and extending outwardly in the same direction as said trough means thereby confining said excess spray and directing it into said trough means, means on said sheet for supporting said sheet material on a fixed support behind an object being sprayed, and said support means including at least one support member extending outwardly from said sheet material adapted to engage said fixed support for supporting the same thereon.

5,688,330
PROCESS APPARATUS

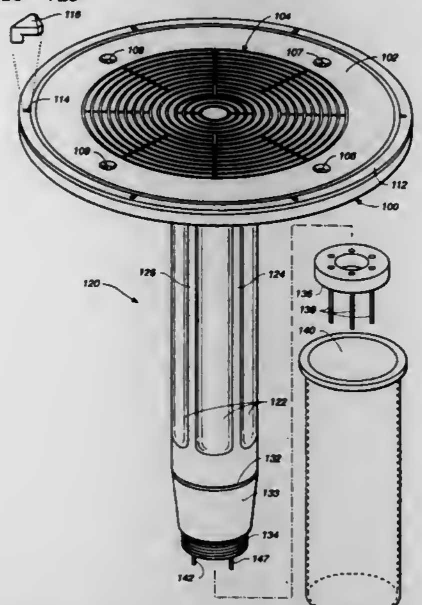
Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku Sendai-shi Miyagi-ken, Japan
Continuation of Ser. No. 335,862, Nov. 10, 1994. This application Sep. 10, 1996, Ser. No. 707,915
Claims priority, application Japan, May 13, 1992, 4-146332
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 118—723 E **6 Claims**



1. An apparatus comprising:
a vessel having interior surfaces;
first and second electrodes disposed in said vessel wherein the first electrode is characterized by an impedance between said first electrode and earth;
a first high-frequency electric power supply connected to said first electrode;
a second high frequency electric power supply;
a means for holding a wafer disposed on said second electrode;
a gas supply for introducing gas into said vessel, wherein said gas is capable of being turned into a plasma;
an impedance means having an impedance wherein the impedance of said impedance means is larger than the impedance between said first electrode and earth; and
means for connecting said impedance means and said second high frequency power supply to said second electrode, said connecting means comprising a switch capable of alternatively connecting one of said second high frequency power supply and said impedance means to said second electrode at a time such that the plasma generated in the vessel is capable of cleaning the interior surfaces of the vessel when said switch connects said impedance means to said second electrode and such that the plasma generated in the vessel is capable of sputtering a target provided on one of the electrodes onto a substrate provided on the other electrode when the switch connects the second high frequency power supply to the second electrode, and
wherein said first high-frequency power supply is capable of using a first frequency when the switch connects the impedance means to the second electrode and a second frequency when the switch connects said second high frequency power supply to the second electrode, wherein the first frequency is higher than the second frequency.

5,688,331
RESISTANCE HEATED STEM MOUNTED ALUMINUM SUSCEPTOR ASSEMBLY

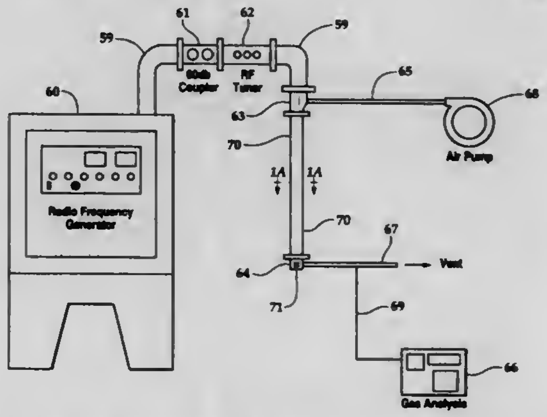
Michio Aruga, Tomisato; Atsunobu Ohkura, Yachimata; Akihiko Saito, Chiba; Kenji Suzuki; Kenichi Taguchi, both of Narita, all of Japan; Dale Robert DuBois, Los Gatos, and Alan Ferris Morrison, Cupertino, both of Calif., assignors to Applied Materisls, Inc., Santa Clara, Calif.
Continuation of Ser. No. 225,956, Apr. 20, 1994, abandoned. This application Jul. 1, 1996, Ser. No. 673,599
Claims priority, application Japan, May 27, 1993, 5-126103
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 118—725 **9 Claims**



1. A susceptor, comprising:
a susceptor wafer support plate composed of aluminum nitride having an electrically conductive element embedded therein, said plate including a back side from which wiring connected to said electrically conductive element embedded therein emerges;
a support stand configured to form a tube, said tube having a first end configured to form a joint with said back side of said support plate, said joint is positioned to surround the location from which said wiring emerges, wherein said support member includes side walls composed of a ceramic material, said support member being configured to support said susceptor wafer support plate, said tube having a second end which is closed with a bottom plate, said support member said support stand and said bottom plate forming the limits of a pressurizable cavity, the cavity having holes therein to pass wiring connected to said electrically conductive element from said cavity, said holes being sealed;
wherein said cavity includes a gas supply opening connected to an inert gas source feeding inert gas into said pressurizable cavity.

5,688,332
PIPE CLEANING USING MICROWAVE ENERGY

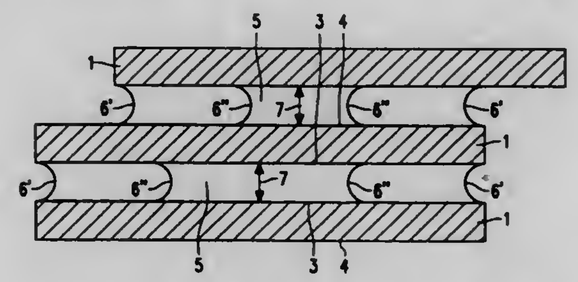
Chang Yul Cha, 3807 Reynolds St., Laramie, Wyo. 82070
Filed Dec. 14, 1995, Ser. No. 572,831
Int. Cl.^{6} B08B *7/00*
U.S. Cl. 134—1.1 **5 Claims**



1. A process for cleaning a metallic pipe fouled within by carbonaceous material comprising:
passing a gas containing oxygen-containing molecules through said pipe; and
converting said pipe to a waveguide by energizing said pipe with radiofrequency energy at a cutoff frequency or above while catalyzing oxidizing reactions between said carbonaceous material and said oxygen-containing molecules.

5,688,333
METHOD OF BULK WASHING AND DRYING OF DISCRETE COMPONENTS

Peter J.E. Schelwald, Stadskanaal, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 27, 1995, Ser. No. 579,651
Claims priority, application European Pat. Off., Dec. 27, 1994, 94203765
Int. Cl.^{6} B08B *3/00;7/00*
U.S. Cl. 134—4 **7 Claims**



1. A method of bulk washing and drying of discrete components, characterized in that the components are washed with a cleaning liquid to produce wet components, the cleaning liquid having a melting point, and the wet components are dried in a freeze-drying process in that the wet components are brought to a temperature below the melting point of the cleaning liquid, so that the cleaning liquid becomes a solid substance, the solid substance having a vapour pressure, and in that the solid substance is evaporated through introduction of the components and the solid substance into a space having a pressure lower than the vapour pressure of the solid substance.

5,688,334
METHOD FOR REMOVING WALLPAPER

Kimberley A. Gaul, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 314,207, Sep. 28, 1994, abandoned, which is a continuation of Ser. No. 21,125, Feb. 23, 1993, abandoned. This application Apr. 15, 1996, Ser. No. 632,689
Int. Cl.^{6} B08B *7/00*
U.S. Cl. 134—4 **13 Claims**

1. A method of removing wallpaper comprising a layer of adhesive from a substrate, comprising the following steps:
a. providing a water-based composition comprising a surfactant in an amount by weight of about 0, 1 to about 10 percent of the weight of said composition, a humectant which is a polyhydric alcohol and is present in an amount by weight of about 0.1 to about 10 percent of the weight of said composition, an organic solvent which is selected from the group consisting of an ester, an aromatic monohydric alcohol, an aliphatic hydrocarbon, a ketone, an aromatic hydrocarbon and a mixture of any two or more of the foregoing and is present in an amount by weight of up to about 10 percent of the weight of said composition, and water in an amount of at least about 82.78 percent by weight based on the total weight of said composition, wherein said mixture is substantially free of enzyme;
b. applying said composition to said substrate and allowing it to remain in contact therewith for a sufficient time to soften or dissolve said adhesive; and
c. removing said wallpaper from said substrate.

5,688,335
CONTAMINANT REMOVAL FROM MATERIAL

Herman Otto Krabbenhoft, Scotia; Jimmy Lynn Webb, Ballston Lake, both of N.Y.; James Hall Maxymillian, Pittsfield, and Stephen Allen Warren, Becket, both of Mass., assignors to General Electric Company, and Maxymillan Technologies, Inc., both of Schenectady, N.Y.
Filed Sep. 5, 1995, Ser. No. 523,177
Int. Cl.^{6} B08B *7/00*
U.S. Cl. 134—19 **3 Claims**

1. An ex situ method to decontaminate particulate material contaminated with halogenated organic compounds comprising the steps of:
admixing the particulate material contaminated with halogenated organic compounds with an additive selected from the group consisting of formic acid, oxalic acid, malonic acid, mono- or di- alkyl substituted malonic acid, salicylic acid, mono- or dialkyl substituted salicylic acid, and sodium bicarbonate, in an amount of about 0.5 to about 25 weight percent based on the weight of material;
heating an admixture of the particulate material contaminated with halogenated organic compounds and the additive to a process temperature of about 250° C. to about 450° C. at below atmospheric pressure for a period of time sufficient to heat all of the admixture to said process temperature;
holding the admixture at the process temperature for a period of time to substantially volatilize the halogenated organic compounds; and then
sweeping steam derived from water through the admixture at a rate of at least about 0.5 pounds of water by weight per minute per ton of particulate material at said process temperature for a period of time sufficient to remove substantially all of the halogenated organic compounds from the admixture so that less than about ten parts per million of the halogenated organic compounds remain in the admixture.

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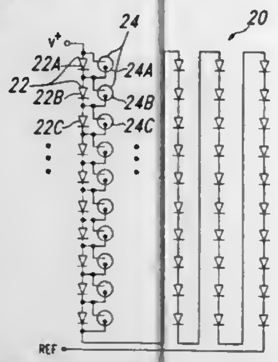
5,688,336
METHOD FOR REMOVAL OF WATER SOLUBLE POLYMERS

James B. Millard, Jr., 509 Woodruff Ct., Frankfort, Ill. 60423
Continuation of Ser. No. 758,237, Sep. 9, 1991, abandoned, which is a continuation of Ser. No. 189,618, May 3, 1988, abandoned. This application Jun. 21, 1996, Ser. No. 666,997
Int. Cl.⁶ C11D *3/386;* **B08B** *1/00*
U.S. Cl. 134—42 **7 Claims**

1. A method of removing a water soluble polymer or residue thereof from a surface bearing a layer of said polymer or residue, said method comprising the steps of:
(a) applying a solvent to said surface, said solvent consisting of an aqueous solution of 1.0 to 29 wt. %, inclusive, ammonium hydroxide, 0.1 to 4.9 wt. %, inclusive and the balance is water; ammonium chloride;
(b) agitating said solvent with respect to said surface for a time sufficient to break said layer to facilitate removal thereof; and
(c) rinsing said surface to remove said polymer or residue.

5,688,337
TEMPERATURE COMPENSATED PHOTOVOLTAIC ARRAY

Dan Michael Mosher, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 30, 1995, Ser. No. 565,428
Int. Cl.⁶ H01L *31/042;31/05*
U.S. Cl. 136—244 **3 Claims**



1. A solar cell module, comprising:
a plurality of solar cells interconnected in series; and
a plurality of thermally activated switches connected in parallel with at least some said solar cells, wherein said switches are activated at different temperatures, whereby said solar cells in parallel with said associated switches are shorted at different temperatures.

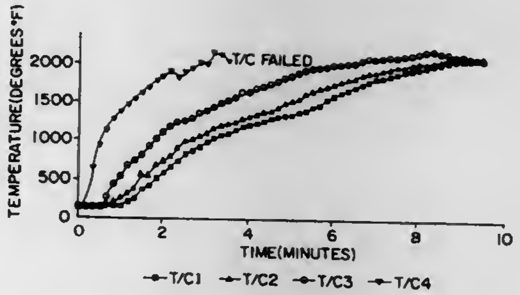
5,688,338

Patent Not Issued For This Number

5,688,339
OXY-FUEL FLAME IMPINGEMENT HEATING OF METALS

Larry Keith Farmer, Fleetwood; Michael Dennis Lanyi, Macungie; Joseph Scott Becker, Schnecksville, and Christopher Alan Ward, Alburtis, all of Pa., assignors to Gas Research Institute, Chicago, Ill.
Continuation of Ser. No. 81,994, Jun. 23, 1993, abandoned.
This application Aug. 18, 1994, Ser. No. 292,657
Int. Cl.⁶ B23K *7/00*
U.S. Cl. 148—194 **11 Claims**

1. A process for rapid heating of a ferrous metal shape to a specified temperature which is required for a subsequent hot mechanical working operation of the ferrous metal shape to be heated, comprising the steps of:
exposing said ferrous metal shape to direct impingement by an oxy-fuel flame;
maintaining said oxy-fuel flame in contact with said ferrous metal shape until the temperature of the surface of said shape exceeds the maximum temperature to which the ferrous metal shape is to be heated, but below that at which surface damage begins to occur;
removing said oxy-fuel flame from contact with said ferrous metal shape until said surface temperature has decreased by at least 100° F.;
alternately impinging and removing said oxy-fuel flame onto said ferrous metal shape in accord with the previous step until said ferrous metal is heated substantially by direct flame impingement to the specified temperature where the surface to core temperature gradient is diminished to a level permitted by the requirements of the subsequent hot mechanical working operation for the ferrous metal shape, and subjecting the ferrous metal shape to a hot mechanical working operation.



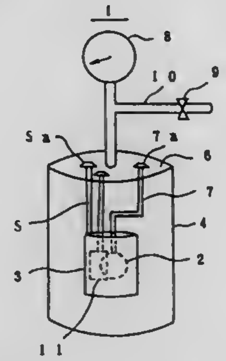
5,688,340
PREPARATION OF METAL SURFACES FOR VITREOUS ENAMELING

Margit Fleischhacker-Jeworrek, Usingen; Dieter Jentsch, Wardenburg/Achternmeer, and Klaus Wittel, Frankfurt, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany
Filed Aug. 22, 1995, Ser. No. 517,816
Claims priority, application Germany, Aug. 24, 1994, 44 29 936.2
Int. Cl.⁶ C23C *22/08*
U.S. Cl. 148—261 **10 Claims**

1. A process for the preparation of a metal surface for a succeeding vitreous enameling by application of a phosphate coating by means of a phosphating solution containing layer-forming cations, comprising: contacting the metal surface with a phosphating solution consisting essentially of:
5 to 20 g/l phospate (calculated as P_2O_5);
0.1 to 0.5 g/l molybdate (calculated as MoO_3);
0.2 to 2 g/l fluoride (calculated as F);
1 to 10 g/l nitrate (calculated as NO_3); and
a layer-forming cation selected from the group consisting of nickel and/or cobalt in an amount of 0.5 to 3 g/l.

5,688,341
HYDROGEN-ABSORBING ALLOY ELECTRODE AND METHOD FOR EVALUATING HYDROGEN-ABSORBING ALLOYS FOR ELECTRODE

Takahiro Isono; Hiroshi Watanabe; Shin Fujitani; Hiroshi Nakamura; Yumiko Nakamura, and Ikuo Yonezu, all of Osaka, Japan, assignors to Sanyo Electric Co. Ltd, Osaka, Japan
Continuation of Ser. No. 318,110, Oct. 5, 1994, abandoned.
This application Jul. 1, 1996, Ser. No. 676,574
Claims priority, application Japan, Oct. 8, 1993, 5-277709; Oct. 13, 1993, 5-280623
Int. Cl.⁶ C21D *11/00;1/54*
U.S. Cl. 148—505 **10 Claims**



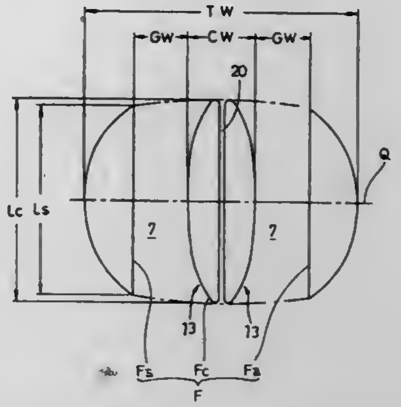
1. A method for evaluating a hydrogen-absorbing alloy E as an electrode material, comprising the steps of:
(1) measuring integrated intensities of X-ray diffraction peaks $I_{M1}(h_1k_1l_1)$, $I_{M2}(h_2k_2l_2)$ . . . , $I_{Mx}(h_xk_xl_x)$ in lattice planes $(h_1k_1l_1)$, $(h_2k_2l_2)$, . . . $(h_xk_xl_x)$, respectively, for a plurality of hydrogen-absorbing alloys $M_1, M_2, \ldots, M_x$, each having a preferred orientation in lattice plane $(h_0K_0l_0)$ and having the same alloy composition as the hydrogen-absorbing alloy E, and measuring integrated intensities of X-ray diffraction peaks $I_s(h_1k_1l_1)$, $I_s(h_2k_2l_2)$ . . . , $I_s(h_xk_xl_x)$ in lattice planes $(h_1k_1l_1)$, $(h_2k_2l_2)$, . . . $(h_xk_xl_x)$, respectively, for a hydrogen-absorbing alloy S having the same alloy composition as the hydrogen-absorbing alloy E,
determining integrated intensity ratios $I_{M1}(h_1k_1l_1)/I_s(h_1k_1l_1)$, $I_{M2}(h_2k_2l_2)/I_s(h_2k_2l_2)$, . . . , $I_{Mx}(h_xk_xl_x)/I_s(h_xk_xl_x)$ and angles ϕ_1, $\phi_2, \ldots, \phi_x$ formed by the lattice planes $(h_1k_1l_1)$, $(h_2k_2l_2)$, . . . , $(h_xk_xl_x)$ and the lattice plane $(h_0k_0l_0)$, respectively, and
determining a parameter P, which varies according to a structure of the plurality of hydrogen absorbing alloys $M_1, M_2, \ldots, M_x$ and is a parameter of a function $F(\phi)$, where:

$$F(\phi)=I(hkl)/I_s(hkl) \qquad \text{(A)}$$

wherein I(hkl) is an integrated intensity of the X-ray diffraction peak in lattice plane (hkl) of the plurality of hydrogen-absorbing alloys $M_1, M_2, \ldots, M_x$; $I_s(hkl)$ is an integrated intensity of the X-ray diffraction peak in lattice plane (hkl) of the hydrogen-absorbing alloy S; and ϕ is an angle formed by the lattice plane $(h_0k_0l_0)$ and the lattice plane (hkl);
(2) determining a relationship between the parameter P and observed values, $T_1, T_2, \ldots, T_x$ representing at least one property of the plurality of hydrogen-absorbing alloys $M_1, M_2, \ldots, M_x$ as an electrode material;
(3) measuring integrated intensities of X-ray diffraction peaks $I_{E1}(h_{E1}K_{E1}l_{E1})$, $I_{E2}(h_{E2}K_{E2}l_{E2})$, . . . , $I_{EY}(h_{EY}k_{EY}l_{EY})$ in lattice planes, $(h_{E1}k_{E1}l_{E1})$, $(h_{E2}k_{E2}l_{E2})$, . . . , $(h_{EY}k_{EY}l_{EY})$, respectively, for the hydrogen-absorbing alloy E,
determining integrated intensity ratios $I_{E1}(h_{E1}k_{E1}l_{E1})/I_s(h_{E1}k_{E1}l_{E1})$, $I_{E2}(h_{E2}k_{E2}l_{E2})/I_s(h_{E2}k_{E2}l_{E2})$, . . . , $I_{EY}(h_{EY}k_{EY}l_{EY})/I_s(h_{EY}k_{EY}l_{EY})$ and angles $\phi_{E1}, \phi_{E2}, \ldots, \phi_{EY}$ formed by the lattice planes $(h_{E1}k_{E1}l_{E1})$, $(h_{E2}k_{E2}l_{E2})$, . . . , $(h_{EY}k_{EY}l_{EY})$ and the lattice plane $(h_0k_0l_0)$, respectively, and
determining a parameter P_E for the hydrogen-absorbing alloy E by substituting the determined integrated intensity ratios and angles for $I(hkl)/I_s(hkl)$ and ϕ in formula (A); and
(4) comparing the parameter P_E with the relationship between the parameter P and the observed values $T_1, T_2, \ldots, T_x$ in step (2) to estimate at least one property of the hydrogen-absorbing alloy E, as an electrode material;
wherein the hydrogen-absorbing alloy E is used as a negative electrode of a metal hydride alkaline secondary battery.

5,688,342
PNEUMATIC TIRE HAVING GROUND CONTACTING AREA

Hideaki Sugihara, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan
Filed Dec. 27, 1994, Ser. No. 363,822
Claims priority, application Japan, Dec. 27, 1993, 5-350822
Int. Cl.⁶ B60C *101/00;111/00*
U.S. Cl. 152—209 R **11 Claims**



1. A pneumatic tire comprising a tread part having two circumferential grooves continuously extending in the circumferential direction, one of said circumferential grooves being disposed on one side of the tire's equator and the other of the circumferential grooves being disposed on the other side of the tire's equator so as to divide the tread part into a pair of shoulder parts, which are located outside outer bottom edges of the circumferential grooves in the axial direction of tire, and a central part, the central part being located between inner bottom edges of the circumferential grooves in the axial direction of the tire; wherein
the central part has a surface configured by an arc of a single radius of curvature R1 composed of
a pair of inner groove walls, each of the inner groove walls extending inward in the tire's axial direction from the inner bottom edges, and
a central ground-contacting surface smoothly connected between the pair of the inner groove walls,
the radius of curvature R1 is in a range of 0.45 to 0.55 times a ground-contact tread width TW,
the central ground-contacting surface is substantially in contact with a virtual tread line between outer surfaces of the shoulder parts, and
when the tire is mounted on a regular rim, inflated with regular internal pressure and applied with normal load,
a ground-contacting area Fc where the central part contacts with the ground has a length Lc in the tire's circumferential direction which is 0.94 to 0.96 times a length Ls in the tire's circumferential direction of a ground-contacting area FS where the shoulder part contacts with the ground.

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5,688,343

TUBELESS PNEUMATIC TIRE WITH CARCASS HAVING BUTYL-BASED INNER TOPPING RUBBER LAYER

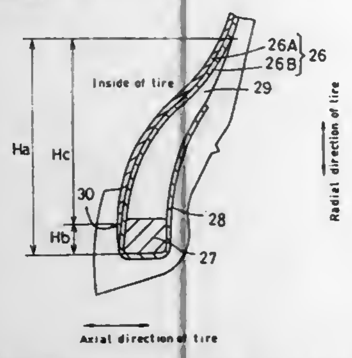
Nobuaki Minami; Kazuya Suzuki, and Yukio Endo, all of Shirakawa, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jul. 24, 1995, Ser. No. 505,896

Claims priority, application Japan, Aug. 22, 1994, 6-196934; Mar. 16, 1995, 7-057747

Int. Cl.^{6} B60C *9/04;15/00;15/06;5/14*

U.S. Cl. 152—510 **5 Claims**



1. A tubeless pneumatic tire free of an inner liner comprising

a carcass comprising a plurality of carcass plies stacked one on the other, radially of the tire, each of said carcass plies having a carcass cord web and topping rubber layers unified with the carcass cord web on opposite sides thereof by calendering, said plurality of carcass plies including an outer carcass ply extending from the tread portion through the sidewall portion to the bead portion and turned up around the bead core outwardly from the inside of the tire in the axial direction and an innermost carcass ply extending from the tread portion through the sidewall portion to the bead portion and terminating at the bead portion without being turned up around the bead core; and

a bead apex rubber provided in a portion surrounded by the turned up portion of the carcass and the bead core, wherein

only the topping rubber layer defining an interior surface of the tire of the innermost carcass ply is formed of a butyl-based rubber, thereby eliminating the inner liner, and

the topping rubber layer other than the topping rubber layer defining the interior surface of the tire is formed of a diene-based rubber material, wherein

difference Hc between radial distance Hb from the terminating end of the innermost carcass ply to a radially inside edge of the bead core and radial distance Ha from a radially outside edge of the bead apex rubber to the radially inside edge of the bead core is not less than 5 mm.

5,688,344

HEAVY DUTY RADIAL TIRE WITH AT LEAST FOUR STEEL CORD LAYERS

Yasuhiko Kobayashi, and Kazuhito Numata, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

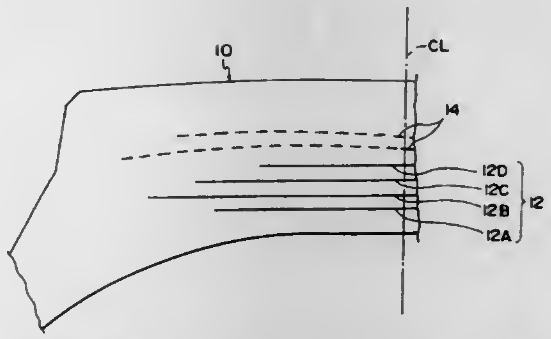
Filed Nov. 21, 1994, Ser. No. 344,676

Int. Cl.^{6} B60C *9/18;9/20*

U.S. Cl. 152—527 **16 Claims**

1. A heavy duty radial tire comprising:

a belt layer assembly which is provided at a crown portion of a carcass extending in a toroidal shape, said belt layer assembly being formed of at least four layers which are formed from steel cords, wherein the layers of said belt layer assembly are divided into two groups, a first group of outer layers positioned at an outer side in a radial direction of said radial tire and a second group of inner layers positioned at an inner side in the radial direction of said radial tire, the cross sectional areas of the steel cords of at least one layer of the first group of outer layers being greater than the cross sectional areas of the steel cords of the second group of inner layers, the cross-sectional areas of the steel cords of each of the first group of outer layers and each of the second group of inner layers being between 3.80 mm^2 and 8.55 mm^2,



wherein ratios I/A of cross sectional secondary moments I and cross sectional areas A of the steel cords of at least one layer of the first group of outer layers and the second group of inner layers are greater than or equal to 4.5×10^{-3} mm^2,

wherein, when the filament diameter of a steel cord is d,

$$I=\Sigma\ ((\pi/64)d^4))$$

and

$$A=\Sigma\pi\ (d/2)^2.$$

5,688,345

TIRE WITH RADIAL CARCASS WITH OUTSIDE TO INSIDE TURN-UPS

Jean Billieres, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablisse-ments Michelin-Michelin & Cie, Clermont-Ferrand Cedex, France

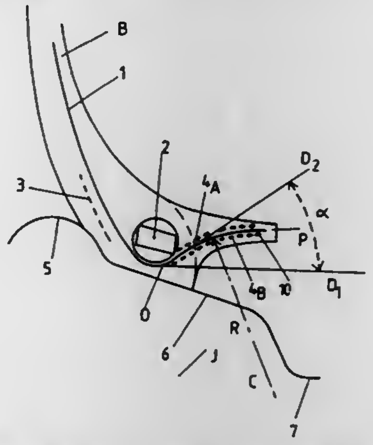
PCT No. PCT/EP94/02982, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO95/09090, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 7, 1994, Ser. No. 619,495

Claims priority, application France, Sep. 30, 1993, 93/11825

Int. Cl.^{6} B60C *15/00;15/024;15/04;15/06*

U.S. Cl. 152—540 **5 Claims**



1. A tire having an aspect ratio of less than 0.8 and having a radial carcass reinforcement (**1**) surmounted radially by a crown reinforcement, the carcass reinforcement (**1**) being formed of at least one ply of cords or cables and being wound in each bead (**B**) around an anchoring bead ring (**2**), going from the outside to the inside in order to form a turn-up (**10**), characterized by the fact that the said turn-up (**10**) is located to the inside of an angle α, open axially toward the inside and radially toward the outside, of at most 45° and defined by two straight lines OD_1 and OD_2 tangent to the circle circumscribed round the anchoring bead ring (**2**), the straight line closest to the axis of rotation of the tire being parallel to said axis.

5,688,346

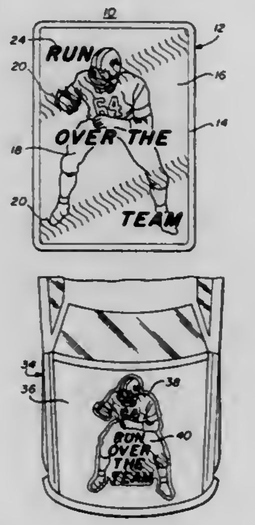
EVENT BOOSTER ITEM FOR AUTOMOTIVE VEHICLE PAINTED SURFACE

Bill Corbusier, 3450 Ranch View Ct., Fort Worth, Tex. 76109

Filed Jun. 7, 1995, Ser. No. 473,086

Int. Cl.^{6} B44F *3/00*

U.S. Cl. 156—60 **8 Claims**



1. A process for promoting a specific event comprising the steps of:

printing promotion indicia for a specific event on the front side of a first pliable sheet having a front side and a back side;

placing an adhesive material on the entire back side of said first sheet, said adhesive enabling the indicia-carrying first sheet to be attached to and removed from a surface without damaging the surface or leaving a residue thereon; and

attaching the entire back side of the indicia-carrying first sheet to said surface with the adhesive to prominently display the specific event promotion indicia on the first side such that the indicia-carrying first sheet can be removed from the surface in one piece after the occurrence of said specific event.

5,688,347

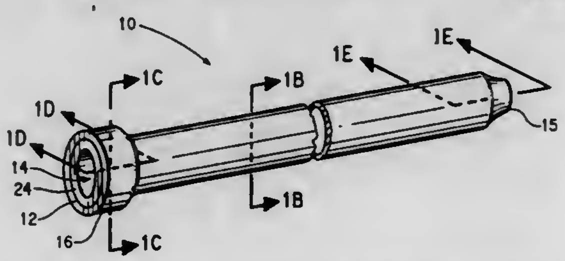
PROCESS FOR MAKING A CERAMIC HOT GAS FILTER

Elizabeth Sokolinski Connolly, Wilmington, Del.; George Daniel Forsythe, Landenberg, Pa., and Govindasamy Paramasivam Rajendran, Newark, Del., assignors to Dupont Lanxide Composite, L.P., Newark, Del.

Continuation of Ser. No. 489,263, Jun. 9, 1995, abandoned, which is a division of Ser. No. 221,139, Mar. 31, 1994, Pat. No. 5,460,637. This application Feb. 6, 1997, Ser. No. 796,377

Int. Cl.^{6} B32B *31/26;* **B01D** *39/20*

U.S. Cl. 156—89 **8 Claims**



1. A method of making a ceramic hot gas filter comprising:

(a) fabricating an elongated porous filter support having an outer surface, an opening at one end into a hollow interior, a closed end opposite said open end, an external flange integral with said open end by coating a ceramic oxide support yarn with a first oxide ceramic material, winding said coated ceramic oxide support yarn onto a mandrel to form a plurality of layers of said coated support yarn, each layer being arranged in a criss-crossing relationship with neighboring layers to form a plurality of quadrilateral-shaped openings wherein said winding is controlled to provide dimensions of said quadrilateral shaped openings between about 100 to 500 microns after the heat treatment and said support having an outer surface and openings at its ends into a hollow interior, said mandrel being contoured to provide an external flange as an integral part of said support adjacent one of said openings, said first oxide ceramic material providing, upon heat treatment, a porous refractory oxide support matrix;

(b) drying the support then removing the mandrel;

(c) forming a porous membrane layer having a porosity less than that of said support by coating a continuous filament oxide ceramic membrane yarn with a second oxide ceramic material, applying said coated membrane yarn in an ordered arrangement on the outer surface of said support using a method selected from the group consisting of hoop winding, multiple yarn winding, and fabric wrapping, and wherein said second oxide ceramic material providing, upon heat treatment, a porous refractory oxide membrane matrix;

(d) closing the end of said support opposite said flanged end with an oxide ceramic; and

(e) heat treating said support and said membrane layer.

5,688,348

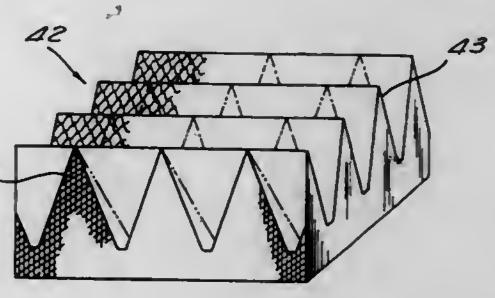
ANECHOIC CHAMBER ABSORBER AND METHOD

Rodolfo E. Diaz; Mark C. Squires, both of Phoenix, and Michael C. Miller, Chandler, all of Ariz., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Division of Ser. No. 368,785, Jan. 4, 1995, Pat. No. 5,594,218. This application Jan. 8, 1997, Ser. No. 779,542

Int. Cl.^{6} B29C *73/10;* **H01Q** *17/00*

U.S. Cl. 156—197 **12 Claims**



1. A method of making an anechoic chamber absorber comprising the following steps:

selecting sheets of material each having first and second edges defining a length and a height;

applying a lossy material to the sheets of material in a repeating wedge-shaped pattern, said wedge-shaped pattern including periodic wedge-shaped units extending along the length of the sheets of material, the wedge-shaped units having narrow tip portions facing the first edge and broadened base portions facing the second edge; and

creating a block of honeycomb material from the sheets of material with said lossy material applied in the wedge-shaped pattern thereby creating wedges of lossy material within the block of honeycomb material, said block of honeycomb material having an T-direction and a L-direction, corresponding to the height and length of the sheets of material, and a W-direction.

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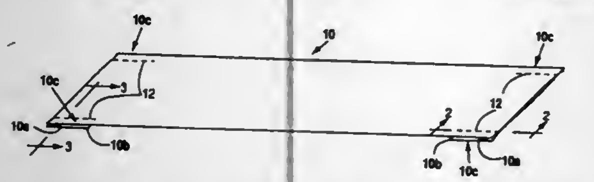
5,688,349
METHOD OF MANUFACTURING A MEDICAL SHEET

Timothy D. Herum, Red Oak, Tex., assignor to PHD Corporation, Richardson, Tex.

Division of Ser. No. 44,803, Apr. 12, 1993, Pat. No. 5,436,053, which is a division of Ser. No. 667,424, Mar. 11, 1991, Pat. No. 5,227,218. This application Jul. 17, 1995, Ser. No. 503,313

Int. Cl.⁶ B32B *31/04*

U.S. Cl. 156—200 **9 Claims**



1. The method of fabricating a protective plastic sheet for an elongated rectangular patient support surface having transverse end portions comprising the steps of:

(1) cutting a rectangular sheet from a roll of plastic, said rectangular sheet having a width slightly greater than the width of the support surface and a length substantially greater than the length of the support surface so that when laid on the patient support surface said sheet comprises a complete cover portion for said patient support surface and excess end portions defined by the longitudinal ends of the sheet;

(2) creating a first pair of folds by transversely folding a portion of both excess end portions of said sheet inward, adjacent the ends of said cover portion;

(3) creating a second pair of folds by transversely folding a portion of both excess end portion of said sheet outward, adjacent the first pair of folds;

(4) creating a third pair of folds by transversely folding a portion of both excess end portions of said sheet inward, adjacent the second pair of folds; and

(5) longitudinally linearly securing the lateral edges of each pair of folds to the adjacent cover portions of the sheet.

5,688,350
METHOD OF LAMINATE MANUFACTURE

Sheila Hamilton, Greenock; Roy Cannon, Kilmacolm; Stewart Robertson, Kilmacolm, and Jonathan Kennett, Howwood, all of United Kingdom, assignors to Teknek Electronics Limited, Renfrewshire, United Kingdom

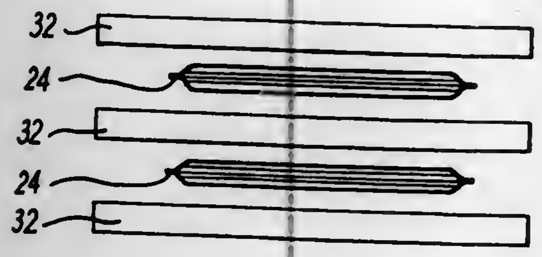
PCT No. PCT/GB94/01519, § 371 Date May 1, 1996, § 102(e) Date May 1, 1996, PCT Pub. No. WO95/02509, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 13, 1994, Ser. No. 583,115

Claims priority, application United Kingdom, Jul. 13, 1993, 9314440

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—213 **6 Claims**



1. A method of forming a metal-faced laminate, comprising forming a stack of plastics sheets between a pair of sheets of metal foil, applying heat and pressure to the edges of the stack to fuse the edges so as to form a sealed edge around the stack to form a sealed unit, cleaning the surfaces of the sheets of metal foil and subsequently heating the sealed unit while applying pressure to its major surfaces to fuse the stack into a laminate.

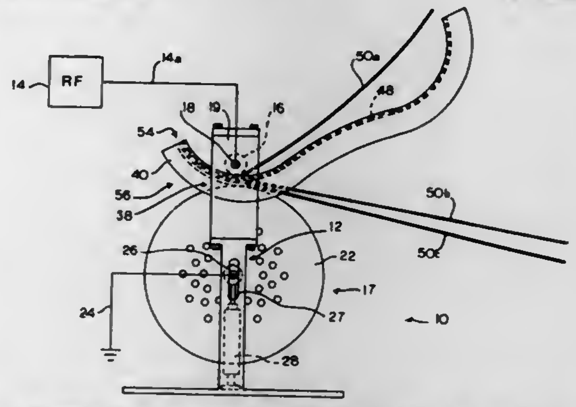
5,688,351
MACHINE AND METHOD FOR FORMING LAMINATIONS

John S. Thomas, 2410 Everett Ave., Raleigh, N.C. 27607

Filed Apr. 1, 1996, Ser. No. 626,718

Int. Cl.⁶ B27G *11/00*

U.S. Cl. 156—214 **30 Claims**



1. A method of forming laminations made of a plurality of individual laminates bonded together by an adhesive, including the steps of:

a) providing a template flange that includes a laminate retainer;

b) shaping a foundation laminate into a predetermined shape;

c) engaging the shaped foundation laminate with the laminate retainer of the template flange so that the laminate retainer holds the foundation laminate in the predetermined shape;

d) positioning at least one structural laminate in generally facing engagement with the foundation laminate held by the laminate retainer;

e) applying adhesive in between facing surfaces of the foundation laminate and the at least one structural laminate; and

f) pressing the laminates together while holding the foundation laminate in the predetermined shape, thereby forming a lamination that assumes the predetermined shape of the foundation laminate.

5,688,352
PROCESS FOR MAKING OF PLASTIC LAMINATES EACH HAVING A METAL LAMINA ON EACH OF TWO OPPOSITE SIDE SURFACES, ESPECIALLY FOR PRINTED CIRCUITS

Bruno Ceraso, Milan, Italy, assignor to Cedal S.R.L., Milan, Italy

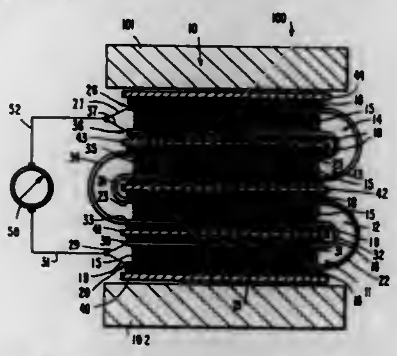
PCT No. PCT/IT93/00030, § 371 Date Jul. 24, 1995, § 102(e) Date Jul. 24, 1995, PCT Pub. No. WO94/17976, PCT Pub. Date Aug. 18, 1994

PCT Filed Mar. 31, 1993, Ser. No. 500,985

Claims priority, application Italy, Oct. 2, 1993, MI93A0224

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—228 **11 Claims**



1. A process for making plastic laminates, each of said plastic laminates comprising a prepreg body having an opposing side surface on each of two opposite sides of the prepreg body and a metal lamina on each of said opposing side surfaces, and each of said prepreg bodies having insulating properties and consisting of a plurality of prepreg layers and including a plastic material, said process comprising the steps of:

a) stacking a plurality of the prepreg bodies, one over the other, so that each pair of adjacent ones of said prepreg bodies has two of said opposing side surfaces of said pair facing each other;

b) passing a first metal band and a second metal band in a serpentine manner back and forth between said prepreg bodies with said first metal band and said second metal band spaced from each other to form a plurality of bends in both said first metal band and in said second metal band, said first and second metal band each having two opposite ends and extending continuously between said two opposite ends;

c) arranging each of said prepreg bodies between the first metal band and the second metal band so that said first metal band contacts on only one of the two opposing side surfaces of each of said prepreg bodies and said second metal band contacts on another of said two opposing side surfaces of each of said prepreg bodies on an opposite side from the one side surface contacted by the first metal band;

d) arranging a rigid flattening sheet provided with an electrically insulating layer covering each of two opposite sides thereof between said adjacent prepreg bodies of each of said pairs and, at the same time, between adjacent sections of said metal bands between said adjacent prepreg bodies to form a stack comprising said prepreg bodies and said rigid flattening sheets with said metal bands passing through said stack in said serpentine manner;

e) passing an electric current through each of the metal bands from one of the opposite ends of each of said metal bands to another of the opposite ends so as to heat the first and second metal bands and thus the prepreg bodies and the rigid flattening sheets with the electrically insulating layers; and

f) applying pressure to the stack of the prepreg bodies and the rigid flattening sheets with the electrically insulating layers.

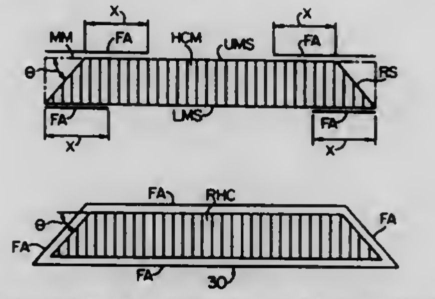
5,688,353
METHOD OF FABRICATING A LOW TOTAL DENSITY, STABILIZED RAMPED HONEYCOMB CORE FOR HIGH PRESSURE CO-CURE COMPOSITE MOLDING

Alex C. Dublinski, Northford; Thomas A. Carstensen, Shelton, and Philip J. Ramey, Milford, all of Conn., assignors to Sikorsky Aircraft Corporation, Stratford, Conn.

Division of Ser. No. 245,984, May 18, 1994, Pat. No. 5,527,414, which is a division of Ser. No. 995,437, Dec. 23, 1992, Pat. No. 5,354,195. This application Dec. 26, 1995, Ser. No. 581,865

Int. Cl.⁶ B26D *3/02;* **B32B** *3/02;3/12;31/04;31/18*

U.S. Cl. 156—256 **2 Claims**



1. A method for fabricating a low total density, stabilized ramped honeycomb core for high pressure co-cure molding of a lightweight honeycomb core composite article, comprising the steps of:

providing a honeycomb core material having upper and lower major surfaces;

applying a layer of low areal weight film adhesive in a picture frame format to the upper and lower surfaces of the honeycomb core material to provide a stabilized honeycomb core material;

machining at least one ramped surface in the stabilized honeycomb core material to provide a stabilized honeycomb core; and

applying a layer of low areal weight film adhesive to the upper and lower surfaces and each ramped surface of the ramped honeycomb core to form the low total density, stabilized ramped honeycomb core for the high pressure co-cure molding of a lightweight honeycomb core composite article.

5,688,354
METHOD FOR ADHERING MASKING FILM

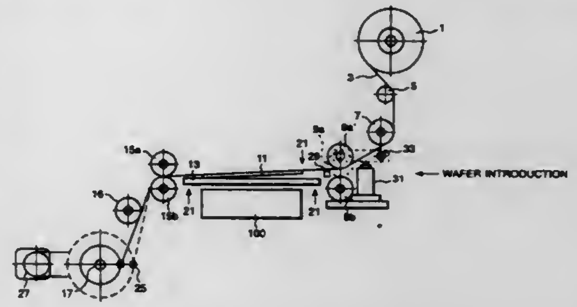
Kyoun-hee Ko, Incheon; Il-ho Kim, Bucheon; Chul-hee Kim, Incheon, and Woung-kwan An, Bucheon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 212,896, Mar. 15, 1994, Pat. No. 5,472,554. This application May 22, 1995, Ser. No. 445,857

Claims priority, application Rep. of Korea, Dec. 31, 1993, 93-32281

Int. Cl.⁶ B32B *31/18*

U.S. Cl. 156—267 **19 Claims**



1. A method for adhering a masking film onto a wafer, comprising the steps of:

sticking said wafer onto a masking film tape;

increasing a separation of said masking film tape from a lower structure by a predetermined distance so that said masking film tape is not adhered to said lower structure;

transporting said masking film tape to a cutting location, maintaining a regular distance between said lower structure and said masking film tape, a tension force being applied to said masking film tape in a crosswise direction of said masking film tape during said step of transporting said masking film tape; and

cutting said masking film tape along a shape of said wafer at said cutting location.

4. A method for adhering a masking film onto a wafer, comprising the steps of:

sticking said wafer onto a masking film tape;

increasing a separation of said masking film tape from a lower structure by a predetermined distance so that said masking film tape is not adhered to said lower structure, said step of increasing said separation of said masking film tape from said lower structure being performed by moving upwardly an upper adhesive roller immediately after said wafer passes through said upper adhesive roller and a lower adhesive roller;

transporting said masking film tape to a cutting location while maintaining a regular distance between said lower structure and said masking film tape; and

cutting said masking film tape along a shape of said wafer at said cutting location.

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5,688,355

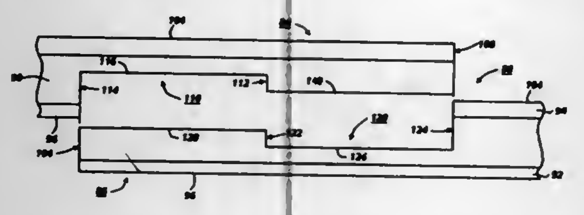
PROCESS FOR FABRICATING FLEXIBLE BELTS USING LASER ABLATION

Robert C. U. Yu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 316,962, Oct. 3, 1994, abandoned. This application Sep. 20, 1996, Ser. No. 717,620

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—272.8 **12 Claims**



1. A process for fabricating a flexible belt comprising, providing a flexible sheet having a substantially rectangular shape, said sheet having a first major exterior surface opposite and parallel to a second major exterior surface and a first edge surface of a first marginal end region of said sheet opposite to and parallel with a second edge surface of a second marginal end region; removing by ablation with a masked excimer laser beam a first segment of material from said first major exterior surface at said first marginal end region to form at least one recess comprising at least one fresh substantally flat surface intersecting at least one adjacent wall at a right angle, said flat surface being substantially parallel to and spaced from said second major exterior surface; removing by ablation with a masked excimer laser beam a second segment of material from said second major exterior surface at said second marginal end region to form at least one recess comprising at least one fresh substantially flat surface intersecting at least one adjacent wall at a right angle, said flat surface at said second marginal end being substantially parallel to and spaced from said first major exterior surface; overlapping said first marginal end region over said second marginal end region whereby said fresh substantally flat surface at said first marginal end region mates with said fresh substantally flat surface at said second marginal end region; and fusing the overlapped end regions together to form a fused seam.

5,688,356

WATER-BASED URETHANE ADHESIVE

Efraim Sagiv, New Haven, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Nov. 6, 1996, Ser. No. 744,288

Int. Cl.⁶ C09J *175/12*

U.S. Cl. 156—331.7 **21 Claims**

1. A water-based adhesive composition, comprising an admixture of:

a first aliphatic water-based urethane resin that is the reaction product of polycaprolactonediol or polycaprolactonetriol, 4,4-methylene bis(cyclohexyl isocyanate), and dimethylolpropionic acid extended with a diamine, said first aliphatic water-based urethane resin comprising from about 99 to about 20 percent by weight of said composition; and

a second aliphatic water-based urethane resin that is the reaction product of 2,6-hexanediol, 4,4-methylene bis(cyclohexyl isocyanate), and dimethylolpropionic acid extended with a diamine, said second aliphatic water-based urethane resin comprising from about 1 to about 80 percent by weight of said composition.

5,688,357

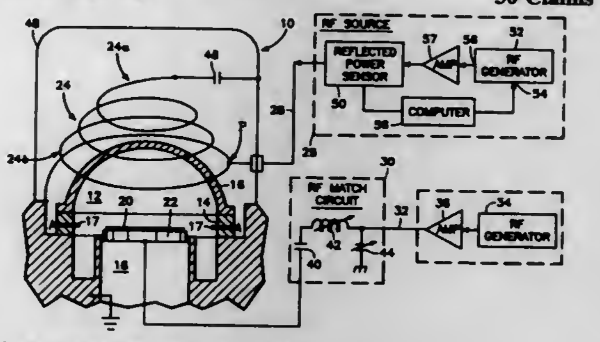
AUTOMATIC FREQUENCY TUNING OF AN RF POWER SOURCE OF AN INDUCTIVELY COUPLED PLASMA REACTOR

Hiroji Hanawa, Sunnyvale, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Feb. 15, 1995, Ser. No. 389,888

Int. Cl.⁶ C23F *1/02*

U.S. Cl. 156—345 **30 Claims**



1. A plasma reactor, comprising:

a reactor chamber for containing a substrate to be processed and a gas inlet to permit introduction of an ionizable gas into said chamber;

a variable frequency RF power source;

an RF antenna near said chamber, said antenna connected to said RF power source for coupling RF power to said ionizable gas to produce a plasma therefrom;

a power sensor connected to said antenna for sensing at least one of: (a) transmitted power to said plasma and (b) reflected power to said source; and

a control circuit connected to a control input of the variable frequency RF power source and responsive to said power sensor for regulating the frequency of said variable frequency RF power source so as to effect at least one of: (a) an increase in said transmitted power and (b) a decrease in said reflected power.

5,688,358

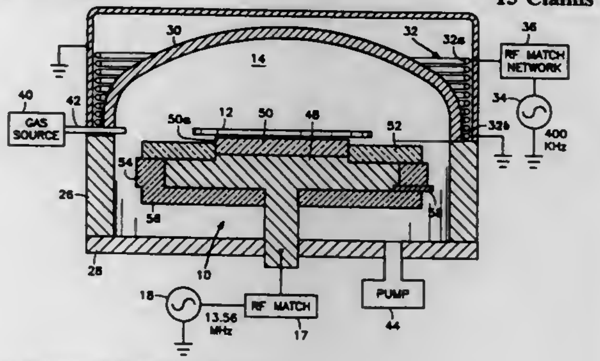
R.F. PLASMA REACTOR WITH LARGER-THAN-WAFER PEDESTAL CONDUCTOR

Yoichiro Tanaka; Megumi Taoka, both of Narita, Japan, and Barney Cohen, Santa Clara, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Mar. 8, 1995, Ser. No. 400,329

Int. Cl.⁶ H01L *21/00*

U.S. Cl. 156—345 **15 Claims**



1. A plasma reactor comprising:

a reactor chamber;

a gas source for supplying a process gas into the interior of said chamber;

a power applicator for coupling power into the interior of said chamber so as to create a plasma of said process gas;

a pedestal inside said chamber with a semiconductor substrate located thereon, said pedestal electrically connected to provide a return path for said power, said pedestal comprising:

a conductive disk platen for supporting said semiconductor substrate having a substrate diameter to be processed as a workpiece in said reactor, said platen having a diameter exceeding the diameter of said substrate so that an outer annular portion of said conductive disk platen provides a direct path for said power from said plasma while a remaining inner portion of said conductive disk provides a path for said power through said semiconductor substrate;

an etch-resistant cover shielding said conductive platen from said plasma, a portion of said etch-resistant cover underlying said substrate, said etch-resistant cover comprising:

an etch-resistant raised disk overlying a central portion of said conductive disk platen and underlying said substrate and having a diameter less than the diameter of said beyond the circumference of said raised disk,

an etch-resistant recessed ring annulus overlying an outer portion of said conductive disk platen and having a top surface which is depressed below a top surface of said raised disk, an inner portion of said recessed ring annulus underlying said peripheral portion of said substrate, leaving a top portion of a side wall of said raised disk exposed to said plasma.

5,688,359

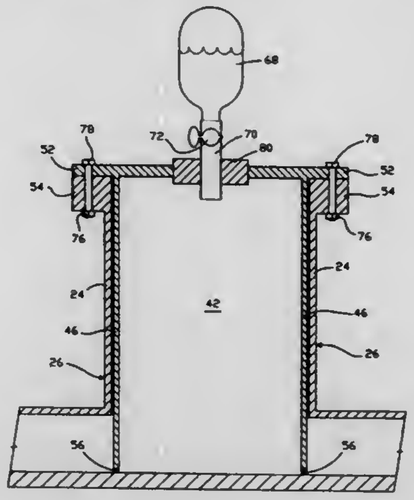
MUFFLE ETCH INJECTOR ASSEMBLY

Maynard Martin, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jul. 20, 1995, Ser. No. 504,839

Int. Cl.⁶ C23C *16/00*

U.S. Cl. 156—345 **14 Claims**



1. A modular muffle etch injector assembly for use in a gas blanketed down-flow chemical vapor deposition apparatus of the type having a muffle and a modular gas injector assembly for introducing chemical vapors into a deposition chamber, the muffle being adapted for receiving and supporting the gas injector assembly, wherein deposition material residue collects on a lower surface of the muffle, the etch injector assembly comprising:

a. an etch chamber having vertical sidewalls, a closed top end and an open bottom end;

b. a supply means for introducing a liquid etchant into the etch chamber; and

c. a sealing means disposed along the bottom end of the etch chamber for providing a seal between the etch chamber and the lower surface of the muffle to confine the etchant to the etch chamber.

5,688,360

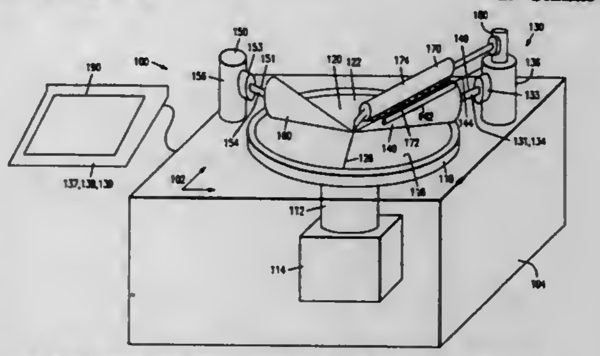
METHOD AND APPARATUS FOR POLISHING A SEMICONDUCTOR SUBSTRATE WAFER

Rahul Jairath, Austin, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 443,133, May 17, 1995. This application Mar. 5, 1996, Ser. No. 611,360

Int. Cl.⁶ B24B *7/00*

U.S. Cl. 156—345 **19 Claims**



1. A semiconductor wafer polishing apparatus comprising:

a housing;

a turntable mounted in the housing, having an axis of rotation and having a surface for affixing a semiconductor wafer;

a motor mounted to the housing and coupled to the turntable to supply a torque for rotating the turntable about the axis of rotation;

a polishing assembly coupled to the housing and extending adjacent to the turntable surface; and

a polishing pad affixed to the polishing assembly and being positionable to contact the semiconductor wafer.

5,688,361

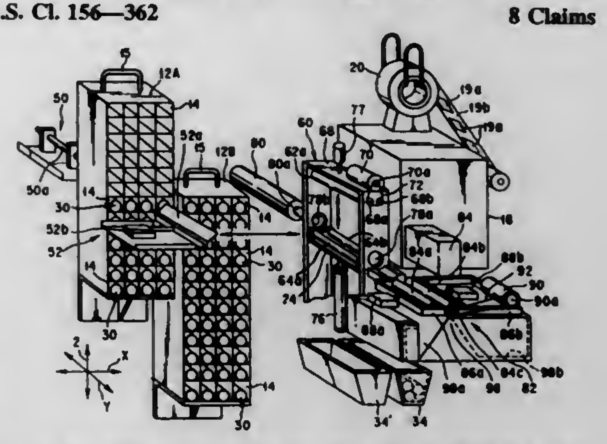
AUTOMATIC VESSEL SUPPLYING AND LABELING APPARATUS

Teruaki Itoh, 5-25, Kokaihonmachi, Kumamoto-shi, Kumamoto-ken 860, Japan

Continuation-in-part of Ser. No. 118,298, Sep. 9, 1993, abandoned. This application May 28, 1996, Ser. No. 652,670

Int. Cl.⁶ B32B *31/00;* **B65C** *9/40*

U.S. Cl. 156—362 **8 Claims**



1. An automatic vessel supplying and labeling apparatus comprising:

vessel classification storage means for storing various vessels in accordance with a predetermined classification;

vessel take-out/supply means for taking out a desired vessel from the vessel classification storage means and for supplying the desired vessel to a vessel supply position;

label supplying means for preparing various labels on which information is displayed, and for supplying a desired label corresponding to the desired vessel in the various labels, to a label supply position separated from the vessel supply position;

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label supply detection means for detecting the desired label at the label supply position;

label applying means for receiving the desired vessel from the vessel take-out/supply means at the vessel supply position, and for moving the received desired vessel between the vessel supply position and the label supply position through a waiting position which is positioned between the vessel supply position and the label supply position;

the label applying means moving the desired vessel from the vessel supply position to the waiting position when the label applying means receives the desired vessel from the vessel take-out/supply means and before the label supplying means supplies the desired label to the label supply position;

moving the desired vessel from the waiting position to the label supply position to apply the desired label on the desired vessel after the label supply detection means detects the desired label; and

moving the desired vessel applied with the desired label from the label supply position to the vessel supply position and discharging the desired vessel applied with the desired label from the vessel supply position;

label application judging means for checking the information on the desired label applied on the desired vessel and judging whether the desired label is correctly applied on the desired vessel or not;

vessel sorting means for sorting the desired vessel on which the desired label has been applied by the label applying means into one of two places, the desired vessel on which the desired label has been applied correctly by the label applying means being sorted into one place, and the desired vessel on which the desired label has not been applied correctly by the label applying means being sorted into the other place; and

correctly labeled vessel collecting means for collecting the desired vessel on which the desired label has been correctly applied by the label applying means and which is sorted by the vessel sorting means into the one place, wherein the label applying means includes at least three rollers arranged in parallel to each other and a rotational driving source for selectively rotating at least one of the rollers, two rollers in the at least three rollers being movable independent of the remaining roller between the vessel supply position and the label supply position through the waiting position, with the desired vessel being supported thereon, and the remaining roller being arranged at the label supply position to sandwich the desired vessel supported on the two rollers with the two rollers when the two rollers are arranged at the label supply position;

the rotational driving source rotates the at least one of the rollers when the two rollers are arranged at the label supply position and the desired vessel supported on the two rollers are sandwiched by the two rollers and the remaining roller so that the sandwiched desired vessel is rotated and the desired label supplied to the label supply position is applied on the rotated, sandwiched desired vessel;

one of the at least three rollers has two members separated coaxially from each other along a rotational axis of the one of the at least three rollers, and

the label supply detection means is arranged at a position between the two members of the one of the at least three rollers.

5,688,362

Patent Not Issued For This Number

5,688,363

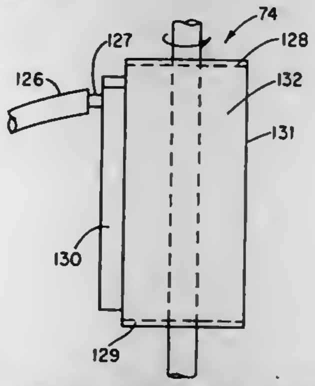
LABELLING MACHINE

Gaylen R. Hinton, Merced, and Stanley B. Black, Modesto, both of Calif., assignors to CMS Gilbreth Packaging Systems, Inc., Trevose, Pa.

Continuation of Ser. No. 308,243, Sep. 19, 1994, abandoned. This application Apr. 18, 1996, Ser. No. 634,506

Int. Cl.⁶ B65C *9/00*

U.S. Cl. 156—578 **2 Claims**



1. A labelling machine for applying glue to labels for attachment to containers comprising, a glue bar having a recess formed therein for the glue, a heater cartridge for warming the glue, said heater cartridge being within the body of said glue bar, a thermocouple secured to said glue bar for controlling said heater cartridge, a glue roller in engagement with said glue bar, said glue roller having a diameter of not more than nine inches and a pair of spaced thermal isolating rings each received within respective ends of said glue roller.

5,688,364

CHEMICAL-MECHANICAL POLISHING METHOD AND APPARATUS USING ULTRASOUND APPLIED TO THE CARRIER AND PLATEN

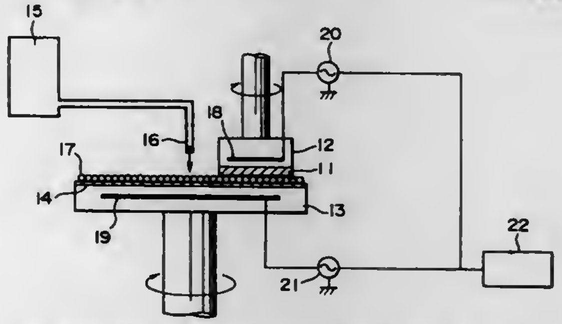
Junichi Sato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 575,139

Claims priority, application Japan, Dec. 22, 1994, 6-320713

Int. Cl.⁶ H01L *21/306*

U.S. Cl. 156—636.1 **11 Claims**



1. An apparatus for simultaneously chemically, mechanically and ultrasonically polishing a surface of a semiconductor wafer, the apparatus comprising:

a rotatable carrier with a downwardly facing surface, the semiconductor wafer to be polished being bonded to the downwardly facing surface of the carrier, the carrier further comprising a first ultrasonic transmitter for transmitting ultrasonic wave energy through the carrier to the wafer, the first transmitter being connected to a first oscillator for driving the first transmitter,

a rotatable platen with an upwardly facing surface, a polishing pad being bonded to the upwardly facing surface of the platen, the platen further comprising a second ultrasonic transmitter for transmitting ultrasonic wave energy through the platen, through the pad and to the wafer, the second transmitter being connected to a second oscillator for driving the second transmitter,

a port for supplying polishing slurry to the pad,

at least one of the platen or the carrier being vertically positionable so that the pad and slurry disposed on the pad engages the wafer with a pressure,

a controller for simultaneously activating the first and second oscillators for a simultaneous transmission of ultrasonic wave energy through the carrier and through the platen.

5,688,365

METHOD OF MAKING SEMICONDUCTOR DEVICE

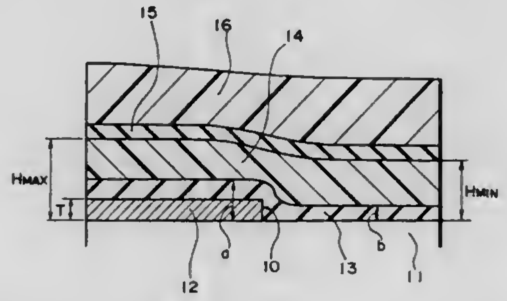
Ken Ogoshi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Feb. 21, 1996, Ser. No. 604,700

Claims priority, application Japan, Feb. 21, 1995, 7-032709; Dec. 29, 1995, 7-353473

Int. Cl.⁶ H01L *21/00*

U.S. Cl. 156—661.11 **22 Claims**



1. A method for making a semiconductor device, a substrate of the semiconductor device having a first layer and a second layer, the first layer being disposed over a portion of a surface of the substrate forming a first step between a surface level of the substrate and a surface level of the first layer, the second layer being disposed over the first layer and the surface of the substrate covering the first step, the method comprising:

forming a first resist layer on the second layer, the first resist layer forming a second step over the first step, a height of the second step being less than a height of the first step by at least about 70%, the first resist layer having a thickness less than about 1.5 μm and being sensitive to a first exposure light;

forming a first anti-reflection coat on the first resist layer, the first anti-reflection coat having a thickness less than about 0.2 μm and having a first reflectance value relative to the second exposure light and the first and second layers having a second reflectance value and a third reflectance value, respectively, relative to the second exposure light, the first reflectance value being less than at least one of the second and third reflectance values;

forming a second resist layer on the first anti-reflection coat, the second resist layer being sensitive to the second exposure light;

forming a first pattern on the second resist layer by exposing the second resist layer to the second exposure light and developing the second resist layer;

forming a second pattern on the first anti-reflection coat, the second pattern being substantially the same as the first pattern on the second resist layer;

forming a third pattern on the first resist layer by exposing the first resist layer to the first exposure light and developing the first resist layer, the third pattern being formed using the second resist layer and the first anti-reflection coat as a first mask and a second mask, the third pattern being substantially the same pattern as the first pattern on the second resist layer; and

etching the second layer using at least the first resist layer as a third mask.

5,688,366

ETCHING METHOD, METHOD OF PRODUCING A SEMICONDUCTOR DEVICE, AND ETCHANT THEREFOR

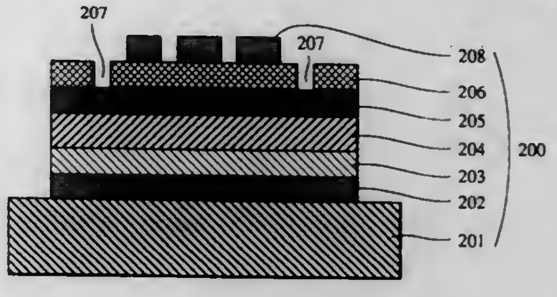
Hirofumi Ichinose; Satoshi Shinkura, both of Tsuzuki-gun; Akio Hasebe, Souraku-gun, and Tsutomu Murakami, Nara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1995, Ser. No. 429,039

Claims priority, application Japan, Apr. 28, 1994, 6-092756

Int. Cl.⁶ C23F *1/10;* **H01L** *21/306*

U.S. Cl. 156—662.1 **22 Claims**



1. An etching method comprising the steps of:

a) disposing an etching paste on a transparent conductive film material in a pattern, said etching paste comprising at least one kind of fine particles and an etching solution, wherein said fine particles comprise resin particles selected from the group consisting of acryl resin, silicone resin, benzoguanamine resin, fluorocarbon resin, urethane resin, and polystyrene resin and b) performing heat treatment on said paste disposed on said material.

5,688,367

METHOD OF MONITORING AND RECOVERING OXYGEN-RICH GAS FROM OZONE BLEACHING

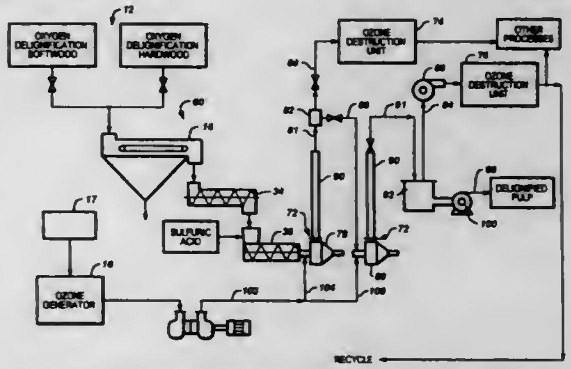
Derek Hornsey, Beaconsfield; Gordon H. Homer, West Vancouver, and John R. Ayton, Delta, all of Canada, assignors to Canadian Liquid Air/Air Liquide Canada LTEE, Canada

Continuation of Ser. No. 121,381, Sep. 13, 1993, abandoned. This application Dec. 11, 1995, Ser. No. 570,369

Claims priority, application Canada, Sep. 15, 1992, 2078276

Int. Cl.⁶ D21C *9/147;9/153;11/06*

U.S. Cl. 162—38 **15 Claims**



1. A method of bleaching lignocellulosic pulp, comprising:

a) generating ozone from oxygen in an oxygen-containing feed gas;

b) contacting at least a portion of lignocellulosic pulp with a mixture comprising oxygen and ozone in a first contactor to produce a treated pulp and a first effluent gas, said first effluent gas being suitable for conducting a secondary process wherein a presence of elevated amounts of gases other than ozone and oxygen is tolerated;

c) transferring at least a portion of said treated pulp to a second contactor, and further treating said pulp portion with a mix-

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ture comprising oxygen and ozone, to produce a further treated pulp and a second effluent gas;
d) recovering a bleach pulp;
e) recovering said second effluent gas, said second effluent gas being oxygen-rich and being suitable for recycling for ozone generation; and
f) monitoring both the first and second effluent gases and adjusting the properties of the mixtures comprising oxygen and ozone based upon the monitoring of the first and second effluent gases.

5,688,368

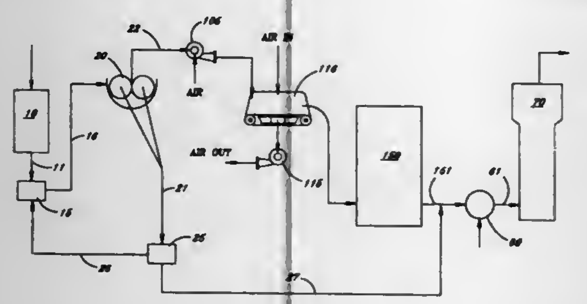
METHOD FOR COOLING AND OZONE BLEACHING WOOD PULP

Oscar Luthi, Nashua, N.H., assignor to Beloit Technologies, Inc., Wilmington, Del.

Continuation of Ser. No. 164,868, Dec. 10, 1993, abandoned. This application Sep. 28, 1995, Ser. No. 535,363

Int. Cl.^{6} D21C *9/153*

U.S. Cl. 162—56 **1 Claim**



1. A method for processing wood pulp, the wood pulp having an elevated temperature, said method comprising the following steps:
introducing the elevated temperature wood pulp into a mixing tank;
introducing a first dilution liquor into the mixing tank, the first dilution liquor having an elevated temperature approximately the same as the wood pulp elevated temperature;
mixing the elevated temperature wood pulp and the elevated temperature first dilution liquor in the mixing tank;
extracting sufficient elevated temperature liquor from the elevated temperature wood pulp to increase consistency of said pulp to more than 25%;
dividing the extracted elevated temperature liquor into two portions, one portion being the first dilution liquor and the other portion being a second dilution liquor, both portions having an elevated temperature approximately the same as the wood pulp elevated temperature;
fluffing the elevated temperature wood pulp and depositing the elevated temperature wood pulp on a moving bed cooler having a provision for blowing air through the wood pulp;
blowing cooling air through the wood pulp to reduce the temperature of the wood pulp;
ozone bleaching the reduced temperature wood pulp; and
diluting the bleached reduced temperature pulp with the elevated temperature second dilution liquor to raise the temperature of the bleached pulp.

5,688,369

METHOD AND DEVICE FOR FEEDING OUT FIBRE PULP

Lars Landmark, Kil, and Mikael Nilsson, Karlstad, both of Sweden, assignors to Kvaerner Pulping Aktiebolag, Karlstad, Sweden

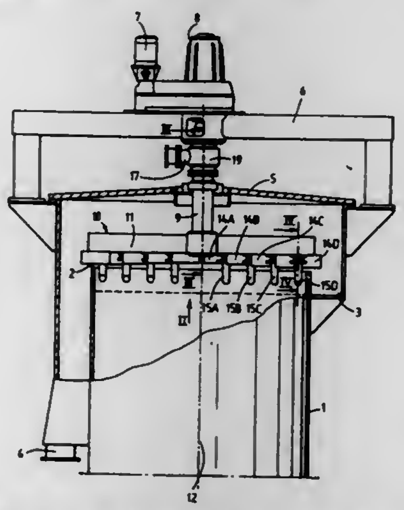
PCT No. PCT/SE94/01022, § 371 Date May 23, 1996, § 102(e) Date May 23, 1996, PCT Pub. No. WO95/14810, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 1, 1994, Ser. No. 649,610

Claims priority, application Sweden, Nov. 29, 1993, 9303946

Int. Cl.^{6} D21C *9/10;7/08*

U.S. Cl. 162—57 **17 Claims**



1. A method for dispersing fiber pulp over an overflow rim disposed at an upper end of a cylindrical container having a longitudinal axis and a bottom, the container containing a suspension, comprising the steps of:
providing a scraper element in rotatable engagement with the container;
providing a plurality of rotatable diluting nozzles attached to the scraper element, the diluting nozzles being rotatable about the longitudinal axis of the container;
continuously feeding fiber pulp from the bottom of the container and upwardly through the container;
suspending the fiber pulp in the suspension contained in the cylindrical container to form a fiber pulp suspension, the fiber pulp suspension having an upper surface;
diluting the fiber pulp suspension at a level that is below the upper surface of the fiber pulp suspension by discharging a liquid through the diluting nozzles, the diluting nozzles extending downwardly through the upper surface;
mixing the fiber pulp suspension and the liquid to form a substantially homogenous diluted suspension by rotating the scraper element, the scraper element extending downwardly into the diluted suspension; and
while forming the homogenous diluted suspension, permitting the homogenous diluted suspension to flow outwardly and over the overflow rim.

5,688,370

SHEET MATERIALS FOR SOLID PHASE EXTRACTIONS AND SOLID PHASE REACTIONS

Donald F. Hagen; Simon S. Fung, both of Woodbury, and Paul E. Hansen, Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 172,042, Dec. 22, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 428,571

Int. Cl.^{6} D21H *13/26*

U.S. Cl. 162—146 **26 Claims**

1. A solid phase extraction or reaction sheet article consisting essentially of in the range of 20 to less than 100 weight percent (based on the total weight of the sheet material) of at least one sorptive synthetic polymer pulp selected from the group consisting of 1) aramid pulp or derivatives thereof, 2) a blend of aramid pulp or a derivative thereof with polyolefin pulp or polyacrylonitrile pulp or fibrillated polytetrafluoroethylene, and 3) a blend of polyacrylonitrile pulp with polyolefin pulp, said sheet being prepared by a wet-laid process, said polymer pulp having enmeshed therein more than zero to 80 weight percent of at least one of sorptive and reactive particles having an average size in the range of 0.1 to 100 micrometers and in an amount sufficient to increase the sorptive or reactive capability of the sheet relative to the pulp without sorptive or reactive particles, said article being a unitary sheet having the property of isolating molecular species from fluids.

5,688,371

PROCESS FOR FIXING DISRUPTIVE SUBSTANCES IN PAPERMAKING

Joachim König; Jürgen Kopp; Udo-Winfried Hendricks, all of Odenthal; Jürgen Reiners, Leverkusen, and Peter Nowak, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

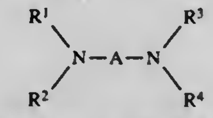
Continuation-in-part of Ser. No. 401,950, Mar. 10, 1995, abandoned. This application Jun. 18, 1996, Ser. No. 664,768

Claims priority, application Germany, Mar. 21, 1994, 44 09 580.5

Int. Cl.^{6} D21H *21/02;17/54*

U.S. Cl. 162—166 **9 Claims**

1. A process for fixing anionic interfering substances in papermaking by the addition of an anionic trash catcher to a papermaking stock, wherein the anionic trash catcher comprises a cationic polycondensation product obtained by reacting:
a) a polyfunctional amine of the formula


(I)

in which, independently of one another,
A denotes a substituted or unsubstituted alkylene chain which may be interrupted by hetero atoms and
R^1–R^4 denote hydrogen, unsubstituted alkyl or alkyl which is substituted by a substituent selected from the group consisting of OH—, CN— and O-C_1–C_4-alkyl, with
b) cyanamide, dicyandiamide, guanidine or biguanidine, in an a)/b) molar ratio of 2:1 to 1:2
in which polycondensation product at least two amino groups of a) have reacted with a compound b) to form the polycondensation product.

5,688,372

METHOD AND DEVICE IN THE REGULATION OF A HEADBOX

Jyrki Huovila; Ari Linsuri, both of Muurame; Petri Nyberg, and Michael Odell, both of Jyvaskyla, all of Finland, assignors to Valmet Corporation, Helsinki, Finland

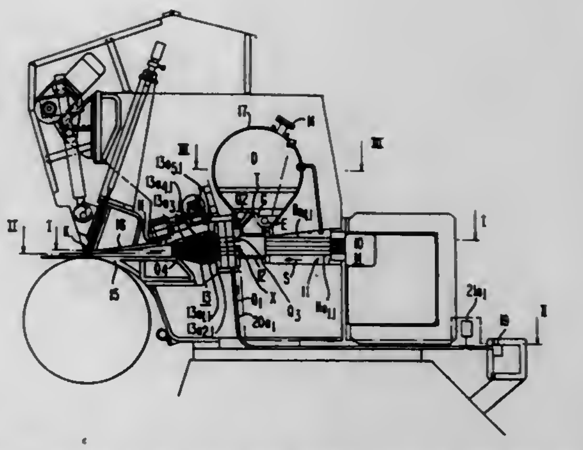
Continuation of Ser. No. 269,566, Jul. 1, 1994, Pat. No. 5,545,293. This application May 1, 1996, Ser. No. 640,511

Claims priority, application Finland, Jul. 1, 1993, 933027; Jun. 13, 1994, 942780

Int. Cl.^{6} D21F *1/08*

U.S. Cl. 162—212 **23 Claims**

1. A method for regulating a total pulp flow from a headbox, said headbox comprising a pulp inlet header, a discharge duct and conduit means for passing the total headbox pulp flow from said inlet header to said discharge duct, said conduit means including a plurality of conduits, said total headbox pulp flow comprising at least one component flow, the method comprising the steps of:
forming said at least one component flow from component subflows arranged at different locations in a direction transverse to a direction of flow of at least one component flow,



forming each of said component subflows from at least first and second subcomponent flows,
directing each of said second subcomponent flows from said inlet header into a respective one of said conduits,
introducing each of said first subcomponent flows into one of said second subcomponent flows at a point within one of said conduits at a certain mixing ratio, said introducing step comprising the steps of arranging a mixing chamber in each of said conduits, passing one of said second subcomponent flows through a separate pipe arranged in each of said mixing chambers, passing a respective one of said first subcomponent flows annularly from around said pipe into an end of the respective one of said mixing chambers, and
regulating the concentration of each of said subflows by adjusting the flow rates of said first subcomponent flow and said second subcomponent flow, which constitute said subflow, relative to one another.

5,688,373

Patent Not Issued For This Number

5,688,374

HEADBOX AND MANIFOLD SYSTEM FOR PRODUCING A MULTI-PLY PAPER WEB

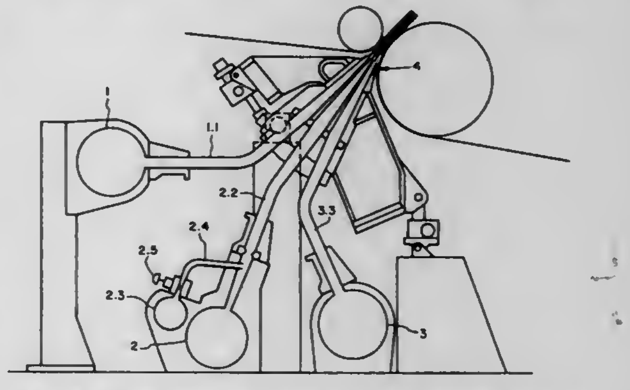
Ulrich Begemann, and Hans-Peter Sollinger, both of Heidenheim, Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Germany

Filed Oct. 6, 1995, Ser. No. 540,207

Claims priority, application Germany, Oct. 7, 1994, 44 35 860.1

Int. Cl.^{6} D21F *1/02;1/06*

U.S. Cl. 162—343 **8 Claims**



1. A headbox and manifold system in a paper machine having a rapport structure and a plurality of mixing systems for generating

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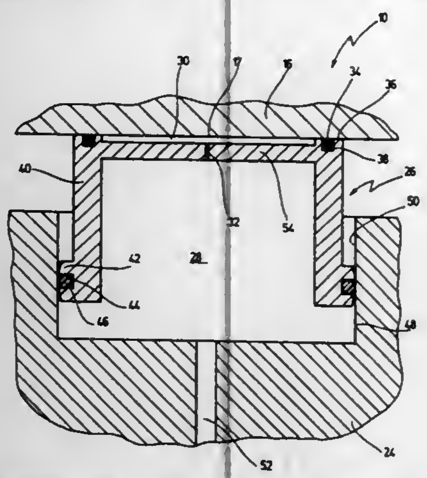
stock suspension flows of differing concentrations for producing a multi-ply paper comprising:

a manifold for each ply of the multi-ply paper, each of said manifolds having distribution conduit arranged transverse to the paper machine direction for conveying one of said stock suspension flows, said manifolds affixed to the paper machine support structure;
each of said manifolds having a plurality of equal length flexible lines providing fluid communication between each respective distribution conduit and a pivotable head box wherein said flexible lines permit relative movement between said headbox and said respectively manifolds without the use of compensators;
said headbox supported by the paper machine support structure;
a slice nozzle extending across an entire width of the multi-ply paper; said slice nozzle attached to and in fluid communication with said headbox, said plurality of stock suspension flows discharged by said slice nozzle;
a turbulence generator for each of said plies located between said manifolds and said slice nozzle; and
at least one second conduit for introducing a fluid into one of said stock suspension flows before said respective turbulence generator whereby said concentration of said stock suspension flow can be adjusted.

5,688,375
SHOE PRESS ROLL FOR A PAPER MACHINE

Christian Schiel, Heidenheim, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Germany
Filed Apr. 5, 1996, Ser. No. 628,278
Claims priority, application Germany, Apr. 29, 1995, 195 15 832.6
Int. Cl.⁶ D21F *3/02;* **B30B** *3/00*
U.S. Cl. 162—358.3 **20 Claims**



1. A shoe press roll for a paper machine, wherein the shoe press roll cooperates with a backing roll to form a press nip through which pass a press jacket on which a web to be dewatered is supported as they travel together through the press nip when the backing roll rotates through the press nip and the press jacket moves through the press nip, the shoe press roll comprising:

a stationary support with a cylinder defined therein opening radially outward toward the press nip and the backing roll;
a press shoe located toward the radial outside of the cylinder, the shoe having an outward surface toward the backing roll which defines the press nip with the backing roll and having an inward surface facing toward the cylinder;
a piston located in the cylinder, the piston having first and second sides below and above the piston, respectively, and the piston being sealingly movable along the cylinder toward and away from the backing roll;
a first pressure chamber in the cylinder below the first side of the piston away from the press shoe, and means for communicating hydraulic pressure to the first pressure chamber;
the piston being shaped for defining a second pressure chamber above the second side of the piston toward the press shoe, the piston second side and the press shoe inward surface being normally cooperatingly shaped for sealing the second pressure chamber; and
a passage from the first pressure chamber to the second pressure chamber, the passage having a cross section sized for defining a throttle point for permitting throttled passage of hydraulic pressure from the first pressure chamber to the second pressure chamber, the passage having a cross section for preventing a rapid reduction of pressure in the first pressure chamber, occurring by a sudden reduction of pressure in the second pressure chamber, thereby permitting continued urging of the piston toward its sealing position against the press shoe for sealing the second pressure chamber.

5,688,376
METHOD FOR THE GAS SEALING MANUFACTURE OF A DOOR FRAME OF A COKE OVEN BATTERY AND SUCH A DOOR FRAME STRUCTURE

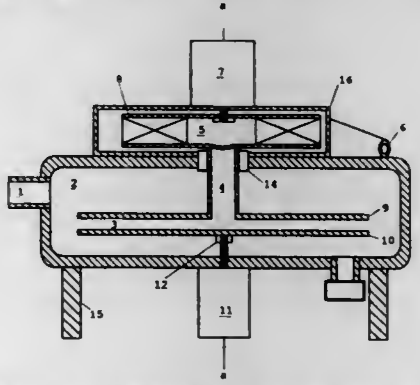
Jacobus Hermanus Maria Van Egmond, Alkmaar, and Hans Willem Smits, Bennebroek, both of Netherlands, assignors to Hoogovens Staal BV, Ijmuiden, Netherlands
Filed Jan. 16, 1996, Ser. No. 585,101
Claims priority, application Netherlands, Jan. 17, 1995, 9500081
Int. Cl.⁶ C10B *47/00;57/00*
U.S. Cl. 201—1 **2 Claims**

1. A method for producing a door frame for repair of a coke oven battery which door frame has a mating surface which is in a gas-tight mating relationship with a first surface of an armor plate, said armor plate having a second surface in contact with a refractory structure which forms a part of the coke oven battery, comprising the steps of:

measuring a profile of the first surface of the armor plate;
shaping the mating surface of the door frame to match the measured profile of the first surface of the armor plate; and
mounting the door frame with the shaped mating surface of the door frame in contact with the first surface of the armor plate to provide a gas-tight seal between the shaped first surface of the door frame and the armor plate.

5,688,377
ROTARY RADIAL CYCLONIC FLUID MIXTURE SEPARATOR

Wilmot H. McCutchen, P.O. Box 701129, Houston, Tex. 77270
Continuation-in-part of Ser. No. 207,800, Mar. 7, 1994, Pat. No. 5,534,118, which is a continuation of Ser. No. 929,286, Aug. 13, 1992, abandoned. This application Nov. 25, 1994, Ser. No. 344,885
Int. Cl.⁶ B01D *3/10*
U.S. Cl. 202—205 **13 Claims**

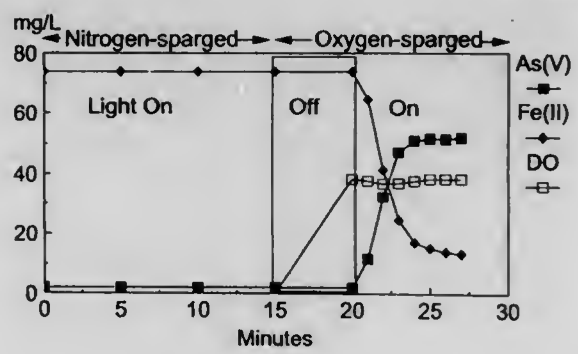


1. Apparatus for separation of a gaseous fluid mixture, the apparatus comprising the combination of:

(a) means for containing the gaseous fluid mixture, said containing means comprising an inlet for gaseous fluid mixture,
(b) spaced-apart surfaces defining between them an afferent mesial passage said surfaces being rotatable with respect to each other,
(c) means for rotating said rotatable surfaces in opposite directions about a common axis of rotation,
(d) a shaft defining within it a bore, the bore fluidly communicating with the afferent mesial passage, and
(e) means for effecting effluent flow from the afferent mesial passage to the bore and then out of the bore through a discharge port,
the combined action of the rotating surfaces and said effluent flow effecting means creating at least one radial cyclonic vortex in the gaseous fluid mixture within the afferent mesial passage, the radial cyclonic vortex having its vortex axis within the afferent mesial passage and radial to the axis of rotation;
whereby gaseous fluid mixture is centrifugated in the radial cyclonic vortex and entrained particles, mist, and vapor are thereby caused to contact the rotating surfaces, the contact accelerating particles, mist, and vapor, thereby ejecting them radially outward with respect to the axis of rotation, while effluent is transported by said effluent flow effecting means along the radial cyclonic vortex axis and through the bore of the shaft.

5,688,378
PHOTOASSISTED OXIDATION OF SPECIES IN SOLUTION

Ging Hauw Khoe, Cronulla; Maree Therese Emett, Pennant Hills, and Robert G. Robins, Lindfield, all of Australia, assignors to CRC for Waste Management & Pollution Control, Australia
PCT No. PCT/AU94/00649, § 371 Date Apr. 22, 1996, § 102(e) Date Apr. 22, 1996, PCT Pub. No. WO95/11195, PCT Pub. Date Apr. 27, 1995
PCT Filed Oct. 24, 1994, Ser. No. 633,810
Claims priority, application Australia, Oct. 22, 1993, PM1969
Int. Cl.⁶ B01D *11/00;* **C02F** *1/68;* **A62D** *3/00*
U.S. Cl. 204—157.4 **21 Claims**

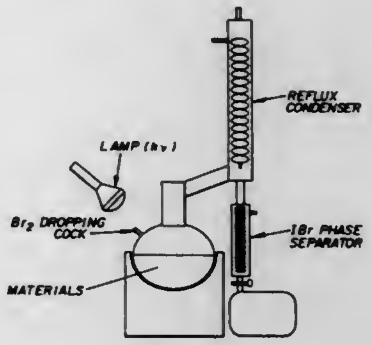


1. A method for the oxidation of As(III) in solution comprising the steps of:

(a) supplying to the solution oxygen, and a photoabsorber which is capable of increasing the rate of As(III) oxidation when exposed to UV radiation; and
(b) irradiating the resultant solution from (a) with UV radiation.

5,688,379
PROCESS FOR PREPARING PERFLUOROALKYL BROMIDES

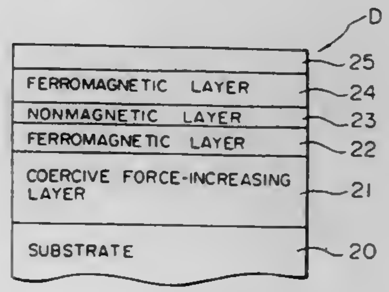
Yasuhisa Furutaka; Tatsuo Nakada; Kazuhiro Shimokawa; Yorisato Hisanaga, and Souichi Ueda, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan
PCT No. PCT/JP93/01738, § 371 Date Oct. 24, 1995, § 102(e) Date Oct. 24, 1995, PCT Pub. No. WO94/12453, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 30, 1993, Ser. No. 424,518
Claims priority, application Japan, Nov. 30, 1992, 4-345303
Int. Cl.⁶ C07C *17/00;17/20*
U.S. Cl. 204—157.95 **5 Claims**



1. A process for preparing a perfluoroalkyl bromide comprising reacting a perfluoroalkyl iodide represented by the formula $C_nF_{2n+1}I$ wherein n is an integer of 6 to 10 with bromine in a light-transmitting reactor with exposure to light and heating at 120° to 180° C. while simultaneously removing IBr resulting as a by-product by separation of a layer.

5,688,380
METHOD OF PRODUCING GIANT MAGNETORESISTIVE MATERIAL FILM AND MAGNETIC HEAD

Fumihito Koike, and Naoya Hasegawa, both of Niigata-ken, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Division of Ser. No. 626,103, Apr. 3, 1996. This application Oct. 15, 1996, Ser. No. 730,285
Claims priority, application Japan, Apr. 3, 1995, 7-078022
Int. Cl.⁶ C23C *14/34*
U.S. Cl. 204—192.2 **2 Claims**



1. A method of producing a giant magnetoresistive material film comprising:

forming a coercive force increasing layer of α-Fe_2O_3 on a substrate by sputtering in an Ar gas atmosphere under a pressure of 3 mTorr or less with application of a magnetic field; and
forming at least two ferromagnetic layers on the coercive force increasing layer with a nonmagnetic layer disposed therebetween.

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5,688,381

MAGNETRON ATOMIZATION SOURCE AND METHOD OF USE THEREOF

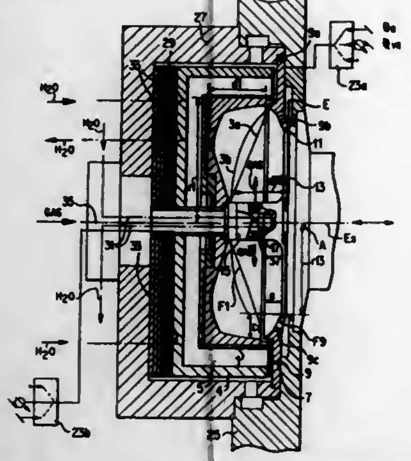
Pius Gruenenfelder, Wangs; Hans Hirscher, Bad Ragaz; Urs Schwendener, Buchs, and Walter Haag, Grabs, all of Switzerland, assignors to Balzers Aktiengesellschaft, Liechtenstein, Liechtenstein

Filed Apr. 7, 1995, Ser. No. 417,854

Claims priority, application European Pat. Off., Apr. 7, 1994, 94105388

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—192.12 **32 Claims**



1. A magnetron atomization chamber, comprising a target body having, in a new condition an atomization surface, F_1, constituting a mirror-symmetrical concave surface constructed with respect to at least one plane, a magnetic circuit arrangement operable to generate a magnetic field over the atomization surface, including an anode arrangement, a receiving frame which extends around an edge of the target body and is electrically insulated with respect thereto, which receiving frame has a receiving opening for at least one workpiece to be coated, and the atomization surface and a surrounding non-atomized residual interior surface of the receiving frame being sized and arranged relative to one another such that a process space bounded substantially by the atomization surface of the target body and the surrounding non-atomized residual interior surface, F_9, of the receiving frame, except for the receiving opening for the at least one workpiece, satisfies the relationship, $F_9 \leqq 50\% F_1$, to minimize the surrounding non-atomized residual interior surface and thereby to ensure, during an atomizing operation, a stable plasma discharge.

5,688,382

MICROWAVE PLASMA DEPOSITION SOURCE AND METHOD OF FILLING HIGH ASPECT-RATIO FEATURES ON A SUBSTRATE

Matthew M. Besen, Tewksbury; Lawrence Bourget, Reading; William M. Holber, Cambridge; Donald K. Smith, Belmont, and Richard S. Post, Lexington, all of Mass., assignors to Applied Science and Technology, Inc., Woburn, Mass.

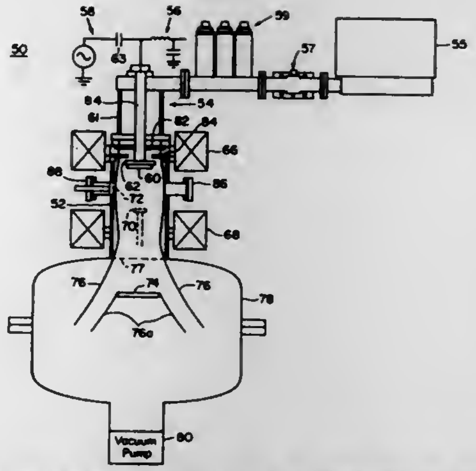
Continuation of Ser. No. 204,069, Mar. 1, 1994, abandoned.

This application Aug. 31, 1995, Ser. No. 521,958

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—192.12 **14 Claims**

1. A microwave plasma deposition source, comprising:
- a vacuum chamber for containing a substance to be energized in a plasma with microwave energy;
- a coaxial microwave feed having an inner conductor and a dielectric window shielded from the plasma for passing microwave radiation substantially unimpeded ending in the chamber;
- a target positioned in the chamber at the end of the coaxial feed;
- a substrate positioned in the chamber and spaced from the target for receiving target material; and



- a first magnet positioned between the target and the substrate and having a magnetic field extending a volume between the target and the substrate for magnetizing a dense plasma throughout the volume between the target and the substrate, thereby increasing the probability of ionizing material sputtered from the target and traversing the plasma volume.

5,688,383

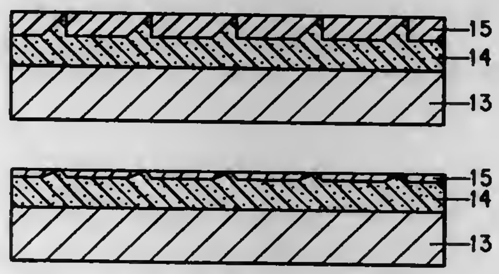
METHOD FOR IMPROVING THE PERFORMANCE OF HIGH TEMPERATURE SUPERCONDUCTING THIN FILM WAFERS

Philip Shek Wah Pang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 22, 1996, Ser. No. 603,838

Int. Cl.^{6} H01L *39/00*

U.S. Cl. 204—192.24 **17 Claims**



1. A method for removing asperities from the surface of a high temperature superconducting thin film, the method comprises exposing the surface of a high temperature superconducting film to an inert ion beam at an angle of incidence of from 5 to about 30 degrees relative to the surface of the thin film, wherein the high temperature superconducting film comprises a Tl—Ba—Ca—Cu—O superconductor.

5,688,384

FLUORINE CELL

Graham Hodgson, and Martin P. Hearne, both of Preston, United Kingdom, assignors to British Nuclear Fuels PLC, Cheshire, United Kingdom

PCT No. PCT/GB95/02145, § 371 Date May 14, 1996, § 102(e) Date May 14, 1996, PCT Pub. No. WO96/08589, PCT Pub. Date Mar. 21, 1996

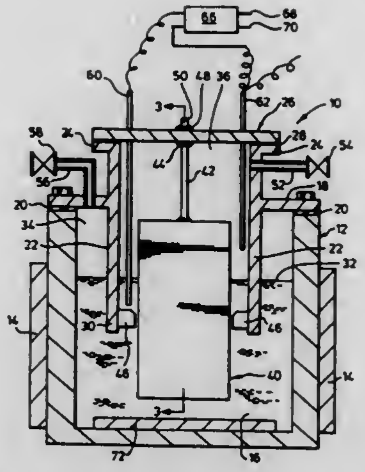
PCT Filed Sep. 11, 1995, Ser. No. 624,409

Claims priority, application United Kingdom, Sep. 14, 1994, 9418598

Int. Cl.^{6} C25B *9/00;11/12*

U.S. Cl. 204—229 **15 Claims**

1. A fluorine cell for the production of fluorine, the fluorine cell comprising: a cell container for containing an electrolyte, a cathode compartment and an anode compartment, the electrolyte having a surface level, the anode compartment having an anode therein, the cathode compartment and the anode compartment having separation means therebetween so as to separate fluorine gas and hydrogen gas generated during operation of said fluorine cell but said separation means allowing passage of the electrolyte, when present, between said compartments; said anode extending below a lower end of the separation means and, in use, being adapted for continuous contact with the electrolyte; wherein said cell has control sensor means in at least one of said anode or cathode compartments adapted to sense the surface level of the electrolyte in said at least one compartment when the electrolyte is present; and electric current supply means responsive to signals from said control sensor means so as to either start or stop current supply in accordance with said signals so as to start or stop electrolysis of the electrolyte, when present, respectively.



5,688,385

APPARATUS FOR PRODUCING CHLORINE ON-SITE

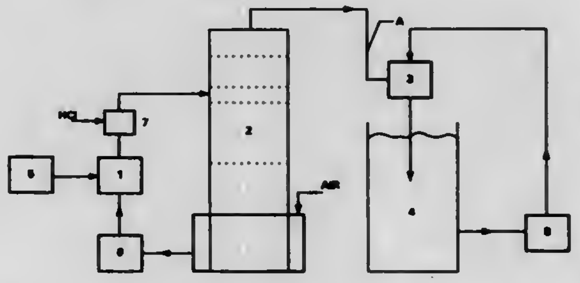
Raymond C. Rhees, Boulder City, Nev.; Ralph E. Behrens; Kathy J. Reid, both of Cedar City, Utah, and Lowell B. Morgan, Las Vegas, Nev., assignors to Pepcon Systems, Inc., Las Vegas, Nev.

Division of Ser. No. 551,290, Oct. 31, 1995, Pat. No. 5,616,234.

This application Mar. 22, 1996, Ser. No. 621,161

Int. Cl.^{6} C25C *7/00;1/26*

U.S. Cl. 204—237 **19 Claims**



1. An apparatus for producing chlorine, said apparatus comprising:
- an electrolyzer having one or more electrolytic cells each containing at least one cathode and at least one anode,
- a gas stripping column wherein said electrolyzer is in fluid communication with said gas stripping column,
- means for removing Cl_2 and H_2 from said gas stripping column,
- means for circulating an electrolyte from said gas stripping column through said electrolyzer to said gas stripping column, and
- a rectifier for providing DC current to said electrolyzer.

5,688,386

Patent Not Issued For This Number

5,688,387

TURBO ELECTROCHEMICAL SYSTEM

Sigurd Fongen, Elv. Alnaes vei 24, N-1410 Kolbotn, Norway

PCT No. PCT/NO94/00083, § 371 Date Jan. 2, 1996, § 102(e) Date Jan. 2, 1996, PCT Pub. No. WO94/26956, PCT Pub. Date Nov. 24, 1994

PCT Filed May 4, 1994, Ser. No. 578,712

Claims priority, application Norway, May 10, 1993, 931689

Int. Cl.^{6} C25B *11/03*

U.S. Cl. 204—263 **11 Claims**

1. An apparatus for carrying out an electrochemical synthesis in two or more electrolysis chambers for the production of nascent oxygen and chemical radicals to be used for delignification and/or bleaching of cellulose fibres in suspensions or oxidation of other solids suspended in liquids, or for oxidation and/or bleaching of organic compounds dissolved in liquids, for example in connection with COD-reduction in wastewater or for disinfection of liquids, carried out in-line or off-line , the apparatus comprised of electrolysis chambers equipped with special electrodes, which are built in a flat form or in a round form;
- wherein the electrodes are perforated metal foils with cylindrically formed holes with diameters in the order of 10–120 µm, the foil having a thickness of the same order, the perforated

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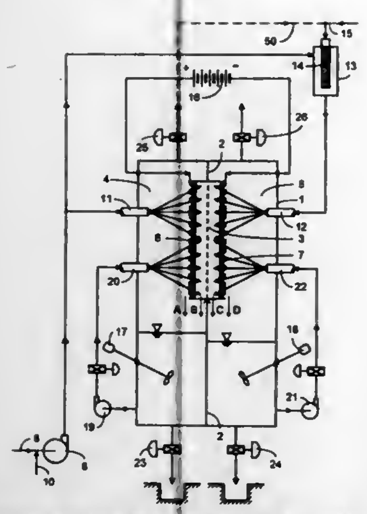


metal foil has an open area between 10 and 40%, and wherein nozzles are placed adapted to pump electrolyte under pressure perpendicularly against and through the perforated metal foil, and wherein electrodes in the form of perforated, metal foils are attached to and are supported by coarse wire textures made out of monofilament, electrically insulating threads or wires, these textures having openings which are substantially larger than the holes of the metal foil, the textures having mesh counts in the order of 50 to 250, and wherein these textures are supported by another, even coarser, insulating wire texture or by rods or plates perforated with large holes, made out of metals or electrically insulating materials.

5. An apparatus as claimed is claim 1 further comprising a diaphragm material between the electrodes made out of an electrically insulating material which is dense enough to stop the jets of the electrolyte which are being sprayed against the diaphragm from both sides through respectively the anode and the cathode and the insulating textures attached to them, the diaphragm is however open enough for giving liquid contact and thereby transportation of electric charges between the electrodes but at the same time dense enough for keeping the anolyte and the catholyte separated from each other in two separate chambers and two circuits, activated by two, separate pumps.

5,688,388

APPARATUS FOR COATING A SUBSTRATE

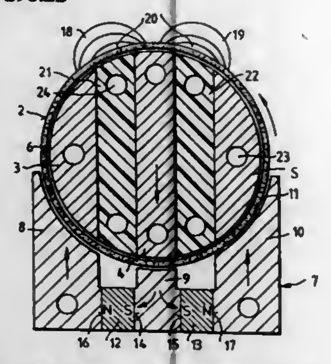
Martin Bähr, Hasselroth; Günter Bräuer, Freigericht, and Erwin Winter, Hanau, all of Germany, assignors to Balzers und Leybold Deutschland Holding AG, Hanau, Germany

Filed Jul. 29, 1996, Ser. No. 681,871

Claims priority, application Germany, Aug. 17, 1995, 195 30 259.1; Mar. 2, 1996, 196 08 073.8

Int. Cl.^{6} C23C *14/35*

U.S. Cl. 204—298.22 **16 Claims**



1. Apparatus for coating a substrate (37) by sputtering the surface of a first tubular target which can be rotated around longitudinal axis (R), the sputtering being accomplished by means of electrical energy, where the first target (2) is provided with magnets (12, 13, 32, 33) to produce a sputtering zone (20) extending in the longitudinal direction of the target (2) and where a pair of magnets (12, 13) are associated with pole shoes (3, 4, 5) of magnetically conductive material inside the target (2) so that the magnetic field can be guided from the magnets (12, 13) to the sputtering zone (20) of the target (2), characterized in that the magnets (12, 13) are set up outside the target (2), and in that the magnetic field is transmitted through the target (2) to the pole shoes (3, 4, 5) inside the target (2) across gaps (6, 11).

5,688,389

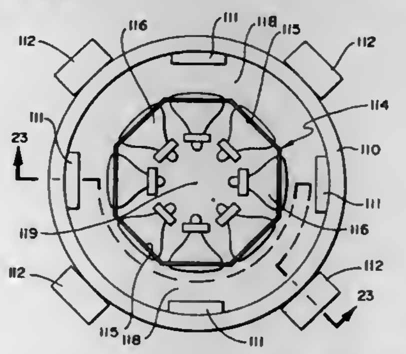
METHOD AND APPARATUS FOR THIN FILM COATING AN ARTICLE

Erik J. Bjornard, Northfield, Minn.; Eric W. Kurman, Healdsburg; Debra M. Steffenhagen, Santa Rosa, both of Calif., and Clifford L. Taylor, Nerstrand, Minn., assignors to Viratec Thin Films, Inc., Faribault, Minn.

Continuation-in-part of Ser. No. 142,638, Oct. 25, 1993, Pat. No. 5,489,369. This application Jun. 7, 1995, Ser. No. 485,214

Int. Cl.^{6} C23C *14/56;14/50;16/00*

U.S. Cl. 204—298.25 **21 Claims**



19. An apparatus for providing a thin film coating to an assembled cathode ray tube in which said cathode ray tube includes a front face portion to be coated and a rearward funnel portion comprising the remaining surface of said cathode ray tube to remain uncoated, said apparatus comprising:

- a process chamber having first and second zones wherein said first zone is a deposition zone and said second zone is an adjacent non-deposition zone;
- a thin film deposition device in said deposition zone for providing a coating to said front face portion; and
- a cathode ray tube support moveable through said process chamber along a closed loop path and at least partially defining said first and second zones, said cathode ray tube support having a first surface facing said first zone and a second surface facing said second zone and at least one support opening for supporting said cathode ray tube in said opening with said front face portion facing and exposed to said first zone and said rearward funnel portion facing and exposed to said second zone.

5,688,390

OXYGEN CONCENTRATION SENSOR

Masanobu Yamauchi, Kariya; Isao Watanabe, Nagoya, and Toshihiro Sakawa, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 11, 1996, Ser. No. 584,464

Claims priority, application Japan, Jan. 12, 1995, 7-020937

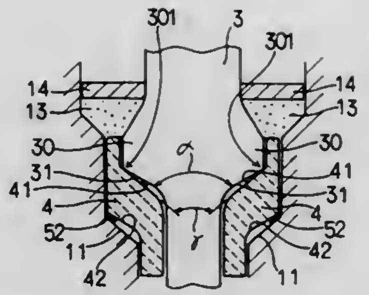
Int. Cl.^{6} G01N *27/409*

U.S. Cl. 204—426 **9 Claims**

1. A laminated oxygen concentration sensor comprising:

- a laminated oxygen concentration sensor element having a plate shape with a flange on a side surface of said plate shape, said flange including a taper surface; and
- a housing in a tubular shape having an inclination seat inclining in a central axial direction of said tubular shape, said housing supporting said laminated oxygen concentration sensor element by contacting said inclination seat with said taper surface of said flange at a circumference of said inclination seat;

wherein an opening angle of said taper surface is greater than an opening angle of said inclination seat.



5,688,391

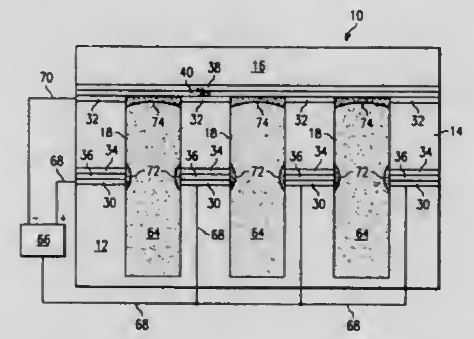
METHOD FOR ELECTRO-DEPOSITION PASSIVATION OF INK CHANNELS IN INK JET PRINTHEAD

Donald J. Hayes, Plano, Tex., assignor to MicroFab Technologies, Inc., Plano, Tex.

Filed Mar. 26, 1996, Ser. No. 621,680

Int. Cl.^{6} C25D *13/12;* **B41J** *2/045*

U.S. Cl. 204—478 **5 Claims**



1. A method for coating exposed conductive surfaces of a workpiece, comprising the steps of:

- placing in a solution of an electrodepositable polymer resin a workpiece comprising an ink jet printhead, said ink jet printhead comprising:
  - a base section formed from a piezoelectric material, said base section having a plurality of generally parallel spaced projections extending longitudinally along said base section, each of said projections having a top side;
  - first conductive surfaces mounted on said top side of each said base section projection;
  - a plurality of intermediate sections mounted on said first conductive surfaces, each intermediate section having a top side and a bottom side and being formed from a piezoelectric material;
  - second conductive surfaces mounted on said top side of each said intermediate section; and
  - a top section mounted on said second conductive surfaces, wherein portions of said first conductive surfaces between said base section projections and said intermediate sections, and of said second conductive surfaces between said intermediate sections and said top section remain exposed thereby forming exposed conductive surfaces;
- attaching said workpiece to a voltage supply wherein said exposed conductive surfaces are made into electrodes;
- energizing said voltage supply thereby causing said electrodepositable polymer resin in said solution to migrate to at least some of said electrodes to form a coating.

5,688,392

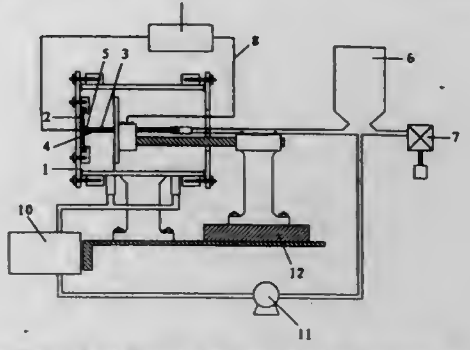
MACHINING BY ELECTRICAL REMOVAL OF MATERIALS UTILIZING DISPERSIONS OF INSOLUBLE PARTICLES

James H. White, Boulder, Colo., assignor to Eltron Research, Inc., Boulder, Colo.

Filed Sep. 7, 1995, Ser. No. 524,621

Int. Cl.^{6} B23H *7/00;7/34*

U.S. Cl. 205—654 **22 Claims**



1. A method of machining a surface of an electrically conductive workpiece comprising the steps of:

- a. providing a tool having an electrically conductive body;
- b. positioning said tool opposite said workpiece with a spacing gap therebetween;
- c. connecting said tool and said workpiece to a DC power source such that said tool is cathodic and said workpiece is anodic;
- d. providing a channel through which a liquid flow;
- e. causing said liquid to flow through said channel and between said tool and said workpiece;
- f. suspending insoluble electrically conductive solid particles in said liquid to form a slurry wherein the concentration of particles in said slurry, the size of said particles, the composition of said particles, the velocity of said slurry, the size of said channel, the spacing between said tool and said workpiece and the temperature of said slurry is such to cause intermittent electrical short circuiting between said tool and said workpiece; and
- g. machining said workpiece by moving said tool in a selected fashion relative to said workpiece.

5,688,393

METHOD FOR THE ELECTRO-OXIDATION OF PHOTOGRAPHIC SOLUTIONS

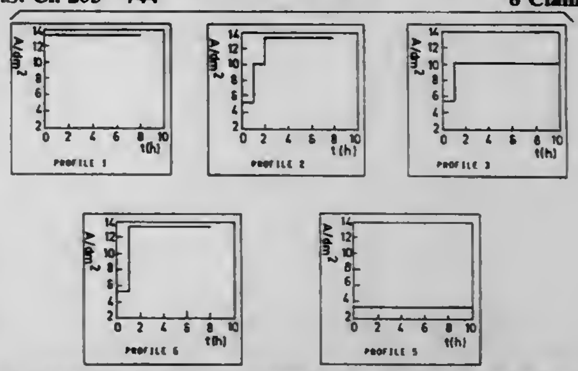
Isabelle Fleury, Chalon sur Saone, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1996, Ser. No. 629,861

Claims priority, application France, Apr. 19, 1995, 95 04942

Int. Cl.^{6} C02F *1/46*

U.S. Cl. 205—744 **8 Claims**



1. Method for electro-oxidizing an aqueous solution having a COD higher than 20 g/l comprising used photographic or X-ray developers in a single compartment electrolysis cell comprising at least one platinum anode and at least one cathode, wherein the method comprises electro-oxidizing the aqueous solution at a first

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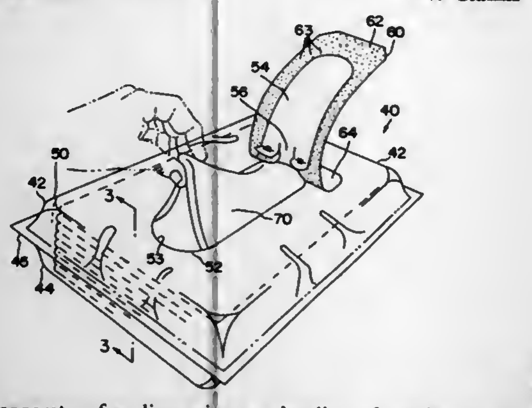
current density applied at the start of electrolysis for a time period of from 10% to 20% of the time needed to obtain a COD of 2 g/l, said first current density not exceeding 50% of the maximum density of the electrolysis current applied during electro-oxidation, and then increasing the current density up to the maximum current density.

5,688,394
METHOD OF PREPARING SURFACE FOR RECEIVING A COATING AND APPARATUS THEREFOR

John S. McBride, Jr., and Kenneth J. O'Connor, both of Spartanburg, S.C., assignors to Contec, Inc. of Spartanburg, Spartanburg, S.C.

Continuation of Ser. No. 484,872, Jun. 7, 1995, Pat. No. 5,595,786. This application Jan. 9, 1997, Ser. No. 780,993
Int. Cl.^{6} B65D *83/00;85/62;* **B05D** *3/00*
U.S. Cl. 206—233 **10 Claims**



1. An apparatus for dispensing a plurality of carrier sheets containing at least one volatile solvent, the apparatus comprising:
- a top panel;
- a bottom panel being joined at its edges to said top panel to form a cavity therebetween;
- at least one multiple-folded carrier sheet disposed in said cavity;
- at least one solvent absorbed within said at least one carrier sheet;
- said top panel being configured with an elongated through-cut defining a flap; and
- a door member configured and disposed to overlie and completely cover said through-cut in said top panel, said door member being configured to be repeatedly raised manually from said top panel and readhering to said top panel.

5,688,395
PROCESS AND CATALYST FOR UPGRADING HEAVY HYDROCARBON

Jose Carrazza; Pedro Pereira, and Nelson Martinez, all of San Antonio de Los Altos, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

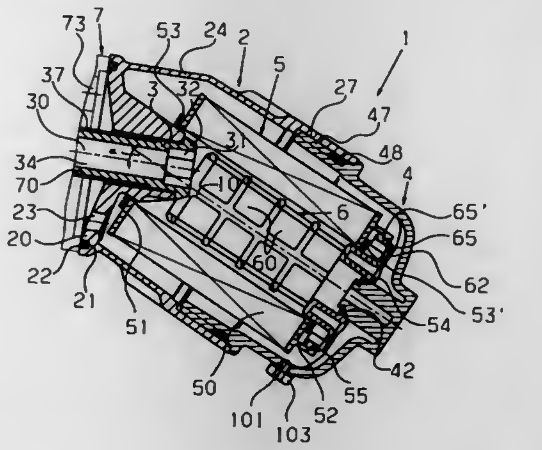
Division of Ser. No. 406,073, Mar. 17, 1995. This application Jul. 2, 1996, Ser. No. 677,439
Int. Cl.^{6} C10G *13/02*
U.S. Cl. 208—130 **17 Claims**

1. A process for steam conversion of a heavy hydrocarbon feedstock, comprising the steps of:
- providing a heavy hydrocarbon feedstock;
- providing a catalytically active phase comprising a first metal and a second metal wherein at least one of the said first metal and said second metal is in the form of an oil soluble compound and wherein said first metal is a non-noble Group VIII metal and said second metal is an alkali metal; and
- contacting said feedstock with steam at a pressure of less than or equal to about 300 psig in the presence of said catalytically active phase so as to provide a hydrocarbon product having a reduced boiling point.

5,688,396
OIL FILTER INCLUDING AN ANGLED MOUNTING SURFACE

Dieter Baumann, Greven, and Wilhelm Ardes, Ascheberg, both of Germany, assignors to Walter Hengst GmbH & Co. KG, Muenster, Germany

Filed Nov. 8, 1995, Ser. No. 590,632
Claims priority, application Germany, Jun. 16, 1995, 295 09 806 U
Int. Cl.^{6} B01D *35/30*
U.S. Cl. 210—130 **20 Claims**



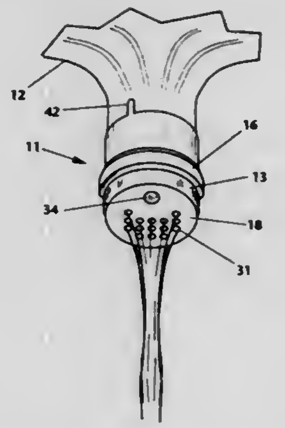
1. A liquid filter for mounting to a filter connecting flange of an internal combustion engine, the filter connecting flange including an outlet port and a threaded inlet aperture that passes through the filter connecting flange, the filter comprising:
- a filter housing including an open first end, a second end that is closed by a front wall, and a peripheral sidewall coaxially surrounding a central axis, a cover releasably attached to the open end of the housing, the filter housing and cover defining a filter chamber, the front wall comprising a central aperture and an inlet port spaced radially outwardly of said central aperture for alignment with the outlet port in said filter connecting flange, said front wall having an inner surface facing said filter chamber and a planar outer surface for mounting to said filter connecting flange; wherein an angle between said central axis and the planar outer surface of said front wall is less than 90°;
- a hollow fastening screw extending axially through said central aperture for defining an outlet of said filter housing, said fastening screw comprising a head portion disposed in the filter chamber, said head portion including a collar bearing against the inner surface of the front wall, the fastening screw further comprising an externally threaded shank extending through the front wall, the externally threaded shank for threadably coupling with the threaded outlet aperture of the filter connecting flange to clamp the outer surface of the front wall of the filter housing to the filter connecting flange, and
- a filter cartridge disposed in said filter chamber between said inlet port and said outlet for filtering a liquid.

5,688,397
COMBINATION BOTTLE CAP AND FILTER

Rick Malmborg, 5390 Canyon Crest Dr., San Ramon, Calif. 94583

Filed Jun. 5, 1995, Ser. No. 463,963
Int. Cl.^{6} B01D *27/02*
U.S. Cl. 210—136 **24 Claims**

1. A combination bottle cap and filter assembly for use with a bottle having a mouth opening and neck, including;
- a filter cartridge dimensioned to be received in the mouth opening and neck of the bottle;

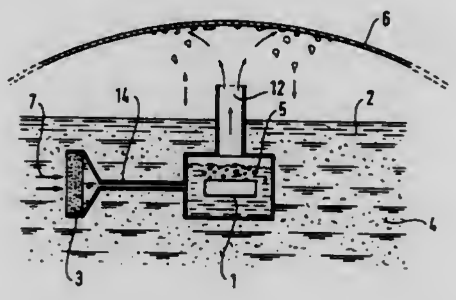


- a charge of water filtering material disposed within said filter chamber;
- an outer sidewall circumscribing a portion of the neck of the bottle and securing said assembly to said bottle;
- end wall means joining said filter cartridge and said outer sidewall, and
- tearaway strip means formed in said outer sidewall for opening a portion of said outer sidewall and releasing said assembly from the bottle and preventing reinstallation of the assembly on a bottle.

5,688,398
DEVICE FOR FILTERING AN ELECTRICALLY INSULATIVE AND THERMALLY CONDUCTIVE LIQUID MEDIUM AND A POWER ELECTRONICS UNIT INCORPORATING A DEVICE OF THIS KIND

Jean Jacquelin, Gorges les Bains, and Claude Agnoux, Ollainville, both of France, assignors to GEC Alsthom Transport SA, Paris, France

Filed Aug. 26, 1996, Ser. No. 703,354
Claims priority, application France, Aug. 30, 1995, 95 10218
Int. Cl.^{6} B01D *35/027;35/28;* **H05K** *7/20*
U.S. Cl. 210—167 **6 Claims**

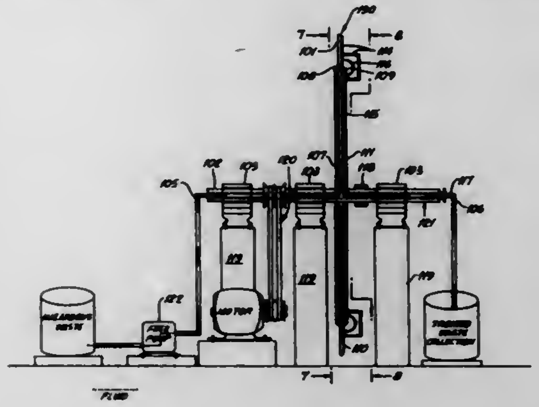


1. A filter device comprising heating means immersed in a liquid medium, immersed means for filtering solid particles permeable to said liquid medium, said immersed filter means being located in a natural convection current of said liquid medium, and an enclosure at least partially immersed in said liquid medium and containing said immersed heating means, said enclosure being at least partially constituted by said immersed means for filtering solid particles in the liquid medium and by an outlet orifice.

5,688,399
MEANS FOR SEPARATION AND REMOVAL OF IMPURITIES FROM LIQUIDS

Albert H. Halff, 3514 Rock Creek Dr., Dallas, Tex. 75225, and Allen F. Reid, 4736 Reservoir Rd., Geneseo, N.Y. 11454

Continuation of Ser. No. 205,165, Mar. 3, 1994, which is a division of Ser. No. 996,581, Dec. 24, 1992, Pat. No. 5,372,725, which is a continuation-in-part of Ser. No. 787,326, Nov. 1, 1991, Pat. No. Des. 339,168. This application Feb. 13, 1996, Ser. No. 600,675
Int. Cl.^{6} C02F *11/08*
U.S. Cl. 210—178 **29 Claims**



1. In a mechanism for converting impurities or contaminants in a fluid to a non-hazardous or less hazardous condition in which the fluid is raised to a supercritical state, the improvement of which comprises:
- (a) a rotatable mechanism;
- (b) said rotatable mechanism having a solution-receiving reaction chamber therewithin adapted to receive the fluid;
- (c) means for introducing said aqueous solution into the solution-receiving chamber of said rotatable mechanism;
- (d) means for rotating the rotatable mechanism together with the solution-receiving chamber therewithin and while said aqueous solution is within said solution-receiving chamber at a high speed whereby the aqueous solution within said solution-receiving chamber is rotated with the rotatable mechanism means;
- (e) means for applying heat to the fluid in the reaction chamber for continuing the rotation thereof and means for continuing the application of heat to the fluid in the reaction chamber until the temperature and pressure of the fluid in the reaction chamber reaches the supercritical state:
- (f) means to maintaining the fluid in said supercritical state until the impurities are separated from the liquid;
- (g) said rotatable mechanism being a circular rotatable mechanism;
- (h) said reaction chamber is a circular reaction chamber within said rotatable mechanism;
- (i) said rotatable mechanism being a closed chamber;
- (j) said reaction chamber being located in the proximity of the outer periphery of the rotatable mechanism
- (k) said rotatable mechanism has a central region spaced axially inwardly of the reaction chamber;
- (l) and means are provided to direction fluid from the central region of the circular rotatable mechanism to said reaction chamber in the outer periphery of the rotatable mechanism.

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5,688,400

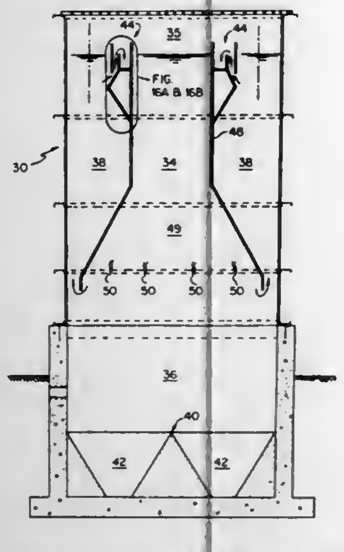
WASTE WATER TREATMENT PLANT

Thomas D. Baxter, Sr., Greenville, Miss., assignor to Environmental Treatment Facilities, Inc., Greenville, Miss.

Filed Mar. 7, 1996, Ser. No. 612,332

Int. Cl.^{6} C02F *3/20*

U.S. Cl. 210—195.3 **8 Claims**



1. A hollow vessel for containing three phases of a waste water treatment process having an upper portion, an open top, a lower portion and a base, said vessel comprising:

- an inverted, funnel shaped aeration chamber disposed in the upper portion of said vessel with a narrow open end extending upwardly to a level above a liquid level in the aeration chamber having a wastewater inflow pipe for directing wastewater downwardly into said aeration chamber and a flared open end disposed over the lower portion of said vessel, the walls of said chamber being spaced away from the sides of said vessel to form therebetween a clarification area with the walls forming the flared open end being closely spaced away from the sides of said vessel;
- at least one upwardly opening hopper formed in and extending upwardly from the base, below the flared open end of said chamber;
- air injection means mounted on the chamber walls forming the flared open end of said chamber and extending thereinto for injecting air upwardly, substantially parallel to the vertical axis of said chamber so that waste water directed downwardly through the narrow open end thereof will mix with a counter current flow of air as it passes downwardly therethrough;
- solids removal means disposed within said hopper for removing solids accumulating therein, settling from aerated waste water in said chamber; and
- clarified water removal means disposed in the open top of said vessel for removing clarified water from said vessel around the narrow open end of said chamber.

5,688,401

APPARATUS FOR REMOVING SILVER FROM SPENT PHOTOPROCESSING SOLUTION

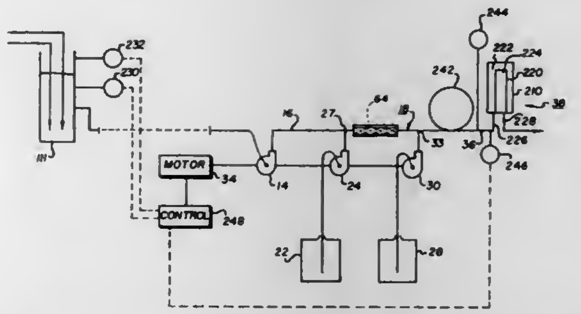
Thomas W. Bober, Rochester; Terry W. Pearl, Waterloo; Dominick Vacco, Rochester, and David C. Yeaw, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 206,355, Mar. 4, 1994, Pat. No. 5,549,820. This application May 16, 1996, Ser. No. 648,477

Int. Cl.^{6} C02F *1/54*

U.S. Cl. 210—199 **33 Claims**

1. Apparatus for removing silver from spent photoprocessing solution, comprising:



- means for providing a spent photoprocessing solution containing silver to be removed;
- conduit means for receiving and passing the spent photoprocessing solution, the conduit means defining a mixing path and having a cross sectional flow area, an inlet end and an outlet end;
- first means for delivering the spent photoprocessing solution at a first flow rate into the inlet end;
- a source of precipitating agent for silver;
- second means for delivering the precipitating agent at a second flow rate into the conduit means;
- a source of flocculating agent for a precipitate formed by mixing the solution and the precipitating agent;
- third means, located downstream of the second means by a first distance providing a first residence time sufficient for mixing of the solution and the precipitating agent and for forming a silver precipitate for flocculation, for delivering the flocculating agent at a third flow rate into the conduit means;
- the outlet end of the conduit means being located downstream of the third means for delivering by a second distance, such that the first, second, and third flow rates, the cross sectional flow area, and the second distance provide a second residence time sufficient for forming clumps of flocculated particles of the silver precipitate;
- the second residence time, the precipitating agent and the flocculating agent being such that the clumps of flocculated particles grow and agglomerate during movement of the solution and clumps through the second distance into enlarged clumps many of which individually extend across and substantially fill the cross sectional flow area, whereby individual enlarged, moving clumps substantially block passage of and strain from the solution remaining fine particles which then adhere to the enlarged, moving clumps as the enlarged clumps move to the outlet end; and
- a settling vessel for receiving clumps and solution from the outlet end and allowing the clumps to settle from the solution.

5,688,402

SELF-CLEANING STRAINER

Thomas A. Green, San Jose, Calif., and Alan J. Bilanin, Princeton, N.J., assignors to General Electric Company, San Jose, Calif.

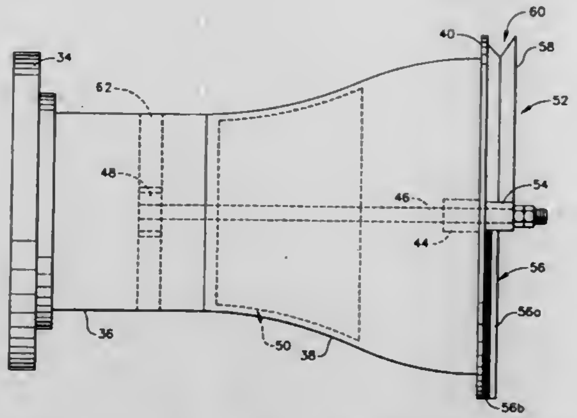
Filed Dec. 15, 1995, Ser. No. 572,917

Int. Cl.^{6} B01D *29/64;35/02;35/027;* **G21C** *19/307*

U.S. Cl. 210—355 **14 Claims**

1. A self-cleaning strainer comprising:

- a conduit having an outlet, an axis and an inlet;
- a perforated end plate disposed across said conduit inlet, said end plate having a central aperture;
- a drive shaft rotatably supported by bearings such that an axis of rotation of said drive shaft is coaxial with said conduit axis, said drive shaft having a portion inside said conduit and a portion which extends through said perforated end plate central aperture and outside said conduit;
- a turbine coupled to said portion of said drive shaft inside said conduit for rotation therewith, said turbine comprising blades having surfaces which are oriented to cause rotation of said turbine and said drive shaft when liquid flows from said conduit inlet to said conduit outlet;



- a brush coupled to said portion of said drive shaft outside said conduit for rotation therewith, said brush comprising a multiplicity of bristles which wipe said perforated end plate during rotation of said drive shaft; and
- a plow coupled to said portion of said drive shaft outside said conduit for rotation therewith, wherein said plow has a channel which extends along its length and said channel has a V-shaped cross section.

5,688,403

REMOVAL OF METAL IONS FROM SOLUTION

Alan S. Rothenberg, Wilton, and Roderick Glyn Ryles, Milford, both of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Filed Feb. 29, 1996, Ser. No. 610,102

Int. Cl.^{6} C02F *1/56*

U.S. Cl. 210—727 **6 Claims**

1. A method of removing metal ions from water being discharged from a commercial operation which comprises contacting said water, in sequence, with an effective amount of 1) a water-soluble polymer containing pendant hydroxamic acid or salt groups to complex said metal ions and 2) a water-soluble cationic polymer to flocculate the resultant metal ion complexes and separating the resultant flocculated metal ion complexes from said water, wherein the metal ions are selected from the group consisting of copper, lead, zinc and nickel.

5,688,404

PHOSPHATE RECOVERY PROCESSES

Donald Allen Luke, Valrico, Fla., and Geoffrey Steven Gagen, Chesapeake, Va., assignors to Allied Colloids Limited, West Yorkshire, England

Filed Jun. 7, 1995, Ser. No. 486,578

Int. Cl.^{6} B03D *3/06;* **B01D** *21/01*

U.S. Cl. 210—734 **16 Claims**

1. A process in which a phosphate feed is separated in one or more primary separation stages into one or more phosphate enriched fractions and a waste aqueous stream containing recoverable phosphate feed particles suspended in an aqueous clay slime,

- the waste aqueous stream is flowed turbulently from a flocculant dosing point along a flow passage which leads through a settling zone for recoverable phosphate feed particles and discharges into a quiescent slime sedimentation area in which the slime sediments, and
- recoverable phosphate feed particles are settled in the settling zone and are recovered from the settling zone and returned to the one or more primary separation stages, and
- settlement of the phosphate feed particles substantially in the absence of the slime is accelerated in the settling zone and sedimentation of the slime is accelerated in the quiescent sedimentation area by flocculating the slime while the phosphate feed particles remain substantially unflocculated by adding a slime-flocculating amount of a water soluble polymeric cationic flocculant for the slime at the flocculant dosing point.

5,688,405

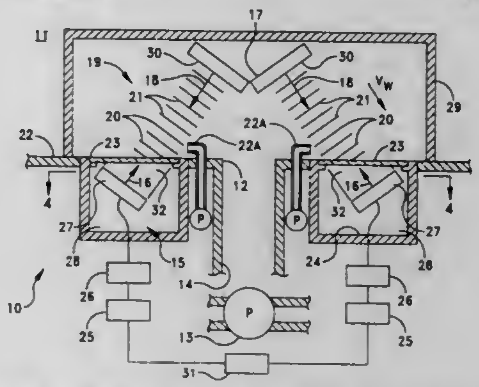
METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATTER FROM A FLUID

Stuart C. Dickinson, Bristol, and Robert Kuklinski, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1996, Ser. No. 613,771

Int. Cl.^{6} C02F *1/36*

U.S. Cl. 210—748 **20 Claims**



1. A method for filtering particulate matter of a preselected size and density from fluid passing through a port along a flow axis from a fluid reservoir, said method comprising the steps of:

- generating a first ultrasonic wave pattern through the fluid entering the port;
- generating a second ultrasonic wave pattern of substantially the same frequency as the first ultrasonic wave pattern through the fluid entering the port;
- directing the first and second ultrasonic wave patterns along first and second directions that are oblique to the flow axis so as to superpose the first and second ultrasonic wave patterns in the fluid to define a composite wave pattern in a region through which the fluid entering the port passes from the reservoir thereby to move the particulate matter therealong and away from the port; and
- urging particulate matter entrained in the fluid passing through the region to a position remote from the composite wave pattern and the port such that the fluid entering the port is substantially free of such particulate matter.

5,688,406

METHOD AND APPARATUS FOR SEPARATING PARTICULATE FROM A FLOWING FLUID

Stuart C. Dickinson, Bristol, and Robert Kuklinski, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1996, Ser. No. 613,772

Int. Cl.^{6} C02F *1/36*

U.S. Cl. 210—748 **16 Claims**

1. A method for filtering particulate matter of a preselected size and density from fluid entering a port in a surface in which the surface and fluid undergo relative motion that establishes a flow boundary spaced from the surface and between a first fluid flow portion contiguous the surface that enters the port and a second fluid flow portion that is spaced from the surface and that bypasses the port, said method comprising the steps of:

- generating first and second ultrasonic waves; and
- superposing the first and second ultrasonic waves in the first fluid flow portion to define a composite wave pattern in a first

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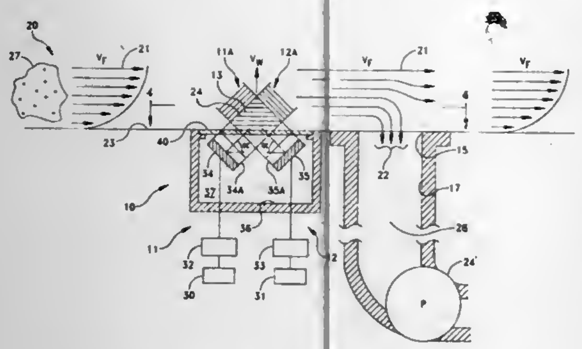


region of the first fluid flow portion upstream of the port such that particulate matter in the fluid passing through the region is transported to the second fluid flow portion and fluid entering the port from the first fluid flow portion is substantially free of such particulate matter.

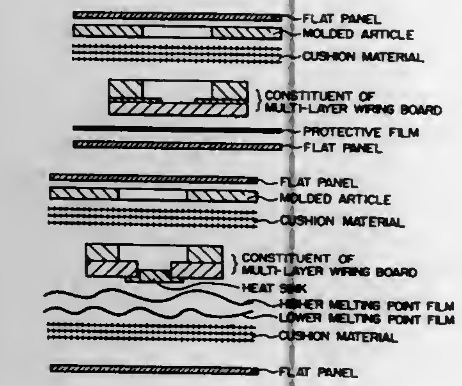
5,688,407

Patent Not Issued For This Number

5,688,408
MULTILAYER PRINTED WIRING BOARD

Yoshiyuki Tsuru, Shimodate; Shigeharu Arike, Shimotsuga; Takashi Sugiyama, Shimodate; Shinjirou Miyashita, Shimodate, and Takayuki Suzuki, Shimodate, all of Japan, assignors to Hitachi Chemical Company Ltd., Tokyo, Japan

Division of Ser. No. 418,443, Apr. 7, 1995, Pat. No. 5,562,971. This application Jul. 2, 1996, Ser. No. 674,876
Claims priority, application Japan, Apr. 19, 1994, 6-080315
Int. Cl.^{6} B44C *1/22*
U.S. Cl. 216—17 **30 Claims**

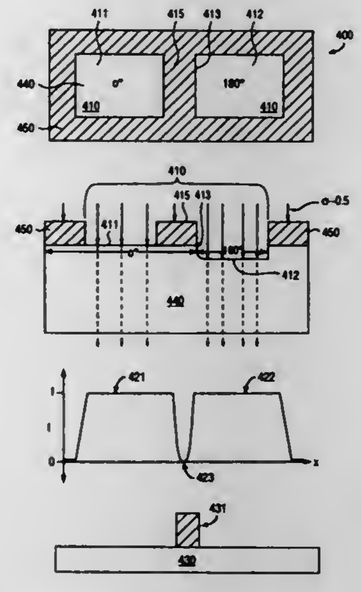


1. A process for producing a multilayer printed wiring board which comprises placing an interlaminar insulating layer between every adjoining insulating circuit boards having circuits formed on an insulating substrate containing reinforcing fiber, said interlaminar insulating layer being B-staged, having a B-stage resin flow of less than 1%, with the difference in glass transition point between the adjoining insulating layers being not greater than 60° C., and not containing reinforcing fiber; integrally laminating them by heating under pressure, and forming via holes for making electrical connection between two or more layers of circuits.

5,688,409
PROCESSES FOR FABRICATING DEVICE LAYERS WITH ULTRAFINE FEATURES

Giang T. Dao, Fremont, and Joseph C. Langston, Los Altos, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 21, 1996, Ser. No. 667,445
Int. Cl.^{6} G03F *7/00*
U.S. Cl. 216—48 **21 Claims**



1. A method for fabricating a device layer with ultrafine features comprising:

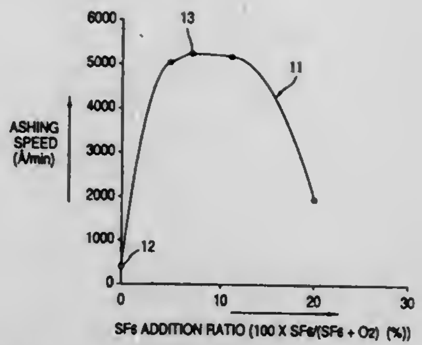
depositing a first device layer to be patterned above a substrate;
depositing a photoresist layer above said first device layer;
providing a reticle, said reticle having a first reticle layer, said first reticle layer having a first phase region and a second phase region, said first phase region having a first phase and said second phase region having a second phase, wherein said first and second phases indicate an mount by which incident radiation is shifted through said reticle; said reticle having a second reticle layer, said second reticle layer disposed above said first reticle layer proximate to the location wherein said first phase region transitions to said second phase region of said first reticle layer;
exposing said photoresist layer to radiation through said reticle using a stepper; and
adjusting the partial coherence of said stepper, wherein said step of adjusting the partial coherence of said stepper controls the critical dimensions of said device layer being fabricated.

5,688,410
METHOD OF ASHING RESIST AND APPARATUS THEREFOR

Masaru Kajitani, Osaka; Satoshi Yabuta, Taki-gun; Katsuhiro Kawai, Yamatotakada, and Masaya Okamoto, Soraku-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1995, Ser. No. 581,197
Claims priority, application Japan, Dec. 29, 1994, 6-340093
Int. Cl.^{6} C23F *1/00;* H01L *21/306*
U.S. Cl. 216—64 **3 Claims**

1. A method of ashing a resist comprising the steps of:
placing a substrate, coated with the resist, to be treated in a mixed gas atmosphere, said mixed gas atmosphere containing SF_6 gas and O_2 gas with the concentration of the SF_6 gas in the mixed gas being selected to be 7.0 vol. %;

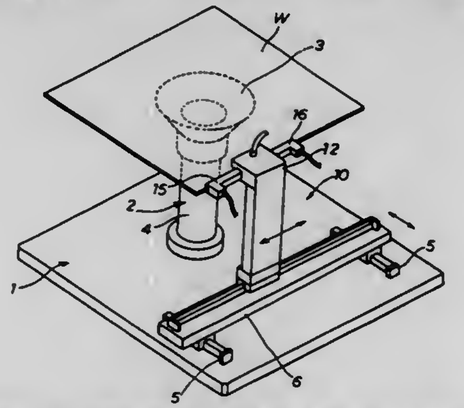


generating plasma of the mixed gas; and
subjecting the resist to the plasma,
whereby the resist is ashed.

5,688,411
METHOD OF AND APPARATUS FOR REMOVING COATING FROM EDGE OF SUBSTRATE

Junji Kutsuzawa; Yoshihito Kai; Hidenori Miyamoto, and Futoshi Shimai, all of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1996, Ser. No. 612,723
Claims priority, application Japan, Mar. 9, 1995, 7-050106
Int. Cl.^{6} H01L *21/30;* B05D *3/00;* B44C *1/22*
U.S. Cl. 216—92 **22 Claims**



1. A method of removing a coating from an edge of a substrate, comprising the steps of:

supplying a solvent into a slot in a removing unit;
passing the solvent in the slot in the removing unit;
horizontally inserting a portion of an edge of a substrate in the slot such that the edge portion is immersed entirely in the solvent in the slot; and
thereafter, moving the removing unit along the edge of the substrate to remove a coating from the edge of the substrate.

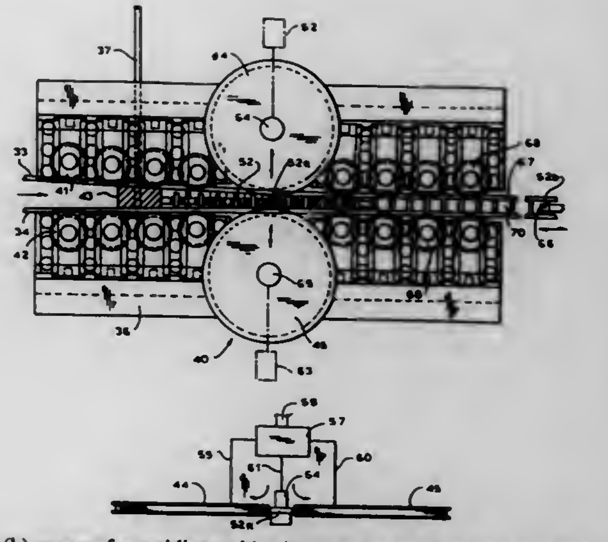
5,688,412
APPARATUS FOR MANUFACTURE OF RACK AND SHELVING SYSTEM

David R. Thalenfeld, Bear Creek, Pa., and Thomas O. Nagel, Blairstown, N.J., assignors to Trion Industries, Inc., Wilkes-Barre, Pa.

Division of Ser. No. 378,187, Jan. 25, 1995. This application May 31, 1996, Ser. No. 657,798
Int. Cl.^{6} B23K *11/06;11/30*
U.S. Cl. 219—56 **11 Claims**

1. Apparatus for manufacturing a ladder type rack strip, which comprises

(a) means for advancing first and second substantially continuous, spaced-apart wire rods longitudinally toward and into a welding position,

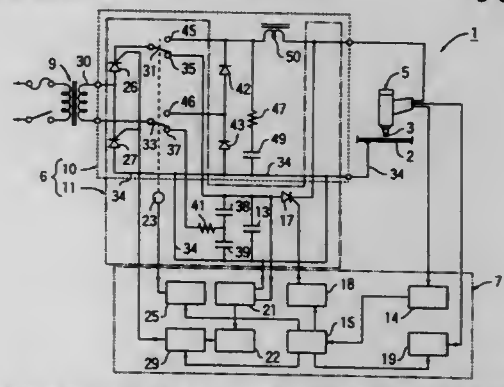


(b) means for guiding said wire rods, at least at said welding position, along parallel paths defining a predetermined plane,
(c) means for conveying successive cross bar elements, disposed at right angles to said wire rods, to a position between said wire rods and in said predetermined plane at said welding position,
(d) first electrode means of a first polarity for engaging and for supplying power to a cross bar element at said welding position,
(e) opposed second electrode means of a second polarity engaging said spaced-apart wire rods at said welding position on opposite outside surfaces of said wire rods, and
(f) an electrical power source connected to said electrodes, and
(g) means for momentarily activating said power source when a cross bar element is positioned at said welding position to fuse the opposite ends of said cross bar element to inside surface portions of said spaced-apart wire rods.

5,688,413
STUD WELDING APPARATUS

Yoshiteru Kondo, Toyoyaski, Japan, assignor to Emhart Inc., Newark, Del.

Filed Feb. 16, 1996, Ser. No. 602,416
Claims priority, application Japan, Feb. 16, 1995, 7-028222
Int. Cl.^{6} B23K *9/20*
U.S. Cl. 219—98 **5 Claims**



1. A stud welding apparatus comprising a welding gun adapted to hold a stud to bring the tip of the stud into contact with a base metal and a power supply system to supply the welding gun with an electric power which forms a pilot arc and a subsequent welding arc between the stud and the base metal; said power supply system comprising

a pilot power supply to rectify A.C. current to D.C. current to apply a pilot current to the welding gun to form the pilot arc;
a welding arc power supply to rectify A.C. current to D.C. current to apply a welding current to the welding gun to form

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the welding arc, said welding arc power supply including a charging capacitor in which an electric power for the welding arc is accumulated;

a power transformer including a primary winding and a secondary winding adapted to provide power input to said pilot power supply and to said welding arc power supply; and

a switching system connecting said secondary winding sequentially to said pilot power supply to produce said pilot current and to said welding arc power supply to produce said welding current.

5,688,414

STUD WELDING APPARTUS

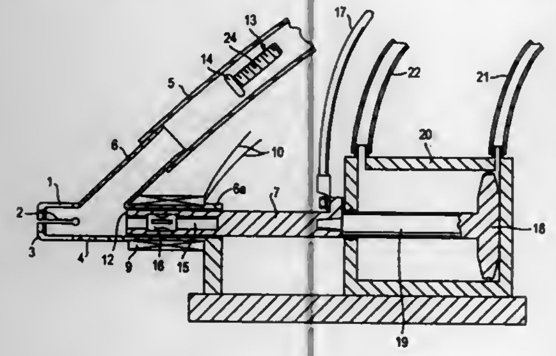
Yoshiteru Kondo, Toyohashi, Japan, assignor to Emhart Inc., Newark, Del.

Filed Apr. 10, 1996, Ser. No. 629,496

Claims priority, application Japan, Apr. 13, 1995, 7-088048

Int. Cl.^{6} B23K *9/20*

U.S. Cl. 219—98 **6 Claims**



1. A stud welding apparatus comprising a hollowed tubular stud-receiving portion including an axially extending slit at the end thereof and a reduced inner diameter portion at the inner side of the end thereof; an adapter opened to communicate with the stud-receiving portion for feeding a flanged stud having a shank and a flange formed at an end of the shank into the stud-receiving portion with the flange moving ahead; a collet positioned to be axially slid in the stud-receiving portion and provided with a bore at the end thereof to receive the stud shank in the bore with the end portion of the collet being made of an electrically conductive material; collet driving means for driving the collet to move the same between a retracted position that the collet end is placed rearward of the opening of the adapter and a projecting position that the collet end projects from the end of the stud-receiving portion to apply urging force to the collet; magnetic field establishing means for establishing a stud pulling magnetic field around the retracted collet to draw the stud from the stud-receiving portion into the bore of the collet; and electric current supply means to supply welding current to the end of the collet; and wherein when the collet is at the retracted position, the flanged stud is fed to the stud-receiving portion and the magnetic field establishing means is energized to retract the stud shank into the collet bore until the rear side of the flange comes into contact with the end of the collet, and then, the collet driving means is actuated to drive the collet to the projecting position to bring the front side of the stud flange gripped in the collet into contact with a member to be welded, and then current is supplied from the electric current supply means to the collet to allow the welding current to flow through the flange of the stud so as to effect a stud welding.

5,688,415

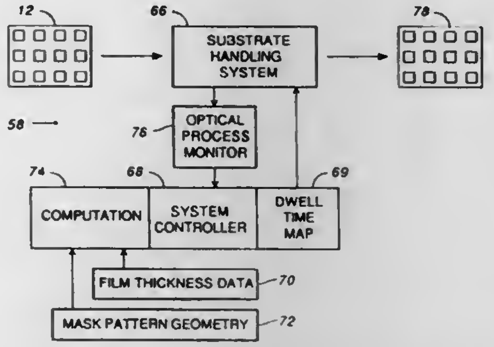
LOCALIZED PLASMA ASSISTED CHEMICAL ETCHING THROUGH A MASK

David Bollinger, and Jim Nester, both of Ridgefield, Conn., assignors to Ipec Precision, Inc., Bethel, Conn.

Filed May 30, 1995, Ser. No. 453,037

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.41 **8 Claims**



1. A method for plasma assisted, chemical etching through a mask having apertures in a predetermined pattern, said method comprising the steps of:

applying the mask to a substrate;

positioning the mask adjacent a plasma etching tool that has an electrode that is smaller in area than the area of the mask;

producing a plasma glow discharge adjacent said electrode; and

moving the plasma etching tool relative to the substrate to transfer the pattern of the mask to the substrate.

5,688,416

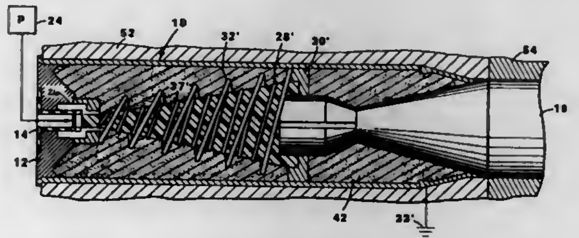
STABILIZED PLASMA ARC INJECTOR

Richard Franklin Johnson, Crystal, Minn., assignor to FMC Corp, Chicago, Ill.

Filed Jun. 1, 1995, Ser. No. 456,981

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.48 **17 Claims**



1. A stabilized plasma arc injector device in a cartridge structure having a power supply connection to provide sufficient power to create plasma and ignite a surrounding combustible mass contained in the cartridge to accelerate a projectile comprising:

primary conductor means including a helical coil of a first diameter mounted on means for supporting said helical coil for conducting power to a first terminal;

secondary conductor means including a helical coil of a second diameter for conducting power to a second terminal wherein said second diameter is larger than said first diameter:

said primary conductor means co-axially disposed in said secondary conductor means forming an interstitial space therebetween;

said primary conductor means forming a contact at said first terminal; and

said secondary conductor means forming a contact at said first terminal.

5,688,417

DC ARC PLASMA TORCH, FOR OBTAINING A CHEMICAL SUBSTANCE BY DECOMPOSITION OF A PLASMA-GENERATING GAS

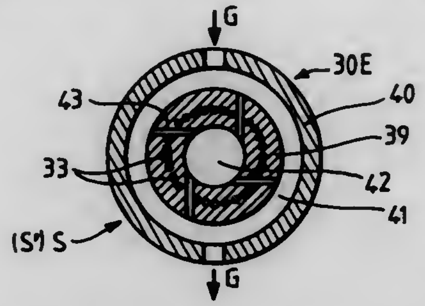
Martine Cadre, Saint Medard en Jalles, and Maxime Labrot, Bordeaux, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Apr. 18, 1996, Ser. No. 634,352

Claims priority, application France, May 19, 1995, 95 05972

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.52 **18 Claims**



1. A DC arc plasma torch, in particular intended for obtaining a chemical substance from a plasma-generating gas (P) which includes said substance, said torch comprising,

a first electrode and a second electrode, said electrodes being tubular, coaxial and arranged in extension of each other, on either side of a chamber (3) for injection of said plasma-generating gas, said electrodes being open at their ends which face said injection chamber, and

means (34) for injecting a stream of the plasma-generating gas into said injection chamber, the arc (**10**) between said electrodes passing through said injection chamber and being anchored by end feet (**10***c*, **10***a*) respectively to the internal surface of said electrodes, while said first electrode (2) is open at its end remote from said injection chamber in order to allow the plasma (13) generated by said are to flow out of the torch, wherein:

said first electrode (2A) is in communication with said injection chamber (3) via a first tubular piece (2B) through which said arc (**10**) passes and which constitutes a first reaction chamber in which said plasma-generating gas (P) gives rise to the plasma (13) under the action of said electric arc (**10**); and

first means (7, 8, S) are provided to form a fluid barrier (14) between said first electrode (2A) and said plasma (13), wherein said first means consist of first blowing means (7, 8, S) which generate, on the internal wall of said first electrode (2A), a first tubular flow (14) of a gas at a pressure at least approximately equal to that of the plasma and at a temperature very much lower than that of said plasma (13), said first tubular fluid flow (14) surrounding said flow of the plasma (13) and flowing in the same direction as the latter.

5,688,418

METHOD AND APPARATUS FOR LASER CUTTING

Shigehiro Yoshiyasu, and Masaru Kanaoka, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1995, Ser. No. 392,488

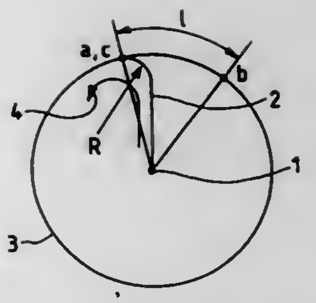
Claims priority, application Japan, Feb. 24, 1994, 6-026423; Feb. 15, 1995, 7-026619

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.71 **33 Claims**

1. A laser cutting method for laser cutting a metallic material workpiece to form a hole in said workpiece, said hole having a desired shape, comprising the steps of:

cutting said workpiece up to a point a predetermined distance from a cutting end point on a circumference of said hole according to first laser cutting conditions;



cutting said workpiece between said point a predetermined distance from said cutting end point and said cutting end point according to second laser cutting conditions, said second laser cutting conditions being different from said first laser cutting conditions, wherein a focus position in said second laser cutting conditions is the same as a focus position in said first laser cutting conditions.

5,688,419

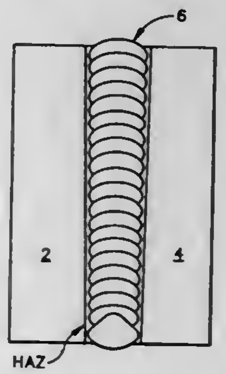
METHOD FOR MITIGATING RESIDUAL STRESSES IN WELDED METAL COMPONENTS USING HIGH TORCH TRAVEL SPEEDS

Henry Peter Offer, Los Gatos, Calif., assignor to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 231,614, Apr. 22, 1994, and Ser. No. 237,732, May 4, 1994, Pat. No. 5,527,441. This application Jun. 15, 1994, Ser. No. 259,805

Int. Cl.^{6} B23K *9/00*

U.S. Cl. 219—137 R **28 Claims**



1. A method for heat treating first and second metal components joined in a depthwise direction by a weld joint formed, at least in part, by a root pass at a near surface and a plurality of passes built successively on top of said root pass in a direction from said near surface to a far surface, comprising the step of heating said far surface of said weld joint during a pass by discharging an arc of electric current from a tip of an electrode traveling along said far surface at a torch travel speed such that a temperature distribution is created across the material between said near and far surfaces, whereby the stress state at said near surface undergoes a reversal from tension to compression substantially without heat sinking external to said near surface.

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LOW-HYDROGEN-TYPE COVERED ARC WELDING ELECTRODE FOR HIGH STRENGTH CR-MO STEELS

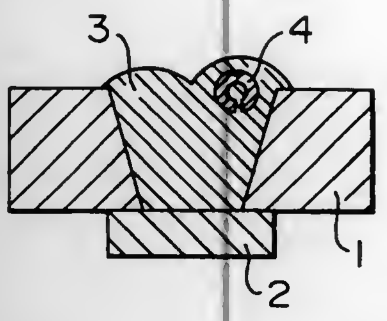
Akinobu Gotoh, and Takeshi Nakagawa, both of Fujisawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 2, 1996, Ser. No. 724,828

Claims priority, application Japan, Oct. 18, 1995, 7-269603; Jul. 26, 1996, 8-198123

Int. Cl.^{6} B23K *35/22*

U.S. Cl. 219—145.23 **1 Claim**



1. A low-hydrogen-type covered arc welding electrode for high-strength Cr—Mo steels comprising a core wire and a covering material, characterized in that:

the contents of components in said covered arc welding electrode satisfy the following correlations:
$[Si]_w+K\times[Si]_f$: 0.35 to 2.4 weight percent,
$[Mn]_w+K\times[Mn]_f$: 0.5 to 2.0 weight percent,
$[Cr]_w+K\times[Cr]_f$: 2.0 to 4.0 weight percent,
$[Mo]_w+K\times[Mo]_f$: 0.01 to 1.5 weight percent,
$[V]_w+K\times[V]_f$: 0.15 to 0.60 weight percent, and
$[C]_w+K\times[C]_f$: 0.15 weight percent or less;

said covered arc welding electrode further contains at least one group of components selected from the groups consisting of (Ti, TiO_2, Zr, and Hf), (Nb and Ta), Ni, Co, W, and (B and B_2O_3), so as to satisfy the following correlations:
$[Ti]_w+[Zr]_w+[Hf]_w+K\times([Ti]_f+0.02\times[TiO_2]_f+[Zr]_f+[Hf]_f)$: 0.005 to 0.500 weight percent,
$[Nb]_w+[Ta]_w+K\times([Nb]_f+[Ta]_f)$: 0.005 to 0.200 weight percent,
$[Ni]_w+K\times[Ni]_f$: 0.10 to 1.00 weight percent,
$[Co]_w+K\times[Co]_f$: 0.10 to 1.00 weight percent,
$[W]_w+K\times[W]_f$: 0.10 to 2.50 weight percent, and
$[B]_w+K\times([B]_f+0.12\times[B_2O_3]_f)$: 0.002 to 0.1 weight percent;

wherein

$[X]_w$ represents a content of chemical component X in said core wire by weight percent to the total weight of said core wire, $[Y]_f$ represents a content of chemical component Y in said covering material by weight percent to the total weight of said covering material, and K equals to $t/(1-t)$ wherein t is a covering rate which represents a weight ratio of the covering material to the welding electrode per unit length; and

the water content in the entire welding electrode is controlled to 50 to 600 ppm by weight,

the basicity BL of said covering material expressed by the following equation is controlled to 2.0 to 8.0:

$$(BL = ([CaO]_f + [MgO]_f + [BaO]_f + [CaF_2]_f + [Na_2O]_f + [K_2O]_f + 0.5 \times ([FeO]_f + [MnO]_f))/([SiO_2]_f + 0.5 \times ([Al_2O_3]_f + [TiO_2]_f + [ZrO_2]_f))),$$

and

the P, S, N, Al and Mg contents are controlled as follows:
$[P]_w+K\times[P]_f$: 0.015 weight percent or less,
$[S]_w+K\times[S]_f$: 0.010 weight percent or less,
$[N]_w+K\times[N]_f$: 0.015 weight percent or less,
$[Al]_w+K\times[Al]_f$: 0.30 weight percent or less, and
$[Mg]_w+K\times[Mg]_f$: 0.50 weight percent or less.

5,688,421

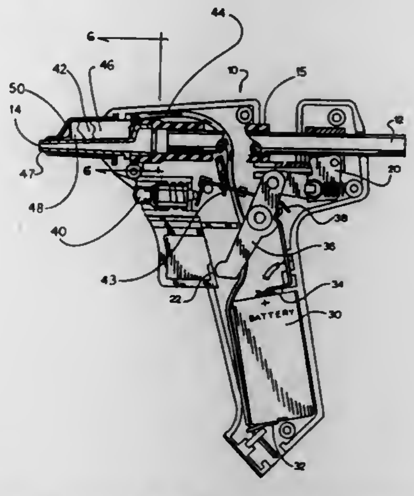
DISPENSER FOR HEAT-LIQUEFIABLE MATERIAL WITH CONTIGUOUS PTC HEATER AND HEAT EXCHANGING MEMBER

William M. Walton, 6564 Thomas Pkwy., Rockford, Ill. 61111

Continuation of Ser. No. 125,548, Sep. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 774,802, Oct. 11, 1991, abandoned. This application Feb. 22, 1996, Ser. No. 605,686

Int. Cl.^{6} H05B *1/00*

U.S. Cl. 219—230 **6 Claims**



1. In a device for heating and dispensing heat-liquefiable material of the type adapted to receive solid heat-liquefiable material, and to dispense liquefied material from the outlet thereto, including means for incrementally feeding said solid heat-liquefiable material into said device, the improvement comprising:

a low volume thermal mass heat exchanger structure comprised of a formed heat conductive material conductor and dispensing outlet with an electrical resistive heating element positioned in contiguous relationship to the outer wall surface of said conductor, said structure arranged to achieve direct contact with said heat-liquefiable material when fed into said device to liquefy and dispense the material when said heat exchanger structure is energized to an average volumetric watt density of at least 125 watts per cubic inch during warm-up to the heat-liquefication temperature,

an operator control means comprised of a manually actuatable momentary on/off switch connected in the circuit to energize said heating element member of said heat exchanger structure and arranged to operate simultaneously with said means for incrementally feeding said solid-heat-liquefiable material,

whereby actuation of said operator control means causes switch closure causing said heat exchanger structure to promptly melt and dispense said heat-liquefiable material and switch opening, allowing re-solidification of said material.

5,688,422

PROGRAMMABLE FAN CONTROL METHOD AND APPARATUS FOR USE IN A FOOD OVEN

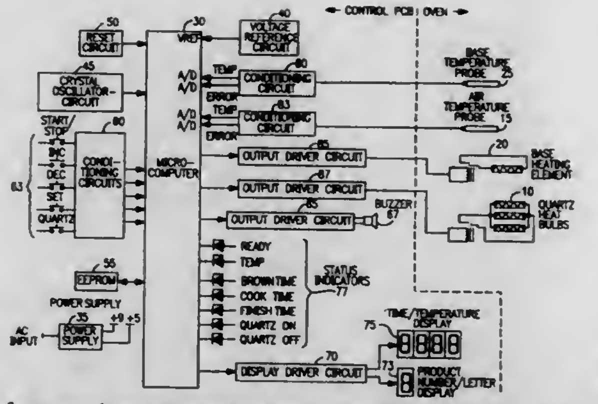
Tim A. Landwehr, West Alexandria, and Gary L. Mercer, Eaton, both of Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed Apr. 28, 1995, Ser. No. 430,718

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—491 **12 Claims**

1. A cooking device for cooking food comprising:
a cavity;
heating means disposed in the cavity;
temperature sensing means for determining the temperature in the cooking device;
a fan operable in at least a HI mode and a LO mode to move air in the cooking device; and



fan control means responsive to the temperature sensing means for determining in which mode to operate the fan;
wherein the fan control means operates the fan in LO mode by pulsing fan power on for a first predetermined amount of time every second predetermined amount of time to ensure continuous movement of the fan.

5,688,423

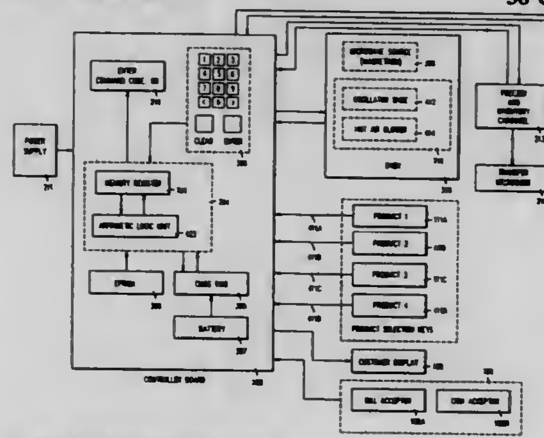
VENDING MACHINE INCLUDING MULTIPLE HEAT SOURCES WITH PROGRAMMABLE COOK CYCLES

Paul T. Rndewicz, Mission Viejo; Thom Thomas, Ventura, and James W. Bradfield, Mill Valley, all of Calif., assignors to KRh Thermal Systems, So. San Francisco, Calif.

Filed Aug. 31, 1994, Ser. No. 299,927

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—501 **38 Claims**



1. An apparatus comprising:
a microcontroller;
a product selection switch coupled to said microcontroller, said product selection switch being associated with one or more displays for indicating a food product to be selected by a user, said product selection switch indicating a selected food product to said microcontroller on being operated by said user;
a memory coupled to said microcontroller, said memory storing a plurality of data structures, each data structure comprising a cook cycle representative of the process for cooking a food product by a heat source, each cook cycle comprising a default cook cycle parameter;
a keypad connected to said microcontroller, wherein said keypad transmits a modified cook cycle parameter to said microcontroller on entry of said modified cook cycle parameter by an operator, and further wherein said microcontroller overwrites said default cook cycle parameter with said modified cook cycle parameter in said memory; and
a first heat source having an input lead coupled to said microcontroller;
wherein said microcontroller reads from said memory said modified cook cycle parameter corresponding to said selected food product indicated by said product selection switch and wherein said microcontroller operates said first heat source to heat at least a portion of said selected food product using said modified cook cycle parameter to control operation of said first heat source.

5,688,424

PTC THERMISTOR

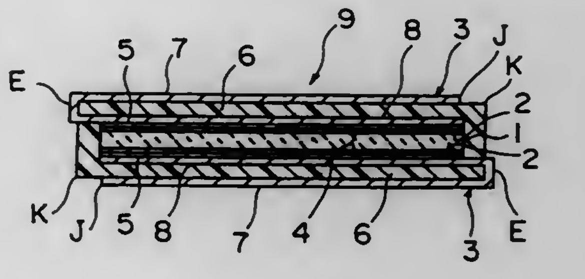
Shyoji Asida, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 216,033, Mar. 22, 1994. This application Feb. 23, 1996, Ser. No. 605,707

Claims priority, application Japan, Mar. 12, 1949, 5-064480

Int. Cl.^{6} H05B *3/06*; H01C *7/10*; H02H *5/04*

U.S. Cl. 219—531 **11 Claims**



1. A PTC thermistor comprising:
a ceramic body having two opposing major surfaces, two opposing side surfaces, and positive temperature coefficient resistivity;
a pair of electrode layers, each of said electrode layers having side surfaces, said electrode layers being provided on both major surfaces of the ceramic body, respectively, so as to be opposed to each other with said ceramic body interposed therebetween;
a pair of metal terminals each having:
a connecting plate having an inner surface and an outer surface, said connecting plate being electrically connected to a respective one of said electrode layers over substantially an entire surface of said respective electrode layer;
a terminal plate having opposed ends, said terminal plate being opposed to and spaced apart from said connecting plate so that an inner space is formed between said terminal plate and said inner surface of said connecting plate, said terminal plate having an inner surface and an outer contact surface opposed to said inner surface; and
a linking portion electrically connecting said connecting plate and said terminal plate, said connecting plate, said terminal plate and said linking portion being integrally formed; and
a resin molded portion provided for integrating said connecting plates and said ceramic body, said resin molded portion being formed so as to: expose said outer contact surface of said terminal plate of each of said metal terminals; fill completely said inner space between said connecting plate and said terminal plate of each of said metal terminals; cover and come into contact with said side surfaces of said ceramic body and corresponding said side surfaces of said electrode layers without spacing therebetween; and have end surfaces which extend outwardly of at least one of said ends of each terminal plate.

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5,688,425

SUBMERGED NOZZLE CHANGING APPARATUS

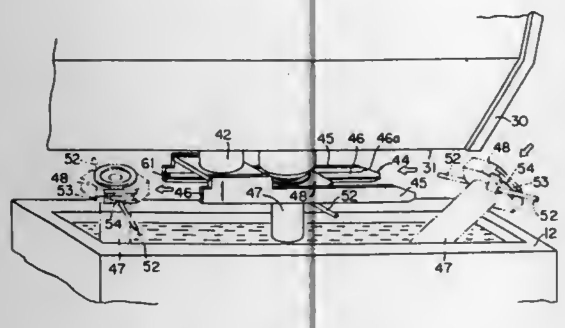
Kenji Yamamoto, Sanyo-cho, and Tadao Taniguchi, Bizen, both of Japan, assignors to Shinagawa Shirorenga Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP94/00742, § 371 Date Jan. 3, 1996, § 102(e) Date Jan. 3, 1996, PCT Pub. No. WO95/30501, PCT Pub. Date Nov. 16, 1995

PCT Filed May 6, 1994, Ser. No. 583,091

Int. Cl.^{6} B22D *41/56*

U.S. Cl. 222—606 **8 Claims**



1. A submerged nozzle changing apparatus comprising:

a submerged nozzle holding cylinder actuator (**42**) fixedly provided below a slide valve device (**32**) provided at a bottom of a molten metal container (**30**) for controlling flow rate of a molten metal, said cylinder actuator (**42**) having a piston rod (**43**) movable vertically with respect to the slide valve device;

a guide arm unit (**44**) fixedly mounted to said piston rod (**43**) for vertical movement with the piston rod and having a pair of a parallel horizontal guide rails (**45**) provided in oppositely facing inner surfaces thereof with horizontal guide grooves (**46**) having open opposite ends, said guide grooves (**46**) being adapted to receive, in slidable engagement therein, tongues (**53**) provided on a nozzle case (**48**) fitted on an upper portion of a submerged nozzle (**47**) respectively, said guide grooves (**46**) having a length for holding at least three nozzle cases; and

a nozzle changing cylinder actuator (**56**) having a pressing member (**60**) movable horizontally into and out of said guide arm unit (**44**) for abutting and shifting the submerged nozzle with said tongues (**53**) in engagement in said guide grooves (**46**), along the guide grooves to a nozzle setting position immediately under a molten metal pouring opening of said slide valve device (**32**), said cylinder actuator (**42**) being operable to move said piston rod (**43**) and hence said guide rails (**45**) upwardly, to thereby move the submerged nozzle (**47**) in said nozzle setting position upwardly so as to press an upper end of said nozzle closely against a bottom of said slide valve device (**32**), said pressing member (**60**) being also movable to shift the submerged nozzle, after said piston rod (**43**) and hence said guide arm unit (**44**) are moved downward, from said nozzle setting position to a position away from the nozzle setting position.

5,688,426

HYBRID METAL WEBBED COMPOSITE BEAM

Brad L. Kirkwood, Kent; Michael M. Stepan, Langley, and Paul J. Patt, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

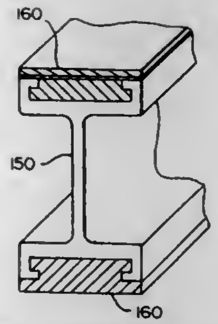
Filed Jun. 7, 1995, Ser. No. 473,910

Int. Cl.^{6} H05B *6/10*

U.S. Cl. 219—633 **17 Claims**

1. A hybrid metal webbed composite beam, comprising:

(a) a T section metal web having at least one spar cap flange;



(b) a fiber-reinforced composite attached to the flange to provide a faying surface for connecting the beam to a wingskin with an adhesive bond or weld.

5,688,427

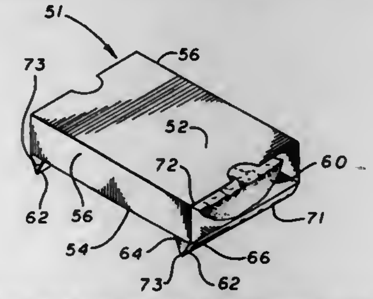
MICROWAVE HEATING PACKAGE HAVING END FLAPS FOR ELEVATING AND VENTING THE PACKAGE

Anthony J. Gallo, Jr., Omaha, Nebr., assignor to ConAgra, Inc., Omaha, Nebr.

Division of Ser. No. 255,065, Jun. 7, 1994, Pat. No. 5,510,132. This application Feb. 27, 1996, Ser. No. 607,583

Int. Cl.^{6} H05B *6/80;* **A23L** *1/01*

U.S. Cl. 219—732 **17 Claims**



1. A microwave heating package for containing a food item to be cooked in a microwave oven, the package comprising a top wall, a bottom wall, and a side wall for enclosing the food item between the top and bottom walls, the side wall including two opposed end walls, each end wall being scored to define a first end flap between the top and bottom walls and a second end flap between the top and bottom walls, each end flap partially separable from the remainder of the package along the scoring, the location of the scoring sufficient to permit the separable portion of each end flap to move from a position between the top and bottom walls to a position underneath the bottom wall.

5,688,428

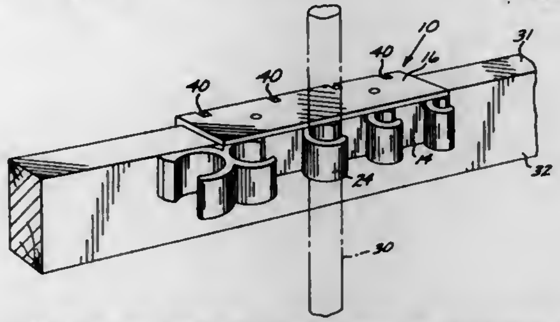
HOLDER FOR VERTICAL STEEL REBAR

Joe Maguire, 1865 261st St., Lomita, Calif. 90717-3306

Filed Mar. 11, 1996, Ser. No. 614,970

Int. Cl.^{6} E04G *17/00*

U.S. Cl. 249—91 **8 Claims**



1. A device for supporting vertical rebar in preparation for pouring concrete into an area framed by a wooden frame member, said device having a vertical axis and being adapted to be positioned on said frame member comprising:

a U-shaped member comprising a base member and first and second leg portions vertically extending to said base member to join said first and second portions, a channel area for receiving the wooden frame member being formed between said joined leg portions, said first and second leg portions having exterior surfaces; and

a first set of vertically elongated holding members extending from the exterior surface of said first leg portion, each of said holding members frictionally engaging and holding vertical rebar of a predetermined outside diameter inserted therein, said first set of elongated members extending and spaced horizontally along said first leg portion.

5,688,429

FLAME-RETARDANT AND FABRIC-SOFTENING TREATMENT OF TEXTILE MATERIALS

Mohsen Zakikhani, and Xiao Ping Lei, both of Birmingham, England, assignors to Albright & Wilson UK Limited, West Midlands, England

Filed Oct. 17, 1995, Ser. No. 545,364

Claims priority, application United Kingdom, Oct. 25, 1994, 9421424

Int. Cl.^{6} D06M *13/313;13/322*

U.S. Cl. 252—8.61 **29 Claims**

1. A composition for both flame-retarding and fabric-softening a textile material, wherein said composition comprises a product obtained by the reaction of:

(a) a tetrakis (hydroxyorgano)phosphonium (THP^+) salt;

(b) an amide selected from the group consisting of urea and thiourea; and

(c) an aliphatic hydroxyl-reactive compound containing at least one alkyl group having from 12 to 30 carbon atoms.

5,688,430

SOFT FERRITE RAW MATERIAL POWDER, ITS SINTERED BODY, AND THEIR PRODUCTION METHOD AND APPARATUS

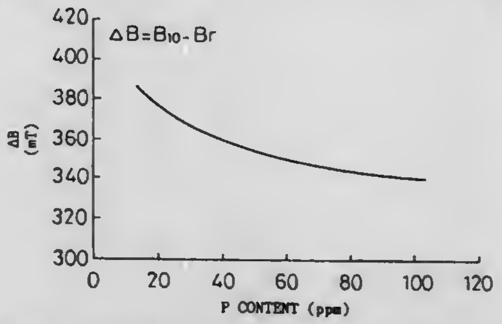
Katsushige Matsuzaki; Tatsunori Sunagawa; Kenji Kawahito, all of Futtsu; Junji Omori, Tokyo; Yoshitaka Yamana, Tokyo; Shoichi Osada, Tokyo; Kiyoshi Aritome, Tokyo; Yoshimasa Ikeda, Futtsu; Izumi Matsushita, Tokyo; Wataru Ohashi, Kawasaki; Kaoru Ito, Kawasaki; Fumihiko Hasegawa, Kawasaki; Shinya Nariki, Kawasaki; Michimasa Sasaki, Kawasaki; Noritane Tsugane, Kashiwa, and Toshiaki Kurihara, Ibaraki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP93/00222, § 371 Date Nov. 16, 1995, § 102(e) Date Nov. 16, 1995, PCT Pub. No. WO94/19283, PCT Pub. Date Jan. 9, 1994

PCT Filed Feb. 23, 1993, Ser. No. 507,519

Int. Cl.^{6} C04B *35/36;35/38;35/40;35/46*

U.S. Cl. 252—62.62 **8 Claims**



1. An Mn—Zn soft ferrite raw material powder produced by a high temperature oxidation method comprising 65–85 wt. % Fe, calculated as Fe_2O_3, 10–30 wt. % Mn, calculated as MnO, and 2–25 wt. % Zn, calculated as ZnO and a P and a Cr content of $P \leqq 20$ ppm and $Cr \leqq 50$ ppm and having a mean particle diameter of not greater than 0.1 μm and composition deviation of Fe_2O_3, MnO and ZnO is microscopically homogenous.

5,688,431

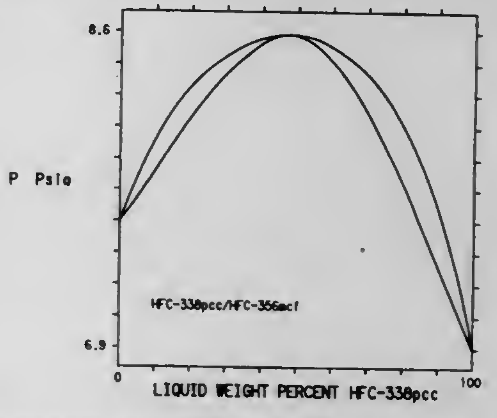
OCTAFLUOROBUTANE COMPOSITIONS

Barbara Haviland Minor, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 484,092, Jun. 7, 1995, which is a division of Ser. No. 315,176, Sep. 29, 1994, Pat. No. 5,562,855. This application Feb. 14, 1996, Ser. No. 601,219

Int. Cl.^{6} C09K *5/04*

U.S. Cl. 252—67 **3 Claims**



1. An azeotropic or azeotrope-like composition consisting essentially of:

(a) 1–80 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 20–99 weight percent 1,1,1,2,2,4-hexafluorobutane wherein when the temperature has been adjusted to about 25° C., the vapor pressure of the composition is higher than the vapor pressure of the individual components;

(b) 1–60 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 40–99 weight percent 1,1,1,3,3-pentafluorobutane wherein when the temperature has been adjusted to about 25° C., the vapor pressure of the composition is higher than the vapor pressure of the individual components;

(c) 1–75 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 25–99 weight percent 2,2-difluorobutane wherein when the temperature has been adjusted to about 25° C., the vapor pressure of the composition is higher than the vapor pressure of the individual components; or

(d) 1–80 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 20–99 weight percent 2,3-difluorobutane wherein when the temperature has been adjusted to about 25° C., the vapor pressure of the composition is higher than the vapor pressure of the individual components.

5,688,432

REPLACEMENT REFRIGERANT COMPOSITION

Stephen Forbes Pearson, Glasgow, United Kingdom, assignor to Star Refrigeration Limited, United Kingdom

PCT No. PCT/GB94/02042, § 371 Date Apr. 19, 1996, § 102(e) Date Apr. 19, 1996, PCT Pub. No. WO95/08602, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 20, 1994, Ser. No. 619,720

Int. Cl.^{6} C09K *5/04*

U.S. Cl. 252—67 **7 Claims**

1. A refrigerant composition for use in a refrigeration apparatus which comprises a mixture of:

(i) 1–50 wt % pentafluoroethane;

(ii) 30–90 wt % tetrafluoroethane; and

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(iii) isobutane in an amount greater than zero and less than an amount which would make the mixture flammable.

5,688,433
AMMONIA REFRIGERATING MACHINE, WORKING FLUID COMPOSITION AND METHOD

Keisuke Kasahara, Tokyo; Kuniaki Kawamura, Ibaragi-ken; Takashi Kaimai, and Hisashi Yano, both of Saitama-ken, all of Japan, assignors to Japan Energy Corporation, and Mayekawa Manufacturing Co., Ltd., both of Tokyo, Japan

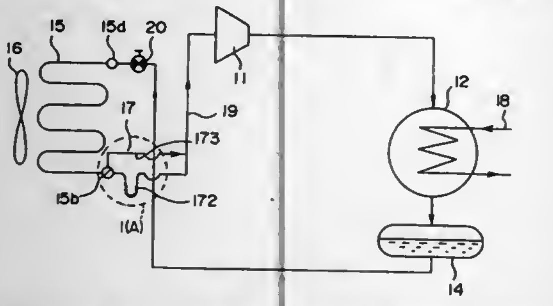
PCT No. PCT/JP92/01551, § 371 Date Jan. 7, 1994, § 102(e) Date Jan. 7, 1994, PCT Pub. No. WO94/12594, PCT Pub. Date Jun. 9, 1994

Continuation of Ser. No. 175,391, Jan. 7, 1994, abandoned.

This PCT application Nov. 27, 1992, Ser. No. 675,513

Int. Cl.⁶ C09K *5/04;* **C10M** *105/18*

U.S. Cl. 252—68 **14 Claims**



1. A working fluid composition for a refrigerating compressor using ammonia as a refrigerant which comprises a mixture of ammonia and at least 2% by weight of one or more polyether compounds having an average molecular weight of 300 to 1,800, said polyether compounds being represented by the formula (I)

$$R_1-[-O-(PO)_m-(EO)_n-R_2]_x \qquad (I)$$

wherein R_1 is a hydrocarbon group having 1 to 6 carbon atoms, R_2 is an alkyl group having 1 to 6 carbon atoms, PO is an oxypropylene group, EO is an oxyethylene group, x is an integer of from 1 to 4, m is a positive integer, and n is 0 or a positive integer.

5,688,434
IMIDE-AROMATIC PEROXYACIDS AS BLEACHING AGENTS

Carlo Venturello, Novara; Claudio Cavallotti, and Fulvio Burzio, both of Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

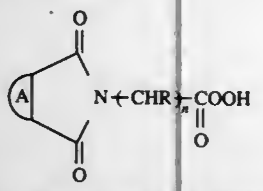
Division of Ser. No. 637,479, Jan. 4, 1991, Pat. No. 5,520,844, which is a continuation of Ser. No. 298,918, Jan. 19, 1989, abandoned. This application Jan. 29, 1996, Ser. No. 593,655

Claims priority, application Italy, Jan. 20, 1988, 19131/88

Int. Cl.⁶ C01B *15/10;* **C11D** *3/395;* **D06L** *3/02*

U.S. Cl. 252—186.42 **2 Claims**

1. A method for bleaching comprising applying a bleaching agent to textiles, wherein the bleaching agent is capable of being effectively operated at temperature between about 20° and 90°, said bleaching agent being an imide-aromatic (poly)peroxycarboxylic acid having the formula:



(I)

wherein A represents the residue of a benzene or napthalene ring optionally substituted by a COOH or COOOH group, the symbol or symbols R, which may be the same or different from each other, represent a hydrogen atom, a C_1–C_5 alkyl group, an OH group, a COOH group, a COOOH group, a COOR' group, wherein R' represents a C_1–C_5 alkyl group, or a substituted C_1–C_5 alkyl group wherein the substituent is nitro, an OH group or a C_1–C_5 alkoxy group, and n is an integer from 1 to 5.

5,688,435
PIGMENTED RHEOPECTIC CLEANING COMPOSITIONS WITH THIXOTROPIC PROPERTIES

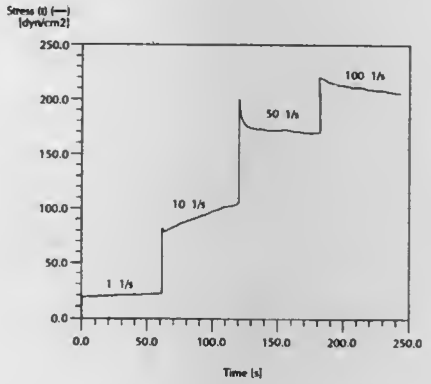
David A. Chang, Waldwick, and James W. Cavanagh, Ramsey, both of N.J., assignors to Reckitt & Colman Inc., Montvale, N.J.

Filed Mar. 18, 1996, Ser. No. 619,864

Claims priority, application United Kingdom, Aug. 10, 1995, 9516372

Int. Cl.⁶ C01B *11/06;11/04;* **C11D** *3/395;7/54*

U.S. Cl. 252—187.25 **6 Claims**

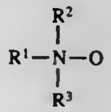


I. A thickened pigmented aqueous hypochlorite composition comprising, on a weight basis:

(a) from 0.5% to 10% of an alkali metal hypochlorite;

(b) from 0.25% to 1% of bentonite clay;

(c) from 0.5% to 2.5% of a tertiary amine oxide of the formula



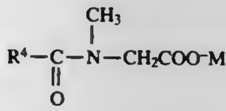
$$R^1-\overset{\displaystyle R^2}{\underset{\displaystyle R^3}{\overset{|}{\underset{|}{N}}}}-O$$

wherein R^1 is alkyl of from 10 to 16 carbon atoms, and each of R^2 and R^3 is alkyl of from 1 to 3 carbon atoms;

(d) from 0.25% to 2.0% of an alkali metal salt;

(e) a pH stabilizer in sufficient amount to provide a pH of 11 or higher;

(f) from 0.10% to 0.75% of an alkali metal sarcosinate of the formula



$$R^4-\underset{\underset{O}{\|}}{C}-\overset{\displaystyle CH_3}{\overset{|}{N}}-CH_2COO^-M^+$$

wherein R^4 is a straight chain alkyl of from 10 to 16 carbon atoms and M is lithium, sodium or potassium;

(g) from 0.08 to 0.80% of an alkali metal alkylbenzene sulphonate in which the alkyl group is straight chained and has from 10 to 14 carbon atoms; and

(h) from 0.01% to 0.5% of an inorganic pigment

wherein the molar ratio of (c) to (g) ranges from 5:1 to 11: 1, and the viscosity of the said composition is from 200 to about 1000 cps.

5,688,436
OPTICALLY ANISOTROPIC MATERIAL, PROCESS FOR PRODUCING IT, AND RETARDATION PLATE AND LIQUID CRYSTAL DISPLAY DEVICE USING SAME

Toshihiro Ohnishi; Takanobu Noguchi; Masato Kuwabara, all of Tsukuba; Koji Higashi, Takatsuki; Makoto Namioka, and Akiko Shimizu, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

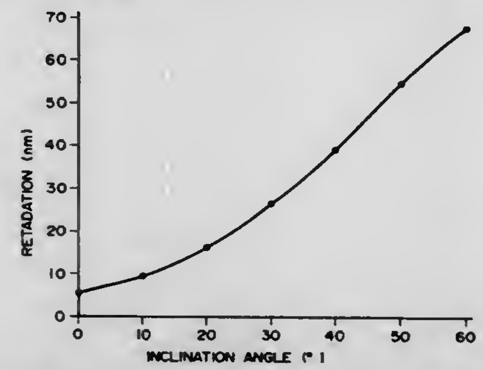
Continuation of Ser. No. 215,637, Mar. 22, 1994, abandoned.

This application Jun. 25, 1996, Ser. No. 670,097

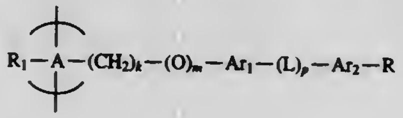
Claims priority, application Japan, Mar. 25, 1993, 5-066640; Jul. 19, 1993, 5-178064; Aug. 11, 1993, 5-199378

Int. Cl.⁶ C09K *19/52;19/34;19/12;19/20*

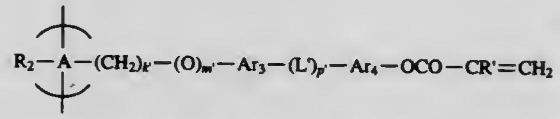
U.S. Cl. 252—299.01 **26 Claims**



1. An optically anisotropic film comprising a polymer of a liquid crystal oligomer having positive refractive index anisotropy and showing nematic or smectic phase, said liquid crystal oligomer being selected from linear-chain or cyclic liquid crystal oligomers having the following recurring units (I) and (II):

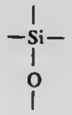


(I)

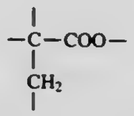


(II)

wherein A is a group represented by the following formula (III) or (IV):

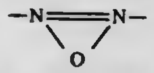


$$-\overset{|}{\underset{\underset{\underset{|}{O}}{|}}{Si}}- \qquad (III)$$



$$-\overset{|}{\underset{\underset{\underset{|}{CH_2}}{|}}{C}}-COO- \qquad (IV)$$

wherein, in the formula (III), —Si—O— is a main chain of the recurring unit (I) or (II) and, in the formula (IV), —C—CH_2— is linked to R_1— and —$(CH_2)_k$— and is a main chain of the recurring unit (I) or to R_2— and —$(CH_2)_{k'}$— and is a main chain of the recurring unit (II) and COO group is positioned as a side chain; when A in the formula (I) is the formula (III) and when A in the formula (II) is the formula (III), R_1 and R_2 are independently hydrogen, a C_{1-6} alkyl group or a phenyl group, and when A in the formula (I) is the formula (IV) and when A in the formula (II) is the formula (IV), R_1 and R_2 are independently hydrogen or a C_{1-6} alkyl group; k and k' are independently an integer of 2 to 10; m and m' are independently 0 or 1; Ar_1, Ar_2, Ar_3 and Ar_4 are independently a 1,4-phenylene group, a 1,4-cyclohexylene group, a pyridine-2,5-diyl group or a pyrimidine-2,5-diyl group; L and L' are independently CH_2—O—, —O—CH_2—, —COO—, —OCO—, —CH_2—CH_2—, —CH=N—, —N=CH— or a divalent group represented by the formula:



(V)

p and p' are independently 0 or 1; R is halogen, a cyano group, a C_{1-10} alkyl group or a C_{1-10} alkoxy group; and R' is hydrogen or a C_{1-5} alkyl group, wherein when the numbers of the recurring units (I) and (II) in one molecule of said oligomer are supposed to be n and n', respectively, n and n' are each an integer of 1 to 20 and satisfy the relation of $4 \leqq n+n' \leqq 21$, and further characterized in that the terminal group of the recurring unit (II) is polymerized, and that the optical axis of said film is aligned in the direction of an angle from between 10° and 80° against the normal line of the film.

5,688,437
LIQUID CRYSTAL COMPOSITION, LIQUID CRYSTAL DEVICE USING THE COMPOSITION, LIQUID CRYSTAL APPARATUS AND DISPLAY METHOD

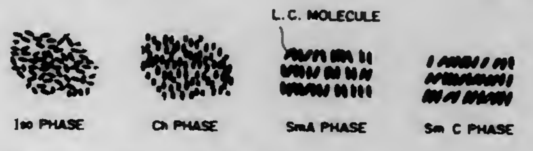
Koichi Sato, Atsugi; Hiroyuki Kitayama, Isehara; Kenji Shinjo, Atsugi; Katsutoshi Nakamura, Hiratsuka, and Shinichi Nakamura, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1995, Ser. No. 422,262

Claims priority, application Japan, Apr. 14, 1994, 6-075929; Apr. 14, 1994, 6-075930; Jul. 26, 1994, 6-174088

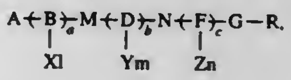
Int. Cl.⁶ C09K *19/34;19/32;19/12;19/20*

U.S. Cl. 252—299.61 **64 Claims**



I. A liquid crystal composition, comprising:

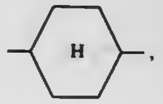
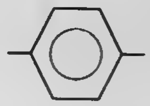
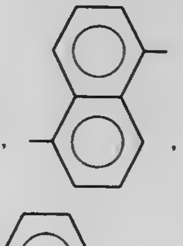
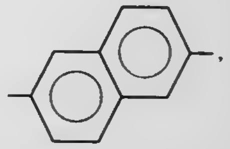
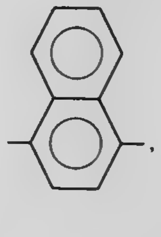
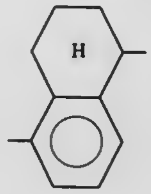
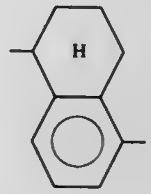
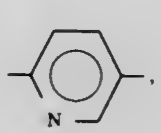
at least one fluorine-containing mesomorphic compound (a) represented by the following formula (I):



$$A-(\underset{\underset{Xl}{|}}{B})_a-M-(\underset{\underset{Ym}{|}}{D})_b-N-(\underset{\underset{Zn}{|}}{F})_c-G-R. \qquad (I)$$

in which

B, D and F independently denote

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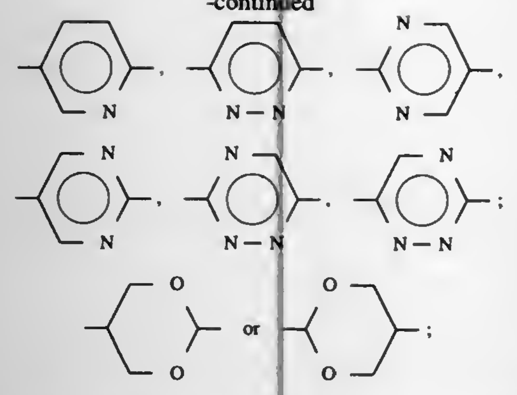


a, b and c independently denote an integer of 0–3 with the proviso that a+b+c is at least 2;

M and N independently denote —COO—, —OCO—, —COS—, —SCO—, —COSe—, —SeCO—, —COTe—, —TeCO—, $-(CH_2CH_2)_d$ wherein d is an integer of 1-4, —CH═CH—, —C≡C—, —CH═N—, —N═CH—, —CH_2O—, —OCH_2—, —CO—, —O— or a single bond;

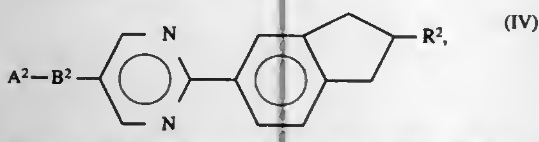
X, Y and Z independently denote —H, —Cl, —F, —Br, —I, —OR, —OCH_3, —CF_3, —OCF_3—, —CH_3, —CN or —NO_2 and l, m and n independently denote an integer of 0– 4;

G is —COO—C_eH_{2e}—, —O—C_eH_{2e}—, —C_eH_{2e}—, —OSOO—, —OOSO—, —SOO—, —SOOC$_eH_{2e}$—, —O(C_eH_{2e}—O)$_q$$C_{e'}H_{2e'}$, —$C_eH_{2e}$—N($C_pH_{2p+1}$)—$SO_2$—, —$C_eH_{2e}$—N($C_pH_{2p+1}$)—CO— wherein e and e' independently denote an integer of 1–20, q is an integer of 1–6 and p is an integer of 0–4;

A is a linear or branched group represented by —O$-(C_fH_{2f}-)_w$O—C_gH_{2g+1}, $-(C_fH_{2f}-O)_w$$C_gH_{2g+1}$, —$C_fH_{2f}$—R', —O—$C_fH_{2f}$—R', —COO—$C_fH_{2f}$—R', —OCO—$C_fH_{2f}$—R' wherein R' is —Cl, —F, —CF_3, —NO_2, —CN, —H, —COO—$C_{f'}H_{2f'+1}$ or —OCO—$C_{f'}H_{2f'+1}$ in which f, f' and g independently denote an integer of 1–20 and w is an integer of 1– 10; and

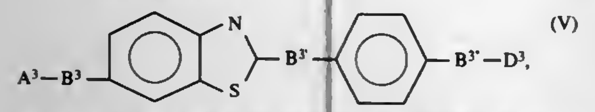
R is $-(C_xF_{2x}O)_z$$C_yF_{2y+1}$ wherein x is independently an integer of 1–10 for each $C_xF_{2x}O$ group, y is an integer of 1–10, and z is an integer of 1–10; and

at least one achiral compound (b) selected from the group consisting of those represented by the following formulae (IV) to (XVI) shown below:



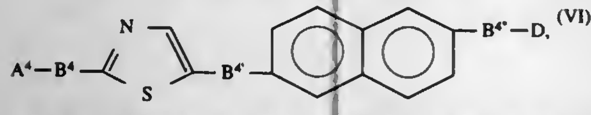
(IV)

in which A^2 is a linear or branched alkyl group having 1–20 carbon atoms; B^2 is a single bond, —O—, —COO— or —OCO—; and D^2 is a linear or branched alkyl group having 1–20 carbon atoms;



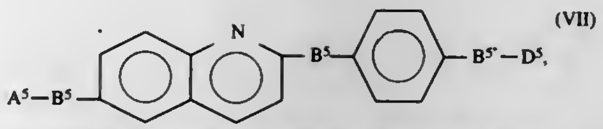
(V)

in which A^3 is a linear or branched alkyl group having 1–20 carbon atoms; B^3, $B^{3'}$ and $B^{3''}$ independently denote a single bond, —O—, —COO— or —OCO—; and D^3 is a linear or branched alkyl group having 1–20 carbon atoms;



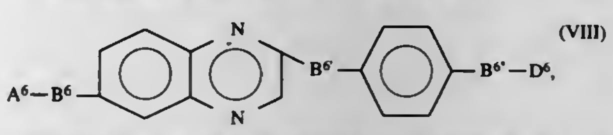
(VI)

in which A^4 is a linear or branched alkyl group having 1–20 carbon atoms; B^4, $B^{4'}$ and $B^{4''}$ independently denote a single bond, —O—, —COO— or —OCO—; and D^4 is a linear or branched alkyl group having 1–20 carbon atoms;



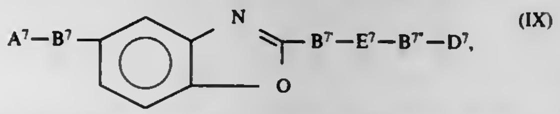
(VII)

in which A^5 is a linear or branched alkyl group having, 1–20 carbon atoms; B^5, $B^{5'}$ and $B^{5''}$ independently denote a single bond, —O—, —COO— or —OCO—; and D^5 is a linear or branched alkyl group having 1–20 carbon atoms;



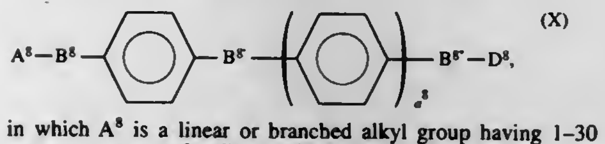
(VIII)

in which A^6 is a linear or branched alkyl group having 1–20 carbon atoms; B^6, $B^{6'}$ and $B^{6''}$ independently denote a single bond, —O—, —COO— or —OCO—; and D^6 is a linear or branched alkyl group having 1–20 carbon atoms;



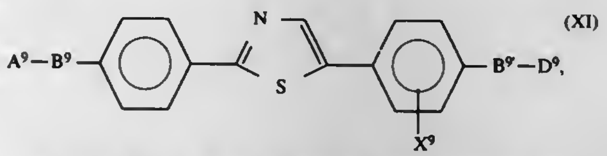
(IX)

in which A^7 is a linear or branched alkyl group having 1–20 carbon atoms; B^7, $B^{7'}$ and $B^{7''}$ independently denote a single bond, —O—, —COO— or —OCO—; D^7 is a linear or branched alkyl group having 1–20 carbon atoms; and E^7 is 1,4-phenylene or 2,6-naphthylene;



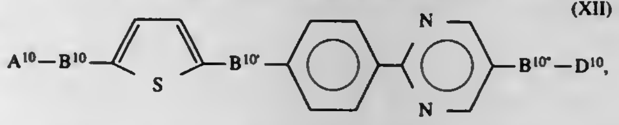
(X)

in which A^8 is a linear or branched alkyl group having 1–30 carbon atoms; B^8, $B^{8'}$ and $B^{8''}$ independently denote a single bond, —O—, —COO— or —OCO—; D^8 is a linear or branched alkyl group having 1–20 carbon atoms; and a^8 is 1 or 2;



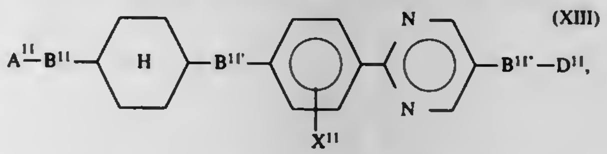
(XI)

in which A^9 is a linear or branched alkyl group having 1–20 carbon atoms; B^9 and $B^{9'}$ independently denote a single bond, —O—, —COO— or —OCO—; D^9 is a linear or branched alkyl group having 1–20 carbon atoms; and X^9 is —H or —F;



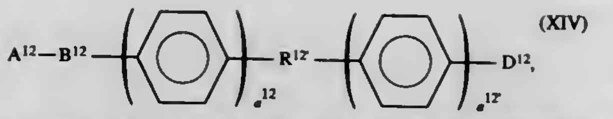
(XII)

in which A^{10} is a linear or branched alkyl group having 1–20 carbon atoms; B^{10}, $B^{10'}$ and $B^{10''}$ independently denote a single bond, —O—, —COO— or —OCO—; and D^{10} is a linear or branched alkyl group having 1–20 carbon atoms;



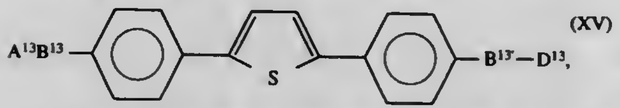
(XIII)

in which A^{11} is a linear or branched alkyl group having 1–20 carbon atoms; B^{11}, $B^{11'}$ and $B^{11''}$ independently denote a single bond, —O—, —COO— or, —OCO—; D^{11} is a linear or branched alkyl group having 1–20 carbon atoms; and X^{11} is —H or —F;



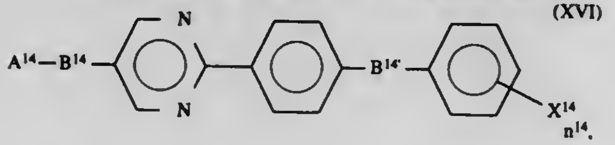
(XIV)

in which A^{12} is a linear or branched alkyl group having 1–20 carbon atoms; B^{12} and $B^{12'}$ independently denote a single bond, —O—, —COO— or —OCO—; D^{12} is a cyano group; and a^{12} and $a^{12'}$ are independently 1 or 2;



(XV)

in which A^{13} is a linear or branched alkyl group having 1–20 carbon atoms; B^{13} and $B^{13'}$ independently denote a single bond, —O—, —COO— or —OCO—; and D^{13} is a linear or branched alkyl group having 1–20 carbon atoms; and



(XVI)

in which A^{14} is a linear or branched alkyl group having 1–20 carbon atoms; B^{14} and $B^{14'}$ independently denote a single bond, —O—, —COO— or —OCO—; X^{14} is —F; and n^{14} is an integer of 1–5.

5,688,438

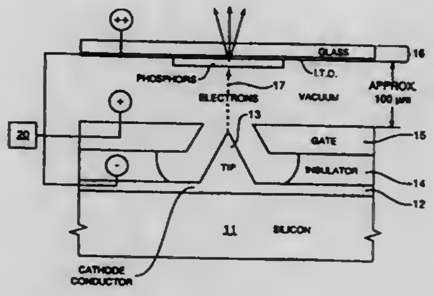
PREPARATION OF HIGH PURITY SILICATE-CONTAINING PHOSPHORS

Surjit S. Chadha, Meridian, Id., assignor to Micron Display Technology, Inc., Boise, Id.

Filed Feb. 6, 1996, Ser. No. 597,218

Int. Cl.^{6} C09K ***11/59***

U.S. Cl. 252—301.4 F **54 Claims**



1. A method for preparing a silicate-containing phosphor comprising:

(a) providing a mixture of oxygen-containing metal or metalloid compounds;

(b) providing a gaseous silicon compound selected from the group consisting of a silicon hydride, a silicon halide, and a silicon hydride halide;

(c) combining the mixture of metal or metalloid compounds with the gaseous silicon compound in an mount sufficient to convert the compounds to silicates; and

(d) heating the silicates under conditions effective to form a phosphor.

5,688,439

COLLOIDAL DISPERSIONS OF CERIUM OXIDE CORE/TITANIUM OXIDE SHEATH PARTICULATES AND PHOTOCATALYTIC COATINGS PROVIDED THEREBY

Thierry Chopin, Saint-Leu la Foret; Denis Huguenin, Paris, and Alain Mathurin, Ouistreham, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed May 9, 1995, Ser. No. 437,310

Claims priority, application France, May 9, 1994, 94 05686

Int. Cl.^{6} B01J ***13/00;21/06;*** **A61K** ***7/42;*** **B32B** ***15/02***

U.S. Cl. 252—309 **24 Claims**

1. A colloidal dispersion comprising solid colloidal particulates in a liquid medium, said colloidal particulates consisting of a core consisting of cerium oxide, said core being at least partially coated with a sheathing layer consisting of titanium oxide.

5,688,440

ORGANIC GELLATION AGENTS

Charles M. Garner, McGregor, Tex., assignor to Baylor University, Waco, Tex.

Filed Oct. 26, 1995, Ser. No. 548,542

Int. Cl.^{6} B01J ***13/00;*** **C10L** ***7/02***

U.S. Cl. 252—315.1 **13 Claims**

1. A method for gelling an organic liquid comprising:

dissolving an effective amount of trans-1-phenyl-4-tert-butylcyclohexanol, trans-1-(para-fluorophenyl)-4-tert-butylcyclohexanol, or trans-1-(pentafluorophenyl)-4-tert-butylcyclohexanol in an organic liquid and cooling resultant mixture to form a gel.

5,688,441

THIXOTROPIC CONDUCTIVE PASTE

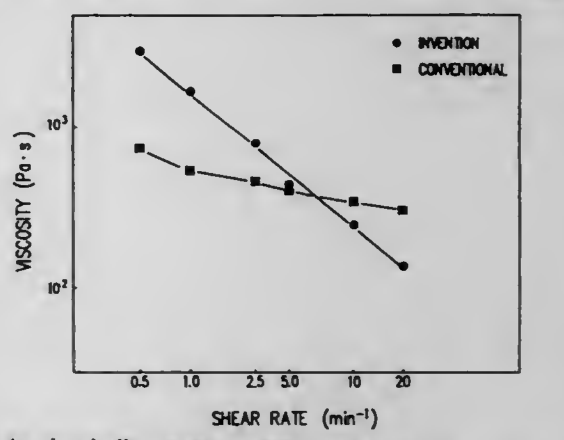
Minehiro Itagaki, Monguchi; Yoshihiro Bessho, Higashiosaka; Satoru Yuhaku, Osaka; Yasuhiko Hakotani, Nishinomiya; Kazuhiro Miura, Osaka, and Kazuyuki Okano, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 240,376, May 10, 1994, Pat. No. 5,503,777. This application Dec. 26, 1995, Ser. No. 581,352

Claims priority, application Japan, May 10, 1993, 5-108492

Int. Cl.^{6} H01B ***1/16;1/22***

U.S. Cl. 252—514 **7 Claims**



1. An electrically conductive paste, comprising:

inorganic material powders containing an inorganic component comprising electrically conductive material powders and glass powders, wherein the electrically conductive material powders are selected from the group consisting of gold, copper, nickel, ruthenium, platinum, molybdenum, tungsten, and alloys and oxides thereof;

an organic vehicle containing an electrically conductive paste resin and an organic solvent, wherein the electrically conductive paste resin contains at least one organic resin selected

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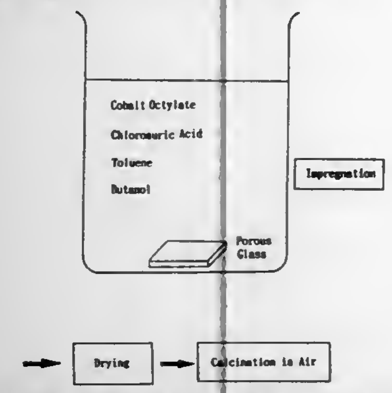
from the group consisting of polyvinyl butyral resin, polyvinyl alcohol resin, butyral resin, acrylic resin and phenol resin; and

0.5 to 5.0% of the entire paste composition by weight of a compound selected from the group consisting of a) a metal organic complex containing an alcohol or an aldehyde, and b) an organic complex of silicon or boron.

5,688,442
NONLINEAR OPTICAL MATERIALS AND PROCESS FOR PRODUCING THE SAME

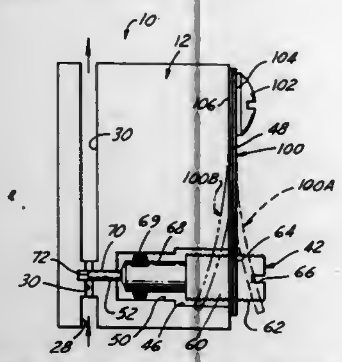
Masanori Ando; Kohei Kadono; Masatake Haruta; Toru Sakaguchi, and Masaru Miya, all of Ikeda, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Division of Ser. No. 399,831, Mar. 7, 1995. This application May 1, 1996, Ser. No. 640,714
Claims priority, application Japan, Mar. 11, 1994, 6-67841
Int. Cl.^{6} F21V *9/00;* G02F *1/35*
U.S. Cl. 252—582 **4 Claims**



1. A process for producing a third-order nonlinear optical material, comprising the steps of impregnating in a porous transparent matrix a solution containing a precursor of at least one oxide of at least one metal selected from the group consisting of V, Cr, Mn, Fe, Co, Ni and Cu, drying, then calcinating the resulting transparent matrix to thereby have particles of the metal oxide having a particle size of 500 nm or below dispersed and deposited in the transparent matrix.

5,688,443
TEMPERATURE COMPENSATED FLUID FLOW METERING CARBURETOR AND METHOD

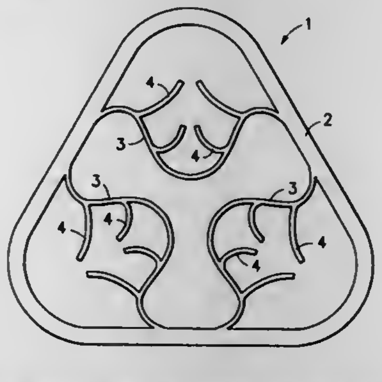
Mark S. Swanson, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.
Continuation of Ser. No. 419,267, Apr. 10, 1995, abandoned. This application Oct. 3, 1996, Ser. No. 739,615
Int. Cl.^{6} F02M *1/10*
U.S. Cl. 261—39.3 **35 Claims**



1. In a carburetor having a mixing passage, a fuel supply chamber, fuel duct means to conduct fuel from the chamber to the mixing passage, a fuel metering system associated with said fuel duct means including variable flow restriction means for varying the effective flow cross-sectional area of said fuel duct means to modulate the flow rate of fuel to said mixing passage, said variable flow restriction means comprising first and second structures defining said flow cross-sectional area and having different coefficients of expansion such that differential expansion and contraction of said first and second structures relative to one another in response to ambient temperature changes varies the flow-controlling cross-sectional area of said fuel duct means inversely relative to ambient temperature changes, said first structure comprising carburetor body support means containing said fuel duct means and having a first coefficient of linear expansion, said second structure comprising flow restriction means having a second coefficient of linear expansion considerably greater than said first coefficient of linear expansion, said flow restriction means having a fuel metering portion disposed in flow controlling relation with said fuel duct means and having a mounting portion secured in fixed relation to said support means and spaced from said fuel metering portion such that the differential expansion and contraction of said flow restriction means relative to said support means in response to the ambient temperature changes causes movement of said fuel metering portion in a direction to effect the variation in flow controlling cross-sectional area of said fuel duct means, the improvement in combination therewith wherein said variable restriction means comprises a needle body and said mounting portion comprises a bi-metal strip having a fixed end fixedly secured immovably to said support means and a movable free operably coupled to one end of said needle body, said fuel metering portion of said restriction means comprising an extension of said needle body extending axially away from said one end of said needle body and having a stem portion slidable in a bore of said support means and terminating at a free end thereof remote from said strip, said needle body being unrestrained from the stem portion free end to the coupling to said strip movable end, said stem portion free end being movable in a fuel passageway of said fuel duct means to vary said flow controlling cross-section thereof in response to ambient temperature-change-induced movement of the strip free end relative to the strip fixed end.

5,688,444
TOWER PACKING ELEMENT

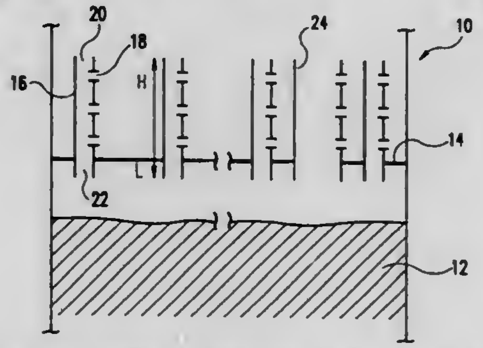
T. Daniel Koshy, Hudson, Ohio, assignor to Norton Chemcial Process Products Corporation, Stow, Ohio
Filed Jul. 29, 1996, Ser. No. 681,652
Int. Cl.^{6} B01F *3/04*
U.S. Cl. 261—94 **5 Claims**



1. A random dumped packing element having a peripheral body member in the general shape of an equilateral triangle having width and depth dimensions, measured from an apex to the nearest point on the opposed base and along the axis of the element respectively, wherein the width is greater than the depth, the space within the peripheral body member being occupied by a plurality of projections from the internal surfaces of the sides of the body member and comprising loops connecting each pair of adjacent sides so as to define passages within the element between each loop and the sides of the body member connected by the loop.

5,688,445
DISTRIBUTOR MEANS AND METHOD

Johannes Wrisberg, Holte, Denmark, assignor to Haldor Topsoe A/S, Lyngby, Denmark
Filed Jul. 31, 1995, Ser. No. 509,323
Int. Cl.^{6} B01F *3/04*
U.S. Cl. 261—96 **3 Claims**



1. Distributor means for supplying a mixed phase flow of gas-liquid feed uniformly on a surface of a trickle-bed of solid particles, comprising:

a tray horizontally arranged above the surface of the trickle-bed; and

a plurality of identical tubular distributor downcomers disposed on the tray, the downcomers having open upper ends for passage of gas flow, horizontal apertures in the walls thereof for passage of liquid flow, the apertures being disposed in the tube walls at different elevations above the tray with a predetermined minimum elevation for maintaining a liquid level on the tray, and open outlet ends for distribution of the liquid onto the surface of the trickle-bed, the downcomers further having a predetermined tube diameter relative to the liquid flow that satisfies the relationship:

$$N_F = \frac{v}{\sqrt{g \cdot D}} < 0.35$$

wherein

N_F is Froude's number;

v is the superficial liquid velocity in the downcomers, m/s;

D is the inner tube diameter; and

g is the acceleration due to gravity, 9.81 m/s^2;

said tray being further equipped with at least one tubular gas chimney extending vertically above and below the tray, the diameter of said chimneys being at least twice that of said downcomers.

5,688,446
EVAPORATIVE HUMIDIFIER

Neville R. Glenn, Milford, Mass., assignor to Holmes Products Corp., Milfrod, Mass.
Continuation of Ser. No. 222,295, Apr. 4, 1994, Pat. No. 5,529,726. This application Jun. 25, 1996, Ser. No. 670,345
Int. Cl.^{6} B01F *3/04*
U.S. Cl. 261—142 **12 Claims**

1. A portable evaporative humidifier comprising:

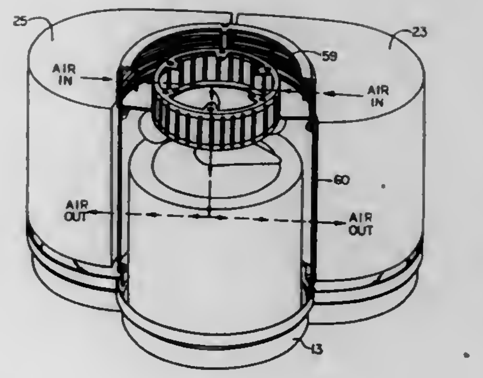
a. base including a portion defining a reservoir for holding water,

b. a substantially cylindrical housing mounted on said base over said reservoir, said housing having an air inlet through an upper portion of the housing and an air outlet through a portion of a sidewall of the housing,

c. a cylindrically shaped wick filter seated in said reservoir and extending into said housing, said cylindrically shaped wick filter having an open end and a sidewall,

d. a cylindrically shaded heater having a radial periphery, said heater being substantially radially aligned with said air inlet and axially aligned with said cylindrically shaped wick filter;

e. a fan positioned below, said heater inside said housing and

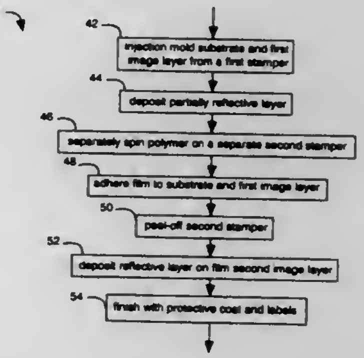


f. a deflector positioned between said fan and said cylindrically shaped wick filter for directing air flow into said open end of said wick filter;

wherein during operation of said humidifier, air is drawn inside said housing through said air inlet, and through said radial periphery of said heater by said fan thereby heating the air, the heated air is forced by the fan through the deflector into the open end of the wick filter and forced through the sidewall of the wick filter thereby humidifying the air, the humidified air is discharged from the housing through the air outlet.

5,688,447
MASS PRODUCTION METHOD FOR FABRICATING MULTI-LAYER CDS

Gilbert H. Hong, 12820 Alta Tierra, Los Altos Hills, Calif. 94022
Division of Ser. No. 515,031, Aug. 14, 1995, Pat. No. 5,635,114. This application Dec. 6, 1996, Ser. No. 761,569
Int. Cl.^{6} B29D *11/00*
U.S. Cl. 264—1.33 **8 Claims**


40
42
injection mold substrate and first image layer from a first stamper
44
deposit partially reflective layer
46
separately spin polymer on a separate second stamper
48
adhere film to substrate and first image layer
50
peel-off second stamper
52
deposit reflective layer on film second image layer
54
finish with protective coat and labels

1. A method of making high-density compact disk type optical media having a multilayer structure, comprising the steps of:

injection molding a first optical layer with a first stamper used as a master having a first set of data;

coating said first optical layer with a partially-reflective layer over a relief image side;

coating, spinning and curing a polymer film on a second stamper used as a master having a second set of data to produce a second optical layer;

laminating said second optical layer onto said first optical layer with said second stamper still attached;

peeling said second stamper from said second optical layer; and

depositing a fully-reflective layer as a final finish.

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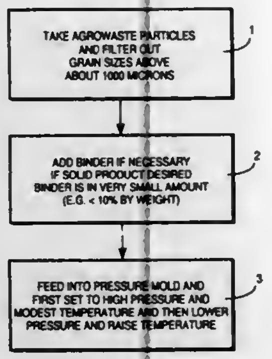
5,688,448
METHOD FOR PRODUCING BIODEGRADABLE PRODUCTS

Fyodor Shutov; George Ivanov, both of Cookeville, Tenn., and Hamid Arastoopour, Downers Grove, Ill., assignors to The Illinois Institute of Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 35,436, Mar. 24, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 458,337

Int. Cl.^{6} B29C *43/02*

U.S. Cl. 264—54 **23 Claims**


TAKE AGROWASTE PARTICLES AND FILTER OUT GRAIN SIZES ABOVE ABOUT 1000 MICRONS
1
ADD BINDER IF NECESSARY IF SOLID PRODUCT DESIRED BINDER IS IN VERY SMALL AMOUNT (E.G. < 10% BY WEIGHT)
2
FEED INTO PRESSURE MOLD AND FIRST SET TO HIGH PRESSURE AND MODEST TEMPERATURE AND THEN LOWER PRESSURE AND RAISE TEMPERATURE
3

1. A method of making a molded product from a particle-binder mix comprising the steps of:

grinding agricultural waste plant material into particles, feeding the particles into a mold, subjecting the particles in the mold to a modest elevated temperature lower than a temperature to cause binding action, and a relatively high pressure which squeezes inherent binder materials in the agricultural waste particles to the surface thereof, then, in a subsequent method stage reducing the mold pressure to a substantially reduced level which allows some of the binder material squeezed to the periphery of the mold to re-enter the interior of the mix, while raising the temperature of the mix to a relatively high value for a given period of time to bind the particles.

5,688,449
METHOD OF FORMING AND EXTRUDING AN ADDITIVE-COATED RESIN COMPOSITION

Steve A. Fox, Hickory, N.C., assignor to NiTech Corporation, Hickory, N.C.

Filed Oct. 2, 1995, Ser. No. 537,988

Int. Cl.^{6} B29C *44/20;* **B05D** *7/00*

U.S. Cl. 264—54 **13 Claims**

1. A method for manufacturing an extruded plastic product consisting essentially of:

(a) uniformly distributing additive agent on polymeric resin to form an extrudable thermoplastic resin composition in particulate form by (i) contacting a polymeric resin in particulate form with a thermoplastic adhesive binder to form a coating of the binder directly adhered onto the surfaces of the resin particles, followed by (ii) contacting the binder-coated resin particles with an additive agent to form a uniform coating of the additive agent directly adhered onto the binder coating of the binder-coated resin particles, and (iii) wherein the binder is together with a solvent in a form selected from the group consisting of a solution, an emulsion, a dispersion, and combinations thereof;

(b) drying the resultant from step (a) to substantially remove the solvent; and

(c) extruding the resultant from step (b) of dried resin particles having a coating of additive agent directly adhered onto the coating of binder that is directly adhered to the surfaces of the resin particles to form an extruded plastic product.

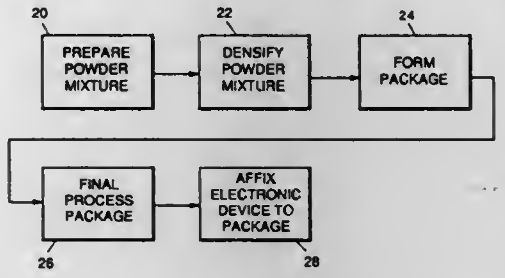
5,688,450
METHOD OF MAKING AN ELECTRONIC PACKAGE STRUCTURE UTILIZING ALUMINUM NITRIDE/ ALUMINUM COMPOSITE MATERIAL

M. Akbar Ali, Lomita; Carl W. Peterson, Carson; Hutan Taghavi, Hermosa Beach, and Bruce W. Buller, Diamond Bar, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 21, 1994, Ser. No. 360,493

Int. Cl.^{6} C04B *33/32;* **B32B** *31/04*

U.S. Cl. 264—61 **14 Claims**



1. A method for making an electronic package structure, comprising the steps of:

preparing a mixture of aluminum nitride powder and aluminum powder, there being no binder present in the mixture, wherein the step of preparing includes the step of

providing a mixture of about 80 percent by weight of aluminum nitride, balance aluminum;

densifying the mixture to form a composite material; and

forming an electronic package structure from the composite material.

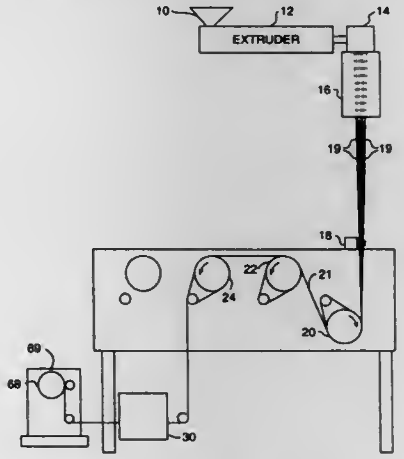
5,688,451
METHOD OF FORMING AN ABSORBABLE BIOCOMPATIBLE SUTURE YARN

Jeffrey D. Hutton, Southbury, Conn., assignor to American Cyanamid Company, Wayne, N.J.

Continuation of Ser. No. 367,880, Jan. 3, 1995, abandoned. This application Oct. 7, 1996, Ser. No. 726,969

Int. Cl.^{6} D01D *5/16;* **D02J** *1/08*

U.S. Cl. 264—103 **16 Claims**



1. A method of forming absorbable, biocompatible suture filaments, comprising the steps of:

melt extruding a bioabsorbable polymer to form a plurality of surgical filaments; and

drawing the filaments to form drawn filaments, wherein

the melt extruding and drawing occur in a single continuous step.

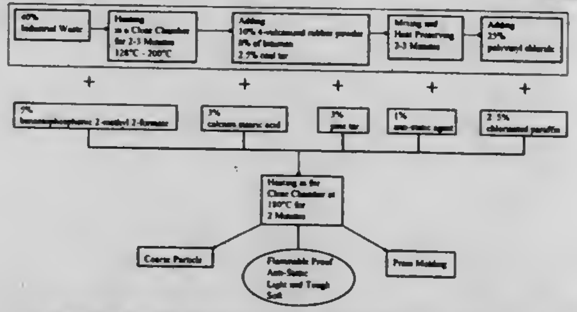
5,688,452
MANUFACTURING PROCESS OF CONSTRUCTIVE MATERIAL

Tin Wing Chan, Suite 401, 8 Queen's Road Central, Central, Hong Kong

Filed Jul. 29, 1996, Ser. No. 688,691

Int. Cl.^{6} B29C *70/28*

U.S. Cl. 264—115 **19 Claims**



1. A manufacturing process of a constructive material, comprising a plurality of steps of:

(a) purifying and fully mixing an industrial waste mixture consisting essentially of coal ash, incense ash, timber dust, argil mud, and natural clay compound, in which said industrial waste mixture has a weight percentage of 35–40% of said constructive material;

(b) placing said industrial waste mixture in a closed chamber for heating to a temperature between 128 degree Celsius to 200 degree Celsius for 2 to 3 minutes;

(c) adding a predetermined amount of synthetic material into said closed chamber for fully blending and mixing with said heated industrial waste mixture and heat preserving for a time period of 2 to 3 mutes, in which said synthetic material includes a 4-vulcanized robber powder having a weight percentage of 10% of said constructive material, a bitumen having a weight percentage of 6% of said constructive material, a coal tar having a weight percentage of 2.5% of said constructive material;

(d) adding a predetermined amount of polyvinyl chloride into said closed chamber and evenly mixing said polyvinyl chloride with said industrial waste mixture, said 4-vulcanized robber powder, said bitumen, and said coal tar inside said closed chamber, wherein said polyvinyl chloride has a weight percentage of at least 25% of said constructive material; and

(e) further adding a predetermined amount of modification material into said closed chamber and heating to a temperature at 180 degree Celsius for 2 minutes to form a raw constructive material compound, in which said modification material includes an ortho-benzene 2-methyl 2-formate having a weight percentage of 5% of said constructive material, a calcium stearic acid having a weight percentage of 5% of said constructive material, a pine tar having a weight percentage of 3% of said constructive material, an anti-static agent having a weight percentage of 1% of said constructive material, and a chlorinated paraffin having a weight percentage of 2.5% of said constructive material.

5,688,453
METHOD FOR FORMING BIOCOMPATIBLE COMPONENTS

Garry Lee England, Winona Lake, and Joel C. Higgins, Claypool, both of Ind., assignors to Biomet, Inc., Warsaw, Ind.

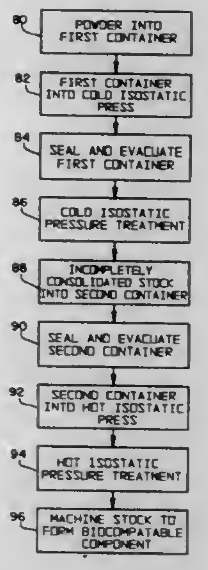
Division of Ser. No. 6,747, Jan. 21, 1993, Pat. No. 5,466,530. This application Jun. 7, 1995, Ser. No. 477,161

Int. Cl.^{6} B29C *43/12;43/14*

U.S. Cl. 264—120 **19 Claims**

1. A method for molding a powder to form a substantially completely consolidated stock of material, said method comprising the steps of:

forming an incompletely consolidated stock from said powder; and


80
POWDER INTO FIRST CONTAINER
82
FIRST CONTAINER INTO COLD ISOSTATIC PRESS
84
SEAL AND EVACUATE FIRST CONTAINER
86
COLD ISOSTATIC PRESSURE TREATMENT
88
INCOMPLETELY CONSOLIDATED STOCK INTO SECOND CONTAINER
90
SEAL AND EVACUATE SECOND CONTAINER
92
SECOND CONTAINER INTO HOT ISOSTATIC PRESS
94
HOT ISOSTATIC PRESSURE TREATMENT
96
MACHINE STOCK TO FORM BIOCOMPATABLE COMPONENT

forming said substantially completely consolidated stock from said incompletely consolidated stock;

wherein said step of forming an incompletely consolidated stock comprises the steps of:

placing said powder into a first flexible container; and

subjecting said first flexible container to a cold isostatic pressure treatment so as to form said incompletely consolidated stock.

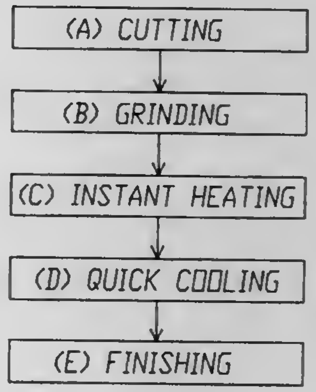
5,688,454
FLOATING BOARD FABRICATION METHOD

Kuan-Min Chi, No. 118, Ta-Jung E. St., Taichung, Taiwan

Filed Oct. 17, 1996, Ser. No. 731,482

Int. Cl.^{6} B29C *67/20*

U.S. Cl. 264—129 **3 Claims**



1. A floating board fabrication method including the steps of:

a) preparing a PE plate from foamed polyethylene and then cutting it into the desired shape corresponding to and slightly larger than the designed finished product;

b) grinding the PE plate to smooth the periphery;

c) instantly heating the PE plate thus obtained at a temperature within an effective temperature range of 175° C. to 185° C. for about 4 minutes, causing the PE plate to expand;

d) quickly cooling down the PE plate through a hydraulic cooling press at 4° C., causing the PE plate to contract; and

e) trimming the periphery of the PE plate thus obtained, polishing its surface, and coating its surface with a paint, so as to obtain a finished product.

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5,688,455

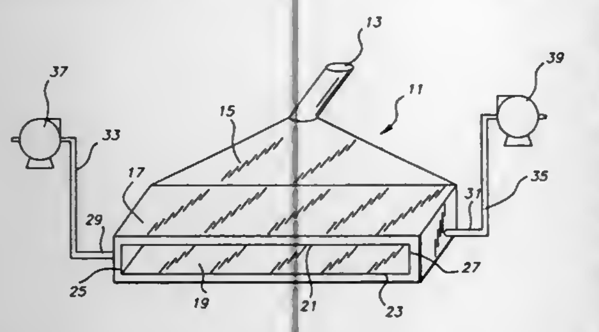
PROCESS FOR MAKING A CELLULOSE TRIACETATE PHOTOGRAPHIC FILM BASE

Randall Joseph Kebl, Churchville, and Eric Eugene Arrington, Farmington, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1996, Ser. No. 592,910

Int. Cl.^{6} B29C *41/26;33/66*

U.S. Cl. 264—169 **11 Claims**



1. A method of making a cellulose triacetate photographic film support by forming a dope solution of cellulose triacetate in a first solvent, passing the dope solution under pressure through a sheet forming die zone having an upper and lower surface and two edge surfaces, injecting a second solvent into the dope solution at the edge surface within the die zone in an amount sufficient to form a slip layer at the two edge surfaces, exiting the dope solution from the sheet forming die zone and separating the solvent from the cellulose triacetate.

5,688,456

PROCESS FOR PREPARATION OF MULTILAYER FILMS

Hiroki Kuriu; Akira Mita; Kazufumi Ueno; Yoshinori Matsumoto; Yoshihiro Wada, all of Moriyama, and Masaaki Iwami, Nabari, all of Japan, assignors to Gunze Limited, Ayabe, Japan

Division of Ser. No. 414,135, Mar. 30, 1995, Pat. No. 5,562,996, which is a continuation of Ser. No. 60,694, May 13, 1993, abandoned, which is a continuation of Ser. No. 721,014, Jun. 26, 1991, abandoned. This application Jul. 16, 1996, Ser. No. 680,776

Claims priority, application Japan, Jun. 27, 1990, 2-171115; Nov. 16, 1990, 2-312162

Int. Cl.^{6} B29C *47/06;55/14*

U.S. Cl. 264—173.14 **4 Claims**

1. A process for preparing a multi-layer film having at least three layers wherein a layer of saponified ethylene-vinyl acetate copolymer (D-1) having an ethylene content of about 20 to about 65 mole % and a saponification value of at least about 90% is sandwiched between mixed polyamides layers (A), said mixed polyamides layer (A) comprising about 50 to about 95% by weight of at least one of an aliphatic crystalline polyamide, an aliphatic crystalline copolymer of aliphatic polyamide and aromatic crystalline polyamide and about 50 to about 5% by weight of an amorphous polyamide, said multi-layer film having a maximum thickness difference of 4 μm or less, which comprises the steps of

(i) forcing out from a T-die by co-extrusion said multi-layer film onto a chill roll and

(ii) sequentially stretching the flat film in the longitudinal direction and lateral direction or in the lateral direction and longitudinal direction.

5,688,457

HIGH SPEED EXTRUSION

Marlin Dwight Buckmaster, Vienna, W. Va.; Donald Leonidas Henry, Elkton, Md., and Stuart Karl Randa, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1996, Ser. No. 632,376

Int. Cl.^{6} D01F *1/02;* **C08K** *3/00*

U.S. Cl. 264—211 **13 Claims**

1. Process comprising steady state melt extruding unfoamed extrudate of molten thermoplastic polymer, said melt extruding being carried out wherein (i) said polymer has foam cell nucleating agent incorporated therein and (ii) said extrudate is formed from laminar flow of said polymer, said melt extruding being carried out at a shear rate which is at least 1.2 times the shear rate at which the onset of surface roughness for said extrudate occurs in the absence of said foam cell nucleating agent and laminar flow, said extrudate being free of surface roughness, the amount of said foam cell nucleating agent being effective to provide said surface free of surface roughness, said foam cell nucleating agent being thermally stable during said extruding, and obtaining said unformed extrudate as a result thereof, whereby articles obtained from said unfoamed extrudate are also unfoamed.

5,688,458

METHOD AND DEVICE TO MANUFACTURE SYNTHETIC ENDLESS FILAMENTS

Gunter Koschinek, Dietzenbach, and Dietmar Wandel, Hanau, both of Germany, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland, and Zimmer AG, Frankfurt am Main, Germany

Continuation of Ser. No. 358,318, Dec. 19, 1994, abandoned, which is a continuation of Ser. No. 146,192, Nov. 22, 1993, abandoned. This application Mar. 19, 1996, Ser. No. 617,626

Claims priority, application Germany, Mar. 18, 1992, 42 08 568.3

Int. Cl.^{6} B29C *35/16;* **D01D** *5/12*

U.S. Cl. 264—211.12 **14 Claims**

1. A method for spinning and cooling synthetic, multifil, endless filaments, comprising the steps of:

spinning filaments from apertures of a nozzle plate at a draw-off speed of at least 2400 m/min., and

passing the filaments through a cooling channel disposed beneath the apertures so that the filament travel draws an air current inwardly through air inlet means of the cooling channel and into cooling relationship with the filaments throughout the length of the cooling channel, a portion of air current being drawn in at an upper end of the cooling channel and contacting the filaments immediately as the filaments emerge from the apertures, and additional portions of the air current being drawn in throughout the length of the cooling channel.

5,688,459

PROCESS FOR PREPARING HIGH WATER-CONTAINING ELASTOMER MEDICAL CATHETER

Lijiang Mao; Yuanjie Hu, and Dongxu Piao, all of Beijing, China, assignors to Chin Rehabilitation Research Center, Beijing, China

Filed May 19, 1995, Ser. No. 445,024

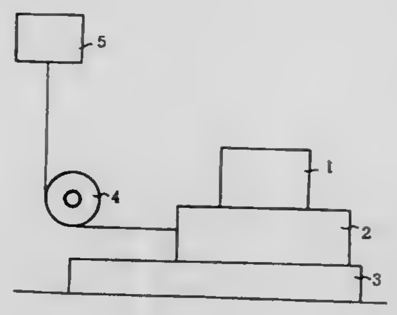
Claims priority, application China, Aug. 30, 1994, 94115612.5

Int. Cl.^{6} B29C *39/02*

U.S. Cl. 264—233 **13 Claims**

1. A process for preparing a high water-containing elstomer medical catheter comprising the steps of:

a) heating a mixture consisting of 20–40 wt % of polyvinyl alcohol, 40–60 wt % of water, 7–15 wt % of sulfoxide having the following general formula



R_1—SO—R_2

wherein R_1 and R_2 individually represent alkyl containing 1–3 carbon atoms, and 2–10 wt % of linear alkane containing 10–55 carbon atoms, based on the total weight of the mixture in a sealed vessel with agitation to form a homogeneous fluid;

b) pouring said homogeneous fluid into a mould having a desired shape;

c) solidifying said homogeneous fluid in the mould by cooling;

d) releasing the solidified fluid from the mould to form a medical catheter; and

e) heat-treating the medical catheter from step d) and washing it with a polar organic solvent to remove sulfoxide.

5,688,460

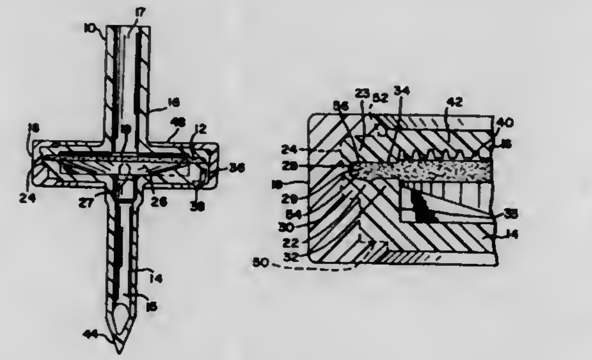
PROCESS FOR MAKING HERMETICALLY SEALED FILTER UNITS

Rick R. Ruschke, McHenry, Ill., assignor to Filtertek Inc., Hebron, Ill.

Division of Ser. No. 233,068, Apr. 26, 1994, Pat. No. 5,556,541. This application Jun. 20, 1996, Ser. No. 667,005

Int. Cl.^{6} B29C *45/14*

U.S. Cl. 264—263 **15 Claims**



1. A method for hermetically sealing a filter element within a housing, comprising the steps of:

(a) aligning a filter element between a first and a second housing member defining a filter cavity;

(b) disposing a thermoplastic skirt adjacent to a peripheral edge of the second housing member to surround an entire peripheral edge of the filter element located between the first and second housing members;

(c) applying pressure to the first and second housing members; and

(d) injection molding a thermoplastic overmold over the skirt and a periphery of the housing members, wherein a temperature and pressure of the injection molded overmold causes the skirt to melt and mix with the overmold to infuse the edge of the filter element.

5,688,461

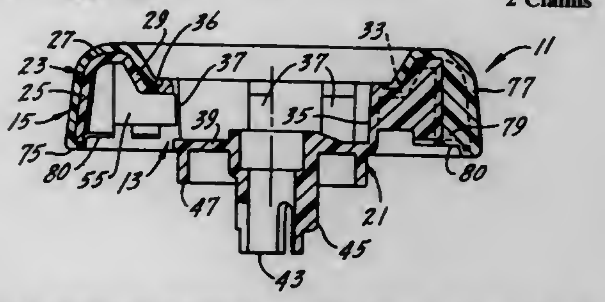
METHOD OF MOLDING A COMPOSITE PLASTIC ARTICLE

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Continuation of Ser. No. 146,946, Nov. 3, 1993, Pat. No. 5,469,758. This application Oct. 12, 1995, Ser. No. 542,313

Int. Cl.^{6} B29C *45/14;70/78*

U.S. Cl. 264—273 **2 Claims**



1. A method of molding a composite plastic article having a cylindrical transverse cross section including the steps of:

forming an inner core of a cylindrical transverse cross section having an elongated hub with a front portion and a rear portion, an outer wall surrounding said front portion of said hub, said outer wall having a front surface and a rear surface, a plurality of ribs extending radially between said hub and said outer wall with said ribs terminating rearwardly of said front portion of said hub, and a plurality of openings extending through said outer wall with each opening located between a pair of said ribs,

injection molding a soft, resilient plastic between only one pair of said ribs at the rearwardly termination of said pair of ribs to flow said soft, resilient plastic through said opening located between said only one pair of ribs to said front surface of said outer wall to form a soft, resilient plastic outer covering on said outer wall of said core and to flow said soft, resilient plastic back through said other openings to interlock said soft, resilient plastic outer covering and said core, and

controlling the back flow of said soft, resilient plastic from said front surface of said outer wall where it forms said outer covering through said other openings to fill said other pairs of ribs to their rearwardly terminations.

5,688,462

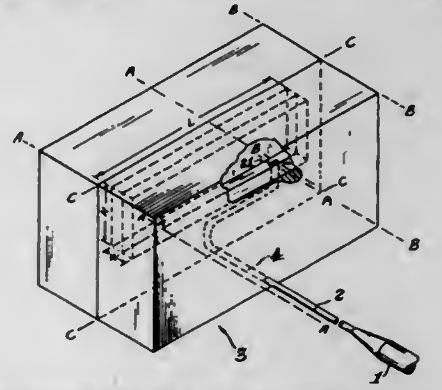
IN-RUNNER POLYMER MELT MIXER

Brent A. Salamon, and Robert J. Donald, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1995, Ser. No. 508,500

Int. Cl.^{6} B29C *45/30;45/72*

U.S. Cl. 264—328.14 **14 Claims**



1. A process for producing a molded thermoplastic article which comprises:

a. injecting a molten thermoplastic through a nozzle and cold runner;

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- b. passing the molten thermoplastic through a cold in-runner static mixing device to acquire a more homogeneous mixture with respect to temperature; and then
- c. passing the more homogeneously mixed molten thermoplastic through a mold gate and into a mold cavity.

5,688,463

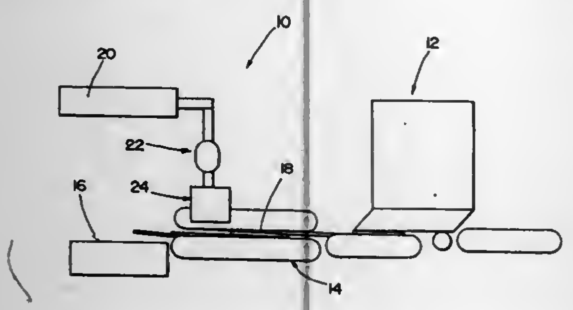
LASER PROCESSING OF DISCRETE SHEETS OF MATERIAL

Arthur W. Robichaud, West Worthington, and Timothy W. Duffy, Dublin, both of Ohio, assignors to Combibloc, Inc., Columbus, Ohio

Continuation of Ser. No. 489,547, Jun. 12, 1995, abandoned. This application Oct. 11, 1995, Ser. No. 541,047

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 264—400 **12 Claims**



1. A process for laser treating material, said process comprising the steps of:
shingling discrete sheets of said material onto a conveyor, such that each of said discrete sheets of material overlaps a portion of an adjacent one of said discrete sheets of material;
conveying each of said discrete sheets in a pre-determined path, in a continuously moving fashion, said path in the view of a laser system; and
directing a laser beam from said laser system onto said discrete sheets, one sheet at a time, in succession.

5,688,464

VIBRATIONALLY ENHANCED STEREOLITHOGRAPHIC RECOATING

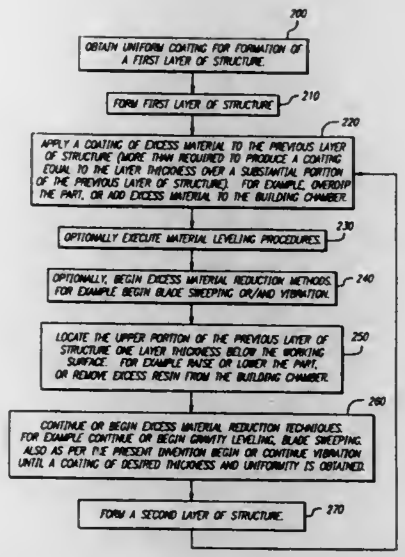
Paul F. Jacobs, La Crescenta; J. Scot Thompson, Northridge; Hop D. Nguyen, Little Rock, and Dennis R. Smalley, Baldwin Park, all of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Division of Ser. No. 384,383, Feb. 3, 1995, which is a continuation of Ser. No. 198,655, Feb. 18, 1994, abandoned, which is a continuation of Ser. No. 932,721, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 495,791, Mar. 19, 1990, abandoned. This application Mar. 16, 1995, Ser. No. 405,812

Int. Cl.^{6} B29C *35/08;41/02*

U.S. Cl. 264—401 **32 Claims**

1. A method for recoating a previous layer of a part having an upper surface comprising the steps of:
(1) coating the upper surface of the part with liquid building material to form an upper coat; and
(2) inducing vibration in the upper coat, wherein said step (1) is comprised of the substep of:


200
OBTAIN UNIFORM COATING FOR FORMATION OF A FIRST LAYER OF STRUCTURE.
FORM FIRST LAYER OF STRUCTURE
210
220
APPLY A COATING OF EXCESS MATERIAL TO THE PREVIOUS LAYER OF STRUCTURE (MORE THAN REQUIRED TO PRODUCE A COATING EQUAL TO THE LAYER THICKNESS OVER A SUBSTANTIAL PORTION OF THE PREVIOUS LAYER OF STRUCTURE). FOR EXAMPLE, OVERDIP THE PART, OR ADD EXCESS MATERIAL TO THE BUILDING CHAMBER.
OPTIONALLY EXECUTE MATERIAL LEVELING PROCEDURES.
230
OPTIONALLY, BEGIN EXCESS MATERIAL REDUCTION METHODS. FOR EXAMPLE BEGIN BLADE SWEEPING OR/AND VIBRATION.
240
LOCATE THE UPPER PORTION OF THE PREVIOUS LAYER OF STRUCTURE ONE LAYER THICKNESS BELOW THE WORKING SURFACE. FOR EXAMPLE RAISE OR LOWER THE PART, OR REMOVE EXCESS RESIN FROM THE BUILDING CHAMBER.
250
260
CONTINUE OR BEGIN EXCESS MATERIAL REDUCTION TECHNIQUES. FOR EXAMPLE CONTINUE OR BEGIN GRAVITY LEVELING, BLADE SWEEPING. ALSO AS PER THE PRESENT INVENTION BEGIN OR CONTINUE VIBRATION UNTIL A COATING OF DESIRED THICKNESS AND UNIFORMITY IS OBTAINED.
FORM A SECOND LAYER OF STRUCTURE.
270

(a) lowering the part having an upper surface in a vat of liquid material by a distance approximately equal to a desired layer thickness.

5,688,465

METHOD OF CORONA TREATING-A HYDROPHOBIC SHEET MATERIAL

David Lewis Myers, Cumming, Ga., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed May 13, 1996, Ser. No. 645,435

Int. Cl.^{6} B29C *71/04*

U.S. Cl. 264—423 **19 Claims**

1. A method of preventing localized arcing to ground during treatment of a sheet material in a corona discharge field generated by a corona discharge apparatus having a bare metal electrode and a dielectric-covered electrode, which method comprises:
passing the sheet material to be treated through the corona discharge field as a layer of a multilayered composite having at least three layers, in which at least one of the layers is a nonconductive sheet material situated between the sheet material to be treated and the bare metal electrode.

5,688,466

ALIGNMENT ASSEMBLY FOR HEATING LAMPS OF A BLOW MOLDING APPARATUS AND METHOD OF USE

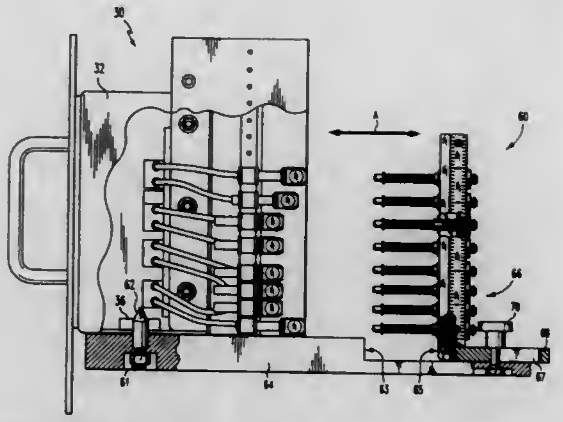
Monroe S. Mitchell, Dunwoody, and Vinson A. Loos, Woodstock, both of Ga., assignors to Constar Plastics, Inc., Atlanta, Ga.

Division of Ser. No. 325,881, Oct. 19, 1994, Pat. No. 5,549,468. This application Mar. 22, 1996, Ser. No. 620,946

Int. Cl.^{6} B29C *49/64;49/78*

U.S. Cl. 264—458 **8 Claims**

7. A method for precisely measuring the position of heating lamps in a heating lamp assembly intended for use in an oven of a blow molding machine, the heating lamp assembly comprising a chassis removably positionable in at least one preselected location in the machine and including a vertical array of generally horizontally disposed lamps held in position by a lamp holder coupled to each end of each lamp, the method comprising the steps of
coupling the chassis of the lamp assembly to a baseplate located outside the blow molding machine, the baseplate having indicator means carried by the baseplate adapted to contact said lamp holders for indicating the relative position of the lamp holders,
vertically aligning a gauge member of the indicator means to confront each lamp holder,



horizontally positioning each gauge member in contact with a confronting lamp holder, and
reading vertical and horizontal scales of the indicator means indicating the position of each gauge member relative to the baseplate.

5,688,467

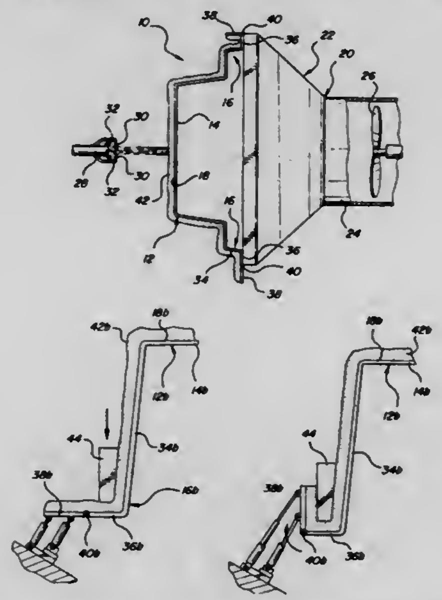
APPARATUS AND METHOD FOR FABRICATING A PREFORM HAVING A NARROW CHANNEL FLANGE

John Kelman, Dover, and David R. Pinson, Rochester, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Dec. 1, 1995, Ser. No. 566,042

Int. Cl.^{6} B27N *5/00;* **B60R** *13/01*

U.S. Cl. 264—517 **10 Claims**



1. A process for forming a fibrous preform using an apparatus comprising a preform screen having a narrow channel flange with a hinged channel outer wall; said process comprising the steps of:
providing a foraminous preform screen comprising a narrow channel flange having a channel floor and a channel outer wall and a hinge connecting the floor to the outer wall;
drawing a vacuum through the screen;
rotating the channel outer wall outward about the hinge until it lays flat and generally parallel to the channel floor;
blowing fibers onto the screen;
spraying binder onto the fibers forming a fiber preform coating on the screen;
rotating the outer wall upward and inward about the hinge;
allowing the binder to cure and bind the fibers together into a fibrous preform;
rotating the side wall open; and
removing the fibrous preform from the screen.

6. An apparatus for use in manufacturing a fibrous preform with a narrow channel flange, said apparatus comprising:
a screen including a main body and a narrow channel flange integrally extending from said main body, said main body and flange defining a common deposition surface;
a fiber source spaced from said deposition surface, said fiber source adapted to emit a stream of chopped fibers toward said deposition surface;
a binder source spaced from said deposition surface and said fiber stream, said binder source adapted to emit binder toward one of said fiber stream and said deposition surface;
said flange including a narrow channel floor extending laterally outward from said main body and a channel outer wall extending from said channel floor toward said fiber source; and
a hinge connecting said channel floor to said channel outer wall to allow said outer wall to lay flat and generally parallel to said channel floor so that said fiber source and said binder source can deposit fiber and binder in an even layer over both said floor and said outer wall.

5,688,468

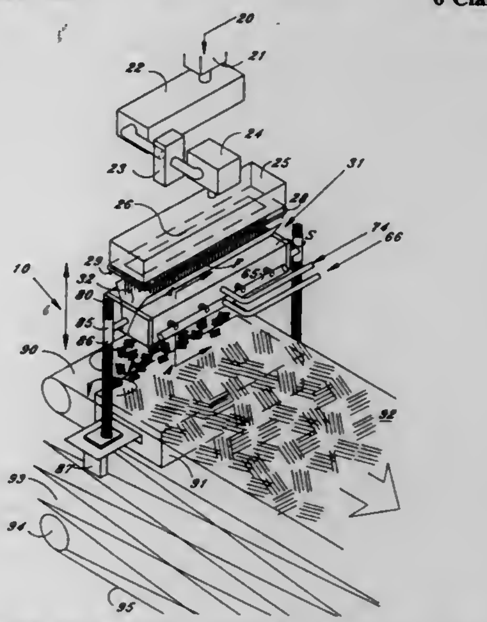
PROCESS FOR PRODUCING NON-WOVEN WEBS

Fumin Lu, Tamarac, Fla., assignor to Ason Engineering, Inc., Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 356,738, Dec. 15, 1994, Pat. No. 5,545,371. This application Mar. 18, 1996, Ser. No. 617,023

Int. Cl.^{6} D01D *5/12;* **D04H** *3/03*

U.S. Cl. 264—555 **6 Claims**



1. A process for forming a spunbond, non-woven, polymeric fabric from a plurality of polymeric extruded filaments, comprising the steps of:
(a) at startup, extruding a plurality of vertically oriented filaments by melt-spinning through a spinneret from a thermoplastic polymer;
(b) at startup, threading the filaments through the slot with drawing means positioned at least 100 cm from said spinneret, using reduced throughput and nominal air pressure, 10 to 20 psig;
(c) increasing the air pressure and the throughput coordinately, while simultaneously reducing the distance between said spinneret and said drawing means until said distance between said spinneret and said drawing means is between 5 to 150 cm whereby the size of the filaments can be controlled by the distance between the drawing means and the spinneret;
(d) forming a web of a spunbound, non-woven polymeric fabric on a web-forming means positioned optimumly below said

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drawing means, whereby the size of the filaments can be controlled by the distance between the drawing means and the spinneret to form a uniform web with desired properties.

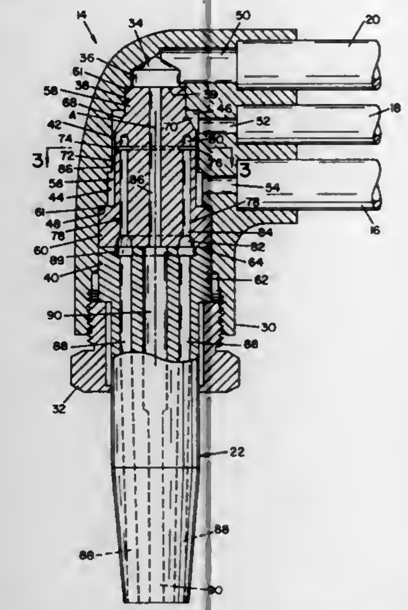
5,688,469
GAS MIXER FOR CUTTING TORCHES

Randy C. Edenfield, Flowery Branch, Ga., assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed Sep. 27, 1996, Ser. No. 722,906

Int. Cl.^{6} B23K *7/00*

U.S. Cl. 266—48 **30 Claims**



1. In a gas torch head having a tip end for attaching a tip thereto, mixing means for delivering a mixture of fuel gas and oxygen to said tip, fuel gas passageway means for delivering a fuel gas to said mixing means, and oxygen passageway means for delivering oxygen to said mixing means, the improvement comprising: said mixing means comprising a bore extending into said head from said tip end and having an axis and an inner end axially spaced from said tip end, said fuel gas passageway means and said oxygen passageway means opening laterally into said bore at axially spaced locations, an insert in said bore coaxial therewith and having an outlet end facing said tip end, outlet passageway means extending axially into said insert from said outlet end, a peripheral mixing recess in said insert in flow communication with said outlet passageway means and having a radially outer end in flow communication with said bore between said locations.

5,688,470
APPARATUS FOR RECOVERY OF NON-FERROUS METALS FROM SCRAP AND DROSS

Han Spoel, 210 MacPherson Avenue, Toronto, Ontario, Canada, M5R 1W8

Continuation of Ser. No. 470,005, Jun. 6, 1995, abandoned, which is a division of Ser. No. 201,335, Feb. 24, 1994, Pat. No. 5,540,752. This application Aug. 20, 1996, Ser. No. 700,044

Claims priority, application Canada, Feb. 2, 1994, 2116249

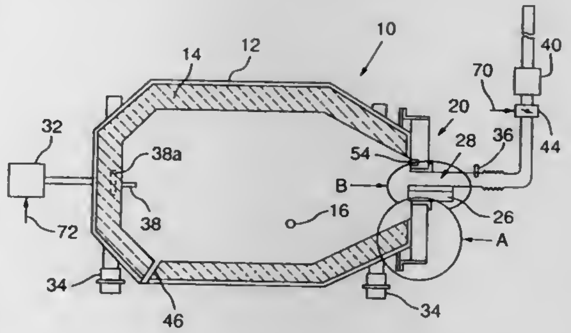
Int. Cl.^{6} C21D *11/00*

U.S. Cl. 266—87 **18 Claims**

1. An apparatus for recovering a non-ferrous metal in molten coherent form from a charge of material to be processed, said material containing said metal, comprising:

a sealable furnace having an interior chamber to receive said material, said furnace being sealable to substantially exclude ambient atmosphere from the interior chamber;

means to agitate said material;



means to introduce an oxidizing agent into the furnace;

means to introduce an inert carrier into the furnace;

means to monitor conditions inside the furnace related to the incipient thermiting of the metal and the conditions under which agglomeration of the metal occurs, and;

means to independently control the flow into the furnace of the oxidizing agent and the carrier responsive to said monitored conditions until such time as a desired condition of said material related to conditions under which agglomeration of the metal occurs is reached, said means to control the flow of oxidizing agent and carrier being capable of simultaneously introducing the oxidizing agent and carrier inot the furnace to provide the desired proportions and total flows of the oxidizing agent and carrier in the furnace to maintain said material at said condition by controlling the proportions and the flow of oxidizing agent and carrier into the furnace in response to the monitored condition until said material is recovered.

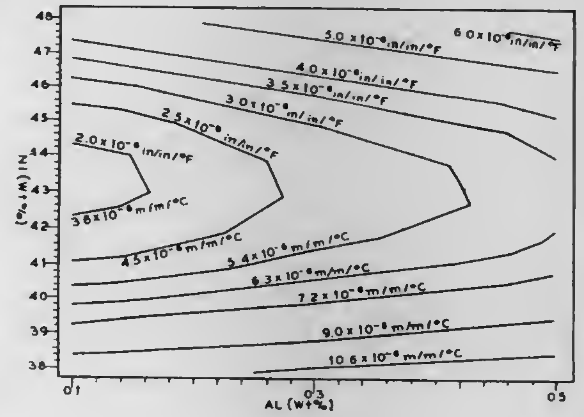
5,688,471
HIGH STRENGTH LOW THERMAL EXPANSION ALLOY

John Scott Smith, Proctorville, Ohio; Ladonna Sheree Hillis, Orlando, Fla., and Melissa Ann Moore, Littleton, Colo., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 519,678, Aug. 25, 1995, abandoned. This application Aug. 14, 1996, Ser. No. 696,487

Int. Cl.^{6} C22C *38/08;32/00*

U.S. Cl. 420—94 **11 Claims**



1. A high strength low coefficient of thermal expansion alloy having a CTE of about 4.9×10^4 m/m/°C. or less at 204° C., consisting essentially of, by weight percent, about 42.3 to about 48 nickel, about 2 to about 3.7 niobium, about 0.75 to about 2 titanium, about 0 to about 2 cobalt, about 0 to about 1 aluminum, about 3.7 or less total niobium plus tantalum, and balance iron and incidental impurities.

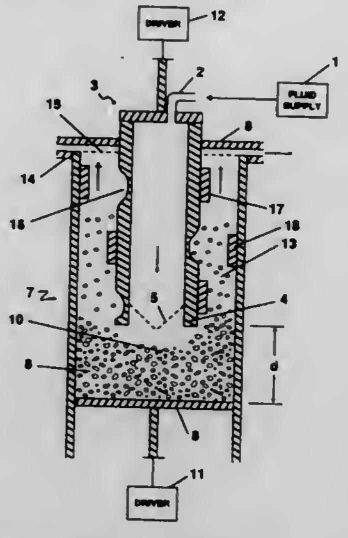
5,688,472
SOLIDS FLUIDIZATION SYSTEM

William A. Wachter, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 246,546, May 20, 1994, abandoned. This application Nov. 18, 1994, Ser. No. 341,785

Int. Cl.^{6} B01J *8/18*

U.S. Cl. 422—143 **9 Claims**



1. A solids fluidization system comprising

a dense bed solids housing;

a dense bed solids support contacting said dense bed solids housing and located within the dense bed solids housing;

fluid injection means aligned annularly within the dense bed solids housing containing a dense bed of solids, wherein one end of the fluid injection means has a fluid inlet means for connecting to a fluid supply and another end of the fluid injection means has a fluid outlet means positioned above the dense bed of solids at a distance from the dense bed solids support for sending fluid downwardly through the fluid injection means and toward the dense bed solids support at conditions sufficient to fluidize the surface solid particles at the upper surface of the dense bed of solids within the annulus between the fluid injection means and the dense bed solids housing;

means for decreasing the distance between the dense bed solids support and the fluid outlet means as fluid is sent through the fluid injection means; and

fluid exit means, said exit means being defined by the dense bed solids housing and the injection means.

5,688,473
REPLACEMENT OF PARTICLES IN A MOVING BED PROCESS

Roger Reed Lawrence, Elmhurst; Frank T. Micklich, Joliet; Charles T. Ressl, Mount Prospect, and Paul Alvin Sechrist, Des Plaines, all of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 239,002, May 6, 1994, Pat. No. 5,545,312. This application Mar. 13, 1996, Ser. No. 596,902

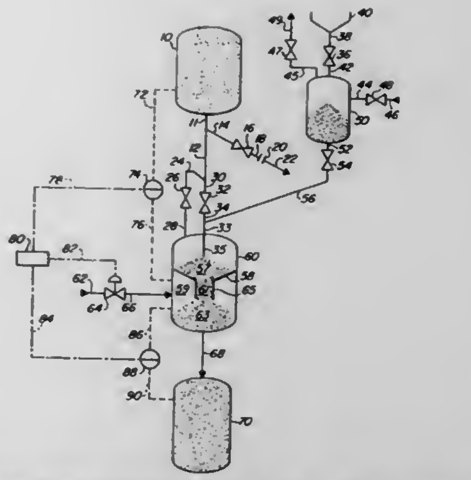
Int. Cl.^{6} F27B *15/08*

U.S. Cl. 422—144 **11 Claims**

1. An apparatus for the transfer of particles, said apparatus comprising:

(a) a vertically-positioned first vessel having a first particle outlet;

(b) a vertically-positioned second vessel, which is located below said first vessel, having a first particle inlet and a second particle outlet, and through which particles may move by gravity from said first particle inlet to said second particle outlet, and which defines a lower portion for containing particles, a means for gas addition, means to distribute gas



about said lower portion of said second vessel for contact with particles in said second vessel, and a gas outlet;

(c) a vertically-positioned third vessel, which is located below said second vessel having a second particle inlet,

(d) a vertically-extended first conduit in communication with said first particle outlet to remove particles therefrom and for containing a gas flow restriction comprising a bed of particles;

(e) a vertically-extended second conduit in communication with said first conduit to remove particles therefrom and in communication with said first particle inlet to supply particles thereto;

(f) means for communicating gas from said gas outlet to said first vessel and restricting the flow of gas from said gas outlet;

(g) a vertically-extended third conduit in communication with said second particle outlet to remove particles therefrom and in communication with said second particle inlet to supply particles thereto;

(h) means for discharging particles from said first vessel; and

(i) a third particle inlet in communication with said second vessel.

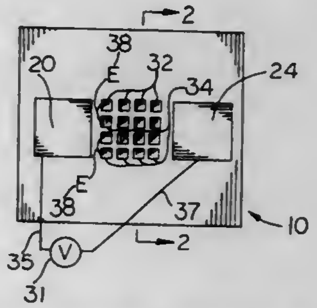
5,688,474
DEVICE FOR TREATING GASES USING MICROFABRICATED MATRIX OF CATALYST

Eduardo E. Wolf, University of Notre Dame, Notre Dame, Ind. 46556, assignor to Eduardo E. Wolf, Granger, Ind.

Continuation-in-part of Ser. No. 69,510, Jun. 1, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 379,304

Int. Cl.^{6} B01D *50/00*

U.S. Cl. 422—170 **10 Claims**



1. A device for treating gases comprising a flow path for said gases, a matrix of catalyst beads disposed in such flow path, said catalyst beads deposited on a nonconductive base substrate in a predetermined pattern, said matrix of catalyst beads further being divided into a first set and a second set, said first set including a plurality of catalyst beads in electrical communication with each other, and said second set including a plurality of catalyst beads in electrical communication with each other, and supply means for creating an electrical field between said beads while said gases are

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communicated over said beads, wherein said electrical energy creates an electrical field between one of said catalyst beads of said first set and a corresponding one of said catalyst beads of said second set, whereby said electrical fields orients reactants in said gases relative to said catalyst beads, said catalyst beads of said first set comprising a first catalytic metal and the catalyst beads of said second set comprising a second catalytic metal, said second catalytic metal being of a dissimilar metal than said first catalytic metal, said first set and said second set of said catalyst beads being separated by a dielectric material, said dielectric material inhibiting flow of electrical current between one of said catalyst beads of said first set and a corresponding one of said catalyst beads of said second set, thereby limiting the strength of said electrical field.

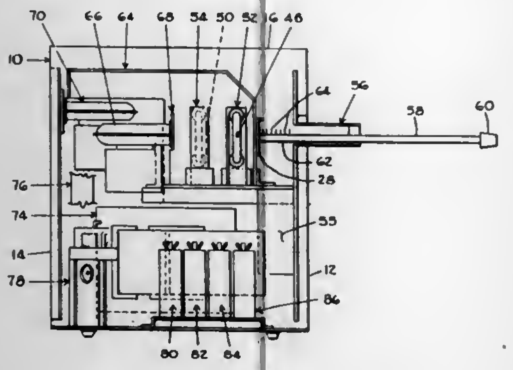
5,688,475
STERILIZATION METHOD AND APPARATUS

Robert E. Duthie, Jr., 9321 Warner Gulf Rd., Holland, N.Y. 14080

Division of Ser. No. 150,280, Nov. 10, 1993, Pat. No. 5,547,635, which is a continuation of Ser. No. 816,853, Jan. 2, 1992, abandoned, which is a continuation of Ser. No. 257,444, Oct. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 112,504, Oct. 22, 1987, abandoned. This application Aug. 19, 1996, Ser. No. 699,659

Int. Cl.^{6} B01J *19/12*

U.S. Cl. 422—186.3 **3 Claims**



1. Ultraviolet sterilization apparatus comprising:

a) a mercury/gallium metal halide ultraviolet lamp for emitting gaseous titanium dioxide and ultraviolet light through a wavelength range from about 175 nanometers to about 450 nanometers;

b) means for supplying electrical power for operating said lamp; and

c) means for supporting an object to be sterilized in proximity to said lamp for exposing a surface of said object to ultraviolet light and gaseous titanium dioxide emitted from said lamp.

5,688,476
SINGLE STEP STERILIZATION WRAP SYSTEM

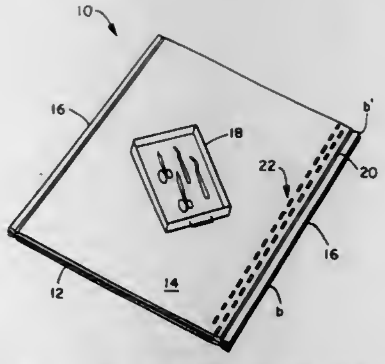
Sonya Nicholson Bourne, Roswell; Nelson McRay, Atlanta; Lavada Campbell Boggs, Marietta; William Ralph Neff; Charles John Morell, both of Roswell, and Marsha Lottie Vaughn, Atlanta, all of Ga., assignors to Kimberly Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 468,164, Jun. 6, 1995, which is a division of Ser. No. 381,060, Jan. 31, 1995, abandoned, which is a continuation of Ser. No. 084,851, Jun. 30, 1993, abandoned. This application Nov. 14, 1996, Ser. No. 751,012

Int. Cl.^{6} A61L *2/26;* **A61B** *19/02*

U.S. Cl. 422—294 **30 Claims**

1. A sterilization wrap system comprising:



an inner wrap sheet and an outer wrap sheet joined to the inner wrap sheet such that the inner wrap sheet and the outer wrap sheet are visually distinguishable as separate sheets.

5,688,477
PROCESS FOR REACTING DISSOCIATED ZIRCON WITH GASEOUS HYDROGEN FLUORIDE

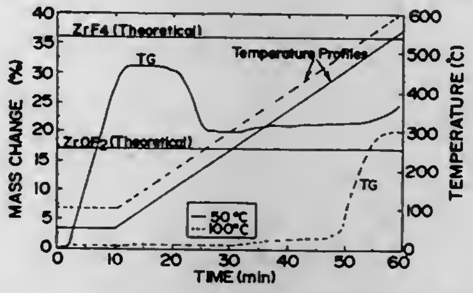
Jonathan Nel, Verwoerdburg, South Africa, assignor to Atomic Energy Corporation of South Africa Limited, Pelindaba, South Africa

Filed Jan. 24, 1995, Ser. No. 377,425

Claims priority, application South Africa, Jan. 31, 1994, 94/0649

Int. Cl.^{6} C01G *25/00;* **C01B** *9/08;11/00;33/08*

U.S. Cl. 423—82 **24 Claims**



1. A process for reacting dissociated zircon with hydrogen fluoride, wherein the hydrogen fluoride is in gaseous form and the reaction is effected at a reaction temperature between 50° C. and 550° C., with the reaction temperature being controlled to obtain at least one zirconium-based compound selected from the group consisting of zirconium tetrafluoride, a zirconium oxide and a zirconium oxyfluoride and at least one silicon-based compound.

5,688,478
METHOD FOR SCAVENGING SULFIDES

Russell Pounds, Richmond, and Doyle Cherry, Kemah, both of Tex., assignors to Crescent Holdings Limited, Houston, Tex.

Continuation-in-part of Ser. No. 350,635, Oct. 31, 1995, Pat. No. 5,462,721, which is a continuation-in-part of Ser. No. 295,270, Aug. 24, 1994, abandoned. This application Oct. 27, 1995, Ser. No. 549,015

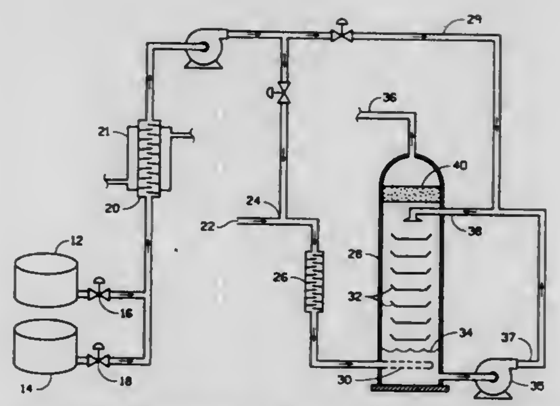
Int. Cl.^{6} B01D *53/48;53/52;* **C10G** *29/20*

U.S. Cl. 423—228 **20 Claims**

15. A method of reducing the level of hydrogen sulfide or organic sulfides present in a gas, a liquid, or a mixture thereof, comprising the step of contacting the sulfides with a composition consisting essentially of the reaction mixture formed from the reaction between:

(a) a dialdehyde having two carbonyl groups; and

(b) an alkanolamine having at least one hydrogen atom bonded directly to a nitrogen atom, wherein the mounts of dialdehyde and alkanolamine provide between about 1.5 and about 6 equivalents of hydrogen atoms bonded directly to a nitrogen atom in the alkanolamine for every equivalent of carbonyl groups in the dialdehyde, and wherein the reaction mixture is substantially free of triazines.



5,688,479
PROCESS FOR REMOVING HCL FROM HYDROCARBON STREAMS

Chien C. Chao, Millwood, N.Y., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 362,305, Dec. 22, 1994, abandoned. This application Apr. 5, 1996, Ser. No. 628,840

Int. Cl.^{6} B01D *53/04*

U.S. Cl. 423—240 S **16 Claims**

1. A process for the removal of hydrogen halide from a fluid hydrocarbon stream comprising hydrogen, hydrocarbons, water and hydrogen halide, which process comprises contacting said stream with a sorbent material in a packed bed, said sorbent material being catalytically inert to formation of green oils from said hydrocarbons, said sorbent material comprising an admixture of magnesium hydroxide and a hydrogen halide reactive material selected from the group consisting of calcium hydroxide, calcium oxide, strontium hydroxide, barium hydroxide, sodium hydroxide, potassium hydroxide, and mixtures thereof, wherein said admixture is calcined at a temperature above about 300° and below about 580° C. to form a cross-linked sorbent material.

5,688,480
COMPLEX METAL OXIDE POWDER AND METHOD FOR THE PRODUCTION OF THE SAME

Masahide Mohri; Hironobu Koike, and Tetsu Umeda, all of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

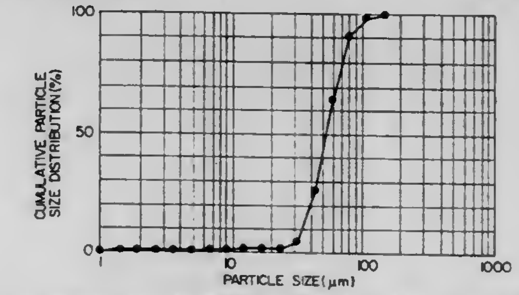
PCT No. PCT/JP94/01330, § 371 Date May 15, 1995, § 102(e) Date May 15, 1995, PCT Pub. No. WO95/04701, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 11, 1994, Ser. No. 411,636

Claims priority, application Japan, Aug. 11, 1993, 5-220715; Oct. 28, 1993, 5-294528; Nov. 9, 1993, 5-304639; Nov. 12, 1993, 5-307425

Int. Cl.^{6} C01F *17/00;* **C01G** *23/04;51/04;53/04*

U.S. Cl. 423—263 **23 Claims**



1. A method for producing a complex metal oxide powder comprising at least two metal elements, which method comprises calcining a mixture of at least two metal oxide powders and/or metal oxide precursor powders, or a metal oxide precursor powder comprising at least two metal elements in an atmosphere containing at least one gas selected from the group consisting of:

(1) a hydrogen halide,

(2) a component prepared from a molecular halogen and steam and

(3) a molecular halogen.

5,688,481
METHOD FOR PRODUCING CALCIUM BORATE

David M. Schubert, Los Angeles, Calif., assignor to U.S. Borax Inc., Valencia, Calif.

Filed Oct. 18, 1995, Ser. No. 544,518

Int. Cl.^{6} C01B *35/12*

U.S. Cl. 423—279 **15 Claims**

1. The method of producing crystalline calcium hexaborate tetrahydrate which comprises reacting boric acid and lime in an aqueous slurry, at a temperature in the range of from about 85° to about 105° C., wherein the molar ratio of boric acid to water is in the range of from about 0.25 to 0.5:1 and the molar ratio of lime to boric acid is in the range of about 0.05 to about 0.15:1, and separating said crystalline calcium hexaborate tetrahydrate from said aqueous slurry.

12. Crystalline calcium hexaborate tetrahydrate consisting of thin, intergrown platelets, arranged in nearly spherical radial cluster, produced according to the method of claim 1.

5,688,482
TEMPERATURE-ACTIVATED POLYSILICIC ACIDS AND THEIR USE IN PAPER PRODUCTION PROCESSES

Sakari Saastamoinen, Taavetti, Finland, assignor to J. M. Huber Corporation, Edison, N.J.

Division of Ser. No. 375,886, Jan. 20, 1995, Pat. No. 5,571,494. This application Jul. 17, 1996, Ser. No. 682,465

Int. Cl.^{6} C01B *33/12*

U.S. Cl. 423—335 **13 Claims**

1. A temperature-activated polysilicic acid prepared by heating an acidified aqueous alkali metal silicate.

5,688,483
ELECTRODE MATERIALS FOR ELECTROCHEMICAL CELLS AND METHOD OF MAKING SAME

Jinshan Zhang, Duluth, and Anaba A. Anani, Norcross, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 575,653, Dec. 20, 1995, Pat. No. 5,647,963. This application Feb. 3, 1997, Ser. No. 794,520

Int. Cl.^{6} C01B *31/00*

U.S. Cl. 423—445 R **17 Claims**

1. A method of fabricating an electrode material for an electrochemical cell, said electrode material consisting of a carbon material, said method comprising the steps of:

heating at least two multifunctional organic monomer at temperatures in excess of 600° C. so that said organic monomers

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form a carbon material characterized by an X-ray diffraction pattern in which the spacing of the (002) plane is between 3.72 Å and 4.20 Å.

5,688,484

NON-HYDROTHERMAL METHOD OF MAKING A TITANIUM-CONTAINING ZEOLITE

Robert J. Saxton, West Chester, and John G. Zajacek, Devon, both of Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Jul. 29, 1996, Ser. No. 681,585

Int. Cl.^{6} C01B *33/34*

U.S. Cl. 423—700 **22 Claims**

1. A non-hydrothermal method of making a titanium-containing zeolite comprising:

(i) preparing a precursor mixture comprised of
  (a) a silica source;
  (b) a titania source; and
  (c) a growth medium comprising a nitrogen-containing organic base, a fluoride-containing mineralizing agent, and, optionally, an organic solvent which does not prevent mineralization of the silica source and the titania source; and
(ii) heating said precursor mixture for a time and at a temperature sufficient to form as-synthesized titanium-containing zeolite.

5,688,485

RADIOLABELLED COMPLEXES OF ESTER-SUBSTITUTED DIAMINETHIOLS

Thomas David Harris, Salem, N.H., assignor to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Filed Dec. 31, 1992, Ser. No. 999,705

Int. Cl.^{6} A61K *51/04;* **C07F** *13/00;* **C07C** *321/00*

U.S. Cl. 424—165 **4 Claims**

2. The compound:

syn-Tc-99m-(D,L)-N,N'-1,2-ethylenediylbiscysteine, diethyl ester and pharmaceutically suitable salts thereof.

5,688,486

USE OF FULLERENES IN DIAGNOSTIC AND/OR THERAPEUTIC AGENTS

Alan D. Watson, Campbell, Calif.; Jo Klaveness, Oslo, Norway; Gene C. Jamieson, Boulder Creek; Jere D. Fellmann, Livermore, both of Calif., and Nils B. Vogt, Oslo, Norway, assignors to Nycomed Salutar, Inc., Sunnyvale, Calif.

PCT No. PCT/GB93/00279, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/15768, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 11, 1993, Ser. No. 284,606

Claims priority, application United Kingdom, Feb. 11, 1992, 9203037

Int. Cl.^{6} A61K *51/00*

U.S. Cl. 424—1.65 **35 Claims**

1. A compound comprising a curved or planar molecular mesh structure in the skeleton of which essentially all mesh aperture ring atoms are branching sites, said compound being externally linked to a metal or metal complex coordinating chelant group, or a conjugate, intercalate, inclusion compound or salt thereof, for use as a diagnostic or therapeutic agent.

5,688,487

DIAGNOSTIC IMAGING METHODS USING RHENIUM AND TECHNETIUM COMPLEXES CONTAINING A HYPOXIA-LOCALIZING MOIETY

Karen Linder, Kingston; Adrian D. Nunn, Ringoes; David P. Nowotnik, Flemington; Kondareddiar Ramalingam, Dayton; Richard J. DiRocco, Allentown, all of N.J.; William L. Rumsey, Wyndmoor, Pa., and John P. Pirro, Mahwah, N.J., assignors to Bracco International B.V., Amsterdam, Netherlands

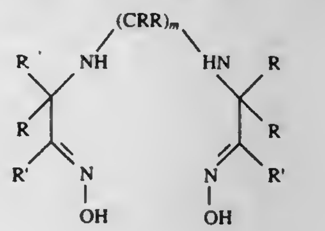
Division of Ser. No. 415,743, Apr. 3, 1995, which is a continuation of Ser. No. 54,120, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 976,079, Nov. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 784,486, Oct. 29, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 476,604

Int. Cl.^{6} A61K *51/04*

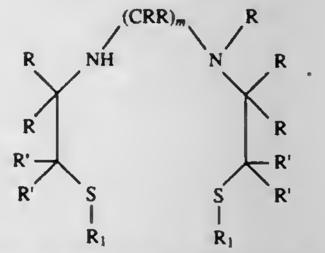
U.S. Cl. 424—1.65 **8 Claims**

1. A method for the diagnostic imaging of hypoxic tissue in a mammalian species comprising the steps of:

administering a pharmaceutical formulation comprising a metal complex, said metal complex comprising a radionuclide of technetium and a ligand of either formula Ia or Ib:

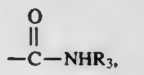


Ia



Ib

wherein at least one R' is —(A)$_p$—R$_2$ where (A)$_p$ is a linking group and R$_2$ is a nitro-heterocyclic hypoxia localizing moiety; and wherein the other R' groups, that are not —(A)$_p$—R^2, and the R groups are the same, or different and are independently selected from hydrogen, halogen, hydroxy, alkyl, alkonyl, alkynyl, alkoxy, aryl, —COOR$_3$,



$$-\overset{\overset{\displaystyle O}{\|}}{C}-NHR_3,$$

—NH$_2$, hydroxyalkyl, alkoxyalkyl, hydroxyaryl, haloalkyl, arylalkyl, alkyl—COOR$_3$, —alkyl—CON(R$_3$)$_2$, —alkyl—N(R$_3$)$_2$, —aryl—COOR$_3$, —aryl—CON(R$_3$)$_2$, —aryl—N(R$_3$)$_2$, 5- or 6-membered nitrogen- or oxygen-containing heterocycle; or two groups taken together with the one or more atoms to which they are attached form a carbocyclic or heterocyclic, saturated or unsaturated spiro or fused ring which may be substituted with R groups;

R$_1$ is hydrogen, a thiol protecting group or —(A)$_p$—R$_2$;
R$_3$ is hydrogen, alkyl or aryl;
m=2 t5;
p=0 t20; and where the term aryl denotes phenyl or substituted phenyl, and

obtaining a diagnostic image of said hypoxic tissue.

5,688,488

COMPOSITION AND METHOD FOR TUMOR IMAGING

Philip Stewart Low, West Lafayette, Ind.; Mark Alan Horn, Piscataway, N.J., and Peter Frederick Heinstein, West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 349,407, Dec. 5, 1994, which is a continuation of Ser. No. 851,544, Mar. 13, 1992, Pat. No. 5,416,016, which is a continuation of Ser. No. 498,762, Mar. 28, 1990, Pat. No. 5,108,921, which is a continuation-in-part of Ser. No. 331,816, Apr. 3, 1989, abandoned. This application May 16, 1995, Ser. No. 442,174

Int. Cl.^{6} A61K *51/08;* **C12N** *5/00;* **A01N** *37/18*

U.S. Cl. 424—1.69 **12 Claims**

1. A method for enhancing cellular uptake of a diagnostic agent by a living cell, said method comprising the step of contacting the cell with a composition comprising a ligand complex, wherein the ligand complex consists essentially of the diagnostic agent complexed with a ligand selected from the group consisting of biotin, biotin receptor-binding analogs of biotin or other biotin-receptor binding ligands, folate, folate receptor-binding analogs of folate or other folate receptor-binding ligands, riboflavin, riboflavin receptor-binding analogs of riboflavin or other riboflavin receptor-binding ligands, and thiamin, thiamin receptor-binding analogs of thiamin or other thiamin receptor-binding ligands, for a time sufficient to permit transmembrane transport of said ligand complex.

5,688,489

NON-RECEPTOR MEDIATED IMAGING AGENTS

Susan H. Peers; Anne Goodbody; Alfred Pollak, and John Thornback, all of Toronto, Canada, assignors to Resolution Pharmaceuticals, Inc., Mississauga, Canada

Filed Sep. 15, 1995, Ser. No. 529,060

Int. Cl.^{6} A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.69 **4 Claims**

1. The compound, dimethyl-G-S-C(Acm)-βA-βA-βA-G-I-G-K-F-L-H-S-A-G-K-F-G-K-A-F-V-G-E-I-M-K-S.

5,688,490

MUCOADHESIVE COMPOSITIONS FOR INCREASING THE ULTRASONIC IMAGE CONTRAST OF THE DIGESTIVE TRACT

Herve Tournier, Valleiry; Roland Hyacinthe, Douvaine, both of France, and Friedrich Cavagna, Vicenza, Italy, assignors to Bracco International B.V., Netherlands

Division of Ser. No. 257,510, Jun. 8, 1994, which is a division of Ser. No. 824,311, Jan. 23, 1992, Pat. No. 5,370,901. This application Feb. 7, 1996, Ser. No. 598,226

Claims priority, application European Pat. Off., Feb. 15, 1991, 91810105

Int. Cl.^{6} A61B *8/13*

U.S. Cl. 424—9.52 **8 Claims**

1. A composition for enhancing the image contrast in ultrasonic imaging of the digestive tract of humans and animals comprising a physiologically acceptable water insoluble and gel forming carrier phase which when hydrated has differential affinity for the gastrointestinal mucosa in admixture with or bound to echogenic particles in the form of air- or gas-filled microspheres bound by a material envelope, the carrier phase being selected from the group consisting of polysiloxanes and copolymers of acrylic acid cross-linked with polyfunctional allyl acrylates or polyfunctional allyl ethers of glycols or sugars.

5,688,491

ORAL COMPOSITIONS

Hooman Shahidi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 306,868, Sep. 15, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 634,030

Int. Cl.^{6} A61K *7/16;7/18*

U.S. Cl. 424—49 **9 Claims**

1. An oral mouthrinse composition effective against diseases of the oral cavity comprising:

(a) from about 20% to about 70% of xylitol;
(b) a safe and effective amount of copper bis-glycinate; and
(c) a pharmaceutically acceptable carrier.

5,688,492

ORAL HYGIENE COMPOSITION

Edward Galley, and Michael David Cooper, both of Nottingham, England, assignors to The Boots Company PLC,, Notts, United Kingdom

Continuation of Ser. No. 331,504, Jan. 27, 1995, abandoned. This application Jul. 22, 1996, Ser. No. 672,232

Claims priority, application United Kingdom, May 22, 1992, 9210947

Int. Cl.^{6} A61K *7/16;7/18;7/22;31/28*

U.S. Cl. 424—49 **20 Claims**

1. An oral composition suitable for use in oral hygiene or dental treatment comprising an effective amount of an antimicrobial agent in the form of a particulate, non-ion-exchanging, zeolite-free, inert metal oxide, a sparingly soluble metal salt providing antimicrobial metal ions in use and a further material selected from the group consisting of humectants, gelling agents, abrasives, fluoride sources, desensitizing agents, flavorings, colorings, sweeteners, preservatives, structuring agents, bactericides,. anti-tartar agents and anti-plaque agents.

5,688,493

COSMETIC COMPOSITION FORMULATED WITH AN AQUEOUS POLYMER EMULSION

Tooru Sugawara, Chiba; Hitoshi Hosokawa; Koichi Nakamura, both of Funabashi; Michitaka Sawada, and Takehiro Tsutsumi, both of Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 53,204, Apr. 28, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 323,578

Claims priority, application Japan, May 1, 1992, 4-112860; Feb. 8, 1993, 5-020112

Int. Cl.^{6} A61K *7/02;7/04*

U.S. Cl. 424—61 **16 Claims**

1. A method of manicuring or pedicuring, which comprises applying to a nail a nail enamel composition, the nail enamel composition comprising:

(i) a pigment; and
(ii) an aqueous polymer emulsion in an mount, as a solid content, of from 1 to 60% by weight based on the total weight of the nail enamel composition,

said aqueous polymer emulsion being produced by polymerizing at least one polymerizable monomer having a double bond in the presence of a plasticizer or film-forming auxiliary selected from the group consisting of cellosolves carbitols, acetates, alcohols, diols, esters, ethers and diethylbenzene, and in which the plasticizer or film-forming auxiliary is not removed from the emulsion except for any plasticizer or film forming auxiliary, if any, present in aggregates which may optionally be removed.

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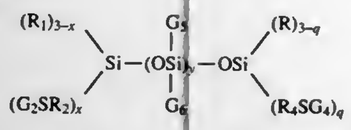
5,688,494
FAST DRYING NAIL ENAMEL COMPOSITION AND METHOD

Gary G. Graves, Germantown, Tenn., and Terry C. Jacks, Olive Branch, Miss., assignors to Maybelline, Inc., Wilmington, Del.

Filed Nov. 17, 1995, Ser. No. 560,542
Int. Cl.⁶ A61K *7/04;7/043*

U.S. Cl. 424—61 **8 Claims**

1. A fast drying nail enamel composition comprising
(A) a base mixture comprising (1) solvent, (2) from about 1 to 12 wt. % plasticizer and (3) from about 1 to 25 wt. % nitrocellulose;
(B) from about 0.1 to 5 wt. % of a vinyl-silicone copolymer of the formula



wherein G_5 represent monovalent moieties which can independently be the same or different selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, fluoroalkyl, hydrogen and —ZSA;
A represents a vinyl polymeric segment consisting of polymerized vinyl monomer,
Z is a divalent linking group selected from the group consisting of alkylene, alkarylene, arylene and alkoxyalkylene,
G_6 represents monovalent moieties which can independently be the same or different selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, fluoroalkyl; hydrogen, and —ZSA;
G_2 comprises A;
G_4 comprises A;
R_1 represents monovalent moieties which can independently be the same or different and are selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and hydroxyl;
R_2 can independently be the same or different and represents divalent linking groups selected from the group consisting of alkylene, alkarylene, arylene and alkoxyalkylene;
R_3 represents monovalent moieties which can independently be the same or different and are selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and hydroxyl;
R_4 can independently be the same or different and are divalent linking groups selected from the group consisting of alkylene, alkarylene, arylene and alkoxyalkylene;
x is an integer of 0–3;
y is an integer of 5 or greater;
q is an integer of 0–3;
wherein at least one of the following is true:
q is an integer of at least 1;
x is an integer of at least 1;
G_5 comprises at least one —ZSA moiety; and
G_6 comprises at least one —ZSA moiety; and
(C) an anti-bubbling effective amount of dimethicone fluid having a viscosity in the range of from 200 to 500 cSt.

5,688,495
TOPICAL DEODORANT COMPOSITIONS

Steven E. Rosen, 2150 SW. 90th Ave. Unit A, Ft. Lauderdale, Fla. 33324, and Robert Lee Brown, 3923 Evergreen, Irving, Tex. 75061

Continuation-in-part of Ser. No. 039,843, Mar. 30, 1993. This application Jan. 29, 1996, Ser. No. 593,401
Int. Cl.⁶ A61K *7/32;7/00*

U.S. Cl. 424—65 **9 Claims**

1. A composition for use as a deodorant consisting essentially of: in the range of about 20 to about 80 percent by weight of an acetylsalicylic acid solution having acetylsalicylic acid in the range of between about 5 percent by weight per unit volume of a solvent mixture up to saturation of said solvent mixture, said solvent mixture consisting essentially of propylene glycol in the range of about 5 to 15 percent by volume, glycerine in the range of about 1 to 10 percent by volume, and the balance of said solvent mixture made up with one or more solvents selected from the group consisting of isopropyl alcohol, water, and ethanol, said balance of said solvent mixture comprising at least 50 percent by volume isopropyl alcohol; and in the range of about 80 to about 20 percent by weight of a waxy carrier.

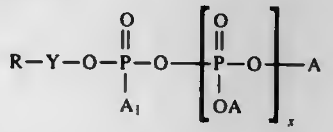
5,688,496
SILICONE MODIFIED PHOSPHOLIPID COMPOSITIONS

Dennis L. Fost, Ridgewood, and Abe Berger, Summitt, both of N.J., assignors to Mona Industries, Inc, Paterson, N.J.

Continuation-in-part of Ser. No. 298,565, Aug. 31, 1994, abandoned, and Ser. No. 420,748, Apr. 12, 1995, Pat. No. 5,623,043. This application Apr. 10, 1996, Ser. No. 630,177
Int. Cl.⁶ A61K *7/06*

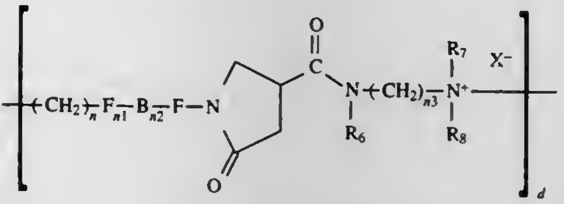
U.S. Cl. 424—70.122 **15 Claims**

1. A cosmetic composition for the care of skin and hair comprising from about 0.1% to about 10% of a silicone-containing phospholipid composition selected from a composition having the general formula:



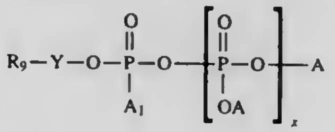
$$R-Y-O-\underset{\underset{\displaystyle A_1}{|}}{\overset{\overset{\displaystyle O}{\|}}{P}}-O-\left[\underset{\underset{\displaystyle OA}{|}}{\overset{\overset{\displaystyle O}{\|}}{P}}-O\right]_x-A$$

wherein:
A is selected from H, M or R—Y—;
A_1 is selected from H, OH, OM or R—Y—O—;
M is a cation;
Y is alkylene optionally interrupted by up to 3 oxygen atoms, which alkylene chain may optionally be substituted with lower alkyl, alkoxyalkyl or hydroxyalkyl with not more than 10 carbon atoms each;
x is 0 or an integer from 1–5; and
R is a quaternized organosilicone amidoamine moiety of the formula:



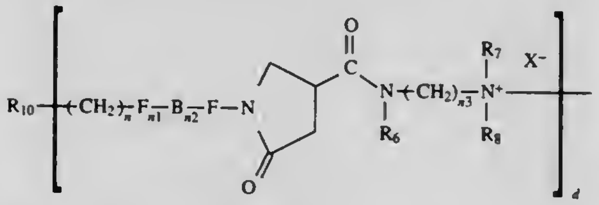
wherein:
R_{10} is the silicone backbone chain to which at least one pyrrolidone containing amidoamine functional group is attached;
R_6 is hydrogen or alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each, cycloalkyl of up to 6 carbon atoms, or polyoxyalkylene of up to 10 carbon atoms within the oxyalkylene unit;
R_7 and R_8, which may be the same or different, are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl moiety or polyoxyalkylene of up to 10 carbon atoms; or in addition R_7 and R_8 taken together with the nitrogen to which they are attached represents an N-heterocycle;
F which can be the same of different is linear or branched alkylene of 1–12 carbon atoms;
X^- is an anion;
n is 0 or 2;
n^1 is 0 or 1;
n^2 is 0 or 1;

n^3 is an integer from 2 to 12.
B is $—NR_{11}$ sulfur or oxygen, wherein R_{11} is hydrogen or lower alkyl (C_{1-6}); with the proviso that when n is 0 and n^2 is 1, n^1 is 1, when n is 2 and n^2 is 1, n^1 is 0 or 1 and when n is 2 and n^2 is 0, n^1 is 0; and;
d is one or greater;
or a composition having the general formula:

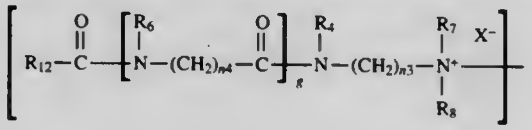


$$R_9-Y-O-\underset{\underset{\displaystyle A_1}{|}}{\overset{\overset{\displaystyle O}{\|}}{P}}-O-\left[\underset{\underset{\displaystyle OA}{|}}{\overset{\overset{\displaystyle O}{\|}}{P}}-O\right]_x-A$$

wherein:
A is selected from H, M or R—Y—;
$A_1$is selected from H, OH, OM or R—Y—O—;
M is a cation;
x is 0 or an integer from 1 to 5;
Y is alkylene or substituted alkylene; and
R_9 is a quaternized silicone-containing amidoamine moiety of the formula a) and the mixture thereof with an organic amidoamine moiety of the formula b), an organic tertiary amine moiety of the formula c) or mixtures of formula b) and formula c):
a) a quaternized organosilicone amidoamine moiety of the formula:

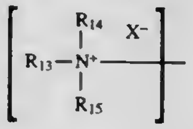


wherein:
R_{10} is a silicone backbone chain to which at least one pyrrolidone containing amidoamine functional group is attached;
R_6 is hydrogen, alkyl, hydroxyalkyl, alkenyl of up to 6 carbon atoms each, cycloalkyl of up to 6 carbon atoms, or polyoxyalkylene of up to 10 carbon atoms within the oxyalkylene unit;
R_7 and R_8, which may be the same or different, are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl, or polyoxyalkylene of up to 10 carbon atoms; or in addition R_7 and R_8 taken together with the nitrogen to which they are attached represent an N-heterocycle;
X^- is an anion;
n is 0 or 2;
n^1 0 or 1;
n^2 is 0 or 1;
n^3 is an integer from 2 to 12;
B is $—NR_{11}$, sulfur (S) or oxygen (O), wherein R_{11} is hydrogen or lower alkyl (C_{1-6}); with the proviso that when n is 0 and n^2 is 1, n^1 is 1, when n is 2 and n^2 is 1, n^1 is 0 or 1 and when n is 2 and n^2 is 0, n^1 is 0; and
d is one or greater;
b) a quaternized organic amidoamine moiety of the formula:



$$\left[R_{12}-\overset{\overset{\displaystyle O}{\|}}{C}-\left[\overset{\overset{\displaystyle R_6}{|}}{N}-(CH_2)_{n4}-\overset{\overset{\displaystyle O}{\|}}{C}\right]_g-\overset{\overset{\displaystyle R_4}{|}}{N}-(CH_2)_{n3}-\underset{\underset{\displaystyle R_8}{|}}{\overset{\overset{\displaystyle R_7}{|}}{N^+}}-\right]X^-$$

wherein:
R_{12} is alkyl, alkenyl, alkoxy or hydroxyalkyl of from 5 to 21 carbon atoms each, alkaryl or aryl of up to 20 carbon atoms;
R_6 is hydrogen, alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each, cycoalkyl of up to 6 carbon atoms, or polyoxyalkylene of up to 10 carbon atoms within the oxyalkylene unit;
R_7 and R_8 which may be the same or different, are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl moiety, or polyoxyalkylene of up to 10 carbon atoms; or in addition R_7 and R_8 taken together with the nitrogen to which they are attached may represent an N-heterocycle;
X^- is an anion;
g is 0 or 1;
n^3 is integer from 2 to 12; and
n^4 is 1 or greater; and
c) an organic quaternized tertiary amine moiety of the formula:



$$\left[R_{13}-\underset{\underset{\displaystyle R_{15}}{|}}{\overset{\overset{\displaystyle R_{14}}{|}}{N^+}}-\right]X^-$$

wherein:
R_{13}, R_{14} and R_{15} are the same or different and are alkyl, substituted alkyl, alkylaryl or alkenyl groups of up to 16 carbon atoms with the proviso that the total carbon atoms in $R_{13}+R_{14}+R_{15}$ is between 10 and 24;
with the proviso that at least 5 equivalent weight percent of the total equivalent weight of amidoamine and amine moieties of the phospholipid composition is a quaternized organosilicone amidoamine moiety.

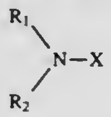
5,688,497
SHAVING AID WITH PHYSIOLOGICAL COOLING EFFECT

Robert V. Lozeau, Madison, and Manuel Andrade, Milford, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 4, 1996, Ser. No. 707,542
Int. Cl.⁶ A61K *7/15*

U.S. Cl. 424—73 **4 Claims**

1. A shaving aid comprising an effective amount of a compound capable of stimulating the cold receptors of the nervous system in the surface tissues of skin when brought into contact therewith, said compound having the formula:



where R_1, when taken separately is H, C_1–C_7, alkyl or C_3–C_6 cycloalkyl;
R_2, when taken separately, is C_3–C_8 alkyl or C_1–C_8 aikylcycloalkyl, alkylcycloalkylalkyl, cycloalkyl or cycloalkylalkyl, with the proviso that R_2 is branched at an alpha carbon atom relative to the N atom when R is H or at an alpha or beta carbon atoms when R is alkyl or cycloalkyl, this condition to be satisfied, in the case of cyclic groups, when the carbon atoms alpha or beta to the N atom is part of the cycle;
R_1 and R_2, when taken together, represent a straight or branched chain alkylene group forming with the N atom to which they are attached a 5–10 membered heterocycle, and preferably having branching at an alpha or beta carbon atom relative to the N atom.
R_1 and R_2, when separate groups and when taken together provide a total of at least 5 carbon atoms, and
X represents $R_3CO—$, $R_4SO_2—$, or R_5R_6 NCO— where;
R_3 is H, C_1–C_4 alkyl, C_3–C_4 cycloalkyl, C_2–C_4 hydroxyalkyl, C_2–C_8 carboxyalkyl or C_3–C_8 alkylcarboxyalkyl with the proviso that when R_3 is C_6 alkyl it is primary in structure;
R_4 is C_1–C_6 alkyl or C_3–C_6 cycloalkyl, with the proviso that when R_4 is C_5 or C_6 alkyl it is primary in structure;
R_5 and R_6, when taken separately, are each H, C_1–C_6 alkyl, C_3–C_6 alkylcyctoalkyl, cycloalkyl, or cycloalkylalkyl, C_2–C_8 hydroxyalkyl, C_2–C_8 carboxyalkyl or C_3–C_8 alkylcarboxy-

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alkyl; or together represent a straight or branched chain C_3–C_{10} alkylene group optionally containing an ether oxygen atom; and where:

R_1, R_2 and X provide a total of from 7–16 carbon atoms.

5,688,498

METHOD AND COMPOSITION FOR COATING WOUND OR PROTECTING ANIMAL SKIN

Carl A. Huprich, Robertsdale, Ala., and Leo L. Timms, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 9, 1996, Ser. No. 644,009

Int. Cl.^{6} A61K *9/10;* **A61L** *25/00*

U.S. Cl. 424—78.02 **6 Claims**

1. A solution of polyether polyurethane in tetrahydrofuran containing benzoin gum wherein said solution upon drying to an elastic film has improved adhesion as compared to the same solution without benzoin gum.

5,688,499

ANTAGONISM OF ENDOTHELIN ACTIONS

James D. Banting; Jeremy P.W. Heaton, and Michael A. Adams, all of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Mar. 13, 1996, Ser. No. 615,659

Int. Cl.^{6} A61K *49/00;38/00;* **G01N** *31/00;* **A61N** *31/17*

U.S. Cl. 424—78.35 **10 Claims**

1. A method for down regulating local endothelin-mediated erectile dysfunction in a patient independently of any normal or abnormal systemic physiology comprising: administering an effective amount of endothelin antagonist agent in a pharmaceutically acceptable carrier therefor.

5,688,500

METHOD OF AQUACULTURE COMPRISING FEEDING MICROFLORA HAVING A SMALL CELL AGGREGATE SIZE

William R. Barclay, Boulder, Colo., assignor to OmegaTech Inc., Boulder, Colo.

Division of Ser. No. 292,490, Aug. 18, 1994, Pat. No. 5,518,918, which is a division of Ser. No. 962,522, Oct. 16, 1992, Pat. No. 5,340,742, which is a continuation-in-part of Ser. No. 911,760, Jul. 10, 1992, Pat. No. 5,340,594, which is a division of Ser. No. 580,778, Sep. 11, 1990, Pat. No. 5,130,242, which is a continuation-in-part of Ser. No. 439,093, Nov. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 241,410, Sep. 7, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 461,137

Int. Cl.^{6} A01N *63/00;* **A23L** *1/237;* **C12N** *1/00*

U.S. Cl. 424—93.1 **8 Claims**

1. A method of aquaculture, comprising feeding microflora selected from the group consisting of Thraustochytrium, Schizochytrium, and mixtures thereof to organisms selected from the group consisting of fish, larval shrimp, brine shrimp, rotifers and mollusks, said microflora having a cell aggregate size less than about 150 microns.

5,688,501

ANTIBACTERIAL THERAPY WITH BACTERIOPHAGE GENOTYPICALLY MODIFIED TO DELAY INACTIVATION BY THE HOST DEFENSE SYSTEM

Carl R. Merril, Rockville, Md.; Richard M. Carlton, Port Washington, N.Y., and Sankar L. Adhya, Gaithersburg, Md., assignors to Exponential Biotherapies, Inc., New York, N.Y., and The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 222,956, Apr. 5, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,269

Int. Cl.^{6} A61K *35/76;* **C12N** *7/02;7/08*

U.S. Cl. 424—93.6 **16 Claims**

1. A method for treating an infectious disease caused by bacteria in an animal comprising:

administering to an animal in need of such treatment lytic or non-lytic bacteriophages that are specific for said bacteria in a dosage effective to substantially eliminate the bacteria, wherein said bacteriophages are obtained by serial passage through an animal's circulatory system of mutagenized or non-mutagenized bacteriophages and are selected to have at least a 15% longer half-life in the animal's circulatory system than corresponding wild-type bacteriophages, wherein said at-least 15% longer half-life is genetically inheritable and wherein said bacteriophages having at least 15% longer half-life contact said bacteria during the course of the infectious disease.

5,688,502

ANIMAL GROWTH PROMOTANT

Thomas Ko Sai Ying, Victoria, Australia, assignor to Enzacor Properties Limited, St. Helier, Channel Islands

Continuation of Ser. No. 230,007, Apr. 19, 1994, Pat. No. 5,567,423, which is a continuation of Ser. No. 833,587, Feb. 12, 1992, abandoned, which is a continuation of Ser. No. 328,075, Feb. 23, 1989, abandoned. This application Aug. 8, 1996, Ser. No. 694,092

Claims priority, application Australia, Aug. 28, 1986, PH 7714/86

Int. Cl.^{6} A61K *38/54*

U.S. Cl. 424—94.3 **26 Claims**

1. An animal growth promotant comprising microgranules having a core consisting of at least one digestive enzyme immobilized by entrapment within a gel matrix wherein said gel matrix restricts the accessibility of denaturing agents to said at least one digestive enzyme, wherein said at least one digestive enzyme is selected from the group consisting of:

(i) protein digesting enzymes;
(ii) carbohydrate digesting enzymes;
(iii) fat digesting enzymes; and
(iv) fibre digesting enzymes;

wherein the core is encapsulated within a water soluble film, and coated with an enteric coating comprising an alkali soluble, acid insoluble polymer, or a high molecular weight polymer whose structure is substituted with or contains windows of fatty acid or other material capable of being solubilized by intestinal juices, whereby said at least one digestive enzyme is not degraded by contact with fluids in the stomach or rumen.

5,688,503

MODIFICATION OF PLASMINOGEN ACTIVATORS

Francesco Blasi, Teglgardsvej 19A, DK-2920 Charlottenlund, Denmark; Maria Patrizia Stoppelli, IIa Trav. L. Bianchi, 389; Maria Rosaria Mastronicola, Via Nicolardi, 109, both of I-80131 Napoli, Italy; Karen Gjersing Welinder, Amosebakken 14, DK-2830 Virum, Denmark, and Isabel Correas, C. Doctor Esquerdo 140-1, 7c, E-28007 Madrid, Spain

Division of Ser. No. 603,675, Dec. 18, 1991, Pat. No. 5,416,006. This application May 15, 1995, Ser. No. 441,358

Claims priority, application Denmark, Apr. 14, 1989, 1822/89

Int. Cl.^{6} A61K *38/49;38/48;* **C12N** *9/48;9/72*

U.S. Cl. 424—94.64 **5 Claims**

4. A pharmaceutical composition comprising a pharmaceutically acceptable carrier or diluent and, as the active ingredient, phosphorylated u-PA or pro-u-PA or combinations thereof, which are substantially free from unphosphorylated u-PA or pro-u-PA.

5,688,504

ANTI-RECEPTOR AND GROWTH BLOCKING ANTIBODIES TO THE VITAMIN B_{12}/TRANSCOBALAMIN II RECEPTOR AND BINDING SITES

Alton Charles Morgan, Jr., Edmonds, Wash., assignor to Receptagen Corporation, Edmonds, Wash.

Continuation-in-part of Ser. No. 880,540, May 8, 1992, abandoned. This application Sep. 13, 1994, Ser. No. 306,504

Int. Cl.^{6} A61K *39/00*

U.S. Cl. 424—141.1 **21 Claims**

1. A method for inhibiting cell division of a target cell in a warm-blooded animal, comprising administering to the animal a monoclonal anti-receptor antibody to a vitamin B_{12}/transcobalamin II receptor on the surface of the target cell, said monoclonal antibody being capable of competitively antagonizing or modulating the receptor to prevent or inhibit cellular uptake of vitamin B_{12} by the target cell.

5,688,505

METHOD FOR TREATING CANCER WITH MONOCLONAL ANTIBODIES TO ONCOFETAL PROTEIN

Thomas E. Webb, Columbus; Paul C. Stromberg, Westerville, and Dorothy E. Schumm, Patriot, all of Ohio, assignors to The Ohio State University, Columbus, Ohio

Division of Ser. No. 222,201, Apr. 1, 1994, Pat. No. 5,532,159. This application May 24, 1995, Ser. No. 449,336

Int. Cl.^{6} A61K *39/395;* **C07K** *16/00;16/18;16/30*

U.S. Cl. 424—145.1 **6 Claims**

1. A method for treating cancer in a patient comprising the following steps:

a. providing a monoclonal antibody to oncofetal protein; and
b. administering said monoclonal antibody to the patient.

5,688,506

IMMUNOGENS AGAINST GONADOTROPIN RELEASING HORMONE

Stephen Grimes, Davis, and Robert Sciblenski, Woodland, both of Calif., assignors to Aphton Corp., Woodland, Calif.

Filed Jan. 27, 1994, Ser. No. 188,223

Int. Cl.^{6} A61K *39/00;38/00;* **C07K** *5/00;17/00*

U.S. Cl. 424—184.1 **10 Claims**

1. An anti-GnRH immunogenic composition comprising a peptide selected from the group consisting of Cys-Pro-Pro-Pro-Pro-Ser-Ser-Glu-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-GlyNH_2 (SEQ ID NO: 5 in the Sequence Listing) and pGlu-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-Ser-Ser-Pro-Pro-Pro-Pro-Cys (SEQ ID NO: 6 in the Sequence Listing) conjugated to an immunogenic carrier.

5,688,507

METHODS AND COMPOSITIONS FOR INHIBITING THROMBOGENESIS

Jeffrey I. Weitz, Ancaster, and Jack Hirsh, Hamilton, both of Canada, assignors to Hamilton Civic Hospitals Research Development, Inc., Ontario, Canada

Continuation of Ser. No. 175,211, Dec. 27, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 559,256

Int. Cl.^{6} A61K *39/395*

U.S. Cl. 424—184.1 **4 Claims**

1. A method for displacing thrombin bound to fibrin in thrombus, said method comprising exposing the thrombus to a soluble F_2 fragment from prothrombin in an aqueous environment, which soluble F_2 fragment binds to a fibrin-binding site on thrombin with sufficient affinity to displace thrombin from the thrombus and inhibit thrombin in the aqueous environment from binding to fibrin in the thrombus.

5,688,508

FEED COMPOSITIONS COMPRISING PURSLANE LEAVES AND METHODS OF USING THEREOF

Michael O. Ezekwe, Colonial Heights; Thomas R. Omara-Alwala, Chester, and Tadesse Mebrahtu, Prince George, all of Va., assignors to Virginia State University, Petersburg, Va.

Filed Feb. 21, 1995, Ser. No. 391,188

Int. Cl.^{6} A01N *63/00;65/00;* **A23K** *1/18;* **C12N** *5/00*

U.S. Cl. 424—195.1 **8 Claims**

1. A feed composition capable of reducing serum cholesterol and triglycerides comprising an effective amount of purslane leaves, wherein said leaves are obtained from purslane plants in full bloom.

5,688,509

CONTROLLED-RELEASE INSECT REPELLENT DEVICE

M. Nabil Radwan, Medina, Ohio, and Gaylord Powers Allin, West Monroe, La., assignors to Tenneco Packaging, Evanston, Ill.

Filed Feb. 20, 1996, Ser. No. 603,727

Int. Cl.^{6} A01N *65/00;25/00;37/02;37/00*

U.S. Cl. 424—195.1 **37 Claims**

1. A controlled-release insect repellent device for repelling insects from food, tobacco, or other consumable items, comprising an insect repellent composition contacting a substrate;

wherein the insect repellent composition comprises (a) a repellent compound chosen from the group consisting of essential oils accepted for food and medical use and active ingredients of said essential oils, (b) a controlled-release agent, and optionally, (c) a solvent;

wherein the repellent compound used in the controlled-release insect repellent device is present in an amount such that it is non-toxic to humans and animals, and

wherein the controlled-release agent will control the rate of release of the repellent compound from the device such that its odor is not objectionable or noticeable by humans.

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5,688,510
PROCESS FOR PRODUCING STABLE MEDICINAL COMPOSITION, AND PHARMACEUTICAL PREPARATION

Koulchi Nakamichi, Shiga; Shougo Izumi, Kyoto, and Hiroyuki Yasuura, Shiga, all of Japan, assignors to Nippon Shinyaku CO. LTD., Japan

PCT No. PCT/JP94/01936, § 371 Date May 17, 1996, § 102(e) Date May 17, 1996, PCT Pub. No. WO95/13794, PCT Pub. Date May 26, 1995

PCT Filed Nov. 17, 1994, Ser. No. 648,174

Claims priority, application Japan, Nov. 18, 1993, 5-289127

Int. Cl.⁶ A16K *35/78;9/20;9/00;9/14*

U.S. Cl. 424—195.1 **14 Claims**

1. A method of increasing the physicochemical stability of a drug substance, comprising:

providing ingredients comprising 1 part by weight of a physiologically inert powdery additive, 0.001–1 part by weight of a macromolecular additive per part by weight of said physiologically inert additive, and a drug substance selected from the group consisting of sublimінal drug, volatile drug, drug hydrolyzable in the presence of water, drug with tendency to develop whiskers, hygroscopic drug, and deliquescent drug; and processing said ingredients en bloc by means of a multi-screw extruder to produce a pharmaceutical composition containing said drug substance, wherein the substance in the composition exhibits increase physicochemical stability.

5,688,511
CELLULAR PROTEIN TDP-43 AND REGULATION OF HIV-1 GENE EXPRESSION

Richard B. Gaynor; S.-H. Iqnatius Ou, both of Dallas, and Foon Kin Wu, Carrollton, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 788,266, Nov. 5, 1991, Pat. No. 5,350,835, and Ser. No. 239,047, May 6, 1994, abandoned. This application Nov. 22, 1994, Ser. No. 343,682

Int. Cl.⁶ C12N *5/06*

U.S. Cl. 424—207.1 **20 Claims**

1. A polypeptide that binds a TAR region of HIV-1 LTR DNA, does not bind to TAR RNA, and that inhibits HIV-1 gene expression, wherein said polypeptide is further defined as comprising a sequence 7–125 of SEQ ID NO:1.

5,688,512
BORRELIA ANTIGEN

Sven Bergstrom, Umea, Sweden, and Alan G. Barbour, San Antonio, Tex., assignors to Symbicom Aktiebolag, Sweden

Division of Ser. No. 79,601, Jun. 22, 1993, Pat. No. 5,523,089, which is a continuation of Ser. No. 924,798, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 422,881, Oct. 18, 1989, abandoned. This application Jan. 20, 1995, Ser. No. 375,993

Claims priority, application Germany, Oct. 22, 1988, 5902/88

Int. Cl.⁶ A61K *39/00;39/02;* **C07K** *14/00;14/20*

U.S. Cl. 424—234.1 **7 Claims**

1. A vaccine comprising:

substantially pure OspA; and

an immunologically acceptable carrier or vehicle.

5,688,513
COCCIDIOSIS VACCINES

Mary-Helen Binger, Hopewell, N.J., and Luis Pasamontes, Trimbach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 729,099, Jul. 12, 1991, Pat. No. 5,403,581. This application Jun. 9, 1994, Ser. No. 257,392

Int. Cl.⁶ A61K *39/012;* **C07K** *14/00;14/455*

U.S. Cl. 424—271.1 **7 Claims**

1. An immunogenic polypeptide which has the amino acid sequence (SEQ ID NO:1) lacking the first 20 amino acid residues of said polypeptide and which is substantially free of other proteins produced by Eimeria parasites.

5,688,514
THICKENERS FOR PRODUCTS FOR TOPICAL APPLICATION

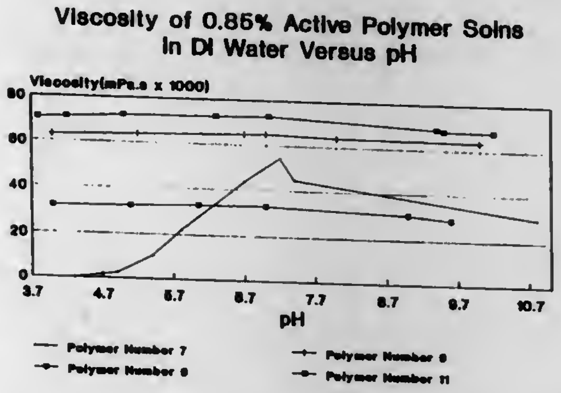
Arshad-Ul-Hag Chaudhry, Wellingborough, and Roman J. Mikolajewicz, Rushden, both of Great Britain, assignors to Scott Bader Company Limited, Northamptonshire, England

Continuation of Ser. No. 95,475, Jul. 22, 1993. This application Oct. 2, 1995, Ser. No. 538,022

Claims priority, application United Kingdom, Mar. 8, 1991, 9104878

Int. Cl.⁶ A61K *7/48*

U.S. Cl. 424—401 **13 Claims**



1. A personal care or pharmaceutical composition for topical application comprising

a topically acceptable liquid phase comprising a water phase,

a polymeric material at least 98% of which is water soluble, which polymeric material consists of monomer components (a) acrylamide, (b) 2-acrylamido-2-methylpropanesulphonic acid and (c) a polyfunctional monomer which is allyl sucrose, allyl pentaerythritol or methylene-bisacrylamide for cross linking with said monomer components (a) and (b), which said monomer components (a) and (b) are present in the polymer material in a molar ratio (a)/(b) of from 85/15 to 15/85 inclusive and which polyfunctional monomer is present in an amount of from 0.12 to 2 milliequivalents inclusive per mole of total monomer units, an oil phase, a water in oil emulsifier, an oil in water emulsifier, and a topically acceptable adjuvant, and whereby said polymeric material serves to thicken the composition and render essentially constant the viscosity of the composition over a pH range of from 5.5 to 9.

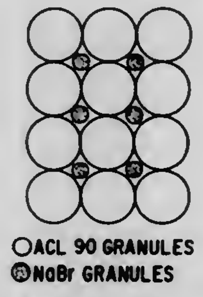
5,688,515
HYPOCHLORITE DONOR/BROMIDE ION DONOR TABLETS WHICH ARE STABLE IN WATER

Thomas C. Kuechler, St. Louis, and Lawrence F. Rakestraw, Chesterfield, both of Mo., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 750,577, Aug. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 750,744, Aug. 21, 1991, abandoned, which is a continuation of Ser. No. 366,936, Jun. 16, 1989, abandoned. This application Dec. 21, 1994, Ser. No. 362,738

Int. Cl.⁶ A01N *25/08*

U.S. Cl. 424—408 **15 Claims**



1. A water stable tablet for disinfecting recirculating water systems that provides prolonged and controlled release of hypobromous acid when immersed in water comprising the following solid particulate materials:

a) chlorinated isocyanurates; and

b) sodium bromide having a moisture content less than about 0.4 wt. %; and

c) a stabilizer selected from active chlorine stabilizer compounds that are compatible with chlorinated isocyanurates in the solid state, and capable of binding active halogen (chlorine or bromine in the +1 valence state), and less soluble when fully chlorinated than in the less than fully chlorinated state.

5,688,516
NON-GLYCOPEPTIDE ANTIMICROBIAL AGENTS IN COMBINATION WITH AN ANTICOAGULANT, AN ANTITHROMBOTIC OR A CHELATING AGENT, AND THEIR USES IN, FOR EXAMPLE, THE PREPARATION OF MEDICAL DEVICES

Isaam Raad, Houston, Tex., and Robert Sherertz, Winston-Salem, N.C., assignors to Board of Regents, The University of Texas System, Austin; Baylor College of Medicine, Houston, both of Tex., and Wake Forest University, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 150,472, Nov. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 975,486, Nov. 12, 1992, Pat. No. 5,362,754. This application Oct. 3, 1994, Ser. No. 317,309

Int. Cl.⁶ A01N *25/08;37/12;* **A61F** *2/02;* **A61M** *31/00*

U.S. Cl. 424—409 **51 Claims**

1. A composition comprising a non-glycopeptide antimicrobial agent other than vancomycin and a second agent selected from the group consisting of: (a) an anticoagulant, (b) an antithrombotic agent and (c) a chelating agent selected from the group consisting of: EGTA, diethylenetriamine penta acetic acid, DMSA, deferoxamine, dimercaprol, zinc citrate, a combination of bismuth and citrate, penicillamine, succimer and Etidronate, wherein the agents are included in a therapeutically effective amount between about 0.001 mg/ml and about 1000 mg/ml.

5,688,517
METHOD FOR ASSESSING SENSITIVITY OF TUMOR CELLS TO CEPHALOMANNINE AND 10-DEACETYLTAXOL

Lawrence Helson, Chappaqua, N.Y., and Sterling K. Ainsworth, Boulder, Colo., assignors to NaPro BioTherapeutics, Inc., Boulder, Colo.

Filed Jan. 29, 1993, Ser. No. 10,821

Int. Cl.⁶ A61F *13/00*

U.S. Cl. 424—422 **15 Claims**

1. The method for assessing the sensitivity of a patient's tumor cells to cephalomannine and 10-deacetyltaxol prior to selecting cephalomannine or 10-deacetyltaxol as a method of treating said tumor cells, said method comprising the following:

removing a sample of tumor cells from the patient;

establishing a cell line from said sample;

culturing cells from said cell line in a medium;

contacting selected varying concentrations of at lest one compound selected from the group consisting of cephalomannine and 10-deacetyltaxol with at least some of said cultured tumor cells, thereby to form treated cells;

performing an assay on said treated cells to assess cytotoxic effect on said treated cells by cephalomannine and 10-deacetyltaxol; and

in instances where said cells exhibit a cytotoxic response to said compound, thereafter formulating a therapeutic dosage containing a carrier material and a selected concentration of said compound for in vivos injection, said concentration determined by the cytotoxic effect the treated cells to said compound in said assay.

5,688,518
ANTIDEPRESSIVE THERAPY

Atul Devdatt Ayer, Palo Alto, and Dana Ridzon, San Francisco, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

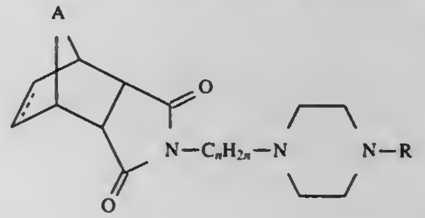
Continuation-in-part of Ser. No. 842,682, Feb. 27, 1992, Pat. No. 5,185,158. This application Jul. 27, 1995, Ser. No. 507,890

Int. Cl.⁶ A61K *9/24*

U.S. Cl. 424—422 **30 Claims**

1. A therapeutic composition of matter comprising:

(a) less than 45% by weight of a drug of the following formula:



in either exo or endo form and the base and pharmaceutically acceptable salts thereof; wherein A is selected from the group consisting of an oxygen atom, a methylene group and an ethylene group, the full line embracing a broken line (———) designates either a single bond or a double bond, R is a phenyl group optionally substituted with a member selected from the group consisting of halogen, an alkyl group of 1–4 carbon atoms, an alkoxy group of 1–4 carbon atoms, a trifluoromethyl group, a 2-pyridyl group and a 2 -pyrimidinyl group;

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(b) 30% to 60% by weight of a polymeric composition comprising:
  (i) a first polymer selected from the group consisting of the repeating molecular unit $-(-O-CH_2CH_2-)-_n$ wherein n is in the range of 4000 to 5500, or a second polymer having the same repeating molecular unit wherein n is in the range of 5700 to 7500; and,

(c)
  (ii) 0–3% by weight of a lubricant;
  (iii) 0–20% by weight of an osmagent;
  (iv) 0–4% by weight of an antioxidant and
  (v) 0–10% by weight of a binder.

5,688,519
FLASH-FLOW FUSED MEDICINAL IMPLANTS
Robert J. Leonard, 4 Hutchins Cir., Lynnfield, Mass. 01940

Continuation of Ser. No. 218,154, Mar. 25, 1994, abandoned, which is a continuation of Ser. No. 82,155, Jun. 24, 1993, abandoned, which is a continuation of Ser. No. 475,200, Feb. 5, 1990, abandoned, which is a continuation of Ser. No. 175,533, Mar. 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 35,379, Apr. 6, 1987, Pat. No. 4,748,024. This application Nov. 28, 1994, Ser. No. 348,351

Int. Cl.^{6} A61K *31/56*

U.S. Cl. 424—426 **24 Claims**

1. A totally-fused pellet capable of sustained-release of a steroid drug comprising.
  a melted and recrystallized steroid drug free of a carrier combined therewith, said pellet characterized by the absence of thermal degradation impurities caused by overexposing said steroid drug to heat when melting said steroid drug.

5,688,520
TRANSMUCOSAL DELIVERY OF MELATONIN FOR PREVENTION OF MIGRAINE
Herve Karsenty, Noisy le Roi; Luce Benes, Orleans; Francoise Horriere, Angerville, and Claire La Coste, Paris, all of France, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 412,717, Mar. 29, 1995, abandoned. This application May 24, 1995, Ser. No. 449,312

Int. Cl.^{6} A61K *47/32*

U.S. Cl. 424—434 **7 Claims**

1. A method of reducing the frequency of and/or preventing migraine, comprising the step of administering melatonin in an amount and for a time sufficient to increase the period of time between episodes of migraine, wherein the melatonin is administered to and across a mucosal surface.

5,688,521
LACTULOSE PASTILLES
Hermann-Josef Bolder, and Faruk Imer, both of Cologne, Germany, assignors to Bolder Arzneimittel GmbH, Cologne, Germany

PCT No. PCT/EP94/01344, § 371 Date Dec. 1, 1995, § 102(e) Date Dec. 1, 1995, PCT Pub. No. WO94/25002, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 28, 1994, Ser. No. 535,073

Claims priority, application Germany, May 4, 1993, 43 14 705.4

Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—439 **11 Claims**

1. Sucking pastilles comprising, based on from 2 to 80% by weight, based on the total mass of the pastilles, at least partially or completely water soluble natural polymers, synthetic polymers, or both selected from the group consisting of gums, alginates, carrageen, starch, pectin, and gelatin which polymers are suitable to form gels or viscous solutions in aqueous systems, and sugar substitutes selected from the group consisting of fructose, sorbitol, mannitol, xylitol, hydrogenated glucose syrup, and sweeteners, and the pastilles further comprising 4-O-β-D-galactopyranosyl-D-fructose (lactulose) as an active substance.

5,688,522
OINTMENT FOR WOUND TREATMENT
Craig J. Hardy, Skipton, United Kingdom, assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Continuation of Ser. No. 439,828, May 12, 1995, abandoned, which is a division of Ser. No. 204,730, Mar. 1, 1994, abandoned. This application Aug. 13, 1996, Ser. No. 696,443

Claims priority, application United Kingdom, Mar. 23, 1993, 9306039

Int. Cl.^{6} A61L *15/00*

U.S. Cl. 424—445 **3 Claims**

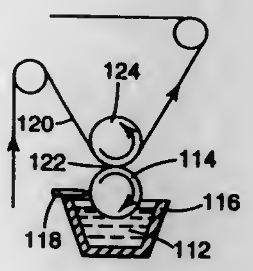
1. A method of forming a wound treatment composition comprising the steps of:
  providing an aqueous wound treatment composition by mixing from 1 to 20% by weight of a gel-forming polysaccharide selected from the group consisting of carboxymethyl cellulose and hydroxyethyl cellulose, from 15 to 50% by weight of hexylene glycol, and water, the weight being based on the weight of the aqueous wound treatment composition; and
  drying the wound treatment composition.

5,688,523
METHOD OF MAKING A PRESSURE SENSITIVE SKIN ADHESIVE SHEET MATERIAL
James E. Garbe, Inver Grove Heights, Minn.; Paul J. Northey, Somerset, Wis., and Timothy A. Peterson, Lino Lakes, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1995, Ser. No. 414,721

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—448 **27 Claims**



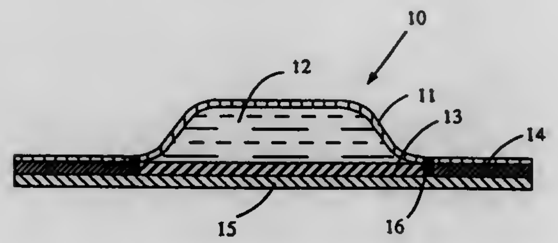
1. A continuous method &making a pressure sensitive skin adhesive sheet material containing a liquid by combining a coating medium comprising said liquid with a polymeric base layer, which sheet material retains substantially all of the liquid until it is applied to the skin, comprising the steps of:
  (i) applying to a substrate layer a base layer of a first polymer said first polymer selected from the group consisting of acrylate polymers, polyisobutylenes, polyisoprenes, styrene block copolymers and silicone adhesives,
  (ii) applying continuously directly to said base layer a coating medium comprising a second polymer selected from the group consisting of acrylate polymers, polyisobutylenes, polyisoprenes, styrene block copolymers and silicone adhesives dissolved or dispersed in a liquid and allowing the coating medium to diffuse into the base layer to provide a pressure sensitive skin adhesive sheet material.

5,688,524
TRANSDERMAL FORMULATIONS FOR ADMINISTERING PRAZOSIN
Tsung-Min Hsu, Union City, and Eric J. Roos, Menlo Park, both of Calif., assignors to Cygnus, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 750,570, Aug. 27, 1991, abandoned. This application Mar. 10, 1993, Ser. No. 28,888

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—449 **16 Claims**



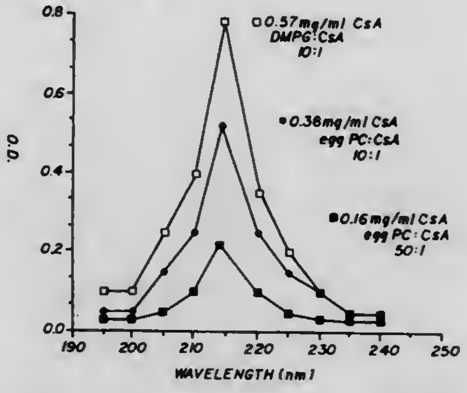
1. A method for administering prazosin to an individual in therapeutically effective amounts comprising administering prazosin transdermally to the individual over a prolonged period in combination with a skin permeation enhancer composition comprising
  (a) at least one nontoxic sulfhydryl-containing compound from the group of N-(2-mercaptopropionyl)glycine, thioglycerol, thioacetic acid, thiosalicylic acid, buciliamine, acetylcysteine and mercaptomenthone,
  (b) a nontoxic fatty acid ester;
  (c) a nontoxic polar solvent to an area of unbroken skin of about 20 to about 60 cm^2 over said period at a rate that provides at least about 50 μg prazosin per hour to the individual.

5,688,525
PHARMACEUTICAL FORMULATION AND PROCESS
Jill P. Adler-Moore, Altadena, and William A. Ernst, San Dimas, both of Calif., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Continuation of Ser. No. 687,812, Apr. 19, 1991, abandoned. This application Jun. 30, 1993, Ser. No. 85,673

Int. Cl.^{6} A61K *9/127;9/133*

U.S. Cl. 424—450 **21 Claims**



1. Liposomes consisting essentially of (i) a phosphatidylcholine having lipid portions principally composed of straight 16 or 18 carbon fatty acid chains, (ii) a negatively charged lipid selected from the group consisting of dimyristoylphosphatidylglycerol, dipalmitoylphosphatidylglycerol, dilaurylphosphatidylglycerol, and dimyristoylphosphatidic acid, (iii) cholesterol, and (iv) a cyclosporin, wherein the liposomes comprise umilamellar vesicles having a diameter of less than 0.2 μm.

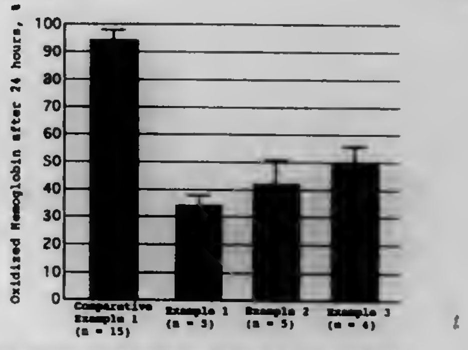
5,688,526
HEMOGLOBIN-ENCAPSULATING LIPOSOME AND METHOD FOR MAKING THE SAME
Takeshi Okamoto, and Hiroshi Goto, both of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Shibuya-ku, Japan

Continuation of Ser. No. 214,133, Mar. 16, 1994, abandoned. This application Dec. 1, 1995, Ser. No. 565,937

Claims priority, application Japan, Mar. 18, 1993, 5-59067

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 424—450 **7 Claims**



1. A hemoglobin-encapsulating liposome comprising
  a liposome comprising a lipid,
  a hemoglobin-containing solution encapsulated in said liposome, wherein said hemoglobin-containing solution is a concentrated stroma free hemoglobin solution derived from natural erythrocyte, and
  at least one further added material selected from the group consisting of malic acid, oxaloacetic acid, citric acid, isocitric acid, α-ketoglutaric acid, succinyl-CoA, succinic acid, fumaric acid, aspartic acid, pyruvic acid, phosphoenolpyruvic acid, acetyl-CoA, and glutamic acid in an amount sufficient to suppress hemoglobin oxidation.

5,688,527
LYSINE DERIVATIVES, PROCESS OF PREPARATION, USES, AND COMPOSITIONS COMPRISING THEM
Thierry Bordier, Tremblay, and Michel Philippe, Wissous, both of France, assignors to L'Oreal, Paris, France

Filed Jan. 23, 1996, Ser. No. 590,446

Claims priority, application France, Jan. 31, 1995, 95 01112

Int. Cl.^{6} A61K *9/127;* **C07C** *271/22*

U.S. Cl. 424—450 **39 Claims**

1. A lysine derivative of formula (1):

$$COOH-CH(NH_2)-(CH_2)-(CH_2)_4-NH-X-(CH_2)_n-R \quad (1)$$

in which n ranges from 0 to 4, X represents a divalent COO or SO_2 group and R represents a linear or branched perfluoroalkyl radical having from 4 to 20 carbon atoms or a salt of the lysine derivative of formula (1).

5,688,528
OIL-IN WATER EMULSIONS
Anders Carlsson, Stockholm; Marina Delogu, Saltsjö-Boo, and Bengt Herslöf, Stockholm, all of Sweden, assignors to Scotia LipidTeknik AB, Stockholm, Sweden

PCT No. PCT/SE95/00115, § 371 Date Jul. 15, 1996, § 102(e) Date Jul. 15, 1996, PCT Pub. No. WO95/20943, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 6, 1995, Ser. No. 676,138

Claims priority, application Sweden, Feb. 4, 1994, 9400368; Jul. 12, 1994, 9402454

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 424—450 **16 Claims**

1. An oil-in water emulsion comprising an emulsifier in an amount of about 0.01–50% by weight of the total preparation, an

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oily material emulsified in a polar solvent in an amount of about 0.1–70% by weight of the total preparation, and polar lipids in the remaining amount of the total preparation,

wherein the emulsifier is a galactolipid material consisting of at least 50% digalactosyldiacylglycerols, and

wherein the ratio of the emulsifier and the oily material is about 1:10 to about 1:40 by weight.

5,688,529
MYCOPHENOLATE MOFETIL HIGH DOSE ORAL SUSPENSIONS

Deborah Marilyn Lidgate, Los Altos; Li-hua Wang-Kessler, Palo Alto; Bindu Joshi, Milpitas; Sayee Gojanan Hegde, Los Angeles, and Leo Gu, Saratoga, all of Calif., assignors to Syntex (U.S.A) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 130,343, Oct. 1, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 412,645

Int. Cl.^{6} A61K *9/14;9/16*

U.S. Cl. 424—489 **18 Claims**

1. A pharmaceutical formulation comprising:

Ingredient	% wt/vol
mycophenolate mofetil	20
hydroxypropylmethylcellulose	0.25
microcrystalline cellulose	0.25
xanthan gum	0.1
sorbitol, 70% solution	30–50
maltitol syrup	10–30
sucrose	0–10
fructose	0–10
aspartame	0–0.5
lecithin	0–0.1
citric acid	0.02–0.25
sodium phosphate dibasic	0.19–0.67
methyl paraben	0–0.20
propyl paraben	0–0.02
flavor	0.3–1.0
flavor enhancer/bitter maskant	0–1
color	0.005
purified water	q.s. to 100

as a liquid suspension suitable for oral administration.

5,688,530
SUSTAINED RELEASE FORMULATIONS OF WATER SOLUBLE PEPTIDES

David Bodmer, Klingnau, Switzerland; Jones W. Fong, Parsippany, N.J.; Thomas Kissel, Staufen, Germany; Hawkins V. Maulding, Mendham, N.J.; Oskar Nagele, Sissach, Switzerland, and Jane E. Pearson, Ogendensburg, N.J., assignors to Novartis AG, Basel, Switzerland

Division of Ser. No. 643,880, Jan. 18, 1991, Pat. No. 5,538,739, which is a continuation-in-part of Ser. No. 411,347, Sep. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 377,023, Jul. 7, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,909

Claims priority, application Hungary, Jun. 25, 1990, 3974/90; United Kingdom, Aug. 1, 1990, 9016840

Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—501 **4 Claims**

1. A method of treating acromegaly comprising administering to a subject in need of such treatment a therapeutically effective amount of a sustained release formulation comprising a microparticle having a diameter of between 1 and 250 microns comprising octreotide, in a free base, acid addition salt or complex form in a biodegradable, biocompatible polymeric matrix of a 40/60 to 60/40 polylactide-co-glycolide ester of a polyol, said polyol being selected from the group consisting of 1) a (C_{3-6}) carbon chain containing alcohol having 3 to 6 hydroxyl groups, 2) a monosaccharide and 3) a disaccharide, and said esterified polyol having at least 3 polylactide-co-glycolide chains, wherein said octreotide is present in a therapeutically effective amount from at least 0.2 percent by weight relative to said polymeric matrix and said octreotide is distributed throughout said polymeric matrix.

5,688,531
METHOD FOR REGULATING BONE FORMING CELLS

Dafna Benayahu, Herzlia, and Shlomo Wientroub, Tel-Aviv, both of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development, Ltd., Tel-Aviv, Israel

Filed Dec. 23, 1994, Ser. No. 363,354

Int. Cl.^{6} A61K *35/28*

U.S. Cl. 424—574 **5 Claims**

1. A method for stimulating osteoblasts, said method comprising the steps of:

collecting conditioned medium from bone marrow stromal adipocyte cell cultures;

treating the osteoblasts with an effective amount of the conditioned medium derived from the adipocytes.

5,688,532
ANTIALLERGIC SPRAY PREPARATIONS

Derek Bryce-Smith, Reading, England, assignor to Kappa Pharmaceuticals Limited, Reading, England

Continuation of Ser. No. 115,571, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 882,112, May 13, 1992, abandoned, which is a continuation of Ser. No. 555,272, Jul. 19, 1990, abandoned. This application Dec. 16, 1994, Ser. No. 357,776

Claims priority, application United Kingdom, Jul. 20, 1989, 8916625

Int. Cl.^{6} A61K *33/32;31/315*

U.S. Cl. 424—641 **13 Claims**

1. A method for the treatment of an allergic condition, said method consisting essentially of spraying a solution comprising a non-toxic, anti-allergy effective amount of ionic zinc to the eye or respiratory tract of a mammal possessed of said allergic condition at a concentration below that which causes irritation to mucus membranes, the majority of said ionic zinc in said spray being unchelated zinc and in the form of free ionic solution, wherein said solution has a zinc ion content of between about 0.002 to about 0.12% (w/v).

5,688,533
ROUND RINGLESS MOLD AND TRIANGULAR SPOKE SPRUE

Robert P. Berger, Encino, Calif., assignor to Belle de St. Claire, Inc., Orange, Calif.

Filed Feb. 12, 1996, Ser. No. 601,074

Int. Cl.^{6} B28B *7/34*

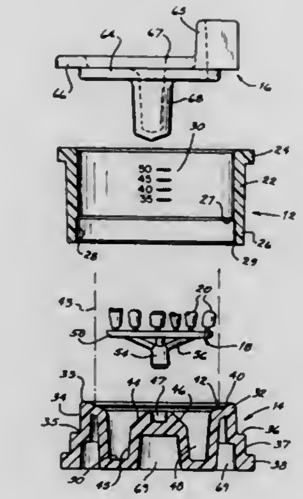
U.S. Cl. 425—123 **17 Claims**

1. A mold assembly for dental investment casting, comprising:

a round casing made of resilient plastic material, having opposite open ends, the casing having an inner surface defining a casing volume and a lower collar separated from the inner surface by a shoulder;

a round base made of resilient plastic material and including a neck having an outer surface extending along the axis of the casing for frictional engagement with the collar, the base including a hub extending along the axis, a floor portion extending radially between the hub and the neck, the neck including an upper ring shaped surface with a circular sighting bead on said ring shaped surface for defining an imaginary cylindrical surface in said casing when said base and casing are fictionally engaged with each other; and

a sprue having a post engaged with said hub and a ring connected to said post and extending into said casing when said casing and said base are fictionally engaged with each other, said ring being within said imaginary cylindrical surface.



5,688,534
APPARATUS FOR INTERMITTENTLY EXTRUDING A PREDETERMINED QUANTITY OF FOOD MATERIAL

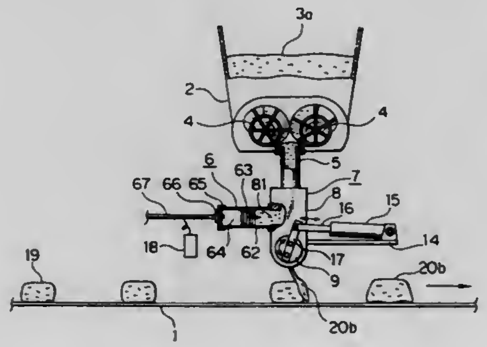
Yukio Watanabe, and Michio Morikawa, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Oct. 27, 1995, Ser. No. 548,995

Claims priority, application Japan, Oct. 27, 1994, 6-263371

Int. Cl.^{6} B29C *47/92*

U.S. Cl. 425—145 **5 Claims**



1. An apparatus for intermittently extruding predetermined quantities of food material onto a conveying means, the apparatus comprising:

a hopper for containing food material, the hopper including an exit port and a supply pump for pumping the food material through the exit port;

an extrusion valve assembly including a housing connected to receive the food material pumped through the exit port of the hopper; and

an accumulator for maintaining the food material located in the extrusion valve at a predetermined pressure by expanding to receive the food material from the housing when a pressure of the food material in the housing becomes greater than the predetermined pressure, and by contracting to push food material into the housing when a pressure of the food material in the housing becomes less than the predetermined pressure.

5,688,535
DRIVE CONTROL APPARATUS FOR AN INJECTION MOLDING MACHINE

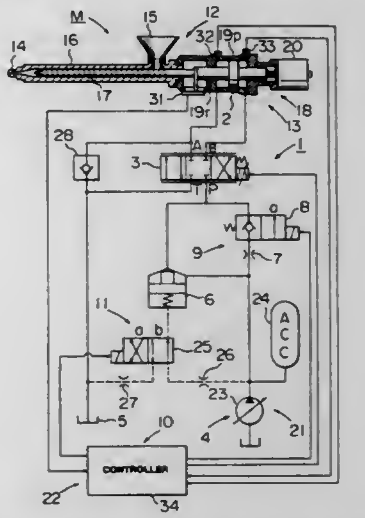
Toshiyasu Koda, and Tsuyoshi Arai, both of Nagano, Japan, assignors to Nissei Plastic Industries, Ltd., Nagano-ken, Japan

Filed Nov. 27, 1995, Ser. No. 562,895

Claims priority, application Japan, Nov. 28, 1994, 6-319089

Int. Cl.^{6} B29C *45/77*

U.S. Cl. 425—145 **6 Claims**



1. A drive control apparatus for an injection molding machine in which a hydraulic source and an oil tank are connected to an injection cylinder through a servo valve and the injection cylinder is controlled by the servo valve, the drive control apparatus for an injection molding machine comprising:

a first change-over valve which is connected between the hydraulic source and the servo valve and has a first capacity of hydraulic fluid; a flow limiting circuit which connects a throttle valve to a second change-over valve having a second capacity of hydraulic fluid smaller than that of the first change-over valve in series and is connected to the first change-over valve in parallel; and

a change-over valve control portion which controls to open both the first change-over valve and the second change-over valve when controlling a first rate of flow of hydraulic fluid and which controls to close the first change-over valve when controlling a second rate of flow of hydraulic fluid, said second rate being smaller than said first rate.

5,688,536
APPARATUS FOR PRODUCING ORIENTED PLASTIC STRAP

Donald L. Van Erden, Wildwood, and Manuel C. Enriquez, Morton Grove, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 474,355, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 353,721, Dec. 12, 1994, Pat. No. 5,525,287, which is a continuation-in-part of Ser. No. 958,803, Oct. 9, 1992, Pat. No. 5,387,388. This application Aug. 14, 1996, Ser. No. 696,433

Int. Cl.^{6} B29C *35/10*

U.S. Cl. 425—174.4 **17 Claims**

1. In combination, a system for simultaneously milling and stretching a sheet workpiece which passes through said system in a predetermined direction of travel, comprising:

a sheet workpiece;

a pair of opposed rollers defining a nip therebetween and through which said sheet workpiece is passed so as to be simultaneously milled and stretched as said sheet workpiece passes through said nip in a single pass;

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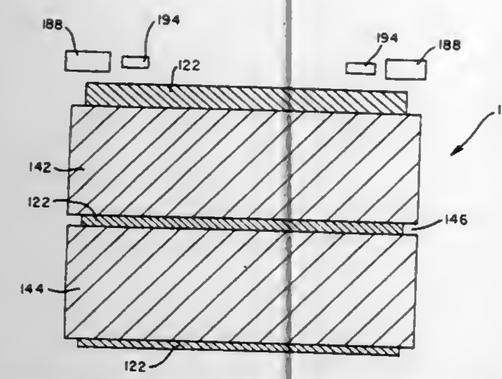
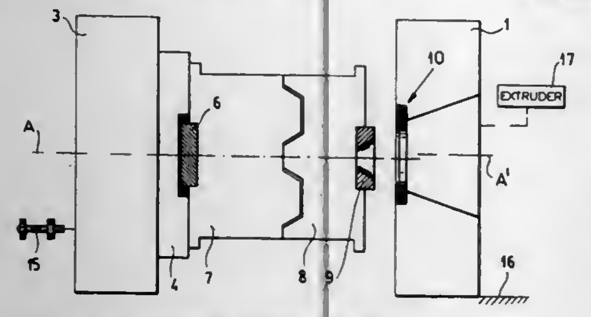


means for driving said opposed rollers in opposite directions and at sufficiently different lineal surface velocities for simultaneously milling and stretching said sheet workpiece within said nip defined between said pair of opposed rollers; and

separate individual means for heating opposite side portions of said sheet workpiece, as considered in the widthwise extent of said sheet workpiece, upstream of said nip, as considered along said predetermined direction of travel of said sheet workpiece, wherein said nip is defined between said pair of opposed rollers, and at axial positions across the width of said sheet workpiece which are located predetermined distances axially inwardly from opposite side edge portions of said sheet workpiece so as to increase the degree of flatness of said simultaneously milled and stretched sheet workpiece across said width of said simultaneously milled and stretched sheet workpiece after said simultaneously milled and stretched sheet workpiece has passed through said nip defined between said pair of opposed rollers by eliminating any concave portions and bump transitional points defined between said concave portions and a main central portion of said sheet workpiece which tend to form at and within the vicinity of said axial positions located said predetermined distances axially inwardly from said opposite side edge portions of said sheet work-piece.

5,688,537
MOLD CENTERING SYSTEM FOR INJECTION-MOLDING MACHINE

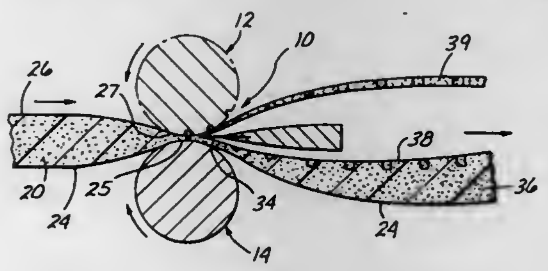
Peter Brams, München, and Peter Lichtinger, Fürstenfeldbruck, both of Germany, assignors to Krauss-Maffel AG, Munich, Germany
Filed May 17, 1996, Ser. No. 649,784
Claims priority, application Germany, May 19, 1995, 19518480.7
Int. Cl.^{6} B29C *45/17*
U.S. Cl. 425—186 **6 Claims**



1. An injection-molding assembly comprising:
a fixed mold plate carrying a centering ring;
a fixed mold half carrying a centering ring snugly interfitted with the fixed-plate centering ring;
a movable mold plate carrying a centering ring;
a movable mold half carrying a centering ring snugly interfitted with the movable-plate centering ring, one of the rings being formed of
an outer ring part having a substantially circular outer periphery and a substantially circular inner periphery and
an inner ring part having a substantially circular outer periphery and a substantially circular inner periphery,
the outer periphery of one of the ring parts having a center of curvature offset radially from a center of curvature of the respective inner periphery; and
means for relatively angularly displacing the ring parts of the one ring to respectively radially shift the respective mold plate and the respective mold half relative to each other and for clamping the ring parts relative to each other.

5,688,538
APPARATUS FOR THREE DIMENSIONAL SURFACE SHAPING OF SYNTHETIC FOAM

Arthur Barr, Riverside; Lewis Sturgill, Fontana, and Jose De Jesus Munoz Contreras, Rancho Cucamonga, all of Calif., assignors to Foamex L.P., Linwood, Pa.
Division of Ser. No. 477,282, Jun. 7, 1995, Pat. No. 5,534,208, which is a continuation of Ser. No. 122,701, Sep. 15, 1993, abandoned. This application Jul. 3, 1996, Ser. No. 675,747
Int. Cl.^{6} B26D *7/14*
U.S. Cl. 425—299 **21 Claims**

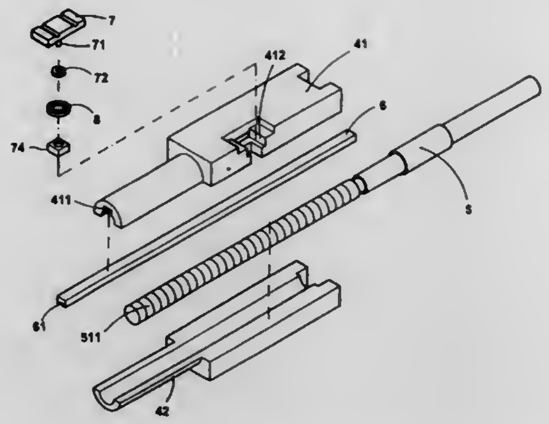


1. Apparatus for shaping a sheet of resiliently compressible synthetic foam to a desired three dimensional surface geometry, comprising:
a continuous three dimensional die pattern surface;
a compression element for compressing a sheet of foam against said pattern surface;
a cutting edge; and
motor means for turning one or both of said die pattern surface and said compression element thereby to urge said sheet of foam against said cutting edge in a compressed condition such that portions of said sheet of foam passing between said cutting edge and said pattern surface are cut away from said sheet of foam;
said cutting edge being sufficiently closely adjacent to said die pattern such that said three dimensional die pattern surface is substantially reproduced with little or no geometric distortion on said sheet of foam.

5,688,539
ZIPPER TEETH FORMING MECHANISM FOR ZIPPER FORMING MACHINES

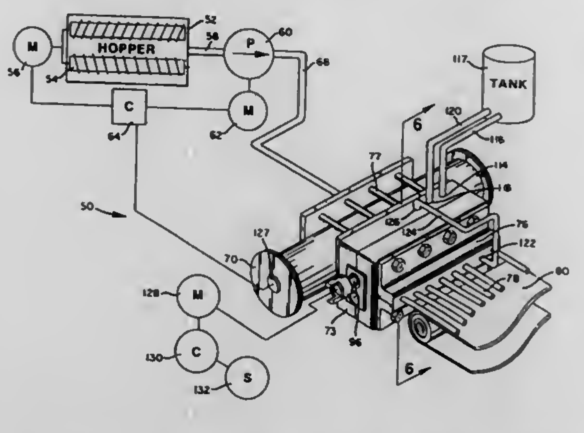
Ray-Long Tsai, and Joseph Wu, both of Taoyuan, Taiwan, assignors to Chung Shan Institute of Science & Technology, Lungtan Taoyan, Taiwan
Filed May 3, 1996, Ser. No. 647,847
Int. Cl.^{6} B29D *5/00*
U.S. Cl. 425—363 **3 Claims**

1. An improved zipper teeth forming mechanism for zipper forming machines, comprising a mold base; a support seat positioned on said mold base; a seat cover; a screw sleeve positioned within said support seat and covered by said seat cover; and a ram mechanism; wherein said screw sleeve includes an upper portion and a lower portion, and a forming screw is disposed between said upper portion and said lower portion of said screw sleeve, said upper portion having an elongate groove and a notch along an inner wall of the upper portion that is proximal to said forming screw, an axis of said elongate groove substantially parallel to an axis of the forming screw and said notch laterally offset from the axis of the elongate groove, said elongate groove receiving a central rod having an elongate gap adjacent to said forming screw for molding a shape of a nylon filament inserted between said forming screw and the central rod; and wherein said ram mechanism is fitted in said notch and includes a ram adjusting seat provided with a post, a bearing positioned on said post, a ram roller fitted onto said bearing, and a slide block fitted onto the end of said post opposite the ram adjusting seat, said ram roller for pressing the nylon filament against the forming screw and forming zipper teeth.



5,688,540
POSITIVE DISPLACEMENT METERING APPARATUS

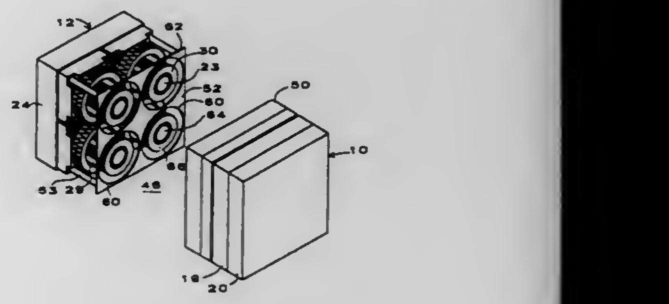
Christopher S. Hannaford, 2110 Toledo Ave. North, Golden Valley, Minn. 55422
Continuation of Ser. No. 452,114, May 26, 1995, Pat. No. 5,536,517. This application Jul. 15, 1996, Ser. No. 680,359
Int. Cl.^{6} A23P *1/00;* **B29C** *47/00*
U.S. Cl. 425—382 R **18 Claims**



1. Apparatus for metering pressurized, viscous food material comprising:
a plurality of positive displacement metering means having input means for receiving material to be metered and output means for discharging metered material, said metering means being operated with energy obtained from said pressurized material; and
means interconnecting a predetermined number of said metering means for synchronizing the interconnected ones of said metering means.

5,688,541
APPARATUS FOR PREVENTING HINDRANCE OF REMOVAL OF MOLDED PRODUCTS FROM MOLD DUE TO CONTACT WITH MOLD PARTS

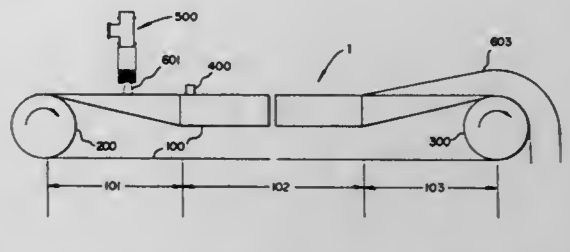
Paul Philip Brown, Carlsbad, Calif., and Jens Ole Sorensen, Cayman Kai, Cayman Islands, assignors to Universal Ventures, Cayman Islands
Filed May 20, 1996, Ser. No. 650,620
Int. Cl.^{6} B29C *45/40*
U.S. Cl. 425—556 **29 Claims**



1. A multi-cavity molding apparatus, comprising:
a cavity part having a plurality of cavity sections;
a core part having a plurality of cores for combination with the cavity part to define a plurality of mold cavities therebetween;
a plurality of locking rings respectively disposed around a plurality of the cores for engagement with respective cavity sections when the core part is combined with the cavity part;
ejection means for ejecting a plurality of products formed in the mold cavities into a space between the cavity part and the core part when the cavity part and the core part are separated from one another; and
shielding means disposed in relation to the cavity part and the core part for limiting obstruction by the cavity part or the core part of removal of said ejected products from the space between the cavity part and the core part. from the space between the cavity part and the core part.

5,688,542
CONTINUOUS CHEESE COAGULATION METHOD

Pedro J. Tortosa, 1431 Co. Rd. V., Houlton, Wis. 54082
Filed Aug. 8, 1996, Ser. No. 694,228
Int. Cl.^{6} A01J *25/00;* **A23C** *19/00*
U.S. Cl. 426—36 **5 Claims**



1. A method of coagulating a continuous feedstream of pre-cheese admixed with coagulant to produce a continuous ribbon of cheese which comprises depositing said admixture in a continuous stream in a moving flexible U-shaped receptacle having a downstream end; coagulating said admixture prior to reaching the downstream end, said admixture, after deposition on the moving receptacle, moving in fixed relation to said receptacle prior to traversing the downstream end of the moving receptacle; and, recovering the coagulated admixture from said downstream end of the receptacle in continuous coagulated ribbon form.

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5,688,543

COMPOSITION AND METHOD FOR FLAVORING UNPOPPED POPCORN

Dana Sue Freeport, St. Louis Park; Charles H. Turpin; Michael E. Bley, both of Minneapolis; Edward Majewicz, Mendota Heights, and Jeff T. Watkins, Eden Prairie, all of Minn., assignors to Golden Valley Microwave Foods, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 397,481, Mar. 2, 1995, Pat. No. 5,585,127. This application Jun. 19, 1996, Ser. No. 666,816

Int. Cl.^{6} A23L *1/05;1/22*

U.S. Cl. 426—93 **13 Claims**

1. A method for preparing a microwavable unpopped popcorn product; said method including the steps of:
   (a) applying an aqueous-based adhesive composition onto kernels of unpopped popcorn; said step of applying comprising applying no more than 2%, by weight, aqueous-based adhesive composition, per weight of unpopped popcorn kernels;
   (b) after said step of applying an aqueous-based adhesive composition, applying dry flavorant onto the kernels of unpopped popcorn;
   (c) drying excess moisture from the kernels of unpopped popcorn;
   (d) introducing said dry flavorant coated unpopped popcorn kernels into a microwavable package having a microwave interactive construction: and
   (e) sealing said microwavable package without addition of oil or fat.

5,688,544

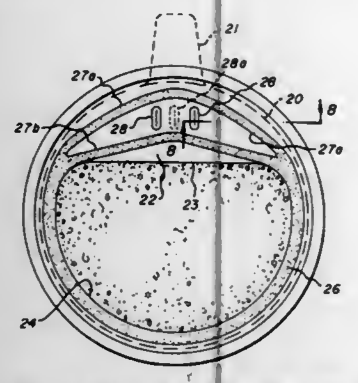
EASY OPENING VENTABLE CLOSURE FOR SEALED PARTICULATE PRODUCT PACKAGE

Stewart L. Bolton, Springfield, N.J., and Michael E. Delonis, New York, N.Y., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Apr. 18, 1995, Ser. No. 424,680

Int. Cl.^{6} B65D *41/32*

U.S. Cl. 426—118 **41 Claims**



1. A cylindrical container containing a particulate product packaged under pressure relative to the surrounding atmosphere, comprising:
   a top having a product access opening therein of a size sufficient for access to and removal of the particulate product when said container is in an upright position, and at least one vent opening which is positioned to be opened prior to operable opening of the product access opening so as to permit the flow of pressurized gases therethrough while minimizing movement of the particulate product outwardly therethrough;
   a lid having a first portion covering the product access opening and a second portion covering the at least one vent opening, said lid comprising a flexible material;
   a first peelable seal connecting the first portion of the lid to the top; and
   a second peelable seal attaching the second portion of the lid to the top so as to surround and hence close off the at least one vent opening, the second peelable seal being positioned to be opened to uncover the at least one vent opening so as to minimize movement of particulate product outwardly through the at least one vent openings and past the second portion and without operable opening of the product access opening and with the first peelable seal still in place, the first peelable seal being positioned to be opened, to uncover the product access opening, after the second peelable seal has been opened and the gases have been vented outwardly therethrough.

5,688,545

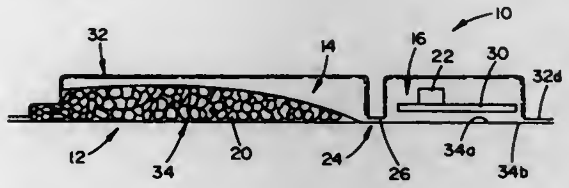
COFFEE PACKAGE WITH ENHANCED AROMA IMPACT

Neil Sanders, Banbury, United Kingdom, assignor to Kraft Jacobs Suchard Limited, Cheltenham, United Kingdom

Filed Mar. 4, 1996, Ser. No. 610,771

Int. Cl.^{6} B65D *85/00*

U.S. Cl. 426—120 **8 Claims**



1. A coffee package with enhanced aroma impact comprising:
   a compartmented container comprising first and second compartments and a flange portion around the perimeter of the container defining a plane,
   a quantity of particulate coffee contained in said first compartment,
   a quantity of coffee aroma liquid containing aromatic volatiles contained in said second compartment,
   and a lid sealed to the flange of the container to cover the first and second compartments with said particulate coffee and said coffee aroma liquid contained respectively therein,
   said container in combination with said lid providing a small channel between said first and second compartments which allows gaseous communication therebetween such that said aromatic volatiles emitted from said coffee aroma liquid pass from the second compartment to said first compartment and such that said particulate coffee and said aroma liquid are inhibited from passing between the first and second compartments so as to at least substantially prevent any mixing between said particulate coffee and the coffee aroma liquid.

5,688,546

SEASONING MATERIAL

Keigo Shima; Tsutomu Harada; Eiichiro Suzuki, and Yutaka Honda, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

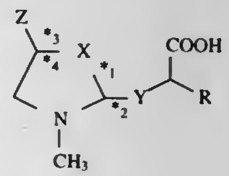
Filed Jul. 19, 1995, Ser. No. 504,136

Claims priority, application Japan, Jul. 19, 1994, 6-166493; Sep. 21, 1994, 6-226438; May 12, 1995, 7-114603

Int. Cl.^{6} A23L *1/22*

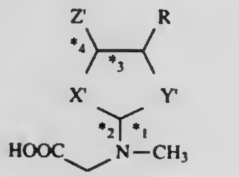
U.S. Cl. 426—534 **2 Claims**

1. A seasoning composition comprising food containing an effective amount of a compound selected from the group consisting of formula (I), formula (II), formula (III), and formula (IV):

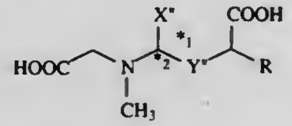

(I)

wherein
   X and Y are each N or NH,
   Z is O or OH,

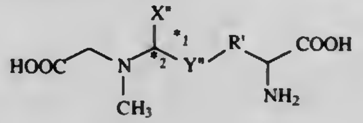
   (1) when X=N and Y=NH, Z=O, and *1 and *3 are double bonds,
   (2) when X=NH and Y=N, Z=O, and *2 and *3 are double bonds,
   (3) when X=N and Y=N, Z=OH, and *2 and *4 are double bonds, and
   R is selected from the group consisting of H, CH_3, CH_2CH_2COOH, $CH_2CH_2CH_2CH_2NH_2$, and $CH_2CH_2CH_2CH_3$;


(II)

wherein
   X' and Y' are each N or NH,
   Z' is O or OH,
   (1) when X'=NH and Y'=N, Z'=O, and *1 and *4 are double bonds,
   (2) when X'=N and Y'=NH, Z'=O, and *2 and *4 are double bonds,
   (3) when X'=N and Y'=N, Z'=OH, and *1 and *3 are double bonds, and
   R is as defined above;


(III)

wherein
   X" is NH_2 or NH,
   Y" is N or NH,
   (1) when X"=NH_2 and Y"=N, *2 is a double bond,
   (2) when X"=NH and Y"=NH, *1 is a double bond, and
   R is as defined above; and


(IV)

wherein
   X" is NH_2 or NH,
   Y" is N or
   (1) when X"=NH_2 and Y"=N, *2 is a double bond,
   (2) when X"=NH and Y"=NH, *1 is a double bond, and
   R' is selected from the group consisting of —$COCH_2$—, —$COCH_2CH_2$—, —$C(NH)NHCH_2CH_2CH_2$—, and—$CH_2CH_2CH_2CH_2$—.

5,688,547

MEAL REPLACEMENT COMPOSITION AND METHOD OF WEIGHT CONTROL

Thomas William Ritchey, Bergen, N.J.; Douglas C. Becker, Orange, and Jack Gray, Suffolk, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Continuation-in-part of Ser. No. 562,357, Aug. 3, 1990, abandoned, and Ser. No. 562,186, Aug. 3, 1990, abandoned. This application Jul. 3, 1991, Ser. No. 725,033

Int. Cl.^{6} A23L *1/05;1/187*

U.S. Cl. 426—573 **4 Claims**

1. A dry, nutritional meal replacement composition comprising a cellulose gel and a cellulose gum, and nutritionally effective amounts of proteins, carbohydrates, dietary fiber, vitamins and minerals, wherein each serving provides about 6 g of fiber, 16 g of protein, about 31 g of carbohydrates and 220 calories after mixing with milk said composition being adapted to mix with a liquid to provide a drinkable beverage when mixed with low shear and a pudding when mixed with high shear.

5,688,548

NON-FAT BAKING INGREDIENT AND METHOD OF MAKING

Karen S. Gaither, Akron, and Rhonda W. Reitz, Medina, both of Ohio, assignors to The J. M. Smucker Company, Orrville, Ohio

Filed Aug. 15, 1996, Ser. No. 698,198

Int. Cl.^{6} A23L *1/035*

U.S. Cl. 426—577 **61 Claims**

1. An improvement in a shortening substitute for a batter used in a bakery product from the group consisting of cakes, breads, muffins, cookies and brownies, said shortening substitute including a mixture of a fruit puree, a sweetener, a preservative and water, said improvement comprising the addition of at least about 0.1% by weight a fat mimetic to said shortening substitute, and an emulsifier.

5,688,549

PROCESS FOR PREPARING REDUCED FAT MEAT

Paul G. Roehrig, New Glarus; Henry J. Overkamp, and Paul G. Morin, both of Madison, all of Wis., assignors to Kraft Foods, Inc., Northfield, Ill.

Division of Ser. No. 570,831, Dec. 12, 1995, abandoned, which is a continuation of Ser. No. 299,228, Aug. 31, 1994, abandoned, which is a division of Ser. No. 130,347, Oct. 1, 1993, Pat. No. 5,382,444, which is a continuation of Ser. No. 838,121, Feb. 19, 1992, abandoned. This application Feb. 13, 1996, Ser. No. 600,664

Int. Cl.^{6} A23L *1/317*

U.S. Cl. 426—646 **40 Claims**

1. A process for providing reduced fat meat having a fat level of about 10 percent by weight or less and a high functionality, comprising the steps of:
   providing a supply of comminuted meat having a fat content about 60% or less by weight, based on the total weight of the comminuted meat;
   heating said comminuted meat supply on a continuous-flow basis to a temperature of about 115° F. or less and adequate to generally melt fat within the supply of comminuted meat but low enough to avoid any significant denaturation of protein within the comminuted meat supply in order to provide a continuous flow of heated substantially undenatured comminuted meat;
   passing said continuous flow of said heated comminuted meat at said temperature and in the substantial absence of interruption of said continuous flow and in the absence of comminution into a centrifuge to subject said continuous flow of said heated comminuted meat to a gravitational force sufficient to reduce the fat content of the comminuted meat to a target reduced fat percentage, and separating said flow of heated comminuted meat into a generally liquid phase containing substantially all of the fat content of the supply of heated comminuted meat and into a lean meat phase which is substantially undenatured and has a high functionality, said lean meat phase being at said target reduced fat percentage which is about 10 percent by weight or less, based on the total weight of the lean meat phase;
   collecting the lean meat phase as a flow of reduced fat meat from the centrifuge; and
   collecting the generally liquid phase as a high fat byproduct.

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5,688,550

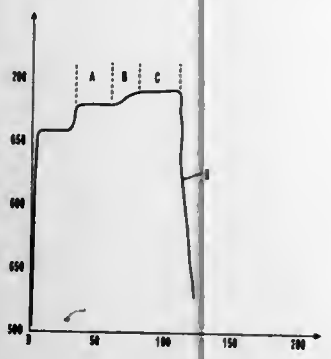
METHOD OF FORMING POLYSILICON HAVING A DESIRED SURFACE ROUGHNESS

Ronald A. Weimer, Boise, Id.; Avishai Kepten, Beit H'Cerem, and Michael Sendler, Migdal Ha'emek, both of Israel, assignors to Micron Technology, Inc., Boise, Id.

Filed Dec. 15, 1995, Ser. No. 572,968

Int. Cl.^{6} C23C *16/56*

U.S. Cl. 427—8 **22 Claims**



1. A method for forming polysilicon having a desired surface said method comprising:

providing a substrate upon which polysilicon is to be formed;
depositing amorphous silicon upon said substrate;
heating said substrate; and
monitoring the emission of said substrate during said heating, wherein said heating of said substrate produces a characteristic emission, and wherein said heating is terminated after a time at which said monitored emission has a first increase therein having no corresponding increase in said characteristic emission.

5,688,551

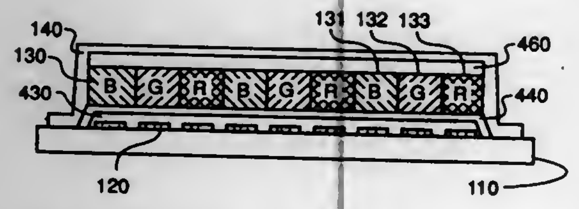
METHOD OF FORMING AN ORGANIC ELECTROLUMINESCENT DISPLAY PANEL

Jon Eric Littman, Honeoye Falls, and Ching Wan Tang, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1996, Ser. No. 648,772

Int. Cl.^{6} B05D *5/06*

U.S. Cl. 427—64 **7 Claims**



1. A method of forming a full color organic electroluminescent display panel, comprising the steps of:

(a) forming and patterning a transparent conductive layer to provide a plurality of spaced electrodes on a transparent substrate;
(b) providing on the spaced electrodes, by close-spaced deposition from a donor sheet, blue, green, and red organic electroluminescent media to form adjacent colored subpixels which emit blue, green and red primary colors, respectively;
(c) forming and patterning a conductive layer on the colored subpixels to provide a plurality of spaced electrodes; and
(d) wherein the close-spaced deposition is provided by transferring to the transparent substrate each of the colored organic electroluminescent media by illuminating the respective donor sheet which is prepatterned with a light absorbing layer.

5,688,552

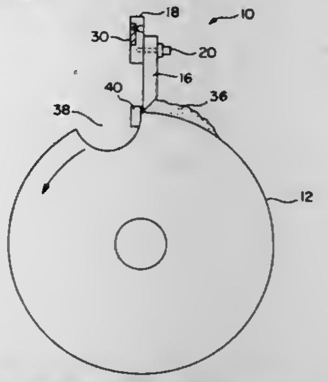
APPARATUS AND METHOD FOR PREPARING CYLINDERS IN OFFSET LITHOGRAPHIC PRINTING PRESSES

Joseph T. Lacomis, Pittston, and Donald L. Welsch, Dunmore, both of Pa., assignors to Panel Prints, Inc., Old Forge, Pa.

Filed Dec. 22, 1995, Ser. No. 577,365

Int. Cl.^{6} B32B *35/00;* **B05D** *3/12*

U.S. Cl. 427—140 **13 Claims**



1. A method for in-place repair of the outer surface of a cylinder in a printing press, comprising the steps of:

cleaning the outer surface of the cylinder while the cylinder remains in the printing press;
applying a continuous epoxy coating on the entire outer surface of the cylinder with a single applicator blade while the cylinder remains in the printing press; and
drying said epoxy coating while the cylinder remains in the printing press.

5,688,553

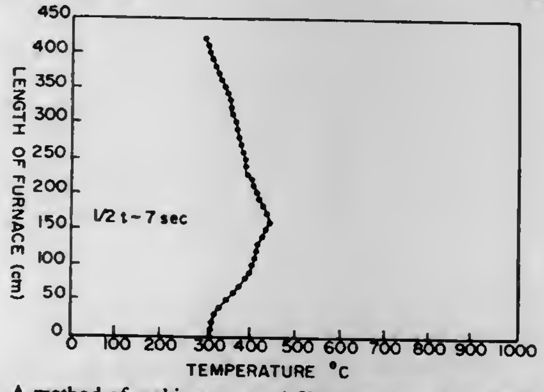
POLYIMIDE COATED HEAVY METAL FLUORIDE GLASS FIBER AND METHOD OF MANUFACTURE

Lubos Vacha, and Peter J. Melling, both of Sturbridge, Mass., assignors to Gallileo Electro-Optics Corporation, Sturbridge, Mass.

Continuation of Ser. No. 277,870, Jul. 20, 1994, Pat. No. 5,567,219. This application Jun. 20, 1996, Ser. No. 666,197

Int. Cl.^{6} B05D *5/06*

U.S. Cl. 427—163.2 **5 Claims**



1. A method of making a coated fiber comprising the steps of:

drawing a fiber through a curable coating solution to form a coated fiber, said fiber having a glass transition temperature and said curable coating solution having a curing temperature which is higher than said glass transition temperature;
drawing said coated fiber through a curing oven to form a cured coated fiber, said oven having a temperature profile which exposes said coated fiber to a temperature above the glass transition temperature and sufficient to cure said curable coating solution, said step of drawing through said oven occurring at a rate sufficient to cure said curable coating solution and to minimize crystallization of said fiber and optical losses caused by crystallization.

5,688,554

METHOD OF SIZING CARBON FIBERS

Yoshihiko Nakaoka, and Osamu Makino, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Japan

Filed Jul. 10, 1996, Ser. No. 677,964

Claims priority, application Japan, Jul. 17, 1995, 7-203848

Int. Cl.^{6} B05D *7/00*

U.S. Cl. 427—215 **9 Claims**

1. A method of sizing carbon fibers, said method comprising the steps of:

preparing a water-based sizing agent by emulsifying or dispersing in water a sizing agent comprising at least one ester and at least one polyepoxy compound having at least two epoxy groups at weight ratio of 2/98–16/84; and
applying said water-based sizing agent to carbon fibers such that said sizing agent is attached to said carbon fibers at a rate of 0.1–5.0 weight % with respect to said carbon fibers;
said at least one ester being one or more selected from the group consisting of Group A, Group B and Group C;
said Group A consisting of esters obtained by esterifying completely aliphatic dihydric-hexahydric alcohol having 2–20 carbon atoms with aliphatic monocarboxylic acid having 6–26 carbon atoms and containing 50–95 molar % of aliphatic monoenic monocarboxylic acid;
said Group B consisting of esters obtained by esterifying completely aliphatic dihydric-hexahydric (poly)etherpolyol with aliphatic monocarboxylic acid having 6–26 carbon atoms and containing 50–95 molar % of aliphatic monoenic monocarboxylic acid; and
said Group C consisting of esters obtained by esterifying completely aliphatic monohydric alcohol having 6–26 carbon atoms and containing 50–95 molar % of unsaturated aliphatic alcohol with aliphatic dicarboxylic-hexacarboxylic acid having 2–20 carbon atoms.

5,688,555

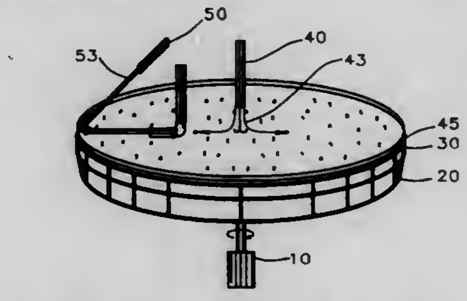
GAS BARRIER DURING EDGE RINSE OF SOG COATING PROCESS TO PREVENT SOG HUMP FORMATION

Ming-Chang Teng, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd, Hsin-Chu, Taiwan

Filed Jun. 3, 1996, Ser. No. 657,223

Int. Cl.^{6} B05D *3/12*

U.S. Cl. 427—240 **25 Claims**



1. A spin coating method comprising the steps of:

providing a substrate on a turntable;
dispensing a film forming material over said substrate;
rotating said turntable;
forming a film of coating of said film forming material over said substrate;
rinsing said film of coating at its outer edge; and
impinging said film at its outer edge with a jet stream of a gas that is inert to said film issuing towards the outer edge of said substrate and following said rinsing.

20. A spin coating apparatus comprising:

a substrate;
a turntable;
a means for holding said substrate;
a dispense nozzle above said turntable;
an edge rinse nozzle above and at the edge of said turntable; and
a jet stream nozzle following said edge rinse nozzle.

5,688,556

BARRIER FILMS HAVING VAPOR COATED EVOH SURFACES

John R. Wagner, Jr., Rochester, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 528,803, Sep. 15, 1995, which is a division of Ser. No. 221,620, Apr. 1, 1994, abandoned. This application Apr. 1, 1996, Ser. No. 625,129

Int. Cl.^{6} B32B *33/00;9/00*

U.S. Cl. 427—248.1 **13 Claims**

1. A method for producing a polymeric film having barrier characteristics, which comprises:

vapor depositing a barrier coating on an exposed surface of an ethylene vinyl alcohol copolymer layer, wherein said ethylene vinyl alcohol copolymer layer is adhered to a polymeric substrate.

5,688,557

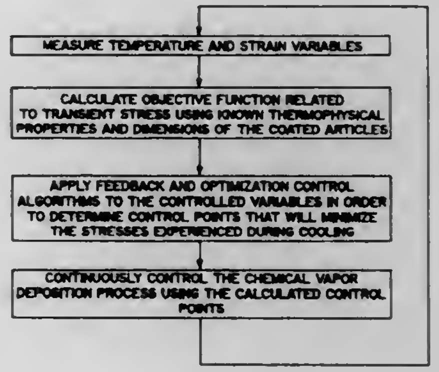
METHOD OF DEPOSITING SYNTHETIC DIAMOND COATINGS WITH INTERMEDIATES BONDING LAYERS

Jerome H. Lemelson, 868 Tyler Way, Incline Village, Nev. 89540, and James G. Conley, 443 Jefferson Ave., Glencoe, Ill. 60022

Filed Jun. 7, 1995, Ser. No. 477,532

Int. Cl.^{6} C23C *16/26*

U.S. Cl. 427—249 **1 Claim**


MEASURE TEMPERATURE AND STRAIN VARIABLES
CALCULATE OBJECTIVE FUNCTION RELATED TO TRANSIENT STRESS USING KNOWN THERMOPHYSICAL PROPERTIES AND DIMENSIONS OF THE COATED ARTICLES
APPLY FEEDBACK AND OPTIMIZATION CONTROL ALGORITHMS TO THE CONTROLLED VARIABLES IN ORDER TO DETERMINE CONTROL POINTS THAT WILL MINIMIZE THE STRESSES EXPERIENCED DURING COOLING
CONTINUOUSLY CONTROL THE CHEMICAL VAPOR DEPOSITION PROCESS USING THE CALCULATED CONTROL POINTS

1. A process for applying a diamond coating to a substrate comprising:

a. coating said substrate with an intermediate coating selected from the group consisting of carbides and nitrides,
b. applying said diamond coating by chemical vapor deposition (CVD) while continuously measuring at least one of the substrate internal temperature, the surface temperature of the substrate and the critical dimensions of the substrate and diamond coating;
c. continuously calculating from said measurements by means of a computer an objective function related to the transient stress in said diamond coating;
d. numerically applying to said objective function on a continuous basis a feedback optimization algorithm to yield control points for at least one of the substrate temperature, CVD gas composition, CVD gas flowrate, microwave radiation intensity, CVD operating pressure, substrate cooling rate and coating cooling rate, said optimization algorithm being designed to minimize the transient stress in said diamond coating; and
e. continuously controlling at least one of said control points based on the results obtained from said optimization algorithm to minimize the transient stress in said diamond coating.

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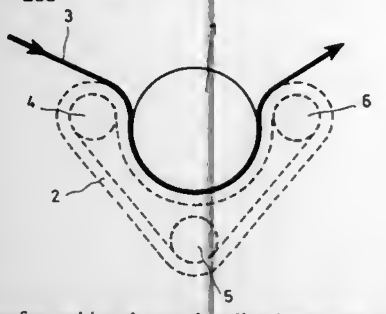
5,688,558

PROCESS OF MAKING BIODEGRADABLE TEXTILE THERMO-BONDING INTERLINING

Pierre Groshens, Peronne, France, assignor to Lainiere de Picardie S.A., France

Continuation of Ser. No. 294,658, Aug. 23, 1994, abandoned.
This application Mar. 28, 1996, Ser. No. 623,630
Claims priority, application France, Sep. 17, 1993, 9311297
Int. Cl.^{6} B05D *5/00*

U.S. Cl. 427—288 **2 Claims**



1. A process for making thermo-bonding interlining made from a weft knit, composed exclusively of yarns of biodegradable cellulosic matter, and a warp composed exclusively of continuous multifilament yarns, said process comprising:

(i) subjecting a weft knit to a first treatment of humidification and of mechanical compacting by passage between a heated cylinder and compression belt, wherein the temperature of the cylinder does not exceed 130° C.;
(ii) depositing spots of thermo-fusible polymer on the weft knit; and
(iii) subjecting the weft knit with spots of the thermo-fusible polymer to a second treatment of humidification and mechanical compacting wherein the cylinder is heated to a temperature less than 80° C.

5,688,559

Patent Not Issued For This Number

5,688,560

PROCESS FOR COATING METAL SURFACES

Takumi Honda, Hiratsuka; Kazuhisa Naito, Chigasaki, and Mutsumi Hirota, Yokohama, all of Japan, assignors to Henkel Corporation, Plymouth Meeting, Pa.

PCT No. PCT/US94/12221, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO95/13145, PCT Pub. Date May 18, 1995
PCT Filed Nov. 1, 1994, Ser. No. 640,956
Claims priority, application Japan, Nov. 9, 1993, 5-303389
Int. Cl.^{6} B05D *3/10;3/00*

U.S. Cl. 427—341 **9 Claims**

1. A process for coating a metal surface, said process comprising steps of

(A) contacting the metal surface with an autodepositing coating composition that comprises acid, oxidizing agent, and water-dispersible or water-soluble organic film-forming resin for a sufficient time to form on the metal surface a wet uncured coating comprising solids derived from the organic film-forming resin, said wet uncured coating being sufficiently adherent to the metal surface to remain in place when removed from contact with the autodepositing composition and rinsed with water;
(B) removing the metal surface bearing the wet uncured coating formed in step (A) from contact with the autodepositing composition, and then contacting the wet uncured coating before it dries or is dried with an aqueous treatment solution that has an adjusted pH from 7 to 11 wherein prior to the adjustment of the pH said solution consists essentially of water and at least one component selected from the group consisting of the following inorganic acids and salts thereof, molybdic acid, tungstic acid, polyphosphoric acid, and polysilicic acid wherein the total concentration of materials selected from the group of molybdic acid, tungstic acid, polyphosphoric acid and polysilicic acid and the salts of these acids is from 0.1 to 50 g/L;
(C) removing the metal surface bearing the wet uncured coating, after contacting it with the aqueous treatment solution, from contact with any aqueous liquid phase except for that which may be absorbed in the coating itself; and
(D) drying the wet uncured coating from the end of step (C) to convert the wet uncured coating into a dry solid coating.

5,688,561

COATING METHOD

Yoshio Ichikawa, Yokohama; Yoshio Niho, and Kiyoharu Suzuki, both of Kanagawa, all of Japan, assignors to Kabushiki Kaisha Nippankenkyusho, Kanagawa, Japan

Filed Apr. 16, 1996, Ser. No. 633,209
Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—376.2 **4 Claims**

1. A coating method comprising the sequential steps of:

applying to a surface of a substrate a first coating composition consisting essentially of 3 to 16 parts by weight on a SiO_2 basis of a quaternary ammonium silicate, 15 to 85 parts by weight of an inorganic filler, and 12 to 82 parts by weight of water; hardening the applied composition by drying at 5°–250° C., and
applying a second coating composition consisting essentially of 2 to 15 parts by weight on an SiO_2 basis of a quaternary ammonium silicate and 98 to 85 parts by weight of water to the substrate.

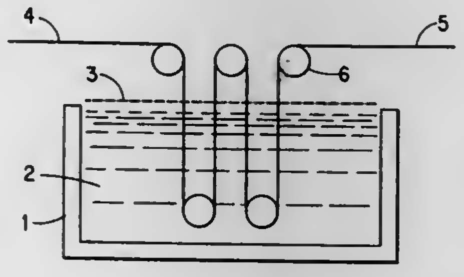
5,688,562

METHOD FOR MODIFYING UNCOATED SYNTHETIC POLYMER FIBERS USING A LANGMUIR-BLODGETT FILM COATING PROCESS

Hui Hsiung, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 16, 1996, Ser. No. 648,746
Int. Cl.^{6} B05D *1/20*

U.S. Cl. 427—434.3 **9 Claims**



1. A method for modifying an uncoated synthetic polymer fiber comprising applying a Langmuir-Blodgett film coating consisting of a water-insoluble amphiphilic polymer, said water-insoluble polymer selected from the group consisting of poly(2-oxazolines) and poly(N-acylethyleneimines), to an uncoated synthetic polymer fiber by passing said fiber through a water-insoluble Langmuir-Blodgett film material that is positioned on a surface of water such that a monomolecular layer film coating of said Langmuir-Blodgett film material is deposited on a surface of said fiber by said passing step.

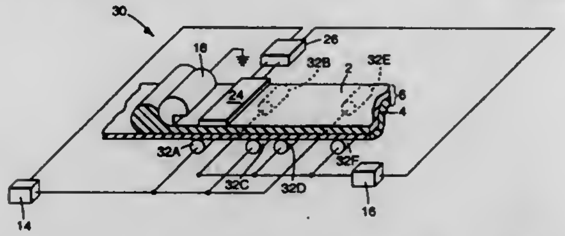
5,688,563

ELECTROSTATIC SYSTEM FOR CONTROLLING THE FLOW OF A FLUID AFTER BEING COATED ONTO A SUBSTRATE

John W. Louks, North Hudson, Wis., and Steven H. Gotz, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 310,847, Sep. 22, 1994, abandoned.
This application Feb. 29, 1996, Ser. No. 608,981
Int. Cl.^{6} B05D *1/30;* **B05B** *5/16;* **B05C** *5/02*

U.S. Cl. 427—472 **25 Claims**



1. A method for minimizing the flow of a fluid after the fluid is coated by a coater onto a first side of a substrate and until further control of the fluid flow is not needed, the method comprising the steps of:

positioning an electrostatic field generator having at least one element relative to the fluid on the substrate for imposing at least one electrostatic field on the fluid to oppose the dewetting tendency of the fluid and to minimize the flow of the fluid after the fluid is coated onto the substrate, the at least one electrostatic field having a field strength; and
subjecting each given point in a desired region on the substrate to a pulsing electrostatic field to vary over time the field strength between a higher and a lower level at least once, thereby to prevent the fluid from becoming electrostatically unaffected by the at least one electrostatic field and to enable the at least one electrostatic field to continue to oppose the dewetting tendency of the fluid.

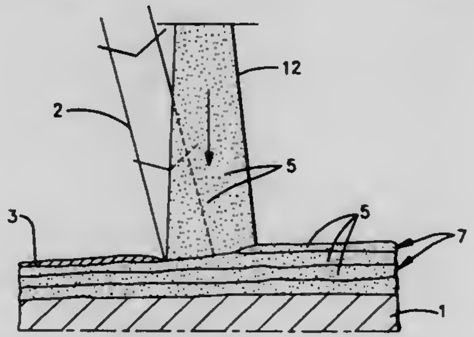
5,688,564

PROCESS FOR THE PREPARATION AND COATING OF A SURFACE

Christian Louis Michel Coddet, Giromagny, and Thierry Marchione, Osthouse, both of France, assignors to Institut Polytechnique de Sevenans, Belfort Cedex, and Irepa Laser, Strasbourg, both of France

Continuation-in-part of Ser. No. 93,715, Jul. 20, 1993, abandoned. This application Aug. 28, 1995, Ser. No. 520,127
Claims priority, application France, Jul. 23, 1992, 92 09277
Int. Cl.^{6} B05D *3/00*

U.S. Cl. 427—554 **12 Claims**



1. A process for the preparation and coating of a surface of a substrate by thermal projection, comprising:

progressively subjecting a surface of a substrate to laser irradiation thereby at least partially to eliminate a superficial contaminating film on the surface of the substrate and to cause the surface to have an increased roughness;
projecting by means of a thermal projection device a deposit material on the surface thus prepared immediately after said preparation so as to result in an overlapping of the impact zones of the laser beam and of the projected deposit material; and
subjecting the surface of the substrate to successive laser and thermal projection treatments to lay down on the surface a plurality of layers of the same said deposit material, thereby to decrease substantially the porosity and to increase the adherence of previously deposited said layers of deposit material.

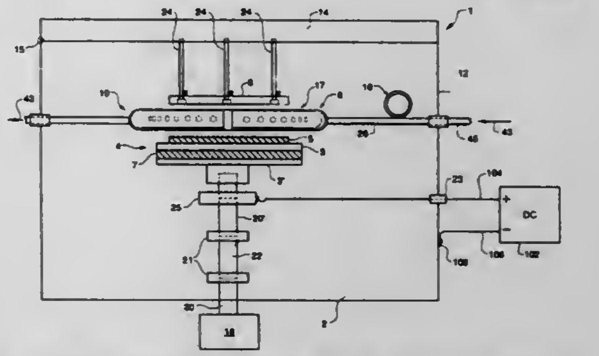
5,688,565

MISTED DEPOSITION METHOD OF FABRICATING LAYERED SUPERLATTICE MATERIALS

Larry D. McMillan; Carlos A. Paz de Araujo, and Michael C. Scott, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 154,927, Nov. 18, 1993, Pat. No. 5,519,234, and Ser. No. 993,380, Dec. 18, 1992, Pat. No. 5,456,945, which is a continuation-in-part of Ser. No. 660,428, Feb. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 690,940, Jun. 17, 1991, Pat. No. 5,138,520, which is a continuation-in-part of Ser. No. 290,468, Dec. 27, 1988, abandoned, said Ser. No. 154,927is a division of Ser. No. 965,190, Oct. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991. This application Jun. 7, 1995, Ser. No. 480,477
Int. Cl.^{6} B05D *3/00*

U.S. Cl. 427—565 **23 Claims**



1. A method of fabricating a thin film of a layered superlattice material, said method comprising the steps of:

(a) providing a liquid precursor including a plurality of metal moieties in effective amounts for forming a layered superlattice material;
(b) placing a substrate inside an enclosed deposition chamber;
(c) producing a mist of said liquid precursor;
(d) flowing said mist through said deposition chamber to form a layer of the precursor liquid on said substrate; and
(e) treating the liquid layer deposited on said substrate to form a solid film of said layered superlattice material.

5,688,566

LIQUID CRYSTAL DISPLAY DEVICE

Dirk J. Broer, and Johannes A. M. M. Van Haaren, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 20, 1996, Ser. No. 602,541
Claims priority, application European Pat. Off., Feb. 23, 1995, 95200443
Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 428—1 **13 Claims**

1. A liquid crystal display device comprising a liquid crystal display cell having a layer of nematic liquid crystal material which is present between two substrates provided with electrodes, and

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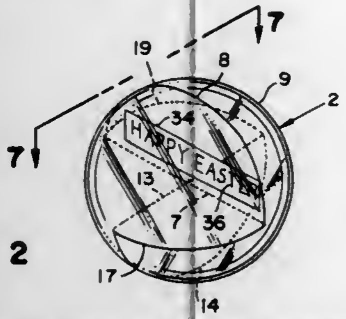
having a polarizer and an optically anisotropic layer, the optically anisotropic layer comprising poly-p-xylylene or a derivative thereof.

5,688,567
SEGMENTED SPHERICAL DISPLAY DEVICE FOR DISPLAYING VISIBLE INDICIA AND IMAGES

Jay S. Daulton, 2359 Meadowmont Dr., San Jose, Calif. 95133
Filed Aug. 15, 1995, Ser. No. 515,238
Int. Cl.^{6} G09F *19/00*
U.S. Cl. 428—11 **60 Claims**



1. A segmented sphere for displaying indicia and/or visual images, comprising:

a) a plurality of individual segment bodies each a mirror-image of one another and configured to form said segmented sphere when interengaged with each other in a confronting relationship; and

b) a plurality of flat facets formed on each segment body on which indicia and/or visual images may be supported, each facet bounded by at least one radially extending edge and a circularly arcuate edge;

c) said flat facets of each segment body being juxtaposed to corresponding flat facets of a confronting segment body when said plurality of segment bodies are interengaged to form said segmented sphere.

5,688,568
ENHANCED GLOWING LOGS AND METHOD

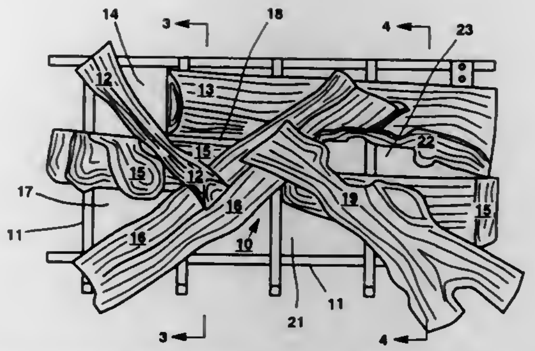
James Frederick Wolf; Ronald John Shimek, both of Prior Lake, and Daniel Curtis Shimek, Apple Valley, all of Minn., assignors to Heat-N-Glo Fireplace Products, Inc., Savage, Minn.
Filed Sep. 27, 1996, Ser. No. 701,352
Int. Cl.^{6} F24C *3/04*
U.S. Cl. 428—18 **15 Claims**

1. A method of making fireplace elements incandescent at low temperatures, comprising the steps of:

forming a fireplace element from a mixture of refractory ceramic fibers and a binder solution,

curing said fireplace element to provide a rigid fireplace element of the type used in artificial log sets,

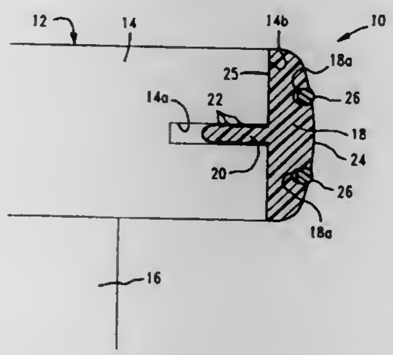
reducing the specific gravity of the surface of the fireplace unit by loosening the fibers at the surface so that the loose fibers



will reach an incandescence glow state and give the appearance of an incandescent surface before the surface of the fireplace element can reach an incandescent temperature.

5,688,569
FLEXIBLE MOLDING STRIP HAVING AN INSERTED DECORATIVE CORD AND FURNITURE PROVIDED WITH SUCH STRIPS

Keith T. Gilmore, Apple Valley; William L. Beihoffer, Burnsville, and Douglas C. Zellmer, Lakeville, all of Minn., assignors to Woodland Holding Corp., Farmington, Minn.
Continuation of Ser. No. 371,813, Jan. 12, 1995, Pat. No. 5,525,384. This application Jun. 10, 1996, Ser. No. 658,513
Int. Cl.^{6} B60R *13/04*
U.S. Cl. 428—31 **7 Claims**



1. A flexible protective or decorative molding strip for furniture comprising,

a first flexible strip member comprising an elongated base strip of flexible plastic resin having a lower surface to be placed into contact with a surface of a furniture item, and said strip having an exposed outer surface that is visible when the base strip is affixed to the furniture item,

a groove is present in the exposed outer surface of the base strip and runs longitudinally thereof,

the groove terminates upwardly in laterally spaced apart parallel upper edges that define centrally projecting rims,

a second flexible strip member comprising a flexible cord formed from plastic resin and including a lower portion with a convex or V-shaped lower surface to enable at least the lower portion of the cord to be inserted into the groove by being pressed between the rims of the groove into place within the groove,

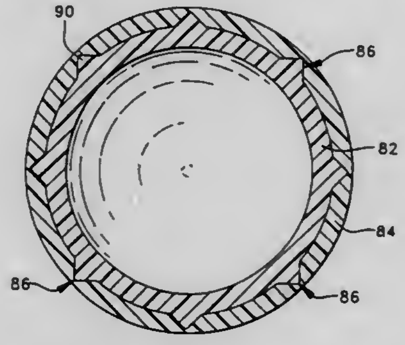
the groove has walls that approach one another to partially surround the cord,

the cord is held in place by contact with the walls of the groove beneath the rims of the groove and the rims extend over portions of the cord to thereby physically enclose at least the lower portion of the cord so as to hold the cord in place within the groove,

said cord, when inserted into the groove, forms a pair of connected flexible plastic strips wherein the base strip supports the cord and the cord has an exposed portion that is visible to create a pleasing decorative effect or to assist in protecting the molding strip from abrasion.

5,688,570
METHOD AND APPARATUS FOR FORMING A MULTI-LAYER PREFORM

Frank A. Ruttinger, Sr., Newman, Ga., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.
Filed Oct. 13, 1995, Ser. No. 543,130
Int. Cl.^{6} B29D *22/00;* **A21C** *3/00;* **B29C** *39/02*
U.S. Cl. 428—35.7 **38 Claims**



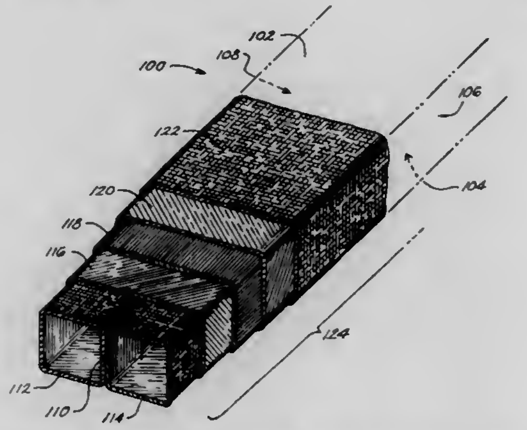
33. An improved multi-layer preform comprising:

at least a first inner layer of a first plastic material, said first inner layer having a gate end and a remote end, said layer having an outer corrugated surface, said corrugated surface defining a plurality of flutes, said flutes beginning substantially proximate said gate end extending longitudinally substantially upstream from the gate end to a location substantially proximate said remote end; and

a second outer layer of a second plastic material overmolded upon the first layer, said second outer layer being joined to said first layer at the corrugated surface.

5,688,571
COMPOSITE TUBULAR MEMBER WITH INTERNAL REINFORCEMENT AND METHOD

Peter A. Quigley, Pocasset, and Stephen C. Nolet, Franklin, both of Mass., assignors to Composite Development Corporation, West Wareham, Mass.
Continuation-in-part of Ser. No. 178,664, Jan. 7, 1994, Pat. No. 5,556,677, and Ser. No. 191,856, Feb. 3, 1994, Pat. No. 5,549,947. This application Feb. 5, 1996, Ser. No. 597,088
Int. Cl.^{6} B29D *22/00;* **B32B** *1/08*
U.S. Cl. 428—36.1 **3 Claims**



1. An axially extending composite tubular member with two spaced apart wall portions having a plurality of plies, each ply having a matrix material and a fiber component, and said member having primary bending stiffness along a longitudinal axis, and comprising

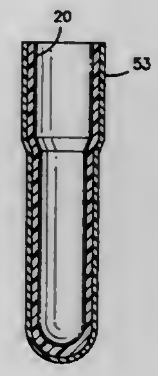
at least one ply having a first fiber component with fibers oriented at an angle relative to said longitudinal axis of between thirty degrees and sixty degrees, and

an internal reinforcement spanning across the tubular interior of the member between and secured to the two spaced apart wall portions,

and wherein said first fiber component provides significant torsional stiffness to the composite member and said internal reinforcement provides significant impact resistance to the composite member.

5,688,572
MULTI-LAYER CONTAINERS

William A. Slat, Brooklyn, Mich., and Richard C. Darr, Seville, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.
Division of Ser. No. 271,088, Jul. 6, 1994, Pat. No. 5,464,106.
This application Mar. 9, 1995, Ser. No. 401,162
Int. Cl.^{6} B65D *1/02;* **B32B** *1/02*
U.S. Cl. 428—36.91 **13 Claims**



1. A multilayer preform for blow molding a container, comprising:

an extruded encircling inner layer which forms a cavity, including:

an upper portion having a first thickness and adapted to be formed into an upper portion of a container;

an intermediate sidewall portion having a second thickness thicker than the first thickness, wherein the

intermediate portion is substantially adjacent to the upper portion and adapted to be formed into an intermediate portion of the container; and

a base portion having a third thickness thicker than the second thickness, wherein the base portion is substantially adjacent the intermediate portion and adapted to be formed into a base portion of the container;

an outer injection molded layer located substantially adjacent the inner layer and coextensive therewith, wherein the outer layer has a substantially uniform thickness adjacent the intermediate portion of the inner layer and adjacent the base portion of the inner layer; and

wherein the preform has an open top, and wherein the upper portion extends to the open top of the preform, and wherein the intermediate portion is an elongated, substantially vertical sidewall portion extending from the upper portion to the base portion.

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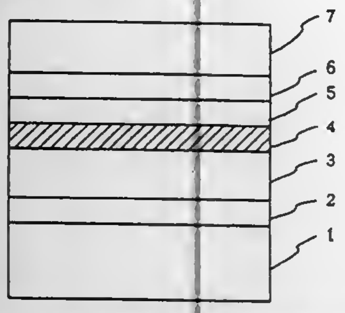
5,688,573
HALOGEN-FREE ACRYLIC URETHANE SHEET MATERIAL

Siegfried Goeb, and Iris Maassen, both of Willich, Germany, assignors to Minnesota Mining and Manufacturing Company
Continuation of Ser. No. 244,355, May 26, 1994, abandoned. This application Oct. 19, 1995, Ser. No. 545,543
Claims priority, application Germany, Dec. 18, 1991, 41 41 914.6
Int. Cl.⁶ C08G *18/00*
U.S. Cl. 428—40.1 **26 Claims**

1. A halogen-free acrylic urethane sheet material comprising a self-supporting film of a polymer comprising the reaction product of components A, B, and C wherein
- component A comprises a copolymer of
  - (i) a monoester of acrylic or methacrylic acid and an aliphatic diol having 2 to 8 carbon atoms and
  - (ii) an ester of acrylic or methacrylic acid and an aliphatic alcohol having 1 to 8 carbon atoms, and
  - (iii) optionally a vinyl group containing material selected from the groups consisting of a vinyl aromatic monomer of N-vinylpyrrolidone and N-vinylcaprolactame,
  - said component A having a Tg of 30° C. to 100° C.;
- component B comprises an aliphatic polyester diol with a weight-average molecular weight less than 20,000; and
- a component C consisting essentially of a polyfunctional isocyanate or blocked polyfunctional isocyanate.

5,688,574
OPTICAL RECORDING MEDIUM

Reiji Tamura; Yoshihiro Ikari; Toshiaki Taii, all of Kitasouma-gun, and Norio Ota, Tsukuba-gun, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed Mar. 14, 1996, Ser. No. 616,011
Claims priority, application Japan, Mar. 14, 1995, 7-081714; May 29, 1995, 7-153839
Int. Cl.⁶ B32B *3/00*
U.S. Cl. 428—64.1 **24 Claims**



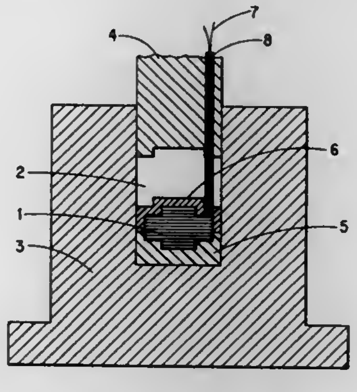
1. An optical recording medium comprising a metallic layer, a first protective layer, a recording layer, a second protective layer, and a reflecting layer on a substrate,
- said recording medium being subjected to recording through change in atomic arrangement of the recording layer from a stable state to a metastable state, and said recording medium being subjected to initialization and erasing through change from the metastable state to the stable state, wherein:
- said recording layer comprises a material containing major components of Ge, Te, Sb, and Se, and said recording layer has an average composition in a direction of thickness which satisfies the following relations as represented by atomic %:

$$Ge \geqq 40\%, \text{ and } Sb+Se \leqq 25\%$$

- said recording medium having a reflectance of not more than 40% with respect to a light beam for reproduction when the atomic arrangement of the recording layer is in the stable state, and said recording medium having a reflectance of not less than 70% with respect to the light beam for reproduction when the atomic arrangement of the recording layer is in the metastable state.

5,688,575
INSERTS ENCAPSULATED WITH A THERMOPLASTIC SHEET MATERIAL VIA COMPRESSION MOLDING

M. Lana Sheer, Kenneth Square, Pa.; Lloyd Fox, North East, Md., and John Carl Solenberger, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 625,734, Mar. 29, 1996, abandoned, which is a continuation of Ser. No. 396,995, Mar. 1, 1995, abandoned, Division of Ser. No. 117,845, Sep. 7, 1993, Pat. No. 5,419,864, which is a continuation-in-part of Ser. No. 700,687, May 15, 1991, abandoned. This application Oct. 21, 1996, Ser. No. 734,208
Int. Cl.⁶ B32B *5/16*
U.S. Cl. 428—76 **13 Claims**

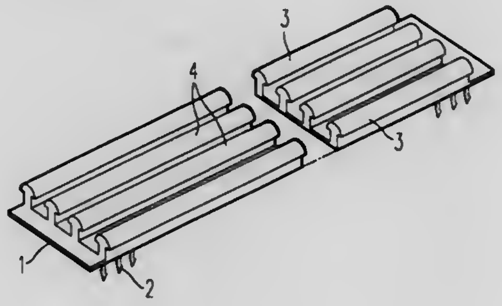


1. A metal-containing insert which is encapsulated with at least one layer of a thermoplastic sheet material, said thermoplastic sheet material comprising a thermoplastic polymer and a glass fiber material selected from glass fibers having a length greater than 3.175 mm (⅛ inch) or a mixture of said glass fibers having a length greater than 3.175 mm (⅛ inch) with flakes or spheres and wherein said thermoplastic sheet material is prepared by:
- (a) co-dispersing said thermoplastic polymer and said glass fiber material into water to form an aqueous slurry;
- (b) depositing said slurry on a forming wire;
- (c) de-watering said slurry to form a fibrous mat; and
- (d) drying said mat;

said encapsulation being accomplished by a compression molding process which includes the steps of:
- (i) heating said thermoplastic sheet material to a temperature which is above the melting point but below the degradation point of the polymer;
- (ii) exposing a portion of the insert to be encapsulated;
- (iii) placing said sheet material over the exposed portion of said insert;
- (iv) forcing the heated thermoplastic sheet material around the exposed portion of said insert; and
- (v) repeating the process until all exposed portions of said insert have been encapsulated with at least one layer of said thermoplastic sheet material.

5,688,576
FASTENER MEMBER FOR MOLDING AND PRODUCTION OF PLASTIC MOLDED ARTICLE WITH FASTENER MEMBER MOLDED THEREON

Yuji Ohno; Kunihiko Shimamura, both of Karashiki, and Tohru Tanokura, Osaka, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Continuation of Ser. No. 350,045, Nov. 29, 1994, abandoned. This application May 3, 1996, Ser. No. 642,631
Claims priority, application Japan, Nov. 29, 1993, 5-325930
Int. Cl.⁶ A44B *18/00*
U.S. Cl. 428—100 **4 Claims**



1. A fastener member for molding of plastic material, the fastener member comprising:
- a fastener tape including a substrate, said fastener tape comprising engaging elements on a top side of the substrate and ridges extending continuously in a longitudinal direction on opposite edges of a back side of the substrate;
- wherein the ridges project outwardly such that an outermost part of the ridges is about 0.3 to 5 mm from an outer edge of the substrate, the ridges are formed by bending back both edges of the substrate of the fastener tape, and a top portion of the ridges comprises an enlarged portion.

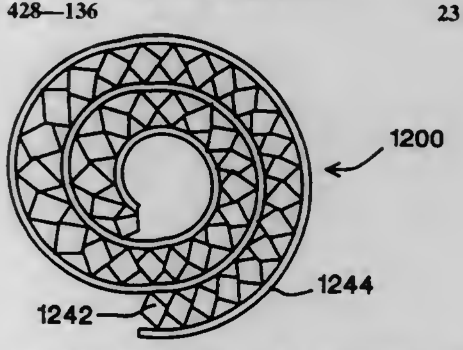
5,688,577
MULTI-DIRECTIONAL FRICTION MATERIALS

W. Novis Smith, Philadelphia, Pa., and Toby Burnham, Auburn, Ala., assignors to R. K. Carbon Fibers, Inc., Philadelphia, Pa.
Filed Jul. 27, 1995, Ser. No. 508,105
Int. Cl.⁶ B32B *5/12*
U.S. Cl. 428—113 **20 Claims**

1. In an improved multi-layered preform for use as a friction material having carbonaceous and/or oxidized polyacrylonitrile based fibers; the improvement comprising at least three stacked unidirectional fabric layers; each layer having said fibers unidirectional so that a longitudinal axis of each layer is oriented at an angle of x degrees respective to the longitudinal axis of any other layer; wherein x is a whole number greater than zero; said angle of x degrees being selected from the group consisting of 22.5, 45.0, 67.5, 90.5, 112.5, 135.0, 157.5 and 180.0; said fibers of each layer being substantially symmetrically spaced; and said layers being needled together to form said multi-layered preform.

5,688,578
COMPOSITE PACKAGING MATERIAL HAVING AN EXPANDED SHEET WITH A SEPARATOR SHEET

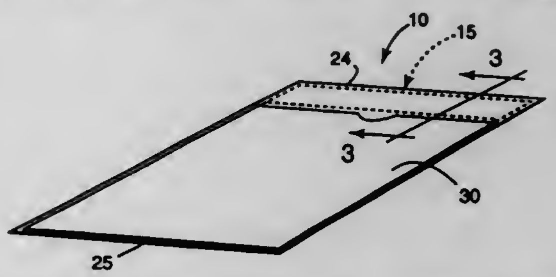
David P. Goodrich, 14 Ox Hill Rd., Newtown, Conn. 06430
Continuation-in-part of Ser. No. 255,062, Jun. 7, 1994, abandoned, Ser. No. 157,277, Nov. 26, 1993, Pat. No. 5,667,871, and Ser. No. 119,472, Sep. 10, 1993, Pat. No. 5,538,778, said Ser. No. 157,277and Ser. No. 119,472, Sep. 10, 1993, Pat. No. 5,538,778, , each is a continuation-in-part of Ser. No. 936,608, Aug. 27, 1992, abandoned, and Ser. No. 962,944, Oct. 19, 1992, abandoned, said Ser. No. 936,608and Ser. No. 962,944, Oct. 19, 1992, abandoned, , each is a continuation-in-part of Ser. No. 851,911, Mar. 16, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 385,336
Int. Cl.⁶ B65D *85/30*
U.S. Cl. 428—136 **23 Claims**



1. A paper cushion wrap comprising a combination of at least one sheet of slit expanded sheet material and a layer of substantially unexpanded sheet material, adjacent layers of expanded sheet material being separated by said substantially unexpanded sheet material, said expanded sheet having rows of cells with semi-rigid peaks, said semi-rigid peaks having an incline such that cells of adjacent layers can nest and interlock, said peaks being prevented from nesting in cells and interlocking with adjacent layers of expanded sheet material by said separator sheet.

5,688,579
MOUNTING COMPOSITE

Patricia R. Konsti, Oakdale; Robert J. Wolf, Woodbury, both of Minn.; Mary K. Miller-Bruns, Cedar Park, Tex., and Christine M. Sawka, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 261,864, Jun. 17, 1994, abandoned. This application Sep. 7, 1995, Ser. No. 524,882
Int. Cl.⁶ B32B *9/00*
U.S. Cl. 428—192 **32 Claims**



1. A mounting composite for removably mounting sheet materials on a vertical wall covered with woven or knitted fabric, said mounting composite comprising;
- a backing layer having opposite front and rear major surfaces;
- means along said front surface and attached to said backing layer for retaining and displaying sheet materials along said front surface; and
- a first fastener strip including a base layer having opposite front and rear major surfaces, said rear major surface being attached surface to surface along the rear major surface of said backing layer, and said fastener strip further including a multiplicity of curved projections, each projection being inte-

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gral with said base layer, decreasing in cross sectional area away from said base layer, having a pointed end portion opposite said base layer, and being curved away from said base layer in the same hook direction generally parallel to the front surface of said base layer with the pointed end portions being generally pointed in said hook direction;

said mounting composite being adapted to be removably attached on a vertical wall formed of woven or knitted fabric with the pointed end portions of said projections directed generally vertically downwardly.

5,688,580
INTERIOR MATERIAL FOR TUNNELS AND TUNNEL INTERIOR CONSTRUCTION

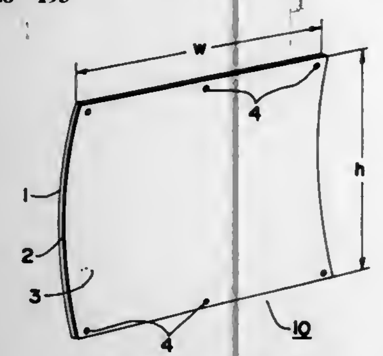
Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry, Co. Ltd., Hyogo, Japan

Division of Ser. No. 99,218, Jul. 29, 1993, Pat. No. 5,556,676. This application Feb. 16, 1996, Ser. No. 602,991

Claims priority, application Japan, Jan. 22, 1993, 5-1288

Int. Cl.^{6} B32B *23/02*

U.S. Cl. 428—193 **11 Claims**



1. An element, which comprises a composite panel in which a fibrous glass material is laminated over a hard substrate, and a fluoropolymer surface layer is laminated over said fibrous glass material.

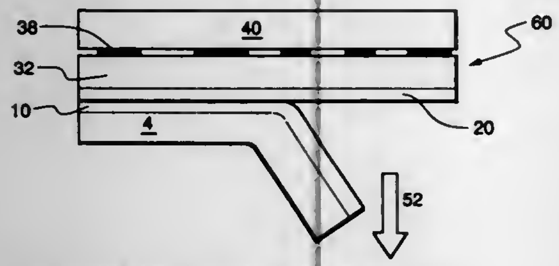
5,688,581
ELECTROGRAPHIC IMAGE TRANSFER ELEMENT HAVING A PROTECTIVE LAYER

Theresa M. Chagnon, Chicopee; Douglas Allan Cahill, Belchertown; Richard Scott Himmelwright, Wilbraham, and Dene Harvey Taylor, Holyoke, all of Mass., assignors to Rexam Graphics, Incorporated, South Hadley, Mass.

Filed Mar. 14, 1996, Ser. No. 615,958

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—195 **23 Claims**



1. An electrographic element comprising, in order:
a) a conductive support base;
b) a release layer;
c) a protective layer consisting essentially of a fluoropolymer and an acrylic polymer compatible with said fluoropolymer, wherein said fluoropolymer has a surface energy of about 16 to 30 dynes/cm, and wherein the weight ratio of fluoropolymer to acrylic polymer is about 65:35 to about 85:15;
d) a dielectric layer comprising a film-forming material having a dielectric constant of about 2 to 5; and
e) an adhesive layer.

5,688,582
BIODEGRADABLE FILAMENT NONWOVEN FABRICS AND METHOD OF MANUFACTURING THE SAME

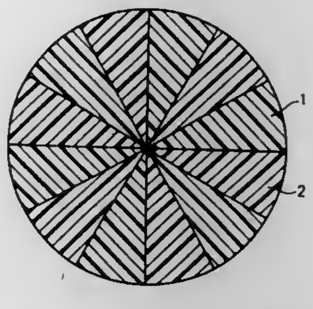
Kolchi Nagaoka; Shigetaka Nishimura; Fumio Matsuoka; Naoji Ichise, all of Uji; Yasuhiro Yonezawa, Okazaki, and Keiko Sakota, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Feb. 20, 1996, Ser. No. 604,532

Claims priority, application Japan, Mar. 8, 1995, 7-047678; Mar. 8, 1995, 7-047680; Mar. 8, 1995, 7-047681; Jul. 12, 1995, 7-175296

Int. Cl.^{6} D04H *3/14;3/16*

U.S. Cl. 428—198 **47 Claims**



1. A biodegradable filament nonwoven fabric comprising a nonwoven web made up of filaments, each filament consisting of a high melting point component composed of a first biodegradable aliphatic polyester and a low melting point component composed of a second biodegradable aliphatic polyester with a melting point lower than that of the high melting point component, the nonwoven web processed to a predetermined nonwoven fabric configuration, at least one of the high melting point component and the low melting point component being arranged in a plurality of divisions in the cross section of the filament, both the high melting point component and the low melting point component extending continuously in the axial direction of the filament, the both components being exposed on the surface of the filament.

5,688,583
ADHESIVE FOR PRINTED CIRCUIT BOARD

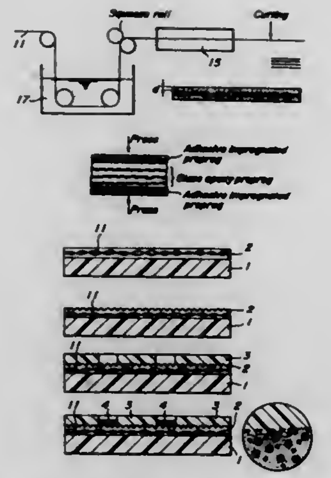
Motoo Asai, and Chie Onishi, both of Gifu, Japan, assignors to Ibiden Co., Ltd., Gifu, Japan

Division of Ser. No. 248,209, May 24, 1994, Pat. No. 5,447,996, which is a division of Ser. No. 913,935, Jul. 17, 1992, Pat. No. 5,344,893. This application Jun. 6, 1995, Ser. No. 466,616

Claims priority, application Japan, Jul. 23, 1991, 3-205618

Int. Cl.^{6} B32B *3/00;7/06;* **C08F** *283/00;* **C09J** *161/20*

U.S. Cl. 428—200 **14 Claims**



1. A prepreg adhesive obtained by forming an adhesive by dispersing a cured fine powder of amino resin which is soluble in an acid or an oxidizing agent into an uncured heat-resistant resin matrix, said uncured heat-resistant resin matrix being curable into a heat-resistant resin matrix which is hardly soluble in the acid or the oxidizing agent, impregnating a fibrous substrate with the adhesive, and removing the cured fine powder with the acid or the oxidizing agent to form a roughened surface for the formation of a conductor pattern through electroless plating.

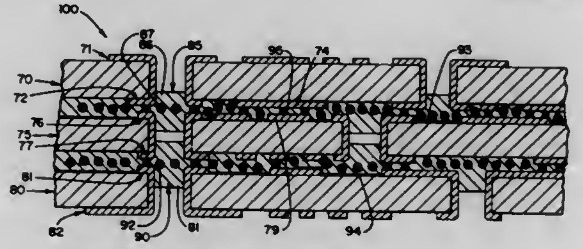
5,688,584
MULTILAYER ELECTRONIC CIRCUIT HAVING A CONDUCTIVE ADHESIVE

Keith L. Casson, Northfield; Carol Myers, Faribault, both of Minn.; Kenneth B. Gilleo, W. Kingston, R.I.; Deanna Suilmann, Bloomer, Wis.; Edward Mahagnoul, Faribault, and Marion Tibesar, Northfield, both of Minn., assignors to Sheldahl, Inc., Northfield, Minn.

Division of Ser. No. 1,811, Jan. 8, 1993, Pat. No. 5,502,889, which is a continuation-in-part of Ser. No. 925,954, Aug. 5, 1992, abandoned, which is a continuation of Ser. No. 206,086, Jun. 10, 1988, abandoned. This application Sep. 27, 1995, Ser. No. 534,630

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—209 **18 Claims**



1. A multilayer circuit board comprising:

at least three conductive layers, each having a conductive pattern and a plurality of contact pads defined thereon, with two of the at least three conductive layers being designated first and second conductive layers, at least two contact pads being respectively disposed on the first and second conductive layers and opposing one another to define opposing interconnecting pads, the first conductive layer affixed to a first insulating substrate; and

an electrically interconnecting adhesive layer interposed between the first and second conductive layers for mechanically connecting the first and second conductive layers in a superposed relationship with a connected distance therebetween, and for electrically connecting the opposing interconnecting pads on the first and second conductive layers, the interconnecting layer being conductive across a thickness thereof and being non-conductive throughout a coplanar direction thereof, and being disposed substantially throughout an overlapping portion of the first and second conductive layers, the interconnecting layer comprising a non-conductive adhesive having a first plurality of deformable conductive metallic particles dispersed substantially uniformly throughout the adhesive such that each particle is electrically insulated from substantially every other particle, the particles and the insulating substrate having substantially similar coefficients of thermal expansion that are within 25% of one another, and the particles having a diameter that is about 90–110% of the distance between the first and second conductive layers.

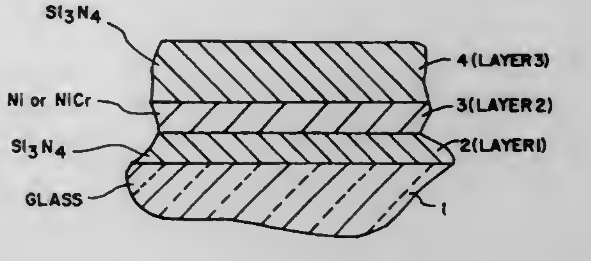
5,688,585
MATCHABLE, HEAT TREATABLE, DURABLE, IR-REFLECTING SPUTTER-COATED GLASSES AND METHOD OF MAKING SAME

Philip J. Lingle, Temperance; Klaus W. Hartig, Brighton, and Steven L. Larson, Monroe, all of Mich., assignors to Guardian Industries Corp., Auburn Hills, Mich.

Continuation-in-part of Ser. No. 486,643, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 102,281, Aug. 5, 1993. This application Dec. 14, 1995, Ser. No. 572,061

Int. Cl.^{6} C03C *17/34*

U.S. Cl. 428—216 **12 Claims**



1. A heat treated glass article exhibiting a glass side reflectance ΔE_H no greater than about 2.0 including a glass substrate having a thickness of about 1.5 mm–13 mm and having thereon a sputter-coated layer system comprising from the glass substrate outward:
a) an undercoat layer comprised of silicon nitride;
b) a substantially metallic layer which includes nickel or a nickel alloy having a nickel content of at least 10% by weight Ni, and which is substantially free of any nitride or oxide; and
c) an overcoat layer comprised of silicon nitride.

5,688,586
POLY(ETHYLENE OXALATE), PRODUCT FORMED OF MOLDED THEREFROM AND PRODUCTION PROCESS OF POLY(ETHYLENE OXALATE)

Zenya Shiiki, and Yukichika Kawakami, both of Fukushima-ken, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

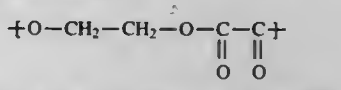
Filed Jun. 20, 1996, Ser. No. 667,265

Claims priority, application Japan, Jun. 20, 1995, 7-176828; Mar. 28, 1996, 8-099274

Int. Cl.^{6} B32B *00/00;* **C08F** *20/00*

U.S. Cl. 428—221 **23 Claims**

1. Poly(ethylene oxalate) containing recurring units represented by the following formula (1):



$$\left[O-CH_2-CH_2-O-\underset{\underset{O}{\|}}{C}-\underset{\underset{O}{\|}}{C} \right] \quad (1)$$

in a proportion or at least 60 basal mol %, wherein
(a) the solution viscosity (η_{inh}) is at least 0.25 dl/g as measured at 30° C. and a polymer concentration of 0.40 g/dl in a 4:1 (by weight) mixed solvent of m-chlorophenol and 1,2,4-trichlorobenzene,
(b) the melt viscosity (η^*) is at least 30 pa.s as measured at 190° C. and a shear rate of 1,000/sec, and
(c) the density is at least 1.48 g/cm^3 as measured in an amorphous state.

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ANTIFALSIFICATION PAPER HAVING A THREAD- OR BAND-SHAPED SECURITY ELEMENT AND A METHOD FOR PRODUCING IT

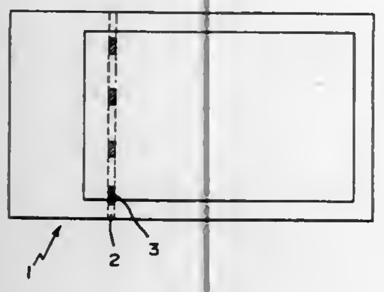
Theo Burchard, Gmud/Tegernsee; Christian Schmitz, Fischbachau, and Michael Böhm, Kirchheim, all of Germany, assignors to Giesecke & Devrient GmbH, Germany

Filed Dec. 21, 1994, Ser. No. 360,500

Claims priority, application Germany, Dec. 24, 1993, 43 44 553.5

Int. Cl.^{6} D04H *21/42*

U.S. Cl. 428—292 **11 Claims**



1. An antifalsification paper having a security element in the form of a band that comprises a translucent plastic film with an opaque coating extending at least partially over the plastic film, the coating having gaps in the form of visually and/or machine readable characters or patterns forming a first information; and a second information in the form of visually and/or machine readable characters or patters disposed on the plastic film, said second information differing from the first information with respect to its size and/or visual impression.

5,688,588

WATER PURIFICATION DEVICE

James Dennis Cotton, Marietta; Dennis Stein Everhart, Alpharetta, and Elizabeth Deibler Gadsby, Mareitta, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Apr. 12, 1996, Ser. No. 631,512

Int. Cl.^{6} A61J *15/00;* **B01D** *24/08;27/02*

U.S. Cl. 428—305.5 **37 Claims**

1. A device that purifies contaminated water by forced movement of water through the device, the device comprising:

at least one filter plug composed of a fibrous structure, the filter plug having sides, a first end, a second end, and a firmness sufficient to avoid collapse of the fibrous nonwoven structure under a pressure drop of from about 0.5 to about 22 cm water/cm filter plug length;

a water purification material integrated in the fibrous structure; and

a liquid impervious wrapper covering the sides of each filter plug, the wrapper defining openings at the first and second ends of the filter plug.

13. A drinking straw that purifies contaminated water by forced movement of water through the straw, the straw comprising:

a filter plug composed of a fibrous structure, the filter plug having sides, a first end, a second end, and a firmness sufficient to avoid collapse of the fibrous structure under a pressure drop of from about 0.5 to about 22 cm water/cm filter plug length;

a water purification material integrated in the fibrous structure; and

a liquid impervious wrapper covering the sides of the filter plug, the wrapper defining openings at the first and second ends of the filter plug.

5,688,589

SELF-ADHESIVE TAPE

Wolfgang Schacht, Neu Wulmsdorf; Robert Gereke, Braunschwelg; Frank Henke, Neu Wulmsdorf/Elsdorf, and Holger Hoffmann, Wedemark, all of Germany, assignors to Beiersdorf AG, Hamburg, Germany

Filed Feb. 21, 1996, Ser. No. 604,511

Claims priority, application Germany, Feb. 23, 1995, 195 06 250.7

Int. Cl.^{6} C09J *7/02*

U.S. Cl. 428—317.3 **11 Claims**

1. A pressure-sensitive self-adhesive tape comprising a backing made of general purpose rubber, the backing being coated on both sides with pressure-sensitive adhesive compositions, said backing containing solid microspheres present therein in a volume proportion of from 1% to 50% by volume.

5,688,590

HIGH HEAT RESISTANT MOLDED PARTS PRODUCED BY STRUCTURAL REACTION INJECTION MOLDING

E. Haakan Jonsson, Coraopolis; Kristen L. Parks, Wexford, both of Pa.; Harald Pielartzik, Krefeld, Germany; Philip E. Yeske, Pittsburgh, and Douglas A. Wicks, Lebanon, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Aug. 21, 1995, Ser. No. 517,541

Int. Cl.^{6} C08G *18/32*

U.S. Cl. 428—320.2 **6 Claims**

1. In a process for preparing a SRIM molded article comprising:

(A) providing a mold, having a cavity therein for forming the SRIM reinforced molded article, wherein at least a portion of the mold cavity defines a mold cavity surface against which surface the article is to be molded,

(B) laying one or more layers of fiber reinforcing mat against the mold cavity surface,

(C) closing the mold,

(D) injecting a reaction mixture via the RIM process into said mold cavity,

and

(E) allowing the reaction mixture to fully react, and removing the resultant molded product from the mold,

the improvement wherein said reaction mixture comprises

(1) one or more polymethylene poly(phenyl isocyanates) (i) having a diisocyanate content of from 25 to less than 50% by weight, (ii) containing less than about 2% by weight of 2,4'-methylene bis(phenyl isocyanate), and (iii) containing less than about 0.5% by weight of 2,2'-methylene bis(phenyl isocyanate), and

(2) a blend of active hydrogen containing compounds consisting essentially of:

(a) at least one polyether polyol having an hydroxyl functionality of from 2 to 8 and a molecular weight of from 350 to below 1800,

(b) at least one hydroxyl functional organic material containing from 2 to 8 hydroxyl groups and having a molecular weight below 350, components (2)(a) and (2)(b) being used in a weight ratio of from about 10:1 to about 1:10,

(c) no more than 45% by weight based on the total weight of components (a), (b), and (c), of one or more active hydrogen containing compounds having a molecular weight of 1800 or more, and

(d) from about 20% to about 40% by weight, based upon the total weight of components (a), (b), (c) and (d) of one or more aldimines corresponding to the formula

$$X—[N{=}CHCH(R_1(R_2)]_n$$

wherein

X represents an organic group which has a valency of n and is obtained by removing the amino groups from a organic polyamine having (cyclo)aliphatically-bound amino groups,

R_1 and R_2 may be identical or different and represent organic groups which are inert towards isocyanate groups at a temperature of 100° C. or less, or R_1 and R_2 together with the β-carbon atom form a cycloaliphatic or heterocyclic ring,

and

n represents an integer having a value of at least 2,

wherein the amounts of components (2)(a), (2)(b), (2)(c) and (2)(d) total by weight, and components (1) and (2) are present in amounts such that the isocyanate index is from about 70 to about 130.

3. The molded article produced by the process of claim 1.

5,688,591

MAGNETIC RECORDING MEDIUM CONTAINING AN UNSATURATED FATTY ACID DIESTER OF A DIHYDRIC ALCOHOL

Takayoshi Kuwajima, and Hideki Sasaki, both of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,476

Claims priority, application Japan, Dec. 27, 1993, 5-353921

Int. Cl.^{6} G11B *05/70*

U.S. Cl. 428—323 **9 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer thereon, said magnetic layer containing a thermoset or electron-cured resin binder and dispersed therein a ferromagnetic powder and a lubricant, wherein at least 3% by weight of said lubricant comprises an unsaturated fatty acid diester of dihydric alcohol having 2 to 6 carbon atoms and an unsaturated fatty acid having 14 to 24 carbon atoms and 1 to 4 unsaturated bonds.

5,688,592

THERMOCHROMIC LAMINATE COMPRISING LIGHT INTERCEPTING PIGMENT AND LIGHT STABILIZER

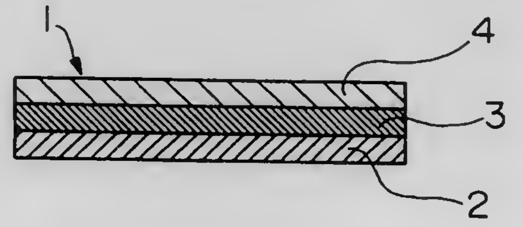
Yutaka Shibahashi, Nagoya, and Katsuyuki Fujita, Bisai, both of Japan, assignors to The Pilot Ink Co., Ltd., Nagoya, Japan

Filed Apr. 20, 1995, Ser. No. 425,788

Claims priority, application Japan, Apr. 22, 1994, 6-107776

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—323 **9 Claims**



1. A thermochromic laminate, comprising:

a thermochromic layer comprising from 0.5–40 wt. % of a homogeneous mixture comprising an electron-donating coloring organic compound, an electron-accepting organic compound and an organic compound for adjusting color change temperature fixed in a first film forming material; and

a combined layer laminated on the thermochromic layer, the combined layer comprising from 0.1–40 wt. % of a light-intercepting pigment and from 1–40 wt. % of a light stabilizer, the light-intercepting pigment and the light stabilizer being from 1.5 –60 wt. % in total and, dispersed and fixed in a second film-forming material,

the light-intercepting pigment being one or more pigments selected from metallic luster pigments, transparent titanium dioxide, transparent iron oxide, transparent cerium oxide, and transparent zinc oxide; and

the light stabilizer being one or more chemicals selected from ultraviolet absorbers, antioxidants, singlet oxygen quenchers, superoxide anion quenchers, ozone quenchers, visible light absorbers, and infrared absorbers.

5,688,593

Patent Not Issued For This Number

5,688,594

HYBRID YARN

Bent Lichscheidt; Hans Knudsen, and Henning Bak, all of Silkeborg, Denmark, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 15, 1995, Ser. No. 573,235

Claims priority, application Germany, Dec. 16, 1994, 44 44 917.8; Feb. 23, 1995, 19506316.3

Int. Cl.^{6} D02G *3/00;3/02*

U.S. Cl. 428—370 **13 Claims**

1. A hybrid yarn comprising at least two varieties of filaments, at least one variety (A) having a lower heat shrinkage and at least one variety (B) having a higher heat shrinkage than the rest of the filaments of the hybrid yarn, wherein

the first variety (A) of filaments are crimped and comprise polymer filaments selected from the group consisting of aramid, polyester, polyacrylonitrile, polypropylene, PEK, PEEK and polyoxymethylene, and inorganic filaments selected from the group consisting of metal, glass, ceramic and carbon having a linear density of 0.1 to 20 dtex,

the second variety (B) of filaments comprises polymer filaments, and the yarn having a dry heat shrinkage tension maximum so large that the total shrinkage force of the proportion of the second variety (B) of filaments is sufficient to force the lower-shrinking filaments present to undergo crimping.

5,688,595

MULTI-PIECE SOLID GOLF BALL

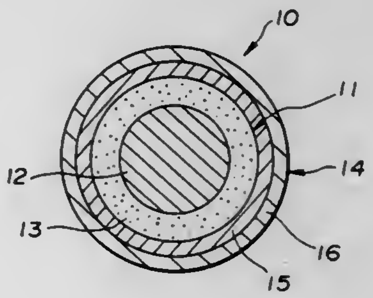
Hisashi Yamagishi; Hiroshi Higuchi; Yasushi Ichikawa, and Junji Hayashi, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1996, Ser. No. 661,778

Claims priority, application Japan, Jun. 14, 1995, 7-171520

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—375 **11 Claims**



1. A multi-piece solid golf ball comprising; a structure of four layers, a core having a structure consisting of an inner sphere and a layer surrounding the inner sphere, and a cover enclosing the core and consisting of inner and outer cover layers, said inner sphere having a diameter of 20 to 39 mm and being formed of a rubber base material to a hardness of 20 to 55 degrees on Shore D, said surrounding layer having a hardness of at least 45 degrees on Shore D, said core having a diameter of 35 to 41 mm, said outer cover layer having a hardness of 40 to 60 degrees on Shore D, and said inner cover layer having a hardness of up to 53 degrees on Shore D and lower than that of said outer cover layer.

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5,688,596

AROMATIC POLYAMIDE FILAMENT HAVING AN ENHANCED WEATHERING RESISTANCE

Osamu Makino; Toshitsugu Matsuki, and Toshihiro Santa, all of Matsuyama, Japan, assignors to Teljin Limited, Osaka, Japan

Continuation of Ser. No. 57,096, May 4, 1993, abandoned.
This application Mar. 20, 1995, Ser. No. 407,805
Claims priority, application Japan, May 7, 1992, 4-114812
Int. Cl.^{6} B32B *15/00*

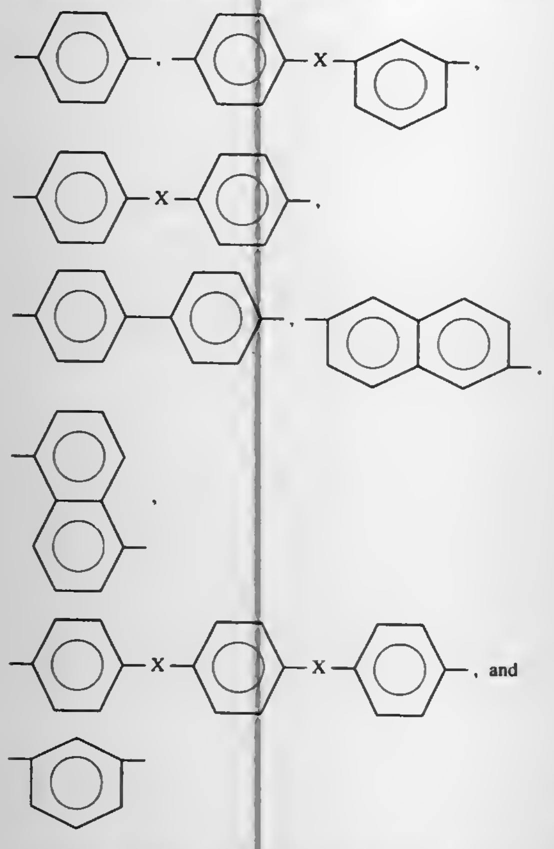
U.S. Cl. 428—379 **3 Claims**

1. An aromatic polyamide filament having an enhanced ultraviolet ray-resistance, comprising a filament matrix having at least one aromatic polyamide and a plurality of extremely fine inorganic particles, wherein:

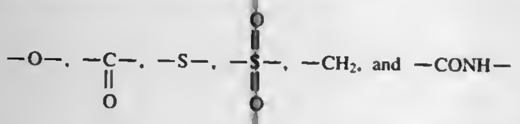
(1) the aromatic polyamide comprises 80 to 100 molar % of principal recurring units of the formula (I):

$$-NH-Ar_1-NHCO-Ar_2-CO- \qquad (I)$$

wherein Ar_1 and Ar_2 respectively and independently from each other represent a member selected from the group consisting of divalent aromatic groups of the formulae:



and X represent a member selected from the group consisting of divalent atoms and groups of the formulae:



$$-O-,\ -\overset{\displaystyle O}{\overset{\|}{C}}-,\ -S-,\ -\underset{\underset{\displaystyle O}{\|}}{\overset{\overset{\displaystyle O}{\|}}{S}}-,\ -CH_2,\ \text{and}\ -CONH-$$

and 0 to 20 molar % of additional recurring units different from those from those of the formula (I);

(2) the extremely fine inorganic particles are selected from the group consisting of rutile titanium dioxide, anatase titanium dioxide, zinc oxide, cadmium red, red mercuric sulfide, red iron oxide, middle chrome yellow, cadmium yellow, yellow iron oxide and chrome vermilion particles having a refractive index of 2.0 or more and an average particle size of 0.3 μm or less, and dispersed in an amount 0.1% to 5% based on the total weight of the filament, only in a surface portion of the filament matrix; and

(3) the filament has an individual filament thickness of 0.5 to 50 deniers, a tensile strength of 18 g/denier or more, an ultimate elongation of 3.5% or more, and an initial modulus of 450 g/denier or more.

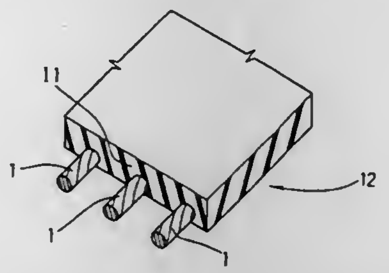
5,688,597

TIRE CORE

Masatsugu Kohno, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Aug. 1, 1995, Ser. No. 509,893
Claims priority, application Japan, Aug. 8, 1994, 6-208127; Aug. 23, 1994, 6-222415
Int. Cl.^{6} B32B *15/00*

U.S. Cl. 428—379 **7 Claims**



1. A tire cord comprising from four to seven filaments twisted together so as to form a core and a sheath surrounding the core, wherein

said from four to seven filaments change place repeatedly along the longitudinal direction of the cord such that one of the filaments forms the core in a portion, but in a different portion of the cord, said one of the filaments forms part of the sheath, thereby defining a plurality of first parts with the core and a plurality of second parts without the core which are disposed alternately in the longitudinal direction of the cord, wherein each of the first parts consists of the core consisting of one of the filaments and the sheath consisting of all the remaining filaments surrounding the core. and each of the second parts is defined by the sheath consisting of all said four to seven filaments surrounding a central space.

5,688,598

NON-BLISTERING THICK FILM COATING COMPOSITIONS AND METHOD FOR PROVIDING NON-BLISTERING THICK FILM COATINGS ON METAL SURFACES

Mitchell T. Keck, Crystal Lake; Ronald J. Lewarchik, Sleepy Hollow, both of Ill., and Jack C. Allman, Twin Lakes, Wis., assignors to Morton International, Inc., Chicago, Ill.

Filed Jun. 28, 1996, Ser. No. 672,280
Int. Cl.^{6} C08L *23/26;67/02;61/28;33/02*

U.S. Cl. 428—458 **33 Claims**

1. A non-blistering, thick film primer coating composition, which comprises:

(a) a hydroxy-functional polyester resin;
(b) a hydroxy-terminal polybutadiene resin;
(c) a blocked isocyanate crosslinker;
(d) an aminoplast crosslinker; and,
(e) a catalyst,

in which components (a)–(e) comprise the resin solids of the primer composition, and the balance of the primer composition comprises:

(f) a pigment; and,
(g) a solvent.

5,688,599

MOIRÉ FABRIC BY UTILIZING PRESSURIZED HEATED GAS

Don M. Bylund, and Howard C. Willauer, Jr., both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 142,575, Oct. 25, 1993, Pat. No. 5,404,626.
This application Mar. 1, 1995, Ser. No. 396,654
Int. Cl.^{6} D06C *23/00*

U.S. Cl. 428—409 **4 Claims**

1. A textile fabric comprising of at least one thermally altered, by means of pressurized, heated gas, thermoplastic yarn that has been treated with pressure of between 300 to 10,000 pounds per linear inch to form a moiré pattern on said textile fabric.

5,688,600

THERMOSET REINFORCED CORROSION RESISTANT LAMINATES

Edward D. Bailey, Jr., Baker, La., assignor to Cobale Co., L.L.C., Baton Rouge, La.

Continuation of Ser. No. 43,200, Apr. 5, 1993, Pat. No. 5,534,337. This application Jun. 26, 1996, Ser. No. 670,631
Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—421 **12 Claims**

1. In a reinforced corrosion resistant laminate utilizing a thermosetting resin, the improvement comprising incorporating therein a surfacing veil of a thermoplastic fluoropolymer, wherein said thermosetting resin is a polyester resin.

5,688,601

EXTERIOR PROTECTIVE LAYER FOR AN ELECTRICAL COMPONENT

Douglas A. Usifer, Belle Mead; Melvin Brauer, East Brunswick, both of N.J.; James C. Chang, Crystal Lake, Ill., and Yuan Chieh Chu, East Windsor, N.J., assignors to Caschem, Inc., Bayonne, N.J.

Filed Mar. 25, 1994, Ser. No. 218,010
Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—457 **19 Claims**

1. An article comprising an electrical component having an outer surface, and a reenterable exterior protective layer on at least a portion of the outer surface wherein the layer comprises a gel of a cured copolymer formed by reaction between a first acrylate or methacrylate compound and a second acrylate or methacrylate compound, wherein the reaction is conducted in the presence of a free radical initiator of a peroxide or hydroperoxide compound, a transition metal catalyst and an extender of an acylated castor oil.

5,688,602

METHOD FOR PRODUCING LAMINATED ARTICLES

Akbar Ghahary, 64 Ricker Dr., Ringwood, N.J. 07456

Continuation of Ser. No. 206,810, Mar. 4, 1994, Pat. No. 5,504,126, and a continuation-in-part of Ser. No. 219,335, Mar. 29, 1994, abandoned, said Ser. No. 206,810is a continuation-in-part of Ser. No. 882,839, May 14, 1992, Pat. No. 5,304,592, and a continuation-in-part of Ser. No. 51,627, Apr. 22, 1993, Pat. No. 5,476,895, and a continuation-in-part of Ser. No. 35,720, Mar. 23, 1993, Pat. No. 5,465,544, said Ser. No. 882,839, said Ser. No. 51,627and a continuation-in-part of Ser. No. 788,982, Nov. 7, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 347,278
Int. Cl.^{6} B32B *27/10*

U.S. Cl. 428—481 **13 Claims**

1. A method for producing a laminated article which comprises forming a laminate comprising a rigid substrate, a polymerizable flowable thermosetting resin composition, said resin containing an immiscible solid filler and being held in place by a gasket and a flexible thin film, placing said laminate in a molding press under sufficient pressure to obtain the desired resin layer thickness, maintaining the said laminate in said press under polymerization conditions until essentially completely polymerized and recovering a laminated article comprising a rigid substrate, a thermoset resin composition and a flexible thin film.

5,688,603

INK-JET RECORDING SHEET

Mohammed Iqbal; Armin J. Paff; Donald J. Williams, all of Austin, Tex.; Omar Farooq, Woodbury, and David W. Tweeten, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 548,438, Oct. 26, 1995, abandoned.
This application Nov. 21, 1996, Ser. No. 754,717
Int. Cl.^{6} B41M *5/00;* **B41J** *2/01*

U.S. Cl. 428—532 **9 Claims**

1. An ink-jet recording sheet comprising a substrate having coated on at least one surface thereof a two-layer coating comprising:

a) an absorptive bottom layer comprising
  i) at least one crosslinkable polymeric component;
  ii) at least one liquid-absorbent component comprising a water-absorbent polymer, and
  iii) from 0 to about 5% of a crosslinking agent,
b) an optically clear top layer comprising
  i) from about 0.05% to about 6% of at least one nonionic fluorocarbon surfactant,
  ii) from about 5% to about 94% of a hydroxycellulose or substituted hydroxycellulose polymer, and
  iii) a metal chelate selected from the group consisting of alkanolamine titanium chelates, alkanol zirconium chelates, and alkanolamine aluminum chelates.

5,688,604

DEFORMABLE AND ELASTIC TENSILE-INTEGRITY STRUCTURE

Ofer J. Matan, 310 Palo Alto Ave., Palo Alto, Calif. 94301, and Illah R. Nourbakhsh, P.O. Box 12104, Stanford, Calif. 94309

Filed Jul. 21, 1995, Ser. No. 505,472
Int. Cl.^{6} E04B *1/19*

U.S. Cl. 428—542.2 **7 Claims**

1. A deformable, elastic recovery tensile-integrity structure comprising:

a center strut having a fixture point;
a first side strut having a first extreme strut tip;
a first elastic chord having a first end fixed to the first extreme strut tip and a second end fixed to the fixture point of the center strut;
a second side strut having a second extreme strut tip; and

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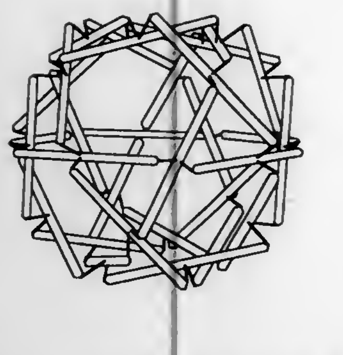


a second elastic chord having a first end fixed to the second extreme strut tip and a second end fixed to the fixture point of the center strut;

whereby the tensile-integrity structure exhibits elastic recovery to its original shape after extreme deformation.

5,688,605

MAGNETORESISTANCE EFFECT ELEMENT

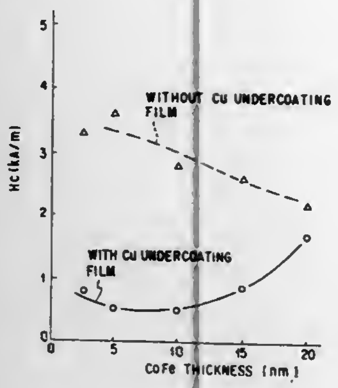
Hitoshi Iwasaki; Yuichi Ohsawa; Reiko Kondoh, all of Yokohama; Susumu Hashimoto, Ebina; Atsuhito Sawabe, Yokosuka; Yuzo Kamiguchi, and Masashi Sahashi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 144,258, Nov. 1, 1993, Pat. No. 5,549,978. This application May 23, 1996, Ser. No. 652,796

Claims priority, application Japan, Oct. 30, 1992, 4-315648; Mar. 12, 1993, 5-78919; Mar. 15, 1993, 5-53605; Mar. 15, 1993, 5-53612

Int. Cl.^{6} G11B *5/127*

U.S. Cl. 428—611 **11 Claims**



1. A magnetoresistance effect element comprising:

substrate;

stacked film formed on said substrate, said stacked film including a first ferromagnetic film, a second ferromagnetic film, and a non-magnetic film disposed between said first and second ferromagnetic films wherein each of said first and second ferromagnetic film, independently, contains a material selected from the group consisting of Co, a CoFe alloy, an NiFe alloy, a CoNi alloy and a COFeNi alloy, and wherein said non-magnetic film contains a material selected from the group consisting of Cu, Al, Pd, Pt, Rh, Ru, Ir, Au, Ag, CuPd, CuAu and CuNi;

a film formed between said stacked layer and said substrate, and having an fcc phase, said film having a lattice constant larger than that of said second ferromagnetic film; and

a pair of leads for supplying a current to said stacked film.

5,688,606

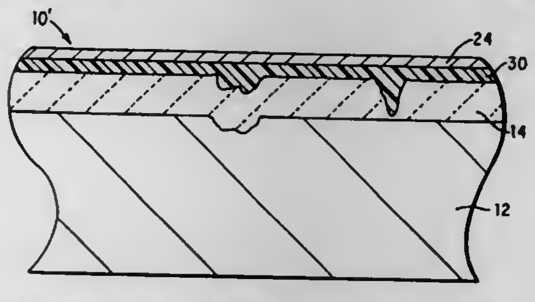
ANODIZED ALUMINUM SUBSTRATE HAVING INCREASED BREAKDOWN VOLTAGE

Deepak Mahulikar, Madison; Efraim Sagiv, Meriden; Arvind Parthasarathi, North Branford; Satish Jalota, Wallingford; Andrew J. Brock, Cheshire, all of Conn.; Michael A. Holmes, Ripon, Calif.; Jeffrey M. Schlater, Oakdale, Calif.; German J. Ramirez, Antioch, Calif., and Dexin Liang, Fremont, Calif., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 427,921, Apr. 26, 1995, Pat. No. 5,534,356. This application Apr. 18, 1996, Ser. No. 633,256

Int. Cl.^{6} B32B *15/00;3/00;* **B21D** *39/00;* **C25D** *5/18*

U.S. Cl. 428—615 **7 Claims**



1. A component for electronic applications comprising:

an anodizable metal core;

an anodic film containing pores having first and second opposing surfaces, said first surface bonded to said core; and

a dielectric polymer filling said pores and constituting a continuous film that coats said anodic film except for said first surface, said continuous film having a thickness of from about 0.0025 mm to about 0.051 mm and being effective to reduce the average surface roughness of said component.

5,688,607

PLATINUM GROUP SILICIDE MODIFIED ALUMINIDE COATED METAL SUPERALLOY BODY

Bernard R. Rose, Gloucester, and Patrick R. Lavery, N. Andover, both of Mass., assignors to Walbar Inc., Peabody, Mass.

Division of Ser. No. 382,874, Feb. 3, 1995, Pat. No. 5,492,726, which is a continuation of Ser. No. 155,617, Nov. 19, 1993, abandoned. This application Jul. 12, 1995, Ser. No. 500,655

Int. Cl.^{6} B32B *15/00*

U.S. Cl. 428—639 **6 Claims**

1. A coated nickel, cobalt or nickel-cobalt metal superalloy body having resistance to oxidation and corrosion and increased ductility and thermal stability at elevated temperatures, said superalloy body comprising a surface coating having a ductile outer zone of a platinum-group metal aluminide, and an inner stabilizing zone of silicided platinum-group metal comprising from 3% to 20% by weight of silicon.

5,688,608

HIGH REFRACTIVE-INDEX IR TRANSPARENT WINDOW WITH HARD, DURABLE AND ANTIREFLECTIVE COATING

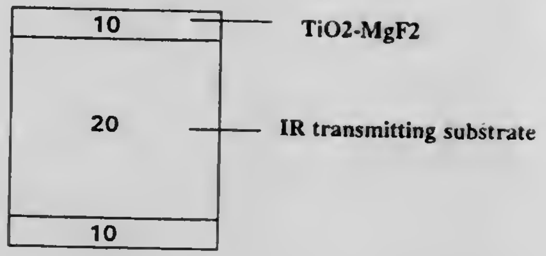
Rung-Ywan Tsai, Kaohsiung, and Fang Chuan Ho, Hsinchu, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Continuation-in-part of Ser. No. 194,572, Feb. 10, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 459,475

Int. Cl.^{6} B32B *15/00*

U.S. Cl. 428—696 **8 Claims**

1. An infrared (IR) transparent window comprising a substrate which has a refractive-index in the range of 1.88 and 4.41 at a wavelength of 1.06 um and is transmissive to infrared irradiation incident from a medium with a refractive-index n_m different from



the refractive-index of said substrate n_s, comprising at least one layer interference coating which is deposited onto said substrate wherein

the thickness of each said layer is one quarter of the wavelength of the IR irradiation,

at least one layer of said coating is composed of a composite of titanium oxide (TiO_2) and magnesium fluoride (MgF_2), which:

is transparent to IR irradiation in the wavelength range of 0.4 to 8 um and has a refractive-index n_f less than 2.1 and greater than 1.37 at a wavelength of 1.06 um, and

is prepared by low temperature ion-assisted coevaporation.

5,688,609

PROCESS FOR THE PRODUCTION OF ELECTRICAL ENERGY IN AN INTERNAL REFORMING HIGH TEMPERATURE FUEL CELL

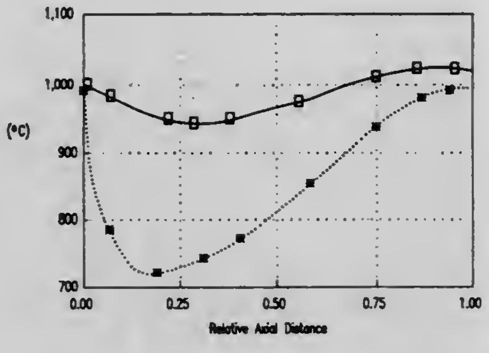
Jens Rostrup-Nielsen, Virum; Lars J. Christiansen, Farum, and Kim Aasberg-Petersen, Virum, all of Denmark, assignors to Haldor Topsoe A/S, Lyngby, Denmark

Filed Sep. 28, 1995, Ser. No. 535,750

Claims priority, application Denmark, Sep. 29, 1994, 1129/94

Int. Cl.^{6} H01M *8/10*

U.S. Cl. 429—15 **12 Claims**



1. In a process for producing electrical energy in an internal reforming high temperature fuel cell by steam reforming, at a reforming rate, a carbonaceous feed gas in the presence of a steam-reforming catalyst in heat-conducting relationship with electrochemical reactions in the fuel cell and electrochemically reacting the steam reformed feed gas in an anode compartment of the fuel cell, the improvement comprising the steps of:

feeding a gaseous sulfur-containing compound to the carbonaceous feed gas; and

controlling the amount of the gaseous sulfur-containing compound fed to the carbonaceous feed gas so as to obtain a sulfur coverage on the steam reforming catalyst and to control the reforming rate.

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DEVICE FOR GENERATING ENERGY

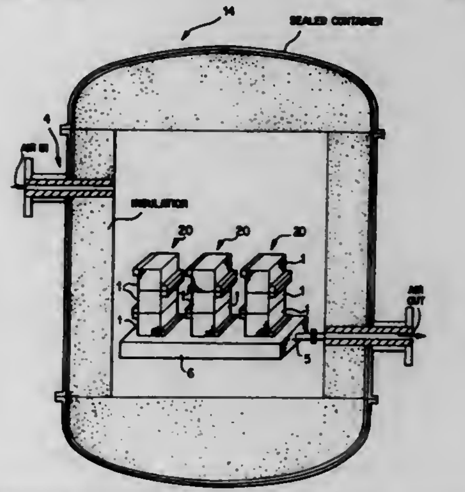
Richard Spaeh, Ueberlingen; Klaus-Peter Zurell, Friedrichshafen; Edmund Wegmann, Markdorf; Joerg Heitzer, Immenstaad, and Reinhold Schamm, Stetten, all of Germany, assignors to Dornier GmbH, Germany

Filed Jul. 26, 1996, Ser. No. 686,961

Claims priority, application Germany, Jul. 27, 1995, 195 27 376.1

Int. Cl.^{6} H01M *8/12;8/24*

U.S. Cl. 429—30 **4 Claims**



1. A fuel cell module comprising:

a plurality of fuel cell stacks stacked on top of one another;

a combustion gas supply connected to said fuel cell stacks by means of pipes;

a closed housing enclosing the fuel cell stacks and defining an air supply therein, air in said air supply surrounding said fuel cell stacks and being in flow communication therewith; and

a plurality of flat seals (11) provided between each of the fuel cell stacks (1) that are located on top of one another in the stack, said seal having a central air opening (22) and a peripheral, separate combustion gas channel (24);

wherein the lowermost fuel cell stack (1) is mounted by one of said seals (11) on a base plate (6), into which base plate a collecting channel (5) for the exhaust air and a channel (9) for the combustion gas are integrated.

5,688,611

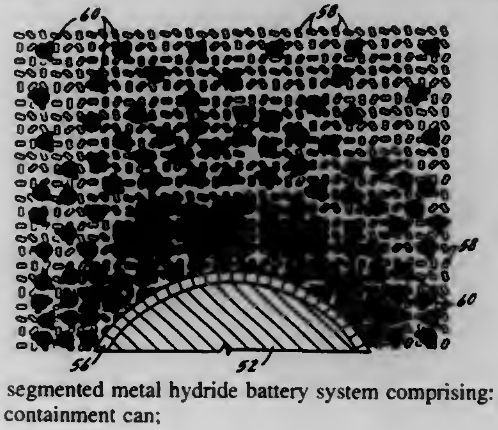
SEGMENTED HYDRIDE BATTERY INCLUDING AN IMPROVED HYDROGEN STORAGE MEANS

P. Mark Golben, Florida, N.Y., assignor to Ergenics, Inc., Ringwood, N.J.

Continuation-in-part of Ser. No. 267,038, Jun. 27, 1994, Pat. No. 5,532,074. This application Jul. 1, 1996, Ser. No. 673,104

Int. Cl.^{6} H01M *10/52*

U.S. Cl. 429—53 **15 Claims**



1. A segmented metal hydride battery system comprising:

a) a containment can;

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b) a stack of hydrogen-metal oxide cells, defining a hydrogen-metal oxide battery, disposed within the containment can;
c) a hermetically enclosed hydrogen storage chamber having at least one aperture and containing a metal hydride material for retaining and storing a concentrated volume of hydrogen, said metal hydride material being capable of releasably absorbing and discharging gaseous hydrogen, and said metal hydride material comprising a mixture of water vapor absorbing particles and metal hydride particles;
d) a communication means at least one aperture and disposed between said hydrogen-metal oxide battery and the enclosed hydrogen storage chamber for permitting reversible communication of a hydrogen gas stream flow between said battery and said chamber;
e) a means for selectively opening and closing said communication means to selectively permit and restrict hydrogen gas flow between said hydrogen-metal oxide battery and said enclosed hydrogen storage vessel through said aperture.

5,688,612

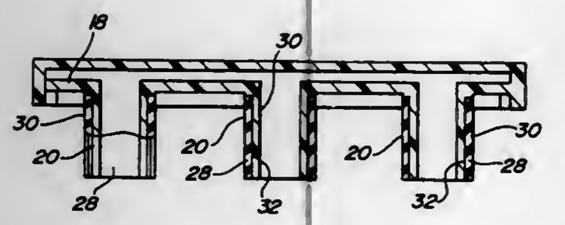
BATTERY COVER AND VENT CAP INTERFACE SEAL

Edward N. Mrotek, Grafton; Thomas J. Dougherty, Waukesha, both of Wis.; Gerald A. Cummins, Union, Ky., and Dean R. Walsten, Slinger, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Continuation of Ser. No. 325,793, Oct. 18, 1994, abandoned. This application Oct. 29, 1996, Ser. No. 739,238

Int. Cl.^{6} H01M *2/12*

U.S. Cl. 429—89 **12 Claims**



1. In an electric storage battery including a battery cover having a substantially cylindrical wall portion surrounding a vent opening and a vent cap having a cylindrical plug for selectively plugging the vent opening, the improvement comprising an interface seal disposed intermediate the cylindrical wall portion and the cylindrical plug and formed integral with a generally annular recess formed in one of the cylindrical wall portion and the cylindrical plug, thereby establishing a gas and liquid-tight seal therebetween.

5,688,613

ELECTROCHEMICAL CELL HAVING A POLYMER ELECTROLYTE

Changming Li, Vernon Hills; Ke Keryn Lian, Northbrook, both of Ill., and Florence O. Eschbach, Duluth, Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 8, 1996, Ser. No. 629,174

Int. Cl.^{6} H01M *6/18;* **H01G** *9/025*

U.S. Cl. 429—192 **12 Claims**

7. An electrochemical cell comprising:
an anode and a cathode each fabricated of the same material, said material selected from the group consisting of Ru, Ir, Co, W, V, Fe, Mo, Ni, Ag, Zn, Pb, Mn, alloys thereof, oxides thereof, carbides thereof, nitrides thereof, sulfides thereof, and combinations thereof, and a polymer electrolyte disposed between and in contact with said anode and said cathode, said polymer electrolyte comprising a polybenzimidazole polymer matrix, and having dispersed therein a metal hydroxide electrolyte active species.

5,688,614

ELECTROCHEMICAL CELL HAVING A POLYMER ELECTROLYTE

Chaugming Li, Vernon Hills; Ke Keryn Lian, Northbrook; Marc K. Chason, Schaumburg; Joseph G. Kincs, Arlington Heights, and Gretchen E. Fougere, Glencoe, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1996, Ser. No. 641,716

Int. Cl.^{6} H01M *6/18;* **H01G** *9/025*

U.S. Cl. 429—192 **43 Claims**

1. An electrolyte system comprising:
a multi-layered polymeric support structure comprising a first layer of a polymeric material comprising a polybenzimidazole, and having first and second major surfaces, and a layer of a second polymeric material disposed on at least one of said first and second major surfaces; and
an electrolyte active species dispersed in said polymeric support structure.

5,688,615

BIPOLAR BATTERY AND METHOD OF MAKING SAME

Edward N. Mrotek, Grafton, and Wen-Hong Kao, Brown Deer, both of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Nov. 3, 1995, Ser. No. 553,103

Int. Cl.^{6} H01M *10/18*

U.S. Cl. 429—210 **12 Claims**

1. A bipolar plate assembly for a bipolar battery comprising:
a frame member having first and second opposing generally planar surfaces and an opening through said frame member from said first surface to said second surface, said opening being countersunk on said first surface of frame member, defining a mounting shoulder that extends into said opening;
a bipolar element including a thin substrate of electrically conducting material, said substrate having first and second generally planar substrate surfaces and a peripheral edge, said bipolar element including positive electrode material disposed on said first substrate surface and negative electrode material disposed on said second substrate surface, said positive active electrode material and said negative active electrode material being spaced inwardly from the peripheral edge of said substrate defining a marginal edge portion for said substrate;
said bipolar element being mounted in said opening of said frame member with said marginal edge portion of said substrate located on said mounting shoulder;
and securing means including an adhesive resin, said adhesive resin containing at least one of aliphatic chains with carboxylic acid and carboxylate functional groups and aromatic chains, for securing said marginal edge portion of said substrate to said mounting shoulder to thereby secure said bipolar element to said flame member.

5,688,616

NON-SINTERED NICKEL ELECTRODE WITH EXCELLENT OVER-DISCHARGE CHARACTERISTICS, AN ALKALINE STORAGE CELL HAVING THE NON-SINTERED NICKEL ELECTRODE, AND A MANUFACTURING METHOD OF THE NON-SINTERED NICKEL ELECTRODE

Akifumi Yamawaki; Shinsuke Nakahori, both of Naruto; Takeo Hamamatsu, Itano-gun, and Yoshitaka Baba, Naruto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

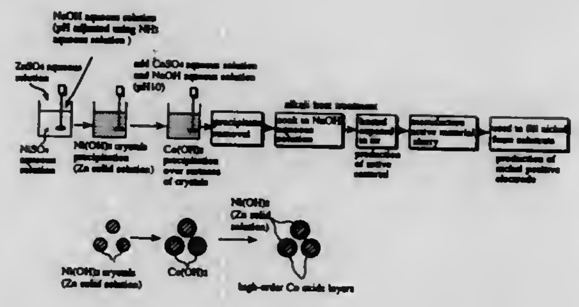
Division of Ser. No. 618,622, Mar. 20, 1996. This application Jun. 27, 1996, Ser. No. 671,199

Claims priority, application Japan, Jul. 31, 1995, 7-195096

Int. Cl.^{6} H0IM *4/04*

U.S. Cl. 429—223 **7 Claims**

1. A method of manufacturing a non-sintered nickel electrode for use in an alkali storage cell, said method comprising the steps of:



precipitating cobalt compound layers on surfaces of nickel hydroxide powder in which at least one of zinc, cadmium, magnesium, and calcium is added in a form of a solid solution, by adding an acid solution in which cobalt compounds are dissolved and an alkali solution into a solution in which the nickel hydroxide powder is dispersed,
subjecting the powder to a heat treatment in a presence of a oxygen and alkali so that the cobalt compound layer has a disordered crystal structure and an oxidation number higher than +2, and
applying the powder subjected to the heat treatment to an active material supporter.

5,688,617

PHASE SHIFT LAYER-CONTAINING PHOTOMASK, AND ITS PRODUCTION AND CORRECTION

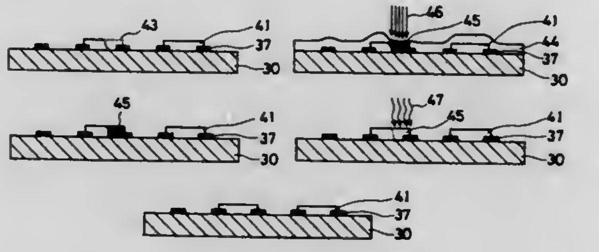
Koichi Mikami; Hiroyuki Miyashita; Yoichi Takahashi; Hiroshi Fujita, and Masa-aki Kurihara, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Division of Ser. No. 337,136, Nov. 10, 1994, Pat. No. 5,614,336, which is a continuation of Ser. No. 763,459, Sep. 20, 1991, abandoned. This application May 9, 1996, Ser. No. 644,856

Claims priority, application Japan, Sep. 21, 1990, 2-253717; Sep. 21, 1990, 2-253718; Dec. 27, 1990, 2-407929; Feb. 28, 1991, 3-33891; Mar. 13, 1991, 3-47850

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **3 Claims**



1. A process for producing phase shift layer-containing photomasks, characterized by comprising at least the steps of:
coating a starting material for spin-on-glass uniformly on a substrate,
drawing a pattern directly on the coating spin-on-glass layer with energy beams,
developing the substrate with a solvent after the pattern drawing with energy beams to wash off an excessive spin-on-glass portion other than the spin-on-glass layer irradiated with the ionizing radiations, and
baking the post-development substrate.

5,688,618

MILLIMETER WAVE DEVICE AND METHOD OF MAKING

Garry N. Hulderman, Riverside; Eugene Phillips, Diamond Bar, and Richard J. Swanson, Pomona, all of Calif., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Division of Ser. No. 42,449, Apr. 1, 1993, abandoned, which is a continuation of Ser. No. 739,205, Jul. 30, 1991, abandoned, which is a division of Ser. No. 112,330, Oct. 23, 1987, Pat. No. 5,062,149. This application May 19, 1995, Ser. No. 446,025

Int. Cl.^{6} G03F *7/00;9/00*

U.S. Cl. 430—22 **4 Claims**

1. A method of fabricating a millimeter wave device housing air channel shim, comprising the steps of:
providing a metallic plate of a thickness in the range of 0.010 to 0.025 inches, having substantially flat parallel top and bottom surfaces and four side edges forming a rectangular outer periphery to said plate;
placing a layer of photoresist material upon each of said top and bottom surfaces;
placing a mask, having a predetermined transparent and opaque pattern formed therein, adjacent each photoresist layer, the masks having identical transparent and opaque patterns;
positioning the masks with their patterns in alignment;
said plate having a first side edge comprising one of said four side edges and the masks each having a projecting portion which projects outwardly from said first side edge of the plate;
placing a spacer along said first side edge of the plate, the spacer having an upper face aligned with the photoresist layer placed on said top surface of said plate and a lower face aligned with the photoresist layer placed on said bottom surface of said plate;
placing said masks in alignment with said projecting portions of said masks projecting over the upper and lower face of said spacer, respectively, and bonding said projecting portions to the respective upper and lower faces of said spacer when said masks are in alignment;
providing ultraviolet light to said masks, said ultraviolet light passing through said mask transparent patterns into said photoresist layers;
removing said masks from each photoresist layer;
developing each photoresist layer so to remove ultraviolet light unexposed portions of each photoresist layer present from said top and bottom surfaces and expose portions of underlying corresponding surfaces; and
spray etching said metallic plate at said exposed portions of both of said underlying corresponding surfaces to form predetermined apertures through the plate.

5,688,619

CHLOROGALIUM PHTHALOCYANINE CRYSTAL AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING SAME

Kazuya Hongo, and Hitoshi Takimoto, both of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 521,042, Aug. 29, 1995, Pat. No. 5,588,991. This application Sep. 30, 1996, Ser. No. 723,250

Claims priority, application Japan, Aug. 31, 1994, 6-229063; Feb. 21, 1995, 7-055234

Int. Cl.^{6} G03G *5/06;* **C09B** *67/50*

U.S. Cl. 430—58 **6 Claims**

1. A electrophotographic photoreceptor comprising a electroconductive substrate having provided thereon a photosensitive layer containing a chlorogallium phthalocyanine crystal, wherein said chlorogallium phthalocyanine crystal has intense diffraction peaks at Bragg angles (2θ°±0.2°) of 7.5° C., 16.7° C., 25.6° C. and 28.4° C., a half width at the peak of the Bragg angle of 7.5° C. is not less than 0.35, and a peak intensity ratio of the peak of the Bragg angle of 28.4° C. to that of 7.5° C. is from 0.4 to 0.7.

3. The electrophotographic photoreceptor as claimed in claim 1, wherein said photosensitive layer comprises a charge generating

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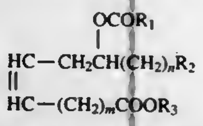
layer and a charge transporting layer, and said chlorogallium phthalocyanine crystal is contained in at least one of said charge generating and said charge transporting layer.

5,688,620
ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING A RESIDUAL CHARGE-SUPPRESSING FATTY ACID ESTER IN THE PHOTOCONDUCTIVE LAYER

Yoshimasa Fujita, Tenri, and Kazushige Morita, Kitakatsuragi-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed May 10, 1996, Ser. No. 644,821
Claims priority, application Japan, May 24, 1995, 7-125241
Int. Cl.^{6} G03G *5/04*
U.S. Cl. 430—59 **17 Claims**

1. An electrophotographic photoreceptor, comprising:
a conductive support; and
a photoconductive layer provided on said conductive support and containing a charge-generating material, a charge-transporting material, a binder resin and a fatty acid ester compound represented by the following Formula (1):



$$\begin{array}{l} \quad\quad\;\; \mathrm{OCOR_1} \\ \quad\quad\quad\; | \\ \mathrm{HC-CH_2CH(CH_2)_nR_2} \\ \| \\ \mathrm{HC-(CH_2)_mCOOR_3} \end{array} \qquad (1)$$

wherein R_1, R_2 and R_3 each independently represent hydrogen or or methyl, and n and m in each represent an integer of 1 to 10, wherein said fatty acid ester compound represented by Formula (1) is contained in said photoconductive layer in a range of 0.001 to 10 parts by weight based on 100 parts by weight of the binder resin contained in said photo conductive layer.

5,688,621
ELECTROPHOTOGRAPHIC PHOTORECEPTOR AND IMAGE FORMING METHOD

Ichiro Takegawa, and Takaaki Kimura, both of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1995, Ser. No. 571,556
Claims priority, application Japan, Dec. 14, 1994, HEI.6-332406
Int. Cl.^{6} G03G *5/10*
U.S. Cl. 430—64 **16 Claims**

1. An electrophotographic photoreceptor comprising a conductive substrate having thereon an undercoat layer and a photosensitive layer, wherein said undercoat layer comprises a copolymer resin containing a monomer having a hydrolytic silyl group co-polymerized to a different monomer.

5,688,622
DEVELOPING METHOD

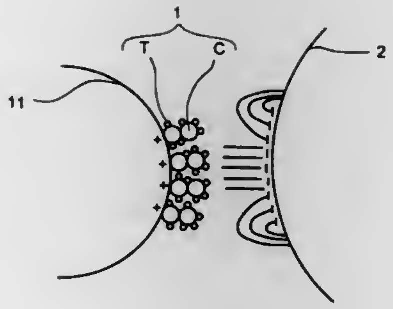
Noboru Ito, Kawanishi; Tamotsu Shimizu, Settsu, and Eiji Gyoutoku, Amagasaki, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Continuation of Ser. No. 518,276, Aug. 23, 1995, abandoned. This application Sep. 23, 1996, Ser. No. 717,750
Claims priority, application Japan, Sep. 9, 1994, 6-242009; Sep. 9, 1994, 6-242010; Sep. 9, 1994, 6-242011
Int. Cl.^{6} G03G *13/09;13/08*
U.S. Cl. 430—102 **20 Claims**

4. A developing method for developing an electrostatic latent image at a developing region, said method comprising steps of:
preparing a developer containing toner particles and carrier particles;
regulating a quantity of the prepared developer on a developer transporter within a range of 0.7~5.0 mg/cm^2;
transporting the regulated developer to the developing region; and
applying an alternating current voltage between the developing region and the electrostatic latent image to generate an oscillating electric field to supply the transported developer to the electrostatic latent image wherein the oscillating electric field is expressed by the following formula:

$$5kV/mm \geqq (Vp\text{-}p/Ds) \geqq 3.5kV/mm$$

wherein the Vp-p is peak-to-peak value of the applied alternating current voltage, and Ds is a distance between the developing region and the electrostatic latent image.



5,688,623
CARRIER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Minoru Nakamura, Itami; Masahiro Anno, Sakai, and Makoto Kobayashi, Settsu, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 10, 1996, Ser. No. 729,068
Claims priority, application Japan, Oct. 12, 1995, 7-263901
Int. Cl.^{6} G03G *9/107;9/113*
U.S. Cl. 430—106.6 **18 Claims**

1. A carrier for developing electrostatic latent image comprising:
(a) a ferrite core particle which contains CaO, MnO and at least one component selected from the group consisting of CuO and ZnO, said CaO being contained in an amount of 0.5 to 4 molar percent on the basis of the core particle, said MnO being contained in an amount of 2 to 20 molar percent on the basis of the core particle; and
(b) a resin overcoating layer formed on a surface of the core particle.

11. A carrier for developing electrostatic latent image comprising a core particle coated with a resin and having a static electric resistance of 1×10^8 to $5\times10^9\Omega\cdot$cm, a dynamic current of 0.2 to 1.0 μA and a saturated magnetization of 65 to 80 emu/g.

5,688,624
LIQUID DEVELOPER COMPOSITIONS WITH COPOLYMERS

Scott D. Chamberlain, Macedon; David H. Pan, Rochester; Christopher M. Knapp, Fairport; John W. Spiewak, Webster; George A. Gibson, Fairport, and Frank J. Bonsignore, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1997, Ser. No. 778,990
Int. Cl.^{6} G03G *9/13*
U.S. Cl. 430—115 **24 Claims**

1. A positively charged liquid developer comprised of a nonpolar liquid, resin, pigment, a charge director, and a charge control agent comprised of poly(ethylene oxide-b-propylene oxide-b-ethylene oxide) triblock copolymer.

5,688,625
TONER COMPOSITIONS WITH DISPERSED WAX

Jacques C. Bertrand, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1996, Ser. No. 606,927
Int. Cl.^{6} G03G *5/00*
U.S. Cl. 430—137 **21 Claims**

1. A process for minimizing the amount of wax that escapes from a toner which consists essentially of melt mixing toner resin and pigment, and injecting a water emulsified wax composition therein, and wherein the generated wax domain size range is from about 50 to about 1,500 nanometers, and wherein said water emulsified wax is directly injected into said toner resin and pigment mixture subsequent to the injection of said resin and said pigment.

5,688,626
GAMUT TONER AGGREGATION PROCESSES

Raj D. Patel, Oakville; Grazyna E. Kmiecik-Lawrynowicz, Burlington; Richard P. N. Veregin, Mississauga, and Maria N. V. McDougall, Burlington, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 8, 1996, Ser. No. 628,062
Int. Cl.^{6} G03G *9/09*
U.S. Cl. 430—137 **38 Claims**

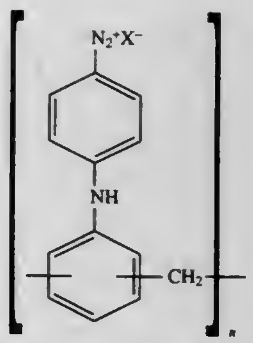
1. A process for the preparation of a combination of color toners comprised of a cyan toner, a magenta toner, a yellow toner, and a black toner, each of said toners being comprised of resin and pigment, and wherein the pigment is cyan, magenta, yellow and black, each of the said pigments are dispersed in a nonionic, or neutral charge surfactant, and wherein each toner in the combination is prepared by
(i) preparing a pigment dispersion, which dispersion is comprised of a pigment and a surfynol nonionic water soluble surfactant;
(ii) shearing said pigment dispersion with a latex or emulsion blend comprised of resin, a counterionic surfactant with a charge polarity of opposite sign to that of said ionic surfactant and a nonionic surfactant;
(iii) heating the above sheared blend below about the glass transition temperature (Tg) of the resin to form electrostatically bound toner size aggregates; and
(iv) heating said bound toner size aggregates above about the Tg of the resin.

5,688,627
LIGHT SENSITIVE DIAZONIUM COMPOUNDS HAVING BOTH BISULFATE AND ZINCATE PARTS, METHOD OF MAKING THE COMPOUNDS AND COMPOSITIONS UTILIZING THEM

Albert S. Deutsch, Hartsdale, N.Y., assignor to Precision Lithograining Corp., South Hadley, Mass.

Filed Jul. 2, 1996, Ser. No. 677,438
Int. Cl.^{6} G03F *7/021*
U.S. Cl. 430—157 **20 Claims**

8. A light sensitive composition which comprises a water dispersible polymeric binder in an amount sufficient to bind the composition components, and a compound having the formula:



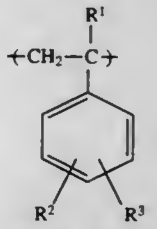
wherein the diphenylamine groups are solely connected by —CH_2— groups; and
having a mixture of salons X^- comprising from about 45 to about 94 mol percent $ZnCl_4^-$ and from about 6 to about 55 mol percent HSO_4^-; and n ranges from about 2 to about 50, in an amount sufficient to render the light sensitive composition sensitive to actinic radiation.

5,688,628
RESIST COMPOSITION

Masayuki Oie, Toyama; Nobunori Abe, Kanagawa; Hideyuki Tanaka, Kanagawa; Akira Oikawa, Kanagawa, and Shuichi Miyata, Kanagawa, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

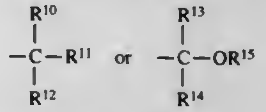
Filed Nov. 10, 1994, Ser. No. 339,203
Claims priority, application Japan, Nov. 11, 1993, 5-305935
Int. Cl.^{6} G03F *7/021;7/023*
U.S. Cl. 430—176 **13 Claims**

1. A resist composition comprising in admixture:
(A) a compound which forms an acid upon exposure to active rays, in an amount of 0.01–50 parts by weight per 100 parts by weight of a component (B);
(B) 100 parts by weight of a polymer which has at least one structural unit with a group unstable to an acid and cleaves at this group in the presence of the acid derived from the compound (A) to turn alkali-soluble and contains, as the structural unit with a group unstable to an acid, at least one structural unit selected from the group consisting of structural units represented by the following formulae (I), (II) and (III):



(I)

wherein R^1 and R^2 are identical with or different from each other, and mean individually a hydrogen atom, a halogen atom, a cyano group, an alkyl group having 1–5 carbon atoms or a substituted alkyl group having 1–5 carbon atoms and a halogen atom as a substituent, and R^3 denotes a linear acetal group, a cyclic acetal group, a carbonate group or —OR^9, in which R^9 is



$$\begin{array}{c} R^{10} \\ | \\ -C-R^{11} \\ | \\ R^{12} \end{array} \quad \text{or} \quad \begin{array}{c} R^{13} \\ | \\ -C-OR^{15} \\ | \\ R^{14} \end{array}$$

in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are independently selected from linear alkyl groups, substituted linear alkyl groups having a halogen atom as a substituent, branched alkyl groups, substituted branched alkyl groups having a halogen atom as a substituent, cycloalkyl groups, substituted cycloalkyl groups having a halogen atom as a substituent, alkenyl groups, substituted alkenyl groups

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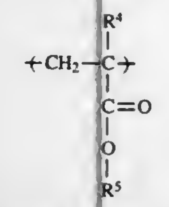
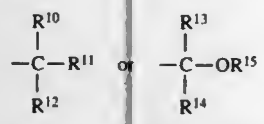
having a halogen atom as a substituent, aryl groups, substituted aryl groups having a halogen atom or a nitro group as a substituent, aralkyl groups and substituted aralkyl groups having a halogen atom or a nitro group as a substituent, or R^{13} and R^{14} may each be a hydrogen atom;



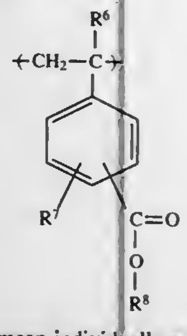
$$\left(CH_2 - \underset{\substack{| \\ C=O \\ | \\ O \\ | \\ R^5}}{\overset{\substack{R^4 \\ |}}{C}} \right) \qquad (II)$$

wherein R^4 means a hydrogen atom, a halogen atom, a cyano group, an alkyl group having 1–5 carbon atoms or a substituted alkyl group having 1–5 carbon atoms and a halogen atom as a substituent, and R^5 is



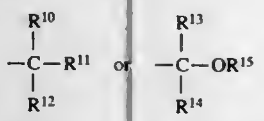
$$-\underset{\substack{| \\ R^{12}}}{\overset{\substack{R^{10} \\ |}}{C}}-R^{11} \quad \text{or} \quad -\underset{\substack{| \\ R^{14}}}{\overset{\substack{R^{13} \\ |}}{C}}-OR^{15}$$

in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are independently selected from linear alkyl groups, substituted linear alkyl groups having a halogen atom as a substituent, branched alkyl groups, substituted branched alkyl groups having a halogen atom as a substituent, cycloalkyl groups, substituted cycloalkyl groups having a halogen atom as a substituent, alkenyl groups, substituted alkenyl groups having a halogen atom as a substituent, aryl groups, substituted aryl groups having a halogen atom or a nitro group as a substituent, aralkyl groups and substituted aralkyl groups having a halogen atom or a nitro group as a substituent, or R^{13} and R^{14} may each be a hydrogen atom; and



(III)

wherein R^6 and R^7 mean individually a hydrogen atom, a halogen atom, a cyano group, an alkyl group having 1–5 carbon atoms or a substituted alkyl group having 1–5 carbon atoms and a halogen atom as a substituent, and R^8 is



$$-\underset{\substack{| \\ R^{12}}}{\overset{\substack{R^{10} \\ |}}{C}}-R^{11} \quad \text{or} \quad -\underset{\substack{| \\ R^{14}}}{\overset{\substack{R^{13} \\ |}}{C}}-OR^{15}$$

in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are independently selected from linear alkyl groups, substituted linear alkyl groups having a halogen atom as a substituent, branched alkyl groups, substituted branched alkyl groups having a halogen atom as a substituent, cycloalkyl groups, substituted cycloalkyl groups having a halogen atom as a substituent, alkenyl groups, substituted alkenyl groups having a halogen atom as a substituent, aryl groups, substituted aryl groups having a halogen atom or a nitro group as a substituent, or R^{13} and R^{14} may each be a hydrogen atom; and

(C) at least one phenolic compound selected from the group consisting of phenols, bisphenols, trisphenols, tetrakisphenols, hydroxybenzophenones, hydroxybiphenyls, hydroxybenzophenone oximes, hydroxybenzotriazoles, hydroxyacetophenones, gallic acid, hydroxystyrenes, hydroxystyrene oligomers, hydroxy-α-methylstyrenes, hydroxy-α-methylstyrene oligomers, novolak oligomers, chromones, flavones, flavonols, flavanones, oxyflavanones, isoflavans, chromans, catechins, spirobichromans, nitrophenols, cyanophenols, alkoxyphenols, halogenated phenols, and derivatives thereof, in an amount of 0.01–100 parts by weight per 100 parts by weight of the component (B); and

(D) a solvent in an amount sufficient to uniformly dissolve the components (A), (B) and (C), said resist composition being positive working when developed with alkaline developer.

5,688,629

PROCESS FOR THE PRODUCTION OF LITHOGRAPHIC PRINTING PLATES UTILIZING PEEL DEVELOPMENT

Willi-Kurt Gries, Wiesbaden, Germany, assignor to Agfa-Gevaert AG, Leverkusen, Germany

Division of Ser. No. 318,542, Oct. 5, 1994. This application May 11, 1995, Ser. No. 439,125

Claims priority, application Germany, Oct. 22, 1993, 43 36 115.3

Int. Cl.⁶ G03F *7/34*

U.S. Cl. 430—254 **20 Claims**

1. A process for the production of a lithographic printing plate, comprising

exposing a material which comprises in the following order:

(a) a support suitable for lithographic printing plates,

(b) a hydrophilic layer which comprises a crosslinkable organic polymer or is a layer formed by crosslinking an organic polymer, and which has a layer weight in the range from 0.001 to 1 g/m^2

(c) a photopolymerizable layer, and

(d) a transparent cover film,

wherein the adhesion of the photopolymerizable layer (c) to the hydrophilic layer (b) and/or to the cover film (d) is changed by exposure, imagewise, through the cover film (d), and

developing the exposed material by peeling off the cover film (d) from the support (a),

wherein the polymer of the hydrophilic layer (b) is crosslinked before or after exposure.

5,688,630

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kohzaburoh Yamada; Hiroshi Takeuchi; Takashi Hoshimiya; Toshihide Ezoe; Shigeo Hirano, and Minoru Sakai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1995, Ser. No. 558,856

Claims priority, application Japan, Nov. 16, 1994, 6-305702; Feb. 2, 1995, 7-035861; Feb. 16, 1995, 7-050372

Int. Cl.⁶ G03C *1/06*

U.S. Cl. 430—264 **7 Claims**

1. A silver halide photographic material comprising a hydrazine compound, wherein the hydrazine compound is selected from (a) a hydrazide compound having an acyl group which is separately substituted (a1) with an anionic group and (a2) with an electron-attracting group having a Hammett's σ_m value of 0.2 or higher, and (b) a hydrazide compound having an acyl group which is separately substituted (b1) with an electron-attracting group having a Hammett's σ_m value of 0.2 or higher and (b2) with a nonionic group which forms an intramolecular hydrogen bond with a hydrogen atom in the hydrazide compound.

5,688,631

METHODS FOR PRODUCING POLYBENZOXAZOL PRECURSORS AND CORRESPONDING RESIST SOLUTIONS

Recai Sezi; Hellmut Ahne, both of Roettenbach, and Eva Rissel, Forchheim, all of Germany, assignors to Siemens Aktiengesellschaft, München, Germany

Filed Mar. 19, 1996, Ser. No. 618,488

Claims priority, application Germany, Mar. 23, 1995, 19510538.9; Mar. 23, 1995, 195105636.2

Int. Cl.⁶ G03C *1/492*

U.S. Cl. 430—270.1 **9 Claims**

1. A method for producing a solution of polybenzoxazol precursors soluble in alkali, comprising:

reacting a dicarboxylic acid halogenide with a bis-(o-aminophenol) in an organic solvent, in the presence of a polymer with a tertiary N atom which is insoluble in the solvent, the polymer being a vinyl pyridine, acryl, methacryl, allyl or vinyl homopolymer, copolymer or terpolymer; and

separating excess polymer and hydrohalogenide from the reaction solution.

5,688,632

PHOTOSENSITIVE POLYMER COMPOSITION CONTAINING A SOLUBLE POLYMER OF ISLANDS-IN-A-SEA STRUCTURE, A PHOTOPOLYMERIZABLE POLYMER, AND A PHOTOPOLYMERIZATION INITIATOR

Shigetora Kashio; Katsutoshi Sasashita, and Tomio Adachi, all of Aichi, Japan, assignors to Toray Industries, Inc., Japan

Filed Jul. 20, 1994, Ser. No. 277,922

Claims priority, application Japan, Jul. 20, 1993, 5-178849

Int. Cl.⁶ G03C *1/73*

U.S. Cl. 430—281.1 **14 Claims**

1. A photosensitive polymer composition containing as essential components (A) a soluble polymer, (B) a photopolymerizable compound having an ethylenic double bond in the molecule thereof and (C) a photopolymerization initiator, said soluble polymer comprising a sea-island structure containing a water-soluble polymer forming a sea and an alcohol-soluble polymer forming a plurality of islands having a diameter of 0.1 –20 microns which is insoluble in water, said soluble polymer being dissolved in a water/alcohol solvent, and at least a portion of said water-soluble polymer or said alcohol-soluble polymer being constituted by a modified nylon obtained by chemically grafting a hydrophilic group onto an N-alkoxymethylated nylon.

5,688,633

SOFT RELIEF PHOTOPOLYMER PRINTING PLATES FOR FLEXOGRAPHIC PRINTING

Douglas R. Leach, Wilmington, Del., assignor to MacDermid Imaging Technology, Inc., Waterbury, Conn.

Continuation of Ser. No. 355,121, Dec. 13, 1994, abandoned. This application Sep. 6, 1996, Ser. No. 711,476

Int. Cl.⁶ G03F *7/027*

U.S. Cl. 430—284.1 **4 Claims**

1. A photosensitive resin composition comprising

(i) an urethane oligomer;

(ii) a monomer having at least one ethylenically unsaturated group; and

(iii) a photopolymerization initiator;

wherein said urethane oligomer is the reaction product of a polyol, a hydroxy-functionalized acrylate or methacrylate, and a mixture of 2,4-toluene diisocyanate and 2,6-toluene diisocyanate in a weight ratio of, 65 to 35 respectively, and wherein said polyol is a mixture of a poly (alkylene oxide) diol and a polyester diol.

5,688,634

ENERGY SENSITIVE RESIST MATERIAL AND PROCESS FOR DEVICE FABRICATION USING THE RESIST MATERIAL

David Anton Mixon, Basking Ridge, and Anthony Edward Novembre, Union, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 282,870, Jul. 29, 1994, abandoned. This application Dec. 1, 1995, Ser. No. 566,445

Int. Cl.⁶ G03F *7/30*

U.S. Cl. 430—296 **10 Claims**

1. A process for device fabrication comprising:

(1) selectively exposing portions of an energy-sensitive resist material overlying a substrate to patterning radiation whereby a difference in ease of removal of exposed portions of the resist material relative to unexposed portions of the resist material by an aqueous base developing agent is effected, wherein the resist material is a phase compatible blend of a matrix polymer and a modifier polymer, wherein the matrix polymer is substantially more soluble in the aqueous base developing agent than the modifier polymer, and the modifier is a vapor-developable copolymer of an alkene and sulfur dioxide that is energy sensitive, wherein the average molecular weight of the modifier polymer is about 5,000 g/mol to about 500,000 g/mol, and wherein the modifier polymer responds to radiation primarily via a self-propagating reaction initiated by radiation to effect ease of removal by removing modifier in the irradiated portions of the resist material;

(2) developing the pattern in an interruptive manner wherein the resist material is treated with an aqueous base developing agent and the development is stopped in a plurality of cycles, the time for the first cycle being insufficient to clear the resist material that is removed by the aqueous base developing agent; and

(3) treating the article undergoing fabrication with an altering agent which preferentially alters regions of the article corresponding with the removed portion of the resist material, relative to the regions of the article surface underlying the remaining portions of the resist material.

5,688,635

TONING OF PHOTOGRAPHIC PRINT MATERIAL

Michael John Parker, Holmes Chapel, Great Britain, and Anthony Martin Lannon, Stockport, England, assignors to Ilford Limited, England

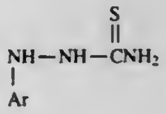
Filed May 6, 1996, Ser. No. 643,683

Claims priority, application United Kingdom, May 13, 1995, 9509757

Int. Cl.⁶ G03C *5/305*

U.S. Cl. 430—464 **11 Claims**

1. A photographic developing solution which is characterised in that it comprises as an image toning agent a compound of formula I:



$$\underset{\substack{| \\ Ar}}{NH}-NH-\overset{\substack{S \\ \|}}{C}NH_2 \qquad I$$

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where Ar is a phenyl ring which is substituted with a water solubilizing group selected from the group consisting essentially of a carboxylic acid group, a sulphonic acid group or a salt thereof, in a concentration of at least 0.00035 moles/liter.

5,688,636
TYPE OF DYE IN PHOTOGRAPHIC MATERIALS

Eric Kiekens, Zele, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed May 29, 1996, Ser. No. 654,715

Claims priority, application European Pat. Off., Jun. 6, 1995, 95201479

Int. Cl.^{6} G03C *1/815*

U.S. Cl. 430—517 **7 Claims**

1. Photographic material comprising a support, at least one silver halide emulsion layer and optionally one or more other hydrophylic layer(s) wherein at least one of said emulsion layer(s) or other hydrophylic layer(s) contains a dye represented by following general formula (I):

$$Q—CO—CO—X \qquad (I)$$

wherein Q represents a substituted or unsubstituted carbocyclic aromatic or hetero-aromatic ring, and —X represents —N(R^1)(R^2) or —OR^3, wherein each of R^1, R^2 and R^3 independently represents H, substituted or unsubstituted alkyl or substituted or unsubstituted aryl, with the proviso that at least one of the R groups or a substituent of Q contains a water- or alkali-solubilising group.

5,688,637
NUCLEOTIDE SEQUENCES DERIVED FROM THE GENOME OF RETROVIRUSES OF THE HIV-1, HIV-2 AND SIV TYPE, AND THEIR USES IN PARTICULAR FOR THE AMPLIFICATION OF THE GENOMES OF THESE RETROVIRUSES AND FOR THE IN VITRO DIAGNOSIS OF THE DISEASE DUE TO THESE VIRUSES

Maurice Moncany, Paris, and Luc Montagnier, Le Plessis-Robinson, both of France, assignors to Institut Pasteur, and Institut National de la Sante et de la Recherche Medicale, both of France

Continuation of Ser. No. 820,599, Jan. 21, 1992, abandoned. This application Dec. 2, 1993, Ser. No. 160,465

Claims priority, application France, Jun. 2, 1989, 89 07354; Sep. 20, 1989, 89 12371

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **14 Claims**

I. An oligonucleotide primer, said primer having a nucleotide sequence selected from the following group of nucleotides oriented in the 5'-3' direction:

nucleotides 636–653, 854–872, 1369–1388, and 2021–2039 of the gag gene of HIV-1 Bru;

nucleotides 900–881, 1385–1369, 1388–1369, and 2039–2021 of a nucleic acid sequence complementary to the gag gene of HIV-1 Bru;

nucleotides 635–652, 864–888, 1403–1421, and 2055–2073 of the gag gene of HIV-1 Mal;

nucleotides 916–897, 1419–1403, 1421–1403, and 2073–2055 of a nucleic acid sequence complementary to the gag gene of HIV-1 Mal;

nucleotides 636–653, 848–872, 1369–1388, and 2024–2042 of the gag gene of HIV-1 Eli;

nucleotides 900–881, 1385–1369, 1388–1369, and 2042–2024 of a nucleic acid sequence complementary to the gag gene of HIV-1 Eli;

nucleotides 859–876, 1160–1184, 1687–1706, and 2329–2349 of the gag gene of HIV-2 ROD;

nucleotides 1212–1193, 1703–1687, 1706–1687, and 2349–2329 of a nucleic acid sequence complementary to the gag gene of HIV-2 ROD;

nucleotides 834–851, 1124–1148, 1651–1670, and 2299–2318 of the gag gene of SIV-MAC; and

nucleotides 1176–1157, 1667–1651, 1670–1651, and 2318–2299 of a nucleic acid sequence complementary to the gag gene of SIV-MAC;

nucleotides 5590–5610 of the vpr gene of HIV-1 Bru;

nucleotides 5870–5849 of a nucleic acid sequence complementary to the vpr gene of HIV-1 Bru;

nucleotides 5585–5605 of the vpr gene of HIV-1 Mal;

nucleotides 5865– 5844 of a nucleic acid sequence complementary to the vpr gene of HIV-1 Mal,

nucleotides 5554–5574 of the vpr gene of HIV-1 Eli;

nucleotides 5834–5813 of a nucleic acid sequence complementary to the vpr gene of HIV-1 Eli;

nucleotides 6233–6296 of the vpr gene of HIV-2 ROD;

nucleotides 6551–6531 of a nucleic acid sequence complementary to the vpr gene of HIV-2 ROD;

nucleotides 6147–6170 of the vpr gene of SIV-MAC; and

nucleotides 6454–6431 of a nucleic acid sequence complementary to the vpr gene of SIV-MAC;

nucleotides 2620–2643, 3339–3361, 4186–4207, and 4992-5011 of the pol gene of HIV-1 Bru;

nucleotides 2643–2620, 3361–3339, 4207–4186, and 5011–4992 of a nucleic acid sequence complementary to the pol gene of HIV-1 Bru;

nucleotides 2615–2638, 3333–3356, 4181–4202, and 4987–5006 of the pol gene of HIV-1 Mal;

nucleotides 2638–2615, 3356–3334, 4202–4181, and 5006–4987 of a nucleic acid sequence complementary to the pol gene of HIV-1 Mal;

nucleotides 2584–2607, 3303–3325, 4150–4171, and 4956–4975 of the pol gene of HIV-1 Eli;

nucleotides 2607–2584, 3325–3303, 4171–4150, and 4975–4956 of a nucleic acid sequence complementary to the pol gene of HIV-1 Eli;

nucleotides 2971–2994, 3690–3712, 4534–4555, and 5340–5359 of the pol gene of HIV-2 ROD;

nucleotides 2994–2971, 3712–3690, 4555–4534, and 5359–5340 of a nucleic acid sequence complementary to the pol gene of HIV-2 ROD;

nucleotides 2887–3010, 3606–3628, 4450–4471, and 5275–5256 of a nucleic acid sequence complementory to the pol gene of SIV-MAC; 5256–5275 of the pol gene of SIV-MAC; and

nucleotides 3010–2887, 3628–3606, 4471–4450, and

nucleotides 9165–9185 and 9542–9564 of the nef2 gene of HIV-2 ROD; 9564–9542 and 9956–9933 of a nucleic acid sequence complementary to the nef2 gene of HIV-2 ROD;

nucleotides 9139–9159 and 9516–9538 of the nef2 gene of SIV-MAC; 9538–9516 and 9839–9870 of a nucleic acid sequence complementary to the nef2 gene of SIV-MAC;

nucleotides 5424–5450 and 5754–5775 of the vif2 gene of HIV-2 ROD;

nucleotides 5775–5754 and 6082–6061 of a nucleic acid sequence complementary to the vif2 gene of HIV-2 ROD; nucleotides 5340–5366 and 5670–5691 of the vif2 gene of HIV-2 ROD;

nucleotides 5691–5670 and 5995–5974 of a nucleic acid sequence complementary to the vif2 gene of SIV-MAC;

nucleotides 5900–5918 of the vpx gene of HIV-2 ROD;

nucleotides 6228–6208 of a nucleic acid sequence complementary to the vpx gene of HIV-2 ROD;

nucleotides 5813–5831 of the vpx gene of HIV-2 ROD;

nucleotides 6141–6121 of a nucleic acid sequence complementary to the vpx gene of SIV-MAC;

nucleotides 6905–6930, 7055–7077, 7360–7384, 7832–7857, 8844–8869, 7629–7647, and 8224–8242 of the env gene of HIV-1 Bru;

nucleotides 6930–6905, 7384–7360, 7857–7832, 8869–8844, and 8242–8224 of a nucleic acid sequence complementary to the env gene of HIV-1 Bru;

nucleotides 6903-6928, 7053-7075, 7821-7846, 7821-7846, 7612-7630, 8213–8231, and 8836–8861 of the env gene of HIV-1 Mal;

nucleotides 6928–6903, 7373–7349, 7846–7821, 8861–8836, and 8231–8213 of a nucleic acid sequence complementary to the env gene of HIV-1 Mal;

nucleotides 6860–6885, 7010–7032, 7306–7330, 7775–7800, 8787–8812, 7572–7590, and 8167–8185 of the env gene of HIV-1 Eli; and

nucleotides 6885–6860, 7330–7306, 7800–7775, 8812–8787, and 8185–8167 of a nucleic acid sequence complementary to the env gene of HIV-1 Eli;

nucleotides 9116–9136 of the nef1 gene of HIV-1 Bru;

nucleotides 9136–9116 and 9503–9483 of a nucleic acid sequence complementary to the nef1 gene of HIV-1 Bru;

nucleotides 9117–9137 of the nef1 gene of HIV-1 Mal; and

nucleotides 9137–9117 and 9505–9484 of a nucleic acid sequence complementary to the nef1 gene of HIV-1 Mal;

nucleotides 9062–9082 of the nef1 gene of HIV-Eli;

nucleotides 9082–9062 and 9449–9428 of a nucleic acid sequence complementary to the nef1 gene of HIV-1 Eli;

nucleotides 5073–5099 and 5383–5405 of the vif1 gene of HIV-1 Bru; and

nucleotides 5405–5383 and 5675–5653 of a nucleic acid sequence complementary to the vif1 gene of HIV-1 Bru;

nucleotides 5068–5094 and 5378–5400 of the vif1 gene of HIV-1 Mal;

nucleotides 5400–5378 and 5670–5648 of a nucleic acid sequence complementary to the vif1 gene of HIV-1 Mal; and

nucleotides 5037–5063 and 5347–5369 of the vif1 gene of HIV-1 Eli;

nucleotides 5369–5347 and 5639–5617 of a nucleic acid sequence complementary to the vif1 gene of.HIV-1 Eli;

nucleotides 6081–6105 and 6240–6263 of the vpu gene of HIV-1 Bru;

nucleotides 6343–6321 of a nucleic acid sequence complementary to the vpu gene of HIV-1 Bru;

nucleotides 6076–6100 and 6238–6261 of the vpu gene of HIV-1 Mal;

nucleotides 6338–6316 of a nucleic acid sequence complementary to the vpu gene of HIV-1 Mal;

nucleotides 6045–6069 and 6207–6230 of the vpu gene of SIV-MAC; and

nucleotides 6307–6285 of a nucleic acid sequence complementary to the vpu gene of SIV-MAC.

5,688,638

Patent Not Issued For This Number

5,688,639
DETECTION OF ISONIAZID RESISTENT STRAINS OF *M. TUBERCULOSIS*

Franklin R. Cockerill; Bruce C. Kline, and James R. Uhl, all of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Filed Apr. 18, 1994, Ser. No. 228,662

Int. Cl.^{6} C12Q *1/68;* C12P *19/34;* C07H *21/04;21/02*

U.S. Cl. 435—6 **7 Claims**

1. A method for determining the susceptibility of a strain of *M. tuberculosis* to isoniazid comprising employing the technique of restriction length polymorphism analysis to determine whether a NciI-MspI restriction site is absent in the DNA of said strain at the codon corresponding to codon 463 of the *M. tuberculosis* katG gene consensus sequence depicted in FIG. 1 (SEQ ID NO:1), wherein said absence is indicative of an INH-resistant strain.

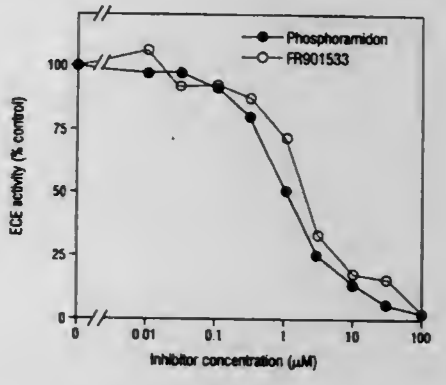
5,688,640
METHODS OF SCREENING OF EFFECTORS OF ENDOTHELIN CONVERTING ENZYME-1

Masashi Yanagisawa, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Aug. 10, 1994, Ser. No. 289,112

Int. Cl.^{6} C12N *15/63;* C12Q *1/68*

U.S. Cl. 435—6 **6 Claims**



1. A method of screening substances as effectors of endothelin converting enzyme comprising the following steps:

(a) obtaining a candidate substance;

(b) obtaining a recombinant endothelin converting enzyme, wherein the enzyme comprises an amino acid sequence in accordance with SEQ ID NO:2;

(c) contacting said endothelin converting enzyme with big endothelin under conditions effective to convert big endothelin to endothelin in the presence of said candidate substance;

(d) measuring the concentration of endothelin produced; and

(e) comparing the concentration of endothelin produced in the presence of said candidate substance to the concentration of endothelin produced under a control having identical conditions but in the absence of said candidate substance;

wherein a decrease or increase in the concentration of endothelin produced in the presence of said candidate substance compared to the control would indicate an effector of endothelin converting enzyme.

5,688,641
CANCER DIAGNOSIS USING NUCLEIC ACID HYBRIDIZATION

Ruth Sager, Brookline, Mass., assignor to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Continuation of Ser. No. 938,823, Sep. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 844,296, Feb. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 662,216, Feb. 28, 1991, abandoned. This application Oct. 13, 1994, Ser. No. 322,742

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **10 Claims**

1. A method of determining, by in situ hybridization, whether a sample containing a test cell from human breast tissue is (a) normal, or (b) cancerous, said method comprising the steps of:

contacting the mRNA of said test cell in situ with a nucleic acid probe comprising a nucleotide sequence at least 15 nucleotides in length which is complementary to a portion of the coding sequence or a candidate tumor suppressor gene, said gene being one which is normally expressed in normal cells of human breast tissue; and

determining whether said probe hybridizes to said mRNA under high stringency conditions selected to permit hybridization of said probe to normal cells of human breast tissue, wherein the failure to hybridize to said mRNA is an indication that said test cell is cancerous; provided that said gene encodes connexin 26, connexin 43, preproelafin, CaN19 is protein, or HBp17.

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5,688,642

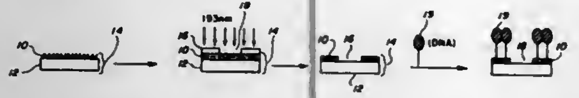
SELECTIVE ATTACHMENT OF NUCLEIC ACID MOLECULES TO PATTERNED SELF-ASSEMBLED SURFACES

Linda A. Chrisey, Bowie; Walter J. Dressick, Ft. Washington, both of Md., and Jeffrey M. Calvert, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 1, 1994, Ser. No. 352,126

Int. Cl.⁶ C12Q *1/68;1/70;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **18 Claims**



1. A method of attaching pre-formed hybridizable synthetic nucleic acid oligomers, modified to include a thiol group, to selected portions along a surface of a substrate to form a pattern of synthetic hybridizable nucleic acid oligomers thereon, comprising the steps of:

covalently binding an organosilane coating to said surface of said substrate, the organosilane molecules of said covalently-bound organosilane coating having, at a site distal from a site of attachment of said organosilane molecule to said surface, at least one active site incapable of binding to said surface and incapable of binding to the other organosilane molecules of said organosilane coating, but available as a covalent attachment site for binding to a heterobifunctional crosslinker, said heterobifunctional crosslinker including a first reactive site that covalently binds to said at least one active site of said organosilane molecule of said coating, a second reactive site available for directly covalently binding to said thiol group of said pre-formed synthetic hybridizable nucleic acid oligomers, thus forming an organosilane-coated assembly;

reacting said organosilane coating with said heterobifunctional crosslinker;

defining, after said reacting step, a pattern within said organosilane coating including a first region, said first region including said organosilane molecules, and said organosilane molecules in said first region retaining said at least one active site available for binding said heterobifunctional crosslinker, and a second region that lacks organosilane molecules having an available active site for binding said heterobifunctional crosslinker, by exposing said organosilane-coated assembly to a pattern of radiation thereby forming a patterned surface;

exposing said patterned surface to said modified pre-formed synthetic nucleic acid oligomers to selectively and covalently attach said thiol group of said modified pre-formed synthetic nucleic acid oligomers to said first region and to non-specifically adsorb said modified pre-formed synthetic nucleic acid oligomers to said patterned surface;

removing said non-specifically adsorbed pre-formed synthetic nucleic acid oligomers from said patterned surface, thereby forming a pattern of covalently attached hybridizable synthetic nucleic acid oligomers upon said substrate.

5,688,643

METHOD OF NUCLEIC ACID-DIFFERENTIATION AND ASSAY KIT FOR NUCLEIC ACID DIFFERENTIATION

Takanori Oka; Hironari Matsunaga, and Akio Yamane, all of Hiroshima, Japan, assignors to Wakunaga Seiyaku Kabushiki Kaisha, Osaka, Japan

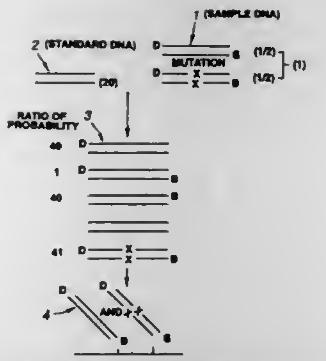
PCT No. PCT/JP94/01106, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO95/02068, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 7, 1994, Ser. No. 392,818

Claims priority, application Japan, Jul. 9, 1993, 5-194196

Int. Cl.⁶ C12Q *1/68;* **C12N** *15/00*

U.S. Cl. 435—6 **9 Claims**



1. A nucleic acid differentiating method for determining the presence, absence or quantity of a mutation or different allele in a particular nucleic acid sequence in a particular region of a target nucleic acid in a specimen, comprising the steps of:

preparing a labeled sample DNA by effecting gene amplification of the particular region of the target nucleic acid in the specimen by using target nucleic acid-amplifying primers comprising a primer having a detectable label introduced therein and a primer having a solid matrix-binding site introduced therein;

adding an excess molar amount of an unlabeled standard DNA to be evaluated for its matching with said labeled sample DNA to said labeled sample DNA;

effecting competitive hybridization between said labeled sample DNA and said unlabeled standard DNA; and

binding said solid matrix-binding site to a solid matrix and measuring the amount of detectable label bound to said solid matrix to determine the amount of binding between said labeled sample DNA and DNA having a solid matrix binding site, thereby determining the presence, absence or quantity of said mutation or different allele.

5,688,644

NUCLEIC ACID PROBES FOR *CANDIDA PARAPSILOSIS* AND METHODS FOR DETECTING CANDIDIASIS IN BLOOD

Timothy J. Lott; Christine J. Morrison, both of Atlanta; Errol Reiss, Chamblee; Brent Lasker, Atlanta, and Sandra Zakroff, Clarkston, all of Ga., assignors to United States of America, Washington, D.C.

Division of Ser. No. 65,845, May 20, 1993, Pat. No. 5,426,027. This application Apr. 26, 1995, Ser. No. 429,520

Int. Cl.⁶ C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **16 Claims**

1. An isolated double stranded nucleic acid consisting of the nucleotide sequence of SEQ ID NO:6.

5,688,645

METHOD FOR DETECTING, IDENTIFYING, AND QUANTITATING NON-VIRAL ORGANISMS

David E. Kohne, La Jolla, Calif., assignor to Gen-Probe Incorporated, San Diego, Calif.

Division of Ser. No. 199,486, Feb. 22, 1994, which is a continuation of Ser. No. 179,922, Jan. 11, 1994, abandoned, which is a continuation of Ser. No. 857,081, Mar. 19, 1992, Pat. No. 5,288,611, which is a continuation of Ser. No. 584,432, Sep. 12, 1990, Pat. No. 4,851,330, which is a continuation of Ser. No. 464,717, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 353,208, May 17, 1989, abandoned, which is a continuation of Ser. No. 655,365, Sep. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 456,729, Jan. 10, 1983, abandoned. This application Jun. 2, 1995, Ser. No. 460,107

Int. Cl.⁶ C12Q *1/68;* **C07H** *21/04*

U.S. Cl. 435—6 **7 Claims**

1. A method of specifically detecting the presence or amount of rRNA in a sample suspected of containing said rRNA, wherein said rRNA is characteristic of a group of non-viral organisms consisting of less than all non-viral organisms, comprising the steps of:

(a) contacting said sample with a nucleic acid probe able to hybridize with only a subunit subsequence of said rRNA;

(b) incubating said probe and said sample under hybridization conditions such that said probe hybridizes with said subsequence of said rRNA, wherein said probe does not contain a sequence sufficiently complementary to an rRNA sequence of an organism not belonging to said group of non-viral organisms such that detecting the presence or amount of said rRNA characteristic of said group of non-viral organisms is prevented; and

(c) assaying for said probe hybridized with said subsequence of said rRNA characteristic of said group of non-viral organisms as an indication of the presence or amount of said rRNA in said sample.

5,688,646

MYCOPLASMAS-AGENTS FOR DETECTING AND CHARACTERIZING MYCOPLASMAS IN VITRO

Luc Montagnier, Le Plessis-Robinson; Alain Blanchard, Montrouge; Anne Marie Di Rienzo, Paris; Denise Guetard, Paris, and Véronique Rame, Paris, all of France, assignors to Institut Pasteur, France

Division of Ser. No. 949,502, Jan. 15, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,055

Claims priority, application France, May 18, 1990, 90 06285

Int. Cl.⁶ C12Q *1/68;1/70*

U.S. Cl. 435—6 **3 Claims**

1. A purified nucleic acid of at least one mycoplasma selected from the group of *M. fermentans* No. 8 CNCM No. I-949 and *M. pirum* strain ber CNCM No. I-950.

5,688,647

DETECTION OF DINUCLEOTIDE REPEAT POLYMORPHISM IN EXON 18 OF LDL RECEPTOR GENE FOR DETERMINING PREDISPOSITION TO OBESITY

Lynette Robyn Griffiths, Burleigh Heads, Australia, assignor to Griffith University, Queensland, Australia

Filed Dec. 8, 1995, Ser. No. 569,872

Int. Cl.⁶ C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **5 Claims**

1. A method for detecting whether an individual is predisposed to obesity, comprising the steps of:

i) obtaining a sample containing human genomic DNA from said individual,

ii) detecting whether genomic DNA in said sample has a 7 AT tandem repeat in exon 18 of the low density lipoprotein receptor gene on one or both chromosomes containing said gene, and

iii) correlating the absence of the 7 AT tandem repeat on said chromosome or chromosomes with a predisposition to obesity in said individual.

5,688,648

PROBES LABELLED WITH ENERGY TRANSFER COUPLED DYES

Richard A. Mathies, El Cerrito; Alexander Glazer, Orinda, and Jingyue Ju, Berkeley, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 189,924, Feb. 1, 1994. This application Dec. 19, 1995, Ser. No. 574,890

Int. Cl.⁶ C12Q *1/68*

U.S. Cl. 435—6 **3 Claims**

1. A method of identification and detection of nucleic acids in a multi-nucleic acid mixture employing detectably different fluorescent labels to detect at least two nucleic acids of interest, wherein said labels are characterized by: (1) having a donor-acceptor fluorescent pair where said donor and said acceptor are each covalently bonded to a backbone chain at specific locations thereon with energy transfer from said donor to said acceptor; and (2) each of the labels absorbs at substantially the same wavelength and emits at a different wavelength;

said method comprising:

covalently bonding different labels to different nucleic acids of said multi-nucleic acid mixture of form labeled nucleic acids;

detecting each of said labeled nucleic acids by irradiating at the absorption wavelength of said donor and detecting the fluorescence of each of said labels.

5,688,649

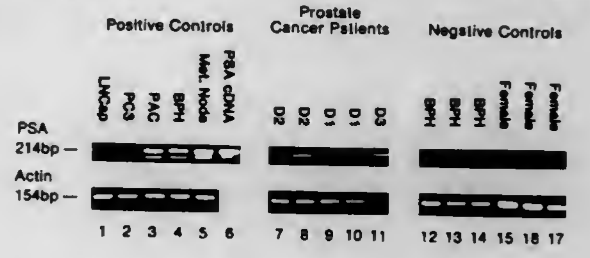
METHODS OF DETECTING MICROMETASTASIS OF PROSTATE CANCER

Carlo Croce, Philadelphia, Pa.; Leonard Gomella, Sewell, N.J.; S. Grant Mulholland, Birchrunville; Jose G. Moreno, Wayne, both of Pa., and Rainer Fischer, Aachen-Leniers, Germany, assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 294,611, Aug. 23, 1994, Pat. No. 5,506,106, which is a continuation of Ser. No. 973,322, Oct. 29, 1992, abandoned. This application Feb. 5, 1996, Ser. No. 596,993

Int. Cl.⁶ C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **9 Claims**



1. A method of detecting prostate cancer micrometastasis in a patient comprising the steps of:

obtaining a sample of blood of the patient;

obtaining a sample of RNA from the blood sample wherein said RNA is obtained from cells from the buffy coat of the Ficoll gradient of a prepared blood sample;

detecting the presence of RNA that encodes prostate specific antigen in said sample of RNA; wherein said presence of RNA that encodes prostate specific antigen indicates circulating hematogenous micrometastasis of prostate cancer.

5,688,650

Patent Not Issued For This Number

5,688,651

PREVENTION OF PROTEIN AGGREGATION

Beka Solomon, Herzlya, Israel, assignor to RAMOT University Authority For Applied Research and Development Ltd., Tel Aviv, Israel

Filed Dec. 16, 1994, Ser. No. 358,786

Int. Cl.⁶ G01N *33/53;33/48;* **A61K** *39/395;* **C07K** *16/00*

U.S. Cl. 435—7.1 **4 Claims**

1. A method of selecting an anti-aggregation molecule having the chaperone-like activity of anti-aggregation, wherein the anti-aggregation molecule is selected from the group consisting of a monoclonal antibody, a genetically engineered antibody antigen binding fragment, and a single chain monoclonal antibody, and

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wherein said anti-aggregation molecule binds to a bioactive native target polypeptide epitope with a high binding constant and is non-inhibitory to the biological activity of the target polypeptide comprising the steps of:
- denaturing a target polypeptide which aggregates,
- mixing the target polypeptide with said anti-aggregation molecule to form a mixture,
- incubating the mixture under conditions allowing for aggregation,
- selecting non-aggregated mixtures, and
- testing the nonaggregated target polypeptide coupled to the anti-aggregation molecule for bioactivity thereby selecting an anti-aggregation molecule with the chaperone-like activity of anti-aggregation which when coupled to the target polypeptide maintains bioactivity.

5,688,652
DETECTION OF COLLAGEN DEGRADATION IN VIVO

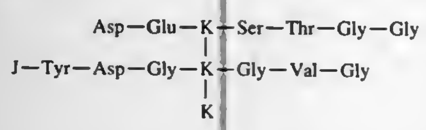
David R. Eyre, Mercer Island, Wash., assignor to Washington Research Foundation, Seattle, Wash.

Continuation of Ser. No. 229,569, Apr. 19, 1994, Pat. No. 5,472,884, which is a continuation of Ser. No. 708,529, May 31, 1991, Pat. No. 5,320,970, which is a continuation-in-part of Ser. No. 614,719, Nov. 21, 1990, Pat. No. 5,300,434, which is a continuation-in-part of Ser. No. 448,881, Dec. 1, 1989, Pat. No. 5,140,103, which is a continuation-in-part of Ser. No. 118,234, Nov. 6, 1987, Pat. No. 4,973,666. This application Nov. 22, 1995, Ser. No. 561,842

Int. Cl.^{6} G01N *33/53*

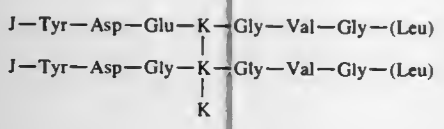
U.S. Cl. 435—7.1 **3 Claims**

1. In a method of analyzing a body fluid sample for the presence or concentration of an analyte indicative of a physiological condition, comprising the steps of contacting the body fluid sample with an immunological binding partner which binds to the analyte, detecting binding of the immunological binding partner in the body fluid sample, and correlating any detected binding to the physiological condition, the improvement comprising contacting the body fluid sample with an immunological binding partner which binds to both



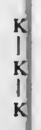
$$\begin{array}{r@{}c@{}l} \text{Asp—Glu—} & \text{K} & \text{—Ser—Thr—Gly—Gly} \\ & | & \\ \text{J—Tyr—Asp—Gly—} & \text{K} & \text{—Gly—Val—Gly} \\ & | & \\ & \text{K} & \end{array}$$

and



$$\begin{array}{r@{}c@{}l} \text{J—Tyr—Asp—Glu—} & \text{K} & \text{—Gly—Val—Gly—(Leu)} \\ & | & \\ \text{J—Tyr—Asp—Gly—} & \text{K} & \text{—Gly—Val—Gly—(Leu)} \\ & | & \\ & \text{K} & \end{array}$$

wherein



$$\begin{array}{c} \text{K} \\ | \\ \text{K} \\ | \\ \text{K} \end{array}$$

is hydroxylysyl pyridinoline or lysyl pyridinoline, J is pyroglutamic acid or glutamine, and (Leu) are optional leucine residues, and correlating any detected binding to degradation of type I collagen in vivo.

5,688,653
3-ALKYLAMINO-2-HYDROXY-4-HYDROXYMETHYL-2-CYCLOPENTEN-1-ONE ADVANCED GLYCOSYLATION ENDPRODUCTS AND METHODS OF USE THEREFOR

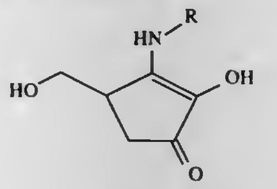
Peter C. Ulrich, Old Tappan, N.J., and Xini Zhang, Wilmington, Del., assignors to The Picower Institute for Medical Research, Manhasset, N.Y.

Filed Jun. 27, 1996, Ser. No. 673,217

Int. Cl.^{6} G01N *33/53;* **C07C** *205/00;* **C07K** *16/00*

U.S. Cl. 435—7.1 **3 Claims**

1. A compound of the formula



wherein R is a lower alkyl group containing from 1 to 6 carbon atoms.

2. An antibody to the compound of claim 1.

5,688,654
GAB$_A$ A RECEPTOR SUBTYPES AND METHODS FOR SCREENING DRUG COMPOUNDS USING IMIDAZOQUINOXALINES AND PYRROLOPYRIMIDINES TO BIND TO GABA$_A$ RECEPTOR SUBTYPES

Kenneth Shaw, Weston; Alan Hutchison, Madison; Andrew Thurkauf, Danbury, and John Tallman, Guilford, all of Conn., assignors to Neurogen Corporation, Braadford, Conn.

PCT No. PCT/US93/03920, § 371 Date Oct. 28, 1994, § 102(e) Date Oct. 28, 1994, PCT Pub. No. WO93/22681, PCT Pub. Date Nov. 11, 1993

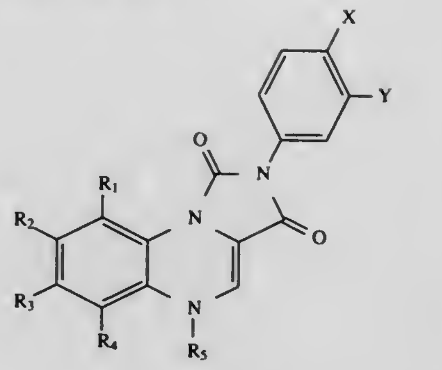
Continuation of Ser. No. 876,050, Apr. 30, 1992, Pat. No. 5,597,920. This PCT application Apr. 30, 1993, Ser. No. 331,501

Int. Cl.^{6} G01N *33/566;33/567*

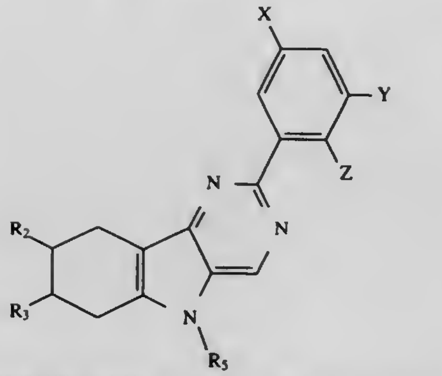
U.S. Cl. 435—7.21 **9 Claims**

1. A method of screening compounds for potential therapeutic activity comprising;
- (a) adding flumazenil to a preparation containing GABAa receptors to allow the flumazenil to bind to GABAa receptors;
- (b) utilizing the resulting treated preparation from (a) in a reaction mixture for conducting a competition reaction between a compound of Formula (I) or (II) radiolabeled with tritium or an iodine isotope and the compound to be screened for remaining GABAa receptors, to which flumazenil has not bound but which have a specific binding site for a compound of formula I or II;
- (c) separating the GABAa receptor bound radiolabeled compound of formula I or II from the reaction mixture of (b); and
- (d) measuring the radioactivity resulting from specific binding of the radiolabeled compound of formula I or II to the remaining GABAa receptors,

where formulae I and II are



I



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and the pharmaceutically acceptable salts thereof wherein:
- R_1, R_2, R_3, R_4 independently represent hydrogen, halogen, straight chain or branched lower alkyl having 1–6 carbon atoms, or straight chain or branched lower alkoxy having 1–6 carbon atoms;
- R_5 is hydrogen or straight chain or branched lower alkyl having 1–6 carbon atoms;
- X and Y are the same or different and represent hydrogen, halogen, straight chain or branched lower alkyl having 1–6 carbon atoms, or straight chain or branched lower alkoxy having 1–6 carbon atoms; and
- Z is hydrogen or fluorine.

5,688,655
METHOD OF SCREENING FOR PROTEIN INHIBITORS AND ACTIVATORS

Gerard Housey, New York, N.Y., assignor to ICT Pharmaceuticals, Inc., New York, N.Y.

Continuation of Ser. No. 977,986, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 392,073, Aug. 10, 1989, Pat. No. 5,266,464, which is a continuation-in-part of Ser. No. 154,206, Feb. 10, 1988, Pat. No. 4,980,281. This application Mar. 17, 1995, Ser. No. 408,443

Int. Cl.^{6} C12Q *1/02*

U.S. Cl. 435—7.21 **16 Claims**

1. A method of determining whether a substance is an inhibitor or an activator of a protein, which comprises:
- a) providing a test cell which overproduces a selected protein relative to a control cell which produces said protein at a lower level or essentially does not produce the protein, and wherein production of said protein in said test cell evokes a responsive change in a phenotypic characteristic, other than the level of said protein in said cell, per se, which is comparatively greater than in said control cell,
- b) treating said test cell containing the overproduced selected protein with said substance, and
- c) examining the treated test cell to determine whether it exhibits a change in said phenotypic characteristic in response to said substance.

5,688,656
CYTOKINE-INDUCED MARKER FOR INFLAMMATORY RESPONSE

Vishva M. Dixit, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 321,162, Oct. 11, 1994, Pat. No. 5,599,669, which is a continuation of Ser. No. 164,611, Dec. 8, 1993, abandoned, which is a continuation of Ser. No. 607,741, Oct. 16, 1990, abandoned. This application May 15, 1995, Ser. No. 441,216

Int. Cl.^{6} C07K *14/47;16/18;* **G01N** *33/536;33/543*

U.S. Cl. 435—7.21 **14 Claims**

1. A method of assaying for the presence of B61 in a patient comprising the steps of:
- a) providing an antibody to B61;
- b) obtaining a sample of the patient's blood or tissue;
- c) contacting the sample under conditions favorable for binding of the antibody to any B61 in the sample; and
- d) detecting the binding of the antibody, the presence of bound antibody being a positive indication of the presence of B61 in the sample.

5,688,657
MONOCLONAL ANTIBODIES AGAINST HUMAN COLON CARCINOMA-ASSOCIATED ANTIGENS AND USES THEREFOR

Kwong Y. Tsang, Bethesda, Md., and Myron Arlen, Great Neck, N.Y., assignors to International Bio-Immune Systems, Inc., Great Neck, N.Y.

Continuation-in-part of Ser. No. 159,836, Nov. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 117,430, Sep. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 670,816, Mar. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 176,337, Mar. 31, 1988, abandoned. This application Sep. 12, 1994, Ser. No. 304,524

Int. Cl.^{6} G01N *33/574;33/53;* **C07K** *16/30;16/18*

U.S. Cl. 435—7.23 **50 Claims**

1. A monoclonal antibody specific for a purified human colon carcinoma-associated protein antigen, wherein said antigen has the following characteristics:
- (a) said antigen is purified to the extent that the membrane fractions are free of HL-A antigen and are substantially free from non-immunogenic glycoprotein fractions;
- (b) said antigen is not detectable on normal colon cancer free human tissues;
- (c) said antigen is not detectable on human carcinoma cells other than colon carcinoma cells;
- (d) said antigen is specifically immunogenic in humans; and
- (e) said antigen induces an immune response in humans having colon carcinoma which is expressed as cell mediated immunity.

5,688,658
DETECTION OF PROSTATE-SPECIFIC ANTIGEN IN BREAST TUMORS

Eleftherios P. Diamandis, Toronto, Canada, assignor to Nordion International, Inc., Canada

PCT No. PCT/CA94/00267, § 371 Date Jan. 5, 1996, § 102(e) Date Jan. 5, 1996, PCT Pub. No. WO94/27152, PCT Pub. Date Nov. 24, 1994

PCT Filed May 13, 1994, Ser. No. 532,808

Claims priority, application Canada, May 14, 1993, 9309966.1

Int. Cl.^{6} G01N *33/574;33/53;33/48*

U.S. Cl. 435—7.23 **7 Claims**

1. A method for detecting the presence of prostate specific antigen (PSA) as a prognostic or predictive indicator of breast carcinoma in female breast tumor tissue, said method comprising:
- i) conducting a biological assay for the presence of PSA in a sample of breast tumor tissue, said assay being capable of

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detecting a concentration of at least as low as 0.03 ng of PSA per mg of total protein in the sample; and

ii) upon detecting PSA in said sample classifying said sample as PSA positive which indicates a favorable prognosis for breast cancer.

5,688,659

STREPTOLYSIN O PEPTIDE ANTIGENS AND METHODS FOR THE DETERMINATION OF STREPTOLYSIN ANTIBODIES

Christoph Seidel, Weilheim; Geoffrey Burns, Munich, and Wolf-Dieter Engel, Feldafing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Division of Ser. No. 158,351, Nov. 29, 1993, Pat. No. 5,445,820. This application Jun. 7, 1995, Ser. No. 482,576

Claims priority, application Germany, Nov. 28, 1992, 42 40 056.2

Int. Cl.^{6} G01N *33/543;33/53;33/569;33/557*

U.S. Cl. 435—7.34 **3 Claims**

1. A method for the determination of anti-SLO antibodies, comprising the steps of

incubating a sample with a peptide antigen under conditions which enable the formation of an antibody-antigen complex, wherein said peptide antigen comprises at least a part of one amino acid sequence selected from the group consisting of SEQ ID NO: 2 and SEQ ID NO: 5, wherein said part of the amino acid sequence is at least 4 amino acids in length, and wherein said antigen has a negative band between 190 and 200 nm in the CD spectrum and

determining any anti-SLO antibodies bound to the peptide antigen.

5,688,660

METHOD FOR DETERMINING PRODUCT BIODEGRADABILITY

Francoise Siquet-Descans, Faimes, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 15, 1995, Ser. No. 404,690

Int. Cl.^{6} C12Q *1/02*

U.S. Cl. 435—29 **15 Claims**

1. A process for determining the biodegradability of an organic carbon source comprising providing a liquid sample of said organic carbon source having a known organic carbon content, diluting said sample to a concentration at which it would enter a waste water system, inoculating said sample with microorganisms obtained from a waste water treatment system, incubating said inoculated sample so that carbon dioxide evolves as said microorganisms metabolize said organic carbon source, contacting the evolved carbon dioxide with a solution which takes up the carbon dioxide and changes its electrical conductivity, measuring the change in conductivity of said solution as carbon dioxide is taken up, and comparing the conductivity of said solution with the conductivity of a known standard to determine the amount of organic carbon contained in said organic carbon source that has been biodegraded by said microorganisms.

5,688,661

FABRICATION METHOD FOR MASK ROM

Jae Seung Choi, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

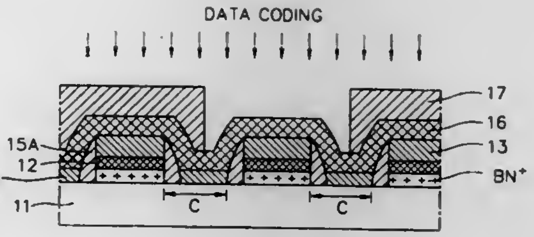
Filed Dec. 27, 1996, Ser. No. 773,843

Claims priority, application Rep. of Korea, Dec. 30, 1995, 68655/1995

Int. Cl.^{6} H01L *21/8246*

U.S. Cl. 437—48 **8 Claims**

1. A fabrication method for a mask ROM according to present invention, comprising the steps of:



forming a diffusion buried layer on a semiconductor substrate;

forming a silicide layer on the diffusion buried layer and forming a first insulating layer on the silicide layer;

forming a pattern comprising the first insulating layer, the silicide layer and the diffusion buried layer by forming and patterning a photoresist layer on the first insulating layer;

forming sidewall spacers at both sides of the pattern;

forming and patterning a polysilicon layer on the entire resultant surface of the semiconductor substrate; and performing a data coding on a predetermined portion of the semiconductor substrate.

5,688,662

GUSTDUCIN POLYNUCLEOTIDES, VECTORS, HOST CELLS AND RECOMBINANT METHODS

Robert F. Margolskee, Upper Montclair, N.J., assignor to Linguagen Corporation, Basking Ridge, N.J.

Filed Apr. 9, 1992, Ser. No. 868,353

Int. Cl.^{6} C12P *21/06;* **C12N** *15/00;* **C07H** *17/00;* **C07K** *14/435*

U.S. Cl. 435—69.1 **5 Claims**

1. A purified and isolated gustducin α subunit polynucleotide consisting of the nucleotide sequence set out in SEQ ID NO: 11.

5,688,663

GENE ENCODING CARBOXYPEPTIDASE OF *ASPERGILLUS NIGER*

Debbie Sue Yaver, and Sheryl Ann Thompson, both of Davis, Calif., assignors to Novo Nordisk Biotech, Inc., Davis, Calif.

Division of Ser. No. 309,341, Sep. 20, 1994, Pat. No. 5,594,119. This application Feb. 28, 1996, Ser. No. 608,267

Int. Cl.^{6} C12P *21/06;* **C12N** *15/00;1/14;1/16*

U.S. Cl. 435—69.1 **22 Claims**

1. A mutant filamentous ascomycete cell which produces at least 25% less carboxypeptidase Y than a corresponding wild-type cell when cultured under identical conditions, wherein the endogenous carboxypeptidase Y gene has been replaced by homologous recombination with a nucleic acid sequence wherein the nucleic acid sequence is selected from the group consisting of (i) the nucleic acid sequence depicted in SEQ ID NO:1 or SEQ ID NO:3 and (ii) a nucleic acid sequence which hybridizes with SEQ ID NO:1 or SEQ ID NO:3 under high stringency conditions; which sequence has been disrupted; and which cell has been transformed to recombinantly produce a heterologous protein.

5,688,664

THROMBIN ACTIVATABLE PLASMINOGEN ANALOGUES

Keith Martyn Dawson; Richard James Gilbert, and Michael George Hunter, all of Oxford, England, assignors to British Bio-Technology Ltd., England

Continuation-in-part of Ser. No. 854,603, Jun. 4, 1992. This application Oct. 29, 1993, Ser. No. 147,000

Claims priority, application WIPO, Dec. 7, 1990, PCT/GB90/01912; United Kingdom, Oct. 29, 1992, 9222758

Int. Cl.^{6} A61K *38/48;* **C12N** *9/68;* **C12P** *21/00*

U.S. Cl. 435—69.2 **22 Claims**

1. In a plasminogen having a cleavage site, the cleavage of which is catalyzed by tPA or uPA, the improvement wherein said cleavage site is replaced with a thrombin cleavage site which contains the sequence (SEQ ID NO:23):

Xaa Xaa Pro Arg Xaa Xaa
1 5

where Xaa at position 1 represents P4; Xaa at position 2 represents P3; Xaa at position 5 represents P1'; and Xaa at position 6 represents P2' and wherein P3 is a basic amino acid residue selected from lysine or arginine, P4 is a hydrophobic amino acid residue selected from valine, isoleucine or leucine, and each of P1' and P2' is independently a non-acidic amino acid residue selected from valine, isoleucine or leucine, said site being clearable by thrombin between Arg and P1'.

5,688,665

ISOLATED NUCLEIC ACID MOLECULES ENCODING THE P27 KIP-1 PROTEIN

Joan Massague, New York, N.Y.; James M. Roberts, Seattle, Wash.; Andrew Koff, and Kornelia Polyak, both of New York, N.Y., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash., and Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 179,045, Jan. 7, 1994, abandoned. This application Jul. 15, 1994, Ser. No. 275,983

Int. Cl.^{6} C12N *15/12;5/10;1/21*

U.S. Cl. 435—69.2 **15 Claims**

1. A recombinant nucleic acid molecule which encodes a protein selected from the group consisting of the mink kip1 (SEQ ID NO:1), mouse kip1 (SEQ ID NO:2) and human kip1 (SEQ ID NO:3) proteins whose sequences are set forth in FIG. 9A.

5,688,666

GROWTH HORMONE VARIANTS WITH ALTERED BINDING PROPERTIES

Steven H. Bass, Redwood City, Calif.; Ronald Greene, Durham, N.C.; Henry B. Lowman, Hercules, and James A. Wells, Burlingame, both of Calif., assignors to Genentech, Inc., San Francisco, Calif.

Division of Ser. No. 715,300, Jun. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 682,400, Apr. 10, 1991, abandoned, and Ser. No. 621,667, Dec. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 264,611, Oct. 28, 1988, abandoned. This application Jan. 14, 1994, Ser. No. 182,530

Int. Cl.^{6} C12P *21/06;* **C07K** *14/61*

U.S. Cl. 435—69.4 **28 Claims**

1. A variant of a native human growth hormone, said variant capable of binding to human growth hormone binding protein and having a set of amino acid substitutions selected from the group consisting of:

F10H,M14G,H18N,H21N;
F10A,M14W,H18D,H21N;
F10Y,M14T,H18V,H21N;
F10I,M14N,H18I,H21N; and
M14S,H18F,H21L, numbered from the N-terminus of 191-amino acid human growth hormone.

5,688,667

Patent Not Issued For This Number

5,688,668

PYRODICTIUM XYLANASE AMYLASE AND PULLULANASE

Carsten Sjøholm, Allerød, Denmark, and Garabed Antranikian, Seevetal, Germany, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

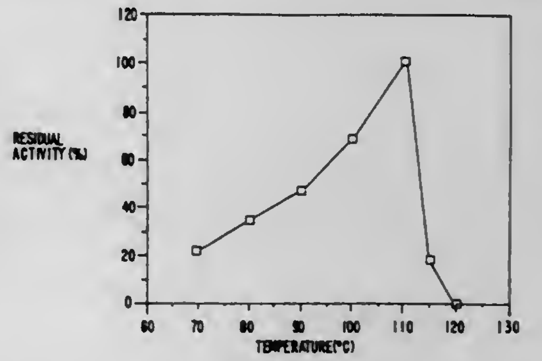
PCT No. PCT/DK95/00211, § 371 Date Nov. 13, 1996, § 102(e) Date Nov. 13, 1996, PCT Pub. No. WO95/34644, PCT Pub. Date Dec. 21, 1995

PCT Filed May 31, 1995, Ser. No. 737,559

Claims priority, application Denmark, Jun. 15, 1994, 0682/94

Int. Cl.^{6} C12P *19/44;* **C12N** *9/24;9/42*

U.S. Cl. 435—74 **5 Claims**



1. A xylanase preparation, which is obtained from a xylanase producing strain of the family Desulfurococcaceae, and has

(a) Activity optimum in the range pH 5.5 to pH 6.5, determined at 100° C. with xylan as substrate;

(b) Activity optimum at temperatures in the range 105°–115° C., determined at pH 5.5 with xylan as substrate.

5,688,669

METHODS FOR NUCLEIC ACID DETECTION, SEQUENCING, AND CLONING USING EXONUCLEASE

James J. Murtagh, 511 Calibre Woods Dr., Atlanta, Ga. 30329

Division of Ser. No. 49,264, Apr. 19, 1993, Pat. No. 5,518,901. This application Jun. 7, 1995, Ser. No. 476,562

Int. Cl.^{6} C12P *19/34;* **C12N** *15/10;15/66;* **C12Q** *1/68*

U.S. Cl. 435—91.2 **10 Claims**

1. A method of adapting a nucleic acid for sequencing comprising:

a. amplifying the nucleic acid using a first primer containing deoxyuridine monophosphate and a second primer not containing deoxyuridine monophosphate to yield a double-stranded DNA with a polyuridylated 5' end on one strand;

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b. Partially disassociating the resultant double-stranded DNA with uracil DNA glycosylase to form a 3' overhang on the polyuridylated 5' end;
c. digesting the double-stranded DNA with a 3' exonuclease which digests only the 3' strand from the end opposite the polyuridylated 5' end for a time sufficient to convert at least a portion of the double-stranded DNA to a single-stranded DNA; and
d. extending the partially digested 3' strand with a polymerase such that sequencing by a dideoxynucleotide process can be performed on the single-stranded DNA.

5,688,670

SELF-MODIFYING RNA MOLECULES AND METHODS OF MAKING

Jack W. Szostak, Boston; Jon R. Lorsch, Cambridge, both of Mass., and Charles Wilson, Bonny Doon, Calif., assignors to The General Hospital Corporation, Boston, Mass.

Filed Sep. 1, 1994, Ser. No. 299,498

Int. Cl.^{6} C12P *19/34;* **C07H** *21/02;* **C12Q** *1/68*

U.S. Cl. 435—91.21 **19 Claims**

1. A method for producing a self-modifying RNA molecule which binds a first ligand and carries out a chemical reaction modifying said self-modifying RNA molecule, comprising the steps of:

a) providing a first population of RNA molecules comprising RNA molecules having a first region of random sequence;
b) contacting said first population of RNA molecules with said first ligand;
c) isolating a first ligand-binding subpopulation of said first population of RNA molecules by partitioning RNA molecules in said first population which specifically bind said first ligand from those which do not;
d) amplifying said first ligand-binding subpopulation in vitro;
e) identifying a first ligand binding RNA sequence present in said amplified first ligand-binding subpopulation;
f) preparing a second population of RNA molecules comprising RNA molecules comprising said first ligand binding sequence and a second region of random sequence;
g) contacting said second population of RNA molecules with a second ligand which binds said first ligand binding sequence, said contacting occurring under conditions which allow said second ligand to participate in a chemical reaction which modifies an RNA molecule in said second population; and
h) isolating a subpopulation of said self-modifying RNA molecules from said population of RNA molecules by partitioning RNA molecules which have been modified in step g) from those which have not been modified.

5,688,671

MUTANT ASPARTOKINASE GENE

Masakazu Sugimoto; Yuri Ogawa; Tomoko Suzuki; Akiko Tanaka, and Hiroshi Matsul, all of Kanagawa, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

PCT No. PCT/JP93/01809, § 371 Date Oct. 27, 1995, § 102(e) Date Oct. 27, 1995, PCT Pub. No. WO94/25605, PCT Pub. Date Nov. 10, 1994

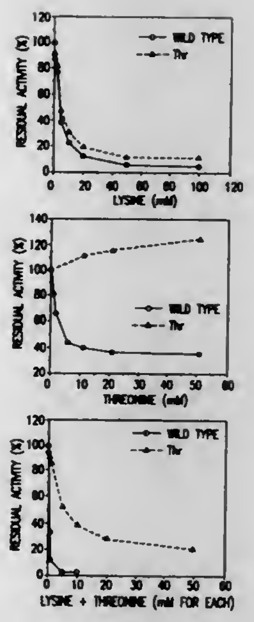
PCT Filed Dec. 14, 1993, Ser. No. 532,828

Claims priority, application Japan, Apr. 27, 1993, 5-101450

Int. Cl.^{6} C12P *13/08;* **C12N** *9/12*

U.S. Cl. 435—115 **12 Claims**

1. A recombinant DNA fragment coding for an aspartokinase α-subunit protein originating from a bacterium belonging to the genus Corynebacterium, in which synergistic feedback inhibition by L-lysine and L-threonine is substantially desensitized, said protein having an amino acid sequence defined by SEQ ID NO: 4, or a sequence in which the 279th residue in said amino acid sequence is changed to an amino acid other than Ala and other than acidic amino acids.



5,688,672

PROCESS FOR THE BIOTECHNOLOGICAL PREPARATION OF L-THIENYLALANINES IN ENANTIOMERICALLY PURE FORM FROM 2-HYDROXY-3-THIENYLACRYLIC ACIDS

Gerhard Kretzschmar, Eschborn; Johannes Meiwes, Idstein; Manfred Schudok, Hattersheim/Main; Peter Hammann, Babenhausen; Ulrich Lerch, Hofheim/Taunus, and Susanne Grabley, Königstein/Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

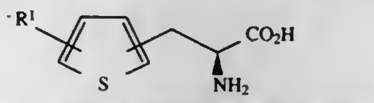
Division of Ser. No. 99,352, Jul. 29, 1993, Pat. No. 5,480,786. This application Jun. 5, 1995, Ser. No. 460,873

Claims priority, application Germany, Jul. 31, 1992, 42 25 280.6

Int. Cl.^{6} C12P *13/04;* **C12N** *9/10*

U.S. Cl. 435—106 **12 Claims**

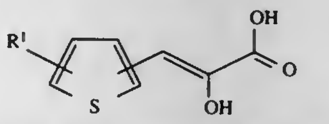
1. A method for making L-thienylalanine of the formula I



(I)

in which R^1 is hydrogen, a halogen radical, a nitro radical or a straight-chain or branched alkyl radial and the 2-amino-2-carboxyethyl radical is in the 2- or 3-position of the thiophene ring, or the salts of these compounds, which comprises;

reacting a compound of formula II



(II)

in which R^1 has the above meanings and the 2-hydroxyacrylic acid radical is in the 2- or 3-position, with L-asparagine, L-glutamine, L-aspartic acid and/or L-glutamic acid using transaminase as a catalyst, wherein the transaminase is produced by *Alcaligenes faecalis, Alcaligenes denitrificans, Pseudomonas paucimobilis, Serratia plymuthca, Agrobacterium tumefaciens, Enterobacter agglomerans, Streptomyces hygroscopicus,* pigs heart, or *Streptomyces viridochromogenes,* to produce the compound of formula I and recovering the compound of formula I.

5,688,673

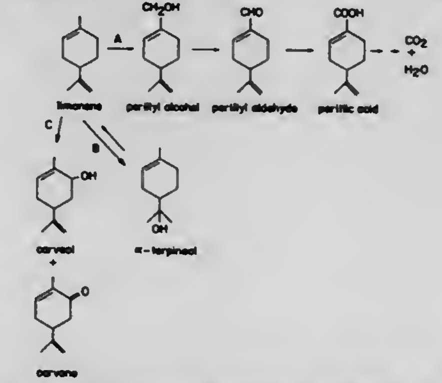
PROCESS FOR THE PREPARATION OF MONOTERPENES USING BACTERIUM CONTAINING RECOMBINANT DNA

Patrick J. Orlel, Midland; Srinivasan Savithiry, East Lansing, both of Mich., and Hae Choon Chang, Taejeon, Rep. of Korea, assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 290,469, Aug. 15, 1994, Pat. No. 5,487,988. This application Jul. 28, 1995, Ser. No. 508,818

Int. Cl.^{6} C12P *7/24;7/02;* **C12N** *1/21;15/70*

U.S. Cl. 435—147 **36 Claims**



1. A recombinant plasmid containing a segment of DNA of a *Bacillus stearothermophilus* which provides a bacterium with the ability to convert limonene to a monoterpene compound in a culture medium.

5,688,674

CONTINUOUS FERMENTATION PROCESS FOR THE PRODUCTION OF METABOLITIES USING A MOVING FILTER

Cha-Yong Choi, Olympic Family Apt. 223-1301, 150, Moonjeong 2-dong, Songpa-ku, Seoul, Rep. of Korea, 138-202, and Young-Lyeol Yang, Seoul, Rep. of Korea, assignors to Cha-Yong Choi, Seoul, Japan

Filed Feb. 27, 1996, Ser. No. 607,482

Claims priority, application Rep. of Korea, Sep. 29, 1995, 95-32844

Int. Cl.^{6} C12P *7/14;7/06;7/08;7/10*

U.S. Cl. 435—162 **15 Claims**

1. A continuous process for producing a metabolite from a carbohydrate substrate which comprises the steps of: (A) pulverizing the carbohydrate substrate; (B) liquefying and saccharifying the pulverized substrate; (C) continuously fermenting the liquesaccharified substrate in a fermentor, in the presence of biological cells and a culture medium to produce a fermentation product mixture; and (D) recovering the metabolite from the fermentation product mixture; wherein the fermentor is equipped with a moving filter having an opening size ranging from 50 to 2,000 mesh and the biological cells are flocculent cells maintained at a concentration ranging from 90 to 160 g/l by the moving filter during the fermentation step.

5,688,675

IN VITRO PACKAGING OF ADENO-ASSOCIATED VIRUS DNA

Xiaohuai Zhou; Nicholas Muzyczka; Sergei Zolotukhin, all of Gainesville, Fla., and Tiehua Ni, Malden, Mass., assignors to Research Foundation of State University of New York, Stony Brook, N.Y.

Filed Jun. 7, 1995, Ser. No. 476,018

Int. Cl.^{6} C12N *15/10;15/86;15/64*

U.S. Cl. 435—172.3 **18 Claims**

1. A method for in vitro packaging of a DNA substrate comprising the steps of:

(a) transfecting a mammalian host cell culture permissive for AAV replication with a dAAV vector containing AAV capsid and Rep gene coding sequences;
(b) infecting said host cell culture with a helper virus;
(c) after said transfecting and said infecting, preparing an extract free of DNA from the transfected cell culture;
(d) combining said extract with said DNA substrate; and,
(e) incubating said extract under conditions to promote packaging of said DNA substrate.

5,688,676

IN VITRO PACKAGING OF ADENO-ASSOCIATED VIRUS DNA

Xiaohuai Zhou; Nicholas Muzyczka; Sergei Zolotukhin, all of Gainesville, Fla., and Tiehua Ni, Malden, Mass., assignors to Research Foundation of State University of New York, Stony Brook, N.Y.

Filed Jun. 7, 1995, Ser. No. 477,511

Int. Cl.^{6} C12P *21/06;* **C12N** *15/64;15/00;7/00*

U.S. Cl. 435—172.3 **19 Claims**

1. A method for in vitro packaging of a DNA substrate into AAV particles that transduce a recipient mammalian cell comprising the steps of:

(a) transfecting a mammalian host cell culture permissive for AAV replication with a dAAV vector containing AAV capsid and Rep gene coding sequences;
(b) infecting said host cell culture with a helper virus;
(c) after said transfecting and said infecting, preparing an extract free of DNA from the transfected cell culture;
(d) combining said extract with said DNA substrate; and,
(e) incubating said extract under conditions to promote packaging of said DNA substrate.

5,688,677

DEOXYRIBONUCLEIC ACIDS CONTAINING INACTIVATED HORMONE RESPONSIVE ELEMENTS

Karl M. Ebert, Millbury; Paul DiTullio, Framingham; Seng Hing Cheng, Wellesley; Harry M. Meade, Newton, and Alan Edward Smith, Dover, all of Mass., assignors to Genzyme Corporation, Framingham, Mass.

Filed Oct. 13, 1993, Ser. No. 135,809

Int. Cl.^{6} C12N *15/06;15/12*

U.S. Cl. 435—240.1 **11 Claims**

1. Recombinant DNA comprising a nucleic acid sequence, the sequence including:

a consensus sequence of at least one hormone responsive element, wherein the consensus sequence is mutated to render said hormone responsive element inactive; and
a sequence encoding a membrane-associated protein.

5,688,678

DNA ENCODING AND METHODS FOR PRODUCING BMP-8 PROTEINS

Rodney M. Hewick; Jack H. Wang, both of Lexington; John M. Wozney, and Anthony J. Celeste, both of Hudson, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 525,357, May 16, 1990, abandoned, and a continuation-in-part of Ser. No. 641,204, Jan. 15, 1991, abandoned. This application Nov. 26, 1991, Ser. No. 800,364

Claims priority, application WIPO, May 15, 1991, PCT/US91/03388

Int. Cl.^{6} C12N *15/16;1/21;* **C07K** *14/51*

U.S. Cl. 435—240.2 **4 Claims**

1. An isolated DNA sequence selected from the group consisting of

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(a) the nucleotide sequence set forth in SEQ ID NO: 13 comprising nucleotide #8 to #850; and
(b) nucleotide sequences which encode the amino acid sequence comprising amino acid #139 to #142 of SEQ ID NO: 14.

5,688,679

HUMAN ERYTHROPOIETIN GENE; HIGH LEVEL EXPRESSION IN STABLY TRANSFECTED MAMMALIAN CELLS

Jerry S. Powell, Seattle, Wash., assignor to University of Washington, Seattle, Wash.

Continuation of Ser. No. 453,381, Dec. 18, 1989, abandoned, which is a continuation of Ser. No. 211,278, Jun. 21, 1988, abandoned, which is a continuation of Ser. No. 879,423, Jun. 27, 1986, abandoned. This application Oct. 6, 1993, Ser. No. 132,489

Int. Cl.^{6} C12N *15/27;15/06;15/16*

U.S. Cl. 435—240.2 6 Claims

1. A recombinant DNA consisting essentially of the 2.4 kb ApaI restriction fragment of genomic human erythropoietin gene.

5,688,680

Patent Not Issued For This Number

5,688,681

MONOCLONAL ANTIBODIES TO HUMAN LEUKEMIA INHIBITORY FACTOR

Kyung Jin Kim, San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 56,966, Apr. 29, 1993, abandoned, which is a continuation of Ser. No. 880,400, May 8, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 258,918

Int. Cl.^{6} C07K *16/24;* **C12P** *21/08;* **C12N** *5/20;* **G01N** *33/53*

U.S. Cl. 435—240.27 13 Claims

1. A monoclonal antibody that specifically binds human LIF and neutralizes a biological activity of human LIF.

5,688,682

METHOD FOR PRODUCING A BACTERIAL VACCINE AND NOVEL VACCINES PRODUCED THEREBY

Martha H. Mulks, Williamston, and Brad J. Thacker, Bath, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Continuation of Ser. No. 107,856, Sep. 14, 1993, abandoned. This application Feb. 15, 1996, Ser. No. 601,835

Int. Cl.^{6} C12N *1/12;1/00;* **G01N** *33/531;* **A61K** *39/01*

U.S. Cl. 435—252.1 12 Claims

1. A method for producing a vaccine from cells of *Actinobacillus pleuropneumoniae* for injection into swine to produce immunity which comprises:
(a) isolating a strain of the *Actinobacillus pleuropneumoniae* from a swine infected with the strain in a virulent form as a result of passage of the strain through the first swine;
(b) growing the strain which is isolated in a growth medium;
(c) harvesting the cells of the strain from the growth medium;
(d) disrupting the cells of the strain by sonication for less than two minutes in an aqueous solution to obtain a mixture containing disrupted cells, capsular and subcapsular antigens; and
(e) preserving the mixture with a preservative which kills the *Actinobacillus pleuropneumoniae* to provide the vaccine.

5,688,683

PLASMID PBUL1 DERIVED FROM A LACTOBACILLUS AND DERIVATIVES THEREOF

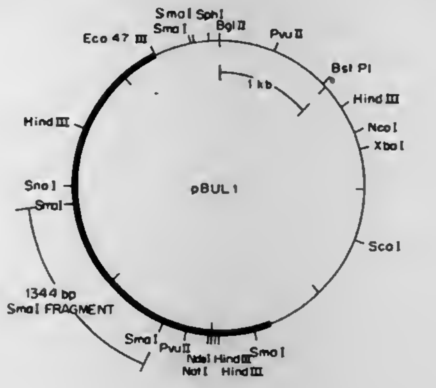
Yoshiyuki Ito; Yasuko Sasaki, and Takashi Sasaki, all of Kanagawa-ken, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation of Ser. No. 940,852, Oct. 22, 1992, Pat. No. 5,426,047. This application Feb. 28, 1995, Ser. No. 396,126

Claims priority, application Japan, Feb. 22, 1991, 3-112674; Mar. 28, 1991, 3-87338; Jun. 28, 1991, 3-183922

Int. Cl.^{6} C12N *1/21*

U.S. Cl. 435—252.3 16 Claims



1. A *Lactobacillus delbrueckii* transformant which has been transformed with a recombinant plasmid comprising at least one foreign gene and a region necessary for replication of plasmid pBUL1, containing the SmaI fragment of 1344 bp shown in SEQ ID NO: 1.

5,688,684

RECOMBINANT β-AMYLASE

Naohiro Yoshigi; Hideo Maeba, and Yukio Okada, all of Yaizu, Japan, assignors to Sapporo Breweries Ltd., Tokyo, Japan

Filed Sep. 21, 1995, Ser. No. 531,601

Claims priority, application Japan, Sep. 28, 1994, 6-233086

Int. Cl.^{6} C12N *1/20:15/00;* **C07H** *21/04*

U.S. Cl. 435—252.33 6 Claims

1. An isolated gene coding for a recombinant β-amylase having an amino acid sequence denoted by SEQ ID NO: 1.

5,688,685

SYSTEM AND METHODS FOR BIODEGRADATION OF COMPOUNDS

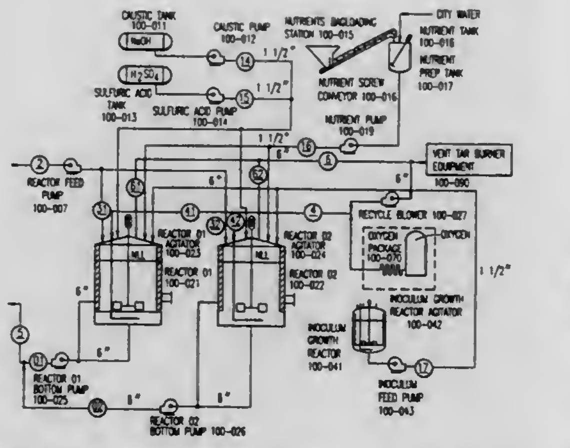
George E. Pierce, Lebanon, N.J., assignor to Cytec Technology Corporation, Wilmington, Del.

Filed Dec. 16, 1994, Ser. No. 357,822

Int. Cl.^{6} B09B *3/00;* **C02F** *3/02*

U.S. Cl. 435—262 33 Claims

1. A method for aerobic degradation of at least one compound selected from the group consisting of aromatic, nitro-aromatic, halo-aromatic, aliphatic, and halo-aliphatic compounds comprising contacting said compound with a microorganism, said microorganism selected from the group consisting of microorganisms having ATCC Accession Nos. 55641, 55642, 55643, 55644, 55645, 55646, 55647, 55648, and 55649.


CAUSTIC TANK 100-011
NaOH
CAUSTIC PUMP 100-012
NUTRIENTS BAGLOADING STATION 100-015
CITY WATER
NUTRIENT TANK 100-016
NUTRIENT PREP TANK 100-017
H_2SO_4
SULFURIC ACID TANK 100-013
SULFURIC ACID PUMP 100-014
NUTRIENT SCREW CONVEYOR 100-016
NUTRIENT PUMP 100-019
1 1/2"
6"
VENT TAR BURNER EQUIPMENT 100-090
REACTOR FEED PUMP 100-007
RECYCLE BLOWER 100-027
REACTOR 01 AGITATOR 100-023
REACTOR 01 100-021
REACTOR 02 AGITATOR 100-024
REACTOR 02 100-022
OXYGEN PACKAGE 100-070
OXYGEN
INOCULUM GROWTH REACTOR AGITATOR 100-042
INOCULUM GROWTH REACTOR 100-041
INOCULUM FEED PUMP 100-043
REACTOR 01 BOTTOM PUMP 100-025
REACTOR 02 BOTTOM PUMP 100-026
8"

5,688,686

FERMENTATION APPARATUS

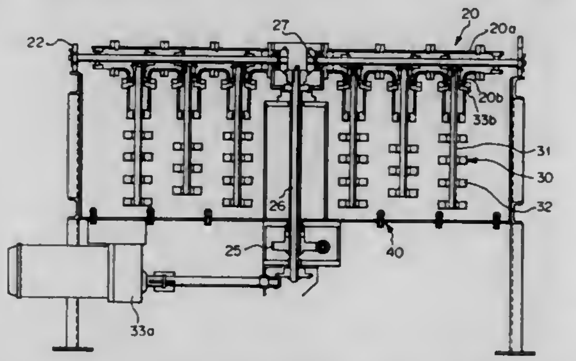
Shigeji Nakajima, 7-6, Sengoku-cho 4-chome, Hitachi-shi, Ibaraki-ken; Teruo Nakamura, 187-155, Nozawa-cho, Utsunomiya-shi, Tochigi-ken, and Shigeru Sato, 30-7, Kuwamizu 1-chome, Kumamoto-shi, Kumamoto-ken, all of Japan

Filed Nov. 6, 1995, Ser. No. 552,525

Claims priority, application Japan, Mar. 22, 1995, 7-63174

Int. Cl.^{6} C05F *17/02*

U.S. Cl. 435—290.2 6 Claims



1. A vertically oriented, multistage, multipurpose fermentation apparatus comprising:
at least one fermentation tank including a housing of a substantially cylindrical configuration;
a support means extending radially outwardly from a center of said fermentation tank and being rotatable about said center of said fermentation tank;
a plurality of agitation means removably connected to and supported by said support means, each of said agitation means including a plurality of spaced apart agitation blades each of which is rotatable about a central axis of said agitation means extending vertically relative to the bottom surface of said fermentation tank, each of said agitation blades extending from one of said plurality of agitation means in a direction which is horizontal relative to the bottom surface of said fermentation tank such that each of said agitation blades is rotatable only in a plane which is horizontal relative to the bottom surface of said fermentation tank;
a gas intake means disposed above said bottom surface of said fermentation tank and below said agitation means, said gas intake means supplying gas to said fermentation tank;
a transfer opening means disposed in said bottom surface of said fermentation tank and arranged to be opened and closed;
at least one filter means disposed in a top surface of the fermentation tank, said filter means filtering gas being exhausted from the fermentation apparatus; and
a maturation tank disposed below said fermentation tank and being in communication with said fermentation tank through said transfer opening means.

5,688,687

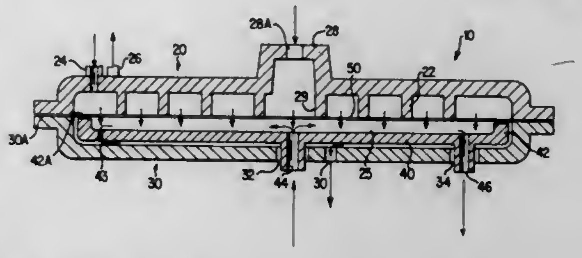
BIOREACTOR FOR MAMMALIAN CELL GROWTH AND MAINTENANCE

Bernhard O. Palsson, La Jolla, Calif.; R. Douglas Armstrong, Ann Arbor, and James Maluta, Dexter, both of Mich., assignors to Aastrom Biosciences, Inc., Ann Arbor, Mich.

Filed Jun. 7, 1995, Ser. No. 478,622

Int. Cl.^{6} C12M *3/00*

U.S. Cl. 435—293.2 16 Claims



1. A bioreactor for the ex vivo maintenance and growth of mammalian cells, comprising:
a substantially circular cell growth chamber defined between a substantially planar cell bed and a gas permeable, liquid impervious membrane;
a media inlet communicating with a radially central portion of said cell growth chamber; and
a plurality of media outlets radially outwardly spaced from said media inlet by a distance sufficient for cell growth to occur between said inlet and said outlets, said outlets being substantially equiangularly circumferentially spaced about said cell growth chamber.

5,688,688

VECTOR FOR EXPRESSION OF A POLYPEPTIDE IN A MAMMALIAN CELL

Paul A. Luciw, Davis; Dino Dina, San Francisco; Steven Rosenberg, Oakland; Barbara S. Chapman, Berkeley; Richard M. Thayer, Alamo, all of Calif., and Nancy L. Haigwood, Bellevue, Wash., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 107,377, Aug. 17, 1993, which is a division of Ser. No. 83,391, Jun. 28, 1993, which is a continuation of Ser. No. 931,191, Aug. 17, 1992, which is a division of Ser. No. 138,894, Dec. 24, 1987, Pat. No. 5,156,949, which is a continuation-in-part of Ser. No. 773,447, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 696,534, Jan. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 667,501, Oct. 31, 1984, abandoned. This application Aug. 10, 1994, Ser. No. 288,336

Int. Cl.^{6} C12N *15/67;15/11;15/85*

U.S. Cl. 435—320.1 24 Claims

1. A vector for expression of a polypeptide in a mammalian cell comprising a first polynucleotide sequence that comprises:
a) an upstream SV40 origin of replication;
b) a downstream SV40 polyadenylation region; and
c) a transcription regulatory region from human cytomegalovirus immediate early region HCMV IE1, wherein the transcription regulatory region includes the first HCMV IE1 intron proximal to the 3' end of the HCMV IE1 promoter, is interposed between the SV40 origin of replication and the SV40 polyadenylation region, and is capable of directing the tran-

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scription of a polypeptide coding sequence operably linked downstream from the transcription regulatory region.

5,688,689

CLONING AND EXPRESSION VECTORS IN AN ACTINOMYCETES STRAIN, PROCESS FOR TRANSFORMATION OF THIS STRAIN, ACTINOMYCETES STRAIN OBTAINED AND PREPARATION OF PROTEINS

Tamara Smokvina; Frederic Boccard, and Michel Guerineau, all of Paris, France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Continuation of Ser. No. 995,544, Dec. 22, 1992, abandoned, which is a continuation of Ser. No. 353,749, May 18, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 477,502

Claims priority, application France, May 18, 1988, 88 06638

Int. Cl.^{6} C07H *21/04;* **C12N** *15/64*

U.S. Cl. 435—320.1 **5 Claims**

1. A vector for cloning and expressing a DNA molecule encoding a particular protein in a strain of Actinomycetes, consisting of:

an att attachment DNA molecule selected from the group consisting of

TTCTCTGTCGGGGTGGCGGGATTTGAAC-CCACGACCTCTTCGTCCCGAA and a DNA molecule which hybridize to it in *S. antibioticus* (DSM 40868), *S. bikiniensis* (ATCC 11062), *S. paryulus* (ATCC 12434), *S. glaucescens* (ETH 22794), *S. actuosus* (ATCC 25421), *S. coelicolor* (A3(2)), *S. ambofaciens*, *S. lividans TK*64 (66), and *S. griseofuscus* (DSM 40191);

a DNA molecule coding for an int protein functional in said strain consisting of the DNA depicted in FIG. 3; and

a DNA molecule encoding said particular protein operably linked to a promoter wherein said DNA molecule encoding said particular protein is inserted into said DNA molecule coding for said int protein

wherein said vector is a plasmid and said att DNA molecule, said DNA molecule coding for said int protein and said DNA molecule are positioned in said vector such that the DNA is expressed in the strain.

5,688,690

HUMAN CYTOTOXIC LYMPHOCYTE SIGNAL TRANSDUCTION SURFACE PROTEIN (P38) AND MONOCLONAL ANTIBODIES THERETO

Nicholas M. Valiante, Palo Alto, Calif., and Giorgio Trinchieri, Wynnewood, Pa., assignors to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Filed Sep. 16, 1994, Ser. No. 307,280

Int. Cl.^{6} C07K *16/00;16/28;* **C12N** *5/12*

U.S. Cl. 435—334 **3 Claims**

2. A hybridoma cell line secreting mAb C1.7 and having ATCC accession no. HB-11717.

5,688,691

INSECT RETINOID-LIKE RECEPTOR COMPOSITIONS AND METHODS

Anthony E. Oro, San Diego, and Ronald M. Evans, La Jolla, both of Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Continuation of Ser. No. 13,975, Feb. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 497,935, Mar. 22, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 464,272

Int. Cl.^{6} C12N *1/20;15/00;* **C07H** *21/04*

U.S. Cl. 455—348 **13 Claims**

1. An isolated DNA encoding an insect retinoid-like receptor polypeptide which is structurally and functionally related to the steroid/thyroid superfamily of receptors wherein said polypeptide is characterized by having:

an amino-terminal domain of about 104 amino acids, wherein said amino terminal domain has:
  - (a) about 19% amino acid identity with the amino-terminal domain of hRXR-alpha,
  - (b) about 24% amino acid identity with the amino-terminal domain of hGR, and
  - (c) about 15% amino acid identity with the amino-terminal domain of hRARα;

a DNA binding domain of about 66 amino acids with 10 Cys residues, wherein said DNA binding domain has:
  - (a) more than about 75% amino acid identity with the DNA binding domain of hRXR-alpha,
  - (b) less than about 60% amino acid identity with the DNA binding domain of hGR, and
  - (c) less than about 60% amino acid identity with the DNA binding domain of hRARα; and

a ligand-binding domain of about 290 amino acids, wherein said ligand-binding domain has:
  - (a) about 44% amino acid identity with the ligand-binding domain of hRXR-alpha,
  - (b) about 20% amino acid identity with the ligand-binding domain of hGR, and
  - (c) about 24% amino acid identity with the ligand-binding domain of hRARα.

5,688,692

TRANSGENIC MOUSE CELLS EXPRESSING TS SV40 LARGE T

Parmjit Singh Jat; Dimitris Kioussis, both of London, and Mark David Noble, Berkhamstead, all of England, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 657,809, Feb. 20, 1991, abandoned. This application Feb. 11, 1993, Ser. No. 17,320

Claims priority, application United Kingdom, Feb. 20, 1990, 9003791

Int. Cl.^{6} C12N *5/00;15/00;* **C12P** *21/06*

U.S. Cl. 435—354 **18 Claims**

1. Method for establishing a cell in culture comprising:

(i) removing a cell from a transgenic mouse, wherein said cell has chromosomally integrated a DNA sequence encoding TAgts protein under the control of a non-constitutive promotor wherein expression of said TAgts protein has been at a sufficiently low functional level in vivo to permit normal development of said cell in said mouse, and

(ii) subjecting the removed cell to permissive conditions in culture, wherein said permissive conditions lead to a functional level of expression of said TAgts protein sufficient to prevent complete differentiation of said cell.

5,688,693

METHOD AND SYSTEM FOR SAMPLING AND DETERMINING THE PRESENCE OF CONTAMINANTS IN RECYCLABLE PLASTIC MATERIALS

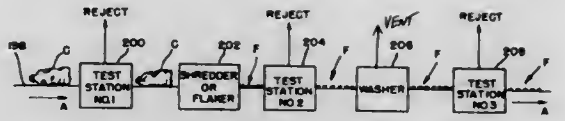
David H. Fine, Lincoln; Freeman W. Fraim, Lexington, both of Mass.; Stephen J. MacDonald, Salem, N.H.; Alex Malaspina, Atlanta, Ga.; Forrest Lee Bayer, Norcross, Ga., and Dirck vanBuren Myers, Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 251,373, May 31, 1994, Pat. No. 5,569,606, which is a continuation-in-part of Ser. No. 890,863, Jun. 1, 1992, Pat. No. 5,352,611. This application Apr. 29, 1996, Ser. No. 639,757

Int. Cl.^{6} G01N *21/90*

U.S. Cl. 436—43 **12 Claims**

1. A method of determining whether plastic material moving along a conveyor obtained from used containers is free of volatiles of contaminants and sorting that material so that the material can be recycled to produce new containers, comprising the steps of:



providing a supply of used containers to the conveyor;

testing each used container for volatiles of contaminants therein;

separating and removing contaminated containers from the conveyor;

breaking each remaining container into pieces of said material, said breaking causing said pieces to be heated to temperatures sufficient to vaporize the contaminants and emit volatiles thereof;

testing said volatiles to determine the presence or absence of said contaminants in said materials;

separating and removing pieces of material containing contaminants from the conveyor;

washing the pieces of materials remaining on the conveyor in a heated fluid to remove a portion of contaminants and to emit detectable levels of volatiles of the contaminants therein;

testing the volatiles of the contaminants from pieces which have been washed to determine the presence or absence of contaminants in the materials; and

separating pieces containing contaminants from those not containing contaminants.

5,688,694

METHOD FOR ESTIMATING THE BIOLOGIC POTENTIAL OF A SELECTED CARCINOMA IN A PATIENT

Michael K. Brawer, Mercer Island, Wash., assignor to University of Washington, Seattle, Wash.

Continuation of Ser. No. 821,120, Jan. 15, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 351,724

Int. Cl.^{6} G01N *33/574;33/483*

U.S. Cl. 436—64 **3 Claims**

1. A method for estimating the biologic potential of a selected carcinoma in a patient, comprising:

obtaining a limited random biopsy sampling of a carcinoma; and

quantifying the vascularity of said biopsy sampling, and therefrom estimating the biologic potential of the selected carcinoma.

5,688,695

OPTICAL METHOD FOR DETERMINATION OF MINUTE AMOUNTS OF OPAQUE INSOLUBLE COLORED LIGHT ABSORPTIVE SUBSTANCES

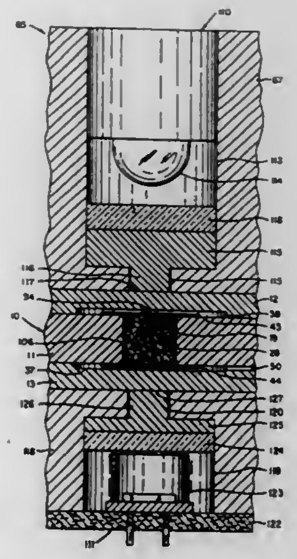
Donald L. Kramer, 1340 SW. 19th Ave., Boca Raton, Fla. 33486

Division of Ser. No. 812,716, Dec. 23, 1991, Pat. No. 5,431,880, which is a continuation-in-part of Ser. No. 559,252, Jul. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 69,960, Jul. 6, 1987, abandoned. This application Jul. 6, 1993, Ser. No. 88,230

Int. Cl.^{6} G01N *21/59*

U.S. Cl. 436—164 **23 Claims**

1. In an optical transmittance type method for the detection of particles of an insoluble substantially opaque substance, the step of bringing into contact such particles and an optical component comprising a matrix of compacted granules of reflective material which is permeable by and substantially nonabsorptive of light and has an initial light scattering coefficient of at least about 80 which affords said component predetermined initial light transmittance capability, the nonabsorptive character of said reflective material permitting transmittance therethrough of incident light without any substantial absorption thereof, the opacity of said particles when in contact with granules of said matrix, masking and preventing any substantial light flow in either direction through the surface areas of said granules contacted by said particles to thereby effect a reduction in the light scattering coefficient of the granules contacted by said particles and thereby a measurable reduction in said light transmittance capability of said optical component.



5,688,696

COMBINATORIAL LIBRARIES HAVING A PREDETERMINED FREQUENCY OF EACH SPECIES OF TEST COMPOUND

Michal Lebl, Oro Valley, Ariz., assignor to Selectide Corporation, Tucson, Ariz.

Filed Dec. 12, 1994, Ser. No. 354,199

Int. Cl.^{6} G01N *33/531;33/543*

U.S. Cl. 436—518 **30 Claims**

1. A method of making a combinatorial library of test compounds which comprises at least two successive iterations of the steps of:

a) selecting a set consisting of two or more types of subunits;

b) dividing a continuous solid phase support having a linker, said linker having reactive sites and having one or more protecting groups, into a number of physically separate pieces of support equal to an integral multiple of the number of selected types of subunits;

c) attaching one type of subunit to substantially all the reactive sites attached to a corresponding piece of solid phase support; and thereafter

d) removing a protecting group from the linker so that reactive sites are provided,

thereby providing at least two subunits attached to each piece of solid phase support, and wherein each piece of solid phase support has a single species of test compound of selected subunits attached to it and each species of test compound is represented on a predetermined number of pieces of solid phase support.

5,688,697

STABILIZED MICROSPHERES AND METHODS OF PREPARATION

Adrien Malick, Granite; Hans H. Feindt, Parkton, and Gerald D. Hahn, Severn, all of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 343,305, Nov. 22, 1994, Pat. No. 5,580,735, which is a division of Ser. No. 1,907, Jan. 4, 1993, Pat. No. 5,393,527. This application May 3, 1996, Ser. No. 642,373

Int. Cl.^{6} G01N *33/531;* **C12Q** *1/00;* **A61K** *37/06*

U.S. Cl. 436—518 **15 Claims**

1. A method of making functionalized microspherical particles comprising:

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- a) preparing a solvent solution comprising a water miscible organic solvent, a liquid silicone compound and an amphiphilic ligand, and;
- b) combining said solvent solution with an aqueous medium to form an oil-in-water microemulsion having as the dispersed phase microspherical particles comprising a liquid silicone core and a monolayer on the surface of the core comprising the amphiphilic ligand.

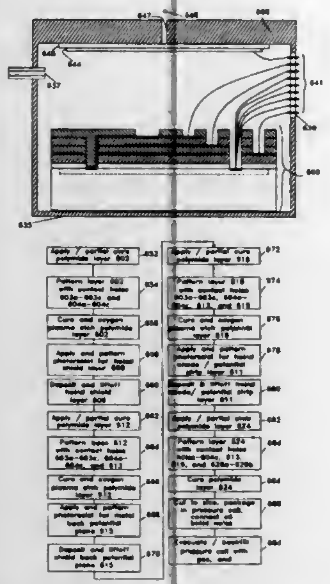
5,688,698
METHOD OF FABRICATING A DEVICE HAVING A WAFER WITH INTEGRATED PROCESSING CIRCUITS THEREON

Douglas S. Robinson; Terrence C. Jensen, and Joseph N. Gray, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Division of Ser. No. 220,913, Mar. 31, 1994, Pat. No. 5,500,534. This application Jun. 7, 1995, Ser. No. 475,331

Int. Cl.^{6} H01L *31/115*

U.S. Cl. 437—3 **12 Claims**



1. A method for fabricating an integrated x-ray detection system, comprising the steps of:

integrating a plurality of active signal processing circuits into a wafer having a corresponding plurality of digital input/output contacts, said plurality of active signal processing circuits receiving pulses at a respective plurality of active signal inputs and processing said pulses to output digital information at said corresponding plurality of digital input/output contacts;

forming an isolating layer over said plurality of active signal processing circuits; and

applying a polyimide layer over said wafer having a plurality of vias, said plurality of vias exposing said plurality of digital input/output contacts; and

fabricating an x-ray detector over said wafer by metal deposition and application of insulating layers at temperatures sufficiently low such that said plurality of active signal processing circuits are not damaged, said x-ray detector having alternating potential strip and a plurality of anodes being electrically coupled to said plurality of active signal processing circuits, wherein said x-ray detector receives x-ray photons and outputs pluses at particular ones of said plurality of anodes closest to said x-ray photons, said active signal processing circuits processing said pulses and outputting digital information indicating locations and energies of said x-ray photons at said plurality of digital input/output contacts, wherein said isolating layer electrically isolates said x-ray detector from said plurality of signal processing circuits.

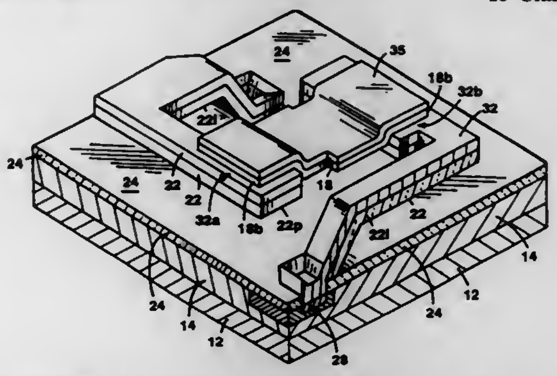
5,688,699
MICROBOLOMETER

Brian T. Cunningham, Stowe, Mass., and Bharat I. Patel, Nashua, N.H., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 16, 1996, Ser. No. 591,198

Int. Cl.^{6} H01L *31/18*

U.S. Cl. 437—3 **15 Claims**



1. A method for forming a bolometer having an infrared sensitive material disposed on a platform elevated over a surface of a semiconductor body, comprising the steps of:

forming a thermally insulating support layer to provide the platform and legs for supporting the platform over the semiconductor body;

patterning a layer of electrically conductive material over the support layer and into electrical connection with contacts for an electronic circuit formed in the semiconductor body, and for electrical connection with the infrared sensitive material;

using the patterned electrically conductive layer as a mask for selectively removing portions of the support layer exposed by the patterned electrically conductive layer while portions of the support layer remain disposed under such patterned electrically conductive layer.

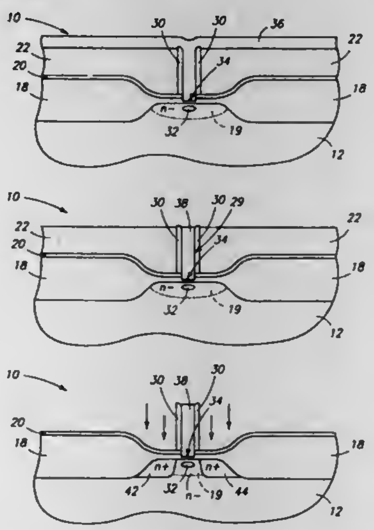
5,688,700
METHOD OF FORMING A FIELD EFFECT TRANSISTOR

David Kao, Meridian, and Yauh-Ching Liu, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Nov. 3, 1995, Ser. No. 552,855

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—29 **22 Claims**



1. A semiconductor processing method of forming a field effect transistor comprising the following steps:

forming an active area region within a substrate;

forming a field isolation region adjacent the active area region;

conducting a blanket LDD implant into the active area region;

after the blanket LDD implant, forming a first layer over the active area region and the field isolation region;

forming a first opening through the first layer, the first opening having a width and a base;

after forming the first opening, forming a nitride-comprising second layer over the first layer and within the first opening to partially fill the first opening and define a second opening within the partially filled first opening;

removing a portion of the second layer from over the first layer and from over the base of the first opening to form a sidewall spacer within the first opening, the sidewall spacer having an inner lateral edge and an opposing outer lateral edge, the outer lateral edge being against the first layer;

conducting a V_t implant into the active area region through the second opening using the first layer and the sidewall spacer as a mask;

forming a gate dielectric layer within the second opening;

after the V_t implant, forming a layer of electrically conductive gate material over the first layer and within the second opening, the layer of electrically conductive material being against an entirety of the inner lateral edge of the sidewall spacer;

removing a portion of the layer of conductive gate material to define a transistor gate within the second opening; and

while the sidewall spacer is adjacent the transistor gate, forming opposing source and drain regions adjacent the transistor gate.

5,688,701
METHOD OF MAKING SEMICONDUCTOR DEVICE HAVING A PLURALITY OF IMPURITY LAYERS

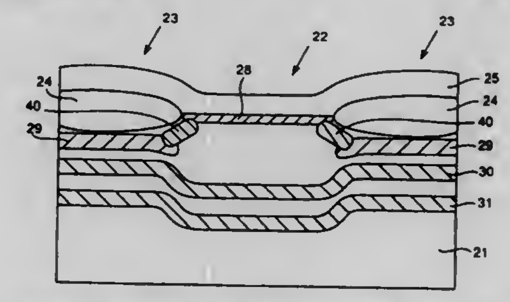
Maiko Kobayashi, and Takashi Kuroi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 339,200, Nov. 10, 1994, Pat. No. 5,543,647. This application Jun. 3, 1996, Ser. No. 657,251

Claims priority, application Japan, Nov. 16, 1993, 5-286884

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—29 **8 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming an isolating insulating film for isolating elements from each other on a main surface of a semiconductor substrate;

forming a mask layer for preventing passage of an impurity, on a main surface of an element forming region surrounded by said isolating insulating film;

forming a first impurity layer only immediately below said isolating insulating film, by ion-implanting an impurity through said isolating insulating film on the main surface of semiconductor substrate having said mask layer;

forming a second impurity layer at a position deeper than said first impurity layer, by ion-implanting an impurity, after removal of said mask layer, through the main surface of said element forming region and through said isolating insulating film;

forming a third impurity layer at a position deeper than said second impurity layer by ion-implanting an impurity through the main surface of said element forming region and through said isolating insulating film; and

forming a fourth impurity layer at a position near the main surface of said element forming region but not below said isolating insulating film.

5,688,702
PROCESS OF MAKING A SEMICONDUCTOR DEVICE USING A SILICON-ON-INSULATOR SUBSTRATE

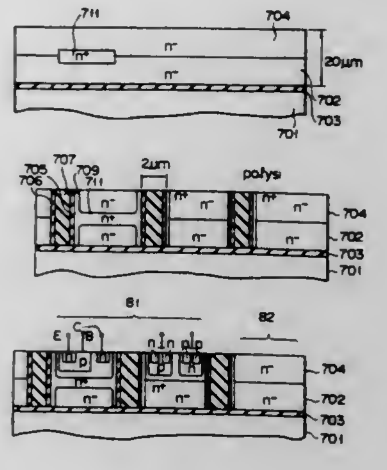
Akio Nakagawa, Hiratsuka; Kazuyoshi Furukawa, Kawasaki; Tsuneo Ogura, and Katsujiro Tanzawa, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 850,964, Mar. 11, 1992, Pat. No. 5,332,920, which is a continuation of Ser. No. 732,575, Jul. 18, 1991, Pat. No. 5,097,314, which is a continuation of Ser. No. 486,395, Feb. 28, 1990, Pat. No. 5,049,968, which is a continuation-in-part of Ser. No. 307,770, Feb. 8, 1989, abandoned. This application Jan. 24, 1994, Ser. No. 188,131

Claims priority, application Japan, Feb. 8, 1988, 63-26787; Sep. 30, 1988, 63-246441; May 16, 1989, 1-122311; Aug. 7, 1989, 1-202936; Dec. 11, 1989, 1-318980

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—33 **7 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a first semiconductor layer containing an impurity on a semiconductor substrate at least the surface of the semiconductor substrate being made of an insulating material;

selectively introducing an impurity into a surface region of said first semiconductor layer to form an impurity region of a first conductivity type in said surface region of the first semiconductor layer so as to leave the first semiconductor layer between said impurity region and said semiconductor substrate, said impurity region having an impurity concentration higher than the impurity concentration of said first semiconductor layer;

forming a second semiconductor layer of the first conductivity type on said first semiconductor layer and on said impurity region;

forming a dielectric isolating region in said first and second semiconductor layers to divide the first and second semiconductor layers into a first element region and a second element region, each of said element regions including a respective portion of said first and of said second semiconductor layers; and

forming a bipolar transistor in said first element region of said first and second semiconductor layers which is isolated by said dielectric isolating region from said second element region, said first element region including said impurity region, wherein said impurity region is bounded laterally by said dielectric isolating region.

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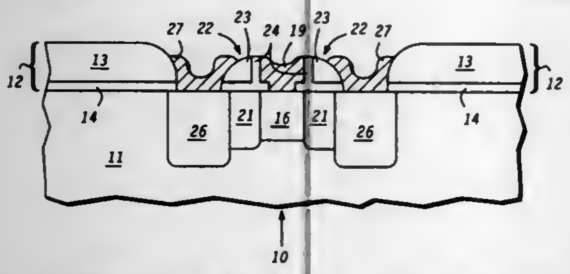
METHOD OF MANUFACTURING A GATE STRUCTURE FOR A METAL SEMICONDUCTOR FIELD EFFECT TRANSISTOR

Lawrence S. Klingbeil, Jr., Chandler, and Marino J. Martinez, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1995, Ser. No. 523,710

Int. Cl.^{6} H01L *21/338*

U.S. Cl. 437—41 **19 Claims**



1. A method of manufacturing a semiconductor device, the method comprising the steps of:

providing a substrate;
implanting ions into the substrate to create a channel region in the substrate;
providing a dielectric layer comprised of a metal on the substrate after implanting the ions;
removing a portion of the dielectric layer to expose a portion of the substrate; and
providing a gate layer on the dielectric layer and over the portion of the substrate, wherein the step of providing the gate layer includes providing the gate layer on the dielectric layer before providing a different layer on the dielectric layer.

5,688,704

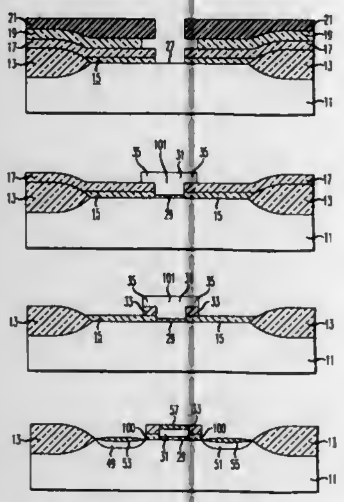
INTERGRATED CIRCUIT FABRICATION

Chun-Ting Liu, Berkeley Heights, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 30, 1995, Ser. No. 565,286

Int. Cl.^{6} H01L *21/8232*

U.S. Cl. 437—41 **6 Claims**



1. A method of semiconductor integrated circuit fabrication comprising:

forming first and second material layers overlying a substrate;
forming a channel through said first and second layers;
isotropically etching said second layer, thereby creating two cavities adjacent said channel;
depositing a conductive material in said channel and said cavities; thereby forming a structure having a generally "T" shape; having two arms and a central portion;
removing said second layer;
anisotropically etching said first layer; thereby forming rectangular spacers comprised of said first material; and
removing said two arms of said "T" shaped structure, at least some of said central portion of said structure remaining, thereby exposing said rectangular spacers.

5,688,705

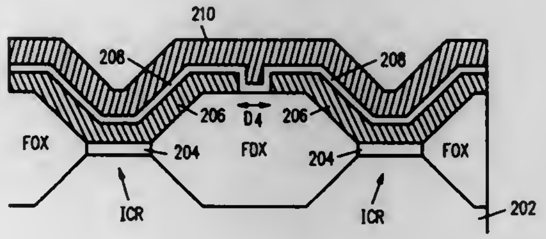
METHOD FOR REDUCING THE SPACING BETWEEN THE HORIZONTALLY ADJACENT FLOATING GATES OF A FLASH EPROM ARRAY

Albert Bergemont, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 292,414, Aug. 18, 1994, abandoned, which is a division of Ser. No. 197,737, Feb. 17, 1994, abandoned. This application Aug. 21, 1996, Ser. No. 701,003

Int. Cl.^{6} H01L *21/8247*

U.S. Cl. 437—43 **6 Claims**



1. A method of fabricating the array of a high-density flash electrically programmable read-only-memory (EPROM) on a semiconductor material, the method comprising the steps of:

forming a plurality of spaced-apart field oxide regions on the semiconductor material;
forming a layer of gate dielectric material on the semiconductor material;
forming a layer of conductive material over the layer of gate dielectric material and the field oxide regions;
forming a layer of first sacrificial material over the layer of conductive material;
forming a layer of second sacrificial material over the layer of first sacrificial material;
etching away selected portions of the layer of second sacrificial material and the underlying layer of first sacrificial material to expose a region of the layer of conductive material formed over the field oxide regions, thereby defining an exposed region of conductive material, the etching away step forming sidewalls to the layer of second sacrificial material and the layer of first sacrificial material;
forming a first layer of insulation material over the layer of second sacrificial material, the sidewalls to the layer of second sacrificial material, the sidewalls to the layer of first sacrificial material, and the exposed region of conductive material;
etching away the layer of first insulation material from the surface of the second sacrificial material and from a central portion of each exposed region of conductive material to form a plurality of spacers and to expose the central portion of each exposed region, thereby defining an exposed central portion of conductive material; and
simultaneously etching away the layer of second sacrificial material and the exposed central portion of each exposed region of conductive material until a portion of the field oxide region has been exposed and the layer of second sacrificial material has been substantially removed from the layer of first sacrificial material.

5,688,706

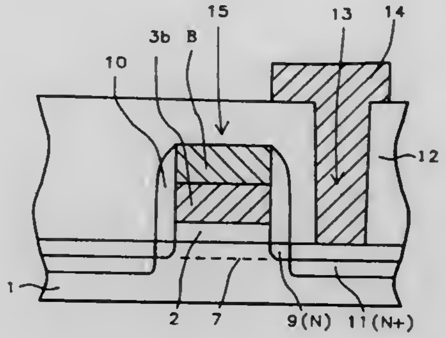
METHOD FOR FABRICATING A MOSFET DEVICE, WITH LOCAL CHANNEL DOPING, SELF ALIGNED TO A SELECTIVELY DEPOSITED TUNGSTEN GATE

Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Aug. 1, 1996, Ser. No. 691,290

Int. Cl.^{6} H01L *21/266*

U.S. Cl. 437—45 **20 Claims**



1. A method of fabricating a MOSFET device, on a semiconductor substrate, with a narrow metal-polysilicon gate structure, self aligned to a local, narrow threshold voltage adjust region, comprising the steps of:

growing a first insulator layer, to be used as a gate insulator layer, on said semiconductor substrate;
depositing a polysilicon layer on said gate insulator layer;
depositing a second insulator layer on said polysilicon layer;
forming a photoresist pattern on said second insulator layer, with a narrow opening in said photoresist pattern, exposing top surface of said polysilicon layer;
forming a narrow hole opening, in said second insulator layer, by removing said second insulator layer from said narrow opening in said photoresist pattern;
ion implanting a first conductivity imparting dopant, through said polysilicon layer, through said gate insulator layer, and into an area of said semiconductor substrate, defined by said narrow hole opening, to create said local, narrow threshold voltage adjust region;
selectively depositing a first metal layer on the top surface of said polysilicon layer, exposed in said narrow hole opening in said second insulator layer, forming a narrow metal gate structure, overlying said polysilicon layer, in said narrow hole opening;
removal of said second insulator layer, from the top surface of said polysilicon layer;
patterning of said polysilicon layer, using said narrow metal gate structure as a mask, to create said narrow metal-polysilicon gate structure, comprised of overlying, said narrow metal gate structure, and underlying, narrow polysilicon gate structure, with said narrow metal-polysilicon gate structure, overlying, and self aligned to, said local, narrow threshold voltage adjust region; and
forming lightly doped source and drain regions, an insulator spacer, and heavily doped source and drain regions, adjacent to said narrow metal-polysilicon gate structure.

5,688,707

METHOD FOR MANUFACTURING FIELD EMITTER ARRAYS

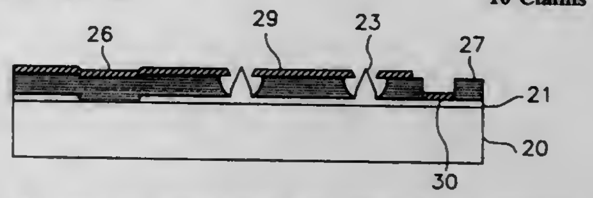
Jong Duk Lee, Department of Electronics Engineering, College of Engineering, Seoul National University, Shin Lim-dong, Kwanak-ku, and Hyung Soo Uh, both of Seoul, Rep. of Korea, assignors to Korea Information & Communication Co., Ltd., and Jong Duk Lee, both of Seoul, Rep. of Korea

Filed Jun. 11, 1996, Ser. No. 661,458

Claims priority, application Rep. of Korea, Jun. 12, 1995, 1995-15449

Int. Cl.^{6} H01L *21/465*

U.S. Cl. 437—51 **10 Claims**



1. A method for manufacturing field emitter arrays, comprising the steps of;

forming a n^+-layer in a polycrystalline or amorphous silicon layer deposited on an insulating substrate;
making an oxide layer disk pattern on said silicon layer;
etching said silicon layer isotropically using said oxide layer disk pattern as a mask;
forming a silicon oxide layer on the upper part of said silicon layer by means of the first oxidation thereof, which results in cone-shaped field emitter tips;
making hollows for insulating pixels from neighboring ones;
depositing a silicon nitride layer with a predetermined thickness on said silicon oxide layer;
removing said silicon nitride layer except that of the side-wall parts around said field emitter tips;
forming a gate insulating layer by means of the second oxidation;
removing said silicon nitride layer of said sidewall parts around said tips;
making contact window by removing the parts of said silicon oxide layer for cathode contact with an external driving circuit;
depositing gate metal on said gate insulating layers to form gate electrode and cathode contact simultaneously;
etching away said oxide layers around said field emitter tips and said metal deposited thereon; and,
patterning gate electrode and cathode contact by removing unnecessary parts of said gate metal.

5,688,708

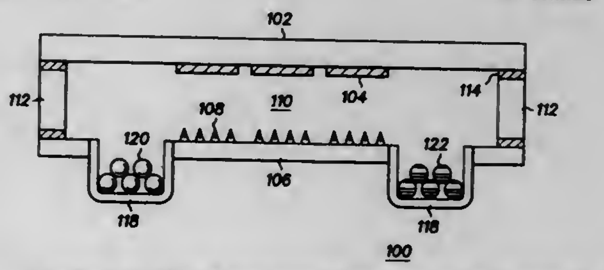
METHOD OF MAKING AN ULTRA-HIGH VACUUM FIELD EMISSION DISPLAY

Yumiko Kato, Mesa, and Ronald O. Petersen, Phoenix, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Jun. 24, 1996, Ser. No. 669,204

Int. Cl.^{6} H01L *21/60*

U.S. Cl. 437—51 **12 Claims**



1. A method for fabricating an ultra-high vacuum field emission display, the method including the steps of:

providing a cathode;
providing an anode;

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- providing a plurality of side members;
- affixing the side members to the cathode and the anode so that the cathode, the anode, and the side members define an interspace region and provide a package;
- providing a first non-evaporable getter material in communication with the interspace region, the first nonevaporable getter material having an activation temperature;
- providing within the interspace region a vacuum having a value less than 10^{-5} Torr; and
- concurrent with the steps of affixing the side members and providing a vacuum, activating the first non-evaporable getter material thereby removing gaseous species outgassed during the steps of affixing the side members and providing a vacuum.

5,688,709

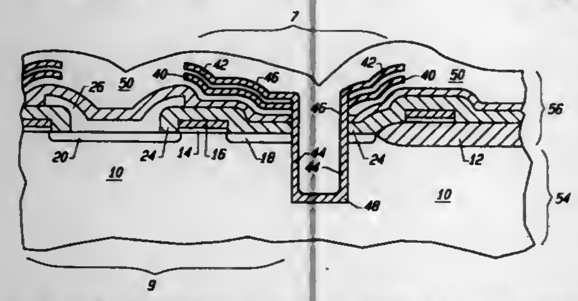
METHOD FOR FORMING COMPOSITE TRENCH-FIN CAPACITORS FOR DRAMS

Michael D. Rostoker, Boulder Creek, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Feb. 14, 1996, Ser. No. 604,867

Int. Cl.⁶ H01L *21/8242*

U.S. Cl. 437—52 **4 Claims**



1. A method of forming a memory cell on a semiconductor subtrate having an upper surface, the method comprising the following steps:

- forming a transistor, including (i) a gate on said upper surface of the semiconductor substrate, (ii) a source region in said semiconductor substrate, and (iii) a drain region in said semiconductor substrate;
- forming a passivation layer over said transistor;
- depositing alternating layers of a sacrificial material and a conductive electrode material;
- etching a trench through said alternating layers and said passivation layer and into said substrate, such that said trench contacts the source region;
- conformally depositing a top layer of said conductive electrode material in said trench and over a top layer of said sacrificial material located outside of the said trench;
- selectively etching to define fin edges of a cell capacitor;
- etching away said layers of said of sacrificial material to expose fins of composite trench-fin capacitor;
- forming a layer of dielectric material on exposed regions of said conductive electrode material; and
- forming a second electrode surrounding said fins.

5,688,710

METHOD OF FABRICATING A TWIN - WELL CMOS DEVICE

Bing-Yau Lu, Taipei, Taiwan, assignor to Holtek Microelectronics, Inc., Hsinchu, Taiwan

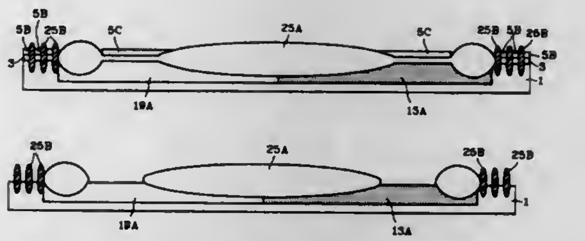
Filed Nov. 27, 1996, Ser. No. 757,179

Int. Cl.⁶ H01L *27/00*

U.S. Cl. 437—57 **9 Claims**

1. A method of fabricating a twin-well integrated circuit device, said method comprising the steps of:

(a) forming a pad oxide layer on a P-type semiconductor silicon substrate;



(b) forming a nitride layer overlaying said pad oxide layer;

(c) forming an alignment mark photoresist pattern overlaying said nitride layer by lithography wherein said alignment mark photoresist pattern is in a clear field, while other regions are in a dark field;

(d) partially etching said nitride layer to form a nitride alignment mark pattern by using alignment mark photoresist pattern as a mask;

(e) stripping said alignment photoresist pattern;

(f) forming a N-well photoresist pattern by lithography;

(g) ion-implanting N-type dopants through said pad oxide layer and said nitride layer into said P-type semiconductor substrate to form an N-doped region;

(h) removing said N-well photoresist pattern;

(i) forming a P-well photoresist pattern by lithography;

(j) ion-implanting P-type dopants through said pad oxide layer and said nitride layer into said P-type semiconductor silicon substrate to form a P-doped region;

(k) removing said P-well photoresist pattern;

(l) first thermally driving in for activating said dopants inside said N-doped and P-doped regions to form N-well and P-well regions;

(m) forming an active region photoresist pattern by lithography;

(n) partially etching said nitride layer to form an opening window, wherein said opening window is between said N-well and P-well regions;

(o) forming the second P-well photoresist pattern by lithography;

(p) deep ion-implanting P-type dopants into said P-well regions;

(q) removing said second P-well photoresist pattern;

(r) second thermally driving in for activating said deep implanted P-type dopants inside said P-well regions, and forming a field oxide region therein said opening window for isolation spontaneously; and

(s) removing a remaining part of said pad oxide layer and said nitride layer.

5,688,711

MONOLITHIC MULTILAYER ULTRA THIN CHIP INDUCTORS AND METHOD FOR MAKING SAME

Herman R. Person; Jeffrey T. Adelman, both of Columbus, Nebr.; Bruce A. Tschosik, Yankton, S. Dak.; Thomas L. Veik, and Scott D. Zwick, both of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

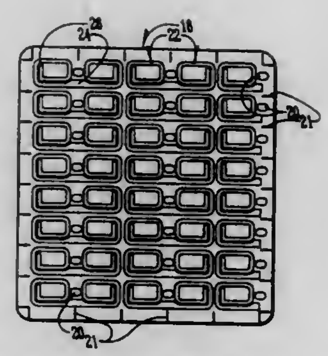
Division of Ser. No. 548,555, Oct. 26, 1995, Pat. No. 5,614,757. This application May 10, 1996, Ser. No. 643,308

Int. Cl.⁶ H01L *21/70*

U.S. Cl. 437—60 **7 Claims**

1. A method of making a monolithic multilayer inductor comprising the steps of:

- selecting a desired number of loop turns in the inductor;
- constructing a bottom coil layer having a first end extending proximate an edge of the inductor to form a first termination and a second end defining a connection end;
- selecting a top coil layer from a set of coil layers each having a different number of turns such that the sum of the number of turns of the bottom coil layer and the top coil layer is approximately the number of turns desired, said top coil having a first end extending proximate an edge of the inductor to form a second termination and a second end defining a connection end corresponding to the connection end of the bottom coil layer;



- constructing the selected top coil layer; and
- electrically connecting the corresponding connection ends of each adjacent coil layer to form a continuous coil from the bottom coil layer to the top coil layer.

5,688,712

PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE

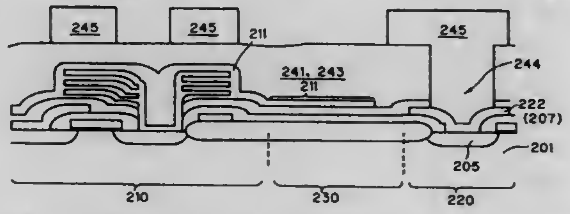
Taiji Ema, and Toshimi Ikeda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 376,082, Jan. 20, 1995, Pat. No. 5,550,395, which is a continuation of Ser. No. 46,149, Apr. 15, 1993, abandoned. This application May 7, 1996, Ser. No. 643,938

Claims priority, application Japan, Apr. 16, 1992, 4-096726; Oct. 9, 1992, 4-271622

Int. Cl.⁶ H01L *21/70*

U.S. Cl. 437—60 **8 Claims**



1. A process of producing a semiconductor device, said process comprising the steps of:

- defining a first area and a second area with a boundary area therebetween on a semiconductor substrate;
- forming a first electronic element on the first and second areas;
- forming a second electronic element only on the first area;
- forming a first conductive layer extending from the first area to the boundary area;
- forming a first insulating layer entirely on the substrate;
- removing the portion of the first insulating layer that covers the first area, and thereby, exposing the first conductive layer;
- forming a second insulating layer entirely on the substrate;
- selectively, removing the first and second insulating layers to form a throughhole; and
- forming a second conductive layer extending from the first area to the second area.

5,688,713

METHOD OF MANUFACTURING A DRAM CELL HAVING A DOUBLE-CROWN CAPACITOR USING POLYSILICON AND NITRIDE SPACERS

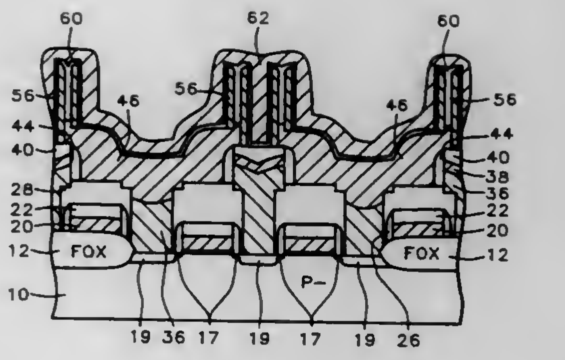
Kung Linliu; Erik Syangywan Jeng, and Tzu-Shih Yen, all of Taipei, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Aug. 26, 1996, Ser. No. 703,254

Int. Cl.⁶ H01L *21/8242*

U.S. Cl. 437—60 **20 Claims**

1. A method for fabricating an array of double-crown storage capacitors on a semiconductor substrate, comprising the steps of:



- providing a semiconductor substrate having device areas surrounded and electrically isolated from each other by field oxide areas and further providing field effect transistors having gate electrodes formed from a patterned first polycide layer and a first insulating layer and having sidewall spacers formed from a second insulating layer and having source/drain areas adjacent to said gate electrodes in said device areas;
- depositing a third insulating layer having a planar surface;
- depositing a first polysilicon layer on said third insulating layer;
- patterning said first polysilicon layer by anisotropic plasma etching and partially etching into said third insulating layer over said device areas adjacent to said gate electrodes forming first recessed areas;
- depositing a conformal second polysilicon layer and anisotropically etching back thereby forming polysilicon spacers on the sidewalls of said first recessed areas;
- anisotropically etching said third insulating layer in said first recessed areas thereby forming concurrently bit line contact openings and capacitor node contact openings;
- depositing a third polysilicon layer thereby filling said contact openings;
- depositing a silicide layer on said third polysilicon layer;
- depositing a silicon nitride layer on said silicide layer;
- patterning said silicon nitride layer, said silicide layer, and said third polysilicon layer thereby forming bit lines and concurrently forming node contacts for said capacitors;
- depositing a conformal second silicon nitride layer and anisotropically etching back to form silicon nitride spacers on said bit lines;
- depositing a fourth polysilicon layer on said substrate;
- depositing a fourth insulating layer on said fourth polysilicon layer and planarizing said fourth insulating layer;
- patterning said fourth insulating layer by photoresist masking and anisotropically etching partially into said fourth insulating layer leaving unetched portions over said node contacts forming second recessed areas elsewhere on said substrate;
- depositing a conformal fifth polysilicon layer and anisotropically etching back to form polysilicon spacers on the sidewalls of said second recessed areas;
- anisotropically etching said fourth insulating layer to said fourth polysilicon layer using said polysilicon spacers as an etch mask thereby forming narrow vertical insulating regions under said polysilicon spacers;
- removing said polysilicon spacers and also removing said fourth polysilicon layer to said first silicon nitride layer;
- depositing a conformal sixth polysilicon layer;
- anisotropically blanket etching said sixth polysilicon layer thereby forming polysilicon double-crown sidewall spacers on said narrow vertical insulating regions;
- selectively etching said narrow vertical insulating regions thereby forming an array of bottom electrodes for said double-crown capacitors;
- depositing a thin interelectrode dielectric layer on said bottom electrodes;
- depositing a conducting layer on said dielectric layer thereby completing said double-crown capacitors.

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5,688,714

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE HAVING A TOP LAYER AND BASE LAYER JOINED BY WAFER BONDING

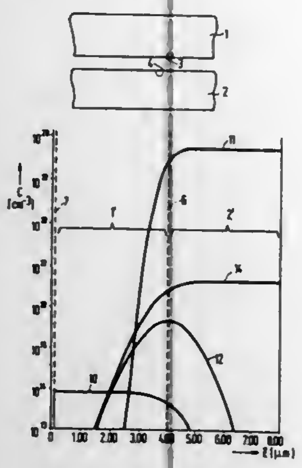
Franciscus P. Widdershoven; Jan Haisma; Arie J. R. De Kock, and Aart A. Van Gorkum, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 679,978, Apr. 3, 1991, abandoned. This application Mar. 7, 1996, Ser. No. 612,201

Claims priority, application Netherlands, Apr. 24, 1990, 9000972

Int. Cl.^{6} H01L *21/38*

U.S. Cl. 437—160 **11 Claims**



1. A method of manufacturing a silicon body having a weakly doped n-type top layer and an adjoining highly doped n-type base layer, comprising the steps of:

- providing a doped first n-type silicon slice with a doping concentration of less than about 10^{15} cm^{-3}, said first silicon slice having a polished surface;
- providing a doped second n-type silicon slice with a doping concentration greater than the doping concentration of the first silicon slice, the second silicon slice having a phosphorous doping as a first doping impurity and either an antimony or arsenic doping as a second doping impurity at a doping concentration greater than the phosphorous doping concentration, said second silicon slice also having a polished surface;
- bringing the polished surfaces of the first and second silicon slices into contact with each other and heating said first and second silicon slices while the polished surfaces are in contact with each other at a temperature and for a time sufficient to bond said polished surfaces, said temperature and time being sufficiently high also to diffuse the phosphorous first doping impurity from the second silicon slice into the first silicon slice to form a boundary layer in the first silicon slice having a doping concentration higher than the doping concentration elsewhere in the first silicon slice, the boundary layer assuring a low contact resistance between the first and second silicon slices, the phosphorous first doping impurity having a doping concentration sufficiently high to overdope any boron diffusion into the boundary layer from boron contamination of the polished surfaces, the second doping impurity diffusing more slowly than phosphorous into the boundary layer to provide a steep doping concentration profile between the first and second silicon slices.

5,688,715

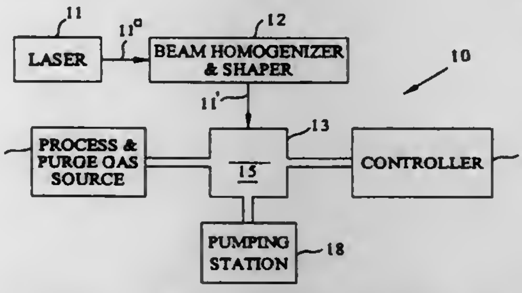
EXCIMER LASER DOPANT ACTIVATION OF BACKSIDE ILLUMINATED CCD'S

Douglas A. Sexton; Stephen D. Russell; Ronald E. Reedy, all of San Diego, and Eugene P. Kelley, Spring Valley, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 171,326, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 591,930, Oct. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 501,707, Mar. 29, 1990, Pat. No. 5,385,633, and a continuation-in-part of Ser. No. 508,317, Apr. 10, 1990, Pat. No. 5,354,420. This application Aug. 14, 1995, Ser. No. 514,922

Int. Cl.^{6} H01L *21/263*

U.S. Cl. 437—173 **5 Claims**



1. A method of effecting a dopant concentration in a CCD formed on a substrate for enhancing spectral response and reducing dark current a pixel array of the CCD comprising the steps of:

- introducing a dopant at a back surface of the substrate;
- illuminating the back surface of the substrate with a beam of energy pulses having a substantially homogeneous intensity over the pixel array and an appropriate wavelength to activate the dopant in a region extending from the back surface of the substrate to the pixel array and to form a concentration of activated dopant within the region that is highest at the back surface of the substrate and decreases with depth; and
- maintaining the CCD at a temperature to avoid heating the substrate outside the region of activated dopant during the step of illuminating the back surface of the substrate.

5,688,716

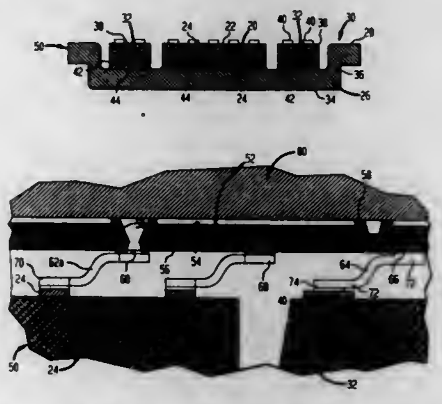
FAN-OUT SEMICONDUCTOR CHIP ASSEMBLY

Thomas H. DiStefano, Monte Sereno; John W. Smith, Palo Alto, both of Calif., and Tony Faraci, Georgetown, Tex., assignors to Tessera, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 440,665, May 15, 1995, which is a division of Ser. No. 271,768, Jul. 7, 1994, Pat. No. 5,518,964. This application May 24, 1996, Ser. No. 653,016

Int. Cl.^{6} H01L *21/44;21/60*

U.S. Cl. 437—182 **17 Claims**



1. A method of making a semiconductor chip assembly comprising the steps of:

(a) providing a subassembly including a semiconductor chip having a front surface and having contacts on the front surface, and a package element attached to the chip so that a peripheral region of the package element projects outwardly away from the chip in horizontal directions generally parallel to the front face of the chip;

(b) providing a dielectric element having top and bottom surfaces and terminals on the top surface, and positioning the dielectric element to overlie the subassembly with the top surface and terminals facing away from the chip and package element, with a central region of the dielectric element disposed adjacent the chip and with a peripheral region of the dielectric element carrying at least some of the terminals overlying the peripheral region of the package element;

(c) providing first leads attached to the chip at one end thereof and to the dielectric element at the other end thereof, the first leads being electrically connected between the contacts of the chip and the terminals on the dielectric element; and

(d) moving the dielectric element and chip relative to one another through a predetermined displacement so that the dielectric element moves with a vertical component of motion away from the chip, and so that the first leads are bent to a configuration in which each said first lead is flexible; and

(e) injecting a curable liquid beneath the dielectric element and curing the liquid to form a compliant layer supporting the dielectric element above the chip and package element.

5,688,717

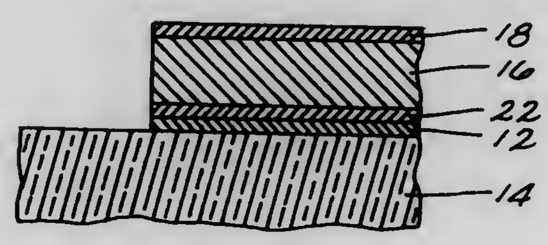
CONSTRUCTION THAT PREVENTS THE UNDERCUT OF INTERCONNECT LINES IN PLASMA METAL ETCH SYSTEMS

Lewis Shen, Cupertino; Sheshadri Ramaswami, San Jose; Mark Chang, Los Altos, and Robin Cheung, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 250,985, May 31, 1994, abandoned. This application Nov. 30, 1995, Ser. No. 565,308

Int. Cl.^{6} H01L *21/28*

U.S. Cl. 437—190 **15 Claims**



1. An improvement in a process for reducing re-entrant undercutting of aluminum on titanium interconnect conducting lines formed over a semiconductor substrate, said process comprising:

- forming an inter-metal layer dielectric consisting essentially of an oxide; and
- forming a patterned multi-layer structure on said inter-metal layer dielectric, said patterned multi-layer structure comprising a titanium nitride anti-reflection layer formed on an aluminum layer formed on a titanium layer formed on said oxide layer, the improvement consisting essentially of:

(a) depositing in either order on said oxide to form said inter-metal layer dielectric (1) a layer consisting essentially of nitrogen and titanium and (2) said titanium layer, thereby forming a titanium-containing layer;

(b) depositing said aluminum layer on said titanium-containing layer;

(c) depositing said titanium nitride anti-reflection layer on said aluminum layer; and

(d) patterning and etching all metal-containing layers to form said interconnect conducting lines.

5,688,718

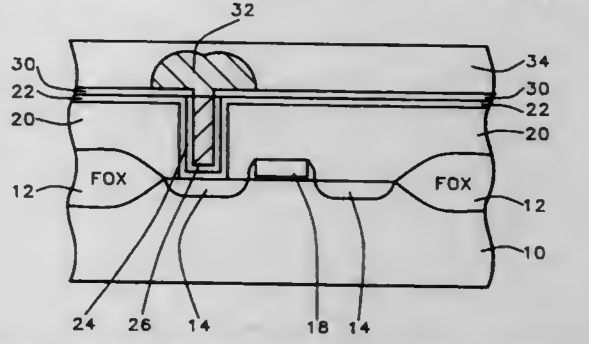
METHOD OF CVD TIN BARRIER LAYER INTEGRATION

Shaulin Shue, Hsinchu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd, Hsin-Chu, Taiwan

Filed Feb. 3, 1997, Ser. No. 794,598

Int. Cl.^{6} H01L *21/283*

U.S. Cl. 437—190 **23 Claims**



16. A method of metallization in the fabrication of an integrated circuit device comprising:

- providing semiconductor device structures in and on a semiconductor substrate;
- depositing an insulating layer overlying said semiconductor device structures;
- etching an opening through said insulating layer to contact one of said semiconductor device structures;
- depositing a first titanium glue layer overlying said insulating layer and within said opening;
- depositing a titanium nitride barrier layer overlying said first titanium glue layer by chemical vapor deposition;
- depositing a first metal layer overlying said barrier layer and filling said opening;
- etching back said first metal layer to leave said first metal layer only within said opening whereby a portion of said first titanium glue layer is exposed;
- depositing a second titanium layer overlying said exposed first titanium glue layer;
- thereafter annealing said substrate to form a titanium nitride protection layer on said second titanium glue layer;
- thereafter cleaning said substrate wherein said protection layer prevents oxidation of said first and second titanium glue layers; and
- depositing a second metal layer overlying said first metal layer and patterning said second metal layer to complete said metallization in the fabrication of said integrated circuit device.

5,688,719

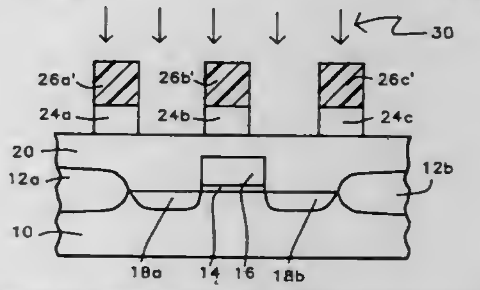
METHOD FOR PLASMA HARDENING OF PATTERNED PHOTORESIST LAYERS

Chia-Shiung Tsai, Shuang-Hsi, and Sung-Mu Hsu, I-Lan, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd, Hsin-Chu, Taiwan

Filed Jun. 7, 1996, Ser. No. 660,303

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—194 **19 Claims**



1. A method for plasma hardening a patterned photoresist layer comprising:

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providing a semiconductor substrate;
forming over the semiconductor substrate a patterned photoresist layer; and
treating the patterned photoresist layer with a helium-hydrogen plasma, without baking the patterned photoresist layer, to form from the patterned photoresist layer a plasma hardened patterned photoresist layer.

5,688,720
METHOD OF FLATTENING THE SURFACE OF A SEMICONDUCTOR DEVICE BY POLISHING

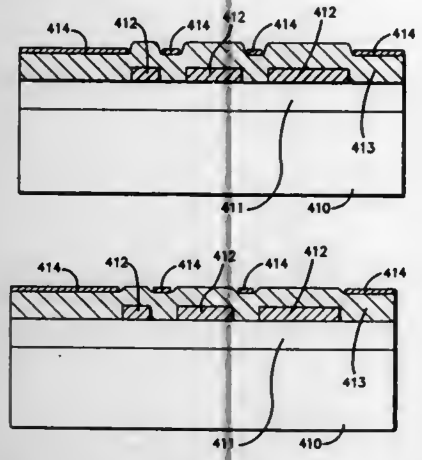
Yoshihiro Hayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 34,167, Mar. 17, 1993, abandoned. This application Apr. 2, 1996, Ser. No. 626,755

Claims priority, application Japan, Apr. 15, 1992, 4-094677

Int. Cl.⁶ H01L *21/304*

U.S. Cl. 437—195 **15 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:
covering a semiconductor substrate with an insulating layer, said semiconductor substrate having a convex pattern, said insulating layer thereby having a surface including a convex portion and a concave portion around said convex portion;
depositing a protection insulating film on said surface of said insulating layer, said protection insulating film being lower in polishing rate than said insulating layer;
selectively removing said protection insulating film to form a patterned protection insulating film, said patterned protection insulating film covering said concave portion of said surface of said insulating layer, and said convex portion of the surface of said insulating layer being exposed without being covered with said patterned protection insulating film; and
polishing said convex portion of the surface of said insulating layer without completely removing said convex portion of said insulating layer while protecting said concave portion of said surface of said insulating layer by said patterned protection insulating film.

5,688,721
3D STACK OF IC CHIPS HAVING LEADS REACHED BY VIAS THROUGH PASSIVATION COVERING ACCESS PLANE

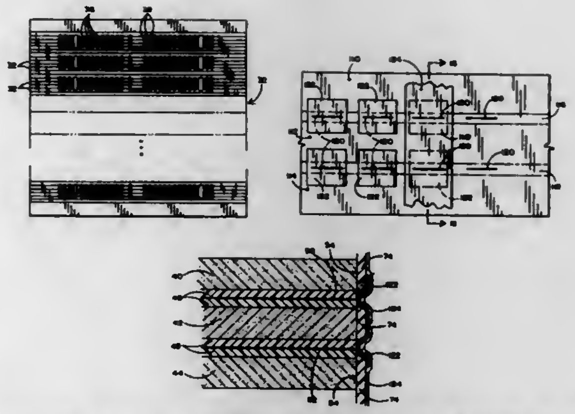
Tony K. Johnson, Irvine, Calif., assignor to Irvine Sensors Corporation, Costa Mesa, Calif.

Continuation of Ser. No. 213,149, Mar. 15, 1994, abandoned. This application Mar. 26, 1996, Ser. No. 622,671

Int. Cl.⁶ H01L *21/283;21/56;21/60;21/70*

U.S. Cl. 437—203 **20 Claims**

1. A process of forming a unitary stack of IC chips containing integrated circuitry as part of a dense electronic package having an access plane, comprising these steps;



forming a plurality of individual IC chips for inclusion in the stack, each having at least one access plane edge;
forming layers of dielectric material for separating and insulating each chip from adjacent chips in the stack;
embedding conductive traces in the dielectric material between each pair of adjacent chips, said traces electrically connecting the integrated circuitry to the access plane;
including adhesive material between a layer of dielectric material and an adjacent chip;
stacking the chips;
causing the adhesive material to hold the stack as an integrated structure;
said structure having an access plane provided by coplanar edges of the stacked chips and coplanar edges of the dielectric chip-separating layers, at which access plane ends of the embedded traces are exposed;
forming a separate dielectric layer on top of the access plane;
removing material from certain areas of said separate dielectric layer to form openings which reach down to the access plane ends of the traces; and
depositing metalization on the access plane to provide terminal connections for the traces;
the conductive traces embedded between each pair of adjacent chips in the stack being spaced from each adjacent chip by a dielectric material sufficiently thick to ensure that the openings which reach down to the access plane ends of the traces do not uncover any portion of any chip surface.

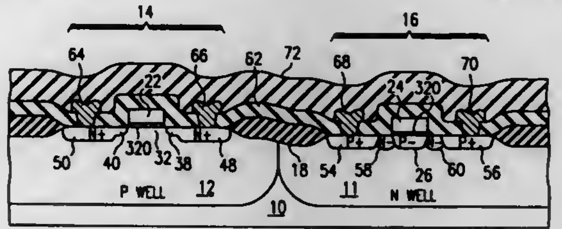
5,688,722
CMOS INTEGRATED CIRCUIT WITH REDUCED SUSCEPTIBILITY TO PMOS PUNCHTHROUGH

Thomas E. Harrington, III, Carrollton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 769,144, Sep. 27, 1991, Pat. No. 5,122,474, which is a continuation of Ser. No. 700,354, May 7, 1991, abandoned, which is a continuation of Ser. No. 555,556, Jul. 18, 1990, abandoned, which is a division of Ser. No. 372,077, Jun. 27, 1989, Pat. No. 4,943,537, which is a continuation-in-part of Ser. No. 210,242, Jun. 23, 1988, Pat. No. 4,906,588. This application Jun. 16, 1992, Ser. No. 899,409

Int. Cl.⁶ H01L *21/336;21/8238*

U.S. Cl. 438—217 **6 Claims**



1. A method for fabricating a CMOS integrated circuit, comprising the steps of:
a.) providing a semiconductor body with monocrystalline semiconductor well regions near the surface thereof, first ones of said well regions being predominantly doped P-type, and

second ones of said well regions being predominantly doped N-type, isolation regions being disposed to prevent conduction between ones of said well regions;
b.) implanting a dosage of acceptor dopants into said second well regions which is sufficient to set the threshold voltage of PMOS transistors to an approximately predetermined value, said implanting being performed with a stopping distance which is selected to provide a predetermined buried channel depth;
c.) providing a gate dielectric layer over said well regions, and forming a thin film gate electrode in a predetermined pattern over said semiconductor body, some portions of said gate electrode extending over portions of said first well regions to define NMOS channel regions therein, and other portions of said gate electrode extending over portions of said second well regions to define PMOS channel regions therein;
d.) encapsulating all exposed surfaces of said gate electrode;
e.) implanting donor dopants into both said first and second well regions, to form N-type lateral field isolation regions near the surface of said second well regions adjacent to said PMOS channel regions therein said implanting step being performed with a stopping depth which will provide a maximum net concentration of N-type dopants at approximately the same depth as said buried channel depth;
f.) introducing donor dopants into said first well regions only, to form lightly-doped-drain-extension regions near the surface of said first well regions adjacent to said NMOS channel regions therein;
g.) forming spacer filaments on the sidewalls of said gate electrode;
h.) forming P-type source/drain regions in portions of said second well regions which are not covered by said gate electrode nor by said spacer filaments, ones of said PMOS channel regions being separated from respectively adjacent ones of said P-type source/drain regions by respective ones of said lateral field isolation regions; and
i.) forming N-type source/drain regions in portions of said first well regions which are not covered by said gate electrode nor by said spacer filaments, ones of said NMOS channel regions being separated from respectively adjacent ones of said N-type source/drain regions by respective ones of said lightly-doped-drain extension regions;
wherein said step d) is performed before said steps e) and f).

5,688,723
METHOD OF FORMING FINE PATTERNS

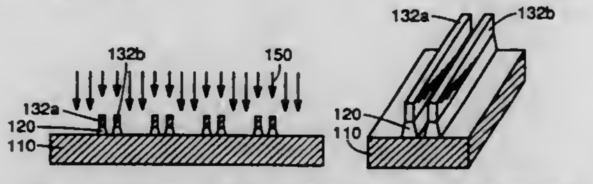
Chikayuki Okamoto; Tadashi Nishioka, and Satoru Kawazu, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Hyogo, both of Japan

Division of Ser. No. 395,025, Feb. 27, 1995, Pat. No. 5,595,941. This application Oct. 4, 1996, Ser. No. 726,235

Claims priority, application Japan, Jun. 1, 1994, 6-120054

Int. Cl.⁶ H01L *21/30*

U.S. Cl. 437—228 **2 Claims**



1. A method of forming a fine pattern, comprising the steps of:
forming an object layer on a support member;
forming on said object layer patterned resist having one sidewall and the other sidewall opposite to each other;
etching away the portion of said object layer excluding the portion immediately below said patterned resist, using said patterned resist as mask, thereby forming a pattern of said object while reforming said one sidewall and the other sidewall of said patterned resist, thereby forming a first sidewall reformed portion on said one sidewall of said patterned resist and a second sidewall reformed portion on said the other sidewall of said patterned resist;
removing the not reformed portion of said patterned resist, thereby leaving said first sidewall reformed portion and said second sidewall reformed portion on said pattern of the object;
etching away the portion of said pattern of the object excluding the portion immediately below said first and second sidewall reformed portions, using said first and second sidewall reformed portions as mask, thereby forming a finer pattern of said object; and
removing said first and second sidewall reformed portions.

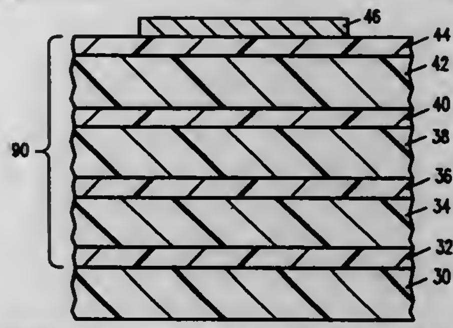
5,688,724
METHOD OF PROVIDING A DIELECTRIC STRUCTURE FOR SEMICONDUCTOR DEVICES

Euisik Yoon, Sunnyvale; Ronald P. Kovacs, Mountain View, and Michael E. Thomas, Milpitas, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 88,312, Jul. 7, 1993, abandoned, which is a division of Ser. No. 907,915, Jul. 2, 1992, abandoned. This application Dec. 23, 1994, Ser. No. 363,972

Int. Cl.⁶ H01L *21/02*

U.S. Cl. 437—235 **18 Claims**



1. A method of providing a dielectric structure on a substrate, comprising the steps of:
(a) providing a first layer of a primary dielectric on the substrate, said primary dielectric being a metal oxide having a high dielectric constant selected from the group consisting of Ta_2O_5, TiO_2, Nb_2O_5 and Al_2O_3;
(b) providing a first secondary dielectric layer on said first primary dielectric layer;
(c) annealing said first primary dielectric layer in an oxygen-bearing ambient:
(d) providing a second layer of said primary dielectric on said first secondary dielectric layer;
(e) providing a second layer of said secondary dielectric on said second primary dielectric layer; and
(f) annealing said second layer of said primary dielectric;
wherein after said step of annealing each of said layers of said primary dielectric has a polycrystalline structure characterized by mean surface roughness of less than about 5 to 7 Angstroms.

5,688,725
METHOD OF MAKING A TRENCH MOSFET WITH HEAVILY DOPED DELTA LAYER TO PROVIDE LOW ON-RESISTANCE

Mohamed N. Darwish, Saratoga, and Richard K. Williams, Cupertino, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Division of Ser. No. 367,027, Dec. 30, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 482,357

Int. Cl.⁶ H01L *21/265;21/44;21/48*

U.S. Cl. 438—270 **16 Claims**

1. A method of fabricating a vertical trench MOSFET, said method comprising the steps of:

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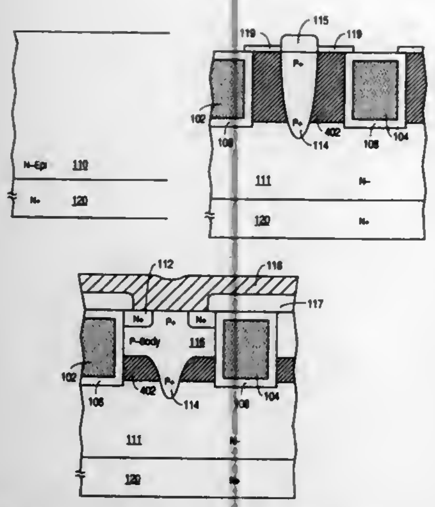
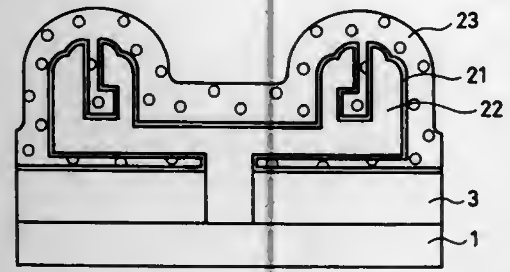


providing a substrate of a first conductivity type;
forming an epitaxial layer of said first conductivity type on a surface of said substrate;
performing a first implant of dopant of said first conductivity type through a top surface of said epitaxial layer so as to form a delta implant region having a dopant concentration greater than a dopant concentration of a remaining portion of said epitaxial layer;
performing a second implant of dopant of a second conductivity type that is opposite to said first conductivity type through said top surface of said epitaxial layer to form a deep diffusion;
after said step of performing a first implant, forming a first trench and a second trench at said top surface, said first and second trenches defining a cell of said MOSFET, said deep diffusion being located in a central region between said first and second trenches, said deep diffusion not being in contact with either said first trench or said second trench;
performing a third implant of dopant of said second conductivity type into said epitaxial layer to form a body implant region;
performing a fourth implant of dopant of said first conductivity type into said epitaxial layer to form a source region; and
depositing metal so as to form a contact with said source and body implant regions.

5,688,726
METHOD FOR FABRICATING CAPACITORS OF SEMICONDUCTOR DEVICE HAVING CYLINDRICAL STORAGE ELECTRODES

Suk Soo Kim, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyougki-do, Rep. of Korea

Filed Aug. 1, 1995, Ser. No. 510,094
Int. Cl.^{6} H01L *21/8242*
U.S. Cl. 438—397 **6 Claims**



1. A method for fabricating a capacitor of a semiconductor device comprising the steps of:
forming a lower insulating layer on a semiconductor substrate, and depositing a first insulating film on the lower insulating layer;
forming a contact hole in the resulting structure obtained after the formation of the first insulating film, using a contact mask, such that the semiconductor substrate is partially exposed through the contact hole;
forming a first conduction layer on the resulting structure obtained after the formation of the contact hole such that the first conduction layer is in contact with the semiconductor substrate through the contact hole;
forming a second insulating film on the first conduction layer, and forming a first storage electrode mask on the second insulating film;
selectively growing the second insulating film, thereby forming a selectively-grown oxide film extending to a height;
forming a second storage electrode mask on both the first storage electrode mask and the selectively-grown oxide film such that the second storage electrode mask extends laterally beyond the first storage electrode mask by a width on each side thereof;
sequentially etching the selectively-grown oxide film, the second insulating film and a portion of the first conduction layer using the second storage electrode mask, thereby forming a selectively-grown oxide film pattern;
removing the second storage electrode mask and the first storage electrode mask, and forming a second conduction layer to a thickness on the resulting structure obtained after the removal of the masks;
anisotropically etching the second conduction layer, thereby forming second-conduction layer spacers;
etching the second insulating film using the second-conduction layer spacers as a mask, and forming a third conduction layer to a thickness on the resulting structure obtained after the etching of the second insulating film;
anisotropically etching the third conduction layer and the first conduction layer, thereby forming third-conduction layer spacers and a first-conduction layer pattern; and
removing the selectively-grown oxide film pattern, the first insulating film and the second insulating film pattern using a wet etching method, whereby a cylindrical storage electrode with an increased surface area is formed.

5,688,727
INFRARED AND ULTRAVIOLET RADIATION ABSORBING BLUE GLASS COMPOSITION

Larry J. Shelestak, Bairdford, and David R. Haskins, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1996, Ser. No. 664,942
Int. Cl.^{6} C03C *3/087*
U.S. Cl. 501—71 **38 Claims**

1. A blue colored, infrared and ultraviolet radiation absorbing glass composition having a base glass portion comprising:
SiO_2 about 66 to 75 percent by weight
Na_2O about 10 to 20 percent by weight
CaO about 5 to 15 percent by weight
MgO 0 to about 5 percent by weight
Al_2O_3 0 to about 5 percent by weight
K_2O 0 to about 5 percent by weight
and a solar radiation absorbing and colorant portion consisting essentially of:
total iron about 0.53 to 1.1 percent by weight
CoO about 5 to 40 PPM
Cr_2O_3 0 to about 100 PPM,
the glass having a redox of about 0.25 to 0.35, a luminous transmittance of at least 55%, and a color characterized by a dominant wavelength of 485 to 489 nanometers and an excitation purity of about 3 to 18 percent.

5,688,728
POROUS CERAMIC MATERIAL

Tomonori Niwa, and Yusuke Makino, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 14, 1995, Ser. No. 557,840
Claims priority, application Japan, Nov. 16, 1994, 6-308294
Int. Cl.^{6} C04B *38/08*
U.S. Cl. 501—80 **6 Claims**

1. A porous ceramic material comprising:
a ceramic sintered body having a sliding surface which is formed with pores dispersedly located in said sintered body and exposed to the sliding surface, said pores being defined respectively by surface layers forming part of said ceramic sintered body, wherein particles of said ceramic sintered body are comprised of at least one material selected from the group consisting of Al_2O_3 system powder, Si_3N_4 system powder, SiC system powder, AlN system powder and ZrO_2 system powder; and
silicon contained in said ceramic sintered body, a content of silicon being higher in at least a part of said surface layers than that in other parts of said ceramic sintered body, and wherein a lubricant is present at least in pores exposed to the sliding surface.

5,688,729
WHISKER-REINFORCED CERAMIC MATERIAL

Mats Andersson, Huddinge, and Marianne Collin, Enskede, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Division of Ser. No. 492,521, Jun. 20, 1995. This application Jun. 13, 1996, Ser. No. 662,523
Claims priority, application Sweden, Jul. 15, 1994, 9402513
Int. Cl.^{6} C04B *35/119;35/577;35/58*
U.S. Cl. 501—89 **7 Claims**

1. A method of manufacturing a ceramic material comprising alumina, 10–50% by volume of silicon carbide whiskers, 1–25% by volume of zirconia and 1–20% by volume of a titanium compound-containing cubic phase comprising mixing and granulating powders of silicon carbide whiskers, alumina and zirconia and a titanium compound capable of forming a cubic phase and hot pressing the mixture at a hot press temperature of 1500°–1750° C. a mechanical pressure of 5–40 MPa having a beating up period before the hot pressing temperature is reached and the mechanical pressure is applied, being performed under a subpressure of 50 to 800 mbar.

5,688,730
OPTICALLY TRANSPARENT GAMMA-ALUMINUM OXYNITRIDE POWDERS AND CERAMIC ARTICLES SHAPED THEREFROM

Roland Bachelard; Jean-Pierre Disson, both of Lyons, and Bruno Morlhon, Villeurbanne, all of France, assignors to Elf Atochem S.A., Puteaux, France

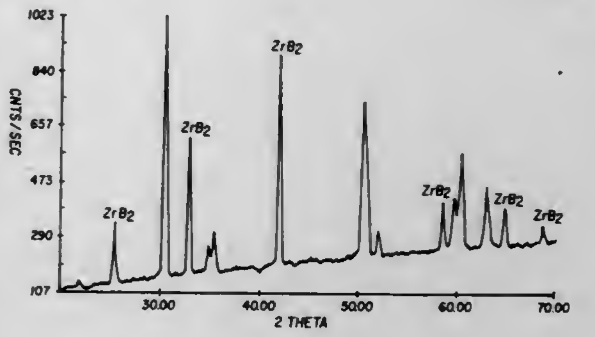
Continuation of Ser. No. 220,268, Mar. 30, 1994, abandoned. This application Jul. 19, 1996, Ser. No. 683,874
Claims priority, application France, Mar. 30, 1993, 93 03718
Int. Cl.^{6} C04B *35/581;35/582*
U.S. Cl. 501—96 **26 Claims**

1. In a process for the preparation of particulate gamma-aluminum oxynitride agglomerates, comprising reacting aluminum nitride with alpha-alumina, wherein the improvement comprises using a grinding facilitating amount of alumina of high specific surface area, or precursor thereof, in the reacting step to produce particulate gamma-aluminum oxynitride agglomerates suitable for conversion into optically transparent ceramic shaped articles.

5,688,731
CERAMIC ARTICLES CONTAINING DOPED ZIRCONIA HAVING HIGH ELECTRICAL CONDUCTIVITY

Dilip K. Chatterjee, Rochester; Gregory S. Jarrold, Henrietta, and Syamal K. Ghosh, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1996, Ser. No. 746,536
Int. Cl.^{6} C04B *35/48;35/58*
U.S. Cl. 501—96 **11 Claims**



1. An electrically conductive ceramic article comprising a composite of a) from 70 to 50 weight percent of 100% tetragonal zirconia alloy or composite of 100% tetragonal zirconia-alumina and b) from 30 to 50 weight percent zirconium diboride.

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5,688,732
DIELECTRIC CERAMIC COMPOSITIONS FOR MICROWAVE

Jung-Rae Park; Tae-Hong Kim; Suk-Jin Lee; Sang-Seok Lee, and Tae-Goo Choi, all of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Inst., Daejeon, Rep. of Korea

Filed Nov. 15, 1995, Ser. No. 559,278

Claims priority, application Rep. of Korea, Nov. 16, 1994, 94-30096; Dec. 13, 1994, 94-33906

Int. Cl.^{6} C04B *35/46*

U.S. Cl. 501—138 **12 Claims**

1. Dielectric ceramic compositions for microwave components comprising Nd_2O_3, TiO_2, a compound selected from the group consisting of BaO and $BaCO_3$, a compound selected from the group consisting of PbO and Pb_3O_4 and at least one compound selected from the group consisting of CeO_2 and La_2O_3 and having composition according to the formula (I):

$$x(Ba_{1-\alpha}Pb_\alpha)O-y(Nd_2O_{3(1-\beta-\gamma)}CeO_{2(\beta)}La_2O_{3(\gamma)})-zTiO_2 \qquad (I)$$

wherein, in mol %, $6 \leqq x \leqq 20$, $10 \leqq y \leqq 20$, $60 \leqq z \leqq 75$, $x+y+z=100$, $0<\alpha \leqq 0.5$, $0 \leqq \beta \leqq 0.2$, $0 \leqq \gamma \leqq 0.2$ and $0<1-\beta-\gamma<1$.

5,688,733
CATALYST AND PROCESS FOR A ZIEGLER POLYMERISATION

Jacob Renkema, Sittard, and Jeroen H. G. Konings, Stein, both of Netherlands, assignors to DSM N.V., Heerlen, Netherlands

Filed Jun. 1, 1995, Ser. No. 457,669

Claims priority, application Belgium, Dec. 21, 1992, 9201115

Int. Cl.^{6} B01J *31/00;* **C08F** *9/02;9/44;9/00*

U.S. Cl. 502—103 **37 Claims**

34. A catalyst comprising a transition metal-imidoaryl complex represented by the formula

$$R-N=M(X)_n(Y)_m(NR_1R_2)_p$$

wherein

- R represents a 2,6-dialkylsubstituted phenyl group,
- M represents a transition metal from groups 3–6 of the Periodic Table,
- X represents a halogen atom,
- Y represents an alkoxy group, an amido group, or a silicon containing hydrocarbyl group,
- R_1 and R_2 contain up to 20 carbon atoms and, independent of one another, represent an alkyl group, an alkenyl group, an aryl group, or a silicon-containing hydrocarbyl group,
- n is an integer and is 0 to 2,
- m is an integer and is 0 to 2,
- p is an integer and is 1 to 3, and
- R–N=represents an imidoaryl ligand.

5,688,734
METHOD FOR PRODUCING PREPOLYMERIZED, SUPPORTED METALLOCENE CATALYST SYSTEMS

Anthony Nicholas Speca, Kingwood, and Kelly Tormaschy, Houston, both of Tex., assignors to Exxon Chemical Patents Inc., Houston, Tex., and Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 499,054, Jul. 6, 1995, abandoned. This application Sep. 19, 1996, Ser. No. 710,589

Int. Cl.^{6} C08F *4/656;10/00*

U.S. Cl. 502—108 **16 Claims**

1. A method for forming a prepolymerized supported metallocene catalyst system, said method comprising the steps of:

- (a) forming a reaction product of metallocene and alkylalumoxane in a hydrocarbon solvent;
- (b) contacting a volume of the reaction product with a porous support;
- (c) drying the resulting supported catalyst system such that at least 90% of all solvent is removed from the pores of the porous support;
- (d) contacting the dried supported catalyst system of step (c) with a volume of hydrocarbon solution wherein the volume is equal to or less than the total pore volume of the porous support;
- (e) prepolymerizing the supported catalyst system with gaseous monomer; and
- (f) recovering prepolymerized supported catalyst system.

5,688,735
METHOD FOR CONTROLLING THE MELTING POINTS AND MOLECULAR WEIGHTS OF SYNDIOTACTIC POLYOLEFINS USING METALLOCENE CATALYST SYSTEMS

John A. Ewen, Houston; B. R. Reddy, Baytown, both of Tex., and Michael J. Elder, Raleigh, N.C., assignors to Fina Technology, Inc., Dallas, Tex.

Division of Ser. No. 903,058, Jun. 22, 1992. This application Jun. 6, 1995, Ser. No. 471,055

Int. Cl.^{6} C08F *4/64*

U.S. Cl. 502—117 **45 Claims**

1. A catalyst system for polymerizing propylene to produce a syndiotactic polypropylene comprising:

a) a metallocene of the general formula:

$$R''(C_5H_4)(C_4H_{4-m}R'_mC_5C_4H_{4-n}R'_n)MeQ_p$$

wherein (C_5H_4) is a cyclopentadienyl ring and $(C_4H_{4-m}R'_mC_5C_4H_{4-n}R'_n)$ is a fluorenyl radical; R' is a hydrocarbyl radical, halogen, an alkoxy, an alkoxy alkyl or an alkylamino radical having from 1–20 carbon atoms, each R' may be the same or different; R" is a structural bridge between the (C_5H_4) and $(C_4H_{4-m}R'_mC_5C_4H_{4-n}R'_n)$ rings to impart stereorigidity; Q is a hydrocarbon radical or a halogen; Me is a Group IVB metal; $1 \leqq m \leqq 4$; $0 \leqq n \leqq 4$; and p is the valence of Me minus 2;

wherein R' is an electron donating substituent on the fluorene ligand at C1, C2, or C3 and has the ability to donate electrons equal to or greater than that for methoxy;

b) a co-catalyst selected from the group consisting of an organoaluminum compound of the general formula (R-Al-O) in the cyclic form or $R(R\text{-}Al\text{-}O)_nAlR_2$ in the linear form wherein R is an alkyl group with 1–5 carbons and n is an integer from about 1 to about 20, a neutral Lewis acid and an ionic ionizing agent.

5,688,736
METHOD OF PRESULFURIZING A HYDROTREATING, HYDROCRACKING OR TAIL GAS TREATING CATALYST

James Dallas Seamans, Woodlands; Charles Terrell Adams, Houston; Wendy Beth Dominguez, Rosenberg, and Andrew An-Ju Chen, Houston, all of Tex., assignors to CRI International, Inc., Houston, Tex.

Continuation of Ser. No. 166,135, Dec. 13, 1993, Pat. No. 5,468,372, which is a division of Ser. No. 969,660, Oct. 30, 1992, Pat. No. 5,292,702, which is a continuation of Ser. No. 737,630, Jul. 30, 1991, Pat. No. 5,215,954. This application Oct. 26, 1995, Ser. No. 548,570

Int. Cl.^{6} B01J *27/04*

U.S. Cl. 502—219 **20 Claims**

1. A method of presulfurizing a sulfidable metal oxide(s)-containing catalyst which comprises:

- (a) contacting said catalyst with a mixture of powdered elemental sulfur and a liquid olefinic hydrocarbon to produce a treated-catalyst; and
- (b) heating the treated-catalyst at an effective temperature to react the olefinic hydrocarbon and to provide a sulfurized catalyst that is more resistant to sulfur leaching than one not contacted with an olefin.

5,688,737
THERMAL TRANSFER RECORDING MEDIUM

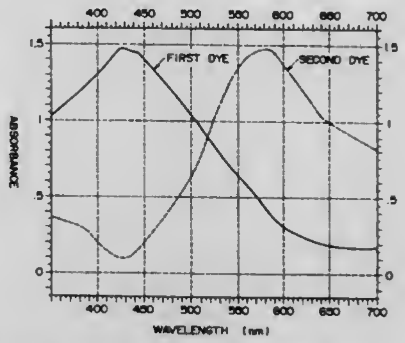
Tetsuya Abe; Toshio Fukuda, and Yoshio Fujiwara, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 981,772, Nov. 25, 1992, abandoned. This application Jun. 29, 1995, Ser. No. 496,435

Claims priority, application Japan, Nov. 29, 1991, 03-316416

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **9 Claims**



1. A thermal transfer recording medium which comprises a substrate and an ink layer formed on the substrate, the ink layer comprising a first dye having a light absorption peak which has a maximum absorption wavelength, λ_{max}, of 420 to 500 nm and a half-value width of at least 100 nm and a second dye having a light absorption peak which has a maximum absorption wavelength, λ_{max}, of 570 to 650 nm and a half-value width of at least 100 nm and wherein a black color image produced from the medium has a substantially constant hue in a density-graded indication.

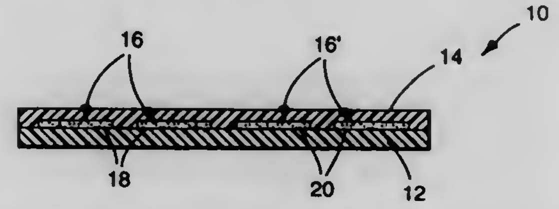
5,688,738
SECURITY CARD AND METHOD FOR MAKING SAME

Shih-Lai Lu, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 294,755, Aug. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 128,484, Sep. 28, 1993, abandoned. This application Jun. 18, 1996, Ser. No. 668,587

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **22 Claims**



1. A security card comprising a backing, a cover sheet, and a security image, said security image being located between said backing and said cover sheet, said backing and said cover sheet being laminated together without an intermediate adhesive layer, wherein said backing comprises an amorphous copolyester or polyvinyl chloride on at least its first side, and said cover film comprises the other of polyvinyl chloride or an amorphous copolyester on at least its first side, the first side of said backing being laminated to the first side of cover sheet, said security image being visible through said cover sheet and comprising one or more colored dyes diffused into the surface of said polyvinyl chloride member.

5,688,739
AMMOXIDATION CATALYSTS CONTAINING GERMANIUM TO PRODUCE HIGH YIELDS OF ACRYLONITRILE

Tama Lee Drenski, Twinsburg; Maria Strada Friedrich, Lyndhurst; Christos Paparizos, Willowick; Michael J. Seely, Twinsburg, and Dev Dhanaraj Suresh, Hudson, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 432,329, May 1, 1995. This application May 3, 1996, Ser. No. 642,707

Int. Cl.^{6} B01J *23/14;23/16;23/28*

U.S. Cl. 502—308 **12 Claims**

1. A catalyst having the atomic ratios set forth in the empirical formula below:

$$A_aB_bC_cGe_dBi_eMo_{12}O_x$$

where

- A=two or more of alkali metals, In and Tl
- B=the combination of Fe plus at least one element selected from the group consisting of Ni and Co plus at least one element selected from the group consisting of Mg, Mn, Ca, Ce, Sn, Cr, Sb, and W
- C=one or more of Pb, Eu, B, Sn, Te, and Cu
- a=0.05 to 5.0
- b=5 to 12
- c=0 to 5.0
- d=0.1 to 2.0
- e=0.1 to 2.0
- x=the number of oxygen atoms required to satisfy the valency requirements of the other elements and
- b>a+c.

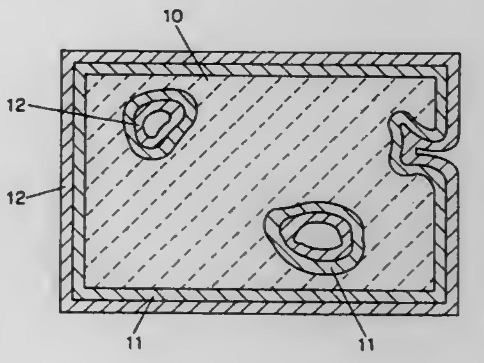
5,688,740
THREE-WAY CATALYST FOR TREATING EXHAUST GASES

Andriy M. Bolshakov, Moscow, Russian Federation, and Seow Boon Quek, Singapore, Singapore, assignors to ARD Co., Pte. Ltd., Singapore, Singapore

Filed Apr. 30, 1996, Ser. No. 640,323

Int. Cl.^{6} B01J *23/74;23/40*

U.S. Cl. 502—326 **18 Claims**



1. A catalyst for purification of exhaust gases comprising a catalyst carrier and first and second catalyst layers formed as discrete layers one over the other on the catalyst carrier with the first layer being formed between the catalyst carrier and the second layer, wherein

- the first layer comprises a material effective to provide an oxygen reservoir during catalysis; and
- the second layer comprises nickel and a platinum group metal, wherein the nickel is present as finely divided needles distributed over the surface of the catalyst.

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5,688,741

PROCESS AND CATALYST FOR UPGRADING HEAVY HYDROCARBON

Jose Carrazza; Pedro Pereira, and Nelson Martinez, all of San Antonio de Los Altos, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Mar. 17, 1995, Ser. No. 406,073

Int. Cl.^{6} C10G *13/02;* **B01I** *23/78*

U.S. Cl. 502—344 **17 Claims**

1. A catalyst comprising a first metal selected from the group consisting of non-noble Group VIII metals and mixtures thereof and a second metal comprising an alkali metal wherein at least one of said first and second metals is in the form of an oil soluble compound.

5,688,742

WATER BASED FORMATION OF A BEADED PRODUCT

William Edward Mayeros, Jr., Horsham, and Fereydon Abdesaken, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 18, 1995, Ser. No. 516,841

Int. Cl.^{6} A01N *25/34*

U.S. Cl. 504—116 **8 Claims**

1. A method for forming a beaded product comprising:
a. forming a mixture comprising a low melting product having water solubility and water at a temperature above the melting point of the low melting product;
b. mixing the mixture at an agitation rate wherein the low melting product forms droplets within the mixture;
c. cooling the mixture to a temperature wherein the droplets solidify forming beads; and
d. separating the beads from the mixture.

5,688,743

PREPARATION OF WATER-DISPERSED FORMULATION BY NUCLEATION AND CRYSTALLIZATION OF LOW-MELTING POINT PESTICIDE ACTIVE INGREDIENT

James Franklin Essinger, Jr., Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 223,334, Apr. 5, 1994, abandoned.
This application Jan. 17, 1997, Ser. No. 785,250

Int. Cl.^{6} A01N *25/08*

U.S. Cl. 504—116 **11 Claims**

1. A water dispersible pesticidal formulation in the form of a powder, granules, or suspension concentrate comprising an inert solid particulate carrier having absorbed on the surfaces thereof a crystalline pesticidally active compound whose crystallinity was rapidly induced while being in contact with the carrier by the presence of a heterogeneous nucleating agent, said pesticidally active compound being selected from the group consisting of pyridines, nitroanilines, acetanilides, organophosphates, triazines, pyrethroids, isoazolidinones, carbamates, benzoxazoles, substituted phenoxys, substituted ureas, triazoles, oxadiazolinones, azoryls and mixtures thereof and said nucleating agent having a melting point in the range from about 30° C. to about 130° C. and being selected from the group consisting of carboxylic acids, esters, and amides with a carbon chain length of 3 to 30.

5,688,744

ANTIMICROBIAL COMPOUNDS WITH QUICK SPEED OF KILL

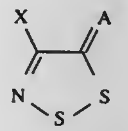
Rhoda Weber Joseph, Buckingham; Diane Lynn Antes, Richboro, and Peter Osei-Gyimah, Horsham, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 11, 1996, Ser. No. 729,991

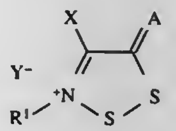
Int. Cl.^{6} A01N *43/36;43/82*

U.S. Cl. 504—156 **3 Claims**

1. A method of inhibiting the growth of bacteria or algae in an industrial locus comprising introducing in, at, or on said locus an effective amount of at least one of a quick speed of kill, non-environmentally persisting antimicrobial compound of formulas I or II:



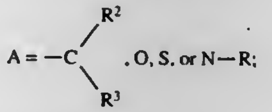
I



II

wherein

X and Y are independently selected from Cl, Br, and I;



$A = -C(R^2)(R^3)$, O, S, or N—R;

R=phenyl, substituted phenyl, benzyl, methyl, or ethyl;
R^1=$(C_1–C_8)$ alkyl;
R^2 and R^3 are independently selected from H, and (C_{1-C8}) alkyl.

5,688,745

ARYLSULFONYLUREAS AND THEIR USE AS HERBICIDES AND GROWTH REGULATORS

Oswald Ort, Taunus; Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein/Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

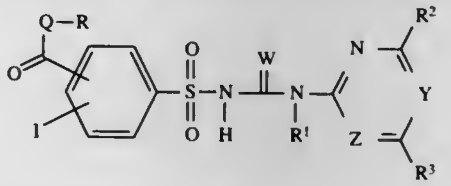
Division of Ser. No. 94,194, Sep. 21, 1993, Pat. No. 5,463,081.
This application Jun. 6, 1995, Ser. No. 471,343

Claims priority, application Germany, Feb. 12, 1991, 41 04 227.1

Int. Cl.^{6} A01N *43/54;43/66;* **C07D** *251/20;239/32*

U.S. Cl. 504—231 **17 Claims**

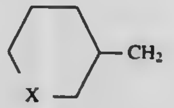
1. A compound of the formula (I) and salts thereof,



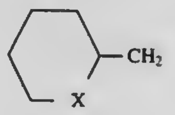
(I)

where

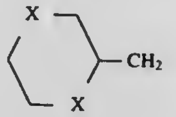
Q is oxygen, sulfur or —N(R^4)—,
W is oxygen or sulfur,
Y and Z independently of one another are CH or N, where Y and Z are not simultaneously CH,
R is hydrogen; $(C_1–C_{12})$alkyl; $(C_2–C_{10})$alkenyl; $(C_2–C_{10})$alkynyl; $(C_1–C_6)$alkyl, which is monosubstituted to tetrasubstituted by radicals selected from the group consisting of halogen, $(C_1–C_4)$alkoxy-, $(C_1–C_4)$thioalkyl, —CN, $(C_2–C_5)$alkoxycarbonyl and $(C_2–C_6)$alkenyl; $(C_3–C_8)$cycloalkyl which is unsubstituted or substituted by radicals selected from the group consisting of $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, $(C_1–C_4)$alkylthio and halogen; $(C_5–C_8)$cycloalkenyl; phenyl$(C_1–C_4)$alkyl which is unsubstituted or substituted in the phenyl radical; or a radical of the formulae A-1 to A-10



A-1



A-2



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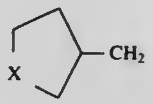
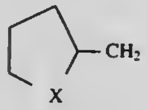
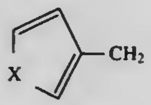


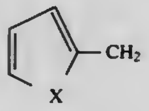
A-4



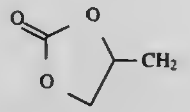
A-5



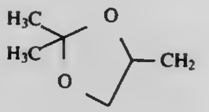
A-6



A-7



A-8



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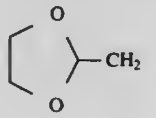

A-10

where

X is O, S, S(O) or SO_2;
R^1 is hydrogen or $(C_1–C_3)$alkyl;
R^2 is hydrogen, halogen, $(C_1–C_3)$alkyl, $(C_1–C_3)$alkoxy, where the two last-mentioned radicals are unsubstituted or monosubstituted or polysubstituted by halogen or $(C_1–C_3)$alkoxy;
R^3 is hydrogen, halogen, $(C_1–C_3)$alkyl, $(C_1–C_3)$alkoxy or $(C_1–C_3)$alkylthio, where the three last-mentioned radicals are unsubstituted or monosubstituted or polysubstituted by halogen or monosubstituted or disubstituted by $(C_1–C_3)$alkoxy or $(C_1–C_3)$alkylthio; or a radical of the formula NR^5R^6, $(C_3–C_6)$cycloalkyl, $(C_2–C_4)$alkenyl, $(C_2–C_4)$alkynyl, $(C_3–C_4)$alkenyloxy or $(C_3–C_6)$alkynyloxy;
R^4 is hydrogen, $(C_1–C_4)$alkyl or $(C_1–C_4)$alkoxy and
R^5 and R^6 independently of one another are hydrogen, $(C_1–C_4)$alkyl, $(C_3–C_4)$alkenyl, $(C_1–C_4)$haloalkyl or $(C_1–C_4)$alkoxy.

5,688,746

RATITE OIL LUBRICANT COMPOSITIONS

Kathryn M. Thacker, Sumner, Ill., assignor to Kaddreco, Inc., Mount Vernon, Ind.

Filed Aug. 9, 1996, Ser. No. 695,358

Int. Cl.^{6} C10M *101/04;129/00*

U.S. Cl. 508—101 **10 Claims**

1. A lubricant composition comprising: (a) a ratite oil; and (b) an oil of lubricating viscosity selected from the group consisting of cutting oils, gear oils, hydraulic fluid oils, oils used in gas engines, stationary power engines, and turbines, automatic transmission fluids, transaxle lubricants, tractor lubricants, metal-working lubricants, crankcase lubricating oils for spark-ignited and compression-ignited internal combustion engines, including automobile, tractor and truck engines, two-cycle engines, aviation piston engines, and marine and railroad diesel engines, and mixtures thereof.

5,688,747

WATER BASED LUBRICANT SOLUTION

Azhar J. Khan, West Valley City; David P. Hopkins, Salt Lake City, and Mohammad A. Khan, Sandy, all of Utah, assignors to Becton Dickinson and Company, Franklin Lakes

Continuation-in-part of Ser. No. 294,275, Aug. 22, 1994, abandoned. This application Mar. 15, 1996, Ser. No. 616,840

Int. Cl.^{6} C10M *155/02;173/02*

U.S. Cl. 508—208 **32 Claims**

1. A water based lubricant solution for a medical device, consisting of a block copolymer polyalkylene oxide-modified polydimethylsiloxane, an amino-modified silicone polyether copolymer and water.

5,688,748

LUBRICATING OIL COMPOSITION FOR INTERNAL COMBUSTION ENGINES

Hirotaka Tomizawa, Saitama, Japan, assignor to Tonen Corporation, Saitama, Japan

Filed Jan. 26, 1996, Ser. No. 592,780

Claims priority, application Japan, Jan. 31, 1995, 7-034270

Int. Cl.^{6} C10M *135/18*

U.S. Cl. 508—363 **7 Claims**

1. A lubricating oil composition for internal combustion engines comprising a major mount of a base oil consisting of a hydrocarbon oil which has a dynamic viscosity of 2–20 mm^2/s at 100° C. and contains 3 wt % or less aromatic components, 45 wt % or more one- and two-ring naphthenes, 50 wt ppm or less sulfur and 50 wppm or less nitrogen, and a minor mount of additive mixture comprising 0.02–0.2 wt % as molybdenum of molybdenum dithiocarbamate, 0.02–0.15 wt % as phosphorus of zinc dithiophosphate, and 0.05–3 wt % of phenol-based antioxidant, all concentrations having with respect to the total weight of the composition.

5,688,749

ANIMAL AND VEGETABLE LUBRICATING OIL COMPOSITION

Masahisa Ibuki, Sennan-gun; Yoko Imamura, Izumisano; Eiko Furumoto, Matsubara, and Tsugio Nishimoto, Naga-gun, all of Japan, assignors to Fuji Oil Company, Limited, Osaka-fu, Japan

Filed May 10, 1996, Ser. No. 644,355

Claims priority, application Japan, May 22, 1995, 7-122890

Int. Cl.^{6} C10M *105/38*

U.S. Cl. 508—486 **4 Claims**

1. An animal or vegetable lubricating oil composition which comprises a triglyceride, wherein the content of isolated trans isomers in component fatty acids of the triglyceride is 40% by

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weight to 100% by weight based on the whole weight of component fatty acids, and wherein the iodine value of the triglyceride is 50 to 90.

5,688,750

BASE FLUID

Nigel Andrew John Cooban, Merseyside, Great Britain, and Hendrik Leendert Rieffe, Gouda, Netherlands, assignors to Unichema Chemie B. V., Gouda, Netherlands

PCT No. PCT/EP94/01634, § 371 Date Dec. 1, 1995, § 102(e) Date Dec. 1, 1995, PCT Pub. No. WO94/28093, PCT Pub. Date Dec. 8, 1994

PCT Filed May 11, 1994, Ser. No. 556,933

Claims priority, application European Pat. Off., Jun. 2, 1993, 93201574

Int. Cl.^{6} C10M *107/34;145/38*

U.S. Cl. 508—497 **17 Claims**

1. A base fluid for metal working fluids comprising a stoichiometrically neutral salt of the esterification product, obtained by partial esterification of:

- (a) polymerized unsaturated C_{12}-C_{24} fatty acid, selected from the group consisting of dimer acid, trimer acid, hydrogenated dimer acid, hydrogenated trimer acid, and mixtures thereof,
- (b) a monohydric alkoxylated alcohol selected from the group consisting of:
  - (1) straight or branched chain, saturated monohydric alcohols having from 1 to 24 carbon atoms, which are alkoxylated with from 2 to 25 moles of a C_2-C_5 alkylene oxide, and
  - (2) alkoxy polyalkylene glycols in which one of the two terminal hydroxyl groups is etherified with a C_1-C_4 aliphatic monohydric alcohol and which is alkoxylated with from 2 to 25 moles of a C_2-C_5 alkylene oxide, and mixtures of (1) and (2), and optionally,
- (c) an aliphatic, straight or branched chain, saturated or unsaturated monohydric alcohol, having from 1 to 24 carbon atoms,

until a partial ester is obtained, having an acid number of from 10 to 120, after which said partial ester is:

- (d) converted into a stoichiometrically neutral salt by means of a neutralizing agent, selected from the group consisting of ammonium hydroxide, the alkali metal hydroxides, the alkyl amines, the alkanol amines, and mixtures thereof.

5,688,751

SALICYLATE SALTS AS LUBRICANT ADDITIVES FOR TWO-CYCLE ENGINES

William K. S. Cleveland, Mentor; Jack L. Karn, Richmond Heights, and Daniel M. Vargo, Willoughby, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 14, 1996, Ser. No. 702,391

Int. Cl.^{6} C10M *129/50*

U.S. Cl. 508—518 **20 Claims**

1. A method for lubricating a two-stroke cycle engine, comprising supplying to the engine a mixture comprising:

- (a) an oil of lubricating viscosity and
- (b) a monovalent metal salt of a hydrocarbyl-substituted hydroxyaromatic carboxylic acid in an amount suitable to reduce piston deposits in said engine;

the mixture supplied to said engine containing less than about 0.06 percent by weight of divalent metals.

5,688,752

AQUEOUS PERSONAL CARE CLEANSER COMPRISING SPECIFIC LIPID COMPOSITION

Graham Andrew Turner, Wirral, United Kingdom, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 19, 1995, Ser. No. 545,490

Claims priority, application United Kingdom, Oct. 20, 1994, 9421185

Int. Cl.^{6} C11D *3/60;17/00;* **A61K** *7/48;7/50*

U.S. Cl. 510—159 **10 Claims**

1. A personal care cleansing composition in the form of an aqueous liquid comprising:

- (i) a lipid composition comprising three components A, B and C, where A is a molecule having at least two hydrocarbon chains and a polar head group for which

$$0.5 < \frac{V}{a_o l_c} \leqq 1.0$$

wherein V is the volume of the hydrocarbon chains,

l_c is the critical length of the hydrocarbon chains, and

a_o is optimum area of the polar head group;

B is a molecule having one long chain and a polar head group; and

C comprises a compound selected from the group consisting of 3β-sterol, squalene, squalane, saponins or sapogenins derived from the plant steroid or triterpenoid, di- and triterpenes; and mixtures thereof; and the molar ratio of A:B:C is 1.0:1.5 to 6.0:1.1 to 8.0;

- (ii) a surface active agent separate from any surfactant defined by component (i) selected from the group consisting of anionic, nonionic, cationic, zwitterionic, amphoteric surface active agents, soap and mixtures thereof; and
- (iii) a deposition aids;

wherein total synthetic surfactant (ii) is greater than amount of soap, if any present.

5,688,753

FLUX REMOVING COMPOSITION

Francis R. Cala, Highland Park, and Richard A. Reynolds, Plainsboro, both of N.J., assignors to Church & Dwight Co.,Inc., Princeton, N.J.

Continuation of Ser. No. 417,883, Apr. 6, 1995, abandoned. This application Jun. 21, 1996, Ser. No. 668,148

Int. Cl.^{6} C11D *1/72;1/83;3/08;3/28*

U.S. Cl. 510—175 **24 Claims**

1. A cleaning composition for the removal of flux residues from circuit assemblies comprising at least one alkali metal salt, an alkali metal silicate in addition to said one alkali metal salt, and a surfactant formulation comprising a mixture of an alkoxylated nonionic surfactant and an N-alkylpyrrolidone wherein said alkyl group contains 6 to 20 carbon atoms, said alkali metal silicate being characterized by the formula M_2O:SiO_2 wherein M represents an alkali metal and in which the ratio of M_2O to SiO_2 is between 1:1.6 and 1:4.0, wherein said N-alkylpyrrolidone comprises 4 to 10 wt. % of said cleaning composition, further wherein said cleaning composition is devoid of an anionic polymer for the purpose of stabilizing said alkali metal silicate in aqueous solution.

5,688,754

LIGHT DUTY LIQUID CLEANING COMPOSITIONS

Julien Drapier, Seraing, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation-in-part of Ser. No. 511,988, Aug. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 337,541, Nov. 8, 1994, abandoned. This application Mar. 1, 1996, Ser. No. 609,317

Int. Cl.^{6} C09K *11/00;* **C11D** *3/43;1/62*

U.S. Cl. 510—218 **6 Claims**

1. A clear light duty liquid cleaning composition which consisting essentially of approximately by weight:

- (a) 12% to 15% of an alkali metal salt of a C_{12-18} paraffin sulfonate;
- (b) 3% and 5% of an alkali metal salt of a C_{8-18} ethoxylated alkyl ether sulfate;
- (c) 3% to 5% of a betaine surfactant;
- (d) 11% to 12% of a nonionic surfactant;
- (e) 0to 12% of at least one solubilizing agent;
- (f) 2% to 5% of an ammonium salt of an alkyl sulfate surfactant;
- (g) 0 to 10% of a supplemental solubilizing agent; and
- (h) the balance being water, said composition having a minimum foam height of 150 mls after 55 rotations at 40° C. as measured by a foam volume test using 0.75 grams of said composition per liter of water having a hardness of 300 ppm and 10 grams of corn oil per liter of said water having said hardness of 300 ppm; and wherein said composition does not contain any choline or more than 0.25 wt. % of a perfume and is not a microemulsion.

5,688,755

ACIDIC CLEANING AQUEOUS SOLUTION FOR ALUMINUM AND ALUMINUM ALLOY AND METHOD FOR CLEANING THE SAME

Satoshi Ikeda, Yamato, and Masayuki Kamimura, Ichikawa, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 280,836, Jul. 26, 1994, abandoned. This application Jun. 10, 1996, Ser. No. 661,143

Claims priority, application Japan, Jul. 30, 1993, 5-190476

Int. Cl.^{6} C11D *1/66;7/08;7/50*

U.S. Cl. 510—254 **10 Claims**

1. An acidic cleaning aqueous solution for aluminum and aluminum alloy, comprising:

- (a) at least one inorganic acid to produce a pH of at most 2 for the acidic cleaning aqueous solution;
- (b) oxidized metal ions;
- (c) at least one surfactant, and
- (d) 0.1 to 5 g/l of a mixture of at least one dihydric alcohol selected from the group consisting of 1,2-butanediol and 1,2-pentanediol and at least one trihydric alcohol having at least two hydroxyl groups directly coupled with respect to two adjacent carbon atoms of a principal chain within one molecule.

5,688,756

GELLED HYPOCHLORITE-BASED CLEANER

Aram Garabedian, Jr., Fremont, and Clement K. Choy, Alamo, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 429,433, Apr. 26, 1995, abandoned, which is a continuation of Ser. No. 97,738, Jul. 27, 1993, abandoned. This application Jan. 16, 1996, Ser. No. 587,314

Int. Cl.^{6} C11D *3/395*

U.S. Cl. 510—369 **13 Claims**

1. A gelled hypochlorite-based cleaner having enhanced chemical stability of the composition and phase stability, said cleaner consisting essentially of:

- (a) about 0.2 to about 5% of a cross-linked polyacrylate polymer;
- (b) about 0.2 to about 5% of a bleach-stable surfactant;
- (c) about 0.1 to about 10% a source of a high purity, high strength hypochlorite; and
- (d) the balance, water.

5,688,757

SUGAR DERIVATIVES CONTAINING BOTH LONG AND SHORT CHAIN ACYL GROUPS AS BLEACH ACTIVATORS

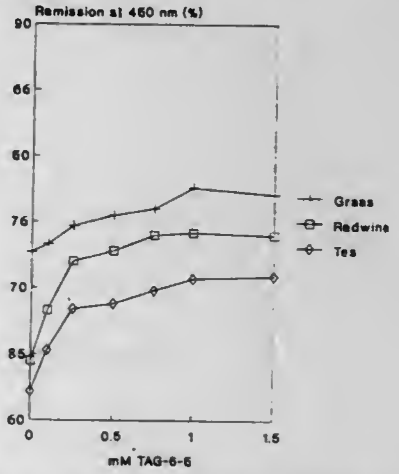
Ture Damhus; Ole Kirk, both of København, Denmark, and Frederick Edward Hardy, Newcastle-on-Tyne, Great Britain, assignors to Novo Nordisk A/S The Procter & Gamble Co., Bagsvaerd, Denmark, and Novo Alle, Cincinnati, Ohio

Continuation of Ser. No. 844,626, Mar. 30, 1992, abandoned. This application Jan. 7, 1994, Ser. No. 178,593

Claims priority, application Denmark, Jan. 22, 1990, 0172/90

Int. Cl.^{6} C11D *7/26;7/38;7/54*

U.S. Cl. 510—376 **3 Claims**



1. A bleaching detergent composition comprising a source of hydrogen peroxide and a compound of formula (I)

$$(A—CO—)\ (R'—CO—)_nX \qquad (I)$$

wherein

X is an aldohexose sugar moiety;

A—CO is a C_6–C_{12} straight or branched, saturated or unsaturated acyl group attached through an ester bond to the anomeric carbon atom of the sugar moiety;

R'—CO is acetyl attached through an ester bond; and

n is 4;

wherein the molar ratio of the source of hydrogen peroxide to the compound is in the range of 1:10 to 20:1.

5,688,758

TEXTILE TREATMENT

Dieter Reinehr, Kandern, Germany, and Claude Eckhardt, Riedisheim, France, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 471,043, Jun. 6, 1995, abandoned. This application Jun. 12, 1996, Ser. No. 662,091

Claims priority, application United Kingdom, Jul. 1, 1994, 94 13270

Int. Cl.^{6} D06M *13/00;13/248;13/322;13/46*

U.S. Cl. 510—516 **27 Claims**

1. A method for the treatment of a textile article, which comprises washing the textile article, then rinsing the washed textile article with an aqueous rinse cycle fabric softener composition comprising:

- a) 5 to 25% by weight, based on the total weight of the composition, of a cationic fabric softening agent;

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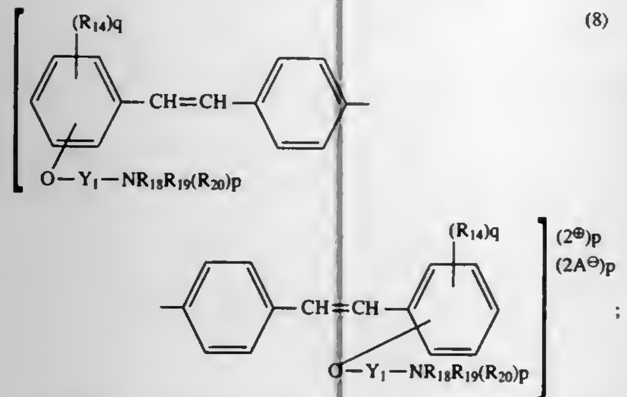
- b) 0.3 to 10% by weight, based on the total weight of the composition, of a fluorescent whitening agent which is compatible with the cationic fabric softening agent and which is selected from the group consisting of:

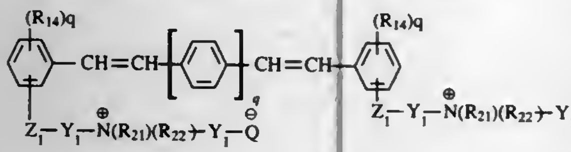
  1) the bistyryl compounds having the formula:



(8)

in which R_{14} is hydrogen, chloro, C_1–C_4alkyl, C_1–C_4alkoxy, cyano or C_1–C_4alkoxycarbonyl; q is 1 or 2; Y_1 is C_2–C_4alkylene or hydroxypropylene; R_{18} is is C_1–C_4alkyl or, together with R_{19} and the nitrogen to which they are each attached, R_{18} forms a pyrrolidine, piperdine, hexamethyleneimine or morpholine ring; R_{19} is C_1–C_4alkyl or, together with R_{18} and the nitrogen to which they are each attached, R_{19} forms a pyrrolidine, piperidine, hexamethyleneimine or morpholine dng; R_{20} is hydrogen, C_1–C_4alkyl, C_3–C_4alkenyl, C_2–C_4alkoxycarbonylmethyl, benzyl, C_2–C_4hydroxyalkyl, C_2–C_4cyanoalkyl or together with R_{18} and R_{19} and the nitrogen to which they are each attached, R_{20} forms a pyrrolidine, piperidine, hexamethyleneimine or morpholine ring; A^0 is an anion; and p is 0 or 1;

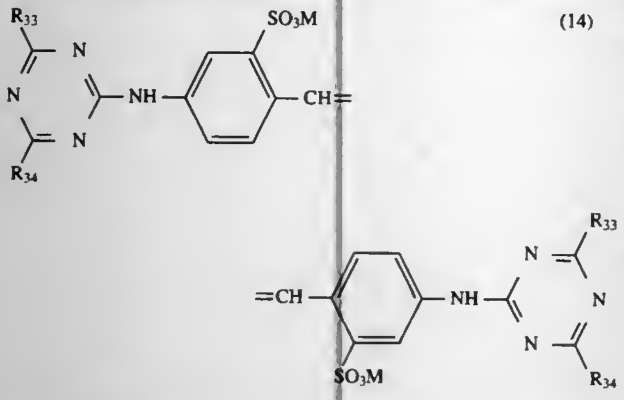
2) the styrene compounds having the formula:


$(R_{14})q$
CH=CH
CH=CH
q
$(R_{14})q$
$Z_1-Y_1-\overset{\oplus}{N}(R_{21})(R_{22})-Y_1-\overset{\ominus}{Q}$
$Z_1-Y_1-\overset{\oplus}{N}(R_{21})(R_{22})-Y_1-\overset{\ominus}{Q}$

(11)

in which R_{14} is hydrogen, chloro, C_1–C $_4$alkyl, C_1–C_4alkoxy, cyano or C_1–C_4alkoxycarbonyl; q is 1 or 2; Y_1 is C_2–C_4alkylene or hydroxypropylene; R_{21} and R_{22}, independently, are C_1–C_4alkyl or C_2–C_3alkenyl or R_{21} and R_{22}, together with the nitrogen atom to which they are each attached, form a pyrrolidine, piperidine, hexamethyleneimine or morpholine ring; Z_1 is oxygen, sulfur, a direct bond, —COO—, —CON(R_{24})— or —$SO_2N(R_{24})$— in which R_{24} is hydrogen, C_1–C_4alkyl or cyanoethyl; and Q is —COO or —SO_3;

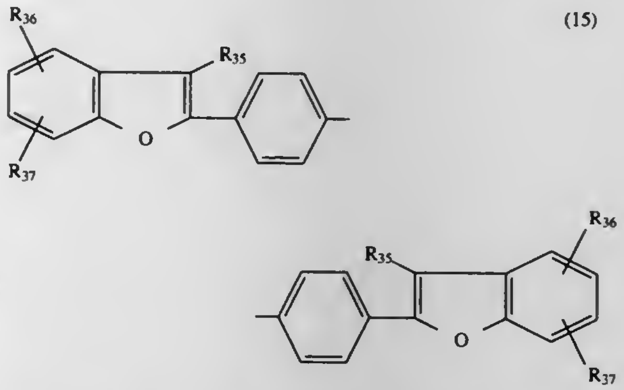
3) the bis(triazinyl)diaminostilbene compound of formula:



(14)

in which R_{33} is NH-phenyl, optionally substituted by one or two SO_3M groups, R_{34} is NH—C_1–C_4alkyl, N(C_1–C_4alkyl)$_2$, N(C_1–C_4alkyl)(C_1–C_4hydroxyalkyl), N(C_1–C_4hydroxyalkyl)$_2$ or morpholino and M is H, Na, K, Ca, Mg, ammonium, mono-, di-, tri- or tetra–C_1–C_4alkylammonium, mono-, di- or tri- hydroxyalkylammonium or ammonium that is di- or tri-substituted with a mixture of C_1–C_4alkyl and C_1–C_4hydroxyalkyl groups;

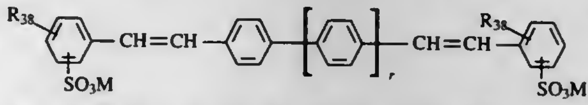
4) the dibenzofuranylbiphenyl compounds having the formula:



(15)

in which R_{35} H, C_1–C_4alkyl, CN, Cl or SO_3M, R_{36} and R $_{37}$, independently, are H, C_1–C_4alkyl, SO_3M, CN, Cl or O—C_1–C_4alkyl and M is H, Na, K, Ca, Mg, ammonium, mono-, di-, tri- or tetra–C_1–C_4alkyl ammonium, mono-, di- or tri-hydroxyalkylammonium or ammonium that is di- or tri-substituted with a mixture of C_1–C_4alkyl and C_1–C_4hydroxyalkyl groups, provided that at least two of R_{35}, R_{36} and R_{37} are SO_3M and the third group has no solubilizing character; and

5) the bistyrylphenyl compounas baving the formula:



(16)

in which R_{36} is H, SO_3M, O—C_1–C_4alkyl, CN, Cl, COO–C_1–C_4alkyl or CON(C_1–C_4alkyl)$_2$, M is H, Na, K, Ca, Mg, ammonium, mono-, di-, tri- or tetra–C_1–C_4alkylammonium, mono-, di- or tri- hydroxyalkylammonium or ammonium that is di- or tri-substituted with a mixture of C_1–C_4alkyl and C_1–C_4hydroxyalkyl groups and r is 0 or 1; and

- c) the substantial remainder of the composition being water, whereby the sun protection factor of the textile fabric is increased by at least 300%.

5,688,759

NITROGEN-FREE ANIONIC CONDITIONING FORMULATIONS

Ansgar Behler, Bottrop; Günther Uphues, Monheim, and Bernd Wahle, Kaarst, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/03075, § 371 Date Mar. 22, 1996, § 102(e) Date Mar. 22, 1996, PCT Pub. No. WO95/08613, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 14, 1994, Ser. No. 619,470

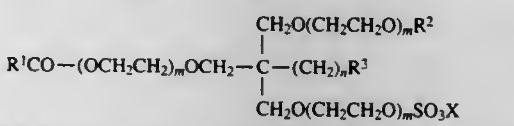
Claims priority, application Germany, Sep. 22, 1993, 43 32 187.9

Int. Cl.^{6} C11D *1/12;1/16;1/24;1/28*

U.S. Cl. 510—526 **19 Claims**

1. A nitrogen-free anionic conditioning or fabric-softening formulation comprising

(A) from about 10 to about 70% by weight of at least one sulfated polyol fatty acid ester of the formula



$$R^1CO-(OCH_2CH_2)_mOCH_2-\underset{\displaystyle CH_2O(CH_2CH_2O)_mSO_3X}{\overset{\displaystyle CH_2O(CH_2CH_2O)_mR^2}{\overset{|}{\underset{|}{C}}}}-(CH_2)_nR^3 \qquad (I)$$

in which R^1CO is a linear or branched, saturated or unsaturated acyl radical containing 6 to 22 carbon atoms, R^2 represents hydrogen, an OCR^1 group or an SO_3X group, R^3 is hydrogen or an $(OCH_2CH_2)_mOR^2$ group, n is 0 or a number of 1 to 5, m is 0 or a number of 1 to 10, and X is an alkali metal, alkaline earth metal, ammonium, alkylammonium, alkanolammonium or glucammonium ion; and

(B) at lease one additive selected from the group consisting of a dispersant, a perfume, a viscosity regulator, another surfactant, an emulsifier, a synthetic resin, a catalyst, and an optical brightener;

wherein the above percentages am based on the solids content of the formulation.

5,688,760

POLYPEPTIDES HAVING BONE RESORPTION INHIBITORY ACTIVITY COMPRISING PTHRP-DERIVED SEQUENCES

Bruce E. Kemp, Kew; Geoffrey C. Nicholson, Geelong; Thomas J. Martin, Kew; Anna J. Fenton, Geelong, all of Australia, and R. Glenn Hammonds, Berkeley, Calif., assignors to Genentech, Inc., San Francisco, Calif., and The University of Melbourne, Victoria, Australia

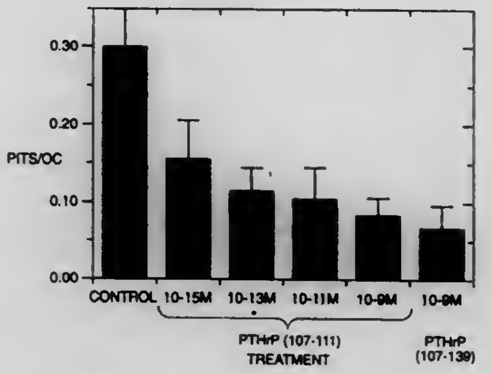
PCT No. PCT/AU91/00580, § 371 Date Aug. 12, 1993, § 102(e) Date Aug. 12, 1993, PCT Pub. No. WO92/10511, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 13, 1991, Ser. No. 64,111

Claims priority, application Australia, Dec. 13, 1990, PK3879; Nov. 19, 1991, PK9567

Int. Cl.^{6} C07K *7/06;7/08;14/635;* **A61K** *38/29*

U.S. Cl. 514—2 **19 Claims**



1. A polypeptide having bone resorption inhibitory activity, said polypeptide having an amino acid sequence:

Xaa_1-Xaa_2-Xaa_3-Xaa_4-Xaa_5-Z,

wherein:

Xaa_1 is an amino acid selected from the group consisting of Thr, Ala, Cys, Pro, D-Trp and n-methylalanine;

Xaa_2 is an amino acid selected from the group consisting of Arg, Lys, His, and D-Ala;

Xaa_3 is an amino acid selected from the group consisting of Ser, Ala, Cys, and D-Ser;

Xaa_4 is an amino acid selected from the group consisting of Ala, n-methylalanine, (3-(2-napthyl)-alanine), and D-Arg;

Xaa_5 is an amino acid selected from the group consisting of Tyr, Trp, D-Thr, α-phenylglycine, and α-napthylalanine;

Z is present or absent, and when present consists of an amino acid sequence beginning at PTHrP amino acid residue 112 as shown in FIG. 1 (SEQ ID NO:1) and ending at any PTHrP amino acid from 112 to 173 as shown in FIG. 1 (SEQ ID NO:1);

or wherein Xaa_1-Xaa_2-Xaa_3-Xaa_4-Xaa_5-Z is the sequence RTRSAW (SEQ ID NO:4) or TRCAWPGTC (SEQ ID NO:15), and

where "D" refers to the D-amino acid isomer;

excluding PTHrP(107-138) and PTHrP(107-141).

5,688,761

CONVERTIBLE MICROEMULSION FORMULATIONS

Albert J. Owen, West Chester, Pa.; Seang H. Yiv, Wilmington, Del., and Ani B. Sarkahian, Bryn Mawr, Pa., assignors to LDS Technologies, Inc., Boothwyn, Pa.

PCT No. PCT/US93/09933, § 371 Date Jun. 8, 1995, § 102(e) Date Jun. 8, 1995, PCT Pub. No. WO94/08604, PCT Pub. Date Apr. 28, 1994

Continuation-in-part of Ser. No. 963,326, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 885,202, May 20, 1992, Pat. No. 5,444,041, which is a continuation-in-part of Ser. No. 841,931, Feb. 25, 1992, abandoned, which is a continuation-in-part of Ser. No. 837,347, Feb. 14, 1992, which is a continuation-in-part of Ser. No. 687,691, Apr. 19, 1991, abandoned. This PCT application Oct. 15, 1993, Ser. No. 406,862

Int. Cl.^{6} A61K *9/107;38/16;39/00*

U.S. Cl. 514—2 **22 Claims**

1. A stable, water-in-oil microemulsion composition suitable for storage and administration of biologically active materials, comprising:

- (a) from about 5 to about 99 volume percent of an oil phase comprising at least one pharmaceutically acceptable oil;
- (b) up to about 60 volume percent of an aqueous phase comprising water;
- (c) a biologically active material having a water:oil partition coefficient greater than 10:1;
- (d) from about 1 to about 70 volume percent of a mixture of surfactants having a combined HLB value of from about 7 to about 14 comprising
  - (i) a low HLB surfactant having an HLB below 8, said low HLB surfactant being at least 80 percent by weight of a C_9 monoglyceride, C_{10} monoglyceride, C_{11} monoglyceride, C_{12} monoglyceride, or C_{13} monoglyceride, and
  - (ii) at least one surfactant having an HLB value above about 8.

5,688,762

METHOD OF TREATING HYPERTENSION USING ANIMAL STOMACH MUCOSA EXTRACT AND ENDOGENOUS PROTEASE-INHIBITOR PEPTIDES

Zoltan W. Steiner, Ungerer Str. 19/I/1o5-2, 80802 Munchen, Germany

Filed Sep. 6, 1995, Ser. No. 523,912

Int. Cl.^{6} A61K *38/17;* **C07K** *1/30;14/00*

U.S. Cl. 514—2 **18 Claims**

1. A process for suppressing the formation of Angiotensin II in an animal comprising the steps of

obtaining a protease-inhibitor peptide-containing extract, wherein said extract is obtained by forming a suspension of an animal stomach mucosa in an acidified solvent, precipitating proteins and recovering said inhibitor peptide-containing extract, said extract having a molecular weight of 10,754 and 101 amino acid residues per mole, and

administering an effective amount of said protease-inhibitor peptide-containing extract to a mammal in need thereof to inhibit the renin-angiotensinogen-angiotensin enzymatic system and to suppress the formation of Angiotensin II.

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5,688,763

COMPOSITIONS AND METHODS FOR THE SYNTHESIS OF GROWTH HORMONE RECEPTOR AND GROWTH HORMONE BINDING PROTEIN

R. Glenn Hammoods, Jr., 5955 Almaden La., Oakland, Calif. 94611; David W. Leung, 7625 E. Mercer Way, Mercer Island, Wash. 98040; Steven A. Spencer, 1967 Ticonderoga Dr.; William I. Wood, 1400 Tarrytown St., both of San Mateo, Calif. 94402, and Peter Cameron Colosi, 1240 Alameda Delas Pugas, No. 312, Belmont, Calif. 94002

Continuation of Ser. No. 2,489, Jan. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 723,358, Jun. 28, 1991, abandoned, which is a division of Ser. No. 62,542, Jun. 12, 1987, Pat. No. 5,057,417. This application May 25, 1994, Ser. No. 248,832

Int. Cl.^{6} A61K *38/27;38/18;38/17;* **C07K** *14/72*

U.S. Cl. 514—12 **16 Claims**

1. A growth hormone receptor having the ability to bind selectively to growth hormone, said growth hormone receptor comprising an amino acid sequence encoded by a nucleic acid sequence selected from the group consisting of:

(a) the nucleic acid sequence shown in FIG. 8*a;*

(b) the nucleic acid sequence shown in FIG. 8*b*; and

(c) a nucleic acid sequence which is capable of hybridizing with the nucleic acid sequence of (a) or (b) under low stringency conditions comprising incubating or washing with about 0.15M sodium chloride and 0.015M sodium citrate at about 32°–50° C., or its equivalent,

wherein said growth hormone receptor is free of proteins normally associated with growth hormone receptor in its in vivo physiological milieu.

5,688,764

INSECTICIDAL PEPTIDES FROM SPIDER VENOM

Janice H. Johnson; Robert M. Kral, Jr., and Karen Krapcho, all of Salt Lake City, Utah, assignors to NPS Pharmaceuticals, Inc., Salt Lake City, Utah

Filed Feb. 17, 1995, Ser. No. 390,882

Int. Cl.^{6} A01N *37/18;* **C07K** *14/435;* **C12N** *1/00;5/10;15/12;15/63*

U.S. Cl. 514—12 **38 Claims**

1. A fraction of whole Calisoga spider venom comprising a fraction which is neurotoxic to *Heliothis virescens*, said neurotoxic fraction comprising SEQ NO:1, SEQ ID NO:2 or SEQ ID NO:3.

5,688,765

OCULAR THERAPY IN SJOGREN'S SYNDROME USING TOPICALLY APPLIED ANDROGENSOR TGF-β

David A. Sullivan, Acton, Mass., assignor to The Schepens Eye Research Institute, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 124,842, Sep. 21, 1993, Pat. No. 5,620,921, which is a continuation of Ser. No. 871,657, Apr. 21, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 477,301

Int. Cl.^{6} A61K *37/00*

U.S. Cl. 514—12 **4 Claims**

1. A method for treating keratoconjunctivitis sicca (KCS) comprising

providing a therapeutic agent comprising a therapeutically effective amount of TGF-β in a pharmaceutically acceptable carrier substance appropriate for ocular administration, and

administering said therapeutic agent locally to the ocular surface or immediate vicinity of an eye of a patient suffering from said KCS.

5,688,766

ANTICARIES COMPOSITIONS

George Joe Revis, The Procter & Gamble Company, 11450 Grooms Rd., Cincinnati, Ohio 45242-1434

Continuation of Ser. No. 334,891, Nov. 4, 1994, abandoned, which is a continuation of Ser. No. 158,536, Dec. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 998,214, Dec. 30, 1992, abandoned. This application Aug. 23, 1995, Ser. No. 538,165

Int. Cl.^{6} A61K *38/00;* **C07K** *14/00*

U.S. Cl. 514—12 **17 Claims**

1. A flavored oral or edible composition comprising an oral or edible carrier composition and cystatin SN or a fragment thereof or mixtures thereof, wherein when used alone or in a mixture, said cystatin or fragment thereof is present at a level of from about 0.001% to about 5%.

5,688,767

TREATMENT OF ENDOTOXIN-ASSOCIATED DISORDERS WITH CATIONIC PEPTIDES

Robert E. W. Hancock, Vancouver; Kevin L. Piers, Red Deer, both of Canada; Melissa H. Brown, Canterbury, Australia, and Niamh Kelly, Vancouver, Canada, assignors to University of British Columbia, Vancouver, Canada

Division of Ser. No. 405,234, Mar. 13, 1995, which is a continuation-in-part of Ser. No. 110,502, Aug. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 933,492, Aug. 21, 1992, abandoned. This application Mar. 13, 1996, Ser. No. 614,516

Int. Cl.^{6} A61K *38/16*

U.S. Cl. 514—12 **6 Claims**

1. A method of inhibiting the growth of bacteria comprising contacting the bacteria with an inhibiting effective amount of the peptide of Sequence ID No.24.

5,688,768

RECOMBINANT THROMBIN RECEPTOR AND RELATED PHARMACEUTICALS

Shaun R. Coughlin, San Francisco, and Robert M. Scarborough, Belmont, both of Calif., assignors to COR Therapeutics, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 657,769, Feb. 19, 1991, Pat. No. 5,256,766. This application Nov. 7, 1991, Ser. No. 789,184

Int. Cl.^{6} A61K *36/00;* **C07K** *7/06;7/08;7/10*

U.S. Cl. 514—15 **9 Claims**

1. A peptide capable of activating thrombin receptor, which peptide is of the formula

$$AA_x—AA_y—(AA_i)_n—Z \qquad (1)$$

wherein AA_x is a small amino acid or threonine, and A_y is a neutral/nonpolar/aromatic amino acid residue or is a neutral/nonpolar/large/nonaromatic amino acid containing a cyclic portion;

wherein AA represents an amino acid residue and the subscript i is an integer which denotes the position of said amino acid residue downstream (N→C) of the AA_y residue of formula (1), and n is an integer of 2–12 so that $(AA_i)_n$ represents AA_1-AA_2; AA_1-AA_2-AA_3; AA_1-AA_2-AA_3-AA_4; through AA_1-AA_2-AA_3-AA_4-AA_5-AA_6-AA_7-AA_8-AA_9-AA_{10}-AA_{11}-AA_{12};

with the proviso that if n=2, Z must be of the formula NR'R' wherein at least one R' is alkyl (1–6C) containing at least one polar substituent;

AA_1 is a neutral or basic amino acid having a free α-amino group in the L-configuration;

AA_2 is a neutral or basic amino acid residue in the L-configuration;

AA_4–AA_{12} are L-amino acid residues; and

Z is a substituent that does not prevent said activating with the proviso that said peptide is not a peptide selected from the group consisting of SFLLKNPNDKYEPF; SFLLRNPNDKYEP; SFLLRNPNDKYE; SFLLRNPNDKY; SFLLRNPNDK; SFLLRNPND; SFLLRNPN; SFLLRNP; SFLLRN; SFLLR; SFLL; and SFL, and the amidated forms thereof.

5,688,769

TREATMENT METHOD

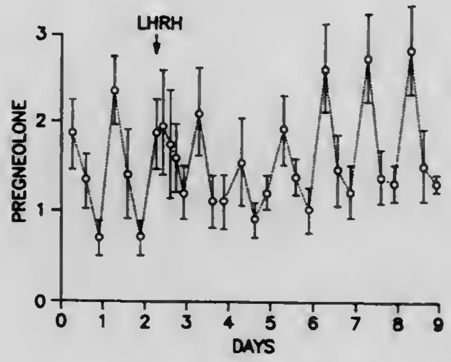
Fernand Labrie, Quebec, Canada, and Jean-Pierre Raynaud, Paris, France, assignors to Roussel Uclaf, France

Division of Ser. No. 19,232, Feb. 18, 1993, Pat. No. 5,389,613, which is a division of Ser. No. 595,297, Oct. 10, 1990, Pat. No. 5,189,021, which is a division of Ser. No. 334,086, Apr. 6, 1989, Pat. No. 5,062,144, which is a division of Ser. No. 120,408, Nov. 13, 1987, Pat. No. 4,851,386, which is a division of Ser. No. 921,737, Oct. 22, 1986, Pat. No. 4,745,102, which is a division of Ser. No. 895,179, Aug. 11, 1986, Pat. No. 4,728,640, which is a division of Ser. No. 621,421, Jun. 18, 1984, Pat. No. 4,743,589, which is a division of Ser. No. 468,932, Feb. 23, 1983, Pat. No. 4,472,382, which is a division of Ser. No. 189,168, Sep. 22, 1980, abandoned. This application Nov. 30, 1994, Ser. No. 347,054

Claims priority, application France, Sep. 21, 1979, 79-23545

Int. Cl.^{6} A61K *38/00*

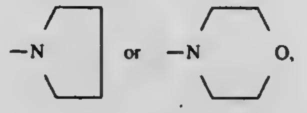
U.S. Cl. 514—15 **3 Claims**



1. A method for inhibiting ovarian steroidogenesis in women comprising administering to normal women with regular menstrual cycles an ovarian steroidogenesis inhibitorally effective amount of at least one peptide of the formula

p Glu-His-Trp-Ser-Tyr-X-Y-Arg-Pro-Z

wherein (a) Z is Gly-NH_2, Y is Leu and X is Gly, (b) Z is Gly-NH_2, Y is Leu, X is DN Leu, DN Val, D Abu (α-aminobutyric acid), D Phe, D Ser, D Thr, D Met, D Pgl, D Lys, Leu, Ile, Nle, Val, N-Val, Met, Phe, D Leu, D Arg, D ser (tbu), D Thr (tbu), D Cys (tbu), D Asp (O tbu), D Glu (Otbu), D Orn (boc), D Lys (boc), D Trp, Trp, 2-methyl Ala, D Tyr, D Met, ε-lauryl D Lys, ε-dextran-D Lys, (c) Z is NH-cyclopropyl- or NH-Alk wherein Alk is alkyl of 1 to 3 carbon atoms, Y is Leu and X is D Ser (tbu), D Thr (tbu), D Asp (Otbu), D Glu (Otbu), D Orn (boc), D Lys (boc), (d) Z is —NH—CH_3, —NH—CH_2—CH_3,—NH—CH_2—CH_2—CH_3, —NH—C.H_2—CH_2—OH,



Y is Leu and X is Gly, (e) Z is —NH—CH_2—CH_3. Y is Leu and X is D Trp, D Leu, D Ala, D Ser (tbu), D Tyr, D Lys, Ala, (f) Z is Gly-NH_2 or —NH—CH_2—CH_3, Y is NαMet Leu and X is Gly (g) Z is —NH-cyclopropyl, Y is Leu and X is D Leu or (h) Z is Gly-NH_2, —NH-cyclopropyl or —NHAlk' where Alk' is alkyl of 1 to 3 carbon atoms, Y is Ser (but), Cys (but), Asp (Obut), Glu (Obut), —Orn (boc), Lys (boc) and X is Gly.

5,688,770

ANTIGLAUCOMA COMPOSITIONS AND METHODS

Robert W. Watkins, Great Meadows, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 450,766, Dec. 14, 1989, Pat. No. 5,326,750. This application Apr. 7, 1994, Ser. No. 224,620

Int. Cl.^{6} A61K *37/14;37/16;38/16;38/08*

U.S. Cl. 514—16 **3 Claims**

1. A method of reducing elevated intraocular pressure in a mammal which comprises topically administering a composition comprising an intraocular pressure reducing amount of a renin inhibitor and a beta adrenergic blocking agent to an eye of said mammal.

5,688,771

LIPOPHILIC OLIGOPEPTIDES WITH IMMUNOMODULATING ACTIVITY

Christopher Penney, Dollard des Ormeaux, and Boulos Zacharie, Laval, both of Canada, assignors to BioChem Pharma Inc., Quebec, Canada

PCT No. PCT/CA93/00144, § 371 Date Oct. 3, 1994, § 102(e) Date Oct. 3, 1994, PCT Pub. No. WO93/20100, PCT Pub. Date Oct. 14, 1993

Continuation-in-part of Ser. No. 917,464, Jul. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 862,694, Apr. 3, 1992, abandoned. This PCT application Apr. 2, 1993, Ser. No. 313,304

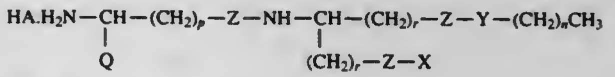
Claims priority, application WIPO, Apr. 2, 1993, PCT/CA93/00144

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—19 **14 Claims**

1. An oligopeptide of formula (II):

(II)



$$\mathrm{HA.H_2N{-}\underset{\displaystyle Q}{\underset{|}{CH}}{-}(CH_2)_p{-}Z{-}NH{-}\underset{\displaystyle (CH_2)_r{-}Z{-}X}{\underset{|}{CH}}{-}(CH_2)_r{-}Z{-}Y{-}(CH_2)_nCH_3}$$

wherein:

p is an integer selected from zero to four;

each Z is independently C=O or C=S;

each r is independently an integer selected from zero to two;

Y is selected from the group consisting of —O—, —S— and —NH—;

n is an integer selected from eleven to nineteen;

X is NH_2, OH or OCH_3;

HA, if present, is an organic or inorganic acid which will form a physiologically acceptable salt with said oligopeptide; and

Q is C_1–C_4 branched or unbranched alkyl, phenyl, benzyl, hydroxymethyl or a side chain from any naturally occurring amino acid.

5,688,772

QUINOA SAPONIN COMPOSITIONS AND METHODS OF USE

Alberto Estrada; Mark J. Redmond, and Bernard Laarveld, all of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Continuation-in-part of Ser. No. 283,980, Aug. 1, 1994, Pat. No. 5,597,807. This application Jul. 27, 1995, Ser. No. 507,843

Int. Cl.^{6} A61K *31/70;35/78*

U.S. Cl. 514—25 **6 Claims**

1. A pharmaceutical composition comprising at least one Quinoa saponin; a selected drug; and a pharmaceutically acceptable vehicle.

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5,688,773

METHOD OF SELECTIVELY DESTROYING NEOPLASTIC CELLS

E. Antonio Chiocca, Boston; David J. Waxman, Newton Centre; Ming X. Wei, Somerville; Xandra O. Breakefield, Newton, and Ling Chen, Brookline, all of Mass., assignors to The General Hospital Corporation; Boston University, and Dana-Farber Cancer Institute, all of Boston, Mass.

Continuation-in-part of Ser. No. 291,500, Aug. 17, 1994, abandoned. This application Oct. 28, 1994, Ser. No. 330,523

Int. Cl.^{6} A61K *48/00;* **C12N** *5/00;15/00;* **C07N** *14/00*

U.S. Cl. 514—44 **27 Claims**

1. A method for selectively killing central nervous system tumor cells in a mammal, said method comprising:

(a) infecting said tumor cells of said mammal with a viral vector, said vector carrying a cytochrome P450 gene, wherein expression of said gene by said tumor cells enables the enzymatic conversion of a chemotherapeutic agent to its cytotoxic form within said tumor, whereby said tumor cells become selectively sensitized to said agent; and

(b) contacting said tumor cells with said chemotherapeutic agent whereby said tumor cells are selectively killed.

5,688,774

A_3 ADENOSINE RECEPTOR AGONISTS

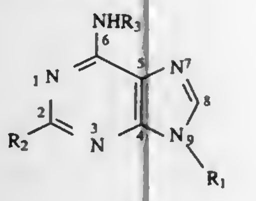
Kenneth A. Jacobson, Silver Spring; Heaok Kim Jeong, Rockville; Suhaib M. Siddiqi, Gaithersburg, all of Md.; Carl R. Johnson, Detroit, Mich.; John A. Secrist, III, and Kamal N. Tiwari, both of Birmingham, Ala., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 274,628, Jul. 13, 1994, which is a continuation-in-part of Ser. No. 163,324, Dec. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 091,109, Jul. 13, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 396,111

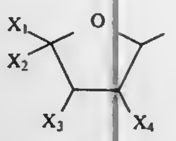
Int. Cl.^{6} A61K *31/70;* **C07H** *19/167;19/173*

U.S. Cl. 514—46 **16 Claims**

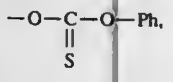
1. A compound of the formula:



wherein R_1 is

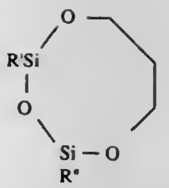


wherein X_1 is hydrogen or C_1–C_{10} alkyl, X_2 is C_1–C_{10} alkylamido, and each of X_3 and X_4 is independently hydrogen, hydroxyl, amino, azido, halo, OCOPh,



$$-O-\underset{\underset{S}{\|}}{C}-O-Ph,$$

or both X_3 and X_4 are oxygen connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring



where R' and R" are independently C_1–C_{10} alkyl, with the proviso that both X_3 and X_4 are not hydroxyl when X_1 is hydrogen; R_2 is hydrogen, halo, or C_1–C_{10} alkylamino; and R_3 is benzyl or halobenzyl.

5,688,775

β-1,3-GLUCAN POLYSACCHARIDES, COMPOSITIONS, AND THEIR PREPARATION AND USES

Donald W. Renn, Glen Cove; Lisa E. Dumont, Rockport; William C. Snow, and Foner P. Curtis, both of Rockland, all of Me., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 776,106, Oct. 15, 1991, abandoned. This application Jan. 24, 1994, Ser. No. 185,642

Int. Cl.^{6} A61K *31/715;* **C07H** *1/00;* **C08B** *37/00*

U.S. Cl. 514—54 **34 Claims**

1. A polysaccharide composition comprising a compound selected from the group consisting of a β-1,3-glucan polysaccharide, a partially depolymerized β-1,3-glucan polysaccharide, a hydroxyalkyl derivative of a β-1,3-glucan polysaccharide, or a partially depolymerized hydroxyalkyl derivative of a β-1,3-glucan polysaccharide, and alkali metal salts thereof, wherein the partial depolymerization is equivalent to the exposure of 200 Krad to 800 Krad of gamma radiation from Cobalt 60, which will form a clear, aqueous 1% by weight sol, has essentially a baseline UV absorption at 260 nm, and a gel of the sol has essentially no background fluorescence when stained with ethidium bromide.

5,688,776

CROSSLINKED POLYSACCHARIDES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Kurt Heinz Bauer, Freiburg, and Juergen Betzing, Aachen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/00225, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/19095, PCT Pub. Date Sep. 30, 1993

PCT Filed Feb. 1, 1993, Ser. No. 302,831

Claims priority, application Germany, Mar. 20, 1992, 42 09 160.8

Int. Cl.^{6} A61K *31/715;* **C08B** *37/06;37/02;37/00*

U.S. Cl. 514—54 **6 Claims**

1. A pharmaceutical composition which comprises an active substance which acts in the large intestine or an active substance which is broken down on passing through the stomach or small intestine, coated with or embedded in a polysaccharide selected from the group consisting of galactomannans, laminarin, pectins, arabinogalactans, xylans and glucomannans which is crosslinked with bifunctional crosslinkers and is no longer water soluble but is still biodegradable, has a swelling of from 100 to 1000%, where the swelling, which means the percentage gain in weight, is determined by the following equation:

$$A = \frac{W_t - W_o}{W_o} \times 100$$

in which A is the percentage gain in weight, W_o is the weight of the dry polymer and W_t is the weight of the swollen polymer saturated with water.

5,688,777

INHIBITION OF *C. DIFFICILE* INFECTIONS BY INDIGESTIBLE OLIGOSACCHARIDES

Keith Allen Garleb, Powell; Bryan Warren Wolf, Newark, both of Ohio; Jonathan Allan Meulbroek, Grayslake, Ill., and Keith Brian Wheeler, Dublin, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 5, 1995, Ser. No. 417,413

Int. Cl.^{6} A01N *43/04*

U.S. Cl. 514—54 **5 Claims**

1. A method of inhibiting the infection of a mammal by *Clostridium difficile* by enterally administering a therapeutically effective amount of an indigestible oligosaccharide selected from the group consisting of fructooligosaccharides.

5,688,778

NUCLEOSIDE ANALOGS

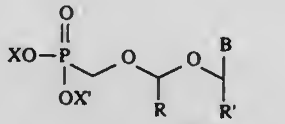
Choung Un Kim, Madison, Conn.; John C. Martin, San Carlos, Calif.; Bing Uh Luh, Killingworth, and Peter F. Misco, Durham, both of Conn., assignors to Institute of Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic, Czech Rep., and Rega Stichting v.z.w., Belgium

Continuation of Ser. No. 765,774, Sep. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 481,569, Feb. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 352,303, May 15, 1989, abandoned. This application Feb. 17, 1995, Ser. No. 391,312

Int. Cl.^{6} A61K *31/675;* **C07F** *9/6561;9/6512;* **C07D** *473/18*

U.S. Cl. 514—81 **24 Claims**

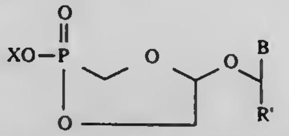
1. A phosphonomethoxymethoxymethyl purine derivative of the formula I



I

wherein X and X' are the same or different and are hydrogen or alkyl having 1 to 6 carbon atoms,

R' is hydrogen and R is the same or different and is hydrogen, alkyl with 1 to 6 carbon atoms, hydroxyalkyl with 1 to 6 carbon atoms or alkanoyl having 2 to 7 carbon atoms, or R is taken together with X' to complete a cyclic phosphonate having the formula II



II

B is a purine base substituted at the 9-position by the substituents shown in formulas I or II, which base is selected from the group of guanine, 8-bromoguanine, 8-hydrazinoguanine, 8-hydroxyguanine, 8-aminoguanine, 8-chloroguanine, 8-methylguanine, 8-thioguanine, 2,6-diaminopurine, adenine, 2-acetamido-6-chloropurine and 2-acetamido-6-diphenylcarbamoyloxypurine, provided that (a) when the base is 2-acetamido-6-chloropurine then the derivative has the structure of formula I, and R, X and X' are methyl, or (b) when the base is 2-acetamido-6-diphenylcarbamoyloxypurine then the derivative has the structure of formula I, X and X' are methyl, and R is hydroxymethyl;

and pharmaceutically acceptable salts thereof.

5,688,779

Patent Not Issued For This Number

5,688,780

ANTIHYPERCHOLESTEROLEMIC COMPOUNDS AND RELATED PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

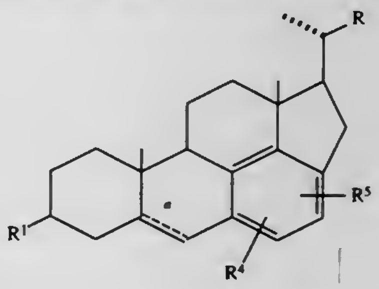
Wesley K. M. Chong, Encinitas; Wan-Ru Chao, Sunnyvale; Dennis M. Yasuda, Campbell; John G. Johansson, Menlo Park, all of Calif.; Mitchell A. Avery, Grand Forks, N. Dak., and Masato Tanabe, Palo Alto, Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 898,934, Jun. 12, 1992, Pat. No. 5,510,340. This application Feb. 29, 1996, Ser. No. 609,982

Int. Cl.^{6} A61K *31/56*

U.S. Cl. 514—169 **17 Claims**

1. A compound having the structural formula (III)



(III)

wherein:

R is selected from the group consisting of CH_3, CH_2OH, $CH_2CH_2CH_2CH(CH_3)_2$, $CH_2CH_2CH_2C(CH_3)_2$—OH, $CH_2CH_2CH_2C(CH_3)_2$—F, and CH=CH—$CH(CH_3)$—$CH(CH_3)_2$, $CH_2CH_2CH(CH_2CH_3)CH(CH_3)_2$, and CH=CH—$CH(CH_2CH_3)CH(CH_3)_2$;

R^1 is selected from the group consisting of —OH, =O, —OR^8, —$O(CO)R^9$, — O(CO)—$(CH_2)_n$—COOH, a sulfate group, and an Mg, Na, or K salt of a sulfate group, where R^8 is lower alkyl, R^9 is a C_1–C_{20} aliphatic group or a phenyl group, and n is an integer in the range of 2 to 6 inclusive;

R^4 and R^5 are independently selected from the group consisting of H, lower alkyl, lower acyl, lower alkoxy, —NH_2 and halogen; and

a represents either a single bond or a double bond.

5,688,781

METHOD FOR TREATING VASCULAR LEAK SYNDROME

Clay Siegall, and Dana Chace, both of Seattle, Wash., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Aug. 19, 1994, Ser. No. 293,351

Int. Cl.^{6} A61K *31/56*

U.S. Cl. 514—179 **8 Claims**

1. A method for preventing vascular leak syndrome induced by a therapeutic agent comprising administering to a mammalian species in need thereof a therapeutically effective amount of a corticosteroid, wherein the corticosteroid does not substantially affect the therapeutic activity of the therapeutic agent.

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5,688,782
MEDICAMENTS FOR TREATING RESPIRATORY DISORDERS

Philip John Neale, and Anthony James Taylor, both of Ware, Great Britain, assignors to Glaxo Group Limited, Greenford, Great Britain

Division of Ser. No. 256,294, Jul. 12, 1994. This application Jun. 2, 1995, Ser. No. 458,241

Claims priority, application United Kingdom, Feb. 6, 1992, 92 02519

Int. Cl.^{6} A61K *31/56;* **A61L** *9/04*

U.S. Cl. 514—180 **18 Claims**

1. A pharmaceutical aerosol formulation which comprises:

(a) beclomethasone dipropionate monohydrate, the particle size of substantially all the monohydrate being less than 20 microns;

(b) at least 0.015% by weight of the formulation of water in addition to the water of crystallisation associated with said monohydrate whereby said at least 0.015% water stabilizes the particle size of said beclomethasone dipropionate monohydrate particles;

(c) a fluorocarbon or hydrogen-containing chlorofluorocarbon propellant.

5,688,783
SALINAMIDES

William H. Fenical, Del Mar; Robert S. Jacobs, Santa Barbara, and Paul R. Jensen, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

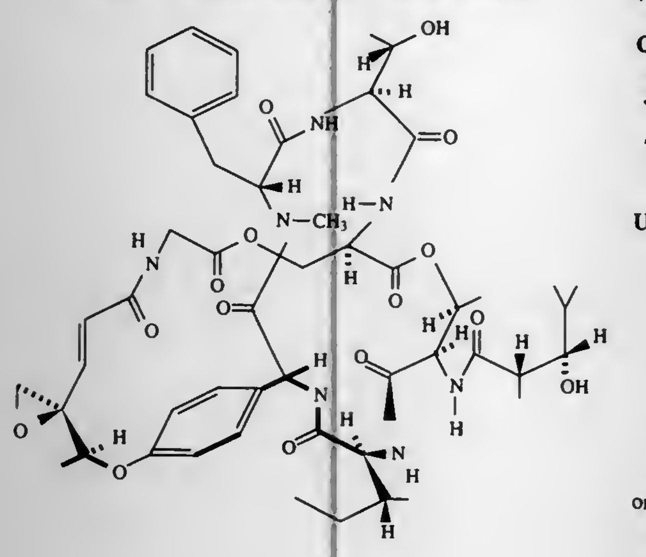
Division of Ser. No. 186,789, Jan. 25, 1994. This application Nov. 3, 1995, Ser. No. 552,841

Int. Cl.^{6} C07D *498/08;* **A61K** *31/395*

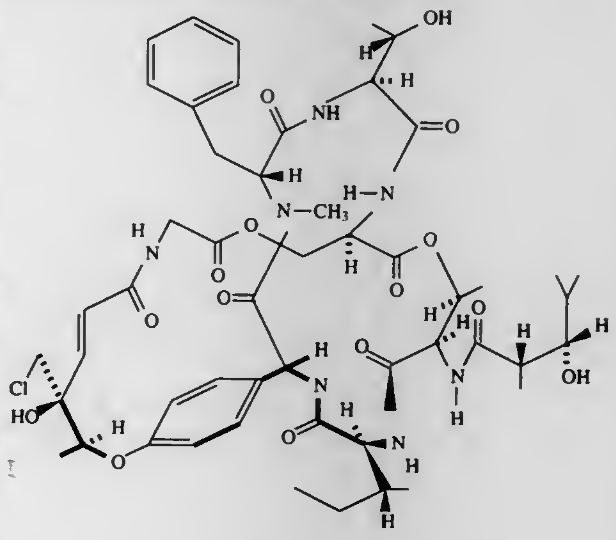
U.S. Cl. 514—183 **3 Claims**

1. A method for treating mammals having inflamed tissue to reduce inflammation which comprises:

administering to said mammal an inflammation reducing effective amount of a composition comprising a bicyclic depsipeptide selected from the group consisting of salinamide A and salinamide B wherein salinamide A has the structure



and; wherein salinamide B has the structure



5,688,784
METHOD OF SUPPRESSING APPETITE WITH VANADIUM COMPLEXES

John Hugh McNeill; Hamid Reza Hoveyda; Chris Orvig; Ying Zhou, all of Vancouver, Canada, and Jere Douglas Fellmann, Livermore, Calif., assignors to The University of British Columbia, Vancouver, Canada

Division of Ser. No. 210,642, Mar. 18, 1994, Pat. No. 5,527,790, which is a continuation-in-part of Ser. No. 40,113, Mar. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 767,510, Sep. 30, 1991, Pat. No. 5,300,496. This application Jun. 7, 1995, Ser. No. 484,970

Int. Cl.^{6} A61K *31/555;31/28*

U.S. Cl. 514—186 **5 Claims**

1. A method of suppressing appetite in a human or non-human mammalian body in need thereof, said method comprising administering to said body bis(maltolato)oxovanadium (IV).

5,688,785
SUBSTITUTED AZETIDINONE COMPOUNDS USEFUL AS HYPOCHOLESTEROLEMIC AGENTS

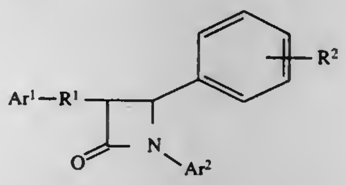
Wayne D. Vaccaro, Yardley, Pa., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 261,785, Jun. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 178,312, Jan. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 734,652, Jul. 23, 1991, abandoned, and Ser. No. 734,426, Jul. 23, 1991, abandoned. This application May 25, 1995, Ser. No. 449,973

Int. Cl.^{6} C07D *205/08;* **A61K** *31/395*

U.S. Cl. 514—210 **6 Claims**

1. A compound represented by the formula



or a pharmaceutically acceptable salt thereof, wherein:

Ar^1 is phenyl or R^3-substituted phenyl;

Ar^2 is phenyl or R^4-substituted phenyl;

R^1 is selected from the group consisting of

—(CH$_2$)$_q$—, wherein q is 2 or 3;

—(CH$_2$)$_e$—Z—(CH$_2$)$_r$, wherein Z is is —O—, e is 0 and r is 2;

R^2 is —(lower alkylene)—COR^5 or —(CH=CH)—COR^5;

R^3 and R^4 are independently selected from the group consisting of 1– 3substituents independently selected from the group consisting of —OR^6 and halogen;

R^5 is —OR or —NRR^{12}, wherein R and R^{12} are independently selected from the group consisting of hydrogen and lower alkyl; and

R^6 are independently selected from the group consisting of hydrogen and lower alkyl.

5,688,786
β-LACTAM ANTIBIOTICS

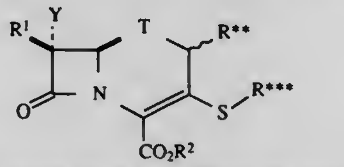
Burton Christensen, Lebanon, N.J.; Tomasz Glinka, Sunnyvale, Calif.; Ving J. Lee, Los Altos, Calif., and Scott Hecker, Los Gatos, Calif., assignors to Microcide Pharmaceuticals, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 413,712, Mar. 30, 1995, Pat. No. 5,604,218, Ser. No. 413,713, Mar. 29, 1995, Ser. No. 413,714, Mar. 29, 1995, Pat. No. 5,607,926, Ser. No. 415,064, Mar. 29, 1995, Ser. No. 415,065, Mar. 29, 1995, abandoned, Ser. No. 415,069, Mar. 29, 1995, Pat. No. 5,593,986, and Ser. No. 455,969, May 31, 1995, which is a continuation-in-part of Ser. No. 415,065, which is a continuation-in-part of Ser. No. 222,262, Apr. 1, 1994, said Ser. No. 413,712, said Ser. No. 413,713, said Ser. No. 413,714, said Ser. No. 415,064, said Ser. No. 415,065, said Ser. No. 415,069, each is a continuation-in-part of Ser. No. 369,798, Jan. 6, 1995, abandoned, which is a continuation-in-part of Ser. No. 222,262, Apr. 1, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 457,673

Int. Cl.^{6} C07D *463/13;505/12;* **A61K** *31/44*

U.S. Cl. 514—210 **22 Claims**

1. A compound active against methicillin resistant bacteria, as demonstrated by a lower minimum inhibitory concentration against methicillin resistant strains than cefotaxime, of the formula:



B

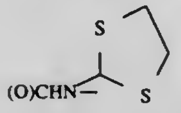
or a pharmaceutically acceptable salt thereof, wherein

T is selected from the group consisting of CH$_2$ and O;

Y is selected from the group consisting of H, OMe, and NHCHO;

R** is selected from the group consisting of H, Me, or Et;

R^1 is selected from the group consisting of —NHC(O)ZR^3; —NR^{4}R^5, and



where Z is selected from the group consisting of —CH$_2$(X*)$_m$—, —C(NOR^6)—, —CH (OR^7)—, —C(CHCO$_2$R^8)— and —CH(NR^{9}R^{10})—,

X* is selected from the group consisting of O and S,

m is 0 or 1;

R^3 is selected from the group consisting of cyano, alkyl, aryl, heterocycle and heteroaralkyl wherein the heterocycle and the heteroaromatic portion of said heteroaralkyl are independently selected from the group consisting of optionally substituted furyl, thienyl, imidazolyl, indolyl, pyridinyl, thiadiazolyl, thiazolyl, piperazinyl, dibenzfuranyl, and dibenzthienyl;

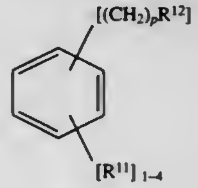
R$^{4-7}$ are independently selected from the group consisting of hydrogen, alkyl, aryl and acyl;

R^8 is selected from the group of hydrogen, alkyl and aryl;

R^9 and R^{10} are selected independently from the group consisting of hydrogen, alkyl, acyl, and heterocyclecarbonyl wherein the heterocyclic portion of said heterocyclecarbonyl is selected from the group consisting of optionally substituted furyl, thienyl, imidazolyl, indolyl, pyridinyl, thiadiazolyl, thiazolyl, piperazinyl, dibenzfuranyl, and dibenzthienyl;

R^2 is selected from the group consisting of hydrogen, alkyl, alkenyl, aryl, heterocycle, aralkyl, heteroaralkyl, and trialkylsilyl wherein the heterocycle and the heteroaromatic portion of said heteroaralkyl are independently selected from the group consisting of optionally substituted furyl, thienyl, imidazolyl, indolyl, pyridinyl, thiadiazolyl, thiazolyl, piperazinyl, dibenzfuranyl, and dibenzthienyl;

R*** is selected from the group consisting of beterotricycle;



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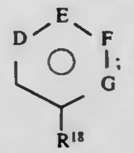
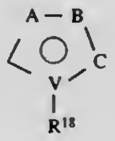


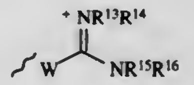
; and



wherein

R^{11} is H or halogen;

R^{12} is



or S—R^{17}

W is selected from the group consisting of S, NH, and CH$_2$;

R$^{13-16}$ are independently selected from the group consisting of H, alkyl, cycloalkyl, acyl, hydroxy, amino, amidino, and phosphoryl and taken together may form a 5-or 6-membered ring;

R^{17} is selected from the group consisting of alkyl, cycloalkyl, and a 5- or 6-membered ring heterocycle containing 0–4 nitrogen atoms, 0–1 oxygen atoms, and 0–1 sulfur atoms, and which is optionally substituted by alkyl, hydroxyl, alkoxyl, amino, hydroxymethyl, aminomethyl, or mono- or dialkylaminomethyl;

p is 0, 1 or 2;

R^{18} is cyano or an optionally substituted phenyl or heteroaryl; wherein said heteroaryl is selected from the group consisting of optionally substituted furyl, thienyl, imidazolyl, indolyl, pyridinyl, thiadiazolyl, thiazolyl, piperazinyl, dibenzfuranyl, and dibenzthienyl

V is carbon or nitrogen;

A, B and C are independently selected from the group consisting of CR^{19} or nitrogen, where R^{19} is hydrogen, alkyl, hydroxyl, amino, cyano, hydroxymethyl, or mono- or dialkylaminomethyl; and

D, E, F, and G are independently selected from the group consisting of CR^{19} or nitrogen, where R^{19} is selected from the group consisting of hydrogen, alkyl, hydroxyl, amino, cyano, hydroxymethyl, and mono- or dialkylaminomethyl.

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5,688,787

SUBSTITUTED β-LACTAM COMPOUNDS USEFUL AS HYPOCHLESTEROLEMIC AGENTS AND PROCESSES FOR THE PREPARATION THEREOF

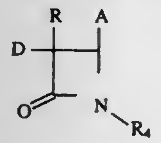
Duane A. Burnett, Fanwood; John W. Clader, Cranford; Sundeep Dugar, Parlin, and Wayne Vaccaro, Princeton, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 178,312, Jan. 11, 1994, which is a continuation-in-part of Ser. No. 734,426, Jul. 23, 1991, abandoned, and Ser. No. 734,652, Jul. 23, 1991, abandoned. This application Jan. 19, 1996, Ser. No. 588,785

Int. Cl.^{6} A61K *31/395;* **C07D** *205/08;403/10;401/04*

U.S. Cl. 514—210 **7 Claims**

1. A compound having the structural formula



wherein

A is —$(CH_2)_p$—X—B, wherein p is 0, 1 or 2 and X is a bond;

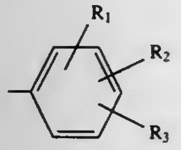
D is B'—$(CH_2)_q$—, wherein q is 2, 3, 4, 5 or 6;

B'—$(CH_2)_e$—Z—$(CH_2)_r$—, wherein Z is —O—, e is 0, 1, 2, 3, 4 or 5 and r is 1, 2, 3, 4 or 5, provided that the sum of e and r is 1, 2, 3, 4, 5 or 6;

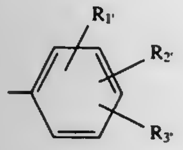
B'—(C_2–C_6 alkenylene)—; or

B'—$(CH_2)_f$—V—$(CH_2)_g$—, wherein V is C_3–C_6 cycloalkylene, f is 1, 2, 3, 4 or 5 and g is 0, 1, 2, 3, 4 or 5, provided that the sum of f and g is 1, 2, 3, 4, 5 or 6;

B is



B' is

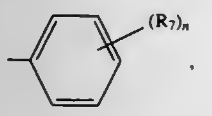


R is hydrogen;

R_1, R_2 and R_3 are independently selected from the group consisting of H, lower alkoxy, alkoxyalkyl, alkoxyalkoxy, alkoxycarbonyl-alkoxy, lower alkyl lower alkanedioyl, allyloxy, phenoxy, OH, m-halogeno and —C(O)R_{12};

$R_{1'}$, R_2' and R_3' are independently selected from the group consisting of H, lower alkoxy and halogeno;

R_4 is



wherein n is 0, 1 2 or 3, or indanyl;

R_7 is lower alkyl, lower alkoxy, halogeno, OH or —OCF_3, and where n is 2 or 3, the R_7 groups can be the same or different; and

R_{12} is alkoxy;

or a pharmaceutically acceptable salt thereof.

5,688,788

N-SUBSTITUTED AZAHETEROCYCLIC CARBOXYLIC ACIDS AND ESTERS THEREOF

Knud Erik Andersen, Smørum; Uffe Bang Olsen, Vallensbæk; Hans Petersen, Vanløse; Frederik Christian Grønvald, Vedbæk, all of Denmark; Ursula Sonnewald, Trondheim, Germany; Tine Krogh Jørgensen, Herlev, Denmark, and Henrik Sune Andersen, Kφbenhaven φ, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

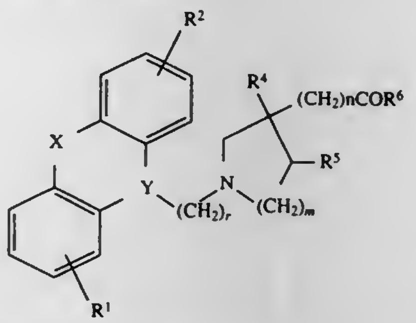
Division of Ser. No. 367,648, Jan. 3, 1995, Pat. No. 5,595,989. This application May 18, 1995, Ser. No. 444,140

Claims priority, application Denmark, Jan. 4, 1994, 0019/94; Nov. 9, 1994, 1290/94

Int. Cl.^{6} C07D *401/06;403/06;413/06;* **A61K** *31/55*

U.S. Cl. 514—211 **15 Claims**

1. A compound of formula I



(I)

wherein

R^1 and R^2 independently are hydrogen, halogen, trifluoromethyl, C_{1-6}-alkyl or C_{1-6}-alkoxy;

Y is >N—CH_2—, wherein only the underscored atom participates in the ring system;

X is —NR^9—(C═O)— wherein R^9 is hydrogen or C_{1-6}-alkyl;

r is 1, 2, or 3;

m is 1 or 2;

n is 1 when m is 1 and n is 0 when m is 2;

R^4 and R^5 are hydrogen when m is 1;

R^4 and R^5 are hydrogen or form a bond when m is 2; and

R^6 is OH or C_{1-8}-alkoxy; or

a pharmaceutically acceptable salt thereof.

5,688,789

PCP RECEPTOR LIGANDS AND THE USE THEREOF

Eckard Weber, Laguna Beach, Calif.; John F. W. Keana, Eugene, Oreg., and Peter Barmettler, Andover, Mass., assignors to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University and the University of Oregon, Eugene, Oreg.

Continuation of Ser. No. 875,787, Apr. 29, 1992, which is a continuation-In-part of Ser. No. 693,244, Apr. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 337,858, Apr. 14, 1989, Pat. No. 5,011,834. This application May 26, 1995, Ser. No. 450,155

Int. Cl.^{6} A61K *31/55;* **C07D** *471/08*

U.S. Cl. 514—214 **23 Claims**

1. A compound selected from the group consisting of
3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(+) 3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
7-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-bromo-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-chloro-7-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-bromo-7-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;

7-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-bromo-7-amino-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-bromo-7-methoxy-N-methyl-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(+)3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-iodo-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(−)-3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(±)-N-methyl-3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(+)-N-methyl-3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(±)-N-methyl-3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
(+)-N-methyl-3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
3-nitro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-azido-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-trifluoromethyl-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
N-methyl-3-trifluoromethyl-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3,7-difluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-phenyl-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-amino-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
8-hydroxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-hydroxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
8-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-cyano-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-methylthio-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
(+)-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene;
N-methyl-5-(iminomethano)-10,11-dihydro-5H-dibenzo[a,d]cycloheptene; and
N-methyl-3-iodo-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;

or a pharmaceutically acceptable salt thereof and/or the optically active isomer thereof.

22. A method of treating a mammal suffering from ischemia, stroke, heart attack, hypoxia, hypoglycemia or brain or spinal cord trauma, comprising administering to the mammal an effective amount of
3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
(+) 3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
7-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-bromo-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a, d]cycloheptene;
(+) 3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-iodo-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene; or
N-methyl-3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene; or a pharmaceutically acceptable salt thereof.

23. A method of treating a mammal suffering from Alzheimer's disease, amyotrophic lateral sclerosis, Huntington's disease or Down's syndrome, comprising administering to the mammal an effective amount of
3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
(+) 3-chloro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
7-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-bromo-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
(+) 3-fluoro-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-methoxy-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene;
3-iodo-5-(iminomethano)-10,11-dihydro-5H-dibenzo-[a,d]cycloheptene; or
N-methyl-3-fluoro-5-(iminomethano)-10,11-dibydro-5H-dibenzo-[a,d]cycloheptene; or a pharmaceutically acceptable salt thereof.

5,688,790

PHENYLPYRROLE DERIVATIVES AND THEIR USE AS ANTIPSYCHOTIC AGENTS

Michael Stewart Hadley, Sawbridgeworth; Christopher Norbert Johnson, Saffron Walden, and Geoffrey Stemp, Bishop's Stortford, all of England, assignors to SmithKline Beecham Plc, Brentford, England

PCT No. PCT/EP94/00992, § 371 Date Sep. 28, 1995, § 102(e) Date Sep. 28, 1995, PCT Pub. No. WO94/24129, PCT Pub. Date Oct. 27, 1994

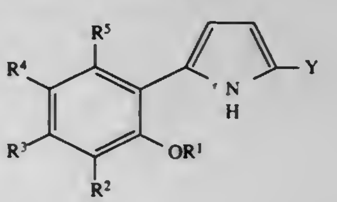
PCT Filed Mar. 29, 1994, Ser. No. 532,548

Claims priority, application United Kingdom, Apr. 8, 1993, 9307400

Int. Cl.^{6} C07D *471/04;455/02;* **A61K** *31/435*

U.S. Cl. 514—214 **7 Claims**

1. A compound of formula (I):



Formula (I)

wherein

R_1 represents C_{1-4}alkyl; and

R^2, R^3, R^4 and R^5 each independently represent hydrogen, halogen, C_{1-4}alkyl, C_{1-4}alkoxy, C_{1-4}alkoxyC_{1-4}alkyl, C_{1-4}alkylsulphonyl, trifluoromethylsulphonyl; optionally substituted arylsulphonyl, optionally substituted heteroarylsulphonyl, optionally substituted aralkylsulphonyl, optionally substituted heteroaralkylsulphonyl, nitro, cyano, amino, mono- or di-alkylamino, trifluoromethyl, trifluoromethoxy, hydroxyl, hydroxyC_{1-4}alkyl, C_{1-4}alkylthio, C_{1-4}alkanoyl, C_{1-4}alkoxycarbonyl, aminosulphonyl, or mono- or diC_{1-4}alkylaminosulphonyl; or

R^1 and R^2 together form a linking chain —$(CH_2)_m$Op; (wherein m is 2 to 4 and p is zero or 1) which chain may be optionally substituted by one or two C_{1-4}alkyl groups;

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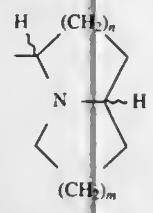
and Y represents a group of formula:



wherein each of n and m independently represent an integer from 1 to 3; and salts thereof.

5,688,791
ARYL GROUP-OR AROMATIC HETEROCYCLIC GROUP-SUBSTITUTED AMINOQUINOLONE DERIVATIVES AND ANTI-HIV AGENT

Tomio Kimura, and Tetsushi Katsube, both of Ube, Japan, assignors to UBE Industries, LTD., Ube, Japan

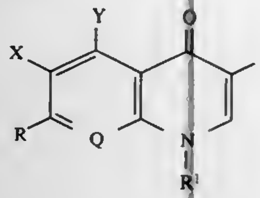
Division of Ser. No. 341,295, Nov. 15, 1994, Pat. No. 5,519,016, which is a continuation of Ser. No. 066,985, May 25, 1993, abandoned. This application Sep. 11, 1995, Ser. No. 526,225

Claims priority, application Japan, May 27, 1992, 4-158912

Int. Cl.⁶ A61K *31/54;31/535;* **C07D** *401/02;403/02*

U.S. Cl. 514—224.5 **21 Claims**

1. A compound of formula (Ia) or a pharmaceutically acceptable salt or ester thereof:



(Ia)

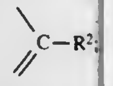
in which

X represents a fluorine atom;

Y represents a hydrogen atom, a halogen atom, a lower alkyl group, an unsubstituted amino group, or an amino group substituted by one or two groups selected from the group consisting of a lower alkyl group and an aralkyl group;

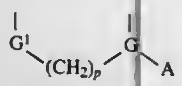
Z represents a protected or an unprotected carboxyl group or a 5-tetrazolyl group;

Q represents a group of formula (d):



(d)

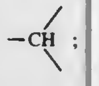
R^1 and R^2 together represent a group of formula (f):



(f)

wherein A represents a hydrogen atom, or a lower alkyl group which is unsubstituted or substituted by at least one substituent selected from the group consisting of a halogen atom, a hydroxy group and a lower alkoxy group;

G represents a nitrogen atom or a group of formula (g):

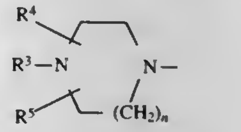


(g)

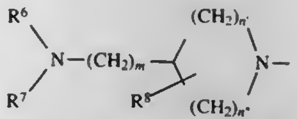
G^2 represents a methylene group, a carbonyl group, an oxygen atom or a group of formula —N(R^{11})—, where R^{11} represents a hydrogen atom or a lower alkyl group;

p=1 or 1;

R represents a group of formula (h) or (i):



(h)



(i)

wherein R^3 is a 5- or 6-membered aromatic heteromonocyclic group having one or two heteroatoms selected from the group consisting of N, O and S, which is unsubstituted or substituted by at least one substituent R as defined below, or a fused aromatic group which is a benzene ring fused with a 5- or 6-membered aromatic heteromonocyclic group having one or two heteroatoms selected from the group consisting of N, O and S, which is unsubstituted or substituted by at least one substituent R^0 as defined below;

R^6 is an aryl group which is unsubstituted or substituted by at least one substituent R^0 as defined below, a 5- or 6-membered aromatic heterocyclic group having one or two heteroatoms selected from the group consisting of N, O and S, which is unsubstituted or substituted by at least one substituent R^0 as defined below, or a fused aromatic group which is a benzene ring fused with a 5- or 6-membered aromatic heteromonocyclic group having one or two heteroatoms selected from the group consisting of of N, O and S, which is unsubstituted or substituted by at least one substituent R^0 as defined below;

R^4, R^5 and R^7 are the same or different, and each represents a hydrogen atom or a lower alkyl group;

R^8 represents a hydrogen atom, a lower alkyl group, a hydroxy group or a lower alkoxy group;

n=1 or 2;

m=0 or 1;

n'=1 or 2; and

n"=1, 2, 3 or 4;

and substituent R^0 is selected from the group consisting of halogen atoms, nitro groups, hydroxy groups, lower alkyl groups which are unsubstituted or substituted with at least one halogen atom, lower alkoxy group, and amino groups which are unsubstituted or substituted with one or two lower alkyl groups, and when there are two or more substituents R^0, each are the same or different.

5,688,792
SUBSTITUTED OXAZINE AND THIAZINE OXAZOLIDINONE ANTIMICROBIALS

Michael R. Barbachyn, Kalamazoo; Steven J. Brickner, Portage, and Douglas K. Hutchinson, Kalamazoo, all of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

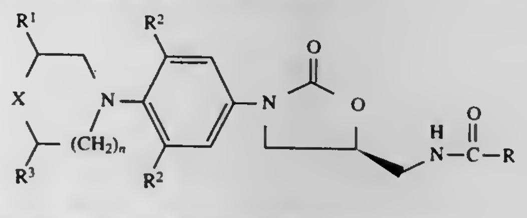
PCT No. PCT/US94/08904, § 371 Date Mar. 5, 1996, § 102(e) Date Mar. 5, 1996, PCT Pub. No. WO95/07271, PCT Pub. Date Mar. 16, 1995

PCT Filed Aug. 16, 1994, Ser. No. 617,877

Int. Cl.⁶ A61K *31/535*

U.S. Cl. 514—235.5 **12 Claims**

1. A compound of structural Formula I:



or pharmaceutically acceptable salts thereof wherein:

X is O;

R is (a) hydrogen,

(b) C_1–C_8 alkyl optionally substituted with one or more of the following: F, Cl, hydroxy, C_1–C_8 alkoxy, C_1–C_8 acyloxy or —O—CH_2—Ph,

(c) C_3–C_6 cycloalkyl,

(d) amino,

(e) C_1–C_8 alkylamino,

(f) C_1–C_8 dialkylamino or

(g) C_1–C_8 alkoxy;

R^1 is H, CH_3, CN, CO_2H, CO_2R or $(CH_2)_{mu}R^{11}$ (m is 1 or 2);

R^2 is independently H, F or Cl;

R^3 is H except when R^1 is CH_3 then R^3 can be H or CH_3;

R^{10} is independently H, C_1–C_4 alkyl (optionally substituted with chloro, fluoro, hydroxy,

C_1–C_8 alkoxy, amino, C_1–C_8 alkylamino, or C_1–C_8 dialkylamino) or p-toluenesulfonyl;

R^{11} is hydrogen, OH, OR, OCOR, NH_2, NHCOR or $N(R^{10})_2$; and n is 0, 1 or 2.

5,688,793
PYRIDAZINO[4',5':3,4]PYRROLO-[2,1-A]-ISOQUINOLINES AND THE USE THEREOF FOR PREPARING PHARMACEUTICAL PREPARATIONS

Walter Lösel, Gau-Algesheim; Otto Roos, Schwabenheim, and Dietrich Arndts, Appenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

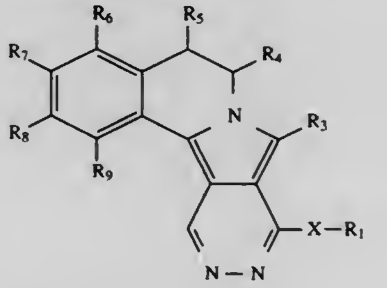
Continuation of Ser. No. 360,863, Dec. 21, 1994, abandoned. This application Aug. 19, 1996, Ser. No. 699,809

Claims priority, application Germany, Dec. 21, 1993, 43 43 649.8

Int. Cl.⁶ A61K *31/50;* **C07D** *487/04*

U.S. Cl. 514—248 **20 Claims**

1. A compound of formula (1)



wherein

X is O, S or NHO;

R_1 has one of the following meanings:

a) C_{3-7}-cycloalkyl;

b) a straight-chained or branched alkyl group having 1 to 10 or an alkenyl or alkynyl group having 2 to 10 carbon atoms, which alkyl, alkenyl or alkynl group may be substituted by hydroxy, C_{1-4}-alkoxy, halogen, NH_2, NH-alkyl having 1 to 2 carbon atoms, N,N-di(C_{1-2})alkylamino, NH-acyl having 2 to 4 carbon atoms, 1 or 2 C_{3-7}-cycloalkyl groups, phenoxy, 1 or 2 phenyl groups (wherein the phenyl ring or rings or phenoxy may in turn be mono- or disubstituted by halogen, CF_3, C_{1-4}-alkyl, C_{1-2}-alkoxy, NH-alkyl having 1 to 2 carbon atoms, N,N-dialkyl having 1 to 2 carbon atoms, NH_2, N-acyl having 2 to 3 carbon atoms, —OCH_2O—, (C_1 or C_2) alkylsulphonylamino, phenoxy or benzyloxy), furyl or thienyl;

R_3, R_4 and R_5, which may be identical or different, are hydrogen or a C_{1-4}-alkyl group;

R_7 and R_8, which may be identical or different, are hydroxy; C_{1-4}-alkoxy; or C_{1-4}-alkylthio;

R_6 and R_9, which may be identical or different, are hydrogen; hydroxy; C_{1-4}-alkoxy; C_{1-4}-alkylthio;

or 2 adjacent substituents of the substituents R_6, R_7, R_8 and R_9 together form the group —O—$(CH_2)_{1\ or\ 2}$—O— and the other 2 substituents are as hereinbefore defined,

or a pharmaceutically acceptable salt thereof,

with the exception of compounds of formula I as hereinbefore defined wherein XR_1 is the group SR_1 wherein R_1 is C_{1-5} alkyl or benzyl.

5,688,794
METHOD FOR MODIFYING OR REGULATING LIPID METALOLISM IN AN ANIMAL OR HUMAN SUBJECT WITH A PROCLACTIN STIMULATING COMPOUND

Albert H. Meier, Baton Rouge, La., and Anthony H. Cincotta, Andover, Mass., assignors to Ergo Science Incorporated, Charlestown, Mass., and Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 995,292, Dec. 22, 1992, Pat. No. 5,585,347, which is a continuation-in-part of Ser. No. 719,745, Jun. 24, 1991, Pat. No. 5,344,832, which is a continuation-in-part of Ser. No. 463,327, Jan. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 192,332, May 10, 1988, abandoned. This application Oct. 31, 1995, Ser. No. 551,063

Int. Cl.⁶ A61K *31/495*

U.S. Cl. 514—250 **12 Claims**

1. A method for modifying or regulating lipid metabolism in an animal or human subject in need of such treatment comprising administering to said subject a prolactin stimulating compound on a timed daily basis at a predetermined time of day and in a dosage amount and for a period of time sufficient to achieve in said subject at least one of the following modifications: reduction in hypercholesterolemia and reduction of hypertriglyceridemia.

5,688,795
[3-(4-PHENYLPIPERAZIN-1-YL)PROPYL-AMINO, THIO AND OXY]-PYRIDINE, PYRIMIDINE AND BENZENE DERIVATIVES AS α_1-ADRENOCEPTOR ANTAGONISTS

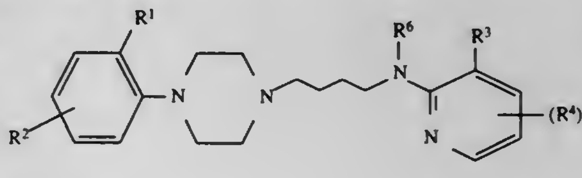
Jürg Roland Pfister, Los Altos; David Ernest Clarke, Mountain View; Todd Richard Elworthy, Palo Alto; David John Morgans, Jr., Los Altos; David Bruce Repke, Milpitas; Eric Brian Sjorgren, Mountain View, and Helen Yen-hui Wu, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 8, 1994, Ser. No. 336,368

Int. Cl.⁶ A61K *31/495;* **C07D** *401/12;403/12;413/14*

U.S. Cl. 514—252 **19 Claims**

1. A method for treating an obstructive uropathy treatable by administration of an α_1-adrenoceptor antagonist in an animal in need of such treatment, which method comprises administering to such animal a therapeutically effective amount of a compound of the formula:



in which:

t is 0, 1 or 2;

R^1 is hydro, hydroxy, halo, nitro, amino, cyano, (C_{1-4})alkylthio, acetylamino, trifluoroacetylamino, methylsulfonylamino, (C_{1-6})alkyl, (C_{3-6})cycloalkyl, (C_{3-6})cycloalkyl (C_{1-4})alkyl, oxazol-2-yl, aryl, aryl (C_{1-4})alkyl, (C_{1-6})alkyloxy, (C_{3-6})cycloalkyloxy, (C_{3-6})cycloalkyl (C_{1-4})alkyloxy, 2-propynyloxy, aryloxy or aryl (C_{1-4})alkyloxy (wherein alkyl is optionally substituted with one to three halo atoms and aryl

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is optionally substituted with one to two substituents independently selected from halo and cyano);

R^2 is hydro, hydroxy, halo, cyano, (C_{1-6})alkyl or (C_{1-6})alkyloxy (wherein alkyl is optionally substituted with one to three halo atoms);

R^3 is —C(O)R^7 (wherein R^7 is (C_{1-6})alkyl, (C_{3-6})cycloalkyl, di(C_{1-4})alkylamino, N—(C_{1-4})alkyl-N—(C_{1-4})alkyloxyamino, pyrrolidin-1-yl, piperidin-1-yl, morpholin-4-yl or piperazin-1-yl);

R^4 is halo, hydroxy, cyano, (C_{1-6})alkyl or (C_{1-6})alkyloxy; and

R^6 is hydro or (C_{1-6})alkyl);

or a pharmaceutically acceptable salt or N-oxide thereof.

11. A compound selected from the group consisting of 2-(3-{4-[2-(2,2,2-trifluoroethoxy)phenyl]piperazin-1-yl}-propylamino)-N,N -dimethylnicotinamide, 2-(3-{4-[2-(2,2,2-trifluoroethoxy)phenyl]piperazin-1-yl}-propylamino-N-methyl-N -methoxynicotinamide, 2-{3-[4-(2-cyclopropylmethoxyphenyl)piperazin-1-yl]propylamino}-N,N-dimethylnicotinamide, 2-{3-[4-(2-oxazol-2-ylphenyl)piperazin-1-yl]propylamino}-N,N-dimethylnicotinamide, and the pharmaceutically acceptable salts thereof.

5,688,796

HETEROCYCLIC SUBSTITUTED BENZOTHIOPHENES, COMPOSITIONS, AND METHODS

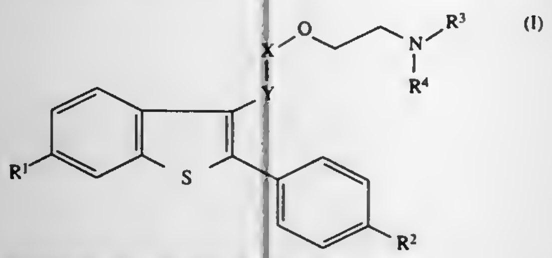
George Joseph Cullinan, Trafalgar, and Kennan Joseph Fahey, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 7, 1997, Ser. No. 797,543

Int. Cl.^{6} A61K *31/50;31/505;* **C07D** *409/14*

U.S. Cl. 514—253 **13 Claims**

1. A compound of formula I



(I)

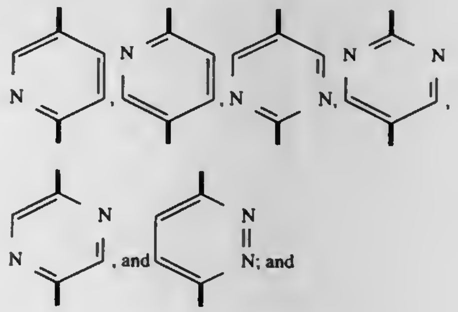
or a pharmaceutically acceptable salt thereof wherein

R^1 is selected from the group consisting of
- hydrogen,
- hydroxy,
- C_1–C_4 alkoxy,
- —OC(O)O(C_1–C_6 alkyl),
- —OC(O)(C_1–C_6 alkyl), and
- —OC(O)Ar wherein which Ar is selected from the group consisting of
  - unsubstituted phenyl, and
  - phenyl substituted with —OSO_2(C_4–C_6 straight chain alkyl);

R^2 is selected from the group consisting of
- hydrogen,
- chloro,
- bromo,
- hydroxy,
- C_1–C_4 alkoxy,
- —OC(O)O(C_1–C_6 alkyl),
- —OC(O)(C_1–C_6 alkyl), and
- —OC(O)Ar wherein which Ar is selected from the group consisting of
  - unsubstituted phenyl, and
  - phenyl substituted with —OSO_2(C_4–C_6 straight chain alkyl);

R^3 and R^4 are independently selected from C_1–C_4 alkyl, or combine to form, together with the nitrogen atom to which they are attached, ring selected from the group consisting of piperidino,
pyrrolidino, and
hexamethyleneimino;

X is selected from the group consisting of



Y is selected from the group consisting of
—CO—,
—CHOH—, and
—CH_2—.

5,688,797

TREATMENT OF ACUTE CENTRAL NERVOUS SYSTEM INJURY WITH PIPERAZINE DERIVATIVES

Raymond F. Regan, Villanova, and Edward H. Jasper, Ottsville, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Filed Apr. 26, 1996, Ser. No. 639,908

Int. Cl.^{6} A61K *31/495*

U.S. Cl. 514—255 **5 Claims**

1. A method of treating acute nervous central nervous system injury in a human comprising:

identifying a patient suffering from an acute central nervous system injury, and

administering an effective amount of at least one bisdioxopiperazine.

5,688,798

PYRIMIDINE COMPOUNDS

Thierry Godel, Basel, Switzerland, and Claus Riemer, Freiburg, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

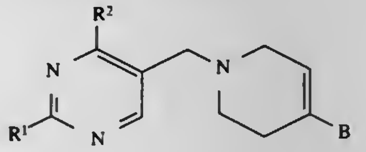
Filed Sep. 11, 1996, Ser. No. 714,030

Claims priority, application Switzerland, Oct. 10, 1995, 2855/95; Jun. 28, 1996, 1625/96

Int. Cl.^{6} A61K *31/505;* **C07D** *239/28*

U.S. Cl. 514—256 **16 Claims**

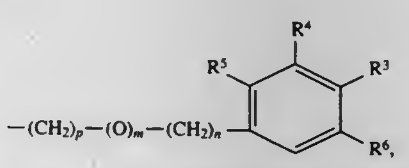
1. A compound of the formula



IA^2

wherein

B is



lower-alkyl, styryl, phenylethynyl or benzoyloxy-lower-alkyl;

R^1 and R^2 is independently, lower-alkyl or amino;

R^3–R^6 is independently, halogen, lower-alkyl, trifluoromethyl, lower-alkoxy or nitro;

n is 0, 1 or 2, and

m, p are, independently, 0 or 1.

5,688,799

9-HYDROXY-PYRIDO[1,2-A]PYRIMIDIN-4-ONE ETHER DERIVATIVES

Jan Vandenberk, Beerse, and Ludo Edmond Josephine Kennis, Turnhout, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

PCT No. PCT/EP94/03804, § 371 Date May 3, 1996, § 102(e) Date May 3, 1996, PCT Pub. No. WO95/14691, PCT Pub. Date Jun. 1, 1995

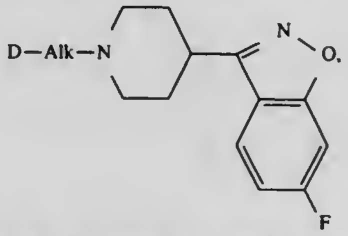
PCT Filed Nov. 16, 1994, Ser. No. 637,754

Claims priority, application European Pat. Off., Nov. 23, 1993, 93203270

Int. Cl.^{6} C07D *471/04;239/00;221/00;* **A61K** *31/505*

U.S. Cl. 514—258 **22 Claims**

1. A compound having the formula

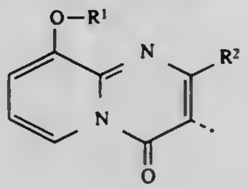


(I)

a pharmaceutically acceptable acid addition salt thereof or a stereochemically isomeric form thereof, wherein

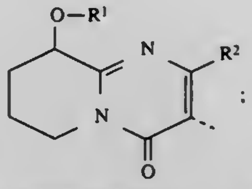
Alk represents C_{1-4}alkanediyl;

D is a bicyclic heterocycle of formula



(a)

or



(b)

wherein each R^1 independently is C_{2-6}alkenyl; C_{2-6}alkynyl; C_{3-6}cycloalkyl optionally substituted with C_{1-4}alkyl; C_{1-19}alkyl optionally substituted with C_{3-6}cycloalkyl, halo, C_{1-6}alkyloxy or cyano; and

each R^2 independently is hydrogen or C_{1-4}alkyl.

5,688,800

CONDENSED PYRIMIDINE DERIVATIVE

Hiroaki Nomura; Toru Haneda; Yoshihiko Kotake; Norihiro Ueda, and Kyosuke Kitoh, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

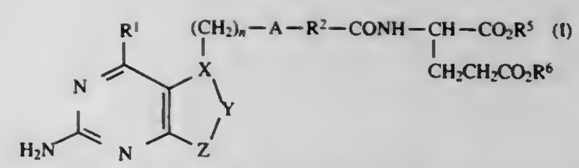
Division of Ser. No. 300,564, Sep. 6, 1994, Pat. No. 5,554,615, which is a continuation of Ser. No. 928,102, Aug. 11, 1992, abandoned. This application Mar. 29, 1995, Ser. No. 413,100

Claims priority, application Japan, Aug. 21, 1991, 3-209252; Sep. 30, 1991, 3-251548

Int. Cl.^{6} A61K *31/505;* **C07D** *239/70*

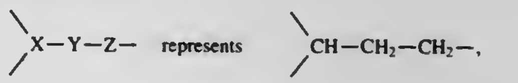
U.S. Cl. 514—258 **21 Claims**

1. A pyrimidine compound represented by the following formula (I) or a pharmacologically acceptable salt thereof:

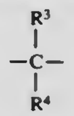


(I)

wherein R^1 represents an amino group; R^2 represents a phenylene, wherein R^5 and R^6 may be the same or different and each represent a hydrogen, a C_1 to C_5 alkyl group, benzyl, nitrobenzyl, methoxybenzyl, phenyl, methoxyphenyl, nitrophenyl, t-butyldimethylsilyl or a t-butyldiphenylsilyl group; the part

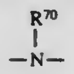


A represents an oxygen atom, a group represented by the formula:



$$-\overset{R^3}{\underset{R^4}{C}}-$$

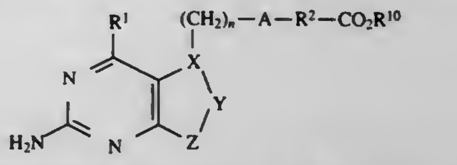
(wherein R^3 and R^4 may be the same or different from each other and each represents a fluorine or halogen atom or a methyl group or a group represented by the formula:



$$-\overset{R^{70}}{N}-$$

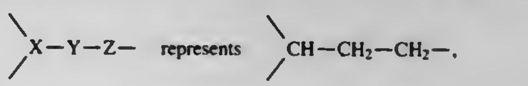
wherein R^{70} represents a hydrogen atom and n is an integer of 1 to 3.

18. A compound represented by the following formula (II) or a salt thereof:

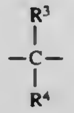


(II)

wherein R^1 represents an amino group, R^2 represents a phenylene; wherein R^{10} represents hydrogen, a C_1 to C_5 alkyl group, benzyl, nitrobenzyl, methoxybenzyl, phenyl, methoxyphenyl, nitrophenyl, t-butyldimethylsilyl or a t-butyldiphenylsilyl group, the part

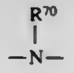


A represents an oxygen atom, a group represented by the formula:



$$-\overset{R^3}{\underset{R^4}{C}}-$$

(wherein R^3 and R^4 may be the same or different from each other and each represents a fluorine or halogen atom or a methyl group.) or a group represented by the formula:



$$-\overset{R^{70}}{N}-$$

wherein R^{70} represents a hydrogen atom, and n is an integer of 1 to 3.

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5,688,801

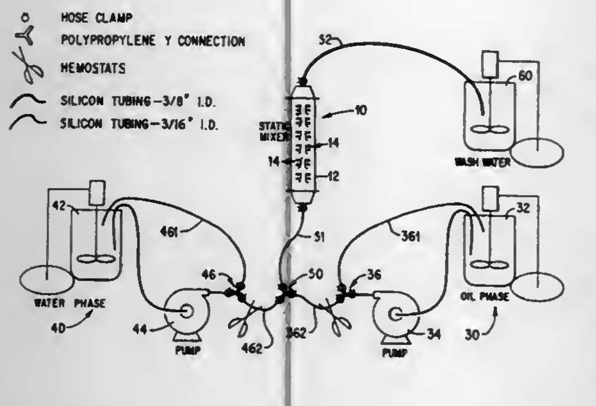
METHOD OF INHIBITING NEUROTRANSMITTER ACTIVITY USING MICROENCAPSULATED 3-PIPERIDINY2-SUBSTITUTED 1,2-BENZISOXAZOLES AND 1,2-BENZISOTHIAZOLES

Jean Mesens, Wechelderzande, Belgium; Michael E. Rickey, Loveland, and Thomas J. Atkins, Cincinnati, both of Ohio, assignors to Janssen Pharmaceutica, Belgium, and Alkermes Controlled Therapeutics Inc. II, Mass.

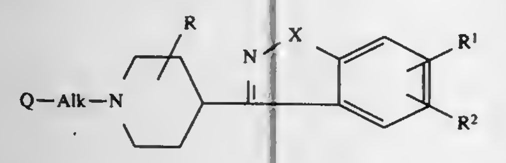
Division of Ser. No. 154,403, Nov. 19, 1993. This application Mar. 14, 1995, Ser. No. 403,432

Int. Cl.^{6} A61K *31/505*

U.S. Cl. 514—258 **5 Claims**



1. A method of inhibiting serotonergic activity or dopaminergic activity in animals wherein said method comprises administering a microparticle composition comprising a 1,2-benzazole of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

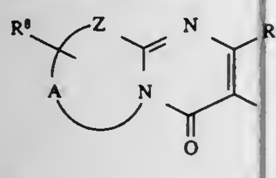
R is hydrogen or alkyl of 1 to 6 carbon atoms;

R^1 and R^2 are independently selected from the group consisting of hydrogen, halo, hydroxy, alkyloxy of 1 to 6 carbon atoms, and C alkyl of 1 to 6 carbon atoms;

X is O or S;

Alk is C_{1-4} alkanediyl; and

Q is a radical of formula



wherein

R^3 is hydrogen or alkyl of 1 to 6 carbon atoms;

Z is —S—, —CH_2—, or —CR^4=CR^5—; where R^4 and R^5 are independently selected from the group consisting of hydrogen or alkyl of 1 to 6 carbon atoms;

A is a bivalent radical —CH_2—CH_2—, —CH_2—CH_2—CH_2— or CR^6=CR^7—; where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, amino or alkyl of 1 to 6 carbon atoms; and

R^8 is hydrogen or hydroxyl;

and a biodegradable and biocompatibly acceptable microparticle polymer carrier.

5,688,802

BORNYL XANTHINE DERIVATIVES WITH ADENOSINE-ANTAGONISTIC ACTIVITY

Ulrike Kufner-Muhl, Mainz; Karl-Heinz Weber, Gau-Algesheim; Gerhard Walther, Bingen; Werner Stransky, Gau-Algesheim; Helmut Ensinger, Ingelheim Am Rhein; Gunter Schingnitz, Bad Kreuznach; Franz Josef Kuhn, Gau-Algesheim, and Erich Lehr, Waldalgesheim, all of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein

Division of Ser. No. 097,478, Jul. 27, 1993, Pat. No. 5,532,368, which is a division of Ser. No. 942,871, Sep. 10, 1992, abandoned, which is a continuation of Ser. No. 691,193, Apr. 25, 1991, Pat. No. 5,175,291, which is a continuation of Ser. No. 452,643, Dec. 18, 1989, abandoned. This application Jun. 14, 1996, Ser. No. 663,417

Claims priority, application Germany, Dec. 22, 1988, 38 43 117.3

Int. Cl.^{6} C07D *473/06;* **A61K** *31/52*

U.S. Cl. 514—263 **3 Claims**

1. The compound 1,3-di-n-propyl-8-(5-norbornen-2-yl) xanthine.

5,688,803

TRICYCLIC DICARBONYL DERIVATIVES

Bernd Büttelmann, Schopfheim, Germany; Thierry Godel, Basel, Switzerland; Laurence Gross, Herrlisheim; Marie-Paule Heitz Neidhart, Bartenheim, both of France; Claus Riemer, Schliengen, Germany, and René Wyler, Zürich, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

PCT No. PCT/EP95/01856, § 371 Date Nov. 15, 1996, § 102(e) Date Nov. 15, 1996, PCT Pub. No. WO95/32205, PCT Pub. Date Nov. 30, 1995

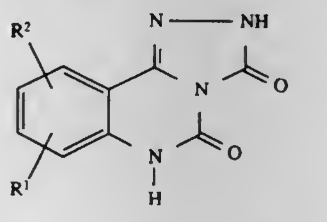
PCT Filed May 16, 1995, Ser. No. 737,240

Claims priority, application Switzerland, May 24, 1994, 1602/94; Feb. 17, 1995, 477/95

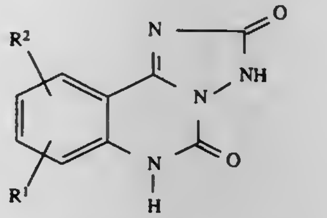
Int. Cl.^{6} C07D *487/04;* **A61K** *31/505*

U.S. Cl. 514—267 **16 Claims**

1. A compound formula



Ia



Ib

wherein

R^1 and R^2 each independently is hydrogen, lower alkyl, lower alkoxy, nitro, trifluoromethyl, amino, halogen, cyano or $R^3R^4NS(O)_2$— and R^3 and R^4 are lower alkyl, and

R^2 can additionally be morpholino or thiomorpholino; a 5- or 6-membered heterocycle with 1–3N atoms, unsubstituted or substituted by lower alkyl, hydroxy, amino or the group —CH_2NHCH_3; a bicyclic heterocycle with 1–3N atoms; or a group —NR^5R^6 or —OR^5 in which R^5 and R^6 can be the same or different and be hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, amino-lower alkyl or lower alkylamino-lower alkyl,

as well as pharmaceutically usable salts of compounds of formulas Ia or Ib, excluding 2,3,5,6-tetrahydro-[1,2,4]-triazolo[1,5-c]quinazoline-2,5-dione.

5,688,804

3-BENZYLAMINO-2-PHENYL-PIPERIDINE DERIVATIVES AS SUBSTANCE P RECEPTOR ANTAGONISTS

Terry J. Rosen, Burlingame, Calif., assignor to Pfizer Inc., New York, N.Y.

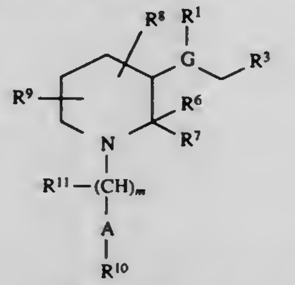
PCT No. PCT/US93/05077, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO94/03445, PCT Pub. Date Feb. 17, 1994

Continuation of Ser. No. 924,773, Aug. 4, 1992, abandoned. This PCT application Jun. 3, 1993, Ser. No. 379,625

Int. Cl.^{6} A61K *31/445;* **C07D** *211/14*

U.S. Cl. 514—272 **7 Claims**

I. A compound having the formula

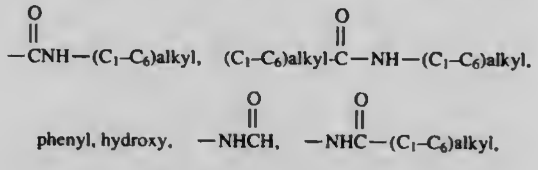


I'

wherein m is an integer from 1 to 8, and any one of the carbon—carbon single bonds of $(CH_2)_m$ may optionally be replaced by a carbon—carbon double bond or a carbon—carbon triple bond, and any one of the carbon atoms of said $(CH_2)_m$ may optionally be substituted with R^{11};

R^1 is hydrogen or $(C_1–C_8)$ alkyl optionally substituted with hydroxy, alkoxy or fluoro;

R^3 is aryl selected from phenyl, indanyl and naphthyl; heteroaryl selected from benzothienyl, benzofuryl, thienyl, furyl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, tetrazolyl, and quinolyl; or cycloalkyl having from three to seven carbon atoms, wherein one of said carbon atoms may optionally be replaced by nitrogen, oxygen or sulfur; wherein each of said aryl and heteroaryl groups may optionally be substituted with one or more substituents, and said $(C_3–C_7)$cycloalkyl may optionally be substituted with one or two substituents, said substituents being independently selected from halo, nitro, $(C_1–C_{10})$alkyl optionally substituted with from one to three fluorine atoms, $(C_1–C_{10})$alkoxy optionally substituted with from one to three fluorine atoms, trifluoromethyl, amino, $(C_1–C_6)$-alkylamino, di$(C_1–C_6)$ alkylamino,

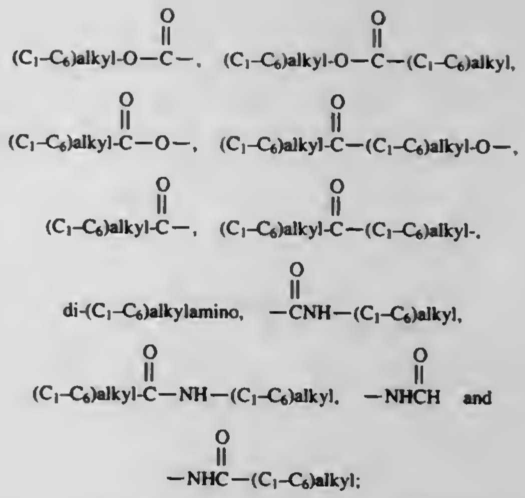


$$-\overset{\text{O}}{\overset{\|}{\text{C}}}\text{NH}-(\text{C}_1\text{–C}_6)\text{alkyl},\quad (\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{NH}-(\text{C}_1\text{–C}_6)\text{alkyl},$$

$$\text{phenyl, hydroxy,}\quad -\text{NH}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{H},\quad -\text{NH}\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl},$$

hydroxy$(C_1–C_6)$alkyl, and $(C_1–C_6)$alkoxy$(C_1– C_6)$alkyl;

R^6 is a functionality selected from hydrogen, $(C_1–C_6)$straight or branched alkyl, $(C_3–C_7)$cycloalkyl wherein one of the carbon atoms may optionally be replaced by nitrogen, oxygen or sulfur; aryl selected from biphenyl, phenyl, indanyl and naphthyl; heteroaryl selected from benzothienyl, thienyl, furyl, benzofuryl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, tetrazolyl and quinolyl; phenyl$(C_2–C_6)$alkyl, benzhydryl and benzyl, wherein each of said aryl and heteroaryl groups and the phenyl moieties of said benzyl, phenyl$(C_2–C_6)$alkyl and benzhydryl may optionally be substituted with one or more substituents independently selected from halo, nitro, $(C_1–C_{10})$alkyl optionally substituted with from one to three fluorine atoms, $(C_1–C_{10})$alkoxy optionally substituted with from one to three fluorine atoms, amino, hydroxy$(C_1– C_6)$alkyl, $(C_1–C_6)$alkoxy$(C_1–C_6)$alkyl, $(C_1–C_6)$-alkylamino,



$$(\text{C}_1\text{–C}_6)\text{alkyl-O}-\overset{\text{O}}{\overset{\|}{\text{C}}}-,\quad (\text{C}_1\text{–C}_6)\text{alkyl-O}-\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl},$$

$$(\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{O}-,\quad (\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl-O}-,$$

$$(\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-,\quad (\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl-},$$

$$\text{di-}(\text{C}_1\text{–C}_6)\text{alkylamino},\quad -\overset{\text{O}}{\overset{\|}{\text{C}}}\text{NH}-(\text{C}_1\text{–C}_6)\text{alkyl},$$

$$(\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{NH}-(\text{C}_1\text{–C}_6)\text{alkyl},\quad -\text{NH}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{H}\quad\text{and}$$

$$-\text{NH}\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl};$$

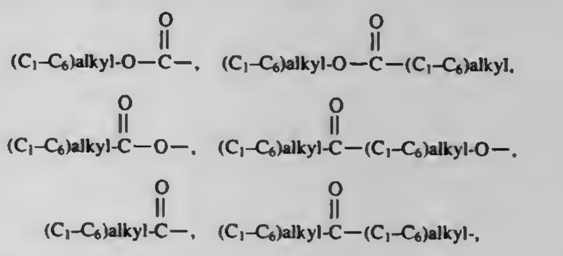
and wherein one of the phenyl moieties of said benzhydryl may optionally be replaced by naphthyl, thienyl, furyl or pyridyl;

R^7 is hydrogen, phenyl or $(C_1–C_6)$alkyl;

or R^6 and R^7, together with the carbon to which they are attached, form a saturated carbocyclic ring having from 3 to 7 carbon atoms wherein one of said carbon atoms may optionally be replaced by oxygen, nitrogen or sulfur;

R^8 may be attached to any atom of the nitrogen containing ring having an available bonding site and R^9 may be attached to any carbon atom of the nitrogen containing ring having an available bonding site;

R^8 and R^9 are independently selected from hydrogen, hydroxy, halo, amino, oxo (=O), cyano, hydroxy-$(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy-$(C_1–C_6)$alkyl, $(C_1–C_6)$alkylamino, di-$(C_1–C_6)$alkylamino, $(C_1–C_6)$alkoxy,



$$(\text{C}_1\text{–C}_6)\text{alkyl-O}-\overset{\text{O}}{\overset{\|}{\text{C}}}-,\quad (\text{C}_1\text{–C}_6)\text{alkyl-O}-\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl},$$

$$(\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{O}-,\quad (\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl-O}-,$$

$$(\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-,\quad (\text{C}_1\text{–C}_6)\text{alkyl-}\overset{\text{O}}{\overset{\|}{\text{C}}}-(\text{C}_1\text{–C}_6)\text{alkyl-},$$

and the functionalities set forth in the definition of R^6;

A is selected from the group consisting of CH_2, nitrogen, oxygen, sulfur and carbonyl;

G is nitrogen, oxygen or sulfur;

R^{10} is a monocyclic or bicyclic heterocycle selected from the group consisting of pyrimidinyl, benzoxazolyl, 2,3-dihydro-3-oxobenzisosulfonazol-2-yl, succinimidyl or thienyl;

R^{11} is oximino (=NOH) or one of the functionalities set forth in any of the definitions of R^6, R^8 and R^9; and

with the proviso that a) neither R^8, R^9, R^{10} nor R^{11} can form, together with the carbon to which it is attached, a ring with R^7, (b) when R^8 and R^9 are attached to the same carbon atom, then either each of R^8 and R^9 is independently selected from hydrogen, fluoro, $(C_1–C_6)$alkyl, hydroxy-$(C_1– C_6)$alkyl, and $(C_1–C_6)$alkoxy-$(C_1–C_6)$alkyl; or R^8 and R^9, together with the carbon to which they are attached, form a $(C_3–C_6)$saturated carbocyclic ring that forms a spiro compound with the nitrogen containing ring to which they are attached, (c) when A is nitrogen, sulfur or oxygen, m is greater than one, (d) when A is CH_2 or carbonyl then R^{10} must be substituted or unsubstituted pyrimidinyl, benzoxazolyl, 2,3-dihydro-3-oxobenzisosulfonazol-2-yl, or succinimidyl; (e) when G is oxygen or sulfur then R^1 is absent.

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5,688,805
TRICYCLIC DERIVATIVES, COMPOSITIONS AND METHODS OF USE

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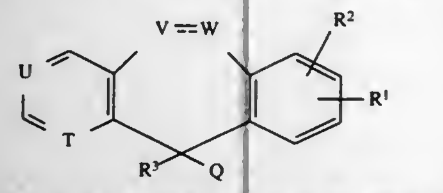
Division of Ser. No. 162,748, Dec. 6, 1993, Pat. No. 5,464,840.
This application Jun. 2, 1995, Ser. No. 458,581
Int. Cl.^{6} A61K *31/445*
U.S. Cl. 514—277 **19 Claims**

1. A method of inhibiting tumor necrosis factor-α comprising administering to a mammal in need of such inhibition an effective anti-tumor necrosis factor amount of a compound of the Formula I:



(I)

or a pharmaceutically acceptable salt or solvate thereof, wherein:

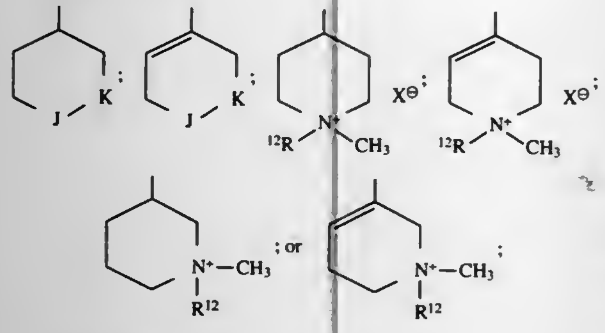
one of T and U represents N and the other represents =CH—; or each of T and U represents =CH—;

the fheight-------- line represents an optional double bond; when fheight-------- a double bond, each of V and W represents =CH—; when fheight-------- represents a single bond, one of V and W represents oxygen and the other represents —CH$_2$—; or each of V and W represents —CH$_2$—;

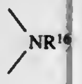
R^1 and R^2 are each independently selected from the group consisting of H and halogen;

R^3 is; alkyl; alkenyl; alkynyl; aryl; alkaryl; aralkyl; cycloalkyl; alkoxy; $(CH_2)_nOR^{10}$; $(CH_2)_nCOOR^{10}$, wherein n is 1 to 3 and R^{10} is or lower alkyl; or $S(O)_eR^{11}$, wherein e is 0 or 2 and R^{11} is alkyl or aryl;

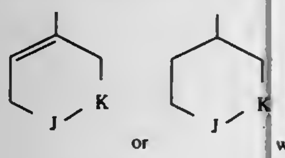
Q represents



wherein one of J and K represents



and the other represents —CH$_2$—, with the proviso that when R^3 is H, Q is limited to either:



wherein J is —CH$_2$—;

R^{12} is lower alkyl;

R^{16} is H; lower alkyl; aryl; aralkyl; alkaryl; COR^{17} or C(O)OR^{18}, wherein R^{17} is H or lower alkyl or aryl, R^{18} is lower alkyl or aryl; and

X represents halogen.

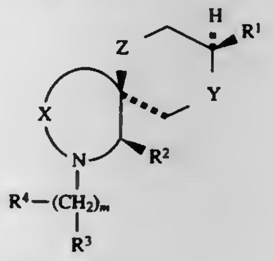
5,688,806
SPIROAZACYCLIC DERIVATIVES AS SUBSTANCE P ANTAGONISTS

Manoj C. Desal, Emeryville, Calif., and Lawrence A. Vincent, Moosup, Conn., assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/US93/11793, § 371 Date Oct. 12, 1995, § 102(e) Date Oct. 12, 1995, PCT Pub. No. WO94/20500, PCT Pub. Date Sep. 15, 1994

Continuation of Ser. No. 26,382, Mar. 4, 1993, abandoned.
This PCT application Dec. 10, 1993, Ser. No. 513,798
Int. Cl.^{6} A61K *31/445;* **C07D** *471/10*
U.S. Cl. 514—278 **15 Claims**

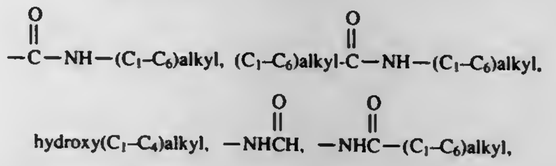
1. A compound of the formula



1

wherein Z is NH, O or CH$_2$;

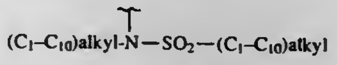
R^1 is phenyl optionally substituted with one or more substituents,, independently selected from hydrogen, halo, nitro, (C_1-C_{10})alkyl optionally substituted with from one to three fluorine atoms, (C_1-C_{10})alkoxy optionally substituted with from one to three fluorine atoms, trifluoromethyl, hydroxy, phenyl, cyano, amino, (C_1-C_6)-alkylamino, di-(C_1-C_6)alkylamino,



$$-\overset{\overset{O}{\|}}{C}-NH-(C_1-C_6)\text{alkyl},\ (C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-NH-(C_1-C_6)\text{alkyl},$$

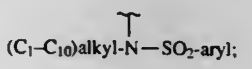
$$\text{hydroxy}(C_1-C_4)\text{alkyl},\ -NH\overset{\overset{O}{\|}}{C}H,\ -NH\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl},$$

(C_1-C_4)alkoxy(C_1-C_4)alkyl, —$S(O)_v$-(C_1-C_{10})-alkyl wherein v is zero, one or two, —$S(O)_v$-aryl wherein v is zero, one or two, —O-aryl, —$SO_2R^4R^5$ wherein each of R^9 and R^{10} is, independently, (C_1-C_6)alkyl, or R^9 and R^{10}, together with the nitrogen to which they are attached, form a saturated ring containing one nitrogen and from 3 to 6 carbons,



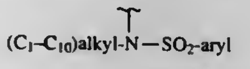
$$(C_1-C_{10})\text{alkyl-}\overset{\top}{N}-SO_2-(C_1-C_{10})\text{alkyl}$$

wherein one or both of the alkyl moieties may optionally be substituted with from one to three fluorine atoms, —$N(SO_2$-(C_1-C_{10})alkyl$)_2$ and



$$(C_1-C_{10})\text{alkyl-}\overset{\top}{N}-SO_2\text{-aryl};$$

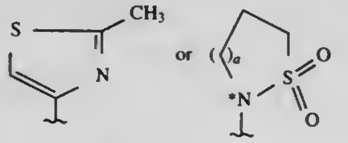
and wherein the aryl moieties of said —$S(O)_v$-aryl, —O-aryl and



$$(C_1-C_{10})\text{alkyl-}\overset{\top}{N}-SO_2\text{-aryl}$$

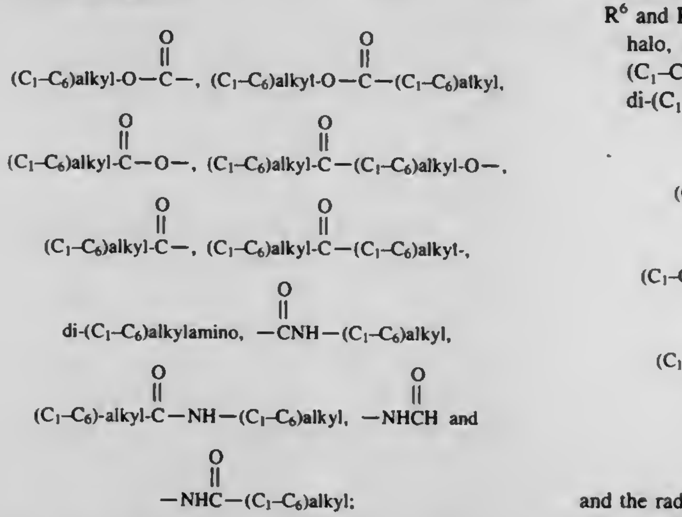
are independently selected from phenyl and benzyl and may optionally be substituted with from one to three substituents independently selected from (C_1-C_4)alkyl, (C_1-C_4)alkoxy and halo;

or R^1 is phenyl substituted with a group having the formula



wherein a is 0, 1 or 2 and the asterisk represents a position meta to the point of attachment of R^1;

R^2 is selected from (C_1-C_6) straight or branched alkyl, (C_3-C_7) cycloalkyl wherein one of the carbon atoms may optionally be replaced by nitrogen, oxygen or sulfur; aryl selected from biphenyl, phenyl, indanyl and naphthyl; heteroaryl selected from thienyl, furyl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, tetrazolyl and quinolyl; phenyl (C_2-C_6)alkyl, benzhydryl and benzyl, wherein each of said aryl and heteroaryl groups and the phenyl moieties of said benzyl, phenyl (C_2-C_6)alkyl and benzhydryl may optionally be substituted with one or more substituents, independently selected from halo, nitro, (C_1-C_{10})alkyl optionally substituted with from one to three fluorine atoms, (C_1-C_{10})alkoxy optionally substituted with from one to three fluorine atoms, amino, hydroxy-(C_1-C_6)alkyl, (C_1-C_6)alkoxy-(C_1-C_6)alkyl, (C_1-C_6)-alkylamino,



$$(C_1-C_6)\text{alkyl-}O-\overset{\overset{O}{\|}}{C}-,\ (C_1-C_6)\text{alkyl-}O-\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl},$$

$$(C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-O-,\ (C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl-}O-,$$

$$(C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-,\ (C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl-},$$

$$\text{di-}(C_1-C_6)\text{alkylamino},\ -\overset{\overset{O}{\|}}{C}NH-(C_1-C_6)\text{alkyl},$$

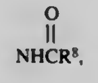
$$(C_1-C_6)\text{-alkyl-}\overset{\overset{O}{\|}}{C}-NH-(C_1-C_6)\text{alkyl},\ -NH\overset{\overset{O}{\|}}{C}H\ \text{and}$$

$$-NH\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl};$$

and wherein one of the phenyl moieties of said benzhydryl may optionally be replaced by naphthyl, thienyl, furyl or pyridyl;

m is an integer from 0 to 8 and any one of the carbon-carbon single bonds of $(CH_2)_m$, wherein both carbon atoms of such bond are bonded to each other and to another carbon atom in the $(CH_2)_m$ chain, may optionally be replaced by a carbon-carbon double bond or a carbon-carbon triple bond, and any one of the carbon atoms of said $(CH_2)_m$ may optionally be substituted with R^4;

R^3 is selected from



$$NH\overset{\overset{O}{\|}}{C}R^8,$$

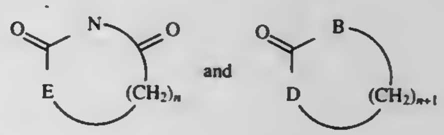
$NHCH_2R^8$, SO_2R^8, AR^5, CO_2H and the radicals set forth in the definitions of R^2, R^6 and R^7;

A is CH$_2$, nitrogen, oxygen, sulfur or carbonyl;

R^8 is (C_1-C_6)alkyl, hydrogen, phenyl or phenyl (C_1-C_6)alkyl;

R^4 is selected from oximino (=NOH) and the radicals set forth in the definitions of R^2, R^6 and R^7;

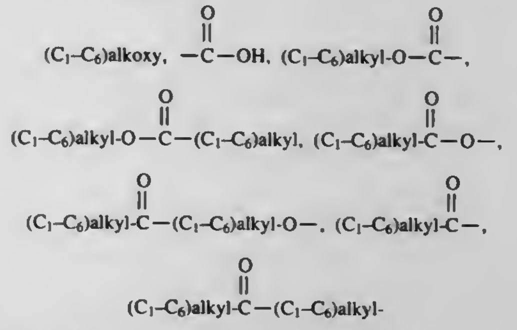
R^5 is a monocyclic or bicyclic heterocycle selected from the group consisting of pyrimidinyl, benzoxazolyl, 2,3-dihydro-3-oxobenzisosulfonazol-2-yl, morpholin-1-yl, thiomorpholin-1-yl, benzofuranyl, benzothienyl, indolyl, isoindolyl, isoquinolinyl, furyl, pyridyl, isothiazolyl, oxazolyl, triazolyl, tetrazolyl, quinolyl, thiazolyl, thienyl, and groups of the formulae



wherein B and D are selected from carbon, oxygen and nitrogen, and at least one of B and D is other than carbon; E is carbon or nitrogen; n is an integer from 1 to 5; any one of the carbon atoms of said $(CH_2)_n$ and $(CH_2)_{n+1}$ may be optionally substituted with (C_1-C_6)alkyl or (C_2-C_6) spiroalkyl; and either any one pair of the carbon atoms of said $(CH_2)_n$ and $(CH_2)_{n+1}$ may be bridged by a one or two carbon atom linkage, or any one pair of adjacent carbon atoms of said $(CH_2)_n$ and $(CH_2)_{n+1}$ may form, together with from one to three carbon atoms that are not members of the carbonyl containing ring, a (C_3-C_5) fused carbocyclic ring;

X is $(CH_2)_q$ wherein q is three and wherein one of the carbon-carbon single bonds in said $(CH_2)_q$ may optionally be replaced by a carbon-carbon double bond, and wherein any one of the carbon atoms of said $(CH_2)_q$ may optionally be substituted with R^6, and wherein any one of the carbon atoms of said $(CH_2)_q$ may optionally be substituted with R^7;

R^6 and R^7 are independently selected from hydrogen, hydroxy, halo, amino, oxo (=O), cyano, hydroxy-(C_1-C_6)alkyl, (C_1-C_6)alkoxy-(C_1-C_6)alkyl, (C_1-C_6)alkylamino, di-(C_1-C_6)alkylamino,



$$(C_1-C_6)\text{alkoxy},\ -\overset{\overset{O}{\|}}{C}-OH,\ (C_1-C_6)\text{alkyl-}O-\overset{\overset{O}{\|}}{C}-,$$

$$(C_1-C_6)\text{alkyl-}O-\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl},\ (C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-O-,$$

$$(C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl-}O-,\ (C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-,$$

$$(C_1-C_6)\text{alkyl-}\overset{\overset{O}{\|}}{C}-(C_1-C_6)\text{alkyl-}$$

and the radicals set forth in the definition of R^2; and

Y is $(CH_2)_z$ wherein z is zero or one;

with the proviso that: (a) when A is —(CH_2)— or carbonyl, R^5 cannot be furyl, pyridyl, isothiazolyl, oxazolyl, triazolyl, tetrazolyl, quinolyl, thiazolyl or thienyl; (b) when m is zero, one of R^3 and R^4 is absent and the other is hydrogen; (c) when R^6 or R^7 is attached to a carbon atom of X that is adjacent to the ring nitrogen, then R^6 or R^7, respectively, must be a substituent wherein the point of attachment is a carbon atom; and (d) when Z is O or CH$_2$, z is one.

or a pharmaceutically acceptable salt of such compound.

5,688,807
METHOD FOR TREATING 5HT$_{2B}$ RECEPTOR RELATED CONDITIONS

James E. Audia, Indianapolis; Marlene L. Cohen, Carmel; Jaswant S. Gidda, Carmel, and David L. G. Nelson, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 212,622, Mar. 11, 1994, abandoned. This application Feb. 6, 1995, Ser. No. 380,566
Int. Cl.^{6} A61K *31/435*
U.S. Cl. 514—285 **13 Claims**

1. A method for treating a mammal suffering from or susceptible to a condition associated with abnormal or dysfunctional 5-HT$_{2B}$

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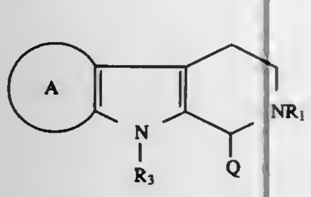
receptor stimulation, comprising administering to the mammal a compound of Formula I:



I

wherein:

Q is hydrogen or $(CHR_2)R_4$

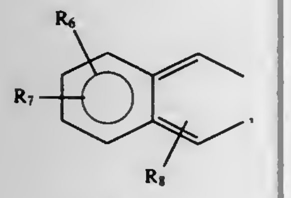
R_1 is hydrogen or C_1–C_3 alkyl;

R_2 is hydrogen or C_1–C_6 alkyl;

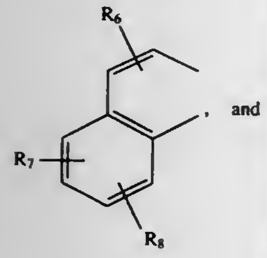
R_3 is hydrogen or C_1–C_3 alkyl;

R_4 is C_5–C_8 cycloalkyl, substituted C_5–C_8 cycloalkyl, C_5–C_8 cycloalkenyl, substituted C_5–C_8 cycloalkenyl, bicyclic or substituted bicyclic;

A is selected from the group consisting of

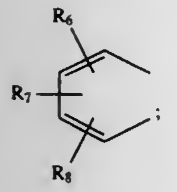


(IIa)



(IIIa)

and



(IVa)

wherein

R_6 and R_7 are, independently, hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, halo, halo$(C_1$–$C_6)$alkyl, halo$(C_2$–$C_6)$alkenyl, COR_5, C_1C_{10} alkanoyl, $CO_2R_{5'}$, $(C_1$–C_6 alkyl$)_m$amino, NO_2, $-SR_5$, or OR_5; or

R_6 and R_7 together with the carbon atoms of group A form a 5- to 8-member carbon ring;

m is 1or 2;

R_5 is hydrogen or C_1–C_4 alkyl;

$R_{5'}$ is C_1–C_4 alkyl; and

R_8 is an R_6 group, substituted C_3–C_8 cycloalkyl, C_3–C_8 cycloalkyl, C_3–C_8 cycloalkyl-$(C_1$–$C_3)$alkyl, C_5–C_8 cycloalkenyl, substituted C_5–C_8 cycloalkenyl, C_5–C_8 cycloalkenyl-$(C_1$–$C_3)$alkyl, or C_7–C_{20} arylalkyl; or

a pharmaceutically acceptable salt or solvate thereof, in an amount that effectively interacts with the 5-HT_{2B} receptor.

5,688,808

STEROID RECEPTOR MODULATOR COMPOUNDS AND METHODS

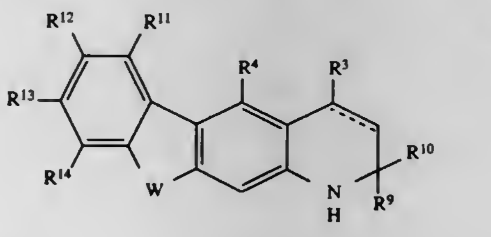
Todd K. Jones, Solana Beach; David T. Winn, San Diego; Lin Zhi, San Diego; Lawrence G. Hamann, San Diego; Christopher M. Tegley, San Diego, and Charlotte L. F. Pooley, San Diego, all of Calif., assignors to Ligand Pharmaceuticals Incorporated, San Diego, Calif.

Continuation-in-part of Ser. No. 363,529, Dec. 22, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 463,231

Int. Cl.^{6} A61K *31/47;* **C07D** *471/04;221/16;491/48;491/52*

U.S. Cl. 514—285 **27 Claims**

1. A compound of the formula:



(III)

wherein:

R^2 is hydrogen, a C_1–C_4 alkyl or perfluoroalkyl, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl;

R^3 is hydrogen, a C_1–C_4 alkyl or perfluoroalkyl, hydroxymethyl, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl;

R^4 is hydrogen, F, Cl, Br, I, NO_2, CO_2H, CO_2R^2, COR^2, CN, CF_3, CH_2OH, a C $_1$–C_4 alkyl or perfluoroalkyl, OR^2, SR^2, $S(O)R^2$, SO_2R^2, SO_3H, $S(NR^2R^7)R^2$, $S(O)(NR^2R^7)R^2$, NR^2R^7, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, where R^2 has the definition given above, R^7 is hydrogen, a C_1–C_4 alkyl or perfluoroalkyl, aryl, heteroaryl, optionally substituted allyl or arylmethyl, OR^8 or NHR^8, where R^8 is hydrogen, a C_1–C_6 alkyl or perfluoroalkyl, aryl, heteroaryl, optionally substituted allyl or arylmethyl, SO_2R^2 or $S(O)R^2$;

R^9 and R^{10} each independently are hydrogen, a C_1–C_6 alkyl or perfluoroalkyl, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, or R^9 and R^{10} taken together can form a three- to seven-membered ring optionally substituted with hydrogen, F, OR^2, or NR^2R^7, where R^2 and R^7 have the definitions given above;

R^{11} through R^{14} each independently are hydrogen, F, Cl, Br, I, NO_2, CO_2H, CO^2R^2, COR^2, CN, CF_3, CH_2OH, a C_1–C_4 alkyl or perfluoroalkyl, OR^2, SR^2, $S(O)R^2$, SO_2R^2, SO_3H, $S(NR^2R^7)R^2$, $S(O)(NR^2R^7)R^2$, NR^2R^7, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, where R^2, R^7 and R^8 have the definitions given above;

W is O, NH, NR^7, CH_2, CHOH, C═O, OC═O, O═CO, NR^7C═O, NHC═O, O═CNR^7, O═CNH, SC═O, O═CS, or $CHOCOR^7$, where R^7 has the definition given above, except that when W is NH, CH_2 or O in the compounds of formula III, then R^{11} through R^{14} and R^4 cannot all be hydrogen when R^3, R^9 and R^{10} are all CH_3, nor can they be a single F, Cl or Br substituent with the remaining substituents all being hydrogen when R^3, R^9 and R^{10} are all CH_3, nor can R3 through R^4 and R^9 through R^{14} all be hydrogen, or all be hydrogen and a single methyl, when W═O; and

the dotted lines in the structures depict optional double bonds.

5,688,809

5-HETEROARYLINDOLE DERIVATIVES

John E. Macor, Penfield, N.Y., assignor to Pfizer Inc., New York, N.Y.

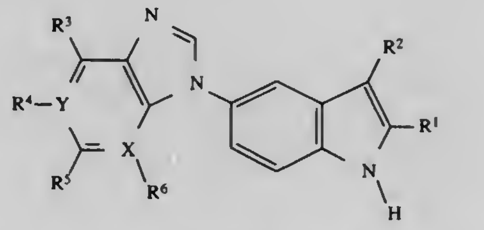
PCT No. PCT/IB94/00407, § 371 Date Oct. 7, 1996, § 102(e) Date Oct. 7, 1996, PCT Pub. No. WO95/21836, PCT Pub. Date Aug. 17, 1995

Continuation of Ser. No. 194,553, Feb. 10, 1994, abandoned. This PCT application Dec. 8, 1994, Ser. No. 687,555

Int. Cl.^{6} C07D *403/04;471/04;* **A61K** *31/415;31/44*

U.S. Cl. 514—303 **11 Claims**

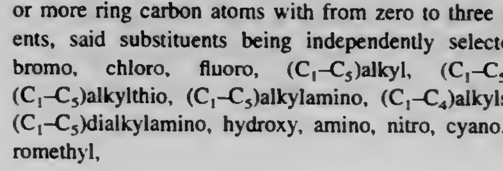
1. A compound of the formula



I

wherein X and Y are independently carbon or nitrogen;

R^1 and R^2 are independently selected from hydrogen, $(C_1$–$C_6)$alkyl, aryl, —$(C_1$–$C_3)$alkylaryl, —$(CH_2)_n$—$(C_4$–$C_7)$cycloalkyl, cyclohexen-1-yl, benzoyl, —$(CH_2)_nCHO$, —$(CH_2)_nCO_2R^7$, —$(CH_2)_nCONR^7R^8$, 3-succinamido, unsaturated heterocycle, benzo-fused heterocycle, —$(C_1$–$C_3)$alkyl-unsaturated heterocycle, and —$(C_1$–$C_3)$alkyl-benzo-fused heterocycle; wherein said unsaturated heterocycle and unsaturated heterocycle moiety of said —$(C_1$–$C_3)$alkyl-unsaturated heterocycle are selected, independently, from pyrrolyl, furyl, thienyl, oxazolyl, isoxazolyl, imidazolyl, thiazolyl, isothiazolyl, pyrazolyl, triazolyl, tetrazolyl, 1,3,5-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,5-thiadiazolyl, 1,2,4-thiadiazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl, 1,2,4-triazinyl, 1,2,3-triazinyl, 1,3,5-triazinyl, 1,2,5-thiadiazinyl, 1,2,5-oxathiazinyl, and 1,2,6-oxathiazinyl; wherein said benzo-fused heterocycle and the benzo-fused heterocyclic moiety of said —(CFC_3)alkyl-benzo-fused heterocycle are selected, independently, from benzoxazolyl, benzothiazolyl, benzimidazolyl, thianaphthenyl, isothianaphthenyl, benzofuranyl, isobenzofuranyl, chromenyl, isoindolyl, indolyl, indazolyl, isoquinolyl, quinolyl, phthalazinyl, quinoxalinyl, quinazolinyl, cinnolinyl and benzoxazinyl; wherein each of said unsaturated heterocycle, benzo-fused heterocycle, —$(C_1$–$C_3)$alkyl-unsaturated heterocycle and —$(C_1$–$C_3)$alkyl-benzo-fused heterocycle may optionally be substituted on one or more ring carbon atoms with from zero to three substituents, said substituents being independently selected from bromo, chloro, fluoro, $(C_1$–$C_5)$alkyl, $(C_1$–$C_5)$alkoxy, $(C_1$–$C_5)$alkylthio, $(C_1$–$C_5)$alkylamino, $(C_1$–$C_4)$alkylsulfonyl, $(C_1$–$C_5)$dialkylamino, hydroxy, amino, nitro, cyano, trifluoromethyl,

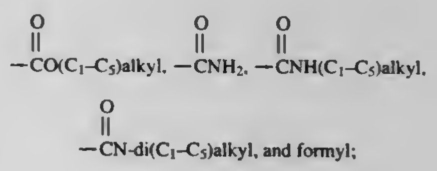


$$-\overset{O}{\overset{\|}{C}}O(C_1\text{–}C_5)\text{alkyl},\ -\overset{O}{\overset{\|}{C}}NH_2,\ -\overset{O}{\overset{\|}{C}}NH(C_1\text{–}C_5)\text{alkyl},$$
$$-\overset{O}{\overset{\|}{C}}N\text{-di}(C_1\text{–}C_5)\text{alkyl, and formyl;}$$

wherein said aryl groups and the aryl moieties of said $(C_1$–$C_3)$alkylaryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with from one to three substituents independently selected from $(C_1$–$C_4)$alkyl, halogen, hydroxy, cyano, carboxamido, nitro, and $(C_1$–$C_4)$alkoxy;

R^3, R^4, R^5, and R^6 are independently selected from hydrogen, $(C_1$–$C_6)$alkyl, aryl, —$(C_1$–$C_3)$alkylaryl, —CN, —CHO, CO_2R^9, —NO_2, —$CONR^9R^{10}$, —$(CH_2)_pOH$, —$(CH_2)_pOR^9$, —$(CH_2)_pNR^9R^{10}$ and halogen; wherein said aryl groups and the aryl moieties of said —$(C_1$–$C_3)$alkylaryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with from one to three substituents independently selected from $(C_1$–$C_4)$alkyl, halogen, hydroxy, cyano, carboxamido, nitro, and $(C_1$–$C_4)$alkoxy;

R^7, R^8, R^9, and R^{10} are independently selected from hydrogen, $(C_1$–$C_6)$alkyl, aryl, —$(C_1$–$C_3)$alkylaryl, unsaturated heterocycle, benzo-fused heterocycle, —$(C_1$–$C_3)$alkyl-unsaturated heterocycle, and —$(C_1$–$C_3)$alkyl-benzo-fused heterocycle; wherein said unsaturated heterocycle and unsaturated heterocycle moiety of said —$(C_1$–$C_3)$alkyl-unsaturated heterocycle are selected independently from pyrrolyl, furyl, thienyl, oxazolyl, isoxazolyl, imidazolyl, thiazolyl, isothiazolyl, pyrazolyl, triazolyl, tetrazolyl, 1,3,5-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,5-thiadiazolyl, 1,2,4-thiadiazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl, 1,2,4-triazinyl, 1,2,3-triazinyl, 1,3,5-triazinyl, 1,2,5-thiadiazinyl, 1,2,5-oxathiazinyl, and 1,2,6-oxathiazinyl; wherein said benzo-fused heterocycle and the benzo-fused heterocyclic moiety of said —$(C_1$–$C_3)$alkyl-benzo-fused heterocycle are selected independently from benzoxazolyl, benzothiazolyl, benzimidazolyl, thianaphthenyl, isothianaphthenyl, benzofuranyl, isobenzofuranyl, chromenyl, isoindolyl, indolyl, indazolyl, isoquinolyl, quinolyl, phthalazinyl, quinoxalinyl, quinazolinyl, cinnolinyl and benzoxazinyl; wherein each of said unsaturated heterocycle, benzo-fused heterocycle, —$(C_1$–$C_3)$alkyl-unsaturated heterocycle and —$(C_1$–$C_3)$alkyl-benzo-fused heterocycle may optionally be substituted on one or more ring carbon atoms with from zero to three substituents, said substituents being independently selected from bromo, chloro, fluoro, $(C_1$–$C_5)$alkyl, $(C_1$–$C_5)$alkoxy, $(C_1$–$C_5)$alkylthio, $(C_1$–$C_5)$alkylamino, $(C_1$–$C_4)$alkylsulfonyl, $(C_1$–$C_5)$dialkylamino, hydroxy, amino, nitro, cyano, trifluoromethyl,



$$-\overset{O}{\overset{\|}{C}}O(C_1\text{–}C_5)\text{alkyl},\ -\overset{O}{\overset{\|}{C}}NH_2,\ -\overset{O}{\overset{\|}{C}}NH(C_1\text{–}C_5)\text{alkyl},$$
$$-\overset{O}{\overset{\|}{C}}N\text{-di}(C_1\text{–}C_5)\text{alkyl, and formyl;}$$

wherein said aryl groups and the aryl moieties of said —$(C_1$–$C_3)$alkylaryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with from one to three substituents independently selected from $(C_1$–$C_4)$alkyl, halogen, hydroxy, cyano, carboxamido, nitro, and $(C_1$–$C_4)$alkoxy;

n is 0, 1, 2, or 3; and

p is 0, 1, or 2;

or a pharmaceutically accepted salt thereof.

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5,688,810

STEROID RECEPTOR MODULATOR COMPOUNDS AND METHODS

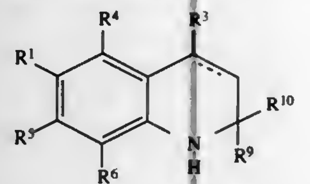
Todd K. Jones, Solana Beach; Mark E. Goldman, San Diego; Charlotte L.F. Pooley, San Diego; David T. Winn, San Diego; James P. Edwards, San Diego; Sarah J. West, San Diego; Christopher M. Tegley, San Diego, and Lin Zhi, San Diego, all of Calif., assignors to Ligand Pharmaceuticals Incorporated, San Diego, Calif.

Continuation-in-part of Ser. No. 363,529, Dec. 22, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 464,541

Int. Cl.^{6} A61K *31/47;* **C07D** *215/12;215/18;215/36;215/38*

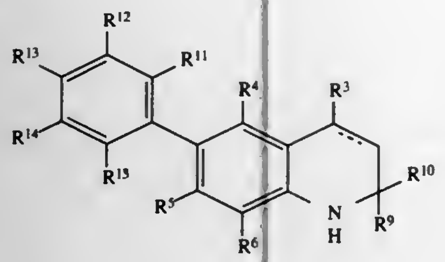
U.S. Cl. 514—311 **27 Claims**

1. A compound of the formula:



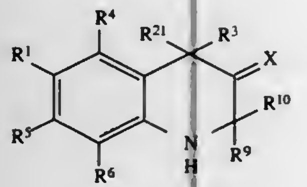
(I)

OR



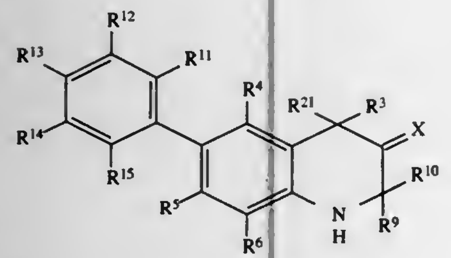
(II)

OR



(X)

OR



(XI)

wherein:

R^1 is a heteroaryl optionally substituted with a C_1–C_4 alkyl, F, Cl, Br, NO_2, CO_2H, CO_2R^2, CHO, CN, CF_3, CH_2OH or $COCH_3$, where R^2 is hydrogen, a C_1–C_4 alkyl or perfluoroalkyl, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, and where said R^1 heteroaryl is attached to compounds of formulas I and X through a carbon or nitrogen atom;

R^3 is hydrogen, a C_1–C_4 alkyl or perfluoralkyl, hydroxymethyl, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl;

R^4 through R^5 each independently are hydrogen, F, Cl, Br, I, NO_2, CO_2H, CO_2R^2, COR^2, CN, CF_3, CH_2OH, a C_1–C_4 alkyl or perfluoroalkyl, OR^2, SR^2, $S(O)R^2$, SO_2R^2, SO_3H, $S(NR^2R^7)R^2$, $S(O)(NR^2R^7)R^2$, NR^2R^7, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, where R^2 has the definition given above, R^7 is hydrogen, a C_1–C_4 alkyl or perfluoroalkyl, aryl, heteroaryl, optionally substituted allyl or arylmethyl, OR^8 or NHR^8, where R^8 is hydrogen, a C_1–C_6 alkyl or perfluoroalkyl, aryl, heteroaryl, optionally substituted allyl or arylmethyl, SO_2R^2 or $S(O)R^2$;

R^6 is hydrogen, F, Cl, Br, I, NO_2, COR^2, CN, CF_3, CH_2OH, a C_1–C_4 alkyl or perfluoroalkyl, OR^2, SR^2, $S(O)R^2$, SO^2R^2, SO_3H, $S(NR^2R^7)R^2$, $S(O)(NR^2R^7)R^2$, NR^2R^7, aryl heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, where R^2 has the definition given above, R^7 is hydrogen, a C_1–C_4 alkyl or perfluoroalkyl, aryl, heteroaryl, optionally substituted allyl or arylmethyl, OR^8 or NHR^8, where R^8 is hydrogen, a C_1–C_6 alkyl or perfluoroalkyl, aryl, heteroaryl, optionally substituted allyl or arylmethyl, SO_2R^2 or $S(O)R^2$;

R^9 and R^{10} each independently are hydrogen, a C_1–C_6 alkyl or perfluoroalkyl, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, or R^9 and R^{10} taken together can form a three- to seven-membered ring optionally substituted with hydrogen, F, OR^2, or NR^2R^7, where R^2 and R^7 have the definitions given above;

R^{11} through R^{15} each independently are hydrogen, P, Cl, Br, I, NO_2, CO_2H, CO_2R^1, COR^2, CN, CF_3, CH_2OH, a C_1–C_4 alkyl or perfluoroalkyl, OR^2, SR^2, $S(O)R^2$, SO_2R^2, SO_3H, $S(NR^2R^7)R^2$, $S(O)(NR^2R^7)R^2$, NR^2R^7, aryl, heteroaryl or optionally substituted allyl, arylmethyl, alkynyl or alkenyl, where R^2, R^7 and R^8 have the definitions given above;

X is CH_2, O, S or NR^7, where R^7 has the definition given above;

R^{21} is hydrogen, a C_1–C_4 alkyl or optionally substituted allyl, arylmethyl, aryl or three- to seven-membered ring optionally substituted with hydrogen, F, Cl, Br, OR^2 or NR^2R^7, where R^2 and R^7 have the definitions given above; and

the dotted lines in the structures depict optional double bonds, except that when there is a C_3–C_4 double bond in the nitrogen bearing ring of compounds of formula II, then R^{11} through R^{15} cannot all be hydrogen and R^3, R^9 and R^{10} cannot all be methyl, and further except when R^1 of the compounds of formula I is 4-pyridyl, then R^3 through R^6, R^9 and R^{10} cannot all be hydrogen, and further yet except that R^3 through R^6 and R^9 through R^{15} cannot all be hydrogen in the compounds of formula II.

5,688,811

AMINOALKYL BENZOXAZOLINONES AND BENZOTHIAZOLINONES

Ange Mouithys-Mickalad, Loos; Patrick Depreux, Armentieres; Daniel Lesieur, Gondecourt; Gérard Adam, Le Mesnil le Roi; Daniel-Henri Caignard, Paris; Pierre Renard, Versailles, and Marie-Claire Rettori, Courbevoie, all of France, assignors to Adir et Compagnie, Courbevoie, France

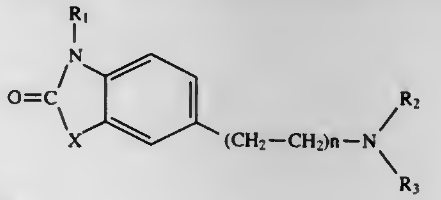
Division of Ser. No. 407,238, Mar. 21, 1995, Pat. No. 5,534,511. This application Dec. 8, 1995, Ser. No. 569,568

Claims priority, application France, Mar. 22, 1994, 94 03298

Int. Cl.^{6} C07D *413/10;417/10;* **A61K** *31/445*

U.S. Cl. 514—321 **7 Claims**

1. A compound which is selected from those of formula (I):



(I)

in which:

R_1 represents hydrogen or alkyl,

n represents 1 or 2,

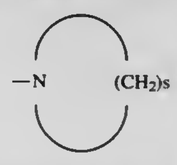
X represents oxygen or sulfur,

R_2 represents hydrogen or alkyl,

and R_3 represents the group $—(CH_2)_m—R_4$ in which:

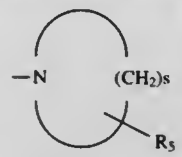
m represents 1,2, 3 or 4

and R_4 represents a a heterocyclic radical of formula:



wherein s is five (5), which is unsubstituted or substituted with a radical selected from aryl, arylalkyl, substituted aryl, and substituted arylalkyl,

or alternatively, when x represents sulfur R_2 forms, with R_3 and the nitrogen atom which bears them, a group:



wherein s is five (5), wherein the substituent R_5 is chosen from aryl, arylalkyl, substituted aryl, and substituted arylalkyl,

the term "substituted", used in reference to the "aryl" and "arylalkyl" radicals, meaning that these groups are substituted with one or more groups chosen from halogen, alkyl, hydroxyl, alkoxy, and trifluoromethyl,

the terms "alkyl" and "alkoxy" denote linear or branched groups containing 1 to 6 carbon atoms inclusive,

the term "aryl" represents a phenyl or naphthyl group,

the term "cycloalkyl" denotes a group of 3 to 9 carbon atoms inclusive,

the optical isomers thereof and the addition salts thereof with a pharmaceutically-acceptable acid and, when R_1 represents a hydrogen atom, with a pharmaceutically-acceptable base.

5,688,812

METHOD OF INHIBITING SEBORRHEA AND ACNE

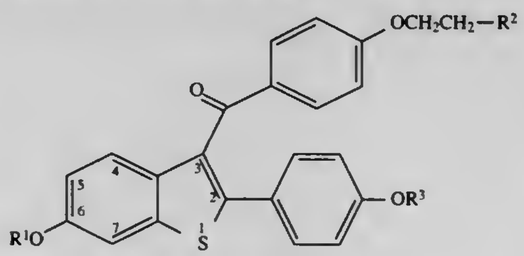
George J. Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 170,970, Dec. 21, 1993, Pat. No. 5,439,923. This application Apr. 14, 1995, Ser. No. 422,293

Int. Cl.^{6} A61K *31/445*

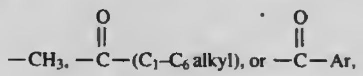
U.S. Cl. 514—324 **3 Claims**

1. A method of inhibiting acne or seborrhea comprising prophylactically administering to a human in need of treatment an effective amount of a compound having the formula



(I)

wherein R^1 and R^3 are independently hydrogen,



$$-CH_3,\ -\overset{\overset{\displaystyle O}{\|}}{C}-(C_1\text{–}C_6\,\text{alkyl}),\ \text{or}\ -\overset{\overset{\displaystyle O}{\|}}{C}-Ar,$$

wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamthylenemino, and piperidino; or a pharmaceutically acceptable salt of solrate thereof.

5,688,813

METHODS OF INHIBITING THROMBIN

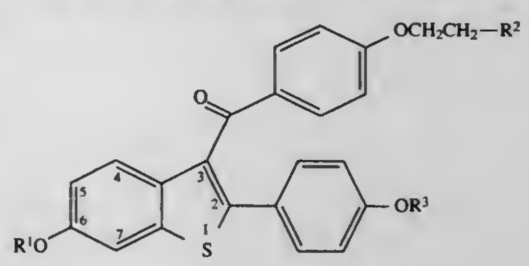
Daniel J. Sall, Greenwood, and Gerald F. Smith, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 171,394, Dec. 21, 1993, Pat. No. 5,544,965. This application Apr. 14, 1995, Ser. No. 422,730

Int. Cl.^{6} A61K *31/445*

U.S. Cl. 514—324 **3 Claims**

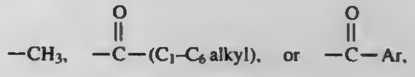
1. A method of inhibiting thrombin comprising prophylactically administering to a human in need of treatment an effective amount of a compound having the formula



(I)

wherein

R^1 and R^3 are independently hydrogen,



$$-CH_3,\quad -\overset{\overset{\displaystyle O}{\|}}{C}-(C_1\text{–}C_6\,\text{alkyl}),\quad \text{or}\quad -\overset{\overset{\displaystyle O}{\|}}{C}-Ar,$$

wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of pyrrolidino, hexamthylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,688,814

4-AMINO-N-(4-METHYL-4-PIPERIDINYL)-2-METHOXYBENZAMIDES

Josepha Eduarda Maria Francisca Leysen, Oud-Turnhout, and Georges Henri Paul Van Daele, Turnhout, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

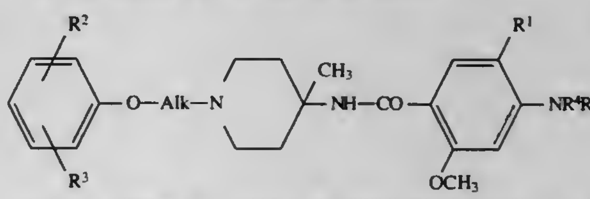
Division of Ser. No. 367,111, Jan. 6, 1995, Pat. No. 5,498,618, which is a continuation of Ser. No. 914,306, Jul. 17, 1992, abandoned. This application Oct. 27, 1995, Ser. No. 549,243

Int. Cl.^{6} A61K *31/445;* **C07D** *211/56*

U.S. Cl. 514—329 **4 Claims**

1. A process of marking a $5HT_2$-receptor with a radiolabeled compound comprising the steps of:

(a) radiolabeling a compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt thereof or a stereoisomeric form thereof, wherein:

R^1 represents hydrogen or halo;

R^2 represents halo;

R^3 represents hydrogen or halo;

$—NR^4R^5$ represents azido; and

Alk represents C_{2-4}alkanediyl,

(b) administering said radiolabeled compound to biological material,

(c) irradiating the receptor/marker complex with UV-light, and

(d) detecting the emissions from the covalently bonded radiolabeled compound.

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5,688,815

HYDROXYPYRIDINONES

Paul Zbinden, Witterswil, Switzerland, assignor to Ciba Geigy Corporation, Summit, N.J.

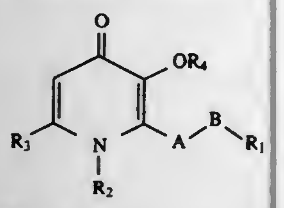
Filed Sep. 27, 1996, Ser. No. 722,820

Claims priority, application Switzerland, Sep. 29, 1995, 2759/95

Int. Cl.⁶ A61K *31/44;* **C07D** *211/94*

U.S. Cl. 514—348 **10 Claims**

1. A compound of formula I



(I)

wherein:

- R_1 is hydrogen, halogen, substituted or unsubstituted lower alkyl or lower alkoxy, lower alkoxycarbonyl, amino, substituted or unsubstituted lower alkylamino or di-lower alkylamino, aminocarbonyl, substituted or unsubstituted N-lower alkylaminocarbonyl or N,N-di-lower alkylaminocarbonyl, carboxyl, lower alkylsulfonyl, aminosulfonyl, cyano, hydroxy, nitro, tetrazolyl, or lower alkylenedioxy which with the group B forms a heterocyclic oxygen-containing ring system;
- R_2 is hydrogen, substituted or unsubstituted lower alkyl or lower alkylenehydroxy, substituted or unsubstituted lower alkylene-lower alkoxy, lower alkylenecarboxy, lower alkylenecarbonyl-lower alkoxy, substituted or unsubstituted lower alkyleneamine, substituted or unsubstituted N-lower alkanoyl-lower alkyleneamine, lower alkanoyloxy-lower alkylene, formyl-lower alkylene;
- R_3 is hydrogen, substituted or unsubstituted lower alkyl, substituted or unsubstituted lower alkanoyloxy-lower alkylene, aminocarbonyl, substituted or unsubstituted N-lower alkylaminocarbonyl, N,N-di-lower alkylaminocarbonyl;
- R_4 is hydrogen, lower alkanoyl, lower alkoxycarbonyl, or a radical that can be removed under physiological conditions;
- A is substituted or unsubstituted methylene, carbonyl; and
- B is mono- or poly-substituted or unsubstituted aryl or mono- or poly-substituted or unsubstituted heteroaryl;

or a stereoisomer, a tautomer or a salt thereof.

5,688,816

CARBAMOYL-1-(PYRIDINYLALKYL)-1H-INDOLES, INDOLINES AND RELATED ANALOGS

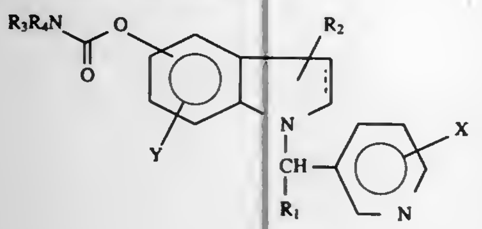
Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Division of Ser. No. 248,920, May 25, 1994, Pat. No. 5,455,245, which is a division of Ser. No. 109,526, Aug. 20, 1993, abandoned, which is a division of Ser. No. 835,510, Feb. 14, 1992, Pat. No. 5,264,442, which is a continuation-in-part of Ser. No. 566,724, Aug. 13, 1990, abandoned. This application May 31, 1995, Ser. No. 455,467

Int. Cl.⁶ A61K *31/04;* **C07D** *401/14;405/14;409/14*

U.S. Cl. 514—333 **I Claim**

I. A compound of the formula



where

- R1 is hydrogen, loweralkyl, loweralkenyl or loweralkynyl;
- R2 is hydrogen, loweralkyl, loweralkenyl, formyl or cyano;
- R3 is hydrogen or loweralkyl;
- R4 is heteroaryl or heteroarylloweralkyl, wherein the heteroaryl group is selected from the group consisting of furanyl, thienyl, pyrrolyl or pyridinyl;
- X and Y are independently hydrogen, nitro, amino, halogen, loweralkyl, loweralkoxy or hydroxy; or the pharmaceutically acceptable acid addition salts thereof, and where applicable, the geometric and optical isomers and racemic mixtures thereof.

5,688,817

DI(AROMATIC) COMPOUNDS AND THEIR USE IN HUMAN AND VETERINARY MEDICINE AND IN COSMETICS

Jean-Michel Bernardon, Nice, and William Robert Pilgrim, Valbonne, both of France, assignors to Centre Int'l. De Recherches Dermatologiques Galderma, Valbonne, France

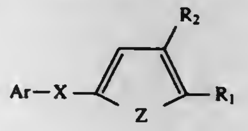
Division of Ser. No. 167,145, Dec. 16, 1993, Pat. No. 5,439,925, which is a division of Ser. No. 859,522, Aug. 4, 1992, Pat. No. 5,387,594. This application Apr. 28, 1995, Ser. No. 430,612

Claims priority, application Luxembourg, Oct. 12, 1990, 87821

Int. Cl.⁶ A61K *31/265;31/325*

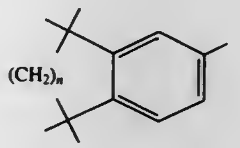
U.S. Cl. 514—346 **20 Claims**

I. A di(aromatic) compound having the formula

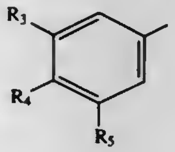


wherein

Ar represents



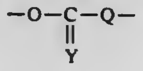
wherein n=1 or 2 or



wherein

- R_3 and R_5 represent hydrogen, OH, alkoxy having 1–6 carbon atoms, α-branched alkyl having from 3–12 carbon atoms, α,α-branched alkyl having from 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, or mono- or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted,
- R_4 represents alkoxy having 1–6 carbon atoms, α-branched alkyl having 3–12 carbon atoms, α,α-branched alkyl having 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, mono- or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted, monohydroxyalkyl, polyhydroxyalkyl, fluorine, chlorine, SH, SR_6, SOR_6, SO_2R_6, alkenyl having 2–6 carbon atoms or alkenyloxy having 2 to 6 carbon atoms,
- R_6 represents lower alkyl,
- R_1 represents $—COR_7$

- R_7 represents hydrogen, OH, $—OR_{10}$, —N(r'r"), monohydroxyalkyl, polyhydroxyalkyl or a sugar residue,
- R_{10} represents alkyl having 1–12 carbon atoms or alkenyl having 2–12 carbon atoms,
- r' and r", each independently, represent hydrogen, lower alkyl, aryl, aralkyl, an amino acid residue, a sugar residue, an amino sugar residue or a heterocycle, or r' and r" taken together form a heterocycle selected from the group consisting of piperidino, morpholino, pyrrolidino, piperazino and piperazino radical substituted at the 4-position with a C_1–C_6 alkyl or a mono- or polyhydroxyalkyl radical,
- R_2 represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine, CF_3, COR_7, CH_2OH or CH_2OR_6 wherein R_6 has the meaning given above,
- Z represents an oxygen atom, a sulphur atom, $—CH{=}CR_{11}—$, —N═CH— or $—N{=}CR_6—$ wherein R_6 has the meaning given above,
- R_{11} represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine or CF_3,
- X represents a divalent radical which can be read from left to right or vice versa and has the formula



$$—O—\underset{\overset{\|}{Y}}{C}—Q—$$

wherein

- Q represents oxygen or —NR'—,
- R' represents a hydrogen atom or a $—CH_3$ radical and
- Y represents oxygen or, alternatively Y represents sulphur when Q represents —NR'

and the salts thereof when R_1 represents a carboxylic acid function.

5,688,818

SUCCINAMIC ACID COMPOUND, PRODUCTION METHOD THEREOF AND USE THEREOF

Hiroshi Hosono, Ubaraki; Toshiyuki Nishio, Kawasaki; Hiromichi Ishikawa, Kobe; Yoshiyuki Nakamura, Shizuoka, and Tetsuo Matsui, Tsukuba, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., and The Green Cross Corporation, both of Osaka, Japan

PCT No. PCT/JP94/01266, § 371 Date Mar. 14, 1996, § 102(e) Date Mar. 14, 1996, PCT Pub. No. WO95/07898, PCT Pub. Date Mar. 23, 1995

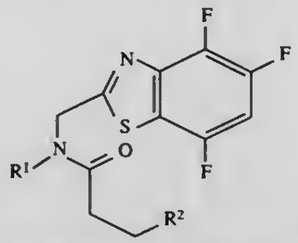
PCT Filed Aug. 1, 1994, Ser. No. 617,824

Claims priority, application Japan, Sep. 14, 1993, 5-250925

Int. Cl.⁶ C07D *277/62;277/64*

U.S. Cl. 514—367 **9 Claims**

I. A succinamic acid compound of the following formula (1)



(1)

wherein R^1 is linear branched or cyclic alkyl or a lower alkenyl and R^2 is an optionally esterified carboxyl, or a pharmaceutically acceptable salt thereof.

5,688,819

CYCLOPENTANE HEPTANOIC ACID, 2-CYCLOALKYL OR ARYLALKYL DERIVATIVES AS THERAPEUTIC AGENTS

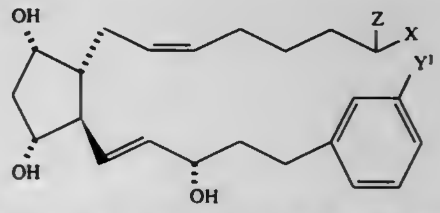
David F. Woodward, El Toro; Steven W. Andrews, Rancho Santa Marguerita; Robert M. Burk, Irvine, and Michael E. Garst, Newport Beach, all of Calif., assignors to Allergan, Waco, Tex.

Continuation-in-part of Ser. No. 371,339, Jan. 11, 1995, Pat. No. 5,607,978, which is a continuation of Ser. No. 154,244, Nov. 18, 1993, abandoned, which is a division of Ser. No. 948,056, Sep. 21, 1992, Pat. No. 5,352,708. This application Feb. 22, 1996, Ser. No. 605,567

Int. Cl.⁶ A61K *31/135;31/44;31/38;31/34*

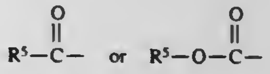
U.S. Cl. 514—357 **20 Claims**

1. A method of treating ocular hypertension or glaucoma which comprises applying to the eye an amount sufficient to treat ocular hypertension or glaucoma of a compound represented by the formula V



V

wherein X is a radical selected from the group consisting $—OR^4$ and $—N(R^4)_2$ wherein R^4 is selected from the group consisting of hydrogen, a lower alkyl radical having from one to six carbon atoms,



$$R^5—\overset{\overset{O}{\|}}{C}— \quad \text{or} \quad R^5—O—\overset{\overset{O}{\|}}{C}—$$

wherein R^5 is a lower alkyl radical having from one to six carbon atoms; Z is ═O or represents 2 hydrogen radicals; Y' is Cl or trifluoromethyl and the 9- and/or 11- and/or 15 esters, thereof.

5,688,820

AMINOALKYL BENZOXAZOLINONES AND BENZOTHIAZOLINONES

Ange Mouithys-Mickalad, Loos; Patrick Depreux, Armentieres; Daniel Lesieur, Gondecourt; Gérard Adam, Le Mesnil le Roi; Daniel-Henri Caignard, Paris; Pierre Renard, Versailles, and Marie-Claire Rettori, Courbevoie, all of France, assignors to Adir et Compagnie, Courbevoie, France

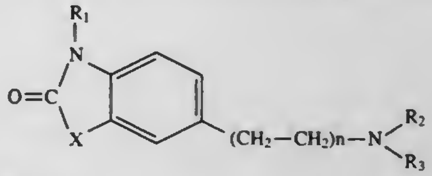
Division of Ser. No. 407,238, Mar. 21, 1995, Pat. No. 5,534,511. This application Dec. 8, 1995, Ser. No. 569,576

Claims priority, application France, Mar. 22, 1994, 94.03298

Int. Cl.⁶ C07D *413/10;417/10;* **A61K** *31/40*

U.S. Cl. 514—367 **4 Claims**

I. A compound which is selected from those of formula (I):



(I)

in which:

- R_1 represents hydrogen or alkyl,
- n represents 1 or 2,
- X represents oxygen or sulfur,
- R_2 represents hydrogen or alkyl,
- and R_3 represents the group $—(CH_2)_m—R_4$ in which:
  - m represents 1,2, 3 or 4,

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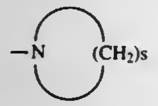
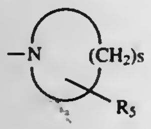
and R_4 represents a heterocyclic radical of formula:



wherein s is four (4), which is unsubstituted or substituted with a radical selected from aryl, arylalkyl, substituted aryl, and substituted arylalkyl,

or alternatively, when X represents sulfur R_2 forms, with R_3 and the nitrogen atom which bears them, a group:



wherein s is four (4), wherein the substituent R_5 is chosen from aryl, arylalkyl, substituted aryl, and substituted arylalkyl,

the term "substituted", used in reference to the "aryl" and "arylalkyl" radicals, meaning that these groups are substituted with one or more groups chosen from halogen, alkyl, hydroxyl, alkoxy, and trifluoromethyl,

the terms "alkyl" and "alkoxy" denote linear or branched groups containing 1 to 6 carbon atoms inclusive,

the term "aryl" represents a phenyl or naphthyl group,

the term "cycloalkyl" denotes a group of 3 to 9 carbon atoms inclusive,

the optical isomers thereof and the addition salts thereof with a pharmaceutically-acceptable acid and, when R_1 represents a hydrogen atom, with a pharmaceutically-acceptable base.

5,688,821
UNSATURATED FATTY ACYL DERIVATIVES OF 2-AMINOTHIAZOLEACETIC ACID AND THEIR SALTS AS INHIBITORS OF PHOSPHOLIPASE A_2 DERIVED FROM HUMAN SOURCES

Kenneth Lewis Kees, Glennmoore, Pa., assignor to American Home Products Corporation, Madison, N.J.

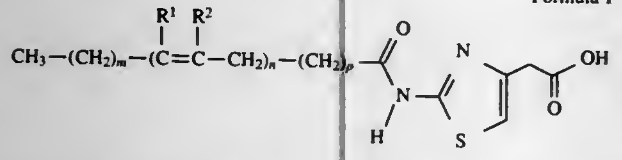
Filed Dec. 20, 1996, Ser. No. 771,742

Int. Cl.⁶ C07D *277/46;* **A01K** *31/425*

U.S. Cl. 514—371 **17 Claims**

1. A compound having the formula

Formula I



where R^1 and R^2 are both hydrogen or R^1 and R^2 form a bond;

m=1 and n=3 and p=6,

or m=3, 5 or 7 and n=1 and p=6,

or m=4 and n=2 and p=6 or 8,

and the E (trans) and Z (cis) isomers when $R^1=R^2=H$;

or a pharmaceutically acceptable basic addition salt thereof.

5,688,822
HETEROARALKYL AND HETEROARYLTHIOALKYL THIOPHENOLIC COMPOUNDS AS INHIBITORS OF 5-LIPOXYGENASE

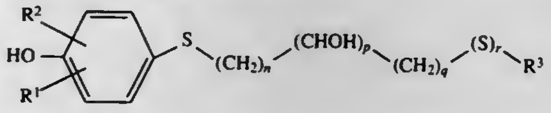
Ish Kumar Khanna, Vernon Hills; Michael Allan Stealey, Libertyville, and Richard Mathias Weier, Lake Bluff, all of Ill., assignors to G.D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 328,212, Oct. 25, 1994. This application Feb. 7, 1996, Ser. No. 597,778

Int. Cl.⁶ A61K *31/40;31/415;31/42;* **C07D** *263/58;235/22*

U.S. Cl. 514—375 **13 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2 are each alkyl;

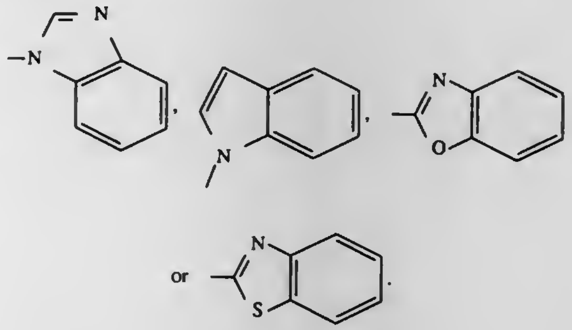
n is an integer of from 1 to 5;

p is an integer of from 0 to 1;

q is an integer of from 0 to 3;

r is an integer of from 0 to 1; and

R^3 is



5,688,823
THIAZOLIDINE AND OXAZOLIDINE DERIVATIVES THEIR PREPARATION AND THEIR MEDICAL USE

Takashi Fujita; Koichi Fujimoto; Takao Yoshioka; Hiroaki Yanagisawa; Toshihiko Fujiwara; Hiroyoshi Horikoshi; Minoru Oguchi, and Kunio Wada, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

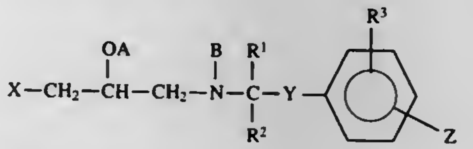
Division of Ser. No. 410,033, Mar. 23, 1995, Pat. No. 5,578,620. This application Feb. 21, 1996, Ser. No. 604,702

Claims priority, application Japan, Mar. 23, 1994, 6-051541

Int. Cl.⁶ A61K *31/42;* **C07D** *263/44*

U.S. Cl. 514—376 **31 Claims**

1. A compound of formula (I):



(I)

wherein:

R^1 and R^2 are the same or different and each represents a hydrogen atom or an alkyl group having from 1 to 8 carbon atoms, or R^1 and R^2 together represent a group of formula —$(CH_2)_k$—

wherein K represents an integer of from 2 to 6;

R^3 represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, a halogen atom or a hydroxy group;

A and B are the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, an aralkyl group in which an alkyl group having from 1 to 5 carbon atoms is substituted by an aryl group as defined below, an aliphatic carboxylic acyl group having from 1 to 11 carbon atoms, an aliphatic carboxylic acyl group which has from 2 to 6 carbon atoms and which is substituted by an aryl group as defined below, an aromatic carboxylic acyl group in which the aryl part is as defined below, a carbamoyl group of formula —$CONR^6R^7$,

wherein R^6 and R^7 are the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 11 carbon atoms, an aryl group as defined below or an aralkyl group in which an alkyl group having from 1 to 5 carbon atoms is substituted by an aryl group as defined below;

or A and B together represent a group of formula >C═O, a group of formula >C═S, a group of formula —C(═O)—C(═O)—, a group of formula —$CH_2C(=O)$—, a group of formula —CH_2CH_2—, a group of formula —SO_2— or a group of formula —CH_2SO_2—;

X represents a group of formula: W—$(CH_2)_m$—X^1—

wherein W represents

an aryl group as defined below, a heterocyclic group having 5 or 6 ring atoms of which from 1 to 3 are hetero-atoms selected from the group consisting of oxygen, sulfur and nitrogen hetero-atoms and being unsubstituted or being substituted by at least one substituent selected from the group consisting of substituents α as defined below or such a heterocyclic group which is fused to at least one ring system selected from the group consisting of carbocyclic and heterocyclic rings having 5 or 6 ring atoms and which is unsubstituted or is substituted by at least one substituent selected from the group consisting of substituents α as defined below,

X^1 represents a single bond, an oxygen atom, a sulfur atom or a group of formula >NR^4

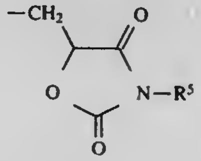
wherein R^4 represents a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, an alkyl group in which an alkyl group having from 1 to 5 carbon atoms is substituted by at least one aryl group as defined below or an aryl group as defined below, and

m represents 0 or an integer of from 1 to 8;

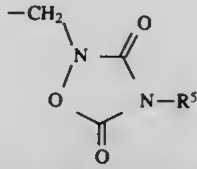
Y represents a group of formula: —$(CH_2)_n$—Y^1—

wherein Y^1 represents a single bond, an oxygen atom or a sulfur atom, and n represents an integer of from 1 to 5;

Z represents a group of formula (iii) or (iv), (v) or (vi):



(iii)



(iv)

wherein R^5 represents a hydrogen atom, a carboxyalkyl group having from 2 to 5 carbon atoms, an alkanoyloxyalkyl group having a total of from 2 to 12 carbon atoms, a cycloalkyl-substituted alkanoyloxyalkyl group having a total of from 6 to 12 carbon atoms, a cycloalkylcarbonyloxyalkyl group having a total of from 5 to 17 carbon atoms, an alkoxycarbonyloxyalkyl group having a total of from 3 to 17 carbon atoms, a cycloalkyl-substituted alkoxycarbonyloxyalkyl group having a total of from 6 to 17 carbon atoms or a cycloalkyloxycarbonyloxyalkyl group having a total of from 5 to 17 carbon atoms;

said aryl groups are carbocyclic aromatic groups which have from 6 to 14 ring carbon atoms and which are unsubstituted or are substituted by at least one substituent selected from the group consisting of substituents α, defined below; and

said substituents α are selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms, alkoxy groups having from 1 to 4 carbon atoms, haloalkyl groups having from 1 to 4 carbon atoms, hydroxy groups, halogen atoms, phenyl groups, nitro groups and groups of formula —NR^aR^b, wherein R^a and R^b are independently selected from the group consisting of hydrogen atoms, alkyl groups having from 1 to 8 carbon atoms, aralkyl groups in which an alkyl group having from 1 to 5 carbon atoms is substituted by an aryl group as defined above, aryl groups as defined above, aliphatic carboxylic acyl groups having from 1 to 11 carbon atoms, aliphatic carboxylic acyl groups which have from 2 to 6 carbon atoms and which are substituted by an aryl group as defined above, and aromatic carboxylic acyl groups in which the aryl part is as defined above, provided that any aryl group represented by or included in a group represented by R^a or R^b is not itself further substituted by a group of formula —NR^aR^b;

or a salt or ester thereof.

5,688,824
USE OF LEFLUNOMIDE TO PREVENT OR CONTROL XENOGRAFT REJECTION

James Williams, 655 Superior, Oak Park, Ill. 60302

Division of Ser. No. 270,908, Jul. 5, 1994, Pat. No. 5,624,946. This application Feb. 7, 1996, Ser. No. 598,149

Int. Cl.⁶ A61K *31/42;31/275;31/535*

U.S. Cl. 514—378 **12 Claims**

1. A method of preventing or controlling acute or chronic rejection in a xenograft transplantation patient comprising administering to a patient receiving a xenograft a therapeutically effective amount of leflunomide product.

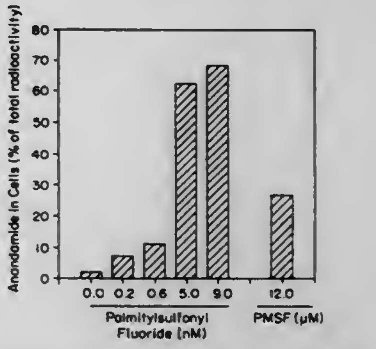
5,688,825
ANANDAMIDE AMIDASE INHIBITORS AS ANALGESIC AGENTS

Alexandros Makriyannis, Ashford; Sonyan Lin, Storrs, and William Adam Hill, Ashford, all of Conn., assignors to University of Connecticut, Storrs, Conn.

Filed May 31, 1996, Ser. No. 658,949

Int. Cl.⁶ A61K *31/40;* **C07C** *235/78;* **C07D** *207/46;295/24*

U.S. Cl. 514—423 **15 Claims**



1. A method of inhibiting anandamide amidase in an individual or animal comprising administering to the individual or animal a therapeutically effective amount of a compound represented by the following structural formula: R—X—Y or a physiologically acceptable salt thereof, wherein:

R is selected from the group consisting of a methyl group, an aryl group, a substituted aryl group, a heteroaryl group, a substituted heteroaryl group, a heterocyclic group and a substituted heterocyclic group;

X is a straight chain hydrocarbyl group or a substituted straight chain hydrocarbyl group containing from about 4 to about 18 carbon atoms if R is an aryl group, a substituted aryl group, a

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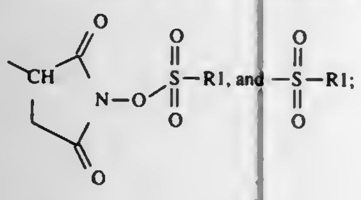
heteroaryl group, a substituted heteroaryl group, a heterocyclic group or a substituted heterocyclic group;

X is a straight chain hydrocarbyl group or a substituted straight chain hydrocarbyl group containing from about 10 to about 24 carbon atoms if R is a methyl group; and

Y is selected from the group consisting of:



wherein:

R1 is selected from the group consisting of —F and O—C_{1-4} alkyl group wherein the alkyl group may be straight or branched chain.

5,688,826

EXCITATORY AMINO ACID DERIVATIVES

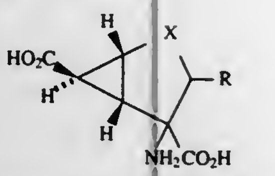
Steven Marc Massey; James Allen Monn, and Matthew John Valli, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 14, 1996, Ser. No. 749,140

Int. Cl.^{6} A61K *31/38;* **C07D** *307/77*

U.S. Cl. 514—443 **14 Claims**

1. A compound of the formula



I

in which X represents O, NR^a, S, SO or SO_2; R represents a hydrogen atom; a (1–6C) alkyl group; a (2–6C) alkenyl group; a (2–6C) alkynyl group; an optionally substituted aromatic group; an optionally substituted heteroaromatic group; a non-aromatic carbocyclic group; a non-aromatic heterocyclic group; a non-aromatic monocyclic carbocyclic group fused with one or two monocyclic aromatic or heteroaromatic groups; a non-aromatic monocyclic heterocyclic group fused with one or two monocyclic aromatic or heteroaromatic groups; or a (1–6C) alkyl, (2–6C) alkenyl or (2–6C) alkynyl group which is substituted by one, two or three groups selected independently from an optionally substituted aromatic group, an optionally substituted heteroaromatic group, a non-aromatic carbocyclic group, a non-aromatic heterocyclic group, a non-aromatic monocyclic carbocyclic group fused with one or two monocyclic aromatic or heteroaromatic groups and a non-aromatic monocyclic heterocyclic group fused with one or two monocyclic aromatic or heteroaromatic groups; R^a represents hydrogen or a group of formula $(CO)_nR^b$; n is 0 or 1; and R^b is as defined for R; or a non-toxic metabolically labile ester or amide thereof; or a pharmaceutically acceptable salt thereof.

5,688,827

Patent Not Issued For This Number

5,688,828

USE OF N,N'-BIS(MERCAPTOACETYL) HYDRAZINE DERIVATIVES AS ANTICATARACT AGENTS

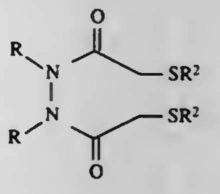
Mark R. Hellberg, Arlington; William H. Garner, Southlake; Jaime E. Dickerson, Jr., Fort Worth, all of Tex., and Marjorie F. Lou, Lincoln, Nebr., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 472,452, Jun. 7, 1995. This application Jul. 31, 1996, Ser. No. 690,610

Int. Cl.^{6} A61K *31/195*

U.S. Cl. 514—565 **6 Claims**

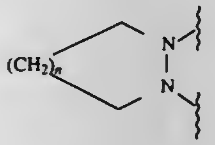
1. A method of treating and/or delaying the onset of cataract in mammals comprising administering to the mammal a composition having a therapeutically effective amount of a compound of formula (I):



(I)

wherein,

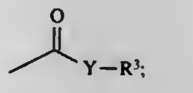
R and R^1 are independently H, C_{2-10} alkyl, (un)substituted aryl, (un)substituted heterocycle, or may form a ring of formula (II):



(II)

wherein n is 1–3;

R^2 is



Y is NH or CH_2;

R^3 is H, C_{1-10} alkyl, (un)substituted aryl, (un)substituted heterocycle.

5,688,829

THERAPEUTIC INJECTABLE ANALGESIC COMPOSITION CONTAINING NIMESULIDE AND A PROCESS FOR THE MANUFACTURE THEREOF

Rajesh Jain, and Amarjit Singh, both of New Delhi, India, assignors to Panacea Biotec Limited, New Delhi, India

Filed Jun. 13, 1996, Ser. No. 662,704

Claims priority, application India, Jul. 25, 1995, 1389/DEL/95; Nov. 6, 1995, 2046/DEL/95; Nov. 8, 1995, 2047/DEL/95; Nov. 8, 1995, 2048/DEL/95

Int. Cl.^{6} A61K *31/18*

U.S. Cl. 514—605 **16 Claims**

1. A therapeutic injectable analgesic pharmaceutical composition for intra-muscular administration comprising:

Nimesulide	2.5% to 10% w/v and
Parenteral absorption enhancing vehicle base	90% to 97.5% w/v

wherein said parenteral absorption enhancing base comprises;

Dimethylacetamide	5% to 12% w/w,
Benzyl benzoate	20% to 50% w/v and
Ethyl oleate	30% to 65% w/v.

5,688,830

TREATMENT OF NEUROPATHIC PAIN

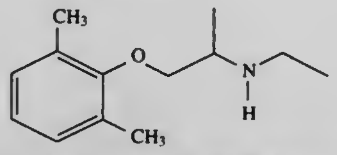
Jacob Berger, Los Altos Hills; Lee Allen Flippin, Woodside; John Cureton Hunter, Saratoga; David Garrett Loughhead, Belmont, and Robert James Weikert, Woodside, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 16, 1997, Ser. No. 782,700

Int. Cl.^{6} A61K *31/135;* **C07C** *217/18*

U.S. Cl. 514—651 **7 Claims**

1. A compound of the formula:



1

namely [2-(2,6-dimethylphenoxy)-1-methylethyl]-ethylamine, or a pharmaceutically acceptable salt thereof.

5,688,831

COSMETIC MAKE-UP COMPOSITIONS

Magda El-Nokaly, Cincinnati, Ohio; Kataline Igo-Kemenes, Thorpe Green, Great Britain; David Andrew Jakubovic; Anne Langlois, both of Staines, Great Britain, and Michael Lee Vatter, Okeana, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/05439, § 371 Date Dec. 6, 1995, § 102(e) Date Dec. 6, 1995, PCT Pub. No. WO94/28860, PCT Pub. Date Dec. 22, 1994

PCT Filed May 16, 1994, Ser. No. 557,019

Claims priority, application United Kingdom, Jun. 11, 1993, 9312100

Int. Cl.^{6} A01N *65/00*

U.S. Cl. 514—938 **25 Claims**

1. A make up composition in the form of an oil-in-water emulsion comprising:

a) from about 1% to about 50% by weight of silicone oil selected from volatile silicones, non-volatile silicones and mixtures thereof,

b) from about 0.1% to about 30% by weight of humectant,

c) from about 0.1% to about 25% by weight of pigment, and

d) from about 0.1% to about 20% by weight of an organic amphiphilic material which is capable of forming smectic lyotropic liquid crystals containing said humectant in product or on the skin.

5,688,832

LOW MOLECULAR WEIGHT ALKENYL AROMATIC POLYMER FOAM

Andrew N. Paquet, and Warren H. Griffin, both of Granville, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US94/10491, § 371 Date Mar. 12, 1996, § 102(e) Date Mar. 12, 1996, PCT Pub. No. WO95/10560, PCT Pub. Date Apr. 20, 1995

PCT Filed Sep. 16, 1994, Ser. No. 612,943

Int. Cl.^{6} C08J *9/08*

U.S. Cl. 521—79 **12 Claims**

1. A process for making an extruded alkenyl aromatic polymer foam structure having a cross-section thickness in minor dimension of greater than 9.5 millimeters and a cross-section of 30 square centimeters or more, comprising:

a) heating to form a melt polymer material an alkenyl aromatic polymer material comprising greater than 50 percent by weight alkenyl aromatic monomeric units and further comprising a weight average molecular weight of 125,000 to to 145,000 and a polydispersity index of 2.05 to 3.0;

b) incorporating into the melt polymer material at an elevated pressure a blowing agent comprising 50 percent or more by weight of an inorganic blowing agent based upon the total weight of the blowing agent to form a foamable gel;

c) cooling the foamable gel to an optimum foaming temperature; and

d) extruding the foamable gel through a die to a zone of lower pressure to form a foam structure.

5,688,833

AZEOTROPE-LIKE COMPOSITIONS OF 1 1 1 3 3-PENTAFLUOROPROPANE AND 1 1-DICHLORO-1-FLUOROETHANE

Earl August Eugene Lund, deceased, late of West Seneca, by Hilde Lund, executrix; Robert Christian Parker, Hamburg; Ian Robert Shankland, Williamsville, and Gary Michael Knopeck, Lakeview, all of N.Y., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Jul. 11, 1996, Ser. No. 678,209

Int. Cl.^{6} C08J *9/14;* **C08G** *18/00*

U.S. Cl. 521—98 **6 Claims**

1. A method of preparing polyurethane and polyisocyanurate foams comprising the step of reacting and foaming a mixture of ingredients which will react to form the polyurethane or polyisocyanurate foams in the presence of a blowing agent an azeotrope-like composition consisting essentially of 1,1,1,3,3-pentafluoropropane and 1,1-dichloro-1-fluoroethane.

5,688,834

CATALYSTS WHICH STABILIZE HYDROHALOCARBON BLOWING AGENT IN POLYURETHANE FOAM FORMULATIONS

Robert Christian Parker, Hamburg, and Timothy Rech Demmin, Grand Island, both of N.Y., assignors to AlliedSignal, Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 752,396, Aug. 30, 1991, abandoned. This application Oct. 15, 1991, Ser. No. 777,876

Int. Cl.^{6} C08J *9/14;* **C08G** *18/16;18/18;18/32*

U.S. Cl. 521—118 **9 Claims**

1. A composition comprising polyisocyanate, polyol, hydrofluorocarbon blowing agent, surfactant, and at least one catalyst for polymerization of said polyisocyanate and said polyol wherein said catalyst is a polyamine of the formula $R^{16}R^{17}N—R^{18}—N(R^{19})—R^{18}—NR^{16}R^{17}$ wherein R^{16}, R^{17}, and R^{19} are the same or different and selected from hydrogen or straight chain and branched alkyl having 1 to 18 carbon atoms; cycloalkyl having 5 to 18 carbon atoms; straight chain or branched substituted alkyl and hydroxyalkyl having 2 to 18 carbon atoms containing $—CH_2—CR^4R^5Cl$ where R^4 and R^5 are the same or different and selected from hydrogen, bromine, chlorine, aryl, or alkyl having 1 to 8 carbon atoms or straight chain or branched alkoxyalkyl having 4 to 23 carbon atoms containing $—CH_2—(CH_2)_n—(CO)_a—O— CH_2—CR^4R^5Cl$ where R^4 and R^5 are the same or different and selected from hydrogen, bromine, chlorine, aryl, or alkyl having 1 to 8 carbon atoms, n is 1 to 3, a is 0 or 1, R^{18} is selected from alkyl having 1 to 18 carbon atoms; and said catalyst results in a decreased amount of decomposition of said hydrofluorocarbon blowing agent to haloalkenes.

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5,688,835

PREPARATION OF POLYURETHANE RIGID FOAMS

Karin Scherbel; Katrin Ebert, both of Schwarzheide; Hartmut Appenroth, Arnsdorf, and Peter von Malotki, Cosel, all of Germany, assignors to BASF Elastogran GmbH, Lemforde, Germany

Filed Jan. 25, 1996, Ser. No. 591,328

Claims priority, application Germany, Jan. 31, 1995, 195 02 969.0

Int. Cl.^{6} C08G *18/32;18/34;18/36*

U.S. Cl. 521—131 **7 Claims**

1. A process for producing polyurethane rigid foams by reacting
a) organic polyisocyanates
b) relatively high molecular weight compounds containing at least two reactive hydrogen atoms and, optionally,
c) low molecular weight chain extenders and/or crosslinkers in the presence of
d) blowing agents
e) catalysts and, optionally,
f) auxiliaries and additives,

wherein the relatively high molecular weight compounds containing at least two reactive hydrogen atoms comprise a mixture of
b1) one or more high-functional, polyether alcohols having functionalities of from 6 to 8 and mean equivalent masses of from 125 to 200,
b2) one or more polyether alcohols based on aliphatic amines having functionalities of from 3 to 4 and mean equivalent masses of from 70 to 130,
b3) one or more low-functional polyether alcohols having functionalities of from 2 to 3 and mean equivalent masses of from 67 to 250, and
b4) an OH-containing fatty acid ester.

5,688,836

POLYTETRAFLUOROETHYLENE POROUS MATERIAL AND PROCESS FOR PRODUCTION OF THE SAME

Katsutoshi Yamamoto; Osamu Tanaka, and Hirofumi Onogi, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP93/01051, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO94/03531, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 27, 1993, Ser. No. 211,056

Claims priority, application Japan, Jul. 30, 1992, 4-203552

Int. Cl.^{6} C08J *9/24*

U.S. Cl. 521—145 **8 Claims**

1. A polytetrafluoroethylene porous material composed of a polytetrafluoroethylene and a heat-meltable resin which has a melting point lower than that of the polytetrafluoroethylene, said material having fibril portions and node portions wherein the fibril portions are mainly of the polytetrafluoroethylene and the heat-meltable resin mainly constitutes the node portions and hardly constitutes the fibril portions, wherein the heat-meltable resin has a heat resistance to the extent that decomposition and/or foaming does not occur during heat setting treatment, and wherein said heat-meltable resin is selected from the group consisting of tetrafluoroethylene-hexafluoropropylene copolymer, tetrafluoroethylene-perfluoroalkyl vinyl ether copolymer and poly (ether ether ketone).

5,688,837

METHOD OF IMPROVING ADHESION OF POLYURETHANE FOAM TO POLYCARBONATE AND ARTICLES MADE THEREBY

Herbert Shin-I Chao, Schenectady; Carol Lynn Fasoldt, Averill Park, both of N.Y.; Abbas Mohamad Safieddine, Dearborn, Mich., and Christian Lietzau, Rhinebeck, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1995, Ser. No. 533,051

Int. Cl.^{6} C08G *18/00*

U.S. Cl. 521—155 **20 Claims**

1. A method for adhering polyurethane foam to polycarbonate comprising:
a. providing nucleophilic reactive radicals on a polycarbonate surface,
b. generating a polyurethane mix comprising at least one polyol and at least one diisocyanate, wherein said polyurethane mix exhibits an isocyanate index of greater than 82, and,
c. foaming the polyurethane mix on said polycarbonate surface.

5,688,838

PROCESS FOR PREPARING HYDROGEN-CONTAINING FLUOROPOLYMERS BY SUSPENSION (CO)POLYMERIZATION

Julio A. Abusleme, Saronno; Pier Antonio Guarda, Nole, both of Italy, and Ralph De Pasquale, S. Augustine Beach, Fla., assignors to Ausimont S.p.A., Milan, Italy

Filed Jul. 28, 1995, Ser. No. 508,926

Claims priority, application Italy, Aug. 4, 1994, MI94A1699

Int. Cl.^{6} C08F *2/46*

U.S. Cl. 522—33 **9 Claims**

1. A process for preparing hydrogen-containing fluoropolymers, said process consisting essentially of (co)polymerizing hydrogen-containing olefinic monomers or a combination of hydrogen-containing and non-hydrogen containing olefinic monomers in an organic suspending medium in the presence of (a) a radical photoinitiator selected from the group consisting of dialkylperoxides, ketones, diacylperoxides, di or polyketones, peroxydicarbonates, peroxyesters, and halogenated or polyhalogenated organic compounds wherein the halogens are selected from the group consisting of F, Cl and Br, and (b) ultraviolet (UV)-visible radiation at a temperature of from −60° to +30° C., with the proviso that said olefinic monomers do not have any halogens other than fluorine or chlorine.

5,688,839

MARBLEIZED RESIN MATERIALS AND METHODS FOR MAKING SAME

Wylie H. Royce, Colts Neck, N.J., assignor to Royce Associates, East Rutherford, N.J.

Filed Jul. 30, 1996, Ser. No. 688,405

Int. Cl.^{6} C09D *5/29*

U.S. Cl. 523—171 **24 Claims**

1. A mixture of colored resin particles useful for making a marbleized resin composite, comprising an admixture of either:
(1) at least two types of colored accent resin particles wherein each type of particle is of a different color and is irradiated; or
(2) at least one type of colored accent resin particles mixed with at least one type of background resin particles, wherein each colored accent resin particle type is irradiated and each background resin particle type is not irradiated, and wherein each colored accent resin particle type is a different color from the other colored accent particle types and the background particle types.

5,688,840

PROCESS FOR PREPARING ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

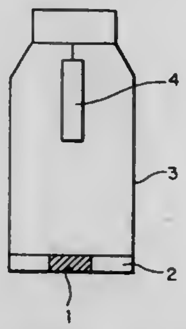
Kazuhisa Ono, Tokyo, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1995, Ser. No. 538,850

Claims priority, application Japan, Oct. 4, 1994, 6-240095

Int. Cl.^{6} C08K *9/02*

U.S. Cl. 523—209 **6 Claims**



1. A process for preparing a room temperature-curable organopolysiloxane composition comprising:
(A) 100 parts by weight of (A-1) a linear organopolysiloxane containing, per molecule, at least one structural unit represented by formula (I):

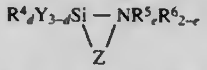
$$R^1_aX^1_bSiO_{(4-a-b)/2} \qquad (I)$$

wherein R^1 which may be the same or different each represents a substituted or unsubstituted monovalent hydrocarbon group; X^1 represents a hydrolyzable group; a represents an integer of 0 to 2, and b represents an integer of 1 to 3, provided a+b is 1 to 3; and having a viscosity of 50 to 500,000 cSt at 25° C. and (A-2) a silicon compound represented by formula (II):

$$R^2_cSiX^2_{4-c} \qquad (II)$$

wherein R^2 which may be the same or different each represents a substituted or unsubstituted monovalent hydrocarbon group or a hydrogen atom; X^2 represents a hydrolyzable group; and c represents an integer of 0 to 2; or a partial hydrolysis product thereof, with the proviso that the amount of (A-1) is from 80 to 100% by weight based on the total weight of (A-1) and (A-2),
(B) 1.0 to 200 parts by weight of silica powder having a specific surface area of 20 to 800 m^2/g,
(C) 0.01 to 25 parts by weight of a curing catalyst, and
(D) a silane coupling agent represented by formula (III) or (IV):

$$R^4_dY_{3-d}Si-Z-NR^5_eR^6_{2-e} \qquad (III)$$



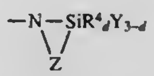
$$R^4_dY_{3-d}\underset{\diagdown\, Z \,\diagup}{Si-N}R^5_eR^6_{2-e} \qquad (IV)$$

wherein R^4 and R^5, which may be the same or different, each represent a substituted or unsubstituted monovalent hydrocarbon group or a hydrogen atom; R^6 represents $-SiR^7_fW_{3-f}$, wherein R^7 which may be the same or different each represents a substituted or unsubstituted monovalent hydrocarbon group or a hydrogen atom; W represents a hydrolyzable group; and f represents an integer of 0 to 3; Y represents a hydrolyzable group; Z represents a substituted or unsubstituted divalent hydrocarbon group; d represents an integer of 0 to 3; and e represents an integer of 0 to 2,

or a linear organopolysiloxane having a substituent represented by

$$-Z-NR^5_eR^6_{2-e}, \quad -NR^5_eZSiR^4_dY_{3-d},$$

or



$$-\underset{\diagdown\, Z \,\diagup}{N-Si}R^4_dY_{3-d}$$

wherein R^4, R^5, R^6, Z, Y, d and e are the same as defined above,
(D) being present in such an amount that it contains 300 to 3,000,000 ppm of nitrogen atom per 100 parts by weight of (A-1),

which comprises adding component (D) to component (A) followed by mixing and kneading, and then adding component (B) to the resulting mixture, followed by mixing and kneading, or mixing and kneading components (A), (B) and (D), and then adding component (C) to the resulting mixture, followed by mixing and kneading.

5,688,841

ANTISTATIC AROMATIC POLYIMIDE FILM

Darrell Joe Parish, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 29, 1996, Ser. No. 681,584

Int. Cl.^{6} C08K *9/00*

U.S. Cl. 523—216 **14 Claims**

1. An antistatic aromatic polyimide film comprising an aromatic polyimide film having dispersed therein from 14 to 50% by weight, based on the weight of the polyimide, of electrically conductive silica particles coated with a layer of antimony-containing tin oxide, wherein the amount of antimony range from 1 to 20% by weight of the tin oxide, to provide a surface resistivity of from 10^4 to 10^{12} ohms/square.

5,688,842

PROCESS FOR PREPARING HIGH INTERNAL PHASE RATIO EMULSIONS AND LATEXES DERIVED THEREOF

James E. Pate, III, Sanford; Nanette E. Lutenske, Bay City; James Peters, and Ronald R. Pelletier, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 463,151, Jun. 5, 1995, Pat. No. 5,539,021. This application Apr. 10, 1996, Ser. No. 630,187

Int. Cl.^{6} C08J *3/02;* **B01J** *13/00*

U.S. Cl. 523—335 **13 Claims**

1. A method of preparing a high internal phase ratio emulsion without phase inversion comprising the steps of:
a) continuously merging into a disperser and in the presence of an emulsifying and a stabilizing amount of a surfactant, an aqueous phase stream having a flow rate R_1, and a disperse phase liquid stream having a flow rate R_2; and
b) mixing the merged streams at a mixing rate sufficiently constant to form the high internal phase ratio emulsion without phase inversion;

wherein R_2:R_1 encompasses a range, the lower limit of which range being defined by a point where the volume average particle size of the high internal phase ratio emulsion begins to show an inverse dependence on R_2:R_1, and wherein the upper limit of which range is just less than an R_2:R_1 where a phase inversion of the high internal phase ratio emulsion takes place, and wherein the disperse phase comprises a polyolefin.

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5,688,843
OIL-ABSORBENT COMPOSITION, PARTICULATE OIL ABSORBER, OIL-ABSORBENT MATERIAL, AND OIL-ABSORBENT PACK

Toru Inaoka; Tomoki Gomi, both of Hyogo; Yoshiyuki Onda, Tokyo; Toshio Tamura, Kanagawa, and Hideyuki Tahara, Osaka, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Continuation of Ser. No. 160,171, Dec. 2, 1993, abandoned. This application Oct. 26, 1995, Ser. No. 548,527

Claims priority, application Japan, Mar. 17, 1993, 5-056920; Sep. 17, 1993, 5-231390

Int. Cl.^{6} C08K *9/00*

U.S. Cl. 523—216 **14 Claims**

1. A method for producing an absorbent, which comprises:

mixing and dispersing 50 to 95 parts by weight of (1) an oil-absorbent, cross-linked polymer formed from 96–99.999% by weight of (A) a monomer having a polymerizable unsaturated group in the molecule, said monomer (A) containing mainly a monomer having a solubility parameter of not more than 9, and 4–0,001% by weight of (B) a cross-linking monomer having at least two polymerizable unsaturated groups in the molecule, provided the sum of monomer (A) and cross-linking monomer (B) is 100%, with 50 to 5 parts by weight of (IV) at least one compound selected from the group consisting of a hydrophobically-treated silica and a hydrophobically-treated alumina provided the sum of oil-absorbent, cross-linked polymer (I) and compound (IV) is 100 parts by weight in an aqueous medium; and then

aggregating and granulating the resultant mixture to form a granular powder having an average particle diameter of 0.01–20 mm.

5,688,844
RESILIENT WELL CEMENT COMPOSITIONS AND METHODS

Jiten Chatterji; Bobby J. King; Patty L. Totten, all of Duncan, and David D. Onan, Lawton, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 1, 1996, Ser. No. 673,970

Int. Cl.^{6} E21B *33/14;* **C08K** *3/34;* **C08J** *9/12*

U.S. Cl. 524—8 **20 Claims**

1. A well cement composition having improved mechanical properties including elasticity and ductility comprising:

a hydraulic cement;

an aqueous rubber latex present in an amount in the range of from about 2.5% to about 45% by weight of hydraulic cement in said composition;

an effective amount of a latex stabilizer;

a defoaming agent comprised of polydimethylsiloxane present in an amount in the range of from about 0.1% to about 0.9% by weight of cement in said composition;

a gas present in an amount sufficient to foam said cement composition and produce a cement composition density in the range of from about 8 to about 16 pounds per gallon;

an effective amount of a foaming agent; and

an effective amount of a foam stabilizer.

5,688,845
HIGH SOLIDS, MALTODEXTRIN-BASED ADHESIVES

James L. Eden, Millstone; Yong-Cheng Shi, Somerville; Russell J. Nesiewicz, Somerset, and Joseph Wieczorek, Jr., Flemington, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed May 6, 1996, Ser. No. 643,643

Int. Cl.^{6} C08L *3/02*

U.S. Cl. 524—48 **20 Claims**

1. An adhesive which consists essentially of:

a) about 15 to about 90% by weight of polyvinyl acetate, ethylene vinyl acetate, or mixtures thereof;

b) about 10 to about 85% by weight of a maltodextrin syrup having a solids content between about 60 to 80% by weight; which is prepared from a converted or a non-converted, chemically derivatized starch having an amylose content of 40% or less; which maltodextrin has (i) substituents in an amount sufficient to provide a degree of substitution of greater than about 0.01 and less than about 0.50; (ii) a reducing sugar content of between about 5 and about 19 dextrose equivalent; and (iii) a polymodal molecular weight distribution having one peak between about 630 to about 1600 daltons and at least one other peak between about 1600 and about 2,500,000 daltons; and about 25 to 45 parts of water; and

c) 0 to about 75% by weight of water; which is characterized by its remoistenability.

5,688,846
SPIRO-PYRANIC COMPOUNDS ENDOWED WITH PHOTOCHROMIC CHARACTERISTICS

Pietro Allegrini; Nereo Nodari; Vincenzo Malatesta, and Luciana Crisci, all of Milan, Italy, assignors to Ministero Dell 'Universita' E Della Ricerca Scientifica E Tecnologica, Rome, Italy

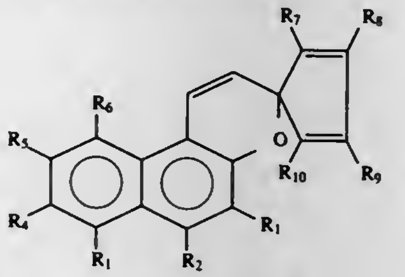
Division of Ser. No. 241,759, May 12, 1994, Pat. No. 5,532,361. This application May 15, 1996, Ser. No. 644,970

Claims priority, application Italy, May 18, 1993, MI93 A 1012

Int. Cl.^{6} C07D *413/08;311/96;* **C08K** *5/15;5/3417*

U.S. Cl. 524—99 **8 Claims**

1. A polymeric composition comprising a polymer and a photochromic compound having the formula (I):

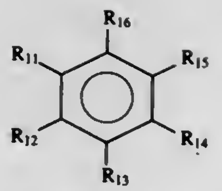


(I)

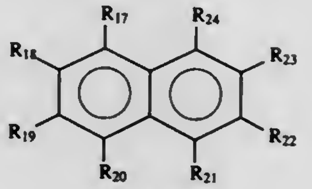
wherein:

(a) R_1 to R_{10} are independently selected from the group consisting of hydrogen; linear and branched C_1–C_5 alkyl groups, optionally having 1–5 halogens; hydroxy groups; C_1–C_5 alkoxy groups; C_1–C_5 acyloxy groups; carboxy-C_1–C_5 alkyl groups; cyano groups; C_2–C_5 alkenyl groups; benzyl groups; halogens; amine groups; mono-(C_1–C_5)-alkyl amino groups; di-(C_1–C_5)-alkyl amino groups; (C_3–C_{10})-cycloalkyl amino groups; piperidino, piperazino, and morpholino groups; carboxy groups; C_2–C_5 alkenyl carboxy groups; aminocarbonyl groups; N-(C_1 –C_5)-alkyl-substituted aminocarbonyl groups; N,N-di-(C_1–C_5)-alkyl-substituted aminocarbonyl groups; nitro groups; sulfonic groups; (C_1–C_5)-alkyl-sulfonate groups; aryl-sulfonate groups; aryl groups selected from the group consisting of phenyl, biphenyl, and naphthyl groups; and carbonyl groups selected from the group consisting of alkyl carbonyls, phenyl carbonyls, naphthyl carbonyls and benzyl carbonyls; wherein the halogen is fluorine, chlorine, bromine, or iodine; or

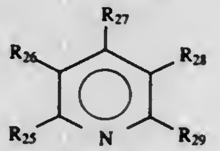
(b) each of the substituents from R_7 to R_{10} alternatively represents, jointly with the group adjacent thereto, a ring structure having a formula selected from the following formulas (II), (III) and (IV):



(II)



(III)



(IV)

and substituents R_1 to R_6 and R_{11} to R_{29} represent the same groups contained by R_1 to R_{10} in part (a).

5,688,847
POLYCYCLIC FLUOROPHOSPHITES USEFUL AS STABILIZERS

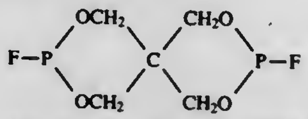
Michael E. Gelbin, Fords; Michael H. Fisch, East Wayne, and R. David Peveler, Woodcliff Lake, all of N.J., assignors to Witco Corporation, Greenwich, Conn.

Filed Nov. 7, 1996, Ser. No. 745,010

Int. Cl.^{6} C07K *5/51;* **C07F** *9/6574*

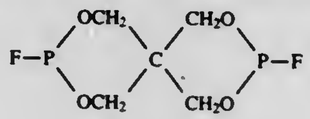
U.S. Cl. 524—118 **15 Claims**

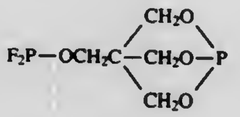
1. A compound of the formula (I)



(I)

2. A product selected from the group consisting of





and (c) mixtures of (a) and (b).

5,688,848
POLYIMIDE COMPOSITION AND POLYIMIDE COMPOSITE

James A. Cella, Clifton Park; Gary K. Shank, Ballston Spa, and Judith A. Serth, Slingerlands, all of N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 25, 1996, Ser. No. 736,214

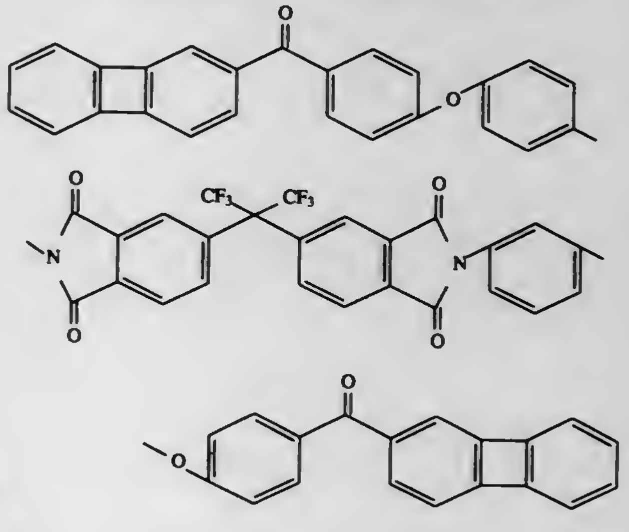
Int. Cl.^{6} C08K *7/06;5/523*

U.S. Cl. 524—141 **8 Claims**

1. A cross-linked polyimide composition obtained by combining:

(a) a polyimide resin,

(b) a reactive plasticizer having at least two four-membered rings which undergo ring scission at an elevated temperature, said plasticizer being combined at a level of from 5 to 25 percent by weight based on the total weight of the composition, wherein said reactive plasticizer is of the formula:



and

(c) a triaryl phosphate, said phosphate being combined at a level of from 0.25 to 5 percent by weight based on the total weight of the composition.

5,688,849
PHOTOLYZABLE POLYOLEFIN COMPOSITION

Sungsam Joe; Kwangho Lee, both of Seoul, Rep. of Korea; V. I. Nikolaichik, Moscow, Russian Federation; V. V. Abramov, Moscow, Russian Federation; E. P. Dontsova, Moscow, Russian Federation; A. M. Tchebotar, Moscow, Russian Federation, and S. N. Degtiareva, Moscow, Russian Federation, assignors to STC Corporation, Seoul, Rep. of Korea

Filed Oct. 3, 1995, Ser. No. 538,813

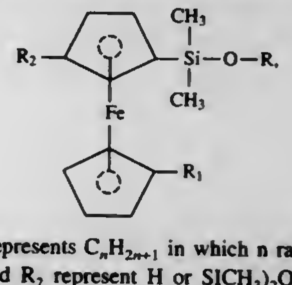
Claims priority, application Rep. of Korea, Oct. 8, 1994, 94-25777

Int. Cl.^{6} C08K *5/24*

U.S. Cl. 524—262 **12 Claims**

1. A polyolefin composition which is photolyzable, comprising: polyolefin; and

an effective amount of a photolytic agent which is an alkoxydimethylsilylferrocene having a general formula (I):



(I)

wherein R represents C_nH_{2n+1} in which n ranges from 4 to 10, and R_1 and R_2 represent H or $SICH_3)_2OR$ and may be the same or different.

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5,688,850

PLASTICIZER COMPOSITION

Donatien Wyffels, Beziers, France, assignor to BP Chemicals Limited, London, England

Filed Jun. 5, 1995, Ser. No. 462,012

Claims priority, application United Kingdom, Sep. 12, 1994, 9418352

Int. Cl.^{6} C08K *5/10*

U.S. Cl. 524—317 **7 Claims**

1. A composition comprising: (i) a copolymer resin of a vinyl aromatic compound and an acrylate or a methacrylate or a mixture of an acrylate and a methacrylate, and (ii) a plasticizer formulation comprising a blend of a polybutene and an aliphatic lactate ester, said blend containing from 50 to 99% w/w of polybutene based on the weight of the total blend.

5,688,851

GEL COAT AND METHOD FOR MANUFACTURE THEREOF

Russell L. Kress, Rowley, Iowa, assignor to Ceramal Research & Development Corporation, Rowley, Iowa

Filed Sep. 18, 1995, Ser. No. 529,620

Int. Cl.^{6} C08K *3/20;* **C09D** *5/10*

U.S. Cl. 524—430 **13 Claims**

1. A sprayable outer gel coating for a surface, said coating consisting essentially of a mixture of a synthetic curable resin selected from the group consisting of a polyester and epoxy and combinations thereof, a chemical catalyst for curing said resin, and a filler, the filler comprising aluminum oxide in powder form present in an amount providing a mixture viscosity from 5,000 to 50,000 centipoise, and a surface treating agent.

5,688,852

IRON OXIDE PARTICLES AND PROCESS FOR PRODUCING THE SAME

Hiromitsu Misawa, Hatsukaichi; Kazuo Fujioka; Koso Aoki, both of Hiroshima; Eiichi Kurita, Yokohama; Yoji Okano, Hiroshima, and Minoru Kozawa, Higashihiroshima, all of Japan, assignors to Toda Kogyo Corporation, Japan

Division of Ser. No. 131,668, Oct. 5, 1993, Pat. No. 5,470,660.

This application Jun. 7, 1995, Ser. No. 482,734

Int. Cl.^{6} C08K *3/18*

U.S. Cl. 524—431 **13 Claims**

1. A pigment comprising iron oxide particles comprising:

100 parts by weight of iron oxide particles having an area-average particle diameter of $0.1\ \mu m \leqq d_3 \leqq 1.0\ \mu m$, an area shape factor of $1.0 \leqq \phi_S \leqq 2.0$ and a specific surface area represented by the following formula (1):

$$6/(\rho \cdot d_3) \times \phi_S \tag{1}$$

wherein ρ represents a specific gravity of said iron oxide particles, d_3 represents the area-average particle diameter and ϕ_S represents the area shape factor, and

0.25 to 10 parts by weight (calculated as an oxide) of the fine particles of an oxide, a hydroxide, a hydroxide oxide, a hydrous oxide or a mixture thereof of one element selected from the group consisting of Al, Si, Zr and Ti, which are adhered to the surfaces of said iron oxide particles,

the increment of BET specific surface area of said iron oxide particles being 1 to 6 m^2/g, and the increment of said BET specific surface area with respect to the amount of said fine particles being not less than 0.35.

5,688,853

WATER-BORNE SOIL RESISTANT COATINGS

Elizabeth A. Salter, Richmond, Australia; Craig D. Meekings, Bracknell, England, and Bruce Leary, Red Hill, Australia, assignors to ICI Australia Operations Proprietary Limited, Melbourne, Australia

PCT No. PCT/AU94/00600, § 371 Date Jul. 8, 1996, § 102(e) Date Jul. 8, 1996, PCT Pub. No. WO95/09210, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 29, 1994, Ser. No. 619,560

Claims priority, application Australia, Sep. 29, 1993, PM 1526

Int. Cl.^{6} C09D *133/08*

U.S. Cl. 524—501 **13 Claims**

1. An aqueous coating composition comprising a blend of a low Tg and a high Tg aqueous polymeric dispersions wherein the PVC of the coating composition as measured by opacity is less than the critical PVC, the polymer dispersion with low Tg has a Tg less than 0° C., the polymer dispersion with high Tg is non film-forming, has a Tg of at least 35° C. and the volume ratio of low Tg polymer dispersion to high Tg polymer dispersion is from 0.4:1 to 1.4:1.

5,688,854

PRODUCTION OF METHYLAMINES

Takeyuki Fujita; Kiyonobu Niwa; Kazumoto Ogura, and Michio Fukatsu, all of Tokyo-to, Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1996, Ser. No. 712,886

Claims priority, application Japan, Sep. 14, 1995, 7-260914; Oct. 12, 1995, 7-289207; Sep. 4, 1996, 8-252219; Sep. 4, 1996, 8-252220

Int. Cl.^{6} C07L *209/16*

U.S. Cl. 564—479 **13 Claims**

1. In a process for producing methylamines, comprising contacting methanol and ammonia or methanol a mixture of methylamines and ammonia, or a mixture of methylamines and ammonia, in a gaseous phase, with a bed of a zeolite catalyst, the improvement which comprises the use of the zeolite catalyst such that the catalyst bed is divided into two or more sub-beds connected in series and/or parallel, and the difference between the inlet and outlet temperatures of each catalyst sub-bed is kept in the range of approximately 5° C. to approximately 70° C. while the reaction is carried out.

5,688,855

THIN FILM HYDROPHILIC COATINGS

Vladimir A. Stoy, Princeton; Gerald A. Gontarz, Jr., Helmetta, and Patrick Stoy, Princeton, all of N.J., assignors to S.K.Y. Polymers, Inc., Rocky Hill, N.J.

Filed May 1, 1995, Ser. No. 434,573

Int. Cl.^{6} C08K *5/15;5/07;5/02;5/06*

U.S. Cl. 524—505 **18 Claims**

1. A hydrophilic coating composition for hydrophobic substrates, comprising:

A mixture of a hydrogel-forming polymeric component A and a polymeric water-soluble component B in a common solvent C, wherein the said polymer component A is capable of forming a hydrogel containing 50% to 99% water in equilibrium, and wherein the said component A is a segmented copolymer of a general formula

$$T_1—X—T_2$$

wherein T_1, T_2 are terminal hydrophilic segments and the central section X comprises at least one hydrophobic polymer sequence.

5,688,856

PROCESS FOR MAKING SUBMICRON STABLE LATEXES OF HYDROGENATED BLOCK COPOLYMERS

David M. Austgen, Jr., Missouri City; Jeffrey G. Southwick, and Bing Yang, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 330,056, Oct. 27, 1994, abandoned.

This application Dec. 30, 1996, Ser. No. 775,469

Int. Cl.^{6} C08J *3/07;* **C08K** *5/01;* **C08L** *53/00*

U.S. Cl. 524—505 **14 Claims**

1. A process for producing stable polymer cement emulsions with an average particle size of less than two microns, which comprises

(a) making a polymer cement of a hydrogenated block copolymer of a conjugated diene and a vinyl aromatic hydrocarbon having an overall peak molecular weight as determined by gel permeation chromatography of 25,000 or more and a vinyl aromatic hydrocarbon block peak molecular weight as determined by gel permeation chromatography of 5000 or more and a blend of from 75 to 85 percent by weight of a non-aromatic solvent for the vinyl aromatic hydrocarbon block which has a solubility parameter in the range from 8.3 to 9.5, is a poor solvent for the conjugated diene blocks, and is immiscible with water, and from 15 to 25 percent by weight of the blend of a non-aromatic cosolvent having a solubility parameter of 7.0 to 8.2; and

(b) emulsifying the polymer cement at an aqueous phase to cement weight ratio of from 10:1 to 1:3 by combining it with an aqueous phase containing from 0.1 to 10 weight percent of the aqueous phase of one or more surfactants.

5,688,857

POLYURETHANE-FORMING COLD-BOX BINDERS AND THEIR USES

Chia-hung Chen, and James T. Schneider, both of Dublin, Ohio, assignors to Ashland Inc., Columbus, Ohio

Filed Apr. 10, 1996, Ser. No. 632,720

Int. Cl.^{6} C08L *75/04;* **B22C** *1/22;9/02*

U.S. Cl. 524—590 **10 Claims**

1. A process for preparing a foundry shape by the cold-box process which comprises:

(a) mixing a major amount of a foundry aggregate with a binder composition wherein said binder composition contains less than five weight percent phenolic resin and comprises:

  (1) a polyol component comprising a monomeric polyol having an average of at least two hydroxyl groups where at least one of said hydroxyl groups is a primary hydroxyl group and said primary hydroxyl group is separated by no more than four carbon atoms from another hydroxyl group; and

  (2) an organic polyisocyanate component;

(b) contacting the shaped foundry mix with a gaseous tertiary amine catalyst; and

(c) removing the foundry shape of step (b) from the pattern.

5,688,858

DISPERSANT

Peter Hermann Quednau, Hillegom, Netherlands, and Walter Andreas Wulff, Preetz, Germany, assignors to Efka Chemicals B.V., Hillegom, Netherlands

Continuation of Ser. No. 179,760, Mar. 11, 1994, abandoned, which is a continuation of Ser. No. 684,445, Apr. 11, 1991, abandoned, which is a continuation of Ser. No. 241,241, Sep. 2, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 482,008

Claims priority, application Netherlands, Apr. 9, 1987, 8702089

Int. Cl.^{6} C08L *39/04;* **C08F** *26/06*

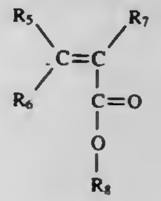
U.S. Cl. 524—555 **8 Claims**

1. A pigment dispersion consisting essentially of:

at least one pigment; water and/or a nonaqueous liquid; and a polymeric water insoluble dispersant which comprises:

A) 5–15 mol % of styrene, vinyltoluene or α-methylstyrene;

B) 25–70 mol % of one or more monomers having the formula:



wherein R_5, R_6 and R_7 may be the same or different and represent H or an alkyl group and R_8 is an alkyl group and wherein the alkyl group R_8 may be interrupted by —O— groups;

C) 25–40 mol % of vinylimidazole monomer;

D) 0–10 mol % of one or more monomers containing one or more groups reactive to cross-linking or coupling; and

E) 0–10 mol % of acrylamide, methylacrylamide, vinyl ester, vinyl ether or acrylonitrile.

5,688,859

AQUEOUS BINDERS AND THEIR USE IN AQUEOUS COATING COMPOSITIONS

Volker Schneider; Harald Blum, both of Wachtendonk, and Armin Sickert, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 16, 1996, Ser. No. 586,051

Claims priority, application Germany, Jan. 24, 1995, 195 02 084.7

Int. Cl.^{6} C08J *3/00;* **C08K** *3/20;* **C08L** *75/00;* **C08G** *63/48*

U.S. Cl. 524—591 **14 Claims**

1. A process for preparing an aqueous binder for aqueous coating compositions which comprises reacting a mixture of

A) 9.9 to 85 wt. % of a hydroxy- and acid-functional poly-(meth)acrylate and

B) 14.9 to 90 wt. % of a hydroxy-functional polyester wherein a portion of the acid component used to prepare the polyester is an unsaturated fatty acid capable of oxidative drying with

C) 0.1 to 20 wt. % of a diisocyanate having a molecular weight of 140 to 318, to form urethane groups and then dissolving or dispersing the reaction product in water with prior or simultaneous neutralization of at least a portion of the carboxyl groups present, wherein the sum of the percentages of A) to C) add up to 100.

5,688,860

POLYURETHANE/POLYUREA ELASTOMERS

Thomas Stone Croft, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 904,841, Jun. 26, 1992, abandoned.

This application Dec. 14, 1995, Ser. No. 572,384

Int. Cl.^{6} C08K *5/01;5/10;5/51;* **C08G** *18/69*

U.S. Cl. 524—710 **13 Claims**

1. A flexible polyurethane/urea elastomer comprising a reaction product of

a) a polyisocyanate component,

b) an isocyanate-reactive component containing at least one polyamine selected from the group consisting of amine-terminated butadiene/acrylonitrile copolymers, and at least one polyol selected from the group consisting of polyalkadiene polyols derived from butadiene polymers, butadiene copolymers or hydrogenated derivatives thereof, said reaction product having an isocyanate index from about 15 to about 80,

wherein said elastomer contains from about 1 to about 199 equivalent percent active amine hydrogen per isocyanate equivalent.

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5,688,861

PROCESS FOR THE PREPARATION OF POLYOL POLYMER DISPERSIONS

Donald W. Simroth, Charleston, W. Va.; Xinhua Zhou, West Chester, and Charles V. Rose, Newtown Square, both of Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Nov. 30, 1995, Ser. No. 565,516

Int. Cl.^{6} C08K *5/06*

U.S. Cl. 524—762 **15 Claims**

1. A method of substantially eliminating transition metal content in the continuous phase of a polyol polymer dispersion prepared by the in situ polymerization of one or more polymerizable monomers in a base polyol comprising in pan one or more double metal cyanide complex-catalyzed polyoxyalkylene polyether polyols, said base polyol containing transition metals derived from said double metal cyanide complex catalyst, said method comprising:

a) selecting as said base polyol a base polyol comprising one or more polyoxyalkylene polyether polyols prepared by the oxyalkylation of one or more oxyalkylation initiator molecules with propylene oxide, optionally in conjunction with one or more alkylene oxides other than propylene oxide, in the presence of an encapsulative double metal cyanide complex catalyst, said base polyol containing transition metals derived from said encapsulative double metal cyanide complex catalyst;

b) polymerizing one or more polymerizable monomers in said base polyol to form a polyol polymer dispersion having a continuous polyol phase and a dispersed phase comprising polymer particles associated with said transition metals; and

c) recovering a polyol polymer dispersion having transition metals substantially removed from said continuous polyol phase.

5,688,862

SEMICONDUCTIVE SILICONE ELASTOMER COMPOSITIONS AND METHOD FOR MAKING

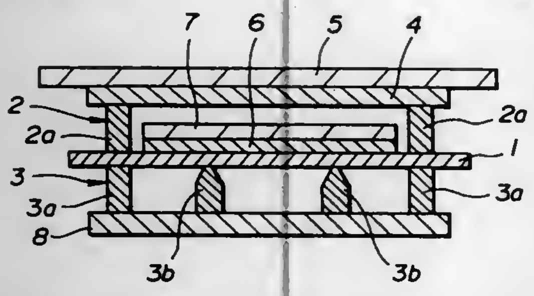
Takashi Kondou; Takeo Yoshida, and Hajime Saito, all of Gunma-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1995, Ser. No. 541,707

Claims priority, application Japan, Oct. 11, 1994, 6-271721

Int. Cl.^{6} C08K *3/08;* **H01B** *1/06*

U.S. Cl. 524—780 **7 Claims**



1. A semiconductive silicone elastomer composition comprising

(a) a liquid organopolysiloxane containing at least two aliphatic unsaturated hydrocarbon groups each attached to a silicon atom in a molecule,

(b) a liquid organohydrogenpolysiloxane containing at least two hydrogen atoms each attached to a silicon atom in a molecule, and

(c) a conductive agent consisting essentially of 1 to 10% by weight of conductive carbon and 99 to 90% by weight of a conductive filler other than conductive carbon having a volume resistivity of 10^1 to 10^8 Ω-cm, said conductive agent being blended in an amount of 20 to 60% by weight of the entire composition,

said composition yielding a semiconductive silicone elastomer having a volume resistivity of 10^5 to 10^{10} Ω-cm with a dispersity of from 1 to 10.

5,688,863

SOFT THERMOPLASTIC POLYURETHANE UREAS A PROCESS FOR THEIR PREPARATION AND THEIR USE

Stephan Kirchmeyer, Leverkusen; Hanns-Peter Müller, Odenthal; Hans-Georg Wussow, Düsseldorf, and Bodo Rehbold, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 312,356, Sep. 26, 1994, abandoned. This application Jan. 5, 1996, Ser. No. 583,262

Claims priority, application Germany, Oct. 4, 1993, 43 33 776.7

Int. Cl.^{6} C08L *75/06;75/08;75/10*

U.S. Cl. 524—839 **4 Claims**

1. A thermoplastic molding composition comprising a polyurethane urea prepared by reacting a mixture comprising

a) at least one polyisocyanate,

b) at least one compound having a number average molecular weight of 400 to 10,000 and on average at least 1.8 Zerewitinoff-active hydrogen atoms and

c) water,

wherein water is introduced into said mixture along with an effective amount of at least one emulsifier, said polyurethane urea having a solid content of at least 70% by weight.

5,688,864

AUTOPHOBIC WATER REPELLENT SURFACE TREATMENT

George B. Goodwin, Mars, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 458,149, Jun. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 220,353, Mar. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 589,235, Sep. 28, 1990, Pat. No. 5,308,705, which is a continuation-in-part of Ser. No. 503,587, Apr. 3, 1990, Pat. No. 4,983,459. This application Oct. 21, 1996, Ser. No. 734,156

Int. Cl.^{6} C08G *77/24*

U.S. Cl. 524—858 **45 Claims**

1. A composition for producing a nonwetting surface on a substrate comprising a perfluoroalkylalkyl silane selected from compounds having the general formula $R_mR'_nSiX_{4-m-n}$, wherein R is a perfluoroalkylalkyl radical, R' is an alkyl or vinyl radical, m is 1, n is 0 or 1 and X is selected from the group consisting of halogen, alkoxy and acyloxy radicals wherein the perfluoroalkyl moiety of the perfluoroalkylalkyl radical is selected from CF_3 to $C_{30}F_{61}$ in a solvent said solvent consisting essentially of an aprotic solvent having a surface tension at least 5 dynes per centimeter higher than the surface free energy of the substrate, a boiling point sufficiently high to prevent evaporation of the solvent during application of the composition to the surface of the substrate and selected from the group consisting of toluene, naptha, chlorobenzene, ethers, ketones, perfluorinated organic compounds and mixtures thereof.

5,688,865

PROCESS AND SYSTEM FOR PREVENTING PRESSURE TAP FOULING IN TANDEM POLYMERIZATION REACTORS

Ahmed H. Ali, Somerset, and Robert O. Hagerty, Metuchen, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 934,290, Aug. 24, 1992, which is a continuation of Ser. No. 665,054, Mar. 6, 1991, abandoned. This application Sep. 4, 1992, Ser. No. 941,345

Int. Cl.^{6} C08F *2/34*

U.S. Cl. 525—53 **8 Claims**

1. A process for producing a bimodal ethylene polymer blend comprising the steps of:

contacting in a first gas phase, fluidized bed reaction zone under polymerization conditions a gaseous monomeric composition

comprising a major portion of ethylene and, optionally, hydrogen to provide a molar ratio of hydrogen to ethylene of less than about 0.3, with a Ziegler-Natta catalyst comprising a transition metal compound as a primary catalyst component and an organometallic compound or metal hydride as reducing cocatalyst to produce a first zone product which is a high molecular weight (HMW) polymer associated with catalyst particles and has a flow index (FI) of about 0.1 to 1.0;

transferring the first zone product to a second gas phase, fluidized bed reaction zone into which is also fed hydrogen and a gaseous monomeric composition comprising a major proportion of ethylene, but no additional transition metal component of said catalyst to produce a polymer deposited on and within the voids of the HMW polymer/catalyst particles

wherein a molar ratio of hydrogen to ethylene in the second gas phase fluidized bed reaction zone ranges from about 0.9 to 5.0; and

adding a relatively small amount of water directly to a plurality of pressure taps of the first reaction zone to eliminate fouling of said pressure taps, wherein the amount of added water is insufficient to reduce or eliminate the positive static in the first reaction zone wherein the relatively small amount of water is from about 0.1 to about 0.6 ppmv based on total ethylene feed.

5,688,866

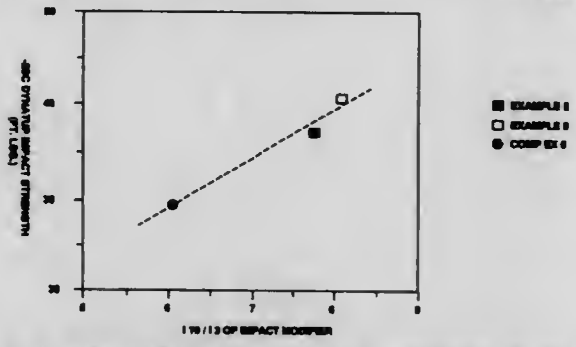
IMPACT MODIFICATION OF THEREMOPLASTICS

H. Craig Silvis; Daniel J. Murray, both of Midland, Mich.; Thomas R. Fiske, Baton Rouge, La.; Stephen R. Betso, Horgen, Switzerland, and Robert R. Turley, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 45,330, Apr. 8, 1993, which is a continuation-in-part of Ser. No. 945,034, Sep. 15, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 469,300

Int. Cl.^{6} C08F *8/30*

U.S. Cl. 525—127 **14 Claims**



1. A thermoplastic olefinic polymer composition having a Dynatup impact performance of at least about 30 ft-lbs at a temperature of −20° F. comprising:

(A) a thermoplastic selected from the group consisting of thermoplastic polyurethanes, polyvinyl chlorides, styrenics, polycarbonate, thermoplastic polyester, polyamides, polyacetals, polysulfones, and polyolefins,

(B) about 30 percent by weight of at least one substantially linear interpolymer of ethylene with at least one C_3–C_{20} α-olefin, wherein the substantially linear interpolymer is characterized as having:

a) a melt flow ratio, $I_{10}/I_2, \leqq 5.63$,

b) a molecular weight distribution, M_w/M_n, defined by the equation:

$$M_w/M_n \leqq (I_{10}/I_2) - 4.63,$$

and

c) a critical shear rate at onset of surface melt fracture of at least 50 percent greater than the critical shear rate at the onset of surface melt fracture of a linear ethylene/α-olefin polymer having about the same I_2 and M_w/M_n.

5,688,867

LOW VOC UNSATURATED POLYESTER SYSTEMS AND USES THEREOF

Anthony S. Scheibelhoffer, Norton; Gerald W. Drabeck, Akron; Ronald E. Thompson, Parma; Dianna B. Dusek, Bedford; Timothy W. Birch, Ravenna, all of Ohio, and Jeffrey L. Wilcoxson, Winonalake, Ind., assignors to Ferro Corporation, Cleveland, Ohio

Filed May 1, 1995, Ser. No. 431,512

Int. Cl.^{6} C08F *8/00;* **C08L** *67/06*

U.S. Cl. 525—168 **19 Claims**

1. A gelcoat comprising (I) a polyester resin comprising (A) from about 5% to about 50% by weight reactive diluent and (B) from about 50% to about 95% by weight of in unsaturated polyester resin prepared from at least one polycarboxylic acid anhydride or ester, at least one polyhydric alcohol, and at least one component selected from the group consisting of (i) from about 0.5% up to about 8% by mole of a polyhydric alcohol, having at least three hydroxyl groups, and at least one transesterification catalyst, (ii) from about 2% up to about 12% by mole of a reaction product of a polyol and a fatty carboxylic acid, and (iii) from about 2% up to about 12% by mole of a fatty reactant selected from the group consisting of a fatty primary alcohol, a fatty epoxide, a fatty monocarboxylic acid and mixtures thereof, wherein each member of the group has up to about 100 carbon atoms and (II) a conventional polyester resin, and at least one thixotropic agent.

5,688,868

PROCESS FOR PREPARING BLENDS OF POLYAMIDE AND IONIC COPOLYMERS

Robert Benham Fish, Jr., Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1996, Ser. No. 703,248

Int. Cl.^{6} C08L *77/00*

U.S. Cl. 525—183 **7 Claims**

1. In a process for preparing a thermoplastic polymer blend which contains a polyamide as a principal component and an acid-containing olefin copolymer as a second component which process comprises melt blending the polyamide and said acid-containing olefin copolymer at a temperature above their melting points but below their decomposition temperatures, the improvement comprising intimately contacting the acid-containing olefin copolymer component in situ as part of the blend with at least one neutralizing basic metal compound having a valence of from 1 to 3 in an amount sufficient to neutralize greater than 100% of the acid groups present in the acid-containing olefin copolymer component of the blend.

5,688,869

GOLF BALL COVER COMPOSITIONS

Michael J. Sullivan, Chicopee, Mass., assignor to Lisco, Inc., Tampa, Fla.

Continuation of Ser. No. 981,751, Nov. 25, 1992, abandoned, which is a continuation-in-part of Ser. No. 901,660, Jun. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 174,765, Dec. 27, 1993, which is a continuation of Ser. No. 776,803, Oct. 15, 1991. This application Jun. 21, 1995, Ser. No. 493,089

Int. Cl.^{6} C08L *33/08;* **A63B** *37/12*

U.S. Cl. 525—196 **56 Claims**

1. A golf ball comprising a core and a cover, wherein the cover comprises from about 90 to about 10 percent by weight of a metal cation neutralized high acid ionomer resin which is a copolymer of greater than 16% by weight of an alpha, beta-unsaturated carboxylic acid and the balance an alpha-olefin having from about 2 to 8 carbon atoms, of which 10 to 90% of the carboxyl groups of the copolymer are neutralized with a metal cation selected from the group consisting of sodium, zinc, magnesium, manganese, lithium, potassium, calcium and nickel ions; and, from about 10 to about 90% by weight of an ionomer resin containing a comonomer of the

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acrylate ester class which is a terpolymer of an alpha-olefin having from about 2 to 8 carbon atoms, an alpha, beta-unsaturated carboxylic acid and an unsaturated monomer of the acrylate ester class having 1 to 21 carbon atoms, of which 10 to 100% of the carboxyl groups of the terpolymer are neutralized with a metal cation selected from the group consisting of sodium, zinc, lithium, magnesium, manganese, potassium, calcium and nickel ions.

5,688,870

PROCESS FOR PREPARING WATER DISPERSIBLE POLYMER POWDERS

Steven Paul Wilkinson, Coopersburg, and Lloyd Mahlon Robeson, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 10, 1996, Ser. No. 630,396

Int. Cl.^{6} C08F *2/00;26/08*

U.S. Cl. 525—244 **9 Claims**

1. A process for the production of a water dispersible polymeric powder comprising:

a) adding to a reactor a first monomer, an initiator, a CO_2-phillic surfactant, and liquid or supercritical CO_2 to form a non-water soluble core polymer; and

b) subsequently adding a second monomer, along with an initiator, to the reactor containing liquid or supercritical CO_2 to form a water soluble or water dispersible shell polymer on the non-water soluble core polymer, thereby forming a core-shell polymer.

5,688,871

RUBBER COMPOSITION CONTAINING A FLAVAN COMPOUND AND A METHOD FOR PRODUCING A VULCANIZED RUBBER CONTAINING SAME

Naoki Inui, Nara; Hironobu Iyama, Osaka; Kyoko Tsuta, Osaka, and Hideo Nagasaki, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 20, 1995, Ser. No. 406,134

Claims priority, application Japan, Mar. 18, 1994, 6-048985; Mar. 18, 1994, 6-048986

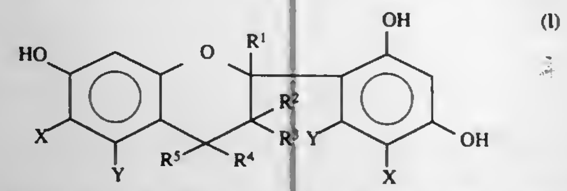
Int. Cl.^{6} C08C *19/20*

U.S. Cl. 525—346 **8 Claims**

1. A method for producing a vulcanized rubber comprising compounding:

carbon black;

at least one flavan compound (B) represented by the formula (I)



(I)

wherein R^1, R^2, R^4 and R^5 independently of one another represent a hydrogen or an aliphatic group have 1–6 carbon atoms, or wherein at least one of R^1 and R^2 or R^4 and R^5, form an alicyclic ring having 4–10 carbon atoms, R^3 represents a hydrogen or an aliphatic group having 1–6 carbon atoms, and X and Y independently of one another represent a hydrogen, hydroxy or an aliphatic group having 1–8 carbon atoms; and

at least one rubber (A) selected from the group consisting of natural rubber, styrene-butadiene copolymer rubber, butadiene rubber, isoprene rubber, acrylonitrile-butadiene copolymer rubber, chloroprene rubber, butyl rubber and halogenated butyl rubber;

wherein the flavan compound (B), and the rubber (A) are compounded during a kneading step conducted at a temperature of about 120°–180° C. to obtain an unvulcanized rubber composition, and the unvulcanized rubber composition is then vulcanized in the presence of a vulcanization agent at a temperature about 40°–120° C.

5,688,872

BISAMINOTHIOPHENOL COMPOUND, PROCESS FOR PRODUCING THE SAME AND CURING AGENT FOR FLUORINE-CONTAINING ELASTOMER COMPRISING THE SAME

Takehiro Sonoi; Haruyoshi Tatsu, both of Ibaraki, Japan; Lev Solomonovich German, deceased, late of Moscow, Russian Federation, by Elena N. German, heir, and Valerii Romanovich Polishchuk, deceased, late of Lod, Israel, by Margarita Polishchuk, heir, assignors to Nippon Mektron, Limited, Tokyo, Japan

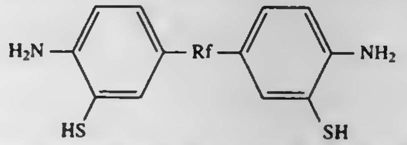
Division of Ser. No. 550,870, Oct. 31, 1995. This application Nov. 25, 1996, Ser. No. 753,407

Claims priority, application Japan, Nov. 17, 1994, 6-308199

Int. Cl.^{6} C08C *19/18*

U.S. Cl. 525—350 **3 Claims**

1. A vulcanizable, fluorine-containing elastomer composition which comprises a fluorine-containing elastomer having cyano group as cross-linkable groups and a bisaminothiophenol compound represented by the following general formula [I]:



[I]

wherein Rf is a perfluoroalkylidene group having 1 to 10 carbon atoms.

5,688,873

ELECTROCONDUCTIVE POLYMER AND PROCESS FOR PRODUCING THE POLYMER

Yoshihiro Saida; Yoshiaki Ikenoue, both of Chiba, and Reiko Ichikawa, Osaka, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

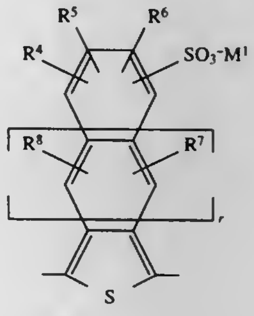
Continuation-in-part of Ser. No. 251,297, May 31, 1994, abandoned, and Ser. No. 985,339, Dec. 4, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,413

Claims priority, application Japan, Dec. 4, 1991, 3-348295; Nov. 24, 1992, 4-336672; May 31, 1993, 5-129798

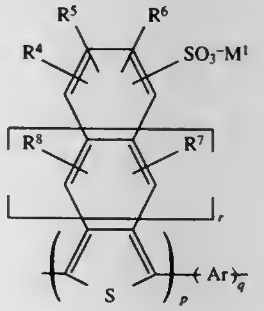
Int. Cl.^{6} C08G *63/91;65/32*

U.S. Cl. 525—410 **4 Claims**

1. An electroconductive polymer comprising at least one structural unit represented by formula (VII), (VIII) or (IX) as a repeating unit:

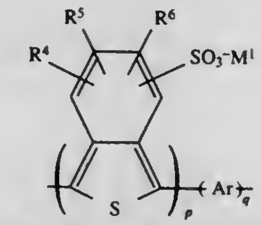


(VII)



(VIII)

-continued



(IX)

wherein R^4, R^5, R^6, R^7 and R^8 each independently represents a monovalent member selected from the group consisting of a hydrogen atom, a linear or branched, saturated or unsaturated alkyl, alkoxy or alkyl ester group each having from 1 to 20 carbon atoms, $SO_3^-M^1$, a halogen atom, a nitro group, a cyano group, a primary, secondary or tertiary amino group, a trihalomethyl group, and a substituted or unsubstituted phenyl group wherein said substituted phenyl group is an alkyl-substituted phenyl group, with the proviso that two or more of R^4, R^5, R^6, R^7 and R^8 are not $SO_3^-M^1$ simultaneously, wherein two of R^4, R^5, R^6, R^7 and R^8 may combine with each other at any optional position to form at least one divalent chain which forms, together with two carbon atoms of the ring substituted with R^4–R^8 at least one 3- to 7-membered saturated or unsaturated hydrocarbon ring structure, and the alkyl group, the alkoxy group, or the alkyl ester group represented by R^4, R^5, R^6, R^7 and R^8 may optionally include a carbonyl, ether, ester, amide, sulfide, sulfinyl, sulfonyl or imino moiety; M^1 represents H^+, an alkali metal ion, or a cation of a Vb Group element unsubstituted or substituted with an alkyl group having from 1 to 30 carbon atoms, or with an aryl group having from 6 to 30 carbon atoms; Ar represents a repeating unit of a π-electron conjugated system having no sulfonic acid group; r represents an integer of from 0 to 3, and indicates the number of condensed rings enclosed by the thiophene ring and the benzene ring having substituents R^4, R^5 and R^6, wherein the condensed ring in the formula may optionally contain a nitrogen atom or an N-oxide group; and p and q represent molar fractions of the respective repeating units in the copolymer and thus do not denote a block copolymer.

5,688,874

PROCESS FOR PREPARING BLENDS OF POLY(ETHYLENE TEREPHTHALATE) AND POLY(ETHYLENE 2,6-NAPHTHALENEDICARBOXYLATE)

Douglas Claire Hoffman, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Dec. 22, 1995, Ser. No. 576,888

Int. Cl.^{6} C08L *67/02*

U.S. Cl. 525—444 **13 Claims**

1. A process comprising:

solid state polymerizing an immiscible polyester blend comprising a first polyester of poly(ethylene) terephthalate homopolymer or copolymer and a second polyester of poly(ethylene) naphthalenedicarboxylate homopolymer or copolymer, wherein said immiscible polyester blend displays a transesterification level of less than about 10% under conditions sufficient to produce a polyester blend having a transesterification level between about 10% and about 20% which when remelted becomes clear.

5,688,875

HYDROPHILIC TETRAMETHYLXYLYLENECARBODIIMIDE

Eiji Sasaki; Yasuo Imashiro; Ikuo Takahashi, and Naofumi Horie, all of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

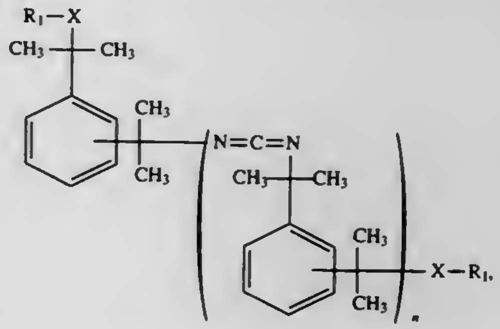
Filed May 31, 1995, Ser. No. 455,413

Claims priority, application Japan, Jun. 10, 1994, 6-152632

Int. Cl.^{6} C08G *18/02*

U.S. Cl. 525—452 **4 Claims**

1. A hydrophilic tetramethylxylylenecarbodiimide represented by the formula:



wherein n is an average polymerization degree and is an integer of 1 to 30; X is —OOC—HN—; and R_1 is a residue of a quaternary ammonium salt of a dialkylaminoalcohol represented by the formula:

$$(R_2)_2—N—R_3—OH,$$

wherein R_2 is lower alkyl and R_3 is alkylene or oxyalkylene of 1–10 carbon atoms.

5,688,876

CURABLE EPOXY RESIN COMPOSITION CURED WITH A MANNICH BASE

Kazuhiko Ando, and Hiroshi Suzuki, both of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Jul. 18, 1996, Ser. No. 687,002

Claims priority, application Japan, Jul. 28, 1995, 7-193253

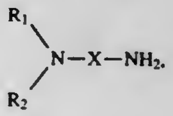
Int. Cl.^{6} C08G *8/28;* **C08L** *61/06*

U.S. Cl. 525—504 **1 Claim**

1. A curable epoxy resin composition comprising:

an epoxy resin having more than one epoxy groups per one molecule, and

a Mannich base prepared by reacting (II-①) an aromatic compound having at least one phenolic hydroxyl group in the molecule, with (II-②) a carbonyl compound having at least one carbonyl group in the molecule, and (II-③) an amino compound represented by the formula:



$$\begin{matrix} R_1 \diagdown & \\ & N—X—NH_2, \\ R_2 \diagup & \end{matrix}$$

wherein R_1 and R_2 each represents an alkyl group having 1 to 5 carbon atoms, and X represents an alkylene group having 1 to 5 carbon atoms, at a molar ratio of (II-①)/(II-②)/(II-③) of 1/(0.1 to 3.0)/(0.1 to 3.0) and a molar ratio of (II-②)/(II-③) of 1/(1.0 to 2.0);

wherein the amount of the Mannich base is 1 to 50 parts by weight per 100 parts by weight of the epoxy resin.

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5,688,877

KINETICALLY CONTROLLED IN-SITU GENERATION OF CATALYTIC SPECIES FOR THE CURING OF EPOXY/AMINE COMPOSITIONS

Raymond A. Koenig, Vendenheim; Joseph Gan, Strasbourg, both of France, and Richard J. Hayman, Frauenfeld, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US94/14692, § 371 Date Jun. 11, 1996, § 102(e) Date Jun. 11, 1996, PCT Pub. No. WO95/18168, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 21, 1994, Ser. No. 656,262

Claims priority, application United Kingdom, Dec. 24, 1993, 9326427

Int. Cl.^{6} C08G *59/68;* **C08B** *65/10*

U.S. Cl. 525—526 **12 Claims**

1. A method of extending the time for cure of an amine-cured epoxy resin, by an amine curing agent having primal and/or secondary amine functionality, by curing the epoxy resin in the presence of an acid ester capable of alkylating the amino groups of the amine curing agent during cure, under conditions wherein said alkylation occurs and which are sufficient to extend the time of cure as compared to that of the corresponding composition not containing said ester.

5,688,878

EPOXY POWDER COATING WITH WRINKLE FINISH

Owen H. Decker, West Reading; David A. Mountz, Birdsboro, both of Pa., and Warren G. Duncan, Crystal Lake, Ill., assignors to Morton International, Inc., Chicago, Ill.

Filed May 17, 1996, Ser. No. 650,081

Int. Cl.^{6} C08G *59/42;* **C08J** *3/03*

U.S. Cl. 525—533 **13 Claims**

1. A powdered coating composition adapted to provide a wrinkled finish, said composition comprising an epoxy resin, a catalyst and a curing agent, wherein said curing agent comprises methylenedisalicylic acid, wherein the methylenedisalicylic acid conventionally contains an amount of sulfuric acid which is neutralized with a cationic/base material to have a cation to sulfur equivalent ratio of at least about 0.4 and no more than about 3.

5,688,879

METHOD OF MAKING FLUOROPOLYMERS

Joseph M. DeSimone, Chapel Hill, N.C., assignor to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation of Ser. No. 529,873, Sep. 18, 1995, which is a continuation of Ser. No. 302,642, Sep. 27, 1994, Pat. No. 5,496,901, which is a continuation-in-part of Ser. No. 858,150, Mar. 27, 1992, abandoned. This application Feb. 7, 1997, Ser. No. 797,308

Int. Cl.^{6} C08F *2/00*

U.S. Cl. 526—89 **6 Claims**

1. A method of isolating a polymer, said method comprising:

providing a solution comprising a polymer and carbon dioxide; and

separating said carbon dioxide from said polymer to isolate said polymer from said carbon dioxide.

5,688,880

READILY SUPPORTABLE METAL COMPLEXES

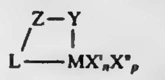
Lee Spencer, Pearland, Tex., and Peter N. Nickias, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 11, 1995, Ser. No. 570,262

Int. Cl.^{6} C08F *4/643*

U.S. Cl. 526—127 **12 Claims**

1. A metal complex corresponding to the formula:



or a dimer, solvated adduct, chelated derivative or mixture thereof, wherein:

L is a delocalized, π-bonded group that is bound to M, containing up to 50 nonhydrogen atoms;

M is a metal of Group 3, 4 or the Lanthanide series of the Periodic Table of the Elements;

Z is a covalently bound, divalent substituent of up to 50 nonhydrogen atoms having the formula, $—(ER_2)_m—$, wherein E independently each occurrence is carbon, silicon or germanium, R independently each occurrence is selected from the group consisting of C_{1-20} hydrocarbyl, and C_{1-20} hydrocarbyloxy, with the proviso that in at least one occurrence R is C_{1-20} hydrocarbyloxy, and m is an integer from 1 to 3;

y is a divalent ligand group comprising nitrogen, phosphorus, oxygen or sulfur, said Y containing up to 20 nonhydrogen atoms;

X' is a neutral Lewis base ligand having up to 20 non-hydrogen atoms;

X" independently each occurrence is a monovalent, anionic moiety selected from hydride, halo, hydrocarbyl, silyl, germyl, hydrocarbyloxy, amide, siloxy, halohydrocarbyl, halosilyl, silylhydrocarbyl, and aminohydrocarbyl having up to 20 non-hydrogen atoms, or two X" groups together form a divalent hydrocarbadiyl group;

n is a number from 0 to 3; and

p is an integer from 0 to 2.

10. A catalyst system comprising a metal complex according to claim **1** and an activating cocatalyst.

11. A supported catalyst system comprising a catalyst system according to claim **10** and an aluminum or silicon containing substrate.

12. A process for polymerizing an α-olefin, comprising contacting an α-olefin or a mixture of α-olefins with a catalyst system according to claim **10** or **11**.

5,688,881

OLIGOMERS AND POLYMERS OF AMINOALKENES

David Fischer, Gönnheim; Franz Langhauser, Bad Dürkheim; Jürgen Kerth, Carlsberg; Günther Schweier, Friedelsheim; Rolf Muelhaupt, and Martin Schneider, both of Freiburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 529,971, Sep. 19, 1995, Pat. No. 5,639,839. This application Jan. 29, 1997, Ser. No. 792,672

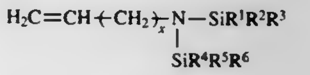
Claims priority, application Germany, Sep. 20, 1994, 44 33 481.8

Int. Cl.^{6} C08F *4/642*

U.S. Cl. 526—127 **1 Claim**

1. A process for preparing oligomers and polymers which comprises oligomerizing or polymerizing components A) and B)

A) from 1 to 30 mol % of at least one aminoalkene of the formula I



$$H_2C{=}CH{+}CH_2{\rangle_x}N{-}SiR^1R^2R^3 \quad (\text{N bearing } SiR^4R^5R^6)$$

I

where

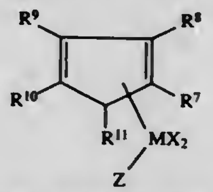
X is an integer from 0 to 25 and

R^1 to R^4 are hydrogen, C_1- to C_{10}-alkyl, 5- to 7-membered cycloalkyl which, in turn, can carry C_1- to C_6-alkyl groups as substituents or C_6- to C_{15}-aryl

and

B) from 70 to 99 mol % of at least one alkene having from 2–10 carbon atoms,

for x= 1 in formula I propene being excluded as component B), at from 0.5 to 3000 bar and from −50° to +300° C. in the presence of a catalyst system which as active components contains metallocene complexes of the formula II



II

where the substituents have the following meanings:

M is titanium, zirconium, hafnium, vanadium, niobium or tantalum,

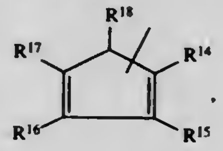
X is fluorine, chlorine, bromine, iodine, hydrogen, C_1- to C_{10}-alkyl, C_6- to C_{15}-aryl or $—OR^{12}$,

R^{12} being C_1- to C_{10}-alkyl, C_6- to C_{15}-aryl, alkylaryl, arylalkyl, fluoroalkyl or fluoroaryl each having 1 to 10 C atoms in the alkyl radical and 6 to 20 C atoms in the aryl radical,

R^7 to R^{11} are hydrogen, C_1- to C_{10}-alkyl, 5- to 7-membered cycloalkyl which, in turn, can carry a C_1- to C_{10}-alkyl as a substituent, C_6- to C_{15}-aryl or arylalkyl, it also being possible, if desired, for two adjacent radicals together also to be a cyclic group containing 4 to 15 C atoms, or $Si(R^{13})_3$ where

R^{13} is C_1- to C_{10}-alkyl, C_6- to C_{15}-aryl or C_3- to C_{10} -cycloalkyl,

Z is X or



the radicals

R^{14} to R^{18} being hydrogen, C_1- to C_{10}-alkyl, 5- to 7-membered cycloalkyl which, in turn, can carry a C_1- to C_{10}- alkyl as a substituent, C_6- to C_{15}-aryl or arylalkyl and it being possible, if desired, for two adjacent radicals together also to be a cyclic group containing 4 to 15 C atoms, or $Si(R^{19})_3$ where

R^{19} is C_1- to C_{10}-alkyl, C_6- to C_{15}-aryl or C_3- to C_{10} -cycloalkyl,

or the radicals

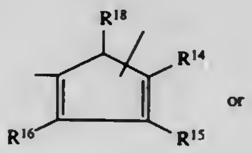
R^{10} and Z together being a group $—(Y(R^{20})_2)_n—E—$, where

Y is silicon, germanium, tin or carbon,

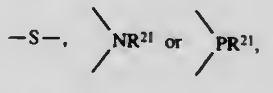
R^{20} is hydrogen, C_1- to C_{10}-alkyl, C_3-C_{10}-cycloalkyl or C_6- to C_{15}-aryl

n is a number 1, 2, 3 or 4

E is



or A, A being —O—,



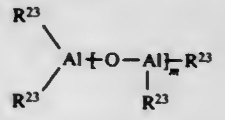
where R^{21} is C_1- to C_{10}-alkyl, C_6- to C_{15}-aryl, C_3- to C_{10} -cycloalkyl, alkylaryl or $Si(R^{22})_3$

where R^{22} is C_1- C_{10}-alkyl, C_6- to c_{15}-aryl, C_3- to C_{10} -cycloalkyl or alkylaryl

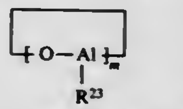
and

D) a metallocene ion-forming compound,

and, optionally open-chain or cyclic alumoxane compounds of the formula III or IV



III



IV

R^{23} being a C_1- to C_4-alkyl group and m being an integer from 5 to 30.

5,688,882

Patent Not Issued For This Number

5,688,883

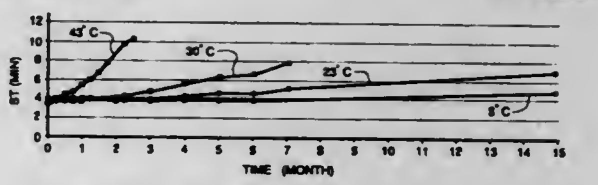
POLYMERIZABLE COMPOSITION

Joachim E. Klee, Radolfzell, and Uwe Walz, Constance, both of Germany, assignors to Dentsply GmbH, Dreieich, Germany

Filed Mar. 14, 1995, Ser. No. 404,402

Int. Cl.^{6} C08F *4/44;4/34;20/10;* **C09J** *133/06*

U.S. Cl. 526—141 **31 Claims**



1. A polymerizable composition formed by mixing a first and a second composition;

said first composition, comprising:

a peroxide, which decomposes by at most fifty percent by weight of said peroxide within 10 hours at 75° C., and

a polymerizable monomer,

said second composition comprising a proton donor, and a metal containing compound,

said polymerizable composition having from 0.2 to 5 percent by weight of said peroxide, from 5 to 99 percent by weight of said polymerizable monomer, and from 0.1 to 3 percent by weight of said proton donor, and from 0.02 to 3 percent by weight of said metal containing compound,

said polymerizable composition having an initial setting time and a storage setting time measured after storage of said first composition and said second composition for 12 months effectively at a temperature of 23° C., the time period of said initial setting time being within 2 minutes of the time period of said storage setting time whereby the difference between said initial setting time and said storage setting time is less than 2 minutes.

5,688,884

POLYMERIZATION PROCESS

Bruce Edward Baker, Wilmington, Del., and Roger John Zipfel, Washington, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 20, 1996, Ser. No. 700,258

Int. Cl.^{6} C08F *2/00*

U.S. Cl. 526—225 **6 Claims**

1. In the process of polymerizing tetrafluoroethylene in an aqueous medium containing initiator and dispersing agent to obtain an aqueous dispersion of polytetrafluoroethylene particles, the

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improvement comprising carrying out the polymerization wherein said dispersing agent is a compound of the formula C_6F_{13}—CH_2CH_2—SO_3M, wherein M is a cation having a valence of 1.

5,688,885
TETRAFLUOROETHYLENE TERPOLYMER

Leslie Mitchell Blair, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 12, 1996, Ser. No. 678,919

Int. Cl.^{6} C08F *214/26*

U.S. Cl. 526—247 **4 Claims**

1. A partially-crystalline copolymer comprising tetrafluoroethylene, hexafluoropropylene in an amount corresponding to HFPI of from 1.9 to about 5.3, and an amount of perfluoro(methyl vinyl ether) effective to improve toughness, characterized by the copolymer exhibiting MIT Flex Life of at least 2000 cycles.

5,688,886
ACRYLIC RUBBER COMPOSITION

Takeshi Noguchi, Kyoto; Tadahiro Inada, Tatsuno, and Yoshiharu Kusaka, Yokohama, all of Japan, assignors to Showa Highpolymer Co., LTD., Tokyo, Japan

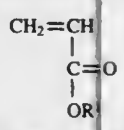
Continuation of Ser. No. 411,698, Apr. 26, 1995, abandoned. This application Oct. 25, 1996, Ser. No. 738,347

Claims priority, application Japan, Aug. 6, 1993, 5-196305

Int. Cl.^{6} C08F *24/00*

U.S. Cl. 526—273 **4 Claims**

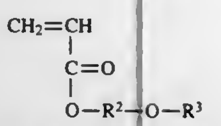
1. An acrylic rubber composition containing an acrylic ester polymer having a weight-average molecular weight of at least 8,000,000 as a rubber component, said acrylic ester polymer being a polymer obtained by emulsion polymerization of a monomer mixture mainly comprising at least one monomer selected from the group consisting of an acrylic ester represented by formula (I):



$$CH_2{=}CH-C({=}O)-OR$$

(I)

wherein R^1 represents an alkyl group or cyanoalkyl group having from 1 to 18 carbon atoms, and an acrylic ester represented by formula (II):



$$CH_2{=}CH-C({=}O)-O-R^2-O-R^3$$

(II)

wherein R^2 represents an alkylene group having from 1 to 12 carbon atoms; and R^3 represents an alkyl group having from 1 to 12 carbon atoms, said emulsion polymerization being carried out in the presence of a polymerization initiator system consisting of an oxidizing agent, a reducing agent, and an activator, with the proportion of said oxidizing agent being from 0.001 to 0.2 parts by weight per 100 parts by weight of the total acrylic ester monomers, and in the presence of a small amount of an emulsifying agent, while maintaining the dissolved oxygen concentration of the aqueous phase of the reaction system at lower than that of a 0.5% aqueous solution of sodium bisulfite, said weight-average molecular weight indicating styrene polymer conversion measured by gel-permeation chromatography, or, when said acrylic ester polymer can not be completely dissolved in a solvent for gel-permeation chromatography, the weight-average molecular weight being measured for an acrylic ester polymer obtained by replacing the monomer unit containing a functional group responsible for the insolubility, with a neutral monomer, the main constituent of said acrylic ester polymer.

5,688,887
REACTIVE, LOW MOLECULAR WEIGHT, VISCOUS POLY(1-OLEFINS) AND COPOLY(1-OLEFINS) AND THEIR METHOD OF MANUFACTURE

Vahid Bagheri, Lisle; Bruce Edward Firth, Buffalo Grove; Joanna Kyrle Money, Chicago; Eric Jan Moore, Carol Stream; Frank Calabrese, Streamwood, and Robert Scott Hensey, West Chicago, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 211,925, Apr. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 889,045, May 26, 1992, abandoned. This application Dec. 21, 1995, Ser. No. 576,594

Int. Cl.^{6} C08F *10/00;4/44;* **C07C** *9/00;2/24*

U.S. Cl. 526—348.7 **22 Claims**

8. An essentially terminally-unsaturated, viscous, essentially-1-olefin-containing poly(1-olefin) or copoly(1-olefin) polymer having a molecular weight in a range from about 300 to about 10,000 and a terminal vinylidene content of more than 80%, which poly(1-olefin) or copoly(1-olefin) is made by polymerizing, under solution phase conditions, a 1-olefin(s)-containing feedstock, wherein the 1-olefin(s) in said feedstock consist essentially of C_3–C_{20} 1-olefins, comprising more than 1 weight percent of at least one volatile hydrocarbon liquid and less than 99 weight percent based on total feedstock of one or more C_3 to C_{20} 1-olefins using a catalyst comprising a cyclopentadienyl or indenyl titanium(IV), zirconium (IV) or hafnium(IV) metallocene and an aluminoxane cocatalyst, wherein the molar ratio of aluminoxane to metallocene is about 150 or greater.

5,688,888
PERALKYLATED PHOSPHAZENE BASE-CATALYZED SILANOL CONDENSATION METHOD

Frank Steven Burkus, II, Clifton Park, N.Y.; Krzysztof Matyjaszewski, Pittsburgh, Pa., and Slawomir Rubinsztajn, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 8, 1996, Ser. No. 629,115

Int. Cl.^{6} C08G *77/06*

U.S. Cl. 528—22 **7 Claims**

1. A method for effecting polycondensation which comprises contacting, at a temperature in the range of about 0°–200° C. and a pressure up to about 350 torr, a silanol-containing organosiloxane with an amount of a peralkylated phosphazene base which is effective for polycondensation of said organosiloxane.

5,688,889
NON-YELLOWING TEXTILE SOFTENING PROCESS IN WHICH A COMPOSITION COMPRISING A POLYORGANOSILOXANE IS USED

Edith Canivenc; Jose-Luis Roca-Ortega, both of Lyons, and Andrew Van Der Spuy, Charbonnieres, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Division of Ser. No. 360,409, Dec. 21, 1994, Pat. No. 5,540,952. This application May 6, 1996, Ser. No. 643,699

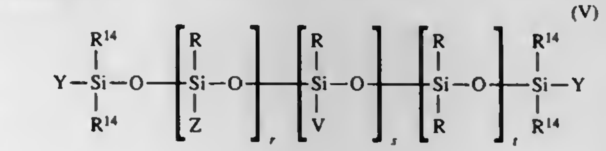
Claims priority, application France, Dec. 27, 1993, 93 15949

Int. Cl.^{6} C08G *77/00*

U.S. Cl. 528—40 **2 Claims**

1. A process for the preparation of linear polyorganosiloxane of formula (V):

(V)



$$Y-\underset{R^{14}}{\overset{R^{14}}{Si}}-O-\left[\underset{Z}{\overset{R}{Si}}-O\right]_r-\left[\underset{V}{\overset{R}{Si}}-O\right]_s-\left[\underset{R}{\overset{R}{Si}}-O\right]_t-\underset{R^{14}}{\overset{R^{14}}{Si}}-Y$$

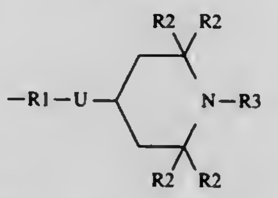
in which:

R is identical or different and is a monovalent radical selected from linear or branched alkyls having from 1 to 4 carbon atoms, the phenyl radical or the 3,3,3-trifluoropropyl radical;

the symbol V represents: a linear or branched alkyl radical having from 5 to 20 carbon atoms; a radical of formula —$(CH_2)_p$—COO—R^{12} in which p represents a number from 5 to 20 and R^{12} represents a linear or branched alkyl radical containing 1 to 12 carbon atoms; or a radical of formula —$(CH_2)_q$—O—R^{13} in which q represents a number from 3 to 10 and R^{13} represents a hydrogen atom, an ethylene oxide chain, a propylene oxide chain, a mixed ethylene oxide+propylene oxide chain or an acyl radical having from 2 to 12 carbon atoms;

Z represents a residue containing (a) sterically hindered piperidyl group (s) selected from the group consisting of:

the residues of formula:



(II)

in which:

R^1-is a divalent radical selected from the group consisting of:

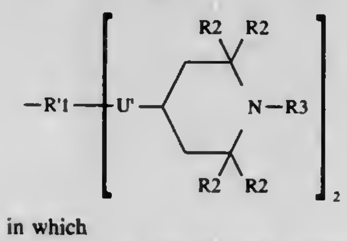
- linear or branched alkylene radicals having from 2 to 18 carbon atoms;
- alkylenecarbonyl radicals in which the linear or branched alkylene part contains 2 to 20 carbon atoms;
- alkylenecyclohexylene radicals in which the linear or branched alkylene part contains from 2 to 12 carbon atoms and the cyclohexylene part contains an —OH group and optionally 1 or 2 alkyl radicals having from 1 to 4 carbon atoms;
- radicals of formula —R^4—O—R^5—, in which the radicals R^4 and R^5, which are identical or different, represent alkylene radicals having 1 to 12 carbon atoms;
- radicals of the formula —R^4—O—R^5— in which the radicals R^4 and R^5 have the meanings indicated above and one of them or both are substituted by one or two —OH group(s);
- radicals of formulae —R^4—COO—R^5 and —R^5—OCO—R^5— in which R^4 and R^5 have the meanings above;
- radicals of formula —R^6—O—R^7—O—CO—R^8— in which R^6, R^7, R^8, which are identical or different, represent alkylene radicals having from 2 to 12 carbon atoms and the radical R^7 is optionally substituted by a hydroxyl group;

U-represents —O— or —NR^9—, R^9 being a hydrogen atom or a linear or branched alkyl radical having from 1 to 6 carbon atoms;

R^2 are radicals, which are identical or different, selected from the group consisting of linear or branched alkyl radicals having from 1 to 3 carbon atoms and the phenyl radical;

R^3 represents a hydrogen atom or the radical R^2;

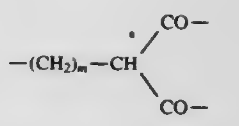
and those of formula:



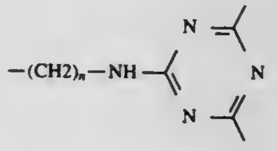
(II')

in which

R'^1-is selected from the group consisting of a trivalent radical of formula



wherein m represents a number from 2 to 20, and a trivalent radical of formula:



where n represents a number from 2 to 20

U'-represents —O— or —NR^{11}—, R^{11} being a hydrogen atom or a linear or branched alkyl radical having from 1 to 6 carbon atoms; R^2 and R^3 have the same meanings as those given with respect to the formula (II);

the symbol Y represents a monovalent radical chosen from the radicals R, Z, V and X, the radical X being selected from an hydroxyl group or a linear or branched alkoxy radical having from 1 to 3 carbon atoms;

the symbols R^{14} are identical or different and represent a monovalent radical selected from the group consisting of a radical R and a radical X such as defined hereinabove with respect to the formula (V);

r, s and t are equal to zero or represent integers or fractional numbers greater than 0, with the additional condition according to which, if r=0, at least one of the two radicals Y represents the radical Z, and s=0;

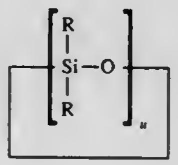
comprising the steps of reacting in suitable proportions, optionally in the presence of a basic catalyst, the following reactants:

a hydrolysable silane of formula:

$$(R)_g(X')_{3-g}SiZ \qquad \text{(VII)}$$

in which the symbols R and Z have the meanings given hereinabove for the formula (V), g is a number selected from the group consisting of 0, 1 and 2 and the symbol X' represents a linear or branched alkoxy group having from 1 to 3 carbon atoms;

a polydiorganosiloxane corresponding to the formula (V) where r=0, s=0, t=10–500, R^{14} is R and Y is CH, and/or a cyclic polydiorganosiloxane of formula:



(VIII)

in which:

R are identical or different and represent a monovalent hydrocarbon radical chosen from linear or branched alkyl radicals having from 1 to 4 carbon atoms, the phenyl radical and the 3,3,3-trifluoropropyl radical; u is an integer or fractional number ranging from 3 to 10;

and optionally a chain-terminating agent consisting of a compound of formula (V) where r=0, s=0, t=0–50, R^{14} is R and Y is R or Z.

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5,688,890

THERMOPLASTIC POLYURETHANE COMPOSITION

Michihiro Ishiguro; Tatuya Oshita; Hiroyuki Ono; Kimio Nakayama, and Koji Hirai, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

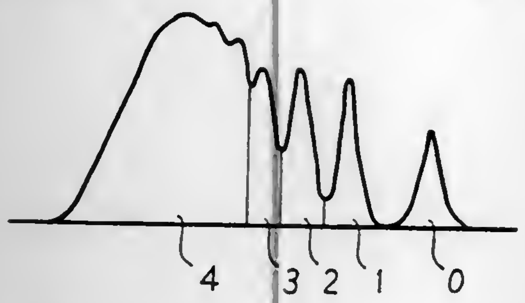
PCT No. PCT/JP94/00717, § 371 Date Dec. 29, 1994, § 102(e) Date Dec. 29, 1994, PCT Pub. No. WO94/25529, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 28, 1994, Ser. No. 356,318

Claims priority, application Japan, Apr. 29, 1993, 5-128406; Apr. 29, 1993, 5-128407

Int. Cl.^{6} C08G *18/08;18/22;18/24*

U.S. Cl. 528—51 **18 Claims**



1. A process for producing thermoplastic polyurethane compositions, which comprises:

a) producing a polymeric diol by esterification polymerization with a titanium-containing esterification catalyst;

b) deactivating said titanium-containing esterification catalyst by the steps of:

(1) heating the polymeric diol containing the titanium-containing esterification catalyst at a temperature and in the presence of an amount of water effective to decrease the activity of said catalyst; or

(2) adding a phosphorus compound to the polymeric diol containing the titanium-containing esterification catalyst; and

c) conducting melt polymerization of said polymeric diol with an organic diisocyanate and a chain extender, in the presence of a tin compound.

5,688,891

T,3-DIOXAN-2-ONE GROUP-CONTAINING OLIGOURETHANES

Wieland Hovestadt; Hans-Josef Buysch, both of Krefeld; Lutz Schmalstieg, Köln; Harald Blum, Wachtendonk, and Norbert Schön, Darmstadt, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 6, 1995, Ser. No. 523,977

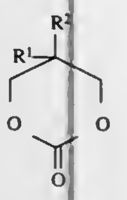
Claims priority, application Germany, Sep. 14, 1994, 44 32 647.5

Int. Cl.^{6} C08G *64/02;* **C07D** *319/06*

U.S. Cl. 528—73 **13 Claims**

1. A process for the preparation of a 1,3-dioxan-2-one group-containing oligourethane which comprises reacting

a) one or more hydroxy-functional 1,3-dioxan-2-ones corresponding to the formula



wherein

R^1 represents a hydroxyalkyl radical and

R^2 represents an alkyl radical with

b) a polyisocyanate component having an average of at least two isocyanate groups per molecule and containing one or more polyisocyanates

to form urethane groups.

5,688,892

PROCESS FOR PRODUCING RAPIDLY CURABLE COLD-SETTING POLYURETHANE COATING WATERPROOFER

Akira Ishii, Yokohama, and Shigeo Katagiri, Matsudo, both of Japan, assignors to Hodogaya Chemical Co., Ltd., and Hodogaya Construction Products Co., Ltd., both of Kawasaki, Japan

PCT No. PCT/JP95/00786, § 371 Date Nov. 2, 1995, § 102(e) Date Nov. 2, 1995, PCT Pub. No. WO95/29198, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 21, 1995, Ser. No. 549,729

Claims priority, application Japan, Apr. 21, 1994, 6-082871; Sep. 19, 1994, 6-223140; Apr. 10, 1995, 7-084024

Int. Cl.^{6} G08G *18/32*

U.S. Cl. 528—76 **7 Claims**

1. A process for producing a rapidly curable cold-setting polyurethane coating waterproofer retaining a required pot life by mixing a base whose principal component is an isocyanate-terminated prepolymer obtained by reacting tolylene diisocyanate with a polyol with a curing agent containing an aromatic polyamine crosslinker and a plasticizer, followed by coating and curing, which comprises:

(a) using a polyoxypropylene polyol and/or a polyoxyethylenepropylene polyol as the principal component of the polyol to be reacted with tolylene diisocyanate,

(b) using diethyltoluenediamine as the principal component of the aromatic polyamine crosslinker contained in the curing agent,

(C) using the plasticizer contained in the curing agent in an amount of 20 to 130 parts by weight per 100 parts by weight of the isocyanate-terminated prepolymer, and

(d) in-situ mixing the base with the curing agent in such proportions that the equivalent ratio of the isocyanate groups of the prepolymer contained in the base to the amino groups of the aromatic polyamine contained in the curing agent ranges from 0.8 to 2.0, followed by coating and curing.

5,688,893

METHOD OF USING A LEWIS BASE TO CONTROL MOLECULAR WEIGHT OF NOVOLAK RESINS

M. Dalil Rahman, Warwick; Daniel P. Aubin, Rockville; Dana L. Durham, East Greenwich, and Ralph R. Dammel, Coventry, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 997,942, Dec. 29, 1992, Pat. No. 5,614,349. This application Dec. 20, 1996, Ser. No. 771,715

Int. Cl.^{6} C08G *8/04;* **G03F** *7/023*

U.S. Cl. 528—146 **5 Claims**

1. A method for producing a water insoluble, aqueous alkali soluble novolak resin comprising:

a) providing an admixture of formaldehyde, one or more phenolic compounds and a catalytic amount of a acidic catalyst;

b) Lewis base concentration before condensation providing such admixture with a of from about 10 to 1000 ppm;

c) condensing the formaldehyde with the one or more phenolic compounds, in presence of the catalyst, and thereby producing a water insoluble, aqueous alkali soluble novolak resin having a substantially consistent molecular weight.

5,688,894

POLYESTER RESIN POWDER COATING COMPOSITIONS

John Ridland, Durham, England, assignor to Tioxide Specialties Limited, United Kingdom

Filed Jun. 20, 1995, Ser. No. 493,183

Claims priority, application United Kingdom, Jun. 28, 1994, 9412908

Int. Cl.^{6} C08G *63/00*

U.S. Cl. 528—176 **23 Claims**

1. A method of curing a powder coating composition comprising heating a polyester resin with an alkanolamine derivative of a metal selected from the group consisting of titanium and zirconium to a sufficiently high temperature to cause said alkanolamine derivative of a metal to react with and cross-link said polyester resin, said alkanolamine derivative of a metal being the reaction product of an organometallic compound selected from orthoesters and condensed orthoesters of said metal with a first alkanolamine which is a trialkanolamine and with a second alkanolamine selected from the group consisting of dialkanolamines having the formula $HN(ROH)_2$ and monoalkanolamines having the formula H_2NROH where, in each formula, R represents a divalent radical, said reaction product containing trialkanolamino radicals derived from said first alkanolamine and alkanolamino radicals derived from said second alkanolamine and said reaction product having a ratio of trialkanolamino radicals to atoms of said metal in the range 0.5:1 to 1.5:1 and a ratio of alkanolamino radicals to atoms of said metal in the range 0.2:1 to 2.0:1.

5,688,895

LIQUID CRYSTALLINE POLY(ESTER-AMIDES)

Irene Greenwald Plotzker; Joel David Citron, both of Wilmington, and Marion Glen Waggoner, Hockessin, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1996, Ser. No. 668,761

Int. Cl.^{6} C08G *63/00*

U.S. Cl. 528—183 **20 Claims**

1. A liquid crystalline poly(ester-amide) consisting essentially of the repeat units:

(i) 100 molar parts, total, of 10 to 50 molar parts of $-R^1NR^2NR^1-$ (I), and 50 to 90 molar parts $-OAr^1O-$ (II);

(ii) 100 molar parts of $-(O)CAr^2C(O)-$ (III);

(iii) 50 to 200 molar parts of $-OAr^3C(O)-$ (IV); and

(iv) 0 to 100 molar parts of $-OR^3O(O)CAr^4C(O)-$ (V);

wherein:

each R^1 is independently hydrogen or alkyl;

R^2 is alkylene or substituted alkylene, each containing 4 to 16 carbon atoms;

R^3 is $-(CH_2)_n-$ wherein n is 2 to 6; and

each of Ar^1, Ar^2, Ar^3 and Ar^4 is independently arylene.

5,688,896

NON-LINEAR OPTICALLY ACTIVE POLYCARBONATE

Tjerk Oedse Boonstra, Duiven, and Ulfert Elle Wiersum, Velp, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

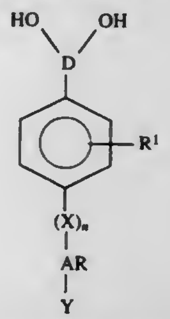
Continuation-in-part of Ser. No. 312,254, Sep. 26, 1994, Pat. No. 5,588,083. This application Feb. 21, 1996, Ser. No. 604,691

Int. Cl.^{6} C08G *64/00*

U.S. Cl. 528—196 **10 Claims**

1. A non-linear optically active side chain condensation polymer, characterised in that the polymer is a polycarbonate obtained from a monomer mixture comprising:

an NLO diol satisfying formula 1:



formula 1

wherein D is a trivalent donor group comprising 2–10 aliphatic, alicyclic, aromatic or heterocyclic carbon atoms, and comprising at least one alkoxy—oxygen atom, at least one sulphur atom, at least one selenium atom, or a nitrogen atom directly or conjugatedly bonded to the benzene ring, and

wherein

X stands for $-CR^2{=}CR^2-$, $-N{=}N-$, $-CR^2{=}N-$ or $-N{=}CR^2-$,

Y stands for $-CN$, $-NO_2$, $CR^2{=}C(CN)_2$, $-CF_3$, SO_2R^4, $-C(CN){=}C(CN)_2$, barbiturate groups, or thiobarbiturate groups,

AR stands for a six-membered aromatic ring, a six-membered aromatic ring substituted with one or more R^3 groups, a non-saturated 6 membered ring, a non-saturated six-membered ring substituted with one or more R^3 groups, a five-membered heteroatomic ring containing O, N, S, or Se, a five-membered heteroatomic ring substituted with one or more R^3 groups and containing O, N, S or Se, or a fused ring structure,

R^1 stands for -halogen, $-R^2$, $-OR^2$, $-COR^2$, $-CN$ or $-CF_3$

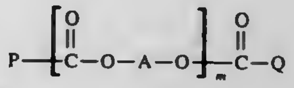
R^2 stands for $-H$, -halogen, an alkyl group having 1–6 carbon atoms, or a halo substituted alkyl group having 1–6 carbon atoms,

R^3 stands for -halogen, $-R^2$, $-OR^2$, COR^2, $-CN$, NO_2, SO_2R^4 or CF_3,

R^4 stands for an (halogenated) alkyl group having 1–4 carbon atoms,

n is an integer from 0 to 4, with the X-groups being the same or different, and

a compound according to formula 2:



$$P-\left[\overset{\overset{O}{\|}}{C}-O-A-O\right]_m-\overset{\overset{O}{\|}}{C}-Q$$

formula 2

wherein:

P stands for $-Cl$, $O-R$, an imidazole group or $-O-Ph$,

Q stands for $-Cl$, $O-R$, an imidazole group or $-O-Ph$,

R stands for an alkylene group having 1–6 carbon atoms,

Ph stands for phenyl,

A stands for $-Ph-$, halogenated $-Ph-$, $-Ph-C(CH_3)_2-Ph-$, $-Ph-SO_2-Ph-$, a cycloalkylene group having 3–24 carbon atoms, a halo substituted cycloalkylene group having 3–24 carbon atoms, an arylene group having 3–20 carbon atoms, or a naphthalene group,

m is an integer from 0 to 5, with the A-groups being the same or different, with the proviso that the polycarbonate obtained from the polymerisation of bisphenol A bischloroformate and a compound according to the following formula:

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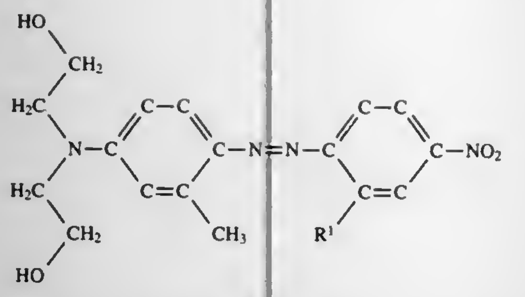


wherein R^1 is alkyl (C_1–C_6), alkoxy, —Cl, —Br, —OH, —NH_2, —NO_2, or —CN, are excluded.

5,688,897
METHOD FOR PRODUCING A STABILIZED OXYMETHYLENE COPOLYMER

Noritaka Tanimura; Yukio Tanigawa, and Sumio Komatsu, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP95/00579, § 371 Date Jul. 10, 1996, § 102(e) Date Jul. 10, 1996, PCT Pub. No. WO95/27747, PCT Pub. Date Oct. 19, 1995

PCT Filed Mar. 28, 1995, Ser. No. 669,541

Claims priority, application Japan, Apr. 7, 1994, 6/069282

Int. Cl.⁶ C08G *4/00;6/00*

U.S. Cl. 528—242 **6 Claims**

1. A method for producing an oxymethylene copolymer, which comprises:

copolymerizing trioxane and a cyclic ether and/or a cyclic formal in the presence of at least one polymerization catalyst selected from the group consisting of boron trifluoride, boron trifluoride hydrate and a coordination compound of an organic compound having an oxygen or a sulphur atom with boron trifluoride to form an oxymethylene copolymer containing residual polymerization catalyst,

volatilizing the residual polymerization catalyst to decrease the amount thereof in said oxymethylene copolymer, by heating the obtained oxymethylene copolymer in an atmosphere of inert gas at or below its melting point, and/or reducing the pressure, without conducting any operation of deactivating the polymerization catalyst before volatilizing the residual polymerization catalyst and

stabilizing terminal moieties of the oxymethylene copolymer after deactivating said residual catalyst or stabilizing terminal moieties of the oxymethylene copolymer directly.

5,688,898
POLYESTERS PRODUCTION PROCESS

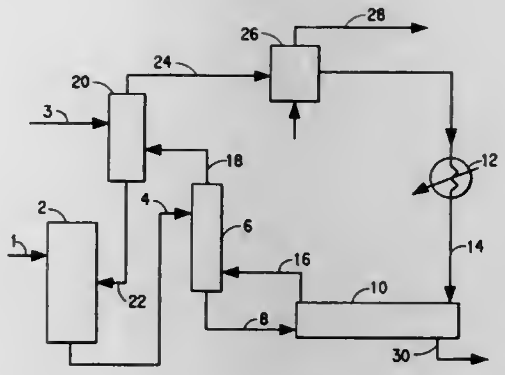
Kamlesh Kumar Bhatia, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 632,994, Apr. 16, 1996, which is a continuation-in-part of Ser. No. 438,299, May 10, 1995, Pat. No. 5,552,513, which is a continuation-in-part of Ser. No. 138,312, Oct. 18, 1993, Pat. No. 5,434,239. This application Oct. 21, 1996, Ser. No. 734,656

Int. Cl.⁶ C08G *63/02;* **C08F** *6/00*

U.S. Cl. 528—272 **10 Claims**

1. A process for preparing poly(1,4-butylene terephthalate) of at least a degree of polymerization of 50, by polymerizing bis(4-hydroxy butyl) terephthalate, or low molecular weight oligomers thereof, with the evolution of 1,4-butane diol and other volatile reaction by-products, the process conducted at atmospheric pressure or above, comprising intimately contacting the bis(4-hydroxy butyl) terephthalate or low molecular weight oligomers thereof in melt form with an inert gas flowing at a velocity of 0.2 to 3 ft/sec, such that the interfacial area between the melt and the gas phase is at least about 20 ft2/ft3 of the melt, and removing the volatile reaction by-products with the inert gas wherein the polymerization is completed in less than about 5 hours of contact time while the reactants are maintained in the melt form.



5,688,899
CLARITY COPOLYESTER

Marc Alan Strand; Bobby Jones Sublett, and Jimmy Ray Trotter, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Jan. 21, 1997, Ser. No. 786,592

Int. Cl.⁶ C08G *00/00*

U.S. Cl. 528—279 **10 Claims**

1. An improved clarity copolyester composition having a b* value of less than 15, having an inherent viscosity of about 0.4 to 1.2 dL/g and comprising:

A. 100 mol percent dicarboxylic acid residue component comprising at least 75 mol percent of terephthalic acid residues;

B. 100 mol percent diol residue component comprising 10 to 50 mol percent diethylene glycol residue and 50 to 90 mol percent ethylene glycol residue;

C. catalyst residues comprising 20 to 100 ppm manganese, 50 to 300 ppm antimony, 0 to 100 ppm titanium and 40 to 150 ppm phosphorus, based on the weight of the copolyester; and

D. color control agent residues comprising organic or inorganic toners present in a sufficient amount whereby the b* color value of the combination of components A, B, and C is reduced to less than 15 by the addition of component D.

5,688,900
ABSORBABLE POLYALKYLENE DIGLYCOLATES

Kevin Cooper, Warren, and Angelo G. Scopelianos, Whitehouse Station, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 375,020, Jan. 19, 1995, abandoned. This application May 16, 1996, Ser. No. 648,902

Int. Cl.⁶ C08G *63/12;63/668;63/672*

U.S. Cl. 528—301 **4 Claims**

1. An absorbable, biocompatible poly(alkylene diglycolate) consisting of the reaction product of:

an acid or ester of diglycolic acid; and,

an aliphatic, saturated alcohol selected from the group consisting of glycerol, pentaerythitol, trimethylolpropane, hydroxyl terminated poly(ethylene glycol)s, ethylene glycol, 1,2 -propanediol, 1,3-propanediol, 1,4-butylene glycol, dipropylene glycol, 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, and 1,8 -octanediol,

wherein the poly(alkylene diglycolate) comprises about 45 mole percent to about 90 mole percent of repeating units with aliphatic saturated tri-, tetra-alcohols, and hydroxyl terminated poly(ethylene glycol)s, and wherein the balance of the poly(alkylene diglycolate) comprises repeating units with diol alcohols.

5,688,901
PARTLY AROMATIC COPOLYAMIDE MOLDING MATERIALS HAVING HIGH CRYSTALLINITY

Herbert Fisch, Wachenheim; Gunter Pipper, Bad Dürkheim; Klaus Mühlbach, Grünstadt, and Heiner Görrissen, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Feb. 6, 1995, Ser. No. 386,801

Claims priority, application Germany, Feb. 10, 1994, 44 04 250.7

Int. Cl.⁶ C08G *69/08;73/10*

U.S. Cl. 528—310 **6 Claims**

1. A partly aromatic semicrystalline thermoplastic polyamide molding composition, consisting essentially of

A) from 40 to 100% by weight of a copolyamide composed of
  - a_1) from 30 to 44 mol % of units which are derived from terephthalic acid;
  - a_2) from 6 to 20 mol % of units which are derived from isophthalic acid;
  - a_3) from 43 to 49.5 mol % of units which are derived from hexamethylenediamine;
  - a_4) from 0.5 to 7 mol % of units which are derived from aliphatic cyclic diamines of 6 to 30 carbon atoms; and
  - a_5) from 0 to 4 mol % of polyamide forming monomer units the molar percentages of components a_1) to a_5) together giving 100%, and

B) from 0 to 50% by weight of a fibrous or particulate filler,

C) from 0 to 30% by weight of an elastomeric polymer and

D) from 0 to 30% by weight of conventional additives and processing assistants,

the percentages by weight of components A) to D) together giving 100%.

5,688,902
PROCESS FOR THE PREPARATION OF POLYIMIDES OR OF THEIR BIODEGRADABLE POLYPEPTIDE HYDROLYSATES

Jean-Marie Bernard, Mornant; Jean-Luc LePage, Francheville; Arnaud Ponce, Aubervilliers, and Florence Tournilhac, Paris, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 342,943, Nov. 21, 1994, abandoned. This application Jun. 27, 1996, Ser. No. 672,163

Claims priority, application France, Nov. 24, 1993, 93 14042; Nov. 24, 1993, 93 14043

Int. Cl.⁶ C08G *69/08;73/10;* **C08K** *3/32*

U.S. Cl. 528—313 **20 Claims**

1. A process for the preparation of polyimides or their polypeptide hydrolysates which are at least 80% biodegradable, by thermal polycondensation of at least one amino acid, optionally followed by hydrolysis, the process comprising carrying out the thermal polycondensation step in the presence of at least one "acid catalyst" selected from the group consisting of

a) sulfuric, nitric, phosphorus, sulfurous, hydrofluoric, silicic and sulphonic acids, organic sulphonic acids, containing less than 50 carbon atoms, amino acids bearing a non-carboxyl strong acid function, organic phosphonic acids, organic carboxylic acids having a pK_a lower than or equal to 5;

b) precursors of these acids;

c) salts of the acids of step a)with an amino acid which is similar to or different from that or those used;

d) salts of the acids of step a) with a polyimide derived from the polycondensation of at least one amino acid which is similar to or different from that or those used;

e) hydrochloric acid and its precursors

f) hydrochloric acid salts of an amino acid which is similar to or different from that or those used, when the amino acid to be polycondensed is other than glutamic acid;

g) hydrochloric acid salts of a polyimide derived from the polycondensation of at least one amino acid which is similar to or different from that or those used;

h) acid salts of sulfuric, phosphoric or phosphorous acids or their precursors;

i) phosphoric acid precursors other than phosphoric anhydride or polyphosphoric acids; and

j) Lewis acids;

according to an "acid catalyst"/amino acid molar ratio of at least 0.001; said thermal polycondensation operation being carried out in bulk, with a reaction medium remaining in the pulverulent or friable form throughout the whole of the polycondensation operation, in which reaction medium the "acid catalyst" is distributed homogeneously.

5,688,903
PROCESS FOR THE PREPARATION OF POLYCONDENSATES OF AMINO ACIDS AND THE BIODEGRADABLE POLYPEPTIDE HYDROLYSATES THEREOF, AND THEIR USE IN DETERGENT COMPOSITIONS

Jean-Luc Lepage, Francheville, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 29, 1995, Ser. No. 535,437

Claims priority, application France, Oct. 12, 1994, 9412150

Int. Cl.⁶ C08G *69/10*

U.S. Cl. 528—328 **7 Claims**

1. A process for the preparation of polycondensates of amino acids or of the polypeptide hydrolysates thereof comprising preparing said polycondensates by bulk thermal polycondensation of amino acids in the presence of a polycondensation catalyst, of phosphoric acid, phosphorus pentoxide or polyphosphoric acid optionally followed by hydrolysis, the said polycondensation process being performed in pulverulent medium containing, per mole of amino acid, from 0.005 to 0.25 mole of catalyst uniformly distributed in the said medium.

5,688,904
POLYASPARTIC ACID CATALYSIS

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to Calwood Chemical Industries Inc., Elkridge, Md.

Continuation-in-part of Ser. No. 559,049, Nov. 16, 1995, Pat. No. 5,610,264. This application Oct. 1, 1996, Ser. No. 724,417

Int. Cl.⁶ C08G *69/10*

U.S. Cl. 528—328 **6 Claims**

1. A process for the production of a polyaspartate salt comprising the steps of:

a.) passing an aqueous solution of ammonium fumarate over a bed of immobilized cells, wherein said cells contain aspartase, to produce an aqueous solution of ammonium aspartate;

b.) adding to said solution of ammonium aspartate a sufficient quantity of a base to allow removal of the ammonium ion present in said solution by evaporation, said base selected from the group of bases consisting of sodium hydroxide, sodium bicarbonate, sodium carbonate, potassium hydroxide, potassium bicarbonate and potassium carbonate;

c.) reducing the volume of said solution by evaporation thereby removing the ammonia contained in said solution;

d.) acidifying said solution with a sufficient quantity of sulfuric acid to produce an aqueous mixture of aspartic acid and sodium bisulfate;

e.) mixing and heating said mixture in a reactor at a temperature of 110°–300° C. for a length of time sufficient to convert at least 60% of the aspartic acid to polysuccinimide;

f.) hydrolyzing said polysuccinimide with a base selected from the group of bases consisting of sodium hydroxide, sodium bicarbonate, sodium carbonate ammonium hydroxide, ammonia, potassium hydroxide, potassium carbonate and potassium bicarbonate to provide solution of a salt of polyaspartic acid.

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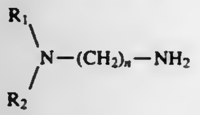
5,688,905
PRIMARY-TERTIARY DIAMINES MIXED WITH POLYAMINES AS EPOXY RESIN HARDENERS

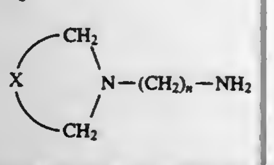
Frederick Herbert Walker, Doylestown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 20, 1995, Ser. No. 530,813
Int. Cl.^{6} C08G *69/34;* **C08L** *63/02;63/04*
U.S. Cl. 528—332 **18 Claims**

1. An amine hardener composition for curing epoxy resin based coatings comprising (A) 5 to 75 wt. % of a diamine which possesses a vapor pressure less than about 133 Pascals at 20° C., contains both a primary amine and a tertiary amine and corresponds to either of the structures I and II:



I



II

where R_1 and R_2 are independently C_1–C_8 alkyl; X is —CH_2—CH_2—, —CH_2—CH_2—CH_2—, or —CH_2—O—CH_2—; and n is 2–6, (B) 25 to 70 wt. % of an amidoamine curing agent; and (C) 5 to 50 wt. % of a poly(alkylene oxide) diamine or triamine containing three or more active hydrogens.

5,688,906
HIGHLY EFFICIENT NONLINEAR OPTICAL POLYIMIDES

Kwan-Yue Alex Jen, Old Bridge, and Kevin Joel Drost, Spotswood, both of N.J., assignors to Enichem S.p.A., Italy

Continuation of Ser. No. 132,707, Oct. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 101,368, Aug. 2, 1993, Pat. No. 5,514,799, which is a continuation-in-part of Ser. No. 158,184, Nov. 24, 1995, which is a continuation of Ser. No. 626,358, Dec. 12, 1990, abandoned. This application Aug. 7, 1995, Ser. No. 500,384
Int. Cl.^{6} C08G *69/26;73/10*
U.S. Cl. 528—353 **47 Claims**

1. A method for preparing a polyamic acid having nonlinear optical (NLO) or pre-NLO side chains, which method comprises:

mixing in a polar aprotic solvent a 1:1 ratio of bis-(aromatic dicarboxylic acid anhydrides) and aromatic diamines, wherein either or both of said bis-(aromatic dicarboxylic acid anhydrides) and said aromatic diamines comprise bis-(aromatic dicarboxylic acid anhydrides) and aromatic diamines having at least one NLO or pre-NLO side chain present in a ratio of between about 1:99 and about 75:25 to unsubstituted bis-(acid anhydrides) and aromatic diamines;

so that a polyamic acid having NLO or pre-NLO side chains is formed in said polar aprotic solvent by condensation of said bis-(acid anhydrides) with said aromatic diamines; and

wherein said NLO or pre-NLO side chains have the structure represented by:

D-R-A

wherein D, R and A form a delocalized resonance configuration in which R is a pi-conjugated non-centrosymmetric moiety comprising at least one heteroaromatic ring, or at least one fused ring system comprising a heteroaromatic ring, A is hydrogen or an electron withdrawing moiety and D is an electron donating moiety covalently linked to said bis-(aromatic dicarboxylic acid anhydride) or said aromatic diamine by nucleophilic substitution, and either D or A is only substituted on said heteroaromatic ring of R.

5,688,907
POLYMERS OF MALEIC ACID WITH AMINES

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to SRCHEM, Inc., Elkridge, Md.

Division of Ser. No. 132,246, Oct. 6, 1993, Pat. No. 5,442,038. This application May 22, 1995, Ser. No. 445,643
Int. Cl.^{6} C08G *69/10;73/00*
U.S. Cl. 528—363 **3 Claims**

1. A polymer produced by a process comprising polymerizing (1) one of the members of the group consisting of maleic acid, malic acid, and fumaric acid, (2) 0.05 equivalents less than one equivalent of ammonia, (3) an amine and (4) a carboxylic acid, at a temperature greater than about 120° C., to produce said polymer.

5,688,908
PROCESS FOR THE PREPARATION OF AROMATIC SULFUR-CONTAINING POLYMERS

Michael Haubs, Bad Kreuznach; Andreas Schleicher, Beselich, and Thorsten Niklas, Marburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Apr. 12, 1996, Ser. No. 631,782
Claims priority, application Germany, Apr. 13, 1995, 195 13 479.6
Int. Cl.^{6} C08G *75/14*
U.S. Cl. 528—388 **20 Claims**

1. A process for producing an aromatic sulfur containing polymer which comprises in a first stage, producing a prepolymer containing halogenated end groups in the presence of a solvent from A) a halogenated aromatic hydrocarbon compound and B) a sulfide, wherein component A) is present in excess; separating the prepolymer from the reaction mixture; and, in a second stage, dissolving the prepolymer in a solvent; adding a small amount of component B) to the resulting solution; polymerizing the mixture thus formed in an homogenous state to obtain an aromatic sulfur containing polymer; and recovering the polymer.

5,688,909
CATALYST COMPOSITION AND PROCESS FOR THE PREPARATION OF COPOLYMERS OF CARBON MONOXIDE AND AN OLEFINICALLY UNSATURATED COMPOUND

Eit Drent, and Mirjam Catharina Theodora De Kock, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 12, 1996, Ser. No. 660,559
Claims priority, application European Pat. Off., Jun. 12, 1995, 95201553
Int. Cl.^{6} C08G *67/02*
U.S. Cl. 528—392 **11 Claims**

1. A catalyst composition consisting essentially of:

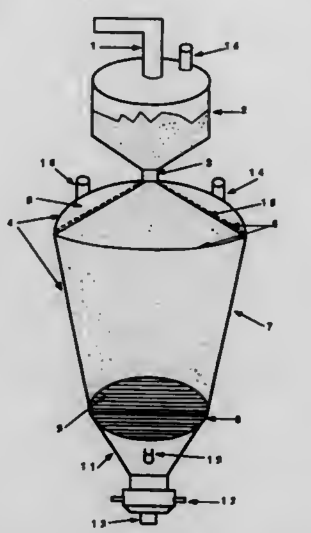
(a) a source of nickel cations, and

(b) a bidentate ligand of the formula $R^1R^2M^1$—R—$M^2R^3R^4$ (I) wherein M^1 and M^2 represent independently phosphorus, nitrogen, arsenic or antimony, R^1, R^2, R^3 and R^4 represent independently optionally polar substituted hydrocarbyl groups; wherein at least one of R^1, R^2, R^3 and R^4 represent a polar substituted aryl group, and R represents a bivalent bridging group of which the bridge consists of two bridging atoms.

5,688,910
PROCESS AND APPARATUS FOR REMOVING UNPOLYMERIZED GASEOUS MONOMERS FROM OLEFIN POLYMERS

Duan Fan Wang, Somerville, N.J., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 26, 1995, Ser. No. 533,771
Int. Cl.^{6} C08C *3/02*
U.S. Cl. 528—483 **7 Claims**



1. An apparatus for removing unpolymerized monomers from a solid olefin polymer containing the monomers which comprises: a purge vessel having tapered walls wherein the vessel has a height-to-bottom-diameter ratio of 0.5:1 to 10:1 and the walls have a tapered angle based on a vertical axis of 0.5 to 15 degrees; a solid discharge element disposed in the lower portion of the purge vessel; a solids receiving hopper; a solids inlet disposed in the receiving hopper; a feeding means disposed in the receiving hopper in communication with an inlet for feeding solids to the purge vessel; a gas-permeable, solids-impermeable constraint means disposed below the feeding means defining the upper limit of an expanded bed of solids and defining a gas collection chamber between the top of the purge vessel and the constraint means; a gas entry means disposed in the purge vessel within or below the expanded bed of solids; and gas discharge means disposed in communication with the gas collection chamber for discharging gas from the chamber.

5,688,911
TRK NEUROTROPHIN BINDING MOTIFS

Rainer Schneider, Canisiusweg 125/4/34, A-6064 Rum, and Jörg M. Windisch, Josef-Stapf-Strasse 1, A-6020 Innsbruck, both of Austria

Filed May 3, 1995, Ser. No. 434,198
Int. Cl.^{6} C07K *14/71;* **C07H** *21/00*
U.S. Cl. 530—324 **6 Claims**

1. Isolated and purified leucine rich motif (LRM_2) of the TrkA receptor having a sequence selected from the group consisting of the following sequences:

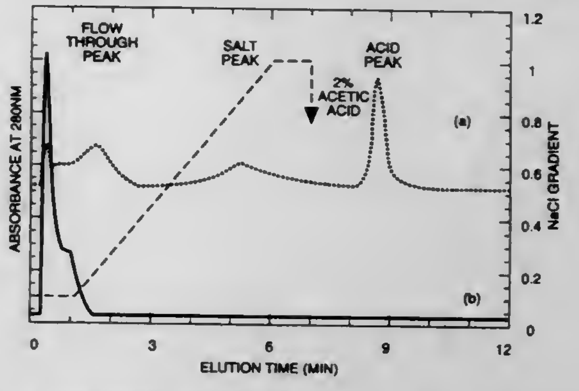
a) T I V K S G L R F V A P D A F H F T P R L S R L (SEQ ID NO:1); and

b) T I V K S G L R F V A P D A F H F T P R L S H L (SEQ ID. NO: 4).

5,688,912
PEPTIDE LIGANDS WHICH BIND TO VON WILLEBRAND FACTOR

Christopher A. Dadd, Cary; George A. Baumbach, Knightdale, and David J. Hammond, Raleigh, all of N.C., assignors to Bayer Corporation, Berkeley, Calif.

Filed Sep. 22, 1995, Ser. No. 537,069
Int. Cl.^{6} C07K *7/04;17/00;* **A61K** *35/14*
U.S. Cl. 530—329 **2 Claims**



1. A composition comprising a defined sequence of six consecutive amino acid residues, wherein the defined sequence is selected from the group consisting of RLHSFY, RLKSFY, RLNSFY, RLQSFY, RFRSFY, RIRSFY, RVRSFY, RYRSFY, RLRSFY, HLRSFY, and KLRSFY.

5,688,913
CS-1 PEPTIDOMIMETICS, COMPOSITIONS AND METHODS OF USING THE SAME

Thomas S. Arrhenius; Mariano J. Elices, both of San Diego, and Federico C. A. Gaeta, Olivenhain, all of Calif., assignors to Cytel Corporation, San Diego, Calif.

Continuation of Ser. No. 164,101, Dec. 6, 1993, abandoned. This application May 5, 1995, Ser. No. 435,286
Int. Cl.^{6} A61K *38/07*
U.S. Cl. 530—330 **18 Claims**

1. A peptide of the following formula:

X—Y-Asp-$(\text{Xaa})_t$Z

wherein

X is selected from the group consisting of phenylacetyl, pyridine-4-carbonyl, pyridine-3-acetyl, anilinocarbonyl, pyridine-3-carbonyl, biotinoyl-ϵ-amidocaproyl phenylalanyl, phthalimido, Europium-labeled ϵ-amidocaproyl phenylalanyl, 3,4-dihydroxyphenylacetyl, benzoyl, 3-quinolinecarbonyl, 1,2,3,4-tetrahydroquinazoline-2,4-dione-3-yl, prolinyl, GlcNAC-O$(CH_2)_5$-CO-phenylalanyl, acetyl phenylalanyl, benzyloxycarbonyl, (5-phenyl)hydantoinyl, pyrazolecarbonyl, 4-pyridinecarbonyl, pivaloyl, phenylpropionyl and phenylalanyl;

Y is selected from the group consisting of leucyl and cyclohexylalanyl;

Asp is an aspartyl residue;

Xaa is an amino acid residue selected from the group consisting of phenylalaninyl, tyrosinyl, leucyl, tryptophanyl, valinyl, homophenylalanyl, phenylglycinyl, and p-nitrophenylalanyl;

t is 0 or 1;

when t is 1, substituent Z, together with the carbonyl group of Xaa, is selected from the group consisting of morpholinamide, D-proline amide, 4-hydroxypiperidinamide, piperazinamide, proline amide, pyrrolidinamide, 3,4-dihydroxypyrrolidinamide, 2-(hydroxymethyl)- prolinamide, piperidinamide and an amide formed between a C-terminal proline carboxyl and a tetraethylenepentamine moiety to which is bonded four peptides, each of which has the formula N-phenylacetyl-leucyl-aspartyl-phenylalanyl-proline; and

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when t is 0, substituent Z, together with the α-carbonyl group of Asp, is selected from the group consisting of N-[1-(carboxamidomethyl)-caprolactam-3-yl]amide, N-((1-carboxamidomethyl) 2-oxo-tetrahydroquinolin- 3-yl)amide, N-(amino-6,7-fused ring lactam)amide, N-(2-oxo-tetrahydroquinolin- 3-yl)amide, N-(2-oxo-tetrahydroquinolin-3-yl)amide, N-(caprolactam-3-yl)-amide, N-(1-(2-N-morpholinylethyl)- 2-oxotetrahydroquinoline-3-yl)amide, benzylamide, phenylethylamide, N-D-(caprolactam-3-yl)amide, and N-(2-N-morpholinyl)ethylamide.

13. A method of treating inflammation comprising administering to a mammal the peptide of claim 1.

5,688,914

COMPOSITION CONTAINING A B EPITOPE OF THE ENVELOPE GLYCOPROTEIN OF A RETROVIRUS AND A T EPITOPE OF ANOTHER DISTINCT PROTEIN OF THIS RETROVIRUS

Marc Girard; Jean-Claude Gluckman, both of Paris, and El Mustapha Bahraoui, Marseille, all of France, assignors to Institut Pasteur, and Universite Pierre et Marie Curie Paris VI, both of France

Continuation of Ser. No. 939,576, Sep. 3, 1992, abandoned, which is a continuation of Ser. No. 821,880, Nov. 17, 1992, abandoned, which is a continuation of Ser. No. 659,422, Apr. 16, 1991, abandoned. This application Nov. 9, 1993, Ser. No. 150,249

Claims priority, application France, Aug. 18, 1989, 89 110044

Int. Cl.^{6} C07K *1/00;14/00;* **A61K** *39/21;39/12*

U.S. Cl. 530—350 **21 Claims**

1. A hybrid molecule of

(a) at least one peptide having a B epitope of env glycoprotein, which is a major neutralization epitope, of a virus selected from the group consisting of human immunodeficiency virus type 1 (HIV-1), human immunodeficiency virus type 2 (HIV-2), simian immunodeficiency virus (SIV), human T-cell lymphotropic virus 1 (HTLVI), and human T-cell lymphotropic virus type II (HTLV-II), wherein said peptide has at least one sequence selected from the group consisting of:

(1) NTRKR IRIQRGPGRA FVTIGK-IGN;
(2) NTRKK IRIQRGPGRA FVTIGK-IGN;
(3) NTRGS IRIQRGPGRA FVTIGK-IGN;
(4) NTRKS IYI--GPGRA FHTTGRIIGD;
(5) NVRRS LSI--GPGRA FRTRE-IIGI;
(6) NTRRG IHF--GPGQA LYTTGIV-GD;
(7) NTRQR TPI--GLGQS LYTTRSR-SI;
(8) NTRKS ITK--GPGRV IYATGQIIGD;
(9) NTRKR ITM--GPGRV YYTTGQIIGD;
(10) DKRQS TPI--GLGQA LYTTRGRTKI;
(11) DKKR QSIRIGPGKV FYAKGG---I;
(12) NTKKG IAI--GPGRT LYAREKIIGD;
(13) HTRKR VTL--GPGRV WYTTGEILGN;
(14) NTRRG SHF--GPGQA LYTTGIVGDI;
(15) KITSRQQTPI--GLQA LYTTRIKGDI;
(16) NVRRR HIHI-GPGRA FYTGEIRNI;
(17) NTRQS TPI--GLGQA LYTTRTKSI;
(8) NTTRS IHI--GPGRA FYATGDIIGTI;
(19) NKRKR IHI--GPGRA FYTTKNIIGDI;
(20) TRPNNNTRKR IRIQRGPGRA FVTIGK-IGN M-RQAH;
(21) TRPNN TRKS IRIQRGPGRA FVT:GK-IGN M-RQAH;
(22) TRPNNNTRKK IRIQRGPGRA FVTIGK-IGN M-RQAH;
(23) TRPNNNTRGS IRIQRGPGRA FVTIGK-IGN M-RQAH;
(24) TRPNNNTRKS IYI-GPGRA FHTTGRIIGD -IRKAH;
(25) TRPYNNVRRS LSI--GPGRA FRTRE-IIGI IRQAH;
(26) TRPGNNTRRG IHF--GPGQA LYTTGIV-GD -IRRAY;
(27) ARPYQNTRQR TPI--GLGQS LYTTRSR-SI -IGQAH;
(28) TRPNNNTRKS ITK-GPGRV IYATGQIIGD -IRKAH;
(29) TRPNNNTRKR ITM--GPGRV YYTTGQIIGD -IRRAH;
(30) TRPGSDKRQS TPI--GLGQA LYTTRGRTKI -IGQAH;
(31) TRPGSDKKIT QSIRIGPGKV FYAKGG---I -TGQAH; and
(32) TRPNNNTKKG IAI--GPGRT LYAREKIIGD -IRQAH; and

(b) at least one peptide having a T epitope, wherein said peptide has at least one sequence of nef protein of HIV-1 BRU selected from the group consisting of:

(1) GMDDP EREVL EWRFD SRLAF HHVAR ELHPE YFKNC;
(2) CYKLV PVEPD KVEEA NKGEN TSLLH PVSLH GMDDP;
(3) EREVL EWRFD SRLAF HHVAR ELHPE YFKNC;
(4) DSRLA FHHVA RELHP EYFKN C;
(5) CGYFP DWQNY TPGPG VRYPL TFGWC YKLVP VEPDK;
(6) VEEAN KGENT SLLHP V; and
(7) CKGGL EGLIH SQRRQ DILDL WIYHT QGYFP D.

5,688,915

LONG TERM MAINTENANCE OF LYMPHOCYTES IN VITRO

Yakov Ron, East Brunswick, and Joseph Dougherty, Hampton, both of N.J., assignors to The University of Medicine and Dentistry of New Jersey, Newark, N.J.

Filed Jun. 1, 1995, Ser. No. 457,482

Int. Cl.^{6} C12N *5/00;5/08;* **C12Q** *1/04*

U.S. Cl. 530—380 **10 Claims**

1. A composition for the long-term culture of resting T lymphocytes, comprising cell culture medium, resting T lymphocytes, and a layer of endothelial-like adherent blood monocytes, wherein the culture medium comprises an adherent blood monocyte growth factor.

5,688,916

HUMAN CELL ADHESION MOLECULE

Robert Alan Reid, Durham, and John Jacob Hemperly, Apex, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 40,741, Mar. 26, 1993. This application Mar. 21, 1995, Ser. No. 408,093

Int. Cl.^{6} C07K *14/705;* **A61K** *38/00*

U.S. Cl. 530—350 **5 Claims**

1. An isolated polypeptide comprising the amino acid sequence of SEQ ID NO:6.

5,688,917

PROCESS FOR FUNCTIONAL EXPRESSION OF THE PARA CATION CHANNEL

Joseph P. Arena, West Orange, N.J.; Guoping Feng, Clayton, Mo.; Linda M. Hall, Williamsville, N.Y.; Ken Liu, Laurence Harbor, N.J.; Leonardus H. T. Van Der Ploeg, Scotch Plains, N.J.; Peiyi Wang, North Brunswick, N.J., and Jeffrey W. Warmke, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 337,339, Nov. 10, 1994, Pat. No. 5,593,864. This application Sep. 30, 1996, Ser. No. 724,095

Int. Cl.^{6} C07K *1/00;14/00;* **C12Q** *1/00;* **C12P** *21/06*

U.S. Cl. 530—350 **1 Claim**

1. A recombinant biologically active voltage activated cation channel in a membrane, said channel comprising an alpha subunit and a beta subunit wherein said alpha subunit is para and said beta subunit is tipE.

5,688,918

P53AS PROTEIN AND ANTIBODY THEREFOR

Molly F. Kulesz-Martin, Buffalo, N.Y., assignor to Health Research, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 195,952, Feb. 14, 1994, which is a continuation-in-part of Ser. No. 100,496, Aug. 2, 1993. This application Jun. 14, 1994, Ser. No. 259,612

Int. Cl.^{6} C07K *16/18;16/32;* **C12N** *5/12*

U.S. Cl. 530—387.7 **6 Claims**

1. An antibody which specifically binds to mammalian p53as protein and does not bind to normal p53 from the same species wherein said antibody binds to an epitope present in a peptide unique to p53as, said peptide occurring within the final 50 carboxyl terminal amino acids of p53as.

5,688,919

PROCESS FOR THE PURIFICATION OF FACTOR XIII, MONOCLONAL ANTIBODIES AGAINST FACTOR XIIIA, THE PREPARATION AND USE THEREOF

Johann Hock, Marburg, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 932,507, Aug. 20, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,656

Claims priority, application Germany, Aug. 22, 1991, 41 27 841.0

Int. Cl.^{6} C07K *16/36;16/00;17/00;17/06*

U.S. Cl. 530—388.25 **8 Claims**

1. A process for the purification of coagulation factor XIII or XIIIA by immunoaffinity chromatography, said process comprising:

a) contacting a solution which contains factor XIII or XIIIA with a monoclonal antibody bound to a support matrix;
b) separating the solution from the support matrix, and;
c) eluting factor XIII or XIIIA from the support matrix in a biologically active form,

wherein said monoclonal antibody binds the alpha subunit of factor XIII or XIIIA and wherein said monoclonal antibody is not of the IgM class.

5,688,920

NUCLEOTIDE AND AMINO ACID SEQUENCES FOR CANINE HERPESVIRUS GB, GC AND GD AND USES THEREFOR

Enzo Paoletti, Delmar, and Keith J. Limbach, Troy, both of N.Y., assignors to Virogenetics Corporation, Troy, N.Y.

Continuation-in-part of Ser. No. 220,151, Mar. 30, 1994, Pat. No. 5,529,780. This application Mar. 29, 1995, Ser. No. 413,118

Int. Cl.^{6} C07K *14/03*

U.S. Cl. 530—395 **18 Claims**

1. A synthetic canine herpesvirus glycoprotein gB, gC or gD isolated from in vitro expression of a vector containing an isolated nucleic acid having a sequence set forth in SEQ ID NO:1, SEQ ID NO:11 or SEQ ID NO:18 and coding for canine herpesvirus gB, gC or gD glycoprotein.

5,688,921

REAGENTS AND METHODS FOR THE DETECTION AND QUALIFICATION OF THYROXINE IN FLUID SAMPLES

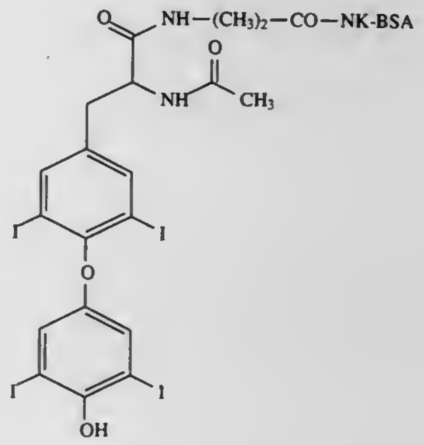
Maciej Adamczyk, Gurnee; Donald D. Johnson, Lindenhurst; Phillip G. Mattingly, Grayslake; Diana E. Clarisse, Naperville; Joan D. Tyner, Beach Park, and Mary M. Perkowitz, Lake Zurich, all of Ill., assignors to Abbott Laboratories D-337/AP6D, Abbott Park, Ill.

Division of Ser. No. 275,064, Jul. 13, 1994, Pat. No. 5,593,896, which is a continuation-in-part of Ser. No. 859,775, Mar. 30, 1992, Pat. No. 5,352,803. This application May 18, 1995, Ser. No. 443,834

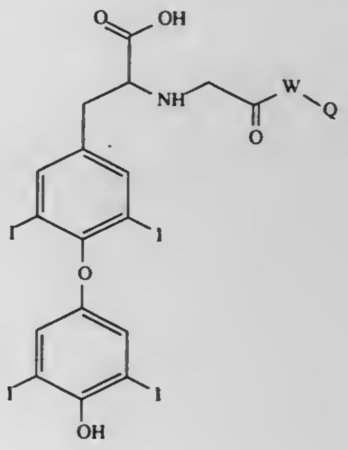
Int. Cl.^{6} C07K *17/00*

U.S. Cl. 530—405 **2 Claims**

1. An immunogen of the formula:



wherein BSA denotes bovine serum albumin, the degree of substitution of BSA by the thyroxine derivative is between 1% to 100% thyroxine is L-isomer, and wherein antibodies directed against the immunogen immunoreact with a thyroxine conjugate of the formula:



where Q is a detectable moiety and W is a linking moiety.

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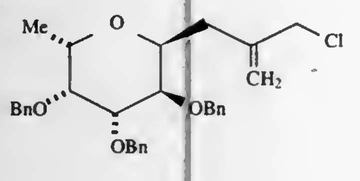
5,688,922
SUBSTITUTED FUCOPYRANOSIDES

Narasinga Rao, Alameda; Mark Brian Anderson, Orinda, and John Henry Musser, San Carlos, all of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Division of Ser. No. 49,018, Apr. 16, 1993, Pat. No. 5,527,890.
This application Jun. 6, 1995, Ser. No. 466,859
Int. Cl.^{6} C07G *3/02;1/00*
U.S. Cl. 536—1.11 **4 Claims**

1. The compound



5,688,923
PECTIN FIBERS

Timothy C. Gerrish, Kennett Square, Pa., and Gary A. Luzio, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 15, 1996, Ser. No. 602,166
Int. Cl.^{6} A61F *13/00;* **B01D** *21/00;* **C08B** *37/06;* **C13D** *3/00*
U.S. Cl. 536—2 **65 Claims**

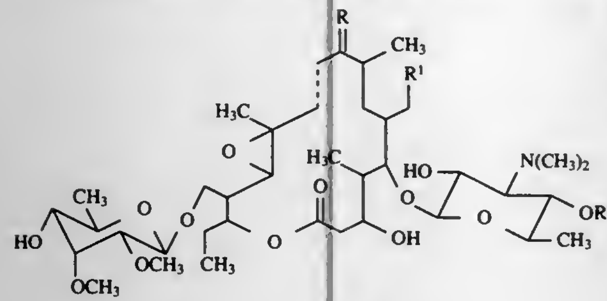
1. A polyvalent cation crosslinked pectin fiber composition comprising a calcium sensitive low methoxyl pectin with a degree of esterification (DE) of less than 15% or calcium sensitive amidated pectin having a DE of less than 50% where the pectin is polyvalent cation crosslinkable and has an average molecular weight (MW) having an upper limit of 200,000 and a lower limit of 5000.

5,688,924
DERIVATIVES OF 12,13-EPOXY-TYLOSIN AND PROCESSES OF MANUFACTURE THEREOF

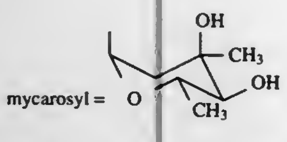
Amalija Narandja, and Nevenka Lopotar, both of Zagreb, Croatia, assignors to PLIVA farmaceutska, kemijska, prehrambena i kozmeticka industrija, d.d., Zagreb, Croatia

Filed Aug. 13, 1996, Ser. No. 696,178
Claims priority, application Croatia, Aug. 14, 1995, 950449
Int. Cl.^{6} C07D *313/00;* **C07H** *5/06;17/08*
U.S. Cl. 536—7.1 **18 Claims**

1. 12,13-Epoxy-tylosin derivatives of the formula I



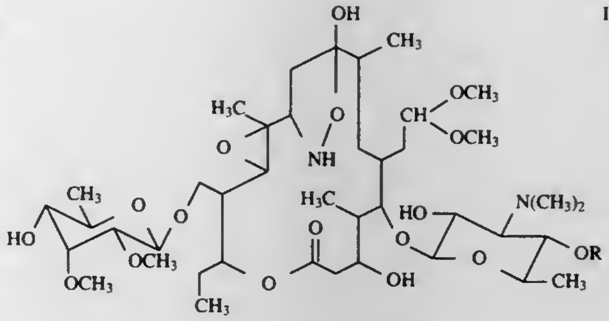
I



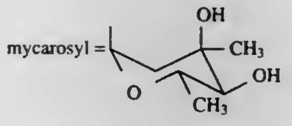
wherein R stands for O, R^1 stands for CHO or $CH(OCH_3)_2$, R^2 stands for H or mycarosyl, and — has the meaning of a single bond;

wherein R stands for NOH, R^1 stands for CHO or $CH(OCH_3)$, R^2 stands for H or mycarosyl, and — has the meaning of a single or a double bond,

and compounds of the formula II



II



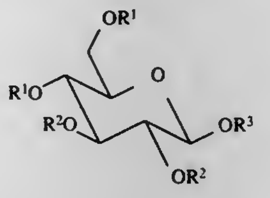
wherein R stands for H or mycarosyl.

5,688,925
INTERMEDIATES FOR THE PREPARATION OF DEMETHYLEPIPODOPHYLLOTOXIN

Pietro Allevi; Mario Anastasia; Ettore Bigatti, and Peter MacDonald, all of Rho, Italy, assignors to Societa Italiana Cortico-Steroldi S.p.A., Milan, Italy

Continuation of Ser. No. 178,340, Feb. 10, 1994, abandoned.
This application May 15, 1995, Ser. No. 441,210
Int. Cl.^{6} C07H *1/00;23/00*
U.S. Cl. 536—186 **7 Claims**

1. In the process for the preparation of demethylepipodophyllotoxin-β-glucosides in which a glucose derivative and a demethylepipodophyllotoxin derivative are allowed to react in the presence of a Lewis acid, the improvement which comprises allowing a glucose derivative of the formula:



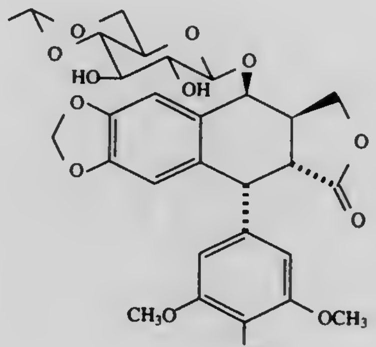
in which the two R^1 groups together are alkylidene, arylalkylidene, or heteroarylalkylidene, R^2 is lower alkanoyl or haloacetyl, and R^3 is trialkylsilyl, to react with demethylepipodophyllotoxin.

5,688,926
PROCESS OF PREPARING ETOPOSIDE PHOSPHATE AND ETOPOSIDE

Lee J. Silverberg, Fayetteville; Purushotham Vemishetti, East Syracuse; John L. Dillon, Jr., Clay, and John J. Usher, East Syracuse, all of N.Y., assignors to Bristol-Myers Squibb Company, New York, N.Y.

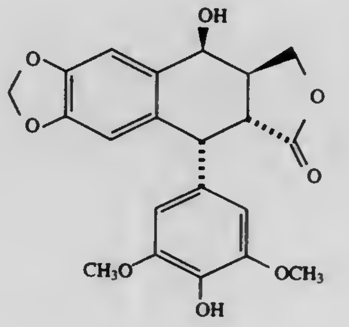
Division of Ser. No. 145,517, Nov. 4, 1993, Pat. No. 5,459,248.
This application Jun. 7, 1995, Ser. No. 483,429
Int. Cl.^{6} C07H *15/24;1/04*
U.S. Cl. 536—18.6 **12 Claims**

1. A process for preparing a compound of Formula VI



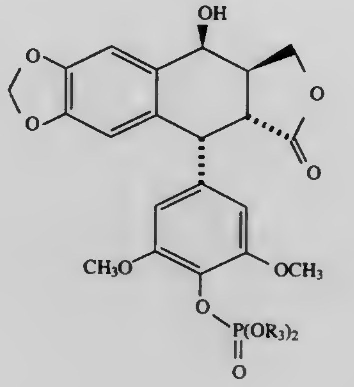
(VI)

comprising phosphorylating a compound of Formula I



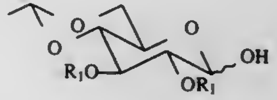
(I)

with a phosphorylation agent to produce a protected 4'-demethyl-4-epipodophyllotoxin-4'-phosphate of Formula II



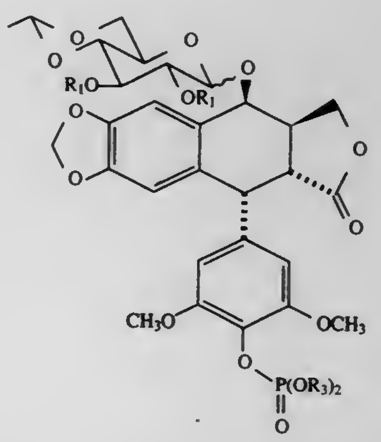
(II)

where R$_3$ is an arylmethyl phosphate protecting group, reacting said compound of Formula II with a protected sugar of Formula III in the presence of a Lewis acid



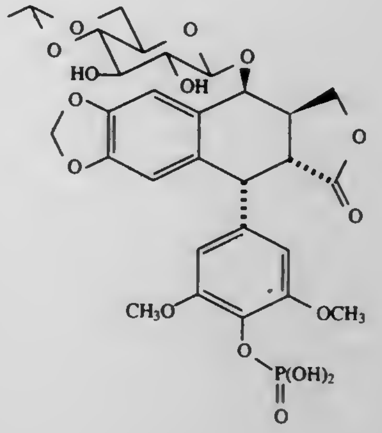
(III)

to produce a compound of Formula IV, where R$_1$ is an arylmethyl hydroxy protecting group;



(IV)

isolating the C-1"-β form of Formula IV; removing the hydroxy and phosphate protecting groups to produce a compound of Formula V;



(V)

treating said compound of Formula V with a phosphatase enzyme to produce the compound of Formula VI.

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5,688,927
MACROPHAGE DERIVED CHEMOKINE

Ronald Godiska, Bothell, and Patrick W. Gray, Seattle, both of Wash., assignors to ICOS Corporation, Bothell, Wash.

Filed Jun. 7, 1995, Ser. No. 480,449

Int. Cl.⁶ C07K *16/22;16/24;16/26*

U.S. Cl. 530—388.23 **10 Claims**

1. A hybridoma cell line producing a monoclonal antibody that is specifically reactive with MDC.

5,688,928
PHENYLBORONIC ACID COMPLEXING REAGENTS DERIVED FROM AMINOSALICYLIC ACID

Mark L. Stolowitz, Long Beach, Calif., assignor to Prolinx, Inc., Bothell, Wash.

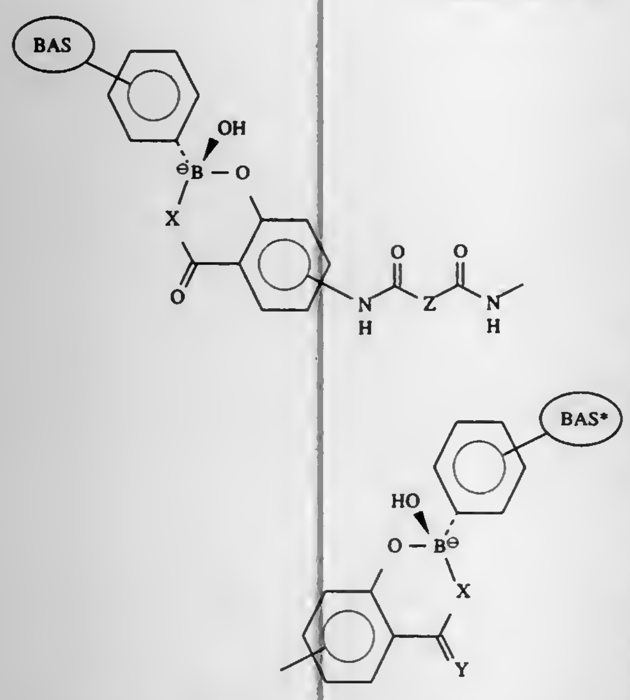
Division of Ser. No. 188,531, Jan. 28, 1994, Pat. No. 5,594,151. This application Jun. 7, 1995, Ser. No. 480,970

Int. Cl.⁶ C07F *5/04*

U.S. Cl. 530—391.1 **4 Claims**

1. A bioconjugate having the general formula:

General Formula VII



wherein group X is selected from the group consisting of O, NH, NCH_3, NOH and $NOCH_3$, wherein group Y is selected from the group consisting of O, S, and NH, wherein group Z is a spacer selected from the group consisting of an alkyl chain of from 1 to 16 carbon equivalents in length and a polyethylene glycol chain, up to 12 carbon equivalents in length, wherein said alkyl chain may contain intermediate amide functionalities, and wherein said Z group may contain a cleavable disulfide bond, and wherein BAS and BAS* are different bioactive species.

5,688,929
SURFACE ACTIVE GALACTURONIC ACID DERIVATIVES

Serge Petit, Montmaco; Robert Ralainirina, Amlens; Serge Favre, Complegne, and Régis De Baynast, Versailles, all of France, assignors to Agro Industrie Recherches et Developpements (A.R.D.), Paris, France, and Zschimmer & Schwarz GmbH & Co. Chemische Fabriken, Lahnstein, Germany

PCT No. PCT/FR92/00701, § 371 Date Feb. 18, 1993, § 102(e) Date Feb. 18, 1993, PCT Pub. No. WO93/02092, PCT Pub. Date Feb. 4, 1993

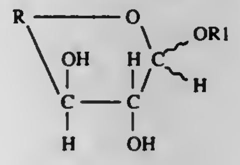
PCT Filed Jul. 17, 1992, Ser. No. 975,546

Claims priority, application France, Jul. 22, 1991, 91 09226

Int. Cl.⁶ C07G *3/00;11/00*

U.S. Cl. 536—4.1 **8 Claims**

1. A galacturonic acid derivative having the formula

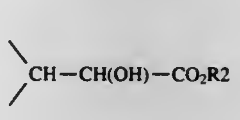


(I)

wherein

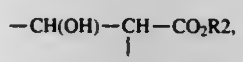
R1 represents linear or branched alkyl having 8–22 carbon atoms, and

R represents



$$>CH-CH(OH)-CO_2R2$$

or



$$-CH(OH)-\underset{|}{C}H-CO_2R2,$$

wherein

R2 is the same as R1 and wherein the carbon atom carrying the hydroxyl group is not attached to the endocyclic oxygen atom.

5,688,930
PROCESS FOR THE PREPARATION OF SURFACE ACTIVE AGENTS USING WHEAT BY-PRODUCTS AND THEIR APPLICATIONS

Jean-Noël Bertho; Philippe Mathaiy; Véronique Dubois, all of Reims, and Régis de Septfontaines De Baynast, Versailles, all of France, assignors to Agro Industrie Recherches et Developpements, Pomacle, France

Filed Aug. 25, 1995, Ser. No. 519,543

Claims priority, application France, Aug. 30, 1994, 94 10406

Int. Cl.⁶ C07G *3/00;* **C07H** *15/04;* **A61K** *31/70*

U.S. Cl. 536—18.6 **9 Claims**

1. A process for preparing a surface active agent wherein wheat bran, wheat fibre or wheat straw is brought into contact with an aqueous acid solution at a temperature of between 20° and 150° C. for at least 5 seconds in order to obtain an aqueous pentose syrup and solid pulp, separating the solid pulp from the aqueous pentose syrup, the latter having a concentration of 30 to 95% by weight of pentoses, contacting the aqueous pentose syrup with an alcohol of the formula R^2OH in which R^2 is a linear alkyl radical having from 1 to 5 carbon atoms at a temperature of between 20° and 150° C. to form a solution of lower alkyl (C_1–C_5) pentosides, contacting the solution of lower alkyl (C_1–C_5) pentosides with an alcohol of the formula R^1OH in which R^1 is a branched or linear alkyl radical having from 6 to 22 carbon atoms at a temperature of between 20° and 150° C. to form a solution of surface active pentosides, and separating the surface active pentosides from the solution.

5,688,931
POLYSACCHARIDE DERIVATIVES AND DRUG CARRIERS

Hideo Nogusa; Hiroshi Hamana; Toshiro Yano; Masahiro Kajiki; Keiji Yamamoto, all of Chiba-ken; Satoshi Okuno, Saitama-ken; Shuichi Sugawara, Chiba-ken; Nobukazu Kashima, Chiba-ken, and Kazuhiro Inoue, Chiba-ken, all of Japan, assignors to Drug Delivery System Institute, Ltd., Tokyo-to, Japan

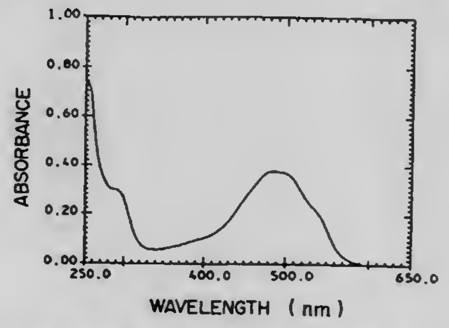
PCT No. PCT/JP94/00322, § 371 Date Dec. 28, 1994, § 102(e) Date Dec. 28, 1994, PCT Pub. No. WO94/19376, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 28, 1994, Ser. No. 325,296

Claims priority, application Japan, Feb. 26, 1993, 5-038635

Int. Cl.⁶ C08B *37/02;37/08;* **C07H** *13/02;* **C07K** *5/00*

U.S. Cl. 536—20 **16 Claims**



1. A polysaccharide derivative comprising a polysaccharide having a carboxyl group into which a peptide chain is introduced at a part or all of the carboxyl groups, the peptide chain comprising 1–8 amino acids where the amino acid may be the same or different, wherein a part or all of the amino groups in the peptide chain which are not involved in the linkages with the carboxyl groups of the polysaccharide or a part or all of the carboxyl groups in the peptide chain may form an acid amide linkage or an ester linkage with a carboxyl group, an amino group or a hydroxyl group of a third compound having the carboxyl group, the amino group or the hydroxyl group, or a salt thereof.

5,688,932

Patent Not Issued For This Number

5,688,933
PREPARATION OF BIOLOGICALLY ACTIVE COMPOUNDS FROM SUBSTANTIALLY PURE ENANTIOMERS OF 2-AZABICYCLO[2.2.1]HEPT-5-EN-ONE

Christopher Thomas Evans, Heydon, and Stanley Micahel Roberts, Kenton, both of England, assignors to Chiroscience, Ltd., Cambridge, England

Continuation of Ser. No. 336,754, Nov. 8, 1994, Pat. No. 5,498,625, which is a continuation of Ser. No. 35,236, Mar. 22, 1993, abandoned, which is a division of Ser. No. 596,306, Oct. 15, 1990, Pat. No. 5,284,769. This application Jun. 5, 1995, Ser. No. 461,973

Claims priority, application United Kingdom, Oct. 16, 1989, 8923278; Oct. 27, 1989, 8924209; Jan. 17, 1990, 9000995

Int. Cl.⁶ C07H *1/00;* **C07D** *437/00;* **C12P** *17/10*

U.S. Cl. 536—22.1 **24 Claims**

1. In a process for producing a substantially pure enantiomer of a compound having biological activity, the process comprising at least one step of reacting racemic or slightly resolved 2-azabicyclo[2.2.1]hept-5-en-3-one to form another racemic or slightly resolved intermediate or product,

the improvement wherein a substantially pure enantiomer of 2-azabicyclo[2.2.1]hept-5-en-3-one is used instead of the racemic or slightly resolved 2-azabicyclo[2.2.1]hept-5-en-3-one, whereby a substantially pure enantiomer of the compound having biological activity is produced.

5,688,934

Patent Not Issued For This Number

5,688,935
NUCLEIC ACID LIGANDS OF TISSUE TARGET

Andrew Stephens, Denver; Daniel J. Schneider; Larry Gold, both of Boulder, all of Colo., and Ulrich Speck, Berlin, Germany, assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo., and Schering Aktiengesellschaft, Berlin, Germany

Continuation-in-part of Ser. No. 964,624, Oct. 21, 1992, Pat. No. 5,496,938, and Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, which is a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned. This application May 3, 1995, Ser. No. 433,126

Int. Cl.⁶ C07H *21/02;21/04;* **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 536—23.1 **13 Claims**

1. A nucleic acid ligand to a target selected from the group consisting of peripheral blood mononuclear cells, fibrin clots, and carotid arteries identified according to a method comprising:

a) preparing a candidate mixture of nucleic acids having a mixture of nucleic acid sequences;

b) contacting said candidate mixture of nucleic acids with said target selected from the group consisting of peripheral blood mononuclear cells, fibrin clots, and carotid arteries, wherein nucleic acids having an increased affinity to the target relative to the candidate mixture may be partitioned from the remainder of the candidate mixture;

c) partitioning the increased affinity nucleic acids from the remainder of the candidate mixture; and

d) amplifying the increased affinity nucleic acids

e) repeating steps a) through d) as required to yield a mixture of nucleic acids enriched for nucleic acid sequences with relatively higher affinity and specificity for binding to said target, whereby a nucleic acid ligand of said target may be identified.

5,688,936
VESICLE MEMBRANE TRANSPORT PROTEINS

Robert H. Edwards, Los Angeles, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 923,096, Jul. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 899,074, Jun. 11, 1992, abandoned. This application May 14, 1993, Ser. No. 63,552

Int. Cl.⁶ C07H *21/04;* **C07K** *14/435*

U.S. Cl. 536—23.5 **1 Claim**

1. An isolated DNA molecule encoding the amino acid sequence shown in FIG. 1 (SEQ ID NO: 2).

5,688,937

Patent Not Issued For This Number

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5,688,938

CALCIUM RECEPTOR-ACTIVE MOLECULES

Edward M. Brown, Milton, Mass.; Forrest H. Fuller, Salt Lake City, Utah; Steven C. Hebert, Wellesley, Mass., and James E. Garrett, Jr., Salt Lake City, Utah, assignors to The Brigham & Women's Hospital, Inc., Boston, Mass., and NPS Pharmaceuticals, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 353,784, Dec. 8, 1994, which is a continuation-in-part of Ser. No. 9,389, Feb. 23, 1993, abandoned, Ser. No. 141,248, Oct. 22, 1993, abandoned, and Ser. No. 292,827, Aug. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 141,248, which is a continuation-in-part of Ser. No. 9,389, which is a continuation-in-part of Ser. No. 17,127, Feb. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 934,161, Aug. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 834,044, Feb. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 749,451, Aug. 23, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 485,588

Int. Cl.^{6} C07K *4/705;* **C12N** *15/12*

U.S. Cl. 536—23.5 **24 Claims**

1. A purified nucleic acid comprising at least 20 contiguous nucleotides of a nucleic acid sequence provided in SEQ ID NO: 1.

5,688,939

PLANT ADENYLOSUCCINATE SYNTHETASE AND DNA CODING THEREFOR

Sharon Lee Potter, Raleigh, and Eric R. Ward, Durham, both of N.C., assignors to Novartis Finance Corporation

Continuation-in-part of Ser. No. 361,611, Dec. 22, 1994, Pat. No. 5,519,125. This application Nov. 29, 1995, Ser. No. 565,655

Int. Cl.^{6} C12N *15/29;5/04;5/06;15/82;1/19;1/21*

U.S. Cl. 536—23.6 **13 Claims**

1. An isolated DNA molecule encoding a plant adenylosuccinate synthetase(ADSS) protein.

5,688,940

LINKER FOR IMMOBILIZATION, MODIFICATION AND SUBSEQUENT RELEASE OF OLIGOMERS WITH A TERMINAL HYDROXYL GROUP

Matthew H. Lyttle, Marin, Calif., assignor to Biosearch Technologies, Inc., San Rafael, Calif.

Filed Feb. 1, 1996, Ser. No. 595,104

Int. Cl.^{6} C07H *21/00;21/02;21/04*

U.S. Cl. 536—25.3 **15 Claims**

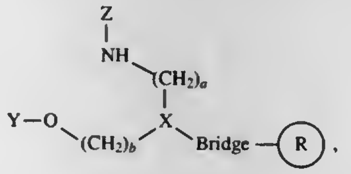
1. A method for the immobilization and subsequent release of an organic hydroxylic compound, R—OH, comprising the following steps:

i) converting the molecule R—OH into its phosphoramidite derivative R—O—P(OR')—N(R")$_2$ wherein R is a primary, secondary, or tertiary aliphatic or aromatic group which may or may not contain other functional groups;

wherein R' is selected from the group consisting of methyl, ethyl, cyanoethyl, phenyl, chlorophenyl, and other aliphatic, branched aliphatic or aromatic groups;

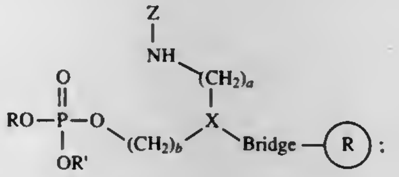
wherein R" is selected from the group consisting of methyl, ethyl, isopropyl and other linear and branched aliphatic groups;

ii) a hydroxyl protecting group Y is selectively removed from a derivatized solid support having the structure



where a+b is greater than 1 but less than 6, and X is a nitrogen or CH group, wherein said structure is attached to a solid support —Ⓡ by a bridge group selected from the group consisting of bifunctional aliphatic, bifunctional branched aliphatic, bifunctional polyethylene glycol containing and bifunctional aromatic groups;

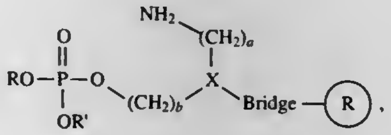
iii) said phosphoramidite is attached to said hydroxyl deprotected derivatized solid support by activation with a tetrazole solution or other phosphoramidite activator solution, followed by oxidation of the phosphorus with iodine solution or other oxidant solution to produce a compound having the structure



iv) the protecting group Z of the intermediate produced by step iii which masks the nitrogen functionality is removed selectively, and;

v) the intermediate produced by step iv is contacted with a mildly basic buffer solution to promote intramolecular attack at phosphorus by the nitrogen to produce the compound R—OH.

12. A method for the release of an organic hydroxylic compound R—OH from a solid support having the structure



where a+b is greater than 1 but less than 6, and X is a nitrogen or CH group;

wherein said structure is attached to a solid support —Ⓡ by a bridge group selected from the group consisting of bifunctional aliphatic, bifunctional branched aliphatic, bifunctional polyethylene glycol containing and bifunctional aromatic groups between X and the support —Ⓡ;

wherein R is a primary, secondary, or tertiary aliphatic or aromatic group which may or may not contain other functional groups;

wherein R' is selected from the group consisting of methyl, ethyl, cyanoethyl, phenyl, chlorophenyl, and other aliphatic, branched aliphatic and aromatic groups comprising contacting said structure with a mildly basic buffer solution to promote intramolecular attack at phosphorus by the nitrogen to produce the compound R—OH.

5,688,941

METHODS OF MAKING CONJUGATED 4' DESMETHYL NUCLEOSIDE ANALOG COMPOUNDS

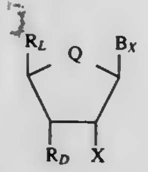
Phillip Dan Cook, Vista, and Kelly Teng, San Diego, both of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 566,836, Aug. 13, 1990, Pat. No. 5,223,618, , which is a continuation-in-part of Ser. No. 39,846, Mar. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 903,160, Jun. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 703,619, May 21, 1991, Pat. No. 5,378,825, which is a continuation-in-part of Ser. No. 566,836, and Ser. No. 558,663, Jul. 27, 1990, Pat. No. 5,138,045. This application Dec. 5, 1996, Ser. No. 760,848

Int. Cl.^{6} C07H *19/06;19/16;21/00*

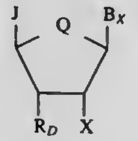
U.S. Cl. 536—25.3 **5 Claims**

1. A method for forming a 4'-desmethyl conjugated monomer having structure:



comprising the steps of:

(a) providing a synthon having structure:



and

(b) contacting this synthon with an activated conjugating group; the contacting being for a time and under reaction conditions sufficient to form the conjugated monomer;

wherein:

R_L is a group of formula:

R_C—$[Y]_e$—Z—

R_C is O-alkyl, O-alkenyl, O-alkynyl, a polyamine, a polyether, a steroid molecule, a reporter molecule, an aromatic lipophilic molecule, a non-aromatic lipophilic molecule, a reporter enzyme, a peptide, a protein, a water soluble vitamin, a lipid soluble vitamin, a carbohydrate, a terpene molecule, a phospholipid, an intercalator, a cell receptor binding molecule, a crosslinking agent, of a porphyrin;

Z is O, S or HN;

Y is a bivalent linker;

e is 0 or 1;

B_x is a nucleobase;

X is H, OH, O-alkyl, O-alkoxylalkyl, O-alkylamino, or F;

J is a leaving group;

Q is O, S, CH_2, CHF or CF_2; and

R_D is H, hydroxyl, an activated phosphorous group, a nucleoside, an activated nucleotide, a nucleotide, an oligonucleotide, an oligonucleoside or a protected derivative thereof.

5,688,942

PROCESS FOR PREPARING 2-ISOCEPHEM DERIVATIVES

Michio Sasaoka; Daisuke Suzuki; Delsoo Suh, and Yoshihisa Tokumaru, all of Tokushima-ken, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP96/00538, § 371 Date Nov. 6, 1996, § 102(e) Date Nov. 6, 1996, PCT Pub. No. WO96/28453, PCT Pub. Date Sep. 19, 1996

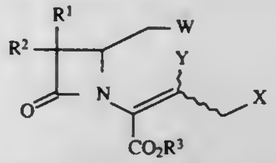
PCT Filed Mar. 6, 1996, Ser. No. 732,446

Claims priority, application Japan, Mar. 10, 1995, 7-079491

Int. Cl.^{6} C07D *513/04;507/08*

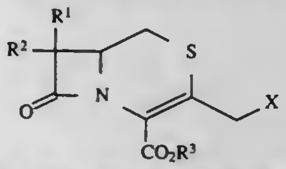
U.S. Cl. 540—214 **6 Claims**

1. A process for preparing a 2-isocephem derivative characterized in that a thioacetic acid derivative which itself is basic or a mixture of a base and a thioacetic acid derivative is caused to act on a 2-azetidinyl-3,4-dihalogeno- 2-butenoic acid compound represented by the general formula (1) in a water-containing organic solvent to obtain a 3-halomethyl- 2-isocephem derivative represented by the general formula (2)



(1)

wherein R^1 is a hydrogen atom, amino or protected amino, R^2 is a hydrogen atom or lower alkoxyl, or R^1 and R^2, when taken together, form a cyclic amino protecting group, R^3 is a hydrogen atom or carboxylic acid protecting group, W is a leaving group, and X and Y are the same or different and are each a halogen atom



(2)

wherein R^1, R^2, R^3 and X are the same as above.

5,688,943

BENZODIAZEPINE DERIVATIVES USEFUL AS CCK-RECEPTOR ANTAGONISTS

Hamish Ryder; Graeme Semple, both of Southampton; David Alan Kendrick, Eastleigh; Michael Szelke, Romsey, all of United Kingdom; Masato Satoh, Ibakaki, Japan; Mitsuaki Ohta, Ibaraki, Japan; Keiji Miyata, Ibaraki, Japan, and Akito Nishida, Ibaraki, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/GB93/00404, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO93/16999, PCT Pub. Date Sep. 2, 1993

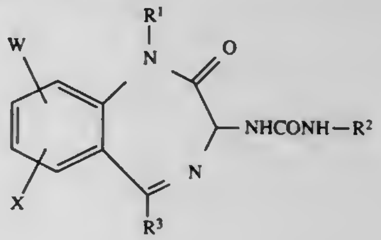
PCT Filed Feb. 26, 1993, Ser. No. 284,462

Claims priority, application United Kingdom, Feb. 27, 1992, 9204221; Jun. 16, 1992, 9212740

Int. Cl.^{6} C07D *243/34;* **A61K** *31/55*

U.S. Cl. 540—509 **16 Claims**

1. A benzodiazepine compound of formula 1, or a pharmaceutically acceptable salt thereof:



I

wherein:

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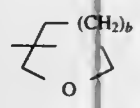
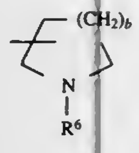
(a) R^1 is $—CH_2CHOH(CH_2)_aR^4$ or a ketone group $—CH_2CO(CH_2)_aR^5$ in which a is 0 or 1, or a group $—CH_2COC(CH_3)_2—R^5$;

R^4 and R^5 are selected from $(C_1–C_8)$alkyl groups; $(C_3–C_8)$cycloalkyl and adamantyl groups, which may be unsubstituted or substituted by one or two $(C_1–C_8)$alkyl groups; and groups of formulae II and III;



II



III

in which

R^6 is H or (C_1C_8)alkyl or $—CO—(C^{1-C}{}_6)$alkyl and b is 1 or 2;

(b) R^2 and R^3 are independently selected from 5-and 6-membered aromatic carbocyclic and 5-and 6-membered heterocyclic groups with one heteroatom selected from the group consisting of N, O and S, where R^2 and R^3 each may have 1 or 2 substituents selected from the group consisting of a halogen atom, an amino group, a hydroxyl group, a nitro group, a cyano group, an alkyl group, an alkoxy group, a hydroxyamino group, an alkylamino group and a dialkylamino group, a carbamoyl group, a formylamino group, an alkylaminoalkyl group, a dialkylaminoalkyl group, a $—(CH_2)_c—CO_2H$ group in which c is 0–2 and a $—(CH_2)_c—CO_2H$ in which c is 0–2, wherein alkyl portions of the recited groups consist of 1 to 6 carbon atoms; and

(c) W and X are selected independently from halogen and hydrogen atoms and $(C_1–C_8)$alkyl and $(C_1–C_8)$alkoxy groups.

5,688,944

CARBAMAZEPINE DERIVATIVES

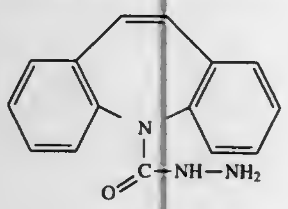
Chengrong Wang, Hockessin, Del., assignor to Dade International Inc., Deerfield, Ill.

Filed Jun. 7, 1995, Ser. No. 473,810

Int. Cl.^{6} C07D *223/22;* **G01N** *33/546*

U.S. Cl. 540—529 **1 Claim**

1. A compound having the structural formula



5,688,945

COMPOUNDS

Susanna Karin Maria Björk, Södertälje; Birgitta Kristina Gotthammar, Saltsjö-Boo; Mats Torbjörn Linderberg, Södertälje; Johan Per Luthman, Gnesta; Kerstin Margareta Irma Persson, Nykvarn, all of Sweden, and Robert Schwarcz, Baltimore, Md., assignors to Astra Aktiebolag, Sodertalje, Sweden, and The University of Maryland at Baltimore, Baltimore, Md.

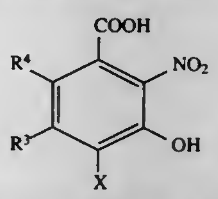
Continuation of Ser. No. 203,908, Feb. 24, 1994, abandoned. This application Dec. 20, 1996, Ser. No. 770,488

Claims priority, application Sweden, Feb. 26, 1993, 9300657

Int. Cl.^{6} C07D *227/02;* **C07C** *315/00;317/00*

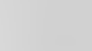
U.S. Cl. 544—235 **1 Claim**

1. A compound of the general formula II



II

wherein X is selected from alkylthio, arylthio, aryloxy, halogen and cyano; R^3, R^4 are the same or different and selected from halogen, methyl, fluoroalkyl, cyano and $Z—R^5$ wherein Z is selected from CH_n, NH_m, O, S, SO_2 and CO wherein n=1 or 2; m=0 or 1 and R^5 is selected from alkyl, aryl and fluoroalkyl; or R^3 and R^4 together form a saturated or unsaturated ring system Y—V—Z wherein Y and Z, independently of each other, are as defined for Z above and V is selected from $C_1–C_3$ alkylene or alkenylene, —N═, —N═N— and



$$—N—R_7$$

wherein R_7=H or alkyl.

5,688,946

HAVING RENIN INHIBITING ACTIVITY

Quirico Branca, Basel, Switzerland; Werner Neidhart, Freiburg im Breisgau, Germany; Henri Ramuz, Birsfelden; Heinz Stadler, Rheinfelden, both of Switzerland, and Wolfgang Wostl, Grenzach-Wyhlen, Germany, assignors to Hoffmann La Roche Inc., Nutley, N.J.

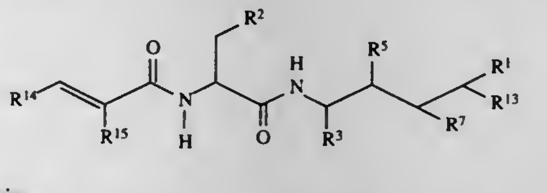
Continuation of Ser. No. 571,689, Aug. 23, 1990, abandoned. This application Jul. 19, 1994, Ser. No. 277,111

Claims priority, application Switzerland, Sep. 4, 1989, 3192/89; Jul. 12, 1990, 2336/90

Int. Cl.^{6} C07D *295/12;295/22;* **A61K** *31/95;37/00*

U.S. Cl. 544—242 **20 Claims**

1. A compound of the formula:



wherein:

R^2 is imidazol-4-yl, R^3 is cyclohexylmethyl or 4,4-difluorocyclohexylmethyl, R^5 and R^7 each are hydroxy or aminomethylcarbonyloxy, R^{12} and R^{13} together with the carbon atom to which they are attached are cyclopropyl or cyclobutyl, R^{14} is phenyl and R^{15} is $C_1–C_4$-alkylcarbonylmethyl, heterocycloalkylcarbonylmethyl, substituted aminocarbonylmethyl, $C_1–C_4$alkylsulphonylmethyl, $C_3–C_6$-cycloalkylsulphonylmethyl, $C_3–C_6$-cycloalkyl-$C_1–C_4$-alkylsulphonylmethyl, substituted amino-$C_1–C_4$-alkylcarbonylmethyl, heterocycloalkylcarbonyloxy, amino-

$C_1–C_4$-alkylsulphonylmethyl or substituted amino-$C_1–C_4$-alkylsulphonylmethyl.

5,688,947

PRODUCTION OF PURINES VIA REDUCTIVE FORMYLATION

Franz Thalhammer, and Jürgen Graefe, both of Trostberg, Germany, assignors to Skw Trostberg Aktiengesellschaft, Trostberg, Germany

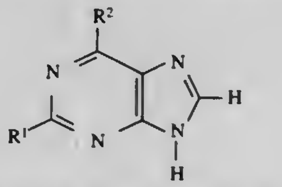
Filed Jun. 26, 1995, Ser. No. 495,051

Claims priority, application Germany, Jun. 28, 1994, 44 22 587.3

Int. Cl.^{6} C07D *473/18;473/16;473/04;473/20*

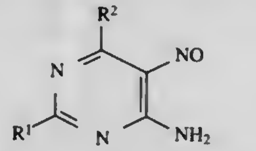
U.S. Cl. 544—264 **25 Claims**

1. Process for the production of a compound of formula (I):



(I)

wherein R_1 and R_2 are the same or different and are selected from the group consisting of H, OH, SH, NH2, N-alkyl, N-dialkyl, halogen, O-alkyl, S-alkyl, alkyl or aryl groups, wherein the alkyl group has from 1 to 4 carbon atoms and the aryl group is a phenyl residue which is non-substituted or substituted by CH_3, OH, NH_2, or halogen; comprising reductively formylating a corresponding 4-amino-5-nitrosopyrimidine compound of formula (II)



(II)

wherein R_1 and R_2 comprises the same groups as recited for Formula I in the presence of formic acid and a noble metal catalyst in a solvent at a temperature of from 80° to 220° C. to produce a 40-amino-5-formylaminopyrimidine intermediate and cyclizing said intermediate to obtain the compound of Formula 1.

5,688,948

PROCESS FOR ISOMERIZING ACYCLIC NUCLEOSIDES AND PROCESS FOR SEPARATING PURINE NUCLEOSIDES

Kunisuke Izawa; Yoshihito Koguchi; Hiroshi Shiragami; Yumiko Uchida, and Satoshi Takamatsu, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

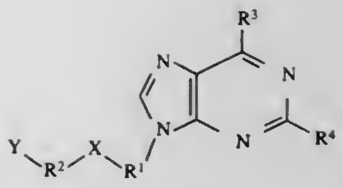
Division of Ser. No. 214,756, Mar. 18, 1994, which is a continuation-in-part of Ser. No. 917,357, Jul. 23, 1992, Pat. No. 5,336,770. This application May 30, 1995, Ser. No. 454,567

Claims priority, application Japan, Sep. 18, 1991, 3-238247

Int. Cl.^{6} C07D *473/18;473/16;473/06;473/30*

U.S. Cl. 544—276 **6 Claims**

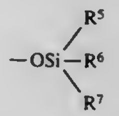
1. A process for producing an acyclic nucleoside derivative represented by the formula (I):



(I)

wherein R^1 represents a methylene group,

R^2 represents an alkylene group with 1 to 4 carbon atoms which may be substituted with hydroxyl group(s), amino group(s), alkoxyl group(s) with 1 to 12 carbon atoms, alkoxycarbonyl group(s), phosphono group(s), dialkoxyphosphoryl group(s), acyloxyl group(s) with 1 to 12 carbon atoms, acylamino group(s) with 1 to 12 carbon atoms, halogen atom(s) and/or silyloxyl group(s) represented by the formula (Ib):

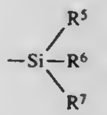


$$—OSi(R^5)(R^6)R^7$$

(Ib)

wherein R^5, R^6 and R^7 which may be identical with, or different from, one another represent an alkyl group with 1 to 4 carbon atoms, a phenyl group or a benzyl group,

R^3 and R^4 each represent independently a hydrogen atom, a halogen atom, a hydroxyl group, an amino group or a mercapto group, said hydroxyl group, amino group and mercapto group being one which may be substituted with an alkyl group with 1 to 12 carbon atoms, an acyl group with 1 to 12 carbon atoms or a silyl group represented by the formula (Ia):



$$—Si(R^5)(R^6)R^7$$

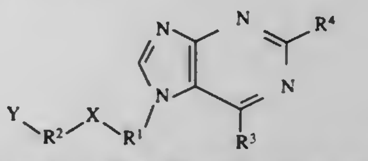
(Ia)

wherein R^5, R^6 and R^7 are the same as those in the formula (Ib),

X represents an oxygen atoms, a sulfur atom, or an amino group, and

Y represents a hydroxyl group, an amino group, an alkoxyl group with 1 to 12 carbon atoms, a phosphono group, a dialkoxyphosphoryl group, an alkoxycarbonyl group with 1 to 12 carbon atoms, an acylamino group with 1 to 12 carbon atoms, a halogen atom, or a silyoxyl group represented by the above-mentioned formula (Ib), wherein acyl is a hydrocarbon carboxylic acid acyl having 1 to 12 carbons, and wherein said process comprises:

(1) heating a solution or suspension containing a 9-substituted purine nucleoside represented by the formula (I) and a 7-substituted purine nucleoside represented by the formula (II) at a temperature within the range from 50° C. to the reflux temperature:



(II)

where R^1, R^2, R^3, R^4, X and Y are respectively the same as in the above-mentioned formula (I), and

(2) crystallizing selectively the 9-substituted purine nucleoside from said solution or suspension.

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PYRAZOLO[1,5-A]PYRIMIDINE DERIVATIVES AND ANTI-INFLAMMATORY AGENT CONTAINING THE SAME

Makoto Inoue; Kinji Hashimoto, both of Naruto; Toshiko Kuwahara, Itano-gun; Yukio Sugimoto, Naruto; Takuji Uesako, Itano-gun, and Toshiaki Funato, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Tokushima-ken, Japan

PCT No. PCT/JP91/01043, § 371 Date Oct. 7, 1993, § 102(e) Date Oct. 7, 1993, PCT Pub. No. WO92/18504, PCT Pub. Date Oct. 29, 1992

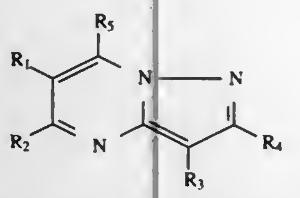
PCT Filed Aug. 6, 1991, Ser. No. 133,086

Claims priority, application Japan, Apr. 22, 1991, 3-090707

Int. Cl.^{6} C07D *487/04;* **A61K** *31/505*

U.S. Cl. 544—281 **3 Claims**

1. A pyrazolo [1,5-a]pyrimidine derivative of the general formula:



wherein R_1, R_2, R_3 and R_4 are the same or different and are each a hydrogen atom, a phenyl group, a lower alkyl group which may optionally be substituted by a hydroxyl group, or a cycloalkyl group, or R_1 and R_2 may combine with each other to form a lower alkylene group; R_5 is a group of the formula: $—SR_6$ or a group of the formula: $—NR_7R_8$ in which R_6 is a pyridyl group or a phenyl group which may optionally be substituted by 1 to 3 groups selected from a hydroxyl group and a lower alkyl group; and R_7 and R_8 are a hydrogen atom or a phenyl group which may optionally be substituted by 1 to 3 groups selected from a hydroxyl group, a lower alkyl group, a lower alkoxycarbonyl group and carboxyl group, provided that R_7 and R_8 are not simultaneously hydrogen atoms, or R_7 and R_8 may combine with each other to form with a nitrogen atom with which they bond 1-pyrrolidinyl group, 2-oxo-1-pyrrolidinyl group, or 1-piperazinyl group substituted by a member selected from the group consisting of a phenyl group having optionally a halogen- or trihalomethyl-substituent, a hydroxy-lower alkyl group or a diphenyl-lower alkyl group, or a salt thereof.

5,688,950
TRICYCLIC AMINOALKYLCARBOXAMIDES; NOVEL DOPAMINE D$_3$ RECEPTOR SUBTYPE SPECIFIC LIGANDS

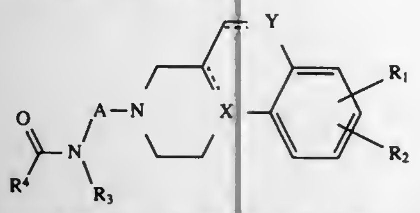
Xi Chen, New Haven; Jun Yuan, Clinton, and Andrew Thurkauf, Danbury, all of Conn., assignors to Neurogen Corporation, Branford, Conn.

Filed Apr. 23, 1996, Ser. No. 636,662

Int. Cl.^{6} C07D *221/06;241/40;241/36*

U.S. Cl. 544—354 **23 Claims**

1. A compound of the formula:



I

or the pharmaceutically acceptable acid addition salts thereof wherein:

R_1 and R_2 are the same or different and represent hydrogen, C_1–C_6 alkyl, halogen, hydroxy, amino, cyano, nitro, trifluoromethyl, trifluoromethoxy, C_1–C_6 alkoxy, $—O_2CR'$, $—NHCOR'$, $—COR'$, $—SO_mR'$, where R' is C_1–C_6 alkyl and wherein m is 0, 1 or 2; or

R_1 and R_2 independently represent $—CONR'R''$, or $—NR'R''$ where R' and R" independently represent hydrogen or C_1–C_6 alkyl;

R_3 is hydrogen or lower alkyl;

A represents an alkylene group of 2 to 6 carbon atoms optionally substituted with one or more alkyl groups having from 1 to 4 carbon atoms;

Y represents methylene;

X is C or CH; and

R_4 is biphenyl, naphthyl, 1 or 2 anthracenyl, 1 or 2 biphenylenyl, dibenzofuranyl, dibenzothiophenenyl, fluorenyl, fluorenonyl, anthroquinonyl, 2-quinoxalinyl or azabiphenyl, each of which is optionally substituted independently by up to three groups selected from halogen, C_1–C_6 alkyl, C_1–C_4 alkoxy, alkylthio, hydroxy, amino, monoalkylamino, dialkylamino, cyano, nitro, trifluoromethyl or trifluoromethoxy.

5,688,951
HINDERED AMINE LIGHT STABILIZER

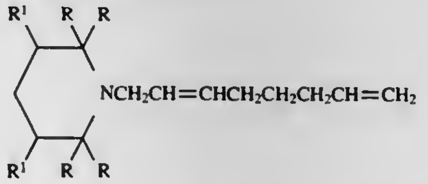
Mark R. Rubino, Pittsburgh, Pa., assignor to Aristech Chemical Corp, Pittsburgh, Pa.

Filed Mar. 11, 1996, Ser. No. 613,898

Int. Cl.^{6} C07D *211/14;211/70;* **C08K** *5/34;5/35*

U.S. Cl. 546—184 **5 Claims**

1. A compound of the formula



wherein each R is independently selected from alkyl groups having from one to two carbon atoms and each R^1 is H or CH_3.

5,688,952
[(BENZODIOXAN BENZOFURAN OR BENZOPYRAN) ALKYLAMINO]ALKYL SUBSTITUTED GUANIDINES

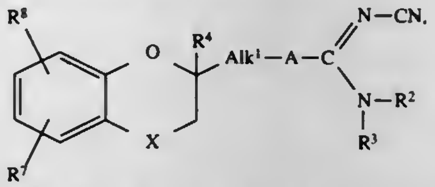
Guy Rosalia Eugène Van Lommen, Berlaar; Marcel Frans Leopold De Bruyn, Hoogstraten, and Walter Jacobus Joseph Janssens, Beerse, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Division of Ser. No. 256,995, Jul. 29, 1994, Pat. No. 5,541,180. This application Apr. 15, 1996, Ser. No. 632,228

Int. Cl.^{6} C07D *403/02;403/14*

U.S. Cl. 546—196 **5 Claims**

1. An intermediate of formula (IX-a):



(IX-a)

the pharmaceutically acceptable acid addition salts thereof, and the stereochemically isomeric forms thereof, wherein:

X is CH_2 or a direct bond;

R^2 is hydrogen, C_{1-6}alkyl, C_{3-6}alkenyl or C_{3-6}alkynyl;

R^3 is hydrogen or C_{1-6}alkyl;

or

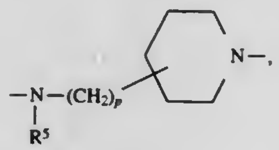
R^2 and R^3 may be taken together to form a bivalent radical of the formula $—(CH_2)_m—$wherein m is 4 or 5;

R^4 is hydrogen or C_{1-6}alkyl;

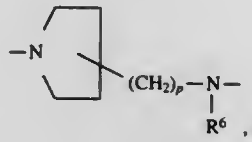
$Alk^1$is a bivalent C_{1-3}alkanediyl radical;

A is a bivalent radical of the formula:

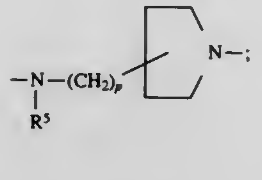
$$—N(R^5)—Alk^2—N(R^6)—$$



(c)



(d)



(e)

wherein:

each R^5 is hydrogen or C_{1-4}alkyl;

each R^6 is hydrogen or C_{1-4}alkyl;

Alk^2 is C_{2-15}alkanediyl or C_{5-7}cycloalkanediyl; and each p is 0, 1 or 2; and

R^7 and R^8 each independently are hydrogen, halo, C_{1-6}alkyl, C_{3-6}alkenyl, C_{3-6}alkynyl, hydroxy, C_{1-6}alkyloxy, cyano, aminoC_{1-6}alkyl, carboxyl, C_{1-6}alkyloxycarbonyl, nitro, amino, aminocarbonyl, mono-or di(C_{1-6}alkyl)amino, or C_{1-6}alkylcarbonylamino,

wherein in the bivalent radical (c), the free bond from the $—N(R^5)—$moiety is bonded to the Alk^1 moiety.

5,688,953
PROCESS FOR THE PREPARATION OF 3,3,5-TRICHLOROGLUTARIMIDE

Timothy J. Adaway, and Larry D. Kershner, both of Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Jul. 31, 1996, Ser. No. 690,722

Int. Cl.^{6} C07C *211/02;211/38*

U.S. Cl. 546—243 **5 Claims**

1. A process for preparing 3,3,5-trichloroglutarimide, comprising:

(a) combining 4-cyano-2,2,4-trichlorobutanoyl chloride with water in an inert organic solvent at a temperature between about 20° C. and about 50° C. to obtain a mixture of 3,3,5-trichloroglutarimide and 3,3,5,6-tetrachloro-5,6-dihydropyridin-2-one; and

(b) heating the 3,3,5,6-tetrachloro-5,6-dihydropyridin- 2-one in the presence of water and inert organic solvent to between about 90° C. and about 100° C. to convert the 3,3,5,6-tetrachloro-5,6-dihydropyridin-2-one to 3,3,5-trichloroglutarimide.

5,688,954
PROCESS FOR THE PREPARATION OF SUBSTITUTED THIOPYRAN-1-OXIDES

Philippe Pitchen, Dagenham, United Kingdom; Matthew Powers, Barto, Pa.; Patrick Leon, Tassin La Demi Lune, and Dominique Petre, Lyons, both of France, assignors to Rhone-Poulenc Rorer Limited, Dagenham, United Kingdom

PCT No. PCT/GB94/02332, § 371 Date Apr. 24, 1996, § 102(e) Date Apr. 24, 1996, PCT Pub. No. WO95/11900, PCT Pub. Date May 4, 1995

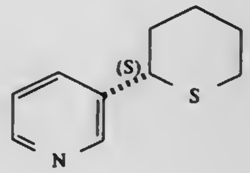
PCT Filed Oct. 24, 1994, Ser. No. 633,749

Claims priority, application United Kingdom, Oct. 25, 1993, 9321939

Int. Cl.^{6} C07D *409/04*

U.S. Cl. 546—268 **11 Claims**

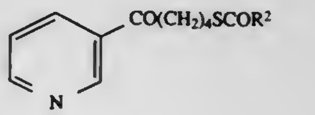
1. A process for the preparation of a compound of formula (IX)



(IX)

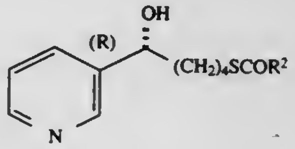
which comprises the following step sequence:

a) reducing a compound of formula (XI)



(XI)

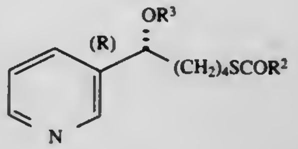
wherein R^2 is a straight or branched C_{1-4} alkyl group or a salt or addition compound thereof using a chiral reducing agent or by biochemical reducing means to provide a compound of formula (X)



(X)

wherein R^2 is as defined previously;

b) converting a compound of formula (X) to a compound of formula (XII)



(XII)

wherein R^2 is as defined previously and R^3 represents an alkyl- or arylsulphonyl group; and

c) cyclising the so-formed (R) isomer of formula (XII) to provide the desired (S) isomer of formula (IX).

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5,688,955

KAPPA AGONIST COMPOUNDS AND PHARMACEUTICAL FORMULATIONS THEREOF

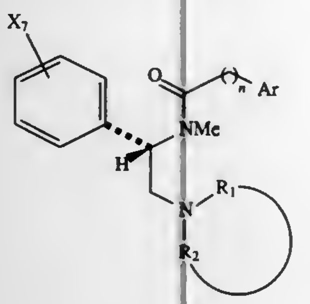
Lawrence I. Kruse, Haddonfield, N.J.; An-Chih Chang, Phoenixville, Pa.; Diane L. DeHaven-Hudkins; John J. Farrar, both of Chester Springs, Pa.; Forrest Gaul, Glen Moore, Pa.; Virendra Kumar, Paoli, Pa.; Michael Anthony Marella, Exton, Pa.; Alan L. Maycock, Malvern, Pa., and Wei Yuan Zhang, Collegeville, Pa., assignors to Adolor Corporation, Malvern, Pa.

Continuation-in-part of Ser. No. 612,680, Mar. 8, 1996. This application Feb. 5, 1997, Ser. No. 796,078

Int. Cl.^{6} C07D *401/10*

U.S. Cl. 546—276.4 **15 Claims**

1. A compound of the formula III or a pharmaceutically acceptable salt thereof



(III)

wherein

n=1–3;

R_1 and R_2 are independently =CH$_3$; —(CH$_2$)$_m$, where m=4–8, —CH$_2$CH(OH)(CH$_2$)$_2$—; —CH$_2$CH(F)(CH$_2$)$_2$—; —(CH$_2$)$_2$O(CH$_2$)$_2$—; or —(CH$_2$)$_2$CH=CHCH$_2$—;

Ar=unsubstituted or mono-, or di-substituted phenyl wherein said substituents are selected from the group consisting of halogen, OCH$_3$, SO$_2$CH$_3$, CF$_3$, amino, alkyl, and 3,4-dichloro; benzothiophenyl; benzofuranyl; naphthyl; diphenyl methyl; or 9-fluorene; or Ar=heteroaromatic groups having 1–3 heteroatoms selected from the group consisting N, O and S and bearing 1–4 substituents selected from the group consisting of chlorobenzoyl, Br, Cl, F, alkyl, alkoxy, carboxy, carboxamided, amine, amide and sulfonamide;

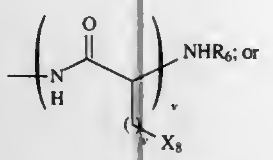
X_7 is

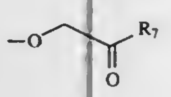
—NHSO$_2$CH$_3$; —NHP(O)(OBn)$_2$; —NHP(O)(OH)$_2$; —(CH$_2$)$_u$NHSO$_2$CH$_3$; —(CH$_2$)$_u$NHC(S)NHCH(CO$_2$H)(CH$_2$)$_u$CO$_2$H; —CONHOH; or —(CH$_2$)$_u$CONHOH;

wherein

u=1–5;

or X_7 is





R_6=—H or -Ac;

X_8=—CO$_2$H; —NHSO$_2$CH$_3$; —NHP(O)(OBn)$_2$; —NHP(O)(OH)$_2$; —OP(O)(OBn)$_2$; or —OP(O)(OH)$_2$;

R_7=—NH(CH$_2$)$_v$CO$_2$H; —NH(CH$_2$)$_v$CH(NH$_2$)(CO$_2$H); —NHCH(CO$_2$H)(CH$_2$)$_v$NH$_2$; —NH(CH$_2$)$_v$SO$_3$H; —NH(CH$_2$)$_v$PO$_3$H$_2$; —NH(CH$_2$)$_v$NHC(NH)NH$_2$; or —NHCH(CO$_2$H)(CH$_2$)$_v$CO$_2$H; and

v=1–20.

5,688,956

METHOD FOR PREPARING N-METHYL 2-(3-PYRIDYL) (1R,2R)-2-TETRAHYDROTHIOPYRANCARBOTHIOAMIDE-1-OXIDE

Marie-Thérèse David-Comte, Villemoisson-su-Orge, France, assignor to Rhone-Poulenc Rorer S.A., Antony Cedex, France

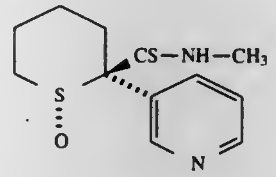
Filed Aug. 15, 1995, Ser. No. 515,421

Claims priority, application France, Mar. 2, 1993, 93 02369

Int. Cl.^{6} C07D *401/04*

U.S. Cl. 546—280.1 **8 Claims**

1. Process for the preparation of (1R,2R)-N-methyl-2-(3-pyridyl) tetrahydrothiopyran-2-carbo-thioamide 1-oxide of formula:



wherein a salt of (1 R,2R)-N-methyl-2-(3-pyridyl) tetrahydrothiopyran-2-carbothioamide 1-oxide with an optically active acid chosen from (–)-camphanic acid and (+)-3-bromo-10-camphorsulphonic acid is selectively precipitated in a solvent chosen from water, aliphatic alcohols containing 1 to 4 carbon atoms and aqueous-alcoholic mixtures, from the salt of a mixture of the (1R,2R)- and (1S,2S)-trans isomers of N-methyl-2-(3-pyridyl)tetrahydrothiopyran-2-carbothioamide 1-oxide with the optically active acid, and the (1R,2R)-N-methyl-2 -(3-pyridyl)tetrahydrothiopyran-2-carbothiodiamine 1-oxide is then liberated from its salt.

5,688,957

[(3"-THIOXACYCLOHEX-1"-ENYL)]-BUT-3'-ENE-1'-YNYL]ARYL AND [(3"-THIOXACYCLOHEX-1"-ENYL)]-BUT-3'-ENE-1'-YNYL]HETEROARYL CARBOXYLIC ACIDS AND ESTERS HAVING RETINOID-LIKE BIOLOGICAL ACTIVITY

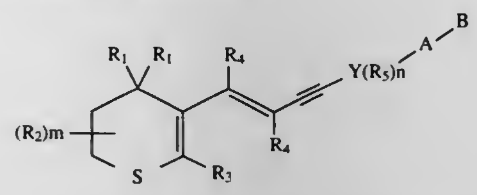
Min Teng, Aliso Viejo, and Roshantha A. Chandraratna, Mission Viejo, both of Calif., assignors to Allergan, Waco, Tex.

Filed Dec. 29, 1995, Ser. No. 581,121

Int. Cl.^{6} C07D *335/02;409/10*

U.S. Cl. 546—280.1 **22 Claims**

1. A compound of the formula



where R_1, R_2, R_3, and R_4 independently are H or lower alkyl of 1 to 10 carbons;

R_5 is lower alkyl of 1 to 10 carbons, fluoro, chloro, bromo, iodo, nitro, or fluoroalkyl having 1 to 10 carbons;

m is an integer having the value of 1–4;

n is an integer having the value of 0–4;

Y is phenyl or a heteroaryl group selected from a group consisting of pyridyl, thienyl, furyl, pyridazinyl, pyrimidinyl, pyrazinyl, thiazolyl and oxazolyl, said Y group being optionally substituted with one or more R_5 group;

A is (CH$_2$)$_p$ where p is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds, and

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, COOR$_8$, CONR$_9$R$_{10}$, —CH$_2$OH, CH$_2$OR$_{11}$, CH$_2$OCOR$_{11}$, CHO, CH(OR$_{12}$)$_2$, CHOR$_{13}$O, —COR$_7$, CR$_7$(OR$_{12}$)$_2$, or CR$_7$OR$_{13}$O, where R_7 is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R10 independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, and R_{13} is divalent alkyl radical of 2–5 carbons.

5,688,958

CATIONIC PHOSPHOLIPIDS FOR TRANSFECTION

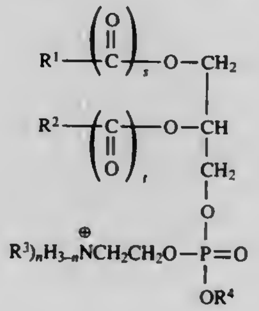
Gary W. Ashley, Alameda, Calif.; Robert C. MacDonald, Evanston, and Miho Shida, Barrington, both of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation of Ser. No. 220,376, Mar. 29, 1994. This application Jun. 6, 1995, Ser. No. 468,873

Int. Cl.^{6} C07F *9/10;9/653*

U.S. Cl. 548—113 **16 Claims**

1. A method for synthesizing a cationic lipid having formula



wherein

R^1 and R^2 independently are H or C_1 to about C_{24} straight or branched alkyl, a C_2 to about C_{24} straight or branched alkenyl, or alkynyl chains optionally substituted with a dansyl, NDB, DPH, carbocyclic aromatics, or heterocyclic moiety,

R^3 is hydrogen or methyl,

R^4 is C_1 to about C_{24} straight or branched alkyl, a C2 to about C24 straight or branched alkenyl, or alkynyl chain optionally substituted with a dansyl, NDB, DPH, carbocyclic aromatic, or heterocyclic moiety, or R^4 is a C_1 to about C_6 straight or branched chain ester, aldehyde, ketone, ether, haloalkyl, azidoalkyl, or a C_4 to about C_6 tetraalkylammonium,

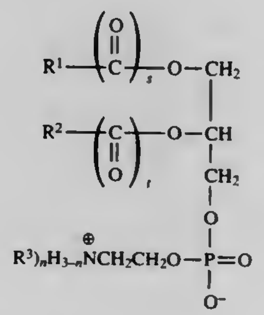
n is 0, 1, 2, or 3,

s is 0 or 1, and

t is 0 or 1,

provided that R^1 and $R^2$are not both H and that when R is H, s is 0, and that when R^2 is H, t is 0,

the method comprising contacting a parent compound having formula:



with a substituted trifluoromethanesulfonate.

5,688,959

PHOTOGRAPHIC COLOR ELEMENTS

Henri François Olbrechts, Brasschaat; Raphaël Karel Van Poucke, Berchem, and Christian Charles Van den Sande, Belsele, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Division of Ser. No. 780,585, Sep. 26, 1985, Pat. No. 5,030,544. This application May 6, 1991, Ser. No. 696,111

Claims priority, application European Pat. Off., Sep. 28, 1984, 84201385

Int. Cl.^{6} C07D *277/46*

U.S. Cl. 548—195 **3 Claims**

1. Infrared-absorbing quinone imine dyes formed by a coupling reaction between an oxidized aromatic primary amino compound and 1-hydroxy-2-N-(5-alkyl-thiazol- 2-yl)-naphthamide couplers bearing on the thiazol-2-yl group a 4-para-C_1–C_4alkoxyphenyl group or a 4-para-C_1–C_4alkylphenyl group, the hydrogen atoms of said C_1–C_4-alkoxy or C_1–C_4-alkyl being unsubstituted or at least one of them having been substituted by a halogen atom.

5,688,960

SUBSTITUTED OXIMES, HYDRAZONES AND OLEFINS USEFUL AS NEUROKININ ANTAGONISTS

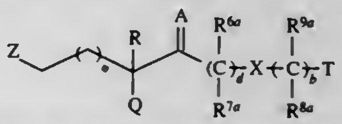
Bandarpalle B. Shankar, Branchburg, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 641,384, Apr. 30, 1996, which is a continuation-in-part of Ser. No. 460,819, Jun. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 432,740, May 2, 1995, abandoned. This application Oct. 31, 1996, Ser. No. 742,013

Int. Cl.^{6} C07D *409/06;* **A61K** *31/445*

U.S. Cl. 546—202 **23 Claims**

1. A compound represented by the structural formula



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or a pharmaceutically acceptable salt thereof, wherein:

a is 0, 1, 2 or 3;

b and d are independently 0, 1 or 2;

R is H, C_{1-6} alkyl, —OR^6 or C_2–C_6 hydroxyalkyl;

A is =N—OR^1, =N—N(R^2)(R^3), =C(R^{11})(R^{12}) or =NR^{25};

X is a bond, —C(O)—, —O—, —NR^6—, —S(O)$_e$—, —N(R^6)C(O)—, —C(O)N(R^6)— —OC(O)NR^6—, —OC(=S)NR^6—, —N(R^6)C(=S)O—, —C(=NOR^1)—, —S(O)$_2$N(R^6)—, —N(R^6)S(O)$_2$—, —N(R^6)C(O)O— or —OC(O)—, provided that when d is 0, X is a bond, —C(O)—, —NR^6—, —C(O)N(R^6)—, —N(R^6)C(O)—, —OC(O)NR^6—, —C(=NOR^1)—, —N(R^6)C(=S)O—, —OC(=S)NR^6—, —N(R^6)S(O)$_2$— or —N(R^6)C(O)O—; provided that when A is =C(R^{11})(R^{12}) and d is 0, X is not —NR^6— or —N(R^6)C(O)—; and provided that when A is =NR^{25}, d is 0 and X is —NR^6— or —N(R^6)C(O)—;

T is H, R^4-aryl, R^4-heterocycloalkyl, R^4-heteroaryl, phthalimidyl, R^4-cycloalkyl or R^{10}-bridged cycloalkyl;

Q is R^5-heteroaryl;

R^1 is H, C_{1-6} alkyl, —(C(R^6)(R^7))$_n$—G, —G^2, —(C(R^6)(R^7))$_p$—M— (C(R^{13})(R^{14}))$_n$—(C(R^8)(R^9))$_u$—G, —C(O)N(R^6)—(C(R^{13})(R^{14}))$_n$—(C(R^8)(R^9))$_u$—G or —(C(R^6)(R^7))$_p$—M—(R^4-heteroaryl);

R^2 and R^3 are independently selected from the group consisting of H, C_{1-6} alkyl, —CN, —(C(R^6)(R^7))$_n$—G, —G^2, —C(O)—(C(R^8)(R^9))$_n$—G and —S(O)$_e$R^{13}; or R^2 and R^3, together with the nitrogen to which they are attached, form a ring of 5 to 6 members, wherein 0, 1 or 2 ring members are selected from the group consisting of —O—, —S— and —N(R^{19})—;

R^4 and R^5 are independently 1–3 substituents independently selected from the group consisting of H, halogeno, —OR^6, —OC(O)R^6, —OC(O)N(R^6)(R^7), —N(R^6)(R^7), C_{1-6} alkyl, —CF$_3$, —C$_2$F$_5$, —COR^6, —CO$_2$R^6, —CON(R^6)(R^7),

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—S(O)$_e$R^{13}, —CN, —OCF$_3$, —NR^{6}CO$_2$R^{16}, —NR^{6}COR^7, —NR^{8}CON(R^6)(R^7), R^{15}-phenyl, R^{15}-benzyl, NO$_2$, —N(R^6)S(O)$_2$R^{13} or —S(O)$_2$N(R^6)(R^7); or adjacent R^4 substituents or adjacent R^5 substituents can form a —O—CH$_2$—O— group; and R^4 can also be R^{15}-heteroaryl;

R^6, R^7, R^8, R^{6a}, R^{7a}, R^{8a}, R^{13} and R^{14} are independently selected from the group consisting of H, C$_{1-6}$ alkyl, C$_2$–C$_6$ hydroxyalkyl, C$_1$–C$_6$ alkoxy-C$_1$–C$_6$ alkyl, R^{15}-phenyl, and R^{15}-benzyl; or R^6 and R^7, together with the nitrogen to which they are attached, form a ring of 5 to 6 members, wherein 0, 1 or 2 ring members are selected from the group consisting of —O—, —S— and —N(R^{19})—;

R^9 and R^{9a} are independently selected from the group consisting of R^6 and —OR^6

R^{10} and R^{10a} are independently selected from the group consisting of H and C$_{1-6}$ alkyl;

R^{11} and R^{12} are independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, —CO$_2$R^6, —OR^6, —C(O)N(R^6)(R^7), C$_1$–C$_6$ hydroxyalkyl, —(CH$_2$)$_r$—OC(O)R^6, —(CH$_2$)$_r$—OC(O)CH=CH$_2$, —(CH$_2$)$_r$—O(CH$_2$)$_s$—CO$_2$R^6, —(CH$_2$)$_r$—O—(CH$_2$)$_s$—C(O)N(R^6)(R^7) and —(CH$_2$)$_r$—N(R^6)(R^7);

R^{15} is 1 to 3 substituents independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, C$_1$–C$_6$ alkoxy, C$_1$–C$_6$ alkylthio, halogeno, —CF$_3$, —C$_2$F$_5$, —COR^{10}, —CO$_2$R^{10}, —C(O)N(R^{10})$_2$, —S(O)$_e$R^{10a}, —CN, —N(R^{10})COR^{10}, —N(R^{10})CON(R^{10})$_2$ and —NO$_2$;

R^{16} is C$_{1-6}$ alkyl, R^{15}-phenyl or R^{15}-benzyl;

R^{19} is H, C$_1$–C$_6$ alkyl, —C(O)N(R^{10})$_2$, —CO$_2$R^{10}, —(C(R^8)(R^9))$_f$—CO$_2$R^{10} or —(C(R^8)(R^9))$_u$—C(O)N(R^{10})$_2$;

f, n, p, r and s are independently 1–6;

u is 0–6;

G is selected from the group consisting of H, R^4-aryl, R^4-heterocycloalkyl, R^4-heteroaryl, R^4-cycloalkyl, —OR^6, —N(R^6)(R^7), —COR^6, —CO$_2$R^6, —CON(R^7)(R^9), —S(O)$_e$R^{13}, —NR^{6}CO$_2$R^{16}, —NR^{6}COR^7, —NR^{8}CON(R^6)(R^7), —N(R^6)S(O)$_2$R^{13}, —S(O)$_2$N(R^6)(R^7), —OC(O)R^6, —OC(O)N(R^6)(R^7), —C(=NOR^8)N(R^6)(R^7), —C(=NR^{25})N(R^6)(R^7), —N(R^8)C(=NR^{25})N(R^6)(R^7), —CN, —C(O)N(R^6)OR^7, and —C(O)N(R^9)—(R^4-heteroaryl), provided that when n is 1 and u is 0, or when R^9 is —OR^6, G is not —OH or —N(R^6)(R^7);

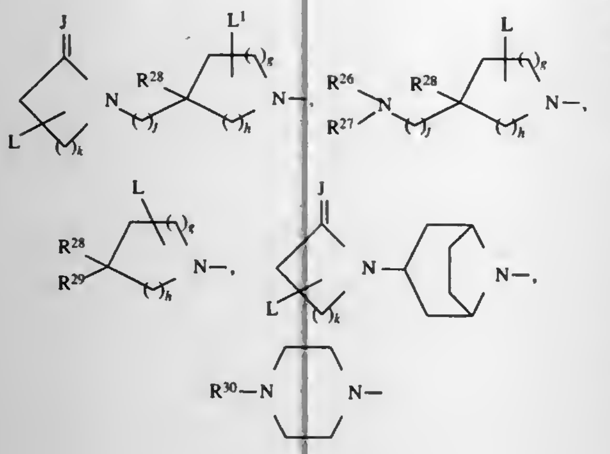
M is selected from the group consisting of a double bond, —O—, —N(R^6)—, —C(O)—, —C(R^6)(OR^7)—, —C(R^8)(N(R^6)(R^7))—, —C(=NOR^6)N(R^7)—, —C(N(R^6)(R^7))=NO—, —C(=NR^{25})N(R^6)—, —C(O)N(R^9)—, —N(R^9)C(O)—, —C(=S)N(R^9)—, —N(R^9)C(=S)— and —N(R^6)C(O)N(R^7)—, provided that when n is 1, G is not OH or —NH(R^6); and when p is 2–6, M can also be —N(R^6)C(=NR^{25})N(R^7)— or —OC(O)N(R^6)—;

G^2 is R^4-aryl, R^4-heterocycloalkyl, R^4-heteroaryl, R^4-cycloalkyl, —COR^6, —CO$_2$R^{16}, —S(O)$_2$N(R^6)(R^7) or —CON(R^6)(R^7);

e is 0, 1 or 2, provided that when e is 1 or 2, R^{13} and R^{10a} are not H;

R^{25} is H, C$_1$–C$_6$ alkyl, —CN, R^{15}-phenyl or R^{15}-benzyl;

Z is



or morpholinyl;

g and j are independently 0–3;

h and k are independently 1–4, provided the sum of h and g is 1–7;

J is two hydrogen atoms, =O, =S, =NR^9 or =NOR^1;

L and L^1 are independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, C$_1$–C$_6$ alkenyl, —CH$_2$-cycloalkyl, R^{15}-benzyl, R^{15}-heteroaryl, —C(O)R^6, —(CH$_2$)$_m$—OR^6, —(CH$_2$)$_m$—N(R^6)(R^7), —(CH$_2$)$_m$—C(O)—OR^6 and —(CH$_2$)$_m$—C(O)N(R^6)(R^7);

m is 0 to 4, provided that when j is 0, m is 1–4;

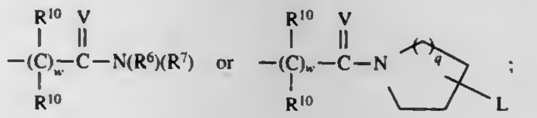
R^{26} and R^{27} are independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, R^4-aryl and R^4-heteroaryl; or R^{26} is H, C$_1$–C$_6$ alkyl, R^4-aryl or R^4-heteroaryl, and R^{27} is —C(O)R^6, —C(O)—N(R^6)(R^7), —C(O)(R^4-aryl), —C(O)(R^4-heteroaryl), —SO$_2$R^{13} or —SO$_2$—(R^4-aryl);

R^{28} is H, —(C(R^6)(R^{19}))$_t$—G, —(C(R^6)(R^7))$_v$—G^2 or —NO$_2$;

t and v are 0, 1, 2 or 3, provided that when j is 0, t is 1, 2 or 3;

R^{29} is H, C$_1$–C$_6$ alkyl, —C(R^{10})$_2$S(O)$_e$R^6, R^4-phenyl or R^4-heteroaryl;

R^{30} is H, C$_1$–C$_6$ alkyl, R^4-cycloalkyl, —(C(R^{10})$_2$)$_w$—(R^4-phenyl), —(C(R^{10})$_2$)$_w$—(R^4-heteroaryl), —C(O)R^6, —C(O)OR^6, —C(O)N(R^6)(R^7),



w is 0, 1, 2, or 3;

V is =O, =S or =NR^6; and

q is 0–4.

5,688,961

METHOD OF MANUFACTURING A SILICON-TYPE CHARGE TRANSPORTING MATERIAL

Nobuo Kushibiki, and Kikuko Takeuchi, both of Kanagawa, Japan, assignors to Dow Corning Asia, Ltd., Tokyo, Japan

Filed Nov. 4, 1996, Ser. No. 740,738

Claims priority, application Japan, Nov. 6, 1995, 7-287644

Int. Cl.^{6} C07F *7/08;7/10;* **G03G** *13/05*

U.S. Cl. 548—955 **12 Claims**

1. A method of manufacturing a silicon-type charge transporting material of a formula A—[R^{1}SiR$^2_{3-n}$Q$_n$]$_p$ wherein A is an aromatic substituted tertiary amine having a plurality of aromatic groups and A represents an organic group derived from a compound having charge transporting properties and an ionization potential within the range of 4.5–6.2 eV; R^1 is an alkylene group of 1–18 carbon atoms; R^2 is a monovalent hydrocarbon group or a monovalent halogen-substituted hydrocarbon group of 1–15 carbon atoms; Q is a hydrolyzable group; and n and p each is 1–3;

the silicon-type charge transporting material is an aromatic substituted tertiary amine having a plurality of aromatic groups, and a silyl group containing the hydrolyzable group Q;

the method comprising introducing, by means of a hydrocarbon group in the presence of a hydrosilylation platinum compound as a catalyst, the silyl group into an aromatic ring of at least one of the aromatic groups of the component A of the formula compound having charge transporting properties and ionization potential within the range of 4.5–6.2 eV;

contacting the silicon-type charge transporting material with an adsorbent for the platinum compound and adsorbing the platinum compound onto the adsorbent; and separating the platinum compound and the adsorbent from the silicon-type charge transporting material, so that the concentration of residual platinum compound in the silicon-type charge transporting material is less than 10 ppm.

5,688,962

CYCLIZATION PROCESS FOR MAKING OXAZOLIKINONES

John Michael Cox, Bracknell; David Philip John Pearson, Holyport; Anthony Marian Kozakiewicz, Wokingham; Richard Butler Moore, Congleton; Glynn Mitchell, Cookham; David William Langton, Reading, and Russell Ellis, Bracknell, all of United Kingdom, assignors to Zeneca Limited, London, England

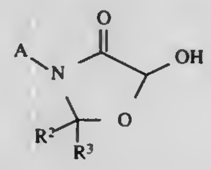
Filed May 16, 1996, Ser. No. 649,843

Claims priority, application United Kingdom, May 26, 1995, 9510750

Int. Cl.^{6} C07D *263/04;263/16;263/46*

U.S. Cl. 548—225 **11 Claims**

1. A process for the synthesis of a compound of general formula II:



II

wherein:

R^2 and R^3 are each independently hydrogen or C$_1$–C$_4$ alkyl; A is an aromatic or heteroaromatic ring system optionally substituted with one or more substituents selected from: halogen, C$_1$–C$_{10}$ hydrocarbyl, —S(C$_1$–C$_{10}$ hydrocarbyl), —SO(C$_1$–C$_{10}$ hydrocarbyl), —SO$_2$(C$_1$–C$_{10}$ hydrocarbyl), cyano, nitro, SCN, SiR$^c_3$ where each R^c is independently C$_1$–C$_4$ alkyl or phenyl, COR^7, CR^{7}NOR^8, NHOH, ONR^{7}R^8, SF$_5$, COOR^7, SO$_2$NR^{7}R^8, OR^9 or NR^{10}R^{11}; and in which any ring nitrogen atom may be quaternised or oxidised;

alternatively, any two substituents of the group A may combine to form a fused 5- or 6-membered saturated or partially saturated carbocyclic or heterocyclic ring in which any carbon or quaternised nitrogen atom may be substituted with any of the groups mentioned above for A or in which a ring carbon atom may be oxidised;

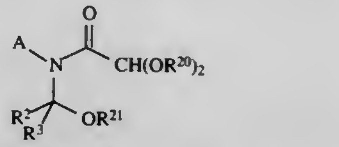
R^7 and R^8 are each independently hydrogen or C$_1$–C$_{10}$ hydrocarbyl;

R^9 is hydrogen, C$_1$–C$_{10}$ hydrocarbyl, SO$_2$(C$_1$–C$_{10}$ hydrocarbyl), CHO, CO(C$_1$– C$_{10}$hydrocarbyl), COO(C$_1$–C$_{10}$ hydrocarbyl) or CONR^{7}R^8;

R^{10} and R^{11} are each independently hydrogen, C$_1$–C$_{10}$ hydrocarbyl, O(C$_1$–C$_{10}$ hydrocarbyl), SO$_2$(C$_1$–C$_{10}$ hydrocarbyl), CHO, CO(C$_1$–C$_{10}$ hydrocarbyl), COO(C$_1$–C$_{10}$ hydrocarbyl) or CONR^{7}R^8;

any of the hydrocarbyl groups within the group A may optionally be substituted with halogen, hydroxy, SO$_2$NR^{a}R^b where R^a and R^b are independently hydrogen or C$_1$–C$_6$ alkyl, cyano, nitro, amino, mono- and dialkylamino in which the alkyl groups have from 1 to 6 or more carbon atoms, acylamino, C$_1$–C$_6$ alkoxy, C$_1$–C$_6$ haloalkoxy, C$_1$–C$_6$ alkylthio, C$_1$–C$_6$ alkylsulphinyl, C$_1$–C$_6$ alkylsulphonyl, carboxy, carboxyamide in which the groups attached to the N atom may be hydrogen or lower hydrocarbyl optionally substituted with halogen; alkoxy carbonyl wherein the alkoxy group may have from 1 to 6 or more carbon atoms, or aryl;

the process comprising cyclising a compound of general formula VII:



VII

wherein A, R^2 and R^3 are as defined for general formula II, R^{20} is hydrogen, benzyl or benzyl substituted with up to five substituents selected from halo, C$_1$–C$_6$ alkyl, O(C$_1$–C$_6$ alkyl) or nitro and R^{21} is C$_1$–C$_8$ alkyl, benzyl or benzyl substituted with up to five of the substituents mentioned above for R^{20}.

5,688,963

INTERMEDIATES FOR THE PREPARATION OF TRIAZOLINONES

Wilhelm Haas, Pulheim; Karl-Heinz Linker, and Kurt Findeisen, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

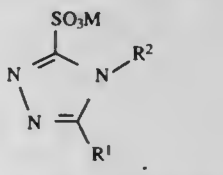
Division of Ser. No. 347,985, Dec. 5, 1994, Pat. No. 5,508,420. This application Jan. 16, 1996, Ser. No. 586,118

Claims priority, application Germany, Dec. 10, 1993, 43 42 190.3

Int. Cl.^{6} C07D *241/12*

U.S. Cl. 548—263.2 **2 Claims**

1. A triazolesulphonic acid or its salt of the formula (III):



(III)

wherein

R^1 represents alkyl having 1 to 6 carbon atoms which is optionally substituted by halogen, cyano or C$_1$–C$_4$-alkoxy, or represents cycloalkyl having 3 to 6 carbon atoms which is optionally substituted by halogen, cyano or C$_1$–C$_4$-alkyl, and

R^2 represents amino, a radical selected from the group consisting of alkyl, alkenyl, alkinyl, alkoxy, alkyl-amino or dialkylamino, each of which has up to 6 carbon atoms in the alkyl, alkenyl or alkinyl groups and each of which is optionally substituted by halogen, cyano or C$_1$–C$_4$-alkoxy, or represents a radical selected from the group consisting of C$_3$–C$_6$-cycloalkyl, C$_3$—C$_6$-cycloalkyl-C$_1$–C$_2$-alkyl or phenyl, each of which is optionally substituted by halogen, cyano, C$_1$–C$_4$-alkyl, C$_1$–C$_4$-alkoxy or C$_1$–C$_4$-alkoxycarbonyl,

and

M represents hydrogen or an alkali metal equivalent or alkaline earth metal equivalent.

5,688,964

PROCESS FOR PREPARING A ACYLHYRAZINO PYRAZOLE DERIVATIVE

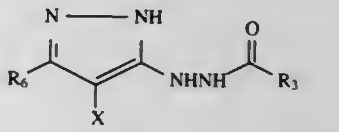
Robert Fogg Romanet, and Susan Marie Fischer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 13, 1996, Ser. No. 600,714

Int. Cl.^{6} C07D *231/38*

U.S. Cl. 548—371.7 **9 Claims**

1. A process for making a compound of formula III



III

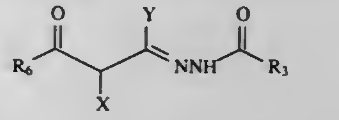
wherein

R$_6$ is a group bonded to the rest of the molecule by a carbon atom;

R$_3$ is a group containing a carbon atom and bonded to the rest of the molecule by a carbon atom or by a heteroatom; and

X is hydrogen or a substituent, comprising:

reacting with hydrazine a compound of formula II



II

wherein

R$_3$, R$_6$, and X have the same meaning as for formula III, and Y is a nucleofugal leaving group selected from halide, alkoxide, and phenoxide.

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5,688,965

AZABICYCLIC COMPOUNDS USEFUL AS AN INTERMEDIATE FOR THE PREPARATION OF PYIDONE CARBOXYLIC ACID COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Choong Sup Kim, Seoul; Jin Woong Kim, Seongnam; Jae Mok Lee, Seoul; Il Hwan Cho; Yong Sik Youn, both of Suwon; Young Jun Shin, Seoul; Ki Ho Lee; Je Hak Kim, both of Suwon; Yong Hwan Jung, Kyonggi-do, and Seung Ho An, Seoul, all of Rep. of Korea, assignors to Cheil Foods & Chemicals, Inc., Seoul, Rep. of Korea

Division of Ser. No. 160,821, Dec. 3, 1993, Pat. No. 5,527,910.

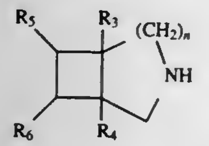
This application Jan. 26, 1996, Ser. No. 592,171

Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26696; Jun. 17, 1993, 93-11125

Int. Cl.^{6} C07D *209/02;209/04;209/52*

U.S. Cl. 548—452 **11 Claims**

1. A compound of the formula:



wherein n is 1 or 2; R_3 and R_4 each represent a hydrogen atom or a lower alkyl group; and R_5 and R_6 each represent a hydrogen atom, a hydroxy or an amino group which is unsubstituted or substituted by a lower alkyl group, with a proviso that one of R_5 and R_6 is not a hydrogen atom, and that at least one of R_3 and R_4 is a hydrogen atom.

8. A process for preparing a compound according to claim 1, comprising

- condensing N-p-toluenesulfonyl-1-methyl-6-oxo-3-azabicyclo[3.2.0]heptane or N-p-toluenesulfonyl-8-oxo-3-azabicyclo[4.2.0]octane with methoxyamine or hydroxyamine hydrochloride in the presence of a base to produce a methoxyimine or hydroxyimine compound;
- reducing said methoxyimine or hydroxyimine compound with a reducing agent to produce an amino compound; and
- deprotecting said amino compound in the presence of an acid.

5,688,966

COMPOUNDS AND METHOD FOR SYNTHESIZING SULFOINDOCYANINE DYES

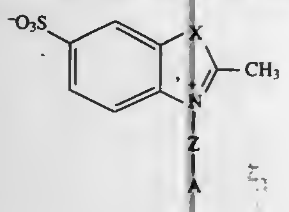
Mark Norman Bobrow, Lexington, and Thomas Joseph Erickson, Carlisle, both of Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 26, 1996, Ser. No. 687,853

Int. Cl.^{6} C07D *403/06*

U.S. Cl. 548—455 **3 Claims**

1. A compound having an indolenine nucleus for synthesizing a sulfoindocyanine dye, said compound having the structure:



wherein

- X is selected from the group consisting of CH_3—C—CH_3, O and S;
- Z is a linkage group through which the indolenine nucleus is linked to A; and
- A is selected from the group consisting of an enzyme substrate and a member of a specific binding pair.

5,688,967

Patent Not Issued For This Number

5,688,968

ENANTIOSELECTIVE SYNTHESIS OF 5,6-DIHYDRO-(S)-4-(ETHYLAMINO)-(S)-6-METHYL-4H-THIENO[2,3-B]THIOPYRAN-2-SULFONAMIDE 7,7-DIOXIDE

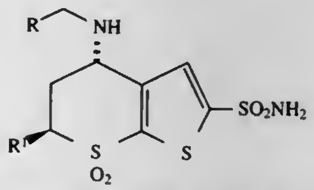
Thomas J. Blacklock, Clark; David J. Mathre, Skillman, and Paul Sohar, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 195,886, Feb. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 35,523, Mar. 23, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,557

Int. Cl.^{6} C07D *495/04*

U.S. Cl. 549—23 **8 Claims**

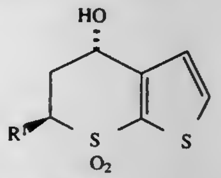
1. A process for the preparation of a Compound of structural formula I:



I

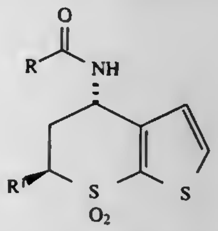
and its hydrochloride salt wherein chirality at C-6 is fixed, and the trans-stereochemical relationship between C-4 and C-6 substituents is retained, compound is crystalline and R and R^1 are the same or different and are C_{1-3} alkyl, which comprises the steps of:

A) treating a compound of formula II with



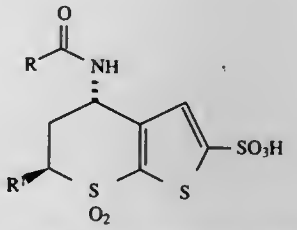
II

a nitrile of formula RCN and a strong acid, such that the amount of water present, depending on the acid employed, is from about 0.5 to about 10 wt %, to form a compound of Structure III:



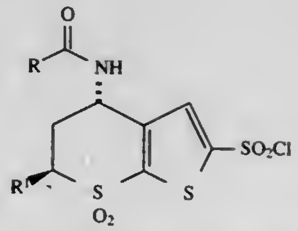
III

B) treating III with chlorosulfonic acid to form a compound of Structure IV:



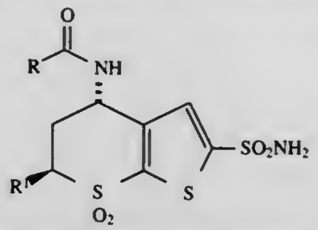
IV

C) treating IV with thionyl chloride to form a compound of Structure V:



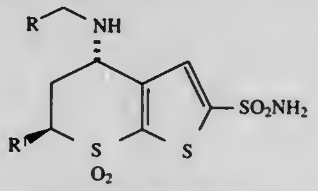
V

D) treating V with ammonia to form a compound Structure VI:



VI

E) treating VI with sodium borohydride and a strong acid, or borane-tetrahydrofuran or borane-dimethyl sulfide to form a compound of Structure VII



VII

F) isolation of VII as the maleate salt VIII;

G) conversion of VIII to the hydro chloride salt of I; and

H) purification of the hydrochloride salt of I.

5,688,969

PROCESS FOR THE PREPARATION OF THIOPHENE-2-5-DICARBOXYLIC ACID AND THE DICHLORIDE THEREOF

Ivan Orban, Basel, Switzerland, assignor to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 517,889, Aug. 21, 1995, abandoned.

This application Nov. 18, 1996, Ser. No. 751,566

Claims priority, application Switzerland, Aug. 25, 1994, 2607/94

Int. Cl.^{6} C07D *333/40*

U.S. Cl. 549—71 **7 Claims**

1. An improved process for the preparation of the dichloride of thiophene-2,5-dicarboxylic acid by reacting thionyl chloride and adipic acid with pyridine as catalyst, wherein the improvement comprises

A) adding 1 part of adipic acid to 3 to 6 parts of thionyl chloride, mixed with a catalytic amount of pyridine,

B) adding a further 4 to 7 parts of thionyl chloride in the temperature range from 85° to 95° C.,

C) removing excess thionyl chloride and volatile by-products under reduced pressure, and

D) bringing the reaction to completion in the temperature range from 140° to 160° C.

wherein the reaction time in steps A up to and including D is below 30 hours in a 1–2 molar batch.

5,688,970

PROCESS TO RECYCLE EXHAUST GASES FROM N-BUTANE CONVERSION INTO MALEIC ANHYDRIDE

Roberto Ruggieri, Milan, and Salvatore Cassarino, Rome, both of Italy, assignors to Sisas Societa' Italiana Serie Acetica E Sintetica SpA, Milan, Italy

Filed Feb. 28, 1995, Ser. No. 395,438

Claims priority, application Italy, Jun. 30, 1994, MI94A1359

Int. Cl.^{6} C07D *307/60*

U.S. Cl. 549—262 **13 Claims**

1. Process for the production of maleic anhydride by catalytic oxidation of n-butane in the vapor phase, comprising the steps of:

- compressing air, oxygen-enriched air or oxygen to a pressure of 1.21 to 3.04 bar;
- mixing said air, oxygen-enriched air or oxygen with recovered exhaust gas to form a recycle gaseous stream;
- compressing said recycle gaseous stream to a pressure of 2.03 to 6.08 bar to form a compressed recycle gaseous stream;
- mixing said compressed recycle gaseous stream with a butane feed to form a reaction mixture at a pressure of 2.03 to 6.08 bar;
- the percentage of exhaust gas in said recycle gaseous stream being regulated such that said reaction mixture has an oxygen content of from 10% to 18% by volume, and the amount of butane being regulated such that the total butane concentration in said reaction mixture ranges from 1.6% to 3.0% by volume;
- feeding said reaction mixture to an oxidation reactor where said butane is catalytically reacted to produce maleic anhydride and other reaction gases comprising nitrogen, oxygen, non-converted butane, organic by-products and water steam;
- cooling said maleic anhydride and other reaction gases;
- feeding said maleic anhydride and other reaction gases to an absorber containing an absorption medium selected from the group consisting of water and an organic solvent to recover said maleic anhydride and produce an exhaust gas fraction, said absorber operating at an outlet pressure of 1.21 to 3.04 bar;
- water-scrubbing said exhaust gas fraction to remove all organic compounds except non-converted butane to produce said recycle gaseous stream and a remaining exhaust gas fraction;
- conveying said remaining exhaust gas fraction to an incinerator where butane and organic products in the remaining exhaust gas fraction are burnt to produce water and carbon dioxide.

5,688,971

PROCESS FOR PRODUCING DIKEGULAC, ITS SALTS AND DERIVATIVES

Stefan Kwiatkowski, Richmond, and Miroslaw J. Golinski, Lexington, both of Ky., assignors to PTRL East, Inc., Richmond, Ky.

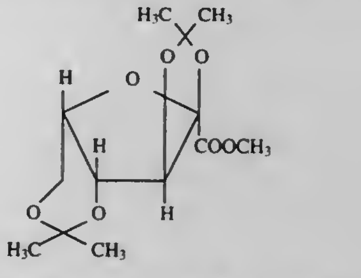
Filed Aug. 9, 1996, Ser. No. 689,545

Int. Cl.^{6} C07D *493/00*

U.S. Cl. 549—361 **3 Claims**

1. A process for producing dikegulac, comprising:

- reacting 2-keto-L-gulonic acid with 2,2-dimethoxypropane to produce a reaction intermediate having a chemical formula



- reacting said reaction intermediate with a base to complete saponification and produce an acid salt having a chemical formula

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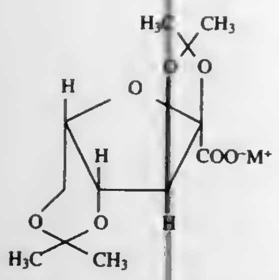


wherein M^+=sodium, potassium, ammonium, calcium, magnesium or copper.

5,688,972

PREPARATION OF ACETALS

Elt Drent, and Dennis Humphrey Louis Pello, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 29, 1995, Ser. No. 536,717

Claims priority, application European Pat. Off., Oct. 3, 1994, 94202860

Int. Cl.^{6} C07D *317/08;319/06;319/12*

U.S. Cl. 549—369 **24 Claims**

1. A process for the preparation of acetals which comprises reacting one or more ethylenically unsaturated compounds with carbon monoxide, hydrogen and a liquid or dissolved organic nucleophilic compound containing at least two vicinal hydroxy groups in the presence of a catalyst system comprising:

a) a source of platinum;

b) a source of anions; and

c) a bidentate ligand of the formula

$$R^1R^2M^1RM^2R^3R^4 \qquad (I)$$

wherein M^1 and M^2 independently represent a phosphorus, arsenic or antimony atom, R represents a bivalent organic bridging group containing from 1 to 4 atoms in the bridge, R^1 and R^2 together represent a bivalent substituted or non-substituted cyclic group wherein the two free valencies are linked to M^1, and R^3 and R^4 independently represent a substituted or non-substituted hydrocarbyl group, or together represent a bivalent substituted or non-substituted cyclic group wherein the two free valencies are linked to M^2.

5,688,973

PROCESS FOR THE PRODUCTION OF 2-VINYL-1,3-DIOXOLANE

Mathias Hoepp, Biebergemuend; Dietrich Arntz, Oberursel; Wolfgang Boeck, Langenselbold; Andreas Bosse-Plois, Bornheim, and Klaus Raible, Frankfurt, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 5, 1995, Ser. No. 523,339

Claims priority, application Germany, Sep. 30, 1994, 44 35 009.0

Int. Cl.^{6} C07D *317/12*

U.S. Cl. 549—430 **24 Claims**

I. A process for the production of 2-vinyl- 1,3-dioxolane, comprising reacting acrolein with ethylene glycol at a temperature of below 50° C. in the presence of a solid acidic catalyst to form a reaction mixture, removing said catalyst to form a catalyst-free reaction mixture, extracting said catalyst-free reaction mixture with an organic solvent wherein the resulting aqueous phase contains ethylene glycol and the resulting organic phase contains 2-vinyl-1,3-dioxolane.

5,688,974

PROCESS FOR THE PREPARATION OF AN ENDOTHELIN ANTAGONIST

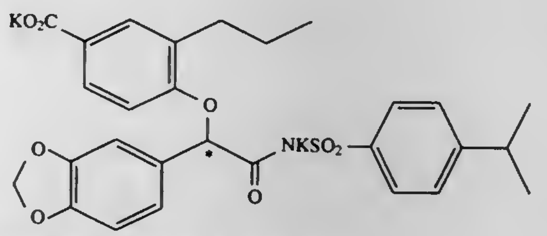
Paul N. Devine, Old Bridge, and David M. Tschaen, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 6, 1996, Ser. No. 759,690

Int. Cl.^{6} C07D *317/44*

U.S. Cl. 549—441 **30 Claims**

1. A process for the preparation of a compound of the structural formula I:

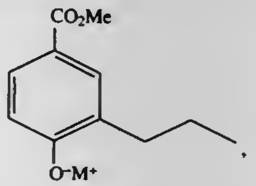


I

wherein the * represents a chiral center;

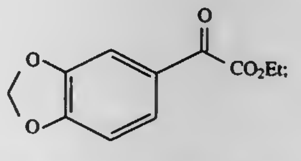
comprising the steps of:

a) reacting the methyl 4-hydroxy-3-n-propylbenzoate with a base in an aprotic solvent to give a salt of methyl 4-hydroxy-3-n-propylbenzoate

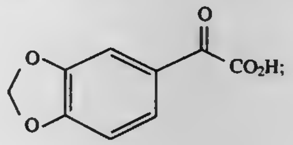


wherein: M^+ is Na^+, K^+, or Li^+;

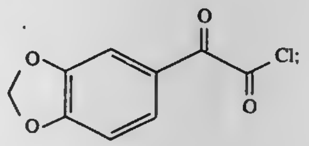
b) acylating 1,3-benzodioxole with ethyl oxalyl chloride in the presence of a lewis acid and an organic solvent to give an ester



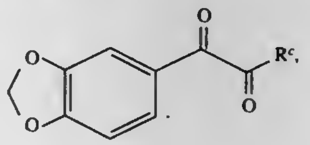
c) hydrolyzing the ester with a base in a solvent to give an acid



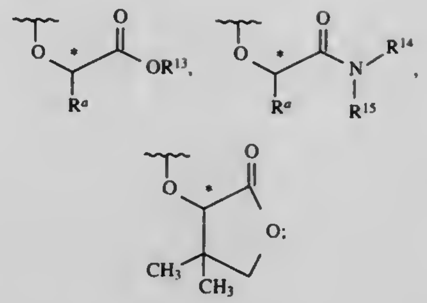
d) reacting the acid with a chlorinating agent in a solvent to give an acid chloride



e) reacting the acid chloride with a chiral auxiliary, R^c, and an organic base to give a substituted ketoester derivative



wherein: R^c is

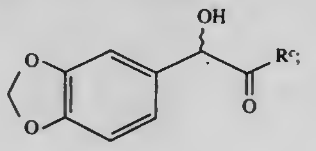


R^a is $(C_1–C_6)$-alkyl, phenyl, or cyclohexyl;

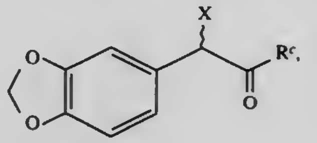
R^{13} is $(C_1–C_6)$-alkyl, phenyl or cyclohexyl;

R^{14} and R^{15} are independently: $(C_1–C_{10})$-alkyl, or R^{14} and R^{15} can join together to form a 5- or 6-membered heterocyclic ring selected from the group consisting of: piperadinyl or pyrrolidinyl;

f) reducing the substituted ketoester derivative with a reducing agent to give a hydroxyl derivative

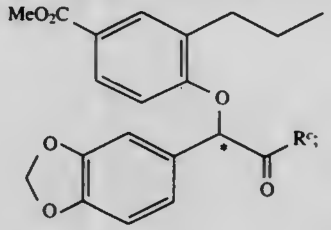


g) halogenating the hydroxyl derivative with a halogenating agent in an organic solvent to give a halo derivative

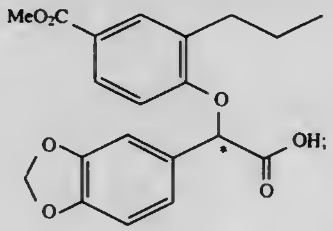


wherein: X is Br, Cl, or I;

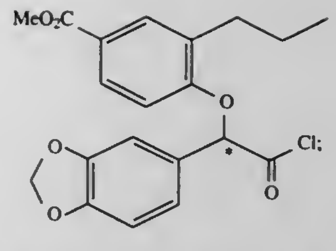
h) alkylating the salt of methyl 4-hydroxy-3-n-propylbenzoate with the halo derivative, in an organic solvent to give a chiral auxiliary phenoxyphenylacetic acid derivative



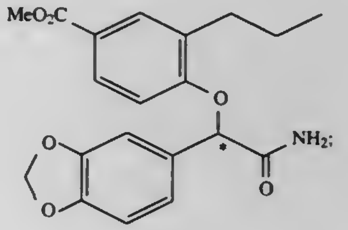
i) hydrolyzing the chiral auxiliary from the phenoxyphenylacetic acid derivative with an inorganic base in an aqueous organic solvent mixture to give a phenoxyphenylacetic acid



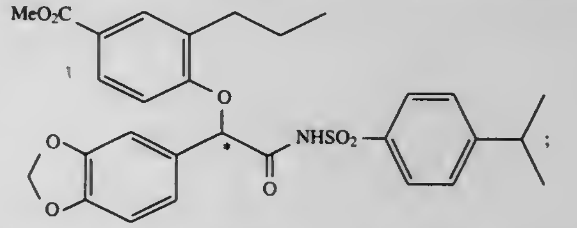
j) reacting the phenoxyphenylacetic acid with a chlorinating agent in a solvent to give an acid chloride



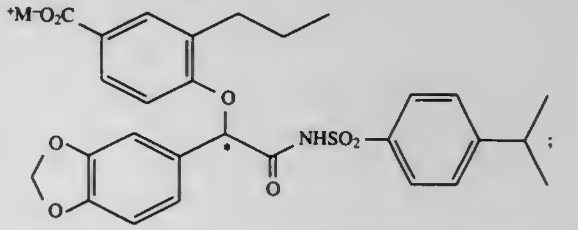
k) reacting the acid chloride with a source of ammonia to give an amide



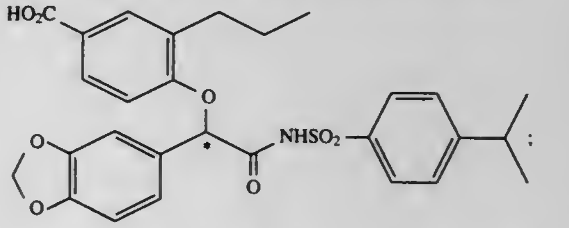
l) alkylating the amide with 4-isopropylbenzenesulfonyl chloride in the presence of a base and a solvent to give a sulfonamide



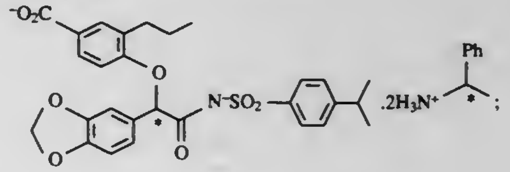
m) hydrolyzing the sulfonamide with an inorganic base in a solvent to give a salt of the acid



n) neutralizing the salt with mineral acid to give a diacid



o) reacting the diacid with two equivalents of α-methylbenzylamine in an organic solvent to give a diastereomeric salt



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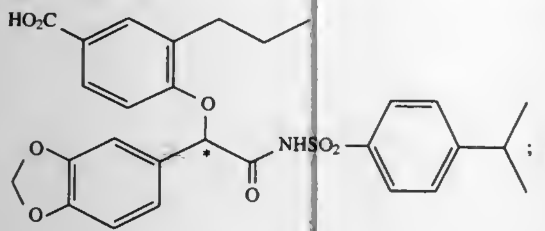
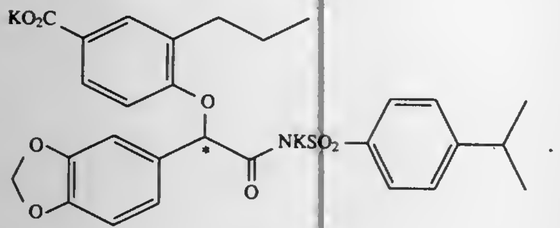
p) breaking the salt with mineral acid to give an optically enriched acid



; and

q) reacting the optically enriched acid with a base in a solvent or mixture of solvents to give a dipotassium salt, the compound of formula I



I

5,688,975
RARE EARTH STABILIZED CR/TI SUBSTITUTED MOLECULAR SIEVES

Vinayan Nair, Oak Park; Deng-Yang Jan, Elk Grove Village; Robert Lyle Patton, Rolling Meadows; Ben A. Wilson, Algonquin, all of Ill., and Donald F. Best, Mahopac, N.Y., assignors to UOP, Des Plaines, Ill.

Filed Apr. 10, 1996, Ser. No. 630,317
Int. Cl.^{6} B01J *29/04;29/87*

U.S. Cl. 549—531 **17 Claims**

1. A molecular sieve having a three-dimensional microporous framework structure which has an empirical formula on an anhydrous basis of:

$$mA: (M_wAl_xSi_y)O_2$$

where A is at least one rare earth metal, "m" is the mole fraction of A and varies from about 0.01 to about (w+x), M is chromium or titanium, "w", "x", and "y" are the mole fractions of M, aluminum and silicon, respectively, present as framework tetrahedral oxide units and "w" has a value of about 0.01 to about 0.49, "x" has a value of about 0.01 to about 0.49 and "y" has a value of about 0.50 to about 0.98, said molecular sieve characterized in that it has the x-ray diffraction pattern characteristic of zeolite Y, erionite, mordenite, zeolite L, offertite, chabazite, ZSM-5, LZ-105, zeolite omega or zeolite beta.

5,688,976
PROCESS FOR THE PRODUCTION OF 8 α, 12-OXIDO-13,14,15,16-TETRANORLABDANE

Georg Knuebel; Andreas Bomhard, both of Duesseldorf; Ulf-Armin Schaper, Krefeld; Theo Stalberg, Monheim, and Thomas Markert, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/03891, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO95/15321, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 24, 1994, Ser. No. 652,525
Int. Cl.^{6} C07D *307/92*

U.S. Cl. 549—458 **19 Claims**

1. In a process for the production of 8α,12-oxido-13,14,15,16-tetranorlabdane by dehydration of 8α,12-dihydroxy-13,14,15,16-tetranorlabdane (diol), the improvement wherein said diol is subjected to cyclizing dehydration in a solvent in the presence of a catalyst consisting of at least one alumino layer silicate having an acid charge of from 100 to 300 mval/100 g.

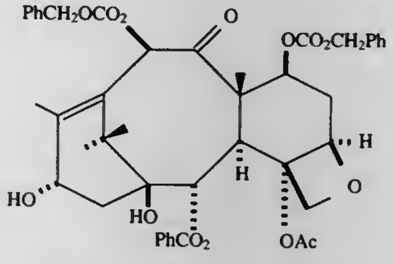
5,688,977
METHOD FOR DOCETAXEL SYNTHESIS

Nicholas J. Sisti, Jeffersonville, and Charles S. Swindell, Merion, both of Pa., assignors to NaPro BioTherapeutics, Inc., Boulder, Colo., and Bryn Mawr College, Bryn Mawr, Pa.

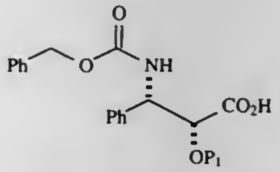
Continuation-in-part of Ser. No. 609,083, Feb. 29, 1996. This application Mar. 19, 1996, Ser. No. 616,467
Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **24 Claims**

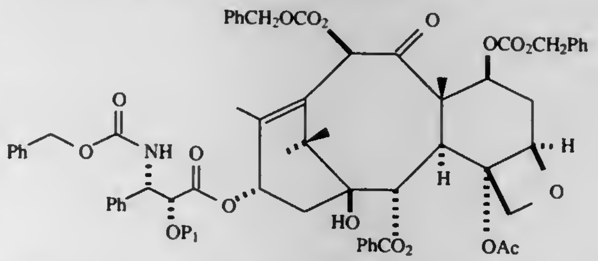
1. A method of producing docetaxel, comprising the steps of:
(a) esterifying C7, C10 di-CBZ 10-deacetyl baccatin III of the formula



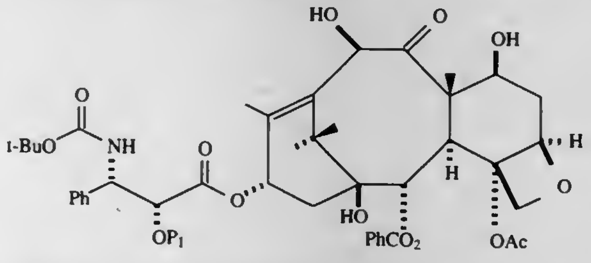
with an N—CBZ C2'-protected 3-phenyl isoserine side chain of the formula



to form a first intermediate compound of the formula



wherein P_1 is a hydrogenatable benzyl-type protecting group;
(b) substituting hydrogen for the C7, C10 carbobenzyloxy groups and substituting t-butoxycarbonyl for the carbobenzyloxy group at the C3' nitrogen site to form a second intermediate compound of the formula:



wherein P_1 is a hydrogenatable benzyl-type protecting group; and

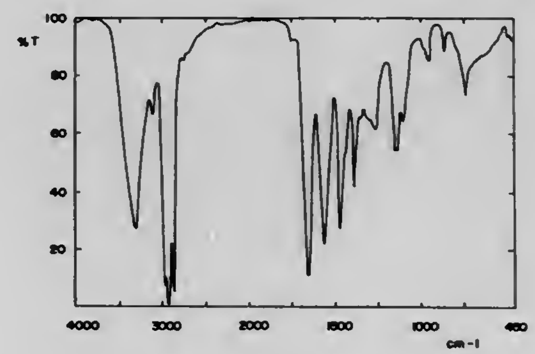
(c) deprotecting the second intermediate compound by substituting hydrogen for P_1 to produce docetaxel.

5,688,978
PREPARATION OF BETA HYDROXYLAKYL-TERMINALLY BRANCHED FATTY ACID AMIDES

Ginette Lefebvre, Bosc Roger en Roumois, and Line Fiquet, Rouen, both of France, assignors to Witco Corporation, Greenwich, Conn.

Division of Ser. No. 167,773, Dec. 15, 1993, Pat. No. 5,439,615. This application May 12, 1995, Ser. No. 440,009
Int. Cl.^{6} C07C *231/00*

U.S. Cl. 554—69 **1 Claim**



1. A method for making a beta-hydroxylalkyl-terminally branched fatty acid amide having a maximum color value of 5.0 Gardner units, up to about 5% by weight of esteramide by-products and up to about 1% by weight of free amine content, said method comprising:

heating a quantity of a terminally branched fatty acid in an inert atmosphere to a temperature of between about 40° to about 70° C.;

adding an antioxidant to said heated fatty acid and mixing for a time period of from about 0.5 to about 2.0 hours;

adding a stoichiometric excess amount of a beta-hydroxyalkylamine and adjusting the temperature to between about 90° C. and 110° C.;

adding a minor effective amount of an amidation catalyst to said vessel to form a reaction mixture and increasing the temperature of the reaction mixture to between about 145° to 170° C.;

permitting the amidation reaction to proceed under generally constant temperature and inert atmosphere conditions until an acid index value (mg KOH/g) of less than about 5.0 is obtained;

adding a second quantity of an antioxidant to the reaction vessel and reducing the pressure in said reaction vessel until substantially all excess amine is eliminated from said reaction mixture;

permitting the temperature of the reaction mixture to fall to a temperature of less than about 75° C. while maintaining the inert atmosphere; and

thereafter, permitting the beta-hydroxyalkyl-terminally branched fatty acid amide product to cool to room temperatures.

5,688,979
ORGANOMETALLIC ZIRCONIUM PRECURSOR, IN-SITU SYNTHESIS THEREOF, LEAD-TITANIUM BASED THIN FILM USING THE SAME, AND PREPARATION METHOD THEREFOR

Wan-in Lee, and Jun-ki Lee, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Division of Ser. No. 415,837, Apr. 3, 1995. This application Oct. 10, 1996, Ser. No. 726,761

Claims priority, application Rep. of Korea, Oct. 10, 1994, 94-25902; Oct. 10, 1994, 94-25905
Int. Cl.^{6} C07F *7/00;* **C04B** *35/46*

U.S. Cl. 556—56 **7 Claims**

1. An organometallic zirconium precursor for ferroelectric lead-zirconium-titanium thin films, represented by the following Formula I:

$$L_x{\cdot}Zr(THD)_4 \qquad [I]$$

wherein
L is an electron donor ligand selected from the group consisting of NR_3 [(R=H, CH_3] gas, wherein R is hydrogen or methyl, and Cl_2 gas;
THD denotes 2,2',6,6'-tetramethyl-3,5-heptanedione; and
x is in the range of 0.3 to 1.5 when L is NR_3,
or x is in the range of 0.5 to 2 when L is Cl_2.

5. A method for the preparation of an organometallic zirconium precursor, comprising flowing a gas phase electron donor into a bubbler containing bis (2,2',6,6'-tetramethyl-3,5-heptanedione)Zr at a predetermined temperature, to synthesize, in-situ, an adduct represented by the following formula II:

$$L_x{\cdot}Zr(THD)_4 \qquad [II]$$

wherein
L is an electron donor ligand selected from the group consisting of NR_3 [(R=H, CH_3)], wherein R is hydrogen or methyl, and Cl_2;
THD denotes 2,2',6,6'-tetramethyl-3,5-heptanedione; and
x is in the range of 0.3 to 1.5 when L is NR_3,
or x is in the range of 0.5 to 2 when L is Cl_2;
said gas phase electron donor serving as a carrier gas and being selected from the group consisting of NH_3 and Cl_2.

5,688,980
ORGANOMETALLIC LEAD PRECURSOR, IN-SITU SYNTHESIS THEREOF, LEAD-TITANIUM BASED THIN FILM USING THE SAME, AND PREPARATION METHOD THEREFOR

Wan-in Lee; Jun-ki Lee, both of Kyungki-do, Rep. of Korea, and Seshu B. Desu, Blacksburg, Va., assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Division of Ser. No. 539,518, Oct. 5, 1995. This application Oct. 10, 1996, Ser. No. 729,089

Claims priority, application Rep. of Korea, Oct. 10, 1994, 94-25903; Nov. 25, 1994, 94-31300
Int. Cl.^{6} C07F *7/24;* **C04B** *35/46*

U.S. Cl. 556—81 **7 Claims**

1. An organometallic lead precursor for ferroelectric lead-titanium based thin films represented by the following Formula I:

$$L_x{\cdot}Pb(THD)_2$$

wherein
L is an electron donor ligand selected from the group consisting of NR_3 gas, wherein R is hydrogen or methyl, and Cl_2 gas;
THD denotes 2,2',6,6'-tetramethyl-3,5-heptanedione; and
x is in the range of 0.5 to 2.

5. A method for the preparation of an organometallic lead precursor, comprising flowing a gas phase electron donor into a bubbler containing bis (2,2',6,6'-tetramethyl-3,5-heptanedione)Pb

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at a predetermined temperature, to synthesize, in-situ, an adduct represented by the following formula II:

$L_x \cdot Pb(THD)_2$

wherein

- L is an electron donor ligand selected from the group consisting of NR_3, wherein R is hydrogen or methyl, and Cl_2;

THD denotes 2,2',6,6'-tetramethyl-3,5-heptanedione; and

x is in the range of 0.5 to 2;

said gas phase electron donor serving as a carrier gas and being selected from the group consisting of NR_3, wherein R is hydrogen or methyl, and Cl_2.

5,688,981
ETHYLENEDIAMINETRIACETIC ACID AND N-ACYL ETHYLENEDIAMINETRIACETIC ACID SILVER CHELATING AGENTS AND SURFACTANTS

Arthur M. Nonomura, Boxborough, Mass., assignor to Hampshire Chemical Corp., Lexington, Mass.

Filed Nov. 21, 1996, Ser. No. 749,364

Int. Cl.^{6} C07F *1/10*

U.S. Cl. 556—116 **13 Claims**

1. Silver chelating agent and surfactant of N-acyl ethylenediaminetriacetic acid or salts thereof, wherein said acyl group is a straight or branched aliphatic or aromatic group containing from 1 to 40 carbon atoms.

8. Silver chelating agent and surfactant of ethylenediaminetriacetic acid or salts thereof.

13. Silver chelating agent and surfactant of N-alkyl ethylenediaminetriacetic acid or salts thereof, wherein said alkyl group contains from 1 to 40 carbon atoms.

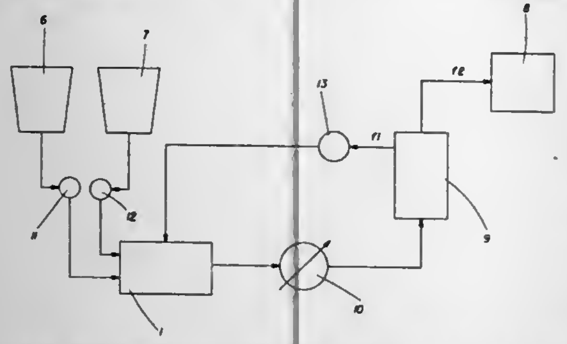
5,688,982
NO-BLEACH PROCESS FOR MAKING SULFONATED FATTY ACID ALKYL ESTER SURFACTANT

Vajih A. Khan, Loveland; Michael T. Creedon, and Benjamin E. Chapman, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 107,504, Aug. 20, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 303,283

Int. Cl.^{6} C11D *1/28*

U.S. Cl. 554—98 **26 Claims**



1. A no-bleach process for preparing a sulfonated fatty acid alkyl ester surfactant comprising, by weight of the surfactant, from about 90% to 100% of sulfonated fatty acid alkyl esters and less than about 10% of impurities selected from the group consisting of sulfonated fatty acid salts, fatty acid salts, fatty acid alkyl esters, and mixtures thereof; said process comprising the steps of:

a) sulfonating fatty acid alkyl esters;

b) reacting the product of step a) with about 10% to about 20%, by weight of the product of step a), of a substantially anhydrous C_1 to C_8 alcohol;

c) continuously neutralizing the product of step b) with an alkoxide of the formula $(R_2O^-)_nM^{n+}$ having a concentration of from about 5% to 35% by weight, in a substantially anhydrous medium of a C_1 to C_8 alcohol; wherein R_2 is on the average a C_1 to C_8 alkyl, M is an alkali metal or alkaline earth metal cation, or a mixture thereof, and n is 1 when M is an alkali metal cation and n is 2 when M is an alkaline earth metal cation;

d) filtering the product of step c); and

e) purifying the product of step d) in a column of activated carbon;

wherein the total amount of alcohol in step c) is from about 30% to 65% by weight, the temperature during step c) is from about 30° to 70° C. and the pH during step c) is from about 3 to 11; and wherein the process does not consist of a bleaching step.

5,688,983
PROCESS FOR THE PREPARATION OF TETRAETHYL METHYLENEBISPHOSPHONATE

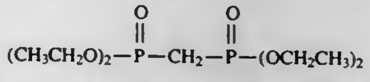
Michael R. Leadbetter, San Leandro; Richard W. Brown, Moraga, and Maureen M. McKenna, Alameda, all of Calif., assignors to Zeneca Limited, London, England

Filed Mar. 12, 1996, Ser. No. 614,234

Int. Cl.^{6} C07F *9/40*

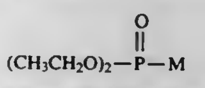
U.S. Cl. 558—136 **13 Claims**

1. A process for preparing a compound of formula (I)



$$(CH_3CH_2O)_2-\overset{\overset{O}{\|}}{P}-CH_2-\overset{\overset{O}{\|}}{P}-(OCH_2CH_3)_2 \qquad (I)$$

comprising: reacting a compound of the formula (II)



$$(CH_3CH_2O)_2-\overset{\overset{O}{\|}}{P}-M \qquad (II)$$

wherein M is selected from the group consisting of alkali metals, alkaline earth metals and hydrogen, with dichloromethane in the presence of at least one polar aprotic solvent other than dichloromethane.

5,688,984
POROUS LITHIUM ALUMINATE CARRIER OF SPINEL STRUCTURE FOR CATALYST

Kyoji Ohdan; Tokuo Matsuzaki, and Mikio Hidaka, all of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed May 22, 1996, Ser. No. 652,729

Claims priority, application Japan, May 22, 1995, 7-146835; Jun. 28, 1995, 7-184907

Int. Cl.^{6} C07C *69/96*

U.S. Cl. 558—277 **5 Claims**

1. A process for the preparation of a carbonate diester which comprises reacting a nitrite ester and carbon monoxide in the presence of a catalyst composition which comprises a carrier of a spinel structure having a mean pore diameter in the range of 40 to 1,000 angstroms and a total pore volume in the range of 0.2 to 1.5 mL/g and a catalyst component comprising a compound of a metal of platinum group.

5,688,985
PROCESS FOR PRODUCING KETO NITRILE DERIVATIVE

Mitsuhiko Fujihara; Kenji Asahina; Toru Watanabe; Toshiyuki Takezawa, and Seiji Watanabe, all of Shizuoka, Japan, assignors to Takasago International Corporation, Tokyo, Japan

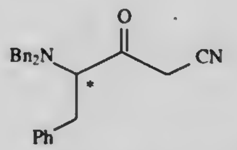
Filed Jan. 23, 1996, Ser. No. 590,177

Claims priority, application Japan, Feb. 28, 1995, 7-063549

Int. Cl.^{6} C07C *253/00;225/00*

U.S. Cl. 558—311 **4 Claims**

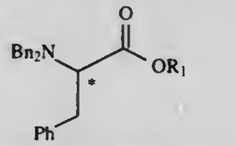
1. A process for producing a (4S)-4-(N,N-dibenzyl)amino-5-phenyl-3-oxo-pentanenitrile derivative represented by formula (II):



(II)

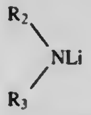
wherein Bn represents a benzyl group, Ph represents a phenyl group, and C* represents an asymmetric carbon atom,

which comprises reacting a (2S)-2-(N,N-dibenzyl aminophenylalanine ester derivative represented by forumla (I):



(I)

wherein R_1 represents a lower alkyl group or a benzyl group, and Bn, Ph and C* are as defined above, with acetonitrile in the presence of a lithium compound or a magnesium compound, wherein said lithium compound is an organolithium compound represented by formula (III):



(III)

wherein R_2 and R_3, which are the same or different, each represent a hydrogen atom, a lower alkenyl group, a phenyl group or a benzyl group, provided that they do not simultaneously represent a hydrogen atom, or when taken together form a 5- or 6-membered ring together with a nitrogen atom.

5,688,986
PROCESSES AND CATALYST COMPOSITIONS FOR HYDROCYANATION OF MONOOLEFINS

Wilson Tam, Boothwyn, Pa.; Kristina Ann Kreutzer, and Ronald James McKinney, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

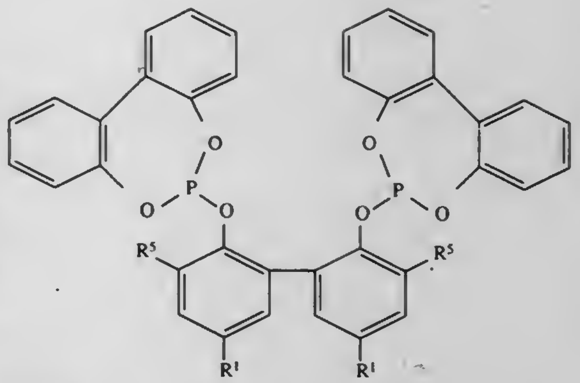
PCT No. PCT/US94/12794, § 371 Date Apr. 26, 1995, § 102(e) Date Apr. 26, 1995, PCT Pub. No. WO95/14659, PCT Pub. Date Jun. 1, 1995

Continuation-in-part of Ser. No. 198,963, Feb. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 157,342, Nov. 23, 1993, abandoned. This PCT application Nov. 7, 1994, Ser. No. 424,351

Int. Cl.^{6} C07C *253/30*

U.S. Cl. 558—338 **18 Claims**

1. A process for hydrocyanation, comprising reacting a nonconjugated acyclic aliphatic monoolefin, monoolefin conjugated to an ester group or monoolefin conjugated to a nitrile group with a source of HCN in the presence of a catalyst precursor composition comprising zero-valent nickel and a bidentate phosphite ligand of Formula I,



I

wherein

each R^1 is independently a tertiary substituted hydrocarbon of up to 12 carbon atoms, or OR^4 wherein R^4 is C_1 to C_{12} alkyl;

each R^5 is independently a tertiary substituted hydrocarbon of up to 12 carbon atoms;

and wherein said reaction is carried out to produce a terminal organonitrile.

5,688,987
NON-SUBLIMING MID-UV DYES AND ULTRA-THIN ORGANIC ARCS HAVING DIFFERENTIAL SOLUBILITY

Jim D. Meador, Ballwin; Xie Shao, Rolla; Vandana Krishnamurthy, Rolla; Earnest C. Murphy, Rolla; Tony D. Flaim, St. James, and Terry Lowell Brewer, Rolla, all of Mo., assignors to Brewer Science, Inc., Rolla, Mo.

Filed Nov. 9, 1994, Ser. No. 336,340

Int. Cl.^{6} C07C *255/00*

U.S. Cl. 558—393 **3 Claims**

1. An improved mid-UV anti-reflective dye of the type useful in ultra-thin sublayers of multi-layer i-line photoresist systems where said sublayer is sandwiched between a top i-line photoresist layer and a microelectronic substrate; the improved dye being characterized as non-subliming and exhibiting differential solubility, said dye being

1,4-divinylbenzenes having terminal acetophenones which are substituted at the para (or 4-) ring position or, optionally, substituted in addition at the meta (or 3-) ring position.

5,688,988
PROCESS FOR THE PROCUCTION OF AROMATIC URETHANES

Aldo Bosetti, Vercelli; Pietro Cesti, Trecate; Emanuele Cauchi, Novara, and Ignazio Prestifilippo, Vercelli, all of Italy, assignors to Ministero dell'Universita' e della Ricerca Scientifica e Technologica, Rome, Italy

Filed Jun. 27, 1996, Ser. No. 671,179

Claims priority, application Italy, Jul. 6, 1995, MI95A1446

Int. Cl.^{6} C09C *261/00*

U.S. Cl. 560—25 **9 Claims**

1. A process for the preparation of aromatic urethanes by the reaction of an organic carbonate with an aromatic amine operating in the presence of a catalyst, characterized in that said catalyst is a zinc and/or copper carbonate hydroxide having the general formula (I):

$$M_aN_b(OH)_c(CO_3)_d(H_2O)_e \qquad (I)$$

wherein: M and N represent a metal selected from zinc and/or copper; a and b vary from 0 to 4, with a proviso that they are not both 0; c and d vary from 1 to 7; and e has a value varying from 0 to 6.

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5,688,989

POLYURETHANE FOAMS MODIFIED WITH NONIONIC SURFACTANTS

Peter Daute, Essen; Roland Gruetzmacher, Wuelfrath; Johann Klein, Duesseldorf; Hermann Kluth, Duesseldorf, and Rainer Hoefer, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/03890, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO95/15349, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 24, 1994, Ser. No. 652,523

Claims priority, application Germany, Dec. 3, 1993, 43 41 264.5

Int. Cl.^{6} G08G *18/10*

U.S. Cl. 560—26 **8 Claims**

1. A polyurethane composition for the production of single-component polyurethane foams on dry or wet substrates, said composition comprising the reaction product of a polyol with a molar excess of difunctional or polyfunctional isocyanates wherein 10% to 80% by weight of said polyol has been replaced by a nonionic surfactant consisting essentially of epoxidized soybean oil ring-opened with alcohols or carboxylic acids which after ring opening has been reacted with an alkylene oxide to a content of 20% to 400% by weight of alkylene oxide, based on non-alkoxylated soybean oil.

5,688,990

SUBSTITUTED AZETIDINONE COMPOUNDS USEFUL AS HYPOCHOLESTEROLEMIC AGENTS

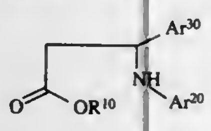
Bandarpalle B. Shankar, 3405 Wellington Ct., Somerville, N.J. 08876

Continuation of Ser. No. 403,081, Mar. 13, 1995, Pat. No. 5,627,176, which is a continuation-in-part of Ser. No. 218,498, Mar. 25, 1994, abandoned. This application May 18, 1995, Ser. No. 444,167

Int. Cl.^{6} C07C *229/02*

U.S. Cl. 560—39 **6 Claims**

1. A process for preparing a chiral β-amino ester of the formula



wherein:

Ar^{20} is Ar^2, a suitably protected hydroxy-substituted aryl or a suitably-protected amino-substituted aryl;

Ar^2 is R^4-substituted aryl;

Ar^{30} is Ar^3, a suitably protected hydroxy-substituted aryl or a suitably-protected amino-substituted aryl;

Ar^3 is R^5-substituted aryl;

R^5 is 1–3 substituents independently selected from the group consisting of $—OR^6$, $—O(CO)R^6$, $—O(CO)OR^9$, $—O(CH_2)_{1-5}OR^9$, $—O(CO)NR^6R^7$, $—NR^6R^7$, $—NR^6(CO)R^7$, $—NR^6(CO)OR^9$, $—NR^6(CO)NR^7R^8$, $—NR^6SO_2$-lower alkyl, $—NR^6SO_2$-aryl, $—CONR^6R^7$, $—COR^6$, $—SO_2NR^6R^7$, $S(O)_{0-2}$-alkyl, $S(O)_{0-2}$ -aryl, $—O(CH_2)_{1-10}—COOR^6$, $—O(CH_2)_{1-10}CONR^6R^7$, o-halogeno, m-halogeno, o-lower alkyl, m-lower alkyl, -(lower alkylene)-$COOR^6$ and $—CH{=}CH—COOR^6$;

R^4 is 1–3 substituents independently selected from the group consisting of R^5, hydrogen, p-lower alkyl, aryl, $—NO_2$, $—CF_3$ and p-halogeno;

R^6, R^7 and R^8 are independently selected from the group consisting of hydrogen, lower alkyl, aryl and aryl-substituted lower alkyl;

R^9 is lower alkyl, aryl or aryl-substituted lower alkyl; and

$—C(O)OR^{10}$ is an acyl radical of a chiral alcohol of the formula $R^{10}OH$ selected from the group consisting of 1-menthyl, isopino-campheyl, (1S)-endo-bornyl, isomenthyl, trans-2-phenylcyclo-hexyl or phenylmenthyl;

comprising reacting a bromoacetate of the formula $R^{10}OC(O)CH_2Br$, wherein $R^{10}OC(O)—$ is as defined above, an imine of the formula $Ar^{20}—N{=}CH—Ar^{30}$, wherein Ar^{20} and Ar^{30} are as defined above, and zinc in an inert solvent at a temperature of 10° to 30° C., optionally in the presence of a zinc activating agent and optionally with ultrasonification.

5,688,991

FERULIC ACID ESTER ANTIOXIDANT/UV ABSORBENT

Hisaji Taniguchi, Wakayama-ken; Eisaku Nomura, Wakayama; Takuo Tsuno, and Seikou Minami, both of Wakayama-ken, all of Japan, assignors to Tsuno Food Industrial Co., Ltd., and Wakayama Prefecture, both of Wakayama, Japan

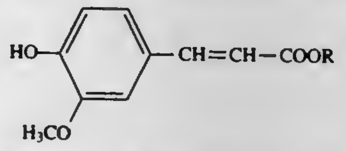
Filed May 8, 1995, Ser. No. 436,687

Claims priority, application Japan, May 11, 1994, 6-097485

Int. Cl.^{6} C07C *69/76;* **A61K** *7/42;7/44*

U.S. Cl. 560—55 **2 Claims**

1. A ferulic acid ester represented by formula (I):



(I)

where R is an alkyl group having 4 to 12 carbon atoms.

5,688,992

O-MALONYLTRYROSYL COMPOUNDS, O-MALONYLTRYROSYL COMPOUND-CONTAINING PEPTIDES, AND USE THEREOF

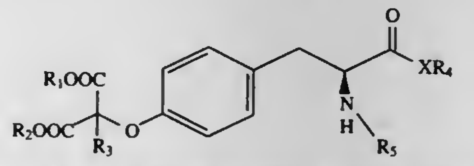
Terrence R. Burke, Jr., Bethesda; Bin Ye, Gaithersburg; Miki Akamatsu, Rockville; Hemanta K. Kole, Baltimore; Xinjian Yan, and Peter R. Roller, both of Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 31, 1995, Ser. No. 414,520

Int. Cl.^{6} C07C *57/145;* **A61K** *31/19;31/195;38/00*

U.S. Cl. 560—82 **11 Claims**

1. O-malonyltryrosyl compounds of the Formula (I):



(I)

wherein R_1 and R_2 are independently hydrogen, optionally substituted alkyl, aralkyl, alkaryl, optionally substituted aryl, and optionally substituted heteroaryl;

wherein R_3 is hydrogen, halogen, amino, hydroxy, and alkoxy;

wherein X is nitrogen or oxygen;

wherein R_4 is hydrogen, optionally substituted alkyl, aralkyl, alkaryl, optionally substituted aryl, and optionally substituted heteroaryl;

wherein R_5 is hydrogen, fluorenyl methoxy carbonyl (FMOC), tert-butoxy carbonyl (BOC), and carbobenzoxy (CBZ), carbamoyl, optionally substituted alkyl, amido, optionally substituted aryl, and optionally substituted heteroaryl.

5,688,993

METHOD FOR MODIFYING CATALYST PERFORMANCE DURING THE GAS PHASE SYNTHESIS OF VINYL ACETATE

William Douglas Provine, Greenville, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 577,451, Dec. 22, 1995, abandoned. This application Feb. 21, 1996, Ser. No. 604,594

Int. Cl.^{6} C07C *67/05*

U.S. Cl. 560—245 **21 Claims**

1. In a gas phase reaction of ethylene with acetic acid in the presence of oxygen and catalyzed by a charge of a metal catalyst, the metal catalyst being degraded over time due to the reaction, a method for improving the performance of the catalyst charge, the improvement comprising:

(a) adding an excess amount of catalyst to the catalyst charge so that the total amount of catalyst would exceed the design limits of the process, if the process were initially run at maximum achievable catalyst activity;

(b) adding a primary catalyst modifier to the feed stream or imbibing the primary catalyst modifier onto at least a portion of the catalyst or a catalyst support, wherein the primary catalyst modifier changes the productivity of the catalyst;

(c) adding a secondary catalyst modifier to the feed stream, the secondary catalyst modifier being different from the primary catalyst modifier, wherein the secondary catalyst modifier increases the productivity of the catalyst, and wherein the catalyst activity due to the secondary catalyst modifier divided by the catalyst activity due to the primary catalyst modifier is greater than 1;

(d) initially running the process at less than maximum achievable catalyst activity; and

(e) continuously or discontinuously altering the relative amounts of the primary catalyst modifier and secondary catalyst modifier, so that as the catalyst degrades during the reaction process, at least a portion of the remaining non-degraded catalyst is caused to continuously or discontinuously increase in productivity.

5,688,994

PROCESS FOR PREPARING N-PHOSPHONOMETHYLIMINODIACETIC ACID

Sherrol Lee Baysdon, Pacific, and David Lee Taxter, St. Louis County, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 474,847, Jun. 7, 1995, abandoned. This application Dec. 17, 1996, Ser. No. 768,334

Int. Cl.^{6} C07F *9/38*

U.S. Cl. 562—17 **23 Claims**

1. A process for preparing N-phosphonomethyliminodiacetic acid comprising combining in a reaction mixture water, a source of iminodiacetic acid, a source of formaldehyde, and a phosphorus trihalide wherein the source of formaldehyde and the phosphorus trihalide are simultaneously infused into the reaction mixture, to form said N-phosphonomethyliminodiacetic acid.

5,688,995

O-HYDROXYPHENYL-S-TRIAZINES

Helmut Luther, Grenzach-Wyhlen; Dietmar Hüglin, Freiburg, and Bernd Herzog, Bad Säckingen, all of Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

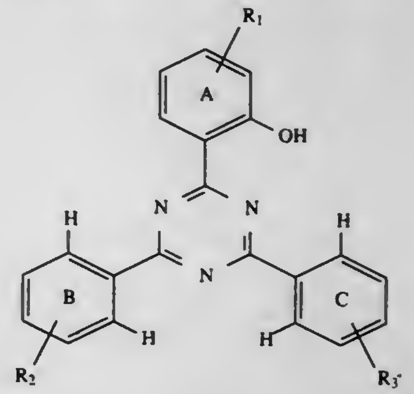
Filed May 15, 1996, Ser. No. 649,940

Claims priority, application Switzerland, May 18, 1995, 1479/95

Int. Cl.^{6} C07C *229/00*

U.S. Cl. 562—30 **8 Claims**

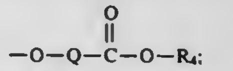
1. A hydroxyphenyl-s-triazine of the formula



(1)

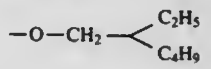
in which

R_1 is hydrogen, hydroxyl, halogen, C_1–C_{15}alkyl, C_1–C_{15}alkoxy, a radical of the formula $—O—CH_2—CH(—OH)—CH_2—O—T$, in which T is C_1–C_8alkyl, or a radical of the formula



$$-O-Q-\overset{\overset{\large O}{\|}}{C}-O-R_4;\qquad (Ia)$$

R_2 and R_3 are



$$-O-CH_2-CH\begin{matrix} \nearrow C_2H_5 \\ \searrow C_4H_9 \end{matrix}$$

R_4 is C_1–C_5alkyl or C_1–C_5alkoxy-C_1–C_5alkyl, and

Q is a C_1–C_4alkylene radical, and

the rings A, B and C can have further substituents.

5,688,996

ETHYENE CONTAINING CYSTEATE SEQUESTRANTS AND METHODS OF MANUFACTURE

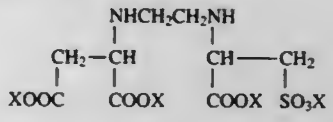
Eddie Nelson Gutierrez, Midland Park; Shang-Ren Wu, Mahwah, and Robert Charles Vermeer, Nutley, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Mar. 19, 1996, Ser. No. 618,218

Int. Cl.^{6} C07C *309/08;309/13*

U.S. Cl. 562—106 **20 Claims**

1. A compound of the formula:



$$\begin{array}{cccc} & \multicolumn{3}{l}{NHCH_2CH_2NH} \\ & | & | & \\ CH_2 - & CH & CH - & CH_2 \\ | & | & | & | \\ XOOC & COOX & COOX & SO_3X \end{array}$$

wherein X is independently selected from the group consisting of hydrogen, sodium, potassium, lithium, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium and mixtures thereof.

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5,688,997

PROCESS FOR PREPARING INTERMEDIATES FOR A COMBINATORIAL DIHYDROBENZOPYRAN LIBRARY

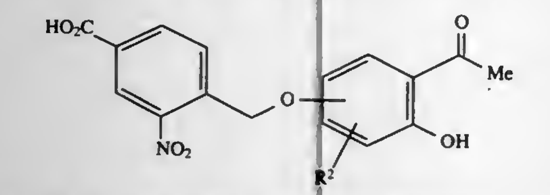
John J. Baldwin, Gwynedd Valley, Pa.; John C. Reader, Princeton, N.J.; Lawrence W. Dillard, Hopewell, N.J.; Ge Li, Franklin Park, N.J.; Jonathan J. Burbaum, Westfield, N.J., and Wenguang Zeng, Lawrenceville, N.J., assignors to Pharmacopela, Inc., Princeton, N.J.

Division of Ser. No. 436,120, May 8, 1995, which is a continuation-in-part of Ser. No. 239,302, May 6, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 482,488

Int. Cl.^{6} C07C *201/12*

U.S. Cl. 562—435 **1 Claim**

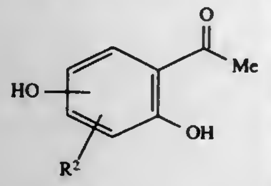
1. A process for preparing a compound of the formula



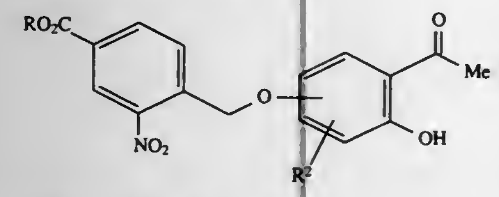
3

where R^2 is H or lower alkyl, said method comprising:

a) reacting allyl 4-(hydroxymethyl)-3-nitrobenzoate with a compound of the formula



in the presence of triphenylphosphine, toluene, and DEAD and stirring the mixture at room temperature to produce a compound of the formula



wherein R is allyl; and

b) reacting a compound so produced with methylene chloride, tetrakistriphenylphosphine palladium (0), and pyrrolidine and stirring the mixture at 0° C.

5,688,998

SURFACE REFORMING AGENT, SURFACE REFORMING METHOD AND CONE-TYPE CALIX [4] RESORCINARENE COMPOUNDS

Kunihlro Ichimura; Eiichi Kurita, both of Yokohama, and Masahide Ueda, Tokuyama, all of Japan, assignors to Toda Kogyo Corporation, Japan

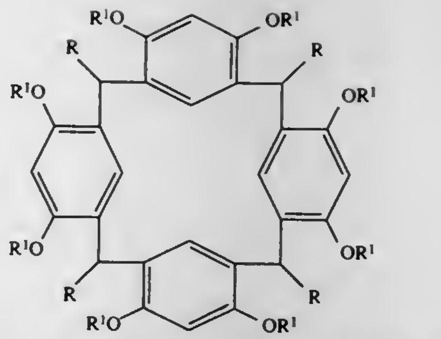
Filed Mar. 10, 1995, Ser. No. 401,499

Claims priority, application Japan, Mar. 11, 1994, 6-067756; Mar. 11, 1994, 6-067757

Int. Cl.^{6} C07C *31/18;57/40*

U.S. Cl. 562—466 **7 Claims**

1. A surface reforming composition comprising a cone-shaped calix [4] resorcinarene compound represented by the formula (1):



(I)

wherein R is an alkyl group having 3 to 18 carbon atoms, an alkenyl group having 3 to 18 carbon atoms, an aralkyl group having 3 to 18 carbon atoms or a substituted or non-substituted aryl group; R^1 is a carboxyalkyl group in which the alkyl group has 1 to 3 carbon atoms, or a hydroxyalkyl group having 2 to 4 carbon atoms.

5,688,999

PRODUCTION OF OXIDIZED HUMIC ACIDS BY AN OXYGEN-ALKALI PROCESS

Stuart E. Lebo, Jr., Schofield; Kevin R. Wirtz, Mosinee, and Stephen L. Dickman, Wausau, all of Wis., assignors to Lignotech USA, Inc., Rothschild, Wis.

Filed Jan. 26, 1996, Ser. No. 592,678

Int. Cl.^{6} C07C *65/01*

U.S. Cl. 562—475 **20 Claims**

1. A method of producing oxidized humic acid concentrates, comprising the steps of:

(a) dissolving a humic acid containing ore in alkali to form a reaction mixture;

(b) reacting said reaction mixture with an oxidant under conditions of temperature and pressure and for a time sufficient to cause the oxidation of the humic acid containing ore to produce an oxidized humic acid concentrate; and

(c) separating the oxidized humic acid concentrate from the reaction mixture.

5,689,000

PROCESS FOR PREPARING CARBOXYLIC ACID SALTS AND CATALYSTS USEFUL IN SUCH PROCESS

Jerry R. Ebner, St. Peters, and Thaddeus S. Franczyk, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 269,718, Jul. 1, 1994. This application Mar. 20, 1995, Ser. No. 407,723

Int. Cl.^{6} C07C *51/295*

U.S. Cl. 562—539 **47 Claims**

1. In a method of preparing a carboxylic acid salt by reacting a primary alcohol with a hydroxide base in the presence of a catalyst, the improvement characterized by employing a catalytic amount of a supported catalyst comprising a finely divided anchor metal partially embedded in an alkali resistant support, the non-embedded portions of the anchor metal having a non-embedded surface, at least some of the nonembedded surface of the anchor metal being coated with a catalytically active metal selected from the group of copper, cobalt, nickel, cadmium and mixtures thereof, in the elemental state.

5,689,001

PROCESS FOR PURIFYING VALINE

Kazuhiro Hasegawa; Tetsuya Kaneko; Noriko Takahashl, and Chlaki Sano, all of Kawasaki, Japan, assignors to Ajlnomoto Co., Inc., Tokyo, Japan

Filed Jun. 10, 1996, Ser. No. 661,117

Claims priority, appllcatioo Japan, Jun. 12, 1995, 7-144843

Int. Cl.^{6} C07C *227/00*

U.S. Cl. 562—554 **20 Claims**

1. A crystalline valine p-isopropylbenzenesulfonate comprising a reaction product of equimolar amounts of valine and p-isopropylbenzenesulfonic acid.

2. A process for purifying valine, comprising:

contacting a valine-containing aqueous solution with p-isopropylbenzenesulfonic acid or a water-soluble salt thereof to form crystalline valine p-isopropylbenzenesulfonate in an aqueous medium;

separating the crystalline valine p-isopropylbenzenesulfonate from the aqueous medium; and

dissociating the valine p-isopropylbenzenesulfonate to obtain valine.

5,689,002

PROCESS FOR THE CRYSTALLIZATION FROM WATER OF (S)-N,N'-BIS[2-HYDROXY-1-(HYDROXYMETHYL)ETHYL]-5-[2-HYDROXY-1-OXOPROPYL)AMINO]-2,4,6-TRIIODO-1,3-BENZENDICARBOXAMIDE

Marina Mauro, Milan, Italy, asslgnor to Bracco International B.V., Amsterdam, Netheriands

Filed Sep. 5, 1996, Ser. No. 708,668

Clalms priority, application Italy, Sep. 8, 1995, RM95A0599; Dec. 19, 1995, RM95A0831

Int. Cl.^{6} C07C *231/22;231/24*

U.S. Cl. 564—153 **8 Claims**

1. A process for the crystallization from water of Iopamidol to give said compound in a crystalline anhydrous form and in accordance to the pharmacopeia standards comprising the following steps:

dissolution of lopamidol in deionized water by heating;

decolorisation of the solution with active carbon;

vacuum-concentration of the aqueous solution at 60° C.;

addition of crystalline germs of anhydrous Iopamidol for seeding the crystallization;

crystallization at 60° C.;

filtration of the resulting precipitate;

vacuum-drying of the wet product.

5,689,003

RUTHENIUM HYDROGENATION CATALYSTS

Richard Paul Beatty, Newark, Del., and Rocco Angelo Paclello, Durkheim, Germany, asslgnors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 381,697, Jan. 31, 1995, Pat. No. 5,554,778. This application May 8, 1996, Ser. No. 646,594

Int. Cl.^{6} C07C *209/48;209/32;* **C07F** *15/00*

U.S. Cl. 564—278 **37 Claims**

1. A process for the hydrogenation of an organic nitrile, comprising the steps of:

(a) contacting said nitrile with gaseous hydrogen in the presence of a ruthenium complex catalyst having the formula: $Ru(\eta^3—C_6H_8—PCy_2)(PCy_3)Cl$ or $RuHCl(H_2)(PCy_3)_2$, wherein Cy is a cyclohexyl group; and

(b) subsequently agitating the nitrile, hydrogen and catalyst to form a primary amine.

13. A process for the reductive hydrolysis of an organic nitrile, comprising the steps of:

(a) contacting said nitrile with gaseous hydrogen and water in the presence of a ruthenium complex catalyst having the formula $Ru(\eta^3—C_6H_8—PCy_2)(PCy_3)Cl$ or $RuHCl(H_2)(PCy_3)_2$; and

(b) subsequently agitating the nitrile, water, hydrogen and catalyst to form an alcohol.

28. A process for the reductive imination of a nitrile to an aldimine, comprising the steps of:

(a) contacting said nitrile with gaseous hydrogen and a primary amine in the presence of a ruthenium complex catalyst having the formula $Ru(\eta^3—C_6H_8—PCy_2)(PCy_3)Cl$ or $RuHCl(H_2)(PCy_3)_2$, where Cy is cyclohexyl; and

(b) subsequently agitating the nitrile, hydrogen, amine and catalyst to form said aldimine.

5,689,004

DIAMINES CONTAINING PENDENT PHENYLETHYNYL GROUPS

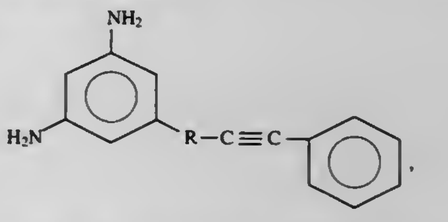
John W. Connell, Yorktown; Joseph G. Smith, Jr., Grafton, and Paul M. Hergenrother, Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 511,422, Aug. 4, 1995, Pat. No. 5,606,014. This application Nov. 12, 1996, Ser. No. 747,472

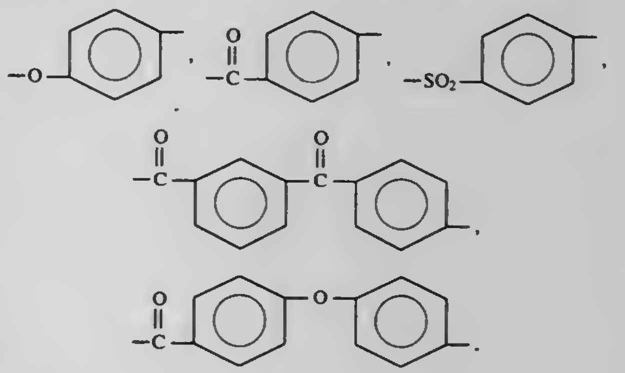
Int. Cl.^{6} C07C *225/22;217/90;317/36*

U.S. Cl. 564—328 **2 Claims**

1. A diamine containing pendent phenylethynyl groups having the following general structure:



wherein R is a radical selected from the group consisting of:



5,689,005

REDUCTIVE DEOXYGENATION USING A REDOX CATALYST

Alfred Hagemeyer, Ludwigshafen; Christopher William Rieker, Mannheim; Thomas Lautensack, Altleiningen, and Dieter Hermeling, Böhl-Iggelheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 28, 1995, Ser. No. 563,627

Claims priority, application Germany, Dec. 6, 1994, 44 43 360.3

Int. Cl.^{6} C07C *209/36*

U.S. Cl. 564—420 **9 Claims**

1. A process for reductive deoxygenation of an organic compound which contains at least one oxo group with partial or

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complete formation of a corresponding deoxygenated compound by reaction with heterogeneous catalysis by a redox catalyst in its reduced or partially reduced form at elevated temperature in the gas phase, and reductive regeneration of the redox catalyst, comprising

carrying out the deoxygenation continuously in a deoxygenation zone containing an outlet, in temporal or spatial alternation with the reductive regeneration of the redox catalyst, and the deoxygenation is carried out as a non steady-state reaction, wherein the organic compound to be deoxygenated is contacted with the redox catalyst in such a way that catalyst with unused deoxygenating activity is still present at the outlet from the deoxygenation zone, wherein

the regeneration of the redox catalyst is carried out with a gaseous reducing agent selected from the group consisting of hydrogen, carbon monoxide, hydrocarbons, ammonia, nitrogen monoxide and sulfur dioxide at elevated temperature, and

the redox catalyst contains in its oxidized form at least one reducible oxide of the metals selected from the group consisting of Bi, V, Cr, Mn, Ti, U, Fe, Co, Pb, Mo, Ce, Sn, Sb and Cu.

5,689,006

PROCESS FOR PRODUCING N-ALKYL-DINITROALKYLANILINES

Stefan Kwiatkowski; Krzysztof Pupek; Brenda L. Lawrence, and Lowell J. Lawrence, all of Richmond, Ky., assignors to SRM Chemical, Ltd. Co., League City, Tex.

Filed Jun. 29, 1995, Ser. No. 496,774

Int. Cl.^{6} C07C *209/18;311/39*

U.S. Cl. 564—399 **19 Claims**

1. A process for producing N-sec-butyl-4-tert-butyl-2,6-dinitroaniline, comprising:

reacting 4-tert-butylphenol with dimethyl sulfate to produce 4-tert-butylanisole;

reacting 4-tert-butylanisole with nitric acid to produce 4-tert-butyl-2,6-dinitroanisole; and

reacting 4-tert-butyl-2,6-dinitroanisole with sec-butylamine to produce N-sec-butyl-4-tert-butyl-2,6-dinitroaniline.

5,689,007

PROCESS OF PREPARING PARA SUBSTITUTED PHENYLAMINES

Russell Edward Malz, Naugatuck, Conn.; Gerard V. Smith, Carbondale, Ill.; Mark Peter Ferrandino, Danbury, Conn.; Ruozhi Song, Carbondale, Ill.; Chung-Yuan Lin, Orange, and Franklin Herbert Barrows, Waterbury, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 318,927, Oct. 6, 1994, Pat. No. 5,574,187. This application Oct. 7, 1996, Ser. No. 729,703

Int. Cl.^{6} C07C *209/36*

U.S. Cl. 564—402 **10 Claims**

1. A process of preparing para substituted phenylamines comprising contacting phenylhydroxylamine, optionally substituted with at least one inert substituent, with a nucleophilic reagent, the molar ratio of nucleophilic reagent to phenylhydroxylamine ranging between about 2 and about 25, the contacting of the phenylhydroxylamine and nucleophilic reagent being conducted in the absence of oxygen and in the presence of a homogeneous acid catalyst at a temperature ranging from about 80° C. to about 100° C. such that a para substituted phenylamine, optionally correspondingly substituted with at least one inert substituent, is formed in a yield greater than about 15 weight percent.

5,689,008

CATALYTIC REACTION RATE ENHANCEMENT AT LOW TEMPERATURES

Sunita Satyapal, Vernon; Arthur S. Kesten, West Hartford; Joseph J. Sangiovanni, West Suffield; James Freihaut, South Windsor, and Charles C. Evans, Vernon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 2, 1996, Ser. No. 595,536

Int. Cl.^{6} C07C *29/141*

U.S. Cl. 568—403 **17 Claims**

1. A method for catalytically reacting a liquid isopropanol reactant, said reactant having a boiling point and a boiling point reaction rate, comprising the steps of:

a. contacting the reactant and a catalyst;

b. providing heat to catalytically activate the catalyst at a first temperature below the boiling point of the reactant;

c. reacting the reactant to form at least one product; and

d. simulating boiling in the reactant;

whereby the reactant reacts at a reaction rate which is substantially equivalent to the boiling point reaction rate of said reactant.

5,689,009

PREPARATION OF HYDROXYBENZALDEHYDES

Helene Lefranc, Chaponost, France, assignor to Rhone-Poulenc Chimie, Courbevole Cedex, France

Filed Feb. 13, 1995, Ser. No. 387,088

Claims priority, application France, Feb. 11, 1994, 94 01562

Int. Cl.^{6} C07C *45/38*

U.S. Cl. 568—432 **29 Claims**

1. A process for the preparation of a hydroxybenzaldehyde, comprising oxidizing the corresponding hydroxybenzyl alcohol with oxygen, in liquid phase, in an aqueous reaction medium which comprises an alkali, in the presence of (i) a catalytically effective amount of a platinum compound and (ii) a cocatalytically effective amount of both boron and bismuth compounds.

5,689,010

PREPARATION OF HIGHER ALDEHYDES

Rocco Paciello, Bad Dürkheim; Franz Merger, Frankenthal; Michael Röper, Wachenheim, and Heinz-Josef Kneuper, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 29, 1996, Ser. No. 638,592

Claims priority, application Germany, May 4, 1995, 195 16 281.1

Int. Cl.^{6} C07C *45/49*

U.S. Cl. 568—451 **19 Claims**

1. A process for preparing aldehydes from olefins by a hydroformylation and an aldol condensation, wherein the olefins are reacted using a hydroformylation catalyst based on rhodium or cobalt with simultaneous use of a Mannich catalyst comprising secondary amines and carboxylic acids to form aldehydes.

5,689,011

PROCESS FOR THE PRODUCTION OF GLYOXALS AND CATALYSTS THEREFOR

Kazuo Wakimura, Sennan; Kazuhuyu Sudoh, Yokohama; Masao Tanaka; Hatuo Inoue, both of Sakai, and Nobuhisa Iwane, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 18, 1995, Ser. No. 443,665

Claims priority, application Japan, May 30, 1994, 6-116980

Int. Cl.^{6} C07C *45/00*

U.S. Cl. 568—486 **10 Claims**

1. A process for producing glyoxal which comprises conducting oxidative dehydrogenation of a glycol at a temperature of 400° to 700° C. in the presence of a silver-based catalyst and phosphorus

or a phosphorus compound, wherein the silver-based catalyst is composed of i) silver particles coated partially with at least one element selected from the group consisting of gold, platinum, rhodium and palladium or ii) particles of a silver supporting inert carrier wherein at least one element selected from the group consisting of gold, platinum, rhodium and palladium is supported on the surface of the particles, and wherein the phosphorus or the phosphorus compound is mixed with the glycol prior to conducting said oxidative dehydrogenation or is added to the process separately from the glycol.

5,689,012

CONTINUOUS PREPARATION OF LOW UNSATURATION POLYOXYALKYLENE POLYETHER POLYOLS WITH CONTINUOUS ADDITON OF STARTER

José F. Pazos, Havertown, and T. Thomas Shih, Bryn Mawr, both of Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Jul. 18, 1996, Ser. No. 683,356

Int. Cl.^{6} C07C *43/11*

U.S. Cl. 568—619 **31 Claims**

1. A continuous process for the preparation of a polyoxyalkylene polyether product of number average molecular weight N employing continuous addition of starter, comprising:

a) establishing in a continuous reactor a first portion of a DMC catalyst/initial starter mixture effective initiate polyoxyalkylation of said initial starter after introduction of alkylene oxide into said continuous reactor;

b) continuously introducing into said continuous reactor one or more alkylene oxides;

c) continuously introducing into said continuous reactor one or more continuously added starters which may be the same or different than said initial starter;

d) continuously introducing into said reactor fresh DMC catalyst and/or further DMC catalyst/further starter mixture such that the catalytic activity is maintained;

e) polyoxyalkylating combined starters by continuously practicing at least steps b) through d) herein until a polyoxyalkylene polyether product of number average molecular weight N is obtained; and

f) continuously removing said polyoxyalkylene polyether product from said continuous reactor.

5,689,013

PROCESS FOR PREPARING TERTIARY ALKYL ETHERS FROM AN OLEFINIC HYDROCARBON FEEDSTOCK

Harri Järvelin, Helsinki; Petri Lindqvist, Porvoo, and Juha Jakkula, Kerava, all of Finland, assignors to Neste Ot, Espoo, Finland

Filed Sep. 12, 1995, Ser. No. 527,319

Int. Cl.^{6} C07C *41/05*

U.S. Cl. 568—697 **14 Claims**

1. A process for preparing tertiary alkyl ethers, comprising the steps of

contacting in the presence of a catalyst a feedstock containing saturated and mono- and multi-unsaturated hydrocarbons having 4 to 7 carbon atoms with an excess amount of hydrogen in relation to the multi-unsaturated hydrocarbons in order selectively to hydrogenate at least a part of the multi-unsaturated hydrocarbons to form a modified hydrocarbon feedstock, the unsaturated hydrocarbons of which are primarily comprised of mono-unsaturated compounds,

feeding the modified hydrocarbon feedstock together with at least a part of the unreacted hydrogen to a catalytic distillation reactor system which includes at least one distillation column,

reacting the C_{4-7} isoolefines of the feedstock with an alkanol in the presence of a catalyst to form tertiary alkyl ethers,

subjecting the reaction mixture to distillation in the distillation column,

recovering the alkyl ethers and substantially all of the unreacted hydrocarbons with the bottoms product of the distillation,

withdrawing an overhead product of the distillation, which mainly contains an azeotrope of C_4 hydrocarbons and the alkanol, and

maintaining the pressure of the distillation column essentially constant by adjusting the amount of gaseous distillate containing hydrogen in the column.

5,689,014

INTEGRATED PROCESS FOR PRODUCING DIISOPROPYL ETHER AND AN ISOPROPYL TERTIARY ALKYL ETHER

Stanley J. Frey, Palatine; Robert J. Schmidt, Barrington; Terry L. Marker, Warrenville, and Richard E. Marinangeli, Arlington Heights, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Oct. 5, 1995, Ser. No. 539,577

Int. Cl.^{6} C07C *41/05*

U.S. Cl. 568—697 **14 Claims**

1. An integrated process for producing diisopropyl ether and an isopropyl tertiary alkyl ether comprising:

a. reacting propylene, water, a tertiary alcohol, and isopropyl alcohol in the presence of an acidic catalyst to afford a first reaction zone effluent;

b. recycling a portion of the first reaction zone effluent to step (a) and removing propylene from the remainder to afford a propylene-depleted stream;

c. separating the propylene-depleted stream into an ether enriched stream, an alcohol enriched stream, and a water enriched stream;

d. reacting the alcohol enriched stream with isobutylene, isoamylene, or a mixture thereof present in a feed stream further containing inert material, in the presence of an acidic catalyst to afford a second reaction zone effluent and an aqueous stream;

e. recycling the aqueous stream to step (a);

f. removing the inert material, and isobutylene, isoamylene, or the mixture thereof from the second reaction zone effluent to afford an iso-olefin depleted stream;

g. water washing a mixture of the iso-olefin depleted stream, the ether enriched stream, and the water enriched stream to afford an aqueous alcohol stream and an oxygenate stream;

h. recycling the aqueous alcohol stream to step (c); and

i. collecting the oxygenate stream.

5,689,015

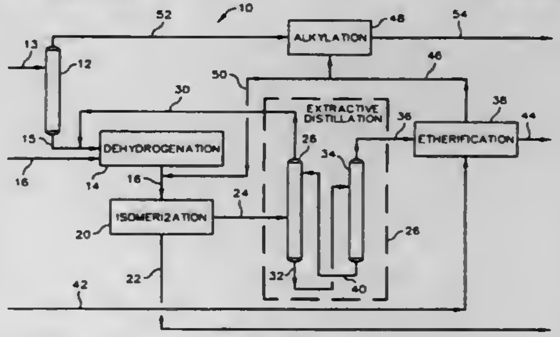
METHOD FOR THE PRODUCTION OF ETHER AND ALKYLATE FROM A PARAFFIN FEEDSTOCK

Harold R. Hunt; Mark D. Scharre, and Warren M. Ewert, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 8, 1996, Ser. No. 613,267

Int. Cl.^{6} C07C *41/06*

U.S. Cl. 568—697 **4 Claims**



1. A process comprising the steps of:

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(A) separating a mixed butane stream comprising n-butane and isobutane into an isobutane stream, comprising isobutane, and an n-butane stream, comprising n-butane;

(B) charging said n-butane stream to a dehydrogenation system for dehydrogenating n-butane to butene compounds, said dehydrogenation system producing a product stream containing butenes;

(C) passing said product stream to an isomerization system for isomerizing linear butenes to isobutene to thereby produce an isomerate stream containing isobutenes;

(D) passing said isomerate stream to an extractive distillation utilizing a suitable extraction solvent to separate butanes and butenes by providing a first overhead stream, containing butane, and a second overhead stream, containing butenes;

(E) passing said second overhead stream to an etherification system for reacting isobutene with a primary alcohol to form ether and to thereby produce an ether product, containing ether, and a raffinate stream, containing linear butenes; and

(F) passing said raffinate stream and said isobutane stream to an alkylation system for reacting isoparaffins and olefins to thereby produce an alkylate stream containing alkylate.

5,689,016

COBALT-CATALYZED PROCESS FOR PREPARING ALKANEDIOLS USING A RHODIUM PROMOTER

Paul Richard Weider; Lynn Henry Slaugh, and Joseph Broun Powell, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 316,676, Sep. 30, 1994, abandoned. This application Mar. 20, 1996, Ser. No. 618,711

Int. Cl.^{6} C07C *27/04*

U.S. Cl. 568—862 **17 Claims**

1. A process for preparing an alkanediol comprising the steps of:

(a) contacting, at a temperature within the range of about 50° to about 100° C. and a pressure within the range of about 500 to about 5000 psig, an ethylene oxide with carbon monoxide and hydrogen in an essentially non-water miscible solvent in the presence of an effective amount of a non-phosphine-ligated cobalt catalyst and an effective amount of a rhodium promoter under reaction conditions effective to produce an intermediate product mixture comprising less than 15 wt % hydroxyaldehyde;

(b) adding an aqueous liquid to said intermediate product mixture and extracting into said aqueous liquid a major portion of the hydroxyaldehyde at a temperature less than about 100° so as to provide an aqueous phase comprising the hydroxyaldehyde in greater concentration than the concentration of hydroxyaldehyde in the intermediate product mixture, and an organic phase comprising at least a portion of the cobalt catalyst or a cobalt-containing derivative thereof and at least a portion of the rhodium promoter or a rhodium-containing derivative thereof;

(c) separating the aqueous phase from the organic phase;

(d) contacting the aqueous phase comprising the hydroxyaldehyde with hydrogen in the presence of a hydrogenation catalyst at a pressure of at least about 100 psig and a temperature during at least a portion of the hydrogenation step of at least about 40° C. to provide a hydrogenation product mixture comprising an alkanediol; and

(e) recovering the alkanediol from the hydrogenation product mixture.

5,689,017

PREPARATION OF A MONOLITHIUM ACETYLIDE/ AMMONIA COMPLEX

Thomas Rühl, Frankenthal; Rolf Müller, Hockenheim; Jochem Henkelmann, Mannheim, and Marc Heider, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 12, 1995, Ser. No. 542,188

Claims priority, application Germany, Oct. 13, 1994, 44 36 498.9

Int. Cl.^{6} C07C *33/04*

U.S. Cl. 568—874 **5 Claims**

1. A process for the preparation of an ammonia solution of a monolithium acetylide/ammonia complex which comprises: reacting lithium amide and acetylene in ammonia in a pressure vessel at a temperature of from −10° to 30° C. under the autogenous pressure of the ammonia.

5,689,018

PROCESS FOR THE PRODUCTION OF DINITROTOLUENE

Uwe Klingler, Dormagen; Thomas Schieb, Rörath; Gerhard Wiechers, Leverkusen, all of Germany, and Jürgen Zimmermann, Walnut Creek, Calif., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 3, 1995, Ser. No. 510,803

Claims priority, application Germany, Aug. 11, 1994, 44 28 462.4

Int. Cl.^{6} C07C *205/00*

U.S. Cl. 568—934 **4 Claims**

1. A two-stage process for the continuous production of isomer mixtures of dinitrotoluene comprising

A) reacting
  1) toluene with
  2) nitrating acid composed of
    a) from 80 to 100% by weight of inorganic materials which include:
      (i) from about 60 to about 90% by weight of sulfuric acid,
      (ii) from about 1 to about 20% by weight of nitric acid, and
      (iii) at least 5% by weight of water and
    b) from 0 to about 20% by weight of organic materials which include:
      (i) from about 70% by weight of isomers of nitrotoluene and
      (ii) from 0 to about 30% by weight of by-products of the nitration reaction

isothermally in a continuously operated reactor at a temperature of from about 0 to about 100° C. in amounts such that the molar ratio of nitric acid to toluene is at least 0.7:1 but no greater than 1.2:1,

B) separating the reaction mixture from A) into an organic phase and an acid phase,

C) reacting the organic phase separated in B) under adiabatic conditions at a temperature of from about 20 to about 200° C. with a nitrating acid which is made up of:
  a) from about 80 to about 100% by weight inorganic materials which include:
    (i) from about 60 to about 90% by weight sulfuric acid,
    (ii) from about 1 to about 20% by weight nitric acid, and
    (iii) at least 5% by weight water, and
  b) from 0 to about 20% by weight organic materials which include:
    (i) from about 70 to about 100% by weight isomers of nitrotoluene and
    (ii) from 0 to about 30% by weight by-products of the nitration reaction,

in amounts such that the molar ratio of nitric acid to mononitrotoluene is at least 0.7:1 but no greater than 1.2:1,

D) separating the reaction mixture from C) into an organic phase and an acid phase,

E) removing at least 5% by weight of water from the acid phase separated in D),

F) adding 50–100% nitric acid to the acid phase from E) and

G) recycling the acid phase from F).

5,689,019

MANUFACTURING METHOD FOR 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE

Hirokazu Aoyama, and Noriaki Shibata, both of Settsu, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP95/01379, § 371 Date Jan. 14, 1997, § 102(e) Date Jan. 14, 1997, PCT Pub. No. WO96/02483, PCT Pub. Date Feb. 1, 1996

PCT Filed Jul. 11, 1995, Ser. No. 765,433

Claims priority, application Japan, Jul. 14, 1994, 6-185369

Int. Cl.^{6} C07C *17/00*

U.S. Cl. 570—167 **9 Claims**

1. A manufacturing method for 1,1,1,2,3,3,3-heptafluoropropane wherein 1,1,1,2,3,3,3-heptafluoropropane is obtained by reacting hexafluoropropene with anhydrous hydrogen fluoride under the presence of antimony catalyst.

5,689,020

HIGH TEMPERATURE CHLORINATION PROCESS FOR THE PREPARATION OF POLYCHLOROOLEFINS

C. Bradford Boyce, Baton Rouge, La., assignor to LaRoche Industries Inc., Atlanta, Ga.

Filed Mar. 11, 1996, Ser. No. 614,005

Int. Cl.^{6} C07C *21/04*

U.S. Cl. 570—216 **10 Claims**

1. A process for preparing a compound selected from the group consisting of 1,1,3,3-tetrachloropropene and 1,3,3,3-tetrachloropropene by

a. admixing a hydrocarbon compound selected from the group consisting of propene, 1-chloropropene, 3-chloropropene, 1,1-dichloropropene, 1,3-dichloropropene, 3,3,-dichloropropene, 1,1-dichloropropane, 1,2-dichloropropane, 1,3-dichloropropane, 1,1,3-trichloropropene, 1,3,3-trichloropropene, 3,3,3-trichloropropene, and mixtures thereof with an inert diluent gas;

b. preheating said mixture to from about 300° C. to about 400° C. and then mixing it with chlorine gas; and

c. thermally treating the mixture of step b. at a temperature of from about 400° C. to about 600° C.

5,689,021

RANEY-TYPE CATALYSTS FOR THE HYDROGENATION OF HALONITROAROMATIC COMPOUNDS

Georges Cordier, Francheville; Jean-Pierre Damon, Le Touvet; Pierre Fouilloux, Caluire et Cuire, and Philippe Marion, Villeurbanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Division of Ser. No. 319,643, Oct. 7, 1994, Pat. No. 5,554,573. This application Mar. 26, 1996, Ser. No. 621,971

Claims priority, application France, Oct. 7, 1993, 93 12149

Int. Cl.^{6} C07C *5/10;5/367*

U.S. Cl. 585—276 **22 Claims**

1. A process for the selective hydrogenation of a halonitroaromatic compound into a corresponding haloaromatic amine, comprising reacting said halonitroaromatic compound with hydrogen, in the presence of a catalytically effective amount of a Raney-type catalyst composition consisting essentially of an alloy of nickel, aluminum and molybdenum, Ni/Al/Mo, the alloy having an Al/Mo ratio by weight thereof being equal to or greater than 1, and a Mo/(Ni+Al) ratio by mass thereof being at least 5%, and the nickel content being not greater than 78% by weight.

15. The process as defined by claim 1, the Ni/(Ni+Al+Mo) ratio being at least 0.5.

5,689,022

PREPARATION OF β-CAROTENE PRODUCTS WITH A HIGH 9 (Z) CONTENT

Joachim Paust, Neuhofen, and Michael John, Lambsheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

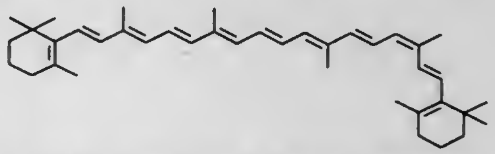
Filed Apr. 30, 1996, Ser. No. 641,032

Claims priority, application Germany, May 12, 1995, 19 517 422.4

Int. Cl.^{6} C07C *403/00*

U.S. Cl. 585—351 **14 Claims**

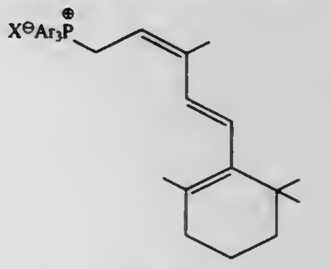
1. A process for preparing β-carotene products with a high content of 9(Z)-β-carotene of formula I:



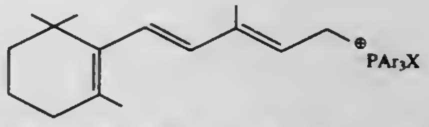
(I)

from a mother liquor from the industrial preparation of C_{15}-triarylphosphonium salts, comprising:

(a) extracting a mother liquor comprising a 9 (Z)-C_{15}-triarylphosphonium salt of formula (II) and an all-(E)-C_{15}-triarylphosphonium salt of formula (VI):



(II)



(VI)

with water to produce an aqueous solution containing the salts, wherein X is halogen or HSO_4 and Ar is an unsubstituted or substituted phenyl group;

(b) precipitating the all-(E)-C_{15}-triarylphosphonium salt of formula (VI) by

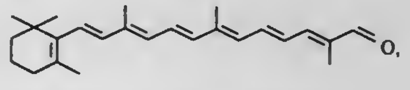
either

  (1) concentrating the aqueous solution containing the salts to produce the salts as an oil, followed by dissolving the oil in a lower alkanol, or
  (2) concentrating the aqueous solution containing the salts while changing the solvent from water to a lower alkanol;

(c) removing the precipitated all-(E)-C_{15}-triarylphosphonium salt to produce a C_{15}-triarylphosphonium salt enriched in the 9(Z)-isomer of formula (II);

(d) reacting the C_{15}-triarylphosphonium salt enriched in the 9(Z)-isomer of formula (II) in the presence of a base in a solvent suitable for a Wittig reaction with either

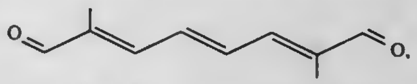
  (1) all-(E)-β-apo-12'-carotenal of formula (III):



(III)

or

  (2) a symmetrical C_{10}-dialdehyde of formula (IV):



(IV)

followed by reacting the resulting 9(Z)-β-apo-12'-carotenal of formula (V):

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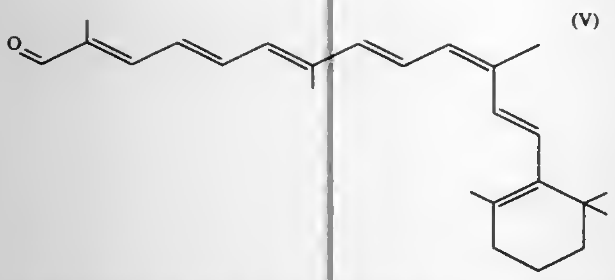


(V)

in the presence of a base in a solvent suitable for a Wittig reaction with said all-(E)-β-C_{15}-triarylphosphonium salt of formula (VI), to produce a β-carotene product enriched in the 9(Z) isomer; and

(e) optionally, isomerizing the (Z) double bond at the 11 or 11' position of the β-carotene product by heating.

5,689,023

PROCESS FOR PREPARING STYRENE FROM ETHYLBENZENE USING A IRON OXIDE CATALYST

David Morris Hamilton, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 355,950, Dec. 14, 1994, abandoned. This application Jul. 10, 1996, Ser. No. 677,759

Int. Cl.^{6} C07C *2/64;4/06;* **B01J** *23/70;23/74*

U.S. Cl. 585—444 **2 Claims**

1. In a method of preparing styrene from ethylbenzene using an extruded iron oxide catalyst, the improvement consisting of increasing the catalytic activity in said process by selecting for use in said catalyst, iron oxide produced from alpha-FeOOH derived from scrap metal via dehydration of a yellow alpha-Fe(OOH) intermediate and having particles with a particle size of at least about 2 microns in at least a median number of particles and wherein said iron oxide is devoid of bound sulfate.

5,689,024

USE OF CRYSTALLINE SUZ-9

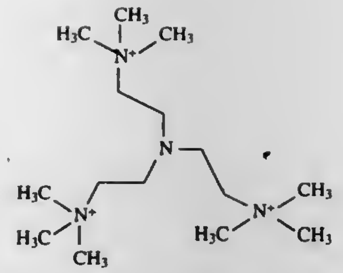
Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 253,992, Jun. 3, 1994, Pat. No. 5,399,337. This application Dec. 1, 1994, Ser. No. 347,917

Int. Cl.^{6} C07C *2/54;7/12;* **C10G** *11/05;35/095*

U.S. Cl. 585—467 **36 Claims**

1. A process for convening a feedstock comprising organic compounds to conversion product, which process is selected from the group consisting of aromatics alkylation, alkylation of isoalkanes, catalytic cracking and reforming and which comprises contacting said feedstock at organic compound conversion conditions with a catalyst composition comprising an active form of crystalline material exhibiting a characteristic X-ray diffraction pattern including d-spacing maxima values as shown in Table 1, said crystalline material having been synthesized by a method comprising (i) preparing a mixture capable, to forming said material, said mixture comprising sources of alkali metal (M), an oxide of trivalent element (X), an oxide of tetravalent element (Y), water and triquat (R) having a formula $C_{15}H_{39}N_4^{+++}$ and represented as follows:



and having a composition, in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	8 to 30
H_2O/YO_2	8 to 22
OH^-/YO_2	0.4 to 1.1
M/YO_2	0.2 to 1.3
R/YO_2	0.03 to 1.2;

(ii) maintaining said mixture under sufficient conditions including a temperature of from about 110° C. to about 150° C. until crystals of said material are formed; and (iii) recovering said crystalline material from step (ii), said recovered crystalline material containing said R.

5,689,025

ETHYLBENZENE PRODUCTION PROCESS WITH EX SITU SELECTIVATED ZEOLITE CATALYST

Jeevan S. Abichandani, Voorhees; Jeffrey S. Beck, Princeton, both of N.J.; Sharon B. McCullen, Newtown, Pa., and David H. Olson, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 69,251, May 28, 1993, Pat. No. 5,476,823. This application Feb. 1, 1995, Ser. No. 382,103

Int. Cl.^{6} C07C *2/68*

U.S. Cl. 585—467 **21 Claims**

1. A process for improved shape selective alkylation of benzene comprising:

contacting a reaction stream comprising ethylene and benzene, under alkylation conditions sufficient to produce ethylbenzene, with a catalytic molecular sieve which comprises a zeolite having a constraint index of from about 1 to about 12 and which has been modified by being exposed to at least two ex-situ selectivation sequences;

wherein each ex-situ selectivation sequence includes the steps of contacting the catalytic molecular sieve with a selectivating agent dissolved in an organic carrier and subsequently calcining the catalytic molecular sieve.

5,689,026

HYDRODEALKYLATION PROCESS

An-hsiang Wu, Bartlesville; Charles A. Drake, Nowata, and Ralph J. Melton, Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1996, Ser. No. 637,118

Int. Cl.^{6} C07C *5/22;4/12;2/52*

U.S. Cl. 585—475 **20 Claims**

1. A hydrodealkylation process comprising contacting (a) a fluid feed which comprises at least one alkyl-substituted benzene containing 9 to 12 carbon per molecule atoms and (b) hydrogen with (c) a catalyst comprising (I) zeolite Beta, (ii) nickel, (iii) molybdenum and (iv) sulfur, at effective hydrodealkylation conditions so as to convert said at least one alkyl-substituted benzene to a product comprising (α)at least one aromatic product hydrocarbon containing 6 to 8 carbon atoms per molecule and (β) at least one alkane containing 1 to 5 carbon atoms per molecule wherein:

said catalyst is prepared by the steps comprising: (1) impregnating a zeolite Beta material with compounds of nickel and molybdenum to produce a nickel- and molybdenum-impregnated zeolite Beta material; (2) calcining Said nickel- and molybdenum-impregnated zeolite Beta material to produce a calcined nickel- and molybdenum-impregnated zeolite Beta material; and (3) sulfiding said calcined nickel- and molybdenum-impregnated zeolite Beta material, said sulfiding is selected from the group consisting of

(A) treating said calcined nickel- and molybdenum-impregnated zeolite Beta material with a mixture of about 1–99 mole-% hydrogen gas and about 99–1 mole-% of at least one sulfur compound selected from the group consisting of ammonium sulfide, carbon disulfide, carbonyl sulfide, hydrogen sulfide, thiophene, alkyl mercaptans, alkyl sulfides and mercaptoalcohols at a temperature of about 350°–500° C.

(B) reducing said calcined nickel- and molybdenum-impregnated Beta material, and thereafter treating said material with a solution of at least one sulfide selected from the group consisting of hydrogen sulfide, ammonium sulfide and alkali metal sulfides, and

(C) combinations thereof.

5,689,027

SELECTIVE ETHYLBENZENE CONVERSION

Jeevan S. Abichandani, Voorhees; Jeffrey S. Beck, Lawrenceville; David H. Olson, Pennington; P. Thomas Reischman, Lambertville; David L. Stern, Lawrenceville, and Chaya R. Venkat, Princeton, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 342,322, Nov. 18, 1994, Pat. No. 5,516,956, and Ser. No. 469,602, Jun. 8, 1995, and Ser. No. 471,631, Jun. 6, 1995, Pat. No. 5,625,104. This application Nov. 14, 1995, Ser. No. 557,251

Int. Cl.^{6} C07C *5/22*

U.S. Cl. 585—481 **42 Claims**

1. A process for isomerizing xylenes in a feed comprising ethylbenzene and xylenes, comprising the steps of:

(a) contacting the feed under ethylbenzene conversion conditions with a first bed of a first catalyst comprising an intermediate pore size zeolite having a constraint index ranging from 1 to 12 and a silica to alumina ratio of at least about 5, said intermediate pore size zeolite having been modified by being exposed to at least one selectivation sequence that comprises the steps of contacting the zeolite with a organosilicon selectivating agent to obtain a selectivated zeolite and subsequently calcining the selectivated zeolite, to form an ethylbenzene depleted product; and

(b) contacting the ethylbenzene depleted product under xylene isomerization conditions with a second bed of a second catalyst comprising an intermediate pore size zeolite, wherein the second catalyst requires less than 50 minutes to sorb ortho-xylene in an amount equal to 30% of the equilibrium sorption capacity for xylenes at 120° C. and at a xylene partial pressure of 4.5±0.8 mm of mercury.

5,689,028

PROCESS TO REGULATE OLEFIN PRODUCTION BY CATALYST SYSTEM INHIBITION

Mark E. Lashier; Jeffrey W. Freeman, and Ronald D. Knudsen, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 199,861, Feb. 18, 1994, abandoned. This application Dec. 18, 1995, Ser. No. 573,655

Int. Cl.^{6} C07C *2/24;* **B01J** *31/00*

U.S. Cl. 585—512 **21 Claims**

1. A process to inhibit an olefin trimerization catalyst system activity and to recover trimerization products and trimerization catalyst system components comprising the sequential steps of:

a) forming a product stream by contacting an olefin trimerization reactor effluent stream which comprises olefin product(s), catalyst system, polymer(s) and/or oligomer(s) with an alcohol that is soluble in any portion of the reactor effluent stream;

wherein said catalyst system comprises a chromium source, a pyrrole-containing compound and an alkylaluminum compound;

b) separating the product stream of (a) by removing and recovering at least one olefin trimerization product to form a product portion and a waste portion;

c) adding an aqueous, inorganic base to the waste portion of (b), to form an aqueous phase which comprises the inorganic base; an organic phase which comprises olefin product(s), polymer(s) and/or oligomer(s); and a precipitate which comprises chromium;

d) removing the precipitate from the aqueous phase and organic phase;

e) separating the aqueous phase and organic phase; and

f) adding a mineral acid selected from the group consisting of sulfuric acid, phosphoric acid and mixtures thereof to the aqueous phase to remove substantially all of the aluminum.

5,689,029

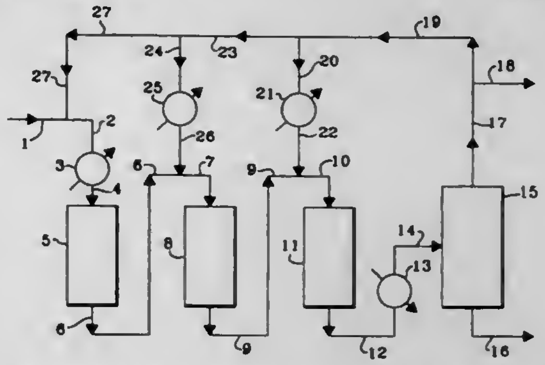
PROCESS FOR THE DEHYDROGENATION OF PARAFFINIC HYDROCARBONS

Bipin V. Vora, Darien, and Tamotsu Imai, Mount Prospect, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 299,874, Sep. 1, 1994, Pat. No. 5,491,275, which is a continuation-in-part of Ser. No. 051,926, Apr. 26, 1993, abandoned. This application Dec. 27, 1995, Ser. No. 579,112

Int. Cl.^{6} C07C *5/32*

U.S. Cl. 585—659 **9 Claims**



1. A process for the dehydrogenation of a paraffinic dehydrogenatable hydrocarbon in N stages wherein N≧2 with reheat between each stage which process comprises:

(a) contacting said paraffinic dehydrogenatable hydrocarbon and hydrogen with a dehydrogenation catalyst at dehydrogenation conditions including a temperature, T_1, in a first dehydrogenation stage wherein the endothermic dehydrogenation reaction reduces the temperature of the resulting first hydrocarbon stream containing hydrogen, dehydrogenated hydrocarbon compounds and unreacted dehydrogenatable hydrocarbon;

(b) mixing the effluent hydrocarbon stream from the immediate preceding stage with a portion of a hereinafter produced hydrogen-rich gaseous recycle stream having a temperature, T_2, which is greater than T_1 to thereby increase the temperature of the resulting mixture to a temperature proximate T_1;

(c) contacting the resulting heated mixture produced in the preceding step with a dehydrogenation catalyst at dehydrogenation conditions in the next subsequent dehydrogenation stage to produce an effluent hydrocarbon stream containing hydrogen, dehydrogenated hydrocarbon compounds and unreacted dehydrogenatable hydrocarbons;

(d) repeating steps (b) and (c), N−1 times;

(e) condensing at least a portion of the effluent stream containing dehydrogenated hydrocarbon compounds recovered from the N^{th} stage to produce a liquid hydrocarbon stream comprising

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dehydrogenated hydrocarbon compounds and a separated hydrogen-rich gaseous stream;

(f) heating at least a portion of said separated hydrogen-rich gaseous stream to produce N+1 heated hydrogen-rich gaseous recycle streams for each dehydrogenation stage subsequent to said first dehydrogenation stage and recycling each heated hydrogen-rich gaseous recycle stream to its designated stage; and

(g) recovering a dehydrogenated hydrocarbon product stream from step (e).

5,689,030

METHOD FOR PROLONGING THE LIFE OF ALKYLATION PRODUCT STREAM DEFLUORINATOR BEDS

Bruce B. Randolph, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 6, 1996, Ser. No. 611,588

Int. Cl.^{6} C10C *2/62*

U.S. Cl. 585—724 **5 Claims**

1. A method for prolonging the life of a defluorinator material used to remove organic fluoride compounds from a product stream of an alkylation process for alkylating olefins by isoparaffins utilizing an alkylation catalyst containing HF and sulfone, said method comprises the steps of:

adding trifluoromethanesulfonic acid (TFA) to said alkylation catalyst in an amount sufficient to inhibit the formation of organic fluorides during the alkylation of olefins by isoparaffins in said alkylation process;

producing said product stream having a concentration of organic fluoride in the range of from about 10 ppm to about 0.5 weight percent; and

contacting said product stream with said defluorinator material to produce a defluorinated product stream having less than 5 ppm organic fluoride.

5,689,031

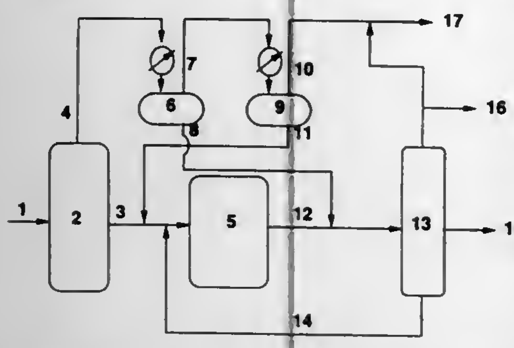
SYNTHETIC DIESEL FUEL AND PROCESS FOR ITS PRODUCTION

Paul Joseph Berlowitz, East Windsor; Bruce Randall Cook, Pittstown, both of N.J., and Robert J. Wittenbrink, Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Oct. 17, 1995, Ser. No. 544,345

Int. Cl.^{6} C07C *5/27*

U.S. Cl. 585—734 **11 Claims**



1. A distillate fraction useful as a fuel heavier than gasoline or as a blending component for a distillate fuel comprising: a 250°–700° F. distillate fraction derived from a Fischer-Tropsch catalytic process and containing

at least 95 wt % paraffins with an iso to normal ratio of about 0.3 to 3.0,

≦50 ppm (wt) each of sulfur and nitrogen

less than about 0.5 wt % unsaturates,

about 0.001 to less than 0.3 wt % linear C_{12}–C_{24} primary alcohol oxygenate, as oxygen on a water free basis.

3. A process for producing a distillate fuel heavier than gasoline comprising:

(a) separating the waxy product of a Fischer-Tropsch process into a heavier fraction containing 700°+ and a lighter fraction containing 700°;

(b) further separating the lighter fraction into at least two fractions, (i) at least one fraction containing primary C_{12}–C_{24} alcohols and (ii) one or more other fractions;

(c) hydroisomerizing at least a portion of the heavier fraction of step (a) and at least a portion of the (b) (ii) fractions at hydroisomerization conditions and recovering a 700° F.– fraction;

(d) blending at least a portion of the fraction (b) (i) with at least a portion of of the 700° F.– fractions of step (c) and recovering a product boiling in the range 250°–700° F.–, containing 0.001 to 0.3 wt % C_{12}–C_{24} primary alcohol oxygenate, as oxygen on a water free basis.

5,689,032

METHOD AND APPARATUS FOR RECOVERY OF H_2 AND C_2 AND HEAVIER COMPONENTS

William A. Krause, and Ronald C. Pasadyn, both of Houston, Tex., assignors to Krause/Pasadyn, a Partnership, Houston, Tex.

Filed Nov. 22, 1994, Ser. No. 343,784

Int. Cl.^{6} C07C *7/00;* **C10G** *49/22;* **F25J** *3/00*

U.S. Cl. 585—802 **13 Claims**

1. A method of separating a hydrocarbon gas into a fraction containing a predominant portion of hydrogen, a fraction containing a predominant portion of the C_2 and heavier components, and a fraction containing the residual components comprising:

(a) separating the feed gas into a first hydrocarbon-rich liquid and a H_2-rich vapor;

(b) separating the H_2-rich vapor into a second, substantially H_2 vapor and a first hydrocarbon-rich vapor;

(c) separating at temperatures above −30.8° F. the first hydrocarbon-rich liquid into a second hydrocarbon-rich liquid comprised substantially of C_2 and heavier components and a second hydrocarbon-rich vapor;

(d) compressing the first and second hydrocarbon-rich vapors to produce a third hydrocarbon-rich vapor and a third hydrocarbon-rich liquid; and

(e) separating at or below −30.8° F. the third hydrocarbon-rich vapor and the third hydrocarbon-rich liquid into a fourth liquid comprised substantially of C_2 and heavier components and a fourth vapor containing a predominant portion of methane.

9. A method of recovering a predominant portion of the C_2 and heavier components in a feed gas comprising:

(a) demethanizing the feed gas at temperatures above −30.8° F. to produce a substantially C_2 and heavier component stream and a methane and lighter component-rich stream;

(b) demethanizing the methane and lighter component-rich stream at or below −30.8° F. to produce a second substantially C_2 and heavier component stream and a residue stream.

11. A method of separating a hydrocarbon gas into a fraction containing a predominant portion of hydrogen, a fraction containing a predominant portion of the C_2 and heavier components and a fraction containing the residual components comprising:

(a) separating the feed gas into a first hydrocarbon-rich liquid and a H_2-rich vapor;

(b) separating the H_2-rich vapor into a second, substantially H_2 vapor and a first hydrocarbon-rich vapor;

(c) demethanizing the first hydrocarbon-rich liquid at temperatures above −30.8° F. to produce a substantially C_2 and

heavier component stream and a methane and lighter component-rich stream;

(d) demethanizing the methane and lighter component-rich stream and the first hydrocarbon-rich vapor at or below −30.8° F. to produce a second substantially C_2 and heavier component stream and a residue stream.

5,689,033

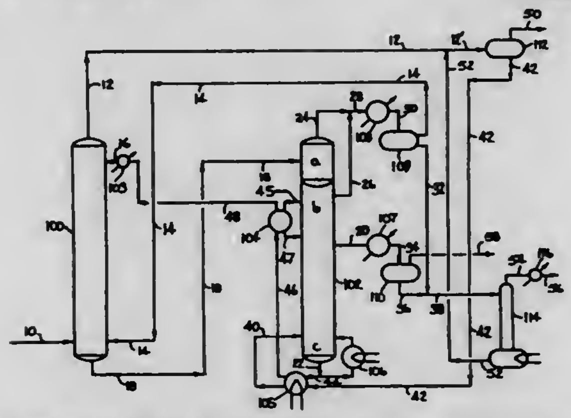
PROCESS FOR REMOVAL OF IMPURITIES FROM LIGHT PARAFFIN ISOMERIZATION FEEDSTOCKS

Paulino Forte, Yonkers, N.Y., and Stanley J. Frey, Palatine, Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 406,441, Mar. 20, 1995, Pat. No. 5,569,788. This application May 2, 1996, Ser. No. 642,092

Int. Cl.^{6} C07C *7/10*

U.S. Cl. 585—833 **13 Claims**



1. A process for the removal of impurities comprising at least one of sulfur compounds, oxygenates, and olefins from a C_4–C_6 hydrocarbon feedstream comprising said impurities, said process comprising:

a) passing said feedstream to a removal zone and therein contacting said feedstream with a lean selective solvent selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol, pentaethylene glycol, 1,3-butane glycol, 1,2-butane glycol, 1,5-pentane glycol, sulfolane, furfural, n-formyl morpholine, n-methyl-2 pyrrolidone, water, and mixtures thereof to provide a treated feedstream depleted in said impurities relative to said feedstream and a rich solvent stream;

b) passing said rich-solvent stream to a stripping zone and therein contacting said rich solvent stream with a stripping medium to provide an extract stream enriched in said impurities relative to said feedstream and a regenerated selective solvent stream;

c) renaming at least a portion of said regenerated selective solvent stream to said removal zone as said lean selective-solvent.

6. A process for the removal of impurities including at least one of sulfur compounds, oxygenates and olefins from a liquid feedstream comprising a mixture of said impurities and C_4 and C_6 hydrocarbons said process comprising:

a) passing said liquid feedstream and a reflux stream at extraction conditions including an extraction temperature and an extraction pressure to a liquid-liquid extraction zone and therein contacting said feedstream and said reflux stream with a selective solvent stream to provide a treated feedstream depleted in said impurities and a rich-solvent stream, enriched in said impurities relative to the selective solvent stream;

b) passing at least a portion of the rich-solvent stream at solvent regeneration conditions including a regeneration temperature and a regeneration pressure to a stripping zone and therein contacting said rich-solvent stream with a stripping medium stream to provide a reflux stream, an extract stream, and a lean-solvent stream; and,

c) passing at least a portion of the lean-solvent stream to the extraction zone to provide said selective solvent stream.

5,689,034

INBRED MAIZE LINE PH24E

Samuel Gregg Fullerton, Huron, S. Dak., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Sep. 5, 1995, Ser. No. 523,660

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **14 Claims**

1. Seed of maize inbred line designated PH24E and having ATCC Accession No. 97925.

5,689,035

BROWN STEM ROT RESISTANCE IN SOYBEANS

David M. Webb, Johnston, Iowa, assignor to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Sep. 26, 1995, Ser. No. 534,091

Int. Cl.^{6} C07H *21/00;* **A01H** *1/04;5/00;* **C12N** *15/29*

U.S. Cl. 800—200 **7 Claims**

1. A method of reliably and predictably introgressing brown stem rot resistance into non-resistant soybean germplasm comprising using one or more nucleic acid markers for marker assisted selection among soybean lines to be used in a soybean breeding program, the markers being associated with brown stem rot resistance, and wherein the nucleic acid markers are pB122a, php03490a, pK375b, pK5a, pG8.15b, pB32b, php03513a, pL69a, pK373a, php03497a, pA233a, or pA724a, and further comprising introgressing said resistance into said non-resistance into said non-resistant germplasm.

5,689,036

HYBRID MAIZE PLANT AND SEED (3730)

Todd Elliott Piper, Eau Claire, Wis., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 398,481, Mar. 3, 1995, abandoned. This application Mar. 5, 1996, Ser. No. 610,905

Int. Cl.^{6} A01H *5/00;4/00;* **C12N** *5/04*

U.S. Cl. 800—200 **6 Claims**

1. A hybrid maize plant designated 3730 and its parts, representative seed capable of producing said hybrid maize planting having ATCC accession number 209127.

5,689,037

SOYBEAN CULTIVAR 902437929045

Craig K. Moots, Taylorville, Ill., assignor to Asgrow Seed Company, Kalamazoo, Mich.

Filed Sep. 30, 1996, Ser. No. 724,503

Int. Cl.^{6} A01H *5/00;5/10*

U.S. Cl. 800—200 **9 Claims**

1. A soybean seed designated 902437929045, deposited as ATCC Accession Number 209095.

2. A plant or plants of the soybean cultivar designated 902437929045 produced by growing the seed of claim 1.

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DECONTAMINATION OF CHEMICAL WARFARE AGENTS USING ACTIVATED ALUMINUM OXIDE

Philip W. Bartram, BelAir, and George W. Wagner, Elkton, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 28, 1996, Ser. No. 671,895

Int. Cl.^{6} A62D *3/00*

U.S. Cl. 588—200 **30 Claims**

1. A method of detoxifying chemical warfare agents in situ which comprises applying a coating of a sorbent comprising aluminum oxide onto a composition comprising a chemical warfare agent and allowing the coating to react with the chemical warfare agent for a sufficient time and under conditions which are sufficient to produce a reaction product having less toxicity than the chemical warfare agent.

5,689,039

PLANT PEPTIDE TRANSPORT GENE

Jeffrey M. Becker, and Gary Stacey, both of Knoxville, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Mar. 16, 1994, Ser. No. 212,188

Int. Cl.^{6} A01H *4/00;* **C07K** *14/415;* **C12N** *5/14;15/29*

U.S. Cl. 800—205 **24 Claims**

11. A transformed plant cell which contains a substantially purified polynucleotide which encodes a plant peptide transport protein, which polynucleotide has a length greater than 10 nucleotide residues, and hybridizes under low stringency conditions to a nucleotide of SEQ ID NO:1 or SEQ ID NO:3.

5,689,040

PLANT PROMOTER SEQUENCES USEFUL FOR GENE EXPRESSION IN SEEDS AND SEEDLINGS

John J. Harada, Davis; James Z. Zhang, Palo Alto, and Debbie Laudencia-Chingcuanco, Albany, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Feb. 23, 1995, Ser. No. 393,219

Int. Cl.^{6} C12N *15/29;15/82;15/11;* **A01H** *5/00*

U.S. Cl. 800—205 **19 Claims**

1. An expression cassette comprising an isocitrate lyase promoter operably linked to a heterologous nucleic acid sequence, wherein the promoter selectively hybridizes to a Brassica isocitrate lyase promoter.

12. A transgenic plant comprising the isocitrate lyase promoter of claim 1 operably linked to a heterologous nucleic acid sequence.

5,689,041

PLANTS MODIFIED WITH BARSTAR FOR FERTILITY RESTORATION

Célestina Mariani, Heusden; Jan Leemans, Deurle, and Willy De Greef, Ghent, all of Belgium, assignors to Plant Gentic Systems N.V., Ghent, Belgium

Continuation of Ser. No. 214,045, Mar. 15, 1994, abandoned, which is a continuation of Ser. No. 671,752, Mar. 21, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 395,649

Claims priority, application European Pat. Off., Aug. 10, 1989, 89402270

Int. Cl.^{6} A01H *4/00;* **C12N** *15/82;5/14*

U.S. Cl. 800—205 **77 Claims**

1. A plant comprising a foreign DNA incorporated in the nuclear genome of its cells, said foreign DNA comprising a foreign restorer gene including:

(a) a fertility-restorer DNA encoding a restorer protein or polypeptide which is barstar or a variant thereof which neutralizes, blocks, offsets, overcomes or prevents activity of barnase; and

(b) a first promoter directing expression of said fertility-restorer DNA at least in specific stamen cells of said plant, said fertility restorer DNA being in the same transcriptional unit as, and under control of, said first promoter; said plant being capable, when crossed to a male-sterile plant having a sterility DNA encoding barnase incorporated in its nuclear genome wherein barnase is selectively produced in said specific stamen cells, of producing male-fertile progeny comprising said sterility DNA and said fertility-restorer DNA.

5,689,042

TRANSGENIC PLANTS WITH ALTERED SENESCENCE CHARACTERISTICS

Richard M. Amasino, and Susheng Gan, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 29, 1995, Ser. No. 413,135

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *15/29;15/82;5/04*

U.S. Cl. 800—205 **24 Claims**

1. A genetic construct comprising an Arabidopsis-derived SAG12 or SAG13 promoter sequence operably connected to a protein-coding DNA sequence not natively connected to the promoter sequence.

12. A plant containing the construct of claim 1.

5,689,043

BIOCIDAL PROTEINS

Willem F. Broekaert, Dilbeek; Bruno P.A. Cammue, Alsemberg, both of Belgium; Rupert W. Osborn, Middlesex; Sarah B. Rees, Berkshire, both of England; Franky R.G. Terras, Amzegem, and Jozef Vanderieyden, Heverlee, both of Belgium, assignors to Zeneca Limited, London, United Kingdom

Division of Ser. No. 377,687, Jan. 25, 1995, Pat. No. 5,538,525, which is a continuation of Ser. No. 2,480, Jan. 4, 1993, abandoned. This application May 26, 1995, Ser. No. 452,078

Claims priority, application United Kingdom, Aug. 29, 1991, 9118523; Feb. 13, 1992, 9203038; Jun. 25, 1992, 9213526

Int. Cl.^{6} A01H *5/00;* **C12N** *5/04;15/29;15/82*

U.S. Cl. 800—205 **13 Claims**

1. A recombinant DNA sequence encoding an antimicrobial protein having an amino acid sequence selected from the group consisting of sequences SEQ ID NO:1 to SEQ ID NO:15, SEQ ID NO:19, SEQ ID NO:49, SEQ ID NO:51, SEQ ID NO:59 and SEQ ID NO:37.

9. A plant transformed with recombinant DNA as claimed in claim 1.

5,689,044

CHEMICALLY INDUCIBLE PROMOTER OF A PLANT PR-1 GENE

John A. Ryals, Durham; Leslie B. Friedrich, Cary; Scott J. Uknes, Apex, all of N.C., and Eric R. Ward, Basel, Switzerland, assignors to Novartis Corporation, Summit, N.J.

Division of Ser. No. 181,271, Jan. 13, 1994, Pat. No. 5,614,395, which is a continuation-in-part of Ser. No. 93,301, Jul. 16, 1993, abandoned, which is a continuation of Ser. No. 973,197, Nov. 6, 1992, abandoned, which is a continuation of Ser. No. 678,378, Apr. 1, 1991, abandoned, which is a continuation of Ser. No. 305,566, Feb. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 165,667, Mar. 8, 1988, abandoned, said Ser. No. 449,043is a continuation-in-part of Ser. No. 42,847, Apr. 6, 1993, abandoned, which is a continuation of Ser. No. 632,441, Dec. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 425,504, Oct. 20, 1989, abandoned, and a continuation-in-part of Ser. No. 165,667, Mar. 8, 1988, abandoned, said Ser. No. 449,043is a continuation-in-part of Ser. No. 848,506, Mar. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 768,122, Sep. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 568,431, Sep. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 425,504, Oct. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 368,672, Jun. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 329,018, Mar. 24, 1989, abandoned, said Ser. No. 449,043is a continuation-in-part of Ser. No. 45,957, Apr. 12, 1993, abandoned. This application May 24, 1995, Ser. No. 449,043

Int. Cl.^{6} A01H *5/00;* **C12N** *5/04;15/29;15/82*

U.S. Cl. 800—205 **7 Claims**

1. A chemically inducible nucleic acid promoter fragment isolated from the 5' flanking region upstream of the coding region of a tobacco PR-1a gene, wherein said promoter fragment comprises a nucleotide fragment of at least 603-bp adjacent to the coding region of said tobacco PR-1a gene, wherein said promoter fragment is inducible by application of a benzo-1,2,3-thiadiazole, an isonicotinic acid compound, or a salicylic acid compound.

3. A chemically inducible nucleic acid promoter fragment isolated from the 5' flanking region upstream of the coding region of an Arabidopsis PR-1 gene, wherein the coding region of said Arabidopsis PR-1 gene comprises the DNA sequence set forth in SEQ ID NO:33 or a DNA sequence which would encode the protein encoded by SEQ ID NO:33, wherein said promoter fragment is inducible by application of a benzo-1,2,3-thiadiazole, an isonicotinic acid compound, or a salicylic acid compound.

5,689,045

TRANSGENIC PATHOGEN-RESISTANT PLANT

Jürgen Logemann, NB Leiden, Netherlands; Guido Jach; Birgit Görnhardt, both of Köln, Germany; John Mundy, V Copenhagen, Denmark; Jeff Schell, Köln; Peter Eckes, Kelkheim, both of Germany, and Ilan Chet, Nes Ziona, Israel, assignors to Max-Planck Gesellschaft zur Forderung Der Wissenschaften, Germany

Continuation of Ser. No. 134,416, Oct. 8, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,797

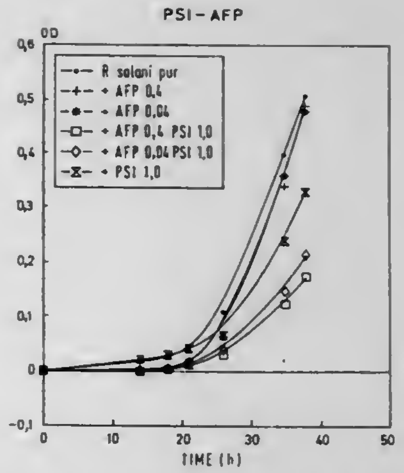
Claims priority, application Germany, Oct. 9, 1992, 42 34 131.0

Int. Cl.^{6} A01H *5/00;* **C12N** *15/29;15/56;15/82*

U.S. Cl. 800—205 **9 Claims**

1. A transgenic plant comprising

(a) at least one gene, operably linked to a plant-functional promoter, said gene being selected from the group consisting of a ChiG gene from barley having a sequence as set forth in SEQUENCE ID NO. 9, a GluG gene from barley having a sequence as set forth in SEQUENCE ID NO. 11, a PSI gene from barley having a sequence as set forth in SEQUENCE ID NO. 4, and an AFP gene from *Aspergillus giganteus* having a sequence as set forth in SEQUENCE ID NO. 1, and



(b) a ChiS gene from *Serratia marcescens* having a sequence as set forth in SEQUENCE ID NO. 8, operably linked to a plant-functional promoter, wherein the plant is resistant to fungal attack.

5,689,046

STILBENE SYNTHASE GENE

Gudrun Schröder; Joachim Schröder, both of Gundelfingen; Rüdiger Hain, Langenfeld, and Peter Helmut Schreier, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 962,993, Oct. 19, 1992, which is a continuation of Ser. No. 635,814, Jan. 2, 1991, abandoned, which is a continuation of Ser. No. 244,760, Sep. 14, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 461,901

Claims priority, application Germany, Sep. 30, 1987, 37 33 017.9

Int. Cl.^{6} A01H *1/04;* **C12N** *5/04*

U.S. Cl. 800—205 **21 Claims**

8. A transgenic whole plant, said whole plant containing genomic DNA in addition to the DNA naturally constituting the genome of said whole plant, and said additional genomic DNA comprising a stilbene synthase gene, wherein said gene is expressed when said transgenic whole plant is exposed to a pest, said transgenic whole plant exhibiting increased resistance to said pest as compared to a non-transgenic whole plant of the same plant species exposed to the same pest under the same conditions, and said increased resistance to said pest being a result of the expression of said gene.

5,689,047

STILBENE SYNTHASE GENES FROM GRAPEVINE

Rüdiger Hain, Langenfeld; Hans-Jörg Reif, Cologne, and Klaus Stenzel, Duesseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 127,097, Sep. 24, 1993, Pat. No. 5,500,367, which is a continuation of Ser. No. 718,507, Jun. 20, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 468,585

Claims priority, application Germany, Jun. 29, 1990, 40 20 648.3; Mar. 8, 1991, 41 07 396.7

Int. Cl.^{6} A01H *5/00;5/10;* **C12N** *15/29;15/82*

U.S. Cl. 800—205 **16 Claims**

1. A transgenic plant cell comprising within its genome a DNA fragment selected from the group consisting of:

(i) a restriction enzyme digestion fragment of genomic grapevine (Vitis) DNA, said fragment encoding a resveratrol synthase, being approximately 4900 base pairs in size and being obtainable from plasmid pVSt12t3 by cleavage with EcoRI;

(ii) a restriction enzyme digestion fragment of genomic grapevine (Vitis) DNA, said fragment encoding a resveratrol syn-

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thase, being approximately 3400 base pairs in size and being obtainable from plasmid pVSt12t3 by partial cleavage with EcoRI;

(iii) a restriction enzyme digestion fragment of genomic grapevine (Vitis) DNA, said fragment encoding a resveratrol synthase, being approximately 12600 base pairs in size and being obtainable from plasmid pVSt12t3 by cleavage with SmaI;

(iv) a cDNA encoding said resveratrol synthase of (i), (ii) or (iii);

(v) a DNA encoding said reveratrol synthase of (i), (ii) or (iii): and

(vi) a synthetic DNA comprising (i), (ii), (iii), (iv) or (v);

wherein said DNA fragment is expressed when said transgenic plant cell is exposed to a pest, said transgenic plant cell exhibiting increased resistance to said pest as compared to a non-transgenic plant cell of the same cell type and plant species exposed to the same pest under the same conditions, and said increased resistance to said pest being a result of the expression of said DNA fragment.

5,689,048
BIOCIDAL PROTEINS

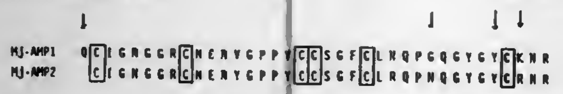
Miguel De Bolle, Louvain; Willem Frans Broekaert, Dilbeek; Bruno Philippe Angelo Cammue, Alsemberg, all of Belgium; Sarah Bronwen Rees, Bracknell, United Kingdom, and Jozef Vanderleyden, Heverlee, Belgium, assignors to Zeneca Limited, London, England

Division of Ser. No. 117,080, Dec. 20, 1993, Pat. No. 5,482,928. This application Jun. 2, 1995, Ser. No. 471,329

Claims priority, application United Kingdom, Mar. 11, 1991, 9105052; Mar. 19, 1991, 9105684

Int. Cl.⁶ A01H *5/00;* **C12N** *15/29;5/04;15/82*

U.S. Cl. 800—205 **8 Claims**


Mj-AMP1 Q C I G N G G R C N E N V G P P Y C C S G F C L K Q P G Q G Y G Y C K N R
Mj-AMP2 C I G N G G R C N E N V G P P Y C C S G F C L R Q P N Q G Y G Y C R N R

1. An isolated recombinant DNA sequence coding for an antimicrobial protein selected from the group consisting of the pure protein Mj-AMP1 having SEQ ID NO: 1 and the pure protein Mj-AMP2 having SED ID NO: 2.

6. Plants transformed with recombinant DNA as claimed in claim I.

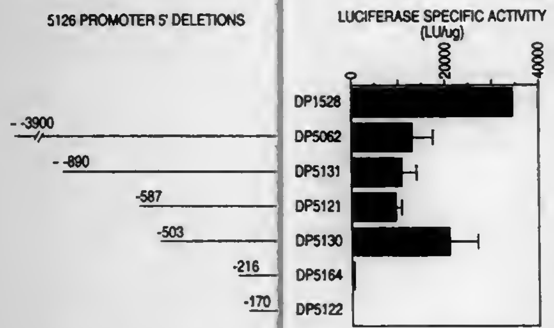
5,689,049
TRANSGENIC PLANT AND METHOD FOR PRODUCING MALE STERILITY USING ANTHER SPECIFIC PROMOTER 5126

Andrew M. Cigan, and Marc C. Albertsen, both of Des Moines, Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 351,899, Dec. 8, 1994. This application Jun. 7, 1995, Ser. No. 471,601

Int. Cl.⁶ C12N *15/00;15/05;* **A01H** *1/06;4/00*

U.S. Cl. 800—205 **5 Claims**



1. A method of producing a male sterile plant, comprising the steps of:

(a) providing a transformed plant that contains a recombinant DNA molecule comprising

(i) a DNA sequence encoding a gene product which inhibits pollen formation or function and

(ii) a 5126 promoter that is operatively linked to said DNA sequence encoding said gene product; and

(b) growing said plant under conditions such that male sterility is achieved as a result of the expression of said DNA sequence.

4. A plant produced by the method of claim 1.

5,689,050
PRODUCTION OF GAMMA LINOLENIC ACID BY A Δ6-DESATURASE

Terry L. Thomas, College Station; Avutu S. Reddy, Bryan; Michael Nuccio, College Station, all of Tex., and Georges L. Freyssinet, Saint Cyr au Mont d'Or, France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Division of Ser. No. 307,382, Sep. 14, 1994, Pat. No. 5,552,306, which is a continuation of Ser. No. 959,952, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 817,919, Jan. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 774,475, Oct. 10, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 473,508

Int. Cl.⁶ C12N *15/82;1/21;15/53;* **A01H** *5/00*

U.S. Cl. 800—205 **18 Claims**

1. A transgenic plant or bacteria comprising at least one of a DNA molecule encoding cyanobacterial Δ6-desaturase wherein said DNA molecule is isolated from a cyanobacterium that produces gamma linolenic acid; a DNA molecule having the sequence of SEQ ID NO:3; or a DNA molecule encoding a Synechocystis Δ6-desaturase.

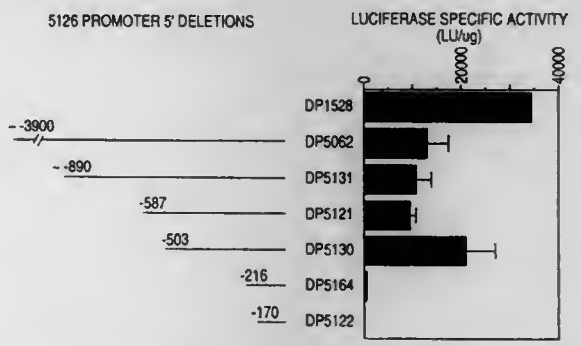
5,689,051
TRANSGENIC PLANTS AND DNA COMPRISING ANTHER SPECIFIC PROMOTER 5126 AND GENE TO ACHIEVE MALE STERILITY

Andrew M. Cigan, and Marc C. Albertsen, both of Des Moines, Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 351,899, Dec. 8, 1994. This application Jun. 7, 1995, Ser. No. 474,556

Int. Cl.⁶ C12H *15/00;15/05;* **A01H** *1/06;4/00*

U.S. Cl. 800—205 **14 Claims**



1. An isolated DNA molecule comprising a nucleotide sequence of promoter 5126, said nucleotide sequence capable of regulating the expression of a DNA sequence in anther tissue when said molecule is part of an operable recombinant DNA construct.

8. An expression vector comprising the isolated DNA molecule of claim 1.

9. The expression vector of claim 8, further comprising a DNA sequence encoding a gene product, said DNA sequence operably linked to said promoter.

12. A transgenic plant comprising the expression vector of claim 9.

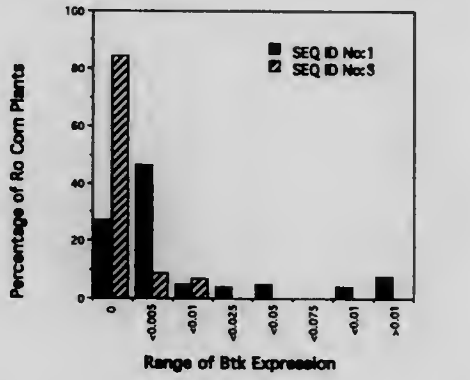
5,689,052
SYNTHETIC DNA SEQUENCES HAVING ENHANCED EXPRESSION IN MONOCOTYLEDONOUS PLANTS AND METHOD FOR PREPARATION THEREOF

Sherri Marie Brown, Chesterfield; Duff Allen Dean, St. Louis; Michael Ernest Fromm, Chesterfield, and Patricia Rigden Sanders, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 172,333, Dec. 22, 1993, abandoned. This application Sep. 19, 1995, Ser. No. 530,492

Int. Cl.⁶ A01H *5/00;* **C12N** *15/11;15/82*

U.S. Cl. 800—205 **10 Claims**



1. A structural gene capable of being expressed in a monocotyledonous plant, the gene comprising a modified nucleotide sequence which encodes an insecticidal protein of *Bacillus thuringiensis* and comprises SEQ ID NO:1.

3. A monocotyledonous plant containing a gene of claim 1.

5,689,053
BRASSICA SP. POLYGALACTURONASE GENE PROMOTER

Laurian S. Robert, Gatineau; Jean L. Gerster, Ottawa, and Hai Ping Hong, Saskatoon, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by Agriculture and Agri-Food, and National Research Council of Canada, both of Canada

Filed Dec. 21, 1995, Ser. No. 577,463

Int. Cl.⁶ C12N *15/29;15/11;15/82;* **A01H** *5/00*

U.S. Cl. 800—205 **14 Claims**

4. A chimeric gene construct comprising a *Brassica sp.* polygalacturonase gene promoter and a coding sequence of an exogenous gene, wherein said promoter directs transcription of the exogenous gene in the pollen and has a nucleotide sequence which is at least 80% homologous to SEQ ID NO: 1.

5,689,054
LOW PHYTIC ACID MUTANTS AND SELECTION THEREOF

Victor Raboy, Bozeman, Mont., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 17, 1994, Ser. No. 215,065

Int. Cl.⁶ C12N *15/00;15/01;* **A01H** *1/00;1/06;5/00*

U.S. Cl. 800—235 **19 Claims**

1. A non-lethal, mutant seed of a cereal plant species characterized by low phytic acid expression relative to wild-type seed of said species.

9. A plant produced by the seed of claim 1.

5,689,055
PLANTS HAVING MODIFIED RESPONSE TO ETHYLENE

Elliott M. Meyerowitz; Caren Chang, both of Pasadena, Calif., and Anthony B. Bleecker, Madison, Wis., assignors to California Institue of Technology, Pasadena, Calif.

Continuation of Ser. No. 86,555, Jul. 1, 1993, abandoned. This application Sep. 19, 1995, Ser. No. 530,010

Int. Cl.⁶ A01H *4/00;* **C12N** *5/14;15/29*

U.S. Cl. 800—205 **8 Claims**

1. A tomato plant comprising plant cells transformed with a modified ETR nucleic acid comprising the modification of a codon of an ETR nucleic acid to substitute or delete an amino acid residue within the 313 N-terminal portion of the encoded ETR protein, wherein said ETR protein is at least 60% homologous and said N-terminal portion is at least 70% homologous to the ETR protein sequence of *Arabidopsis thaliana* as set forth in Seq. ID NO. 3, and wherein said tomato plant has a phenotype characterized by a decrease in response of said transformed plant cells to ethylene as compared to a wild-type tomato plant cells not containing said modified ETR nucleic acid.

5,689,056
HMG2 PROMOTER EXPRESSION SYSTEM

Carole Lyn Cramer, and Deborah Louise Weissenborn, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation of Ser. No. 100,816, Aug. 2, 1993, abandoned. This application Nov. 7, 1995, Ser. No. 550,544

Int. Cl.⁶ A01H *5/00;* **C12N** *15/82;5/04*

U.S. Cl. 800—205 **30 Claims**

1. An isolated HMG2 promoter comprising a promoter of a plant gene whose coding sequence selectively hybridizes under high stringency conditions to a tomato 3-hydroxy-3-methylglutaryl CoA reductase 2 (HMGR2) coding sequence, which HMG2 promoter confers wound-induced, pathogen infection-induced, pest infestation-induced or elicitor-induced expression to an operably linked coding sequence.

6. A gene fusion comprising the HMG2 promoter of claim 1 operably linked to a second nucleotide sequence encoding a heterologous gene, wherein the transcription of the heterologous gene is under the control of the HMG2 promoter.

24. A plant having the gene fusion of any one of claims 6 to 11 and 17 to 21.

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5,689,057

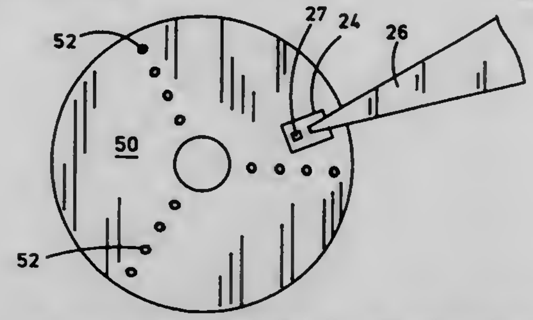
CALIBRATION DISK WITH DISK BUMPS FOR CALIBRATING PZT SLIDERS

Peter Michael Baumgart, San Jose; Karl A. Flechsig, Los Gatos; Michael Franklin Lee, Los Altos; Wing P. Leung, Arcadia; Ullal Vasant Nayak, San Jose; Thao Anh Nguyen, San Jose; Timothy Christopher O'Sullivan, San Jose, and Andrew Ching Tam, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 364,562, Dec. 27, 1994, Pat. No. 5,528,922. This application Feb. 27, 1996, Ser. No. 607,753

Int. Cl.^{6} G01B *5/28*

U.S. Cl. 73—1 J **7 Claims**



1. A calibration disk for calibrating a PZT test slider comprising:
a multilayered disk;
one of the layers of the disk having a plurality of crater shaped bumps, each bump emulating an asperity on a production run magnetic disk;
each crater shaped bump having a predetermined diameter D_r and a peripheral ridge which extends upwardly from a nominal surface of the calibration disk a predetermined height h_r; and
said predetermined diameter D_r of each crater shaped bump being in the range of 5 to 20 μm and said predetermined height h_r of the peripheral ridge of the crater shaped bump being in the range of 75 to 120 nm.

5,689,058

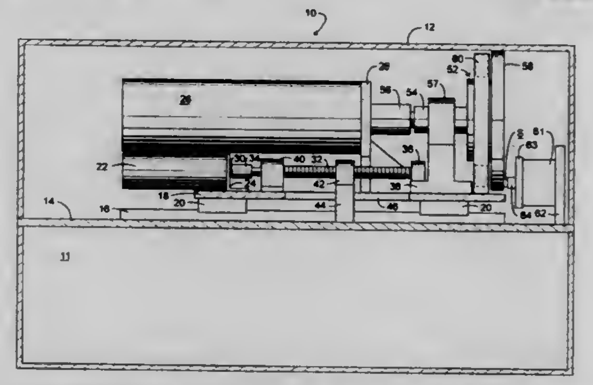
FRICTION MATERIAL EVALUATION APPARATUS

Yongbin Yuan, Winchester, Va., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 20, 1996, Ser. No. 771,022

Int. Cl.^{6} G01N *19/02*

U.S. Cl. 73—9 **2 Claims**



1. Evaluation apparatus for use in determining the friction, wear, groan and squeal noise characteristics of a brake friction material, and comprising:
an apparatus base;
an apparatus movable table slidably supported on said apparatus base;
a force transducer fixedly positioned with respect to said apparatus base and having an attached friction material specimen holder;
a variable-speed electric motor supported by and fixedly positioned with respect to said apparatus movable table;
a brake rotor rotationally coupled to said variable-speed electric motor and having a friction surface that is spaced-apart from the friction material specimen holder attached to said force transducer and that selectively contacts a friction material specimen carried by and projecting from the friction material specimen holder attached to said force transducer;
a reversible electric motor fixedly positioned on said apparatus movable table;
ball screw and nut drive means co-operably connected to said reversible electric motor, to said apparatus movable table, and to said apparatus base; and
control means for selectively varying the rotational speed of said variable-speed electric motor and the direction and magnitude of the output torque of said reversible electric motor until a specified contact load and relative slide speed are developed by the operating contact of the friction surface of said brake rotor with a friction material specimen carried by the friction material specimen holder attached to said force transducer, said variable-speed electric motor having a near-zero constant rotational operating speed capability, and said reversible electric motor operating independently of said variable-speed electric motor to advance said apparatus table through said ball screw drive means into selective engagement of the friction surface of said brake rotor element with a friction material specimen positioned in the friction material specimen holder attached to said force transducer and with a variable normal force that correlates to the output torque of said reversible electric motor.

5,689,059

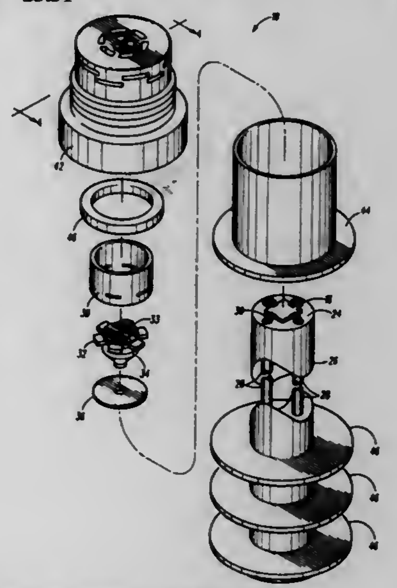
SELECTIVE GAS SENSOR

Seajin Oh; Jose Joseph, both of Palo Alto, Calif.; Neil Adams, Novi, Mich.; Daniel A. Young, Gurnee, and Gary K. Mui, Wheeling, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 14, 1996, Ser. No. 696,550

Int. Cl.^{6} G01N *7/00*

U.S. Cl. 73—23.31 **17 Claims**



1. A selective gas sensor comprising:
a heat exchanger;
a mechanical support frame mounted to the heat exchanger;
a sensing element in thermal contact with the heat exchanger;
a gas-permeable membrane mounted to the mechanical support frame and positioned over the sensing element, the gas-permeable membrane configured for transporting a measurement gas therethrough, the measurement gas having a characteristic temperature;

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an electrochemical oxygen pump mounted to the mechanical support frame and positioned over the gas-permeable membrane,
wherein a lower surface of the electrochemical oxygen pump is configured to deliver oxygen to the sensing element, and
wherein an upper surface of the electrochemical oxygen pump is configured to receive the measurement gas;
an insulating layer overlying the electrochemical oxygen pump; and
a heating element overlying the insulating layer,
wherein the heating element maintains the electrochemical oxygen pump at a first temperature, and
wherein the heat exchanger maintains the sensing element at a second temperature, and
wherein the second temperature is less than the characteristic temperature of the measurement gas at steady-state conditions and less than the first temperature; whereby the selective gas sensor is segregated into a plurality of distinct thermal management zones for optimal heat conduction within each zone.

5,689,060

HUMIDITY MEASURING DEVICE AND A HEAT COOKER EMPLOYING THE DEVICE

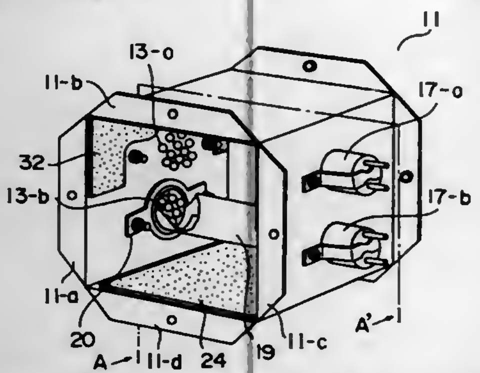
Haruo Matsushima, Yamatokoriyama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 642,080, May 1, 1996, abandoned, which is a continuation of Ser. No. 307,314, Sep. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 27,076, Mar. 5, 1993, Pat. No. 5,387,254. This application Sep. 30, 1996, Ser. No. 724,146

Claims priority, application Japan, Mar. 6, 1992, 4-49230; May 11, 1992, 4-117118

Int. Cl.^{6} G01N *29/02*

U.S. Cl. 73—24.04 **17 Claims**



1. An oven containing a humidity measuring device comprising a first hollow chamber for accommodating reference air and a second hollow chamber for accommodating air in which the humidity in the second hollow chamber is to be determined, each of said hollow chambers being made of a thin high thermally conductive material and having a sonic wave absorbable material forming a wall of said chambers, such sonic wave absorbable material being capable of effectively absorbing reflected waves so that the sonic wave to be generated will be detected substantially as transmitted; the first chamber is disposed within the second chamber; a sonic wave generating means disposed at one end of said chambers; a separate sonic wave receiving means at the opposite end of each hollow chamber in which the distance between the sonic wave generating means and the sonic wave receiving means of each chamber is the same; and a phase difference detecting means at the output of the sonic wave receiving means from both chambers to detect any difference in the phase of the sonic waves in the chambers so that said difference will be used to determine the humidity condition in the second chamber.

5,689,061

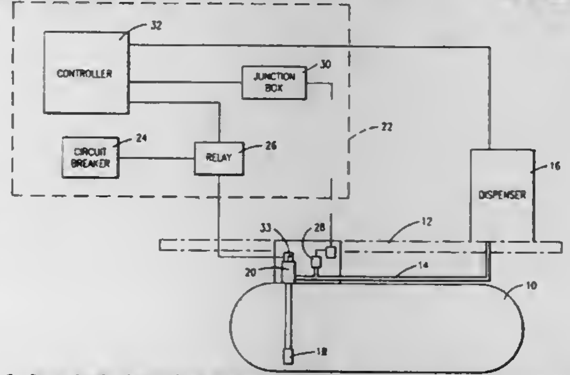
LEAK DETECTION METHOD AND SYSTEM FOR PRODUCT LINES IN FUEL DISPENSING SYSTEMS

Larry E. Seitter, and Jerry W. Bradshaw, both of Olathe, Kans., assignors to Marley Pump, Overland Park, Kans.

Filed Aug. 15, 1996, Ser. No. 698,135

Int. Cl.^{6} G01M *3/28*

U.S. Cl. 73—40.5 R **10 Claims**



1. In a leak detection apparatus for a fuel product line through which fuel is pumped by a pump for dispensing, the improvement comprising:
means for sensing a preselected pressure in the product line that is approximately 15 psi below a relief pressure at which the product line is normally maintained when fuel is not being pumped therethrough;
means for declaring a passed hourly test if said preselected pressure in the product line is not sensed within a first time duration;
means for declaring a passed monthly test if said preselected pressure in the product line is not sensed within a second time duration longer than said first duration;
means for declaring a passed annual test if said preselected pressure in the product line is not sensed within a third time duration longer than said second duration;
means for sensing the presence of thermally induced expansion in the product line;
means for overriding all of said declaring means and effecting a thermal expansion test mode when thermally induced expansion is present;
means when in the thermal expansion test mode for declaring a passed monthly test if a predetermined pressure higher than said preselected pressure but below the relief pressure is not sensed within a fourth time duration longer than said second duration; and
means when in the thermal expansion mode for declaring a passed annual test if a predetermined pressure higher than said preselected pressure but below the relief pressure is not sensed within a fifth time duration longer than said third duration.

5,689,062

METHOD OF ASSESSING TOOL-LIFE IN GROOVED TOOLS

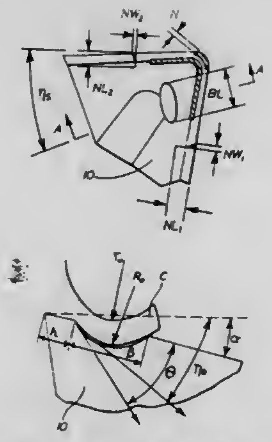
Ibrahim S. Jawahir, Lexington, Ky.; Xiangdong D. Fang, Keiraville, Australia; Peng X. Li, and Ranajit Ghosh, both of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Jan. 11, 1996, Ser. No. 584,590

Int. Cl.^{6} G01N *3/58*

U.S. Cl. 73—104 **5 Claims**

1. In a system having a machine with a tool for cutting a workpiece and a fixture for mounting the workpiece, a method of assessing tool-wear for a selected coated, grooved cutting tool performing a machining operation, said method comprising;
measuring cutting tool geometry including flank wear VB, width of groove backwall wear BW, length of groove backwall wear BL, depth of groove backwall wear KT, width of secondary face wear SW and depth of secondary face wear SD;



determining a tool coating effect factor W_c and a chip-groove effect factor W_g for said coated, grooved cutting tool based upon characteristics of the workpiece material to be cut, depth of cut, feed rate, cutting speed and said measured cutting tool geometry; and
calculating a theoretical tool-life for said coated, grooved cutting tool under selected machining operation conditions.

5,689,063

ATOMIC FORCE MICROSCOPE USING CANTILEVER ATTACHED TO OPTICAL MICROSCOPE

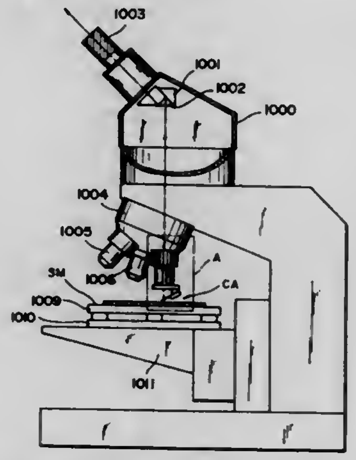
Takamitsu Fujiu, Zama; Shunji Watanabe, Setagaya-ku; Tatsushi Nomura; Yoshinori Sango, both of Machida; Toru Fujii, Yamato, and Tetsuo Hattori, Yokohama, all of Japan, assignors to Nikon Corporation, Japan

Continuation-in-part of Ser. No. 276,021, Jul. 15, 1994, Pat. No. 5,537,863. This application Dec. 4, 1995, Ser. No. 566,631

Claims priority, application Japan, Jul. 15, 1993, 5-175368; Jul. 22, 1993, 5-180532; Jul. 22, 1993, 5-180534; Mar. 11, 1994, 6-040227; Dec. 8, 1994, 6-305202

Int. Cl.^{6} G01B *5/78*

U.S. Cl. 73—105 **6 Claims**



1. An atomic force microscope, comprising:
a tubular piezoelectric actuator which can deform along the axial direction thereof;
an objective lens arranged in said tubular piezoelectric actuator; and
a cantilever attached to said tubular piezoelectric actuator, said cantilever being deflectable, said cantilever having a pointed portion arranged under said objective lens, said cantilever being comprised of piezoelectric material, wherein said cantilever comprises:
a silicon layer;
a piezoelectric crystal layer;
a first electrode located between said piezoelectric crystal layer and said silicon layer, having a first layer comprised of titanium, and a second layer comprised of platinum, and
a second electrode formed on said piezoelectric crystal layer.

5,689,064

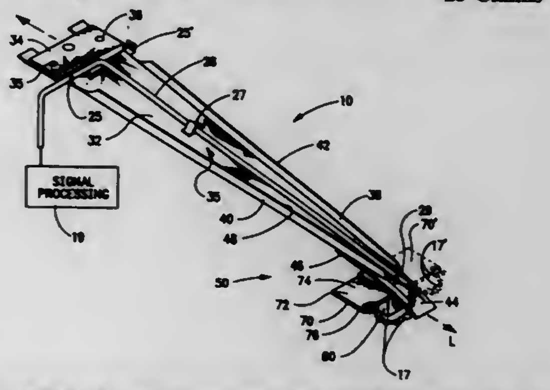
GLIDE HEAD ASSEMBLY AND METHOD THEREFOR

Leo Eugene Kennedy, 5125 Halfmoon Dr., Colorado Springs, Colo. 80915, and Stanley Clifford Smith, Jr., 10895 Belevidere Ave., Green Mountain Falls, Colo. 80819

Filed Feb. 1, 1996, Ser. No. 602,209

Int. Cl.^{6} G01B *5/28*

U.S. Cl. 73—105 **25 Claims**



1. A glide head assembly associated with a support structure and adapted for use with a system for testing a moving surface to detect a presence of asperities thereon, wherein the system includes signal processing operative to process an electronic signal generated in response to the presence of an asperity, comprising:
(a) a flexure extending along a longitudinal axis and including a proximal end portion adapted to be secured to said support structure and a distal end portion adapted to be positioned in proximity to the moving surface;
(b) a slider secured to said distal end portion; and
(c) a piezoelectric transducer disposed in a region between said slider and said distal end portion so that a portion of said transducer is sandwiched therebetween, said piezoelectric transducer including an exposed free end portion which protects outwardly from the region between said distal end portion and said slider to define a cantilever having a selected length and width.

5,689,065

COMBUSTION STATE-DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Shigetaka Kuroda, and Yuichi Shimasaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 520,567

Claims priority, application Japan, Sep. 8, 1994, 6-240655

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—117.3 **6 Claims**

1. A combustion state-detecting system for an internal combustion engine having at least one spark plug, and a crankshaft, comprising:
rotational speed-detecting means for detecting a value of rotational speed of said engine with a predetermined repetition period shorter than a firing period of said spark plug whenever said crankshaft rotates through a predetermined angle;
difference amount-calculating means for calculating a difference amount between a value of said rotational speed of said engine detected by said rotational speed-detecting means and a value of said rotational speed of said engine detected by said rotational speed-detecting means a predetermined number of firing periods earlier;

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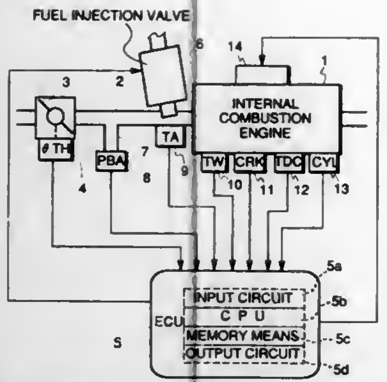


combustion state-detecting means for detecting a combustion state of said engine, based on said difference amount calculated by said difference amount-calculating means;

engine braking state-detecting means for detecting an engine braking state of said engine; and

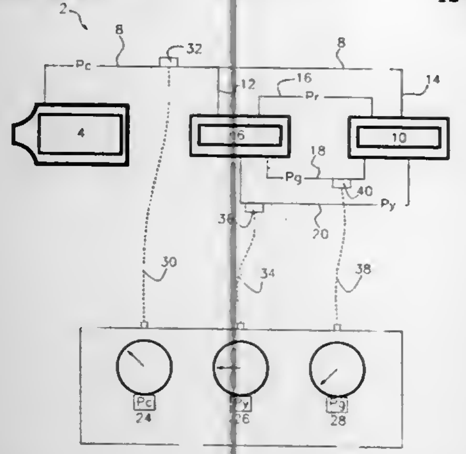
difference amount-storing means for storing said difference amount calculated by said difference amount-calculating means when said engine braking state of said engine is detected by said engine braking state-detecting means,

wherein said combustion state-detecting means compares said difference amount detected by said difference amount-detecting means with said difference amount stored by said difference amount-storing means when said engine braking state of said engine is detected, and detects said combustion state of said engine, based on a result of said comparison.

5,689,066

METHOD AND APPARATUS FOR ANALYZING GAS TURBINE PNEUMATIC FUEL SYSTEM

Dennis B. Stevenson, 106 Midland Dr., Lafayette, La. 70506
Filed Aug. 15, 1995, Ser. No. 515,273
Int. Cl.^{6} G01M *15/00*
U.S. Cl. 73—118.1 **12 Claims**



1. A method of analyzing a gas turbine pneumatic fuel system, with the system containing a fuel control device, a power turbine governor, and a gas turbine engine assembly, the method comprising the steps of:

obtaining a first baseline set of pressures from said fuel system at an initial start time, and wherein said step of obtaining a first baseline set of pressures includes generating a curve of the pressure of the governor (Pg); generating a curve of the pressure of the compressor (Pc); and generating a curve of the operating pressure (Py);

obtaining a second baseline set of pressure from said fuel system at a second start time;

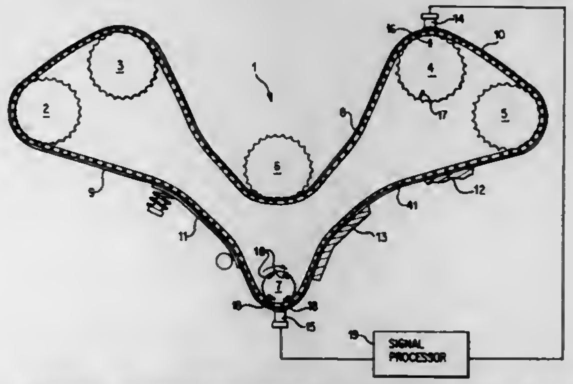
comparing said first baseline set of pressure with said second baseline set of pressures; and,

analyzing said first baseline set of pressure with said second baseline set of pressures in order to determine abnormal operation of said fuel system.

5,689,067

DIAGNOSTIC METHOD AND APPARATUS FOR MONITORING THE WEAR OF AT LEAST AN ENGINE TIMING CHAIN

Siegfried Klein, and Bernd Rehfus, both of Esslingen, Germany, assignors to Daimler-Benz AG, Germany
Filed Jan. 25, 1996, Ser. No. 591,403
Claims priority, application Germany, Feb. 3, 1995, 195 03 457.0
Int. Cl.^{6} G01M *15/00;13/02;* **G01B** *7/02;* **B60K** *35/00*
U.S. Cl. 73—118.1 **30 Claims**



1. Method for evaluating wear of a continuously circulating chain in a chain circuit of an engine, comprising the steps of:

measuring relative phase of two sprockets in said chain circuit at a plurality of positions of said chain during at least a circulation of said chain in said chain circuit;

comparing measured relative phase values with a predetermined desired value to generate a series of deviation values;

comparing said deviation values to detect variations thereof during said at least a circulation of said chain in said chain drive circuit; and

determining a type of wear of said chain as a function of said variations.

5,689,068

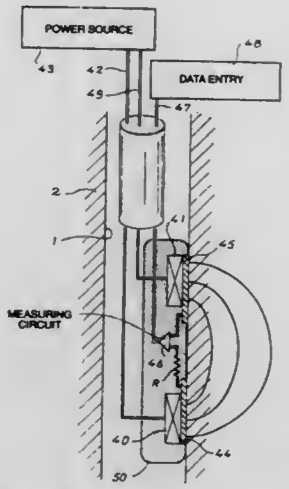
DETERMINATION OF THE POROSITY AND PERMEABILITY OF A GEOLOGICAL FORMATION FROM AN ELECTROFILTERING PHENOMENON

Marcel Locatelli, Montbonnot; Jean Berthier, Meylan, and Henri Glenat, Corenc, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Jan. 11, 1996, Ser. No. 586,458
Claims priority, application France, Jan. 10, 1995, 95 00202
Int. Cl.^{6} F21B *49/00;* **G01V** *03/26;11/00*
U.S. Cl. 73—152.02 **16 Claims**

1. Method for determining the porosity and/or permeability of a geological formation likely to generate non-linear electrofiltering phenomena from an electrofiltering effect generated in the formation and including stages consisting of:

—mechanically and repeatedly exciting a fluid of said formation so as to propagate a pressure wave with suitable characteristics for generating an electrofiltering effect in the formation,

—measuring a variable representative of an electrofiltering potential generated in the formation by said pressure wave, wherein it further includes stages consisting of:



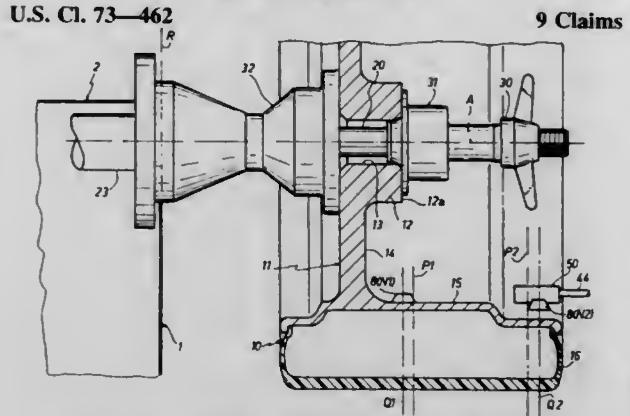
—determining a critical frequency of propagation of the pressure wave by varying a mechanical excitation frequency of the formation and following up the corresponding variation of the variable representative of the non-linear electrofiltering phenomenon,

—determining the porosity and/or permeability of the formation on the basis of the relation linking them to said critical frequency.

5,689,069

METHOD AND APPARATUS FOR BALANCING VEHICLE WHEELS BY MEANS OF BALANCE WEIGHTS

Remo Corghi, Correggio, Italy, assignor to Corghi S.p.A., Correggio, Italy
Filed Mar. 29, 1996, Ser. No. 620,810
Claims priority, application Italy, Mar. 31, 1995, RE95A0016
Int. Cl.^{6} G01M *1/38*
U.S. Cl. 73—462 **9 Claims**



1. A method for balancing vehicle wheels by means of at least one balance weight to be applied to the wheel rim, comprising the steps of:

determining and memorizing the position of a prechosen balancing plane and a balancing plane weight value;

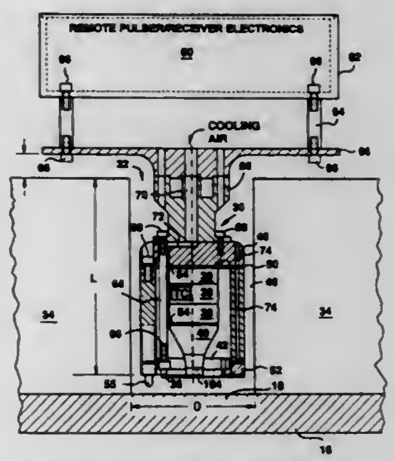
determining an application plane weight value; and

determining, by electronic computing means, the position of an application plane and an angular position for application of each balance weight weighting an amount equal to said application plane weight value within a relatively small range about the prechosen balancing plane computed on the basis of the application plane weight value.

5,689,070

HIGH TEMPERATURE ELECTROMAGNETIC ACOUSTIC TRANSDUCER (EMAT) PROBE AND COIL ASSEMBLIES

Steven P. Clark, Forest; John H. Flora, and Daniel T MacLauchlan, both of Lynchburg, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Jul. 24, 1995, Ser. No. 506,413
Int. Cl.^{6} G01N *29/22;29/04*
U.S. Cl. 73—643 **23 Claims**



1. An electromagnetic acoustic transducer (EMAT) probe assembly for producing an ultrasonic pulse in a workpiece, comprising:

magnet means for producing a magnetic field in the workpiece;

frustoconical focus core means, made of a material having a high magnetic permeability and connected to the magnet means, for focusing the magnetic field at a surface of the workpiece;

coil assembly means located proximate to an end of the frustoconical focus core means distal from the magnet means, for producing eddy currents at the surface of the workpiece which interact with the focused magnetic field to produce the ultrasonic pulse in the workpiece;

a metal disk made of high thermal conductivity material attached to the coil assembly means and heat conductive supporting means for supporting and conducting heat away from the metal disk and the coil assembly means; and

ferromagnetic, cup-shaped probe assembly means having an end cap and a barrel for carrying the coil assembly means, the magnet means and the frustoconical focus core means, wherein the magnet means is located within the barrel and connected to the end cap, the cup-shaped probe assembly means positions the coil assembly means proximate the surface of the workpiece, and wherein the cup-shaped probe assembly means serves to provide a return path for magnetic flux of the magnetic field back to the magnet means.

5,689,071

WIDE RANGE, HIGH ACCURACY FLOW METER

Donald F. Ruffner, and Paul D. Olivier, both of Scottsdale, Ariz., assignors to Exact Flow, L.L.C., Scottsdale, Ariz.
Filed May 24, 1996, Ser. No. 652,948
Int. Cl.^{6} G01F *1/12*
U.S. Cl. 73—861.84 **4 Claims**

1. A turbine type flow meter comprising:

a housing with an inlet port and an outlet port at opposite ends of a longitudinal cylindrical opening;

a shaft centrally supported within said cylindrical opening along the axis thereof;

first and second rotors mounted on said shaft;

a pickoff coil mounted on said housing and excited by an a–c signal at a given carrier frequency;

said inlet port and said outlet port being fashioned to facilitate connections to fluid flow passageways through which the rate of fluid flow is to be measured;

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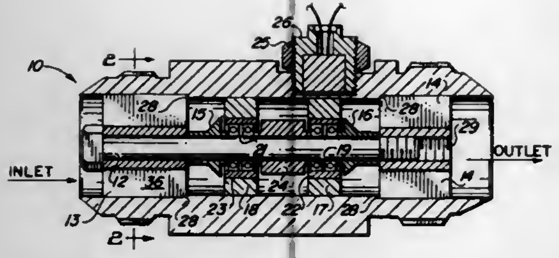


said second rotor being positioned by a rotor spacer a short distance downstream from said first rotor and adjacent said pickoff coil;

said first and second rotors having oppositely canted vanes which cause said first and second rotors to rotate in opposite directions when a fluid entering said inlet port passes through said first and second rotors and exits said outlet port;

said second rotor having said vanes that are made from a magnetic material;

whereby a fluid flowing through said first and second rotors causes said first and second rotors to turn at velocities proportional to the rate of fluid flow through said flow meter, said vanes of said second rotor passing through the magnetic field of said pickoff coil causing pulses to be superimposed upon said carrier frequency of said a–c signal of said pickoff coil, the repetition rate of said pulses being proportional to the flow rate of said fluid flowing through said flow meter and said repetition rate being convertible to rate of flow values by an external flow rate computer;

said first rotor serving to precondition and alter the flow pattern at the entrance of said second rotor in such a way as to extend the effective metering range to lower flow rates and providing improved accuracy and linearity at such lower flow rates of fluid flow.

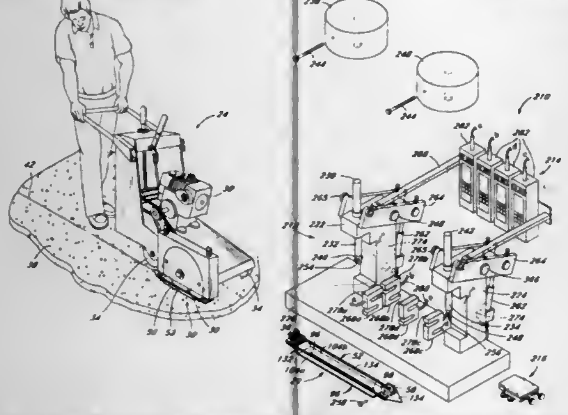
5,689,072
METHOD AND APPARATUS FOR PRELOADING A SKID PLATE FOR AN EARLY CUTTING CONCRETE SAW

Edward R. Chiuminatta, 16405 Everett, Riverside, Calif. 92508, and Alan R. Chiuminatta, 231 Avenida Vista Del Oceano, San Clemente, Calif. 92672

Filed Jul. 12, 1996, Ser. No. 679,132

Int. Cl.^{6} B28D *1/04*

U.S. Cl. 73—862.541 **42 Claims**



41. A method of calibrating a skid plate assembly comprising a skid plate having at least a leading and trailing end with least a first mounting portion configured to be releasably fastened to a saw, the skid plate having a slot through which a cutting blade extends during cutting, and a truss for maintaining the skid plate in a predetermined configuration, comprising the steps of:

applying a predetermined loading to the skid plate causing the skid plate to deform;

directly or indirectly monitoring the deformation of the skid plate at least at one location;

adjusting the deformation of the skid plate in response to the monitoring in order to achieve a predetermined deformation of the skid plate; and

connecting the truss to the skid plate to hold the predetermined deformation.

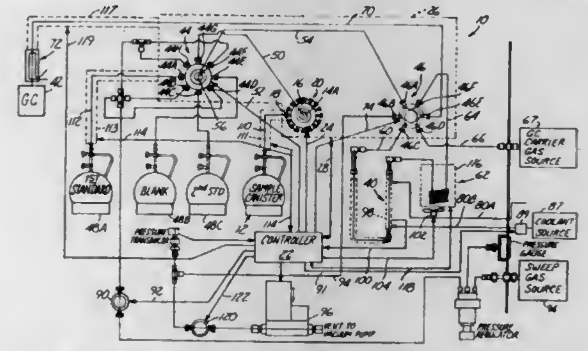
5,689,073
VERIFICATION CIRCUIT FOR A FLUID HANDLING ANALYTICAL INSTRUMENT

Larry J. DaPrato, Cincinnati, and Michael A. Hill, Loveland, both of Ohio, assignors to Tekmar Company, Cincinnati, Ohio

Filed Nov. 13, 1995, Ser. No. 556,661

Int. Cl.^{6} G01N *1/16*

U.S. Cl. 73—863.01 **12 Claims**



1. A fluid sampling system, comprising:

a valve for controlling a sample taken from a sample enclosure, the valve having an inlet fluidly coupleable to receive such sample and an outlet;

a controlled device;

a controller operably coupled to the valve and the controlled device to selectively control the valve and the controlled device, wherein the controller provides a control signal to activate the controlled device; and

a sensing device for sensing the control signal, the sensing device being coupled to the controller to provide a status signal indicative of activation of the controlled device.

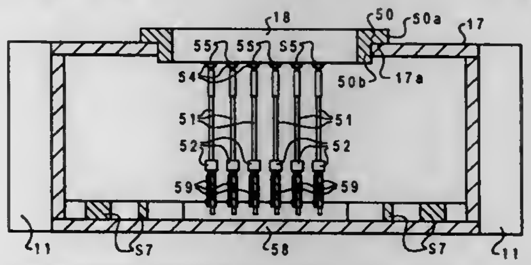
5,689,074
MUSICAL INSTRUMENT

Stanley Penridge, 15100 Hamilton Pool Rd., Austin, Tex. 78738

Filed Mar. 7, 1996, Ser. No. 612,184

Int. Cl.^{6} G10D *3/02*

U.S. Cl. 84—294 **27 Claims**



1. An acoustic modification member for a stringed musical instrument comprising:

(a) an annular supporting member, said annular supporting member having an upper surface lying essentially in a first plane and a central axis normal to said first plane;

(b) a plurality of elongated acoustically vibratable members each having an elongated axis substantially parallel to said central axis; and

(c) attachment means including affixing means for interconnecting an end of each of said elongated acoustically vibratable members to said annular supporting member thereby to dispose said elongated acoustically vibratable members in a spaced array.

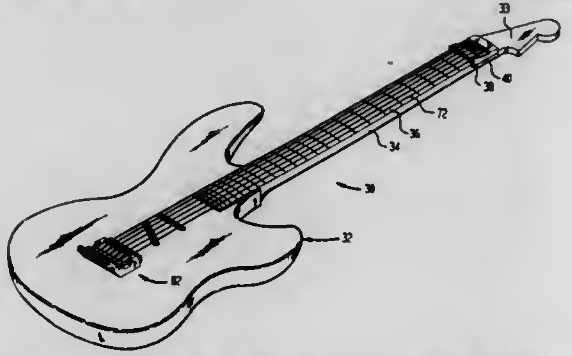
5,689,075
TUNING SYSTEMS FOR STRINGED INSTRUMENTS

Floyd D. Rose, 117 Via de la Valle, Del Mar, Calif. 92104

Filed Jun. 7, 1995, Ser. No. 484,890

Int. Cl.^{6} G10D *3/00*

U.S. Cl. 84—297 R **16 Claims**



1. A stringed instrument comprising: a body; a neck attached to said body; a fretboard arranged on said neck, said fretboard having a first end and a second end; a bridge including a plurality of bridge critical contact surfaces mounted on said body spaced from one end of said fretboard; a nut mounted on said neck at an opposing end of said fretboard spaced from said bridge; and a plurality of strings each having a first end and a second end and a predetermined length extending between said first and second ends, said plurality of strings arranged in contact with corresponding ones of said bridge critical contact surfaces and said nut and extending thereacross, each of said plurality strings being anchored at a location wherein said first end is spaced from corresponding ones of said bridge critical contact surfaces by no greater than one inch and said second end is spaced from said nut by no greater than one inch.

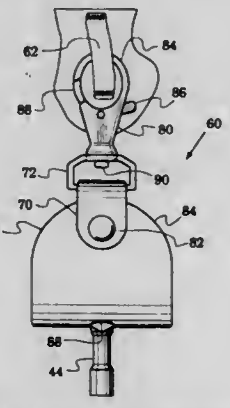
5,689,076
DRUM ADJUSTMENT APPARATUS

Shinichi Usuda, 3-41-20 Matubara Setagayaku, Tokyo, Japan

Filed Feb. 4, 1992, Ser. No. 829,918

Int. Cl.^{6} G10G *7/00*

U.S. Cl. 84—458 **4 Claims**



1. A drum adjustment apparatus, comprising:

a drum key defining an end configured to mate with a drum tension rod for adjustment thereof;

means for rotatably attaching said drum key to the clothes of a user of said apparatus for use in adjusting the tension of a drumhead, said apparatus thereby conveniently retained on said user for ready use,

said means including a spring loaded snap dimensioned to be removably attached to a belt loop of said user of said apparatus, said snap having a rotatable yoke; and

means for removably mounting said drum key to said yoke, said mounting means exposing said drum key end for mating with said tension rod.

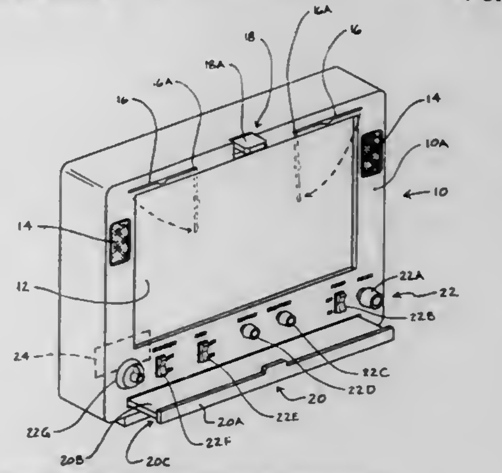
5,689,077
MUSICAL SCORE DISPLAY AND AUDIO SYSTEM

Thomas J. Jasinski, 1378 White Rd., Phelps, N.Y. 14532

Filed Sep. 13, 1996, Ser. No. 713,918

Int. Cl.^{6} G09B *15/02*

U.S. Cl. 84—477 R **4 Claims**



1. A musical score display system comprising:

a. a monitor including a screen;

b. a means for showing a musical score display on the screen;

c. the monitor including a sheet music attachment means for attaching a top edge of sheet music to the monitor, above the screen; and

d. a shelf configured to slide in and out of the monitor, for supporting a bottom edge of the sheet music.

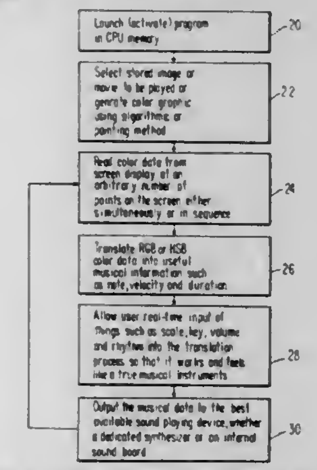
5,689,078
MUSIC GENERATING SYSTEM AND METHOD UTILIZING CONTROL OF MUSIC BASED UPON DISPLAYED COLOR

Peter T. McClard, New York, N.Y., assignor to Hologramaphone Research, Inc., New York, N.Y.

Filed Jun. 30, 1995, Ser. No. 496,887

Int. Cl.^{6} G10H *7/00*

U.S. Cl. 84—600 **73 Claims**


Launch (activate) program in CPU memory
20
Select stored image or movie to be played or generate color graphic using algorithms or painting method
22
Read color data from screen display of an arbitrary number of points on the screen either simultaneously or in sequence
24
Translate RGB or HSB color data into useful musical information such as note, velocity and duration
26
Allow user real-time input of things such as scale, key, volume and rhythm into the translation process so that it works and feels like a true musical instruments
28
Output the musical data to the best available sound playing device, whether a dedicated synthesizer or an internal sound board
30

1. A system for generating music from input data comprising: a central processing unit;

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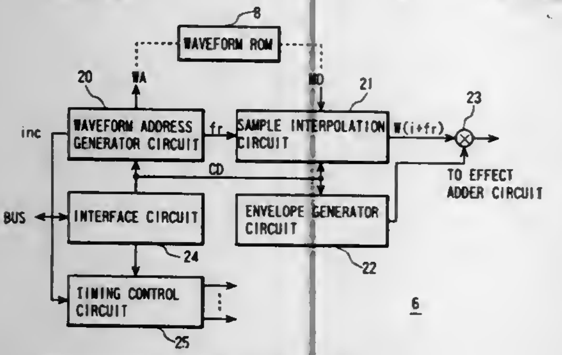
an input device connected to said central processing unit; storage means for storing data output by said central processing unit, graphical images for display and commands for directing the operation of said central processing unit; color graphical output means, connected to said central processing unit, for displaying images in response to information input via said input device;

screen buffer means communicating with said central processing unit for storing information corresponding to images displayed on said color graphical output means; sound output means responsive to input from said central processing unit; and

conversion means interacting with said CPU for converting selected color data, corresponding to a selected portion of an image displayed on said color graphical output means, into a signal comprising musical information, such that music can be output by said sound output means.

5,689,079
MUSICAL TONE GENERATOR

Taichi Kosugi, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan
Filed May 26, 1995, Ser. No. 452,304
Claims priority, application Japan, May 31, 1994, 6-139613
Int. Cl.^{6} G10H *7/00;7/02*
U.S. Cl. 84—603 **8 Claims**

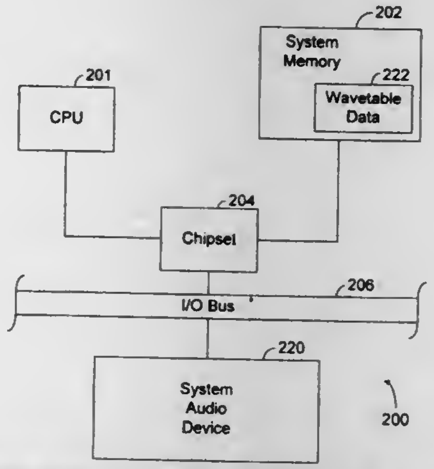


1. A musical tone generator comprising:
a first waveform memory means for storing a musical tone waveform,
an interpolation means for performing an interpolatory calculation on the basis of a plurality of continuous waveform sample values,
a second waveform memory means in which at least, the sample values needed for the interpolatory calculation at the beginning of tone generating are stored, and
a transfer means for reading out the sample values from said second waveform memory means and writing them into said interpolation means at the beginning of tone generating.

5,689,080
COMPUTER SYSTEM AND METHOD FOR PERFORMING WAVETABLE MUSIC SYNTHESIS WHICH STORES WAVETABLE DATA IN SYSTEM MEMORY WHICH MINIMIZES AUDIO INFIDELITY DUE TO WAVETABLE DATA ACCESS LATENCY

Dale E. Gulick, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Mar. 25, 1996, Ser. No. 622,761
Int. Cl.^{6} G10H *7/02*
U.S. Cl. 84—604 **15 Claims**

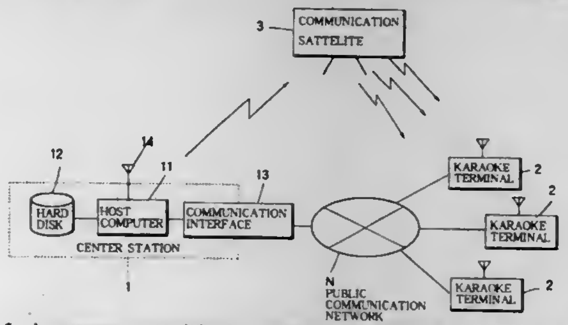
1. A computer system for performing wavetable music synthesis comprising:
a system memory, said system memory storing wavetable data;
an I/O bus coupled to said system memory; and
a system audio device comprising:



an I/O bus interface coupled to said I/O bus; and
a synthesizer coupled to said I/O bus interface, wherein said synthesizer generates a request to said I/O bus interface for one or more wavetable data samples, wherein said synthesizer generates sounds in response to said one or more wavetable data samples;
wherein if said system audio device is unable to retrieve said one or more wavetable data samples within a desired frame time said synthesizer outputs one or more surrogate values, wherein said synthesizer calculates said surrogate values so as to avoid producing audible artifacts in said sound generated by said synthesizer.

5,689,081
NETWORK KARAOKE SYSTEM OF BROADCAST TYPE HAVING SUPPLEMENTARY COMMUNICATION CHANNEL

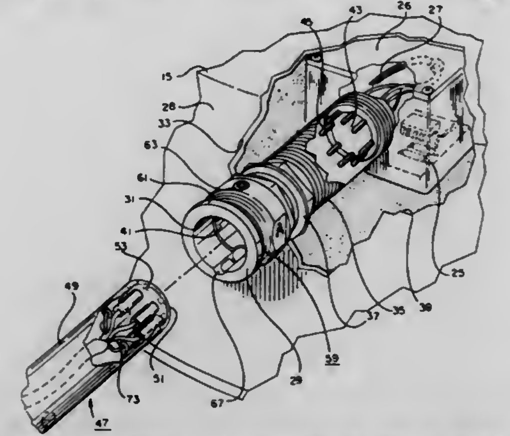
Kanehisa Tsurumi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed May 1, 1996, Ser. No. 641,495
Claims priority, application Japan, May 2, 1995, 7-108828
Int. Cl.^{6} A63H *5/00;* **G04B** *13/00;* **G10H** *7/00*
U.S. Cl. 84—609 **8 Claims**



1. A system comprising a center station which transmits song dam, and a plurality of karaoke terminals which communicate with the center station to receive therefrom the song data so that each karaoke terminal can provide a karaoke service based on the received song data, wherein:
the center station comprises a first transmitter that broadcasts the song data to transmit the same simultaneously to all of the karaoke terminals, and a second transmitter that responds to a request from each karaoke terminal to individually transmit the song data to each karaoke terminal;
each karaoke terminal comprises a first receiver that is capable of receiving the song data broadcasted by the center station, a detector that detects when the first receiver has failed to receive the broadcasted song data for communicating with the center station to notify thereto a request for re-transmission of the song data, and a second receiver that receives the song data re-transmitted from the second transmitter of the center station in response to the re-transmission request; and
the center station transmits index information which lists items of the song data to be broadcasted, and each karaoke terminal receives the index information so that the detector checks received items of the song data with reference to the received index information to detect when the first receiver has failed to receive any of the listed items of the song data which is missing from the received song data.

5,689,082
ELECTRICAL CONNECTOR SYSTEM FOR AN ACOUSTICAL GUITAR

Paul E. Youngblood, 1617 E. Stella St., Fort Worth, Tex. 76104
Filed Aug. 21, 1995, Ser. No. 517,094
Int. Cl.^{6} G10H *1/32;3/18*
U.S. Cl. 84—743 **10 Claims**

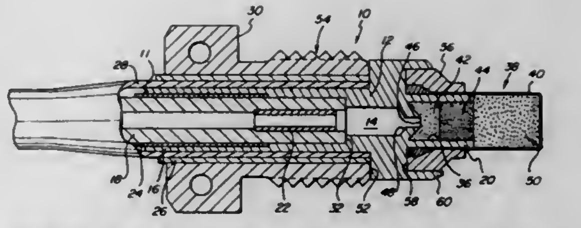


1. An electrical connector system for an acoustical guitar which has been adapted to receive an electrical pickup having an electrical lead which passes from the electrical pickup to the interior of the guitar, the connector system comprising:
a female jack portion having an exposed mouth region which protrudes from a button hole opening provided on the body of the guitar, the female jack portion also having an elongate body with an open interior which terminates in a primary contact plate having a plurality of electrical contacts for electrical connection with the electrical lead from the pickup;
a male jack portion having a shaft which is adapted to be matingly received within the open interior of the female jack portion, the shaft of the male jack portion terminating in a mating secondary contact plate having a plurality of electrical contacts which mate with the electrical contacts of the primary contact plate provided on the female jack member when the male jack portion of the connector system is inserted within the female jack portion;
wherein the electrical contacts provided on a selected one of the primary connector plate and mating secondary connector plate are formed as a plurality of pins adapted to be received within mating receptacle openings provided in the other of the selected primary connector plate and mating secondary connector plate; and
wherein a selected one of the primary contact plate and mating secondary contact plate is provided with at least three mating electrical contacts.

5,689,083
OBTURATING INITIATION FITTING

William C. Hadden, Springfield, Mass., assignor to The Ensign-Bickford Company, Simsbury, Conn.
Filed May 9, 1996, Ser. No. 647,336
Int. Cl.^{6} C06C *5/00*
U.S. Cl. 102—275.2 **6 Claims**

1. An obturating initiation fitting comprising:
a sleeve member having a first end and a second end and defining an internal passage extending therethrough from the first end to the second end, the sleeve member being dimensioned and configured to be secured to a connected device;



an initiating charge disposed in the internal passage for producing an initiation signal comprising a signal-initiating shock wave and a pressure pulse of explosive gases;
initiation means disposed at the first end of the sleeve member for initiating the initiating charge; and
obturating means for hindering the passage of the pressure pulse of explosive gases from the initiating charge to the first end of the sleeve member;
wherein the obturating means comprises a malleable flange in the sleeve member, the flange having a closure surface and protruding into the internal passage where the initiating charge is in juxtaposition with the closure surface, the flange being dimensioned and configured to collapse into the internal passage in response to detonation of the initiating charge.

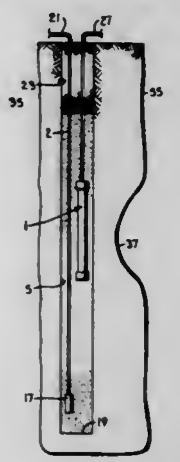
5,689,084
BONDING METHOD AND THE RESULTING ARTICLE

Lyle O. Malotky; Marvin A. Pedersen, both of Oxon Hill, Md., and Dana E. Spencer, Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 25, 1974, Ser. No. 519,468
Int. Cl.^{6} F42B *33/06*
U.S. Cl. 102—293 **4 Claims**

1. A method of inactivating a fuze comprising:
(a) allowing a filler material to flow around fuze components;
(b) applying quick setting adhesive to said filler material;
(c) said adhesive being at least one adhesive selected from the group consisting of a cyanoacrylate adhesive and an anaerobic adhesive; and
(d) allowing said adhesive to cure.

5,689,085
EXPLOSIVE DISPLACING BORE HOLE TUBE

Wayne G. Turner, R.R. 2, Box 257, Manchester, Iowa 52057
Filed Sep. 6, 1995, Ser. No. 524,260
Int. Cl.^{6} F42B *3/00;* **E21B** *33/00*
U.S. Cl. 102—313 **21 Claims**



1. An explosive displacing structure for use in combination with an explosive in a bore hole and comprising:

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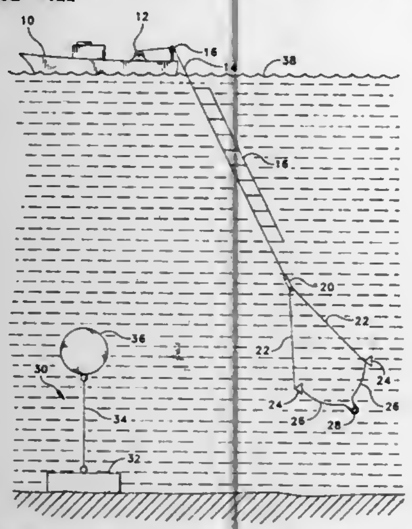
(a) an elongated tubular member having a selected length, a selected outer diameter, a selected wall thickness, and opposite ends;
(b) an end closure member secured to and closing each of said opposite ends of said tubular member; and
(c) an inert material filling said tubular member; and
(d) wherein said tubular member is configured to operably and selectively diminish the intensity of a blast from the explosive spaced alongside said tubular member.

5,689,086

SIMULATED SUSPENDED MINE RETRIEVAL SYSTEM

Thomas R. Stottlemyer, Mystic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1996, Ser. No. 668,609
Int. Cl.^{6} F42B *22/10;* **B63B** *21/56;* **F16B** *45/02*
U.S. Cl. 102—411 **3 Claims**



1. A simulated suspended mine retrieval system comprising:
a tow cable; and
a loop attached to said tow cable, said loop includes a spring loaded locking shackle comprised of a substantially U-shaped bar having a locking arm with a torsion spring, one end of said locking arm being affixed to one leg of said U-shaped bar and the other end being held in abutment with the other leg of said U-shaped bar for inhibiting the other end of said locking arm from moving toward the end of said other leg of said U-shaped bar and for enabling said locking arm under a torque greater and opposite to that of the torsion spring to move away from the other leg of the U-shaped bar toward the center of the U-shaped bar.

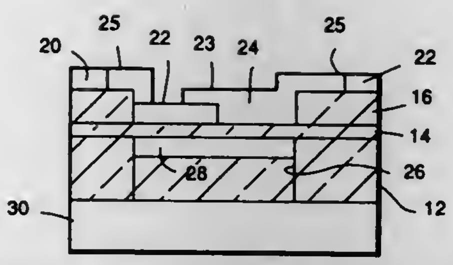
5,689,087

INTEGRATED THERMOPILE SENSOR FOR AUTOMOTIVE, SPECTROSCOPIC AND IMAGING APPLICATIONS, AND METHODS OF FABRICATING SAME

Michael D. Jack, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Oct. 4, 1994, Ser. No. 322,442
Int. Cl.^{6} H01L *35/02*
U.S. Cl. 136—213 **33 Claims**

1. A thermal energy sensor responsive to incident electromagnetic radiation having wavelengths of interest, comprising:
a substrate comprised of a semiconductor material and a layer of dielectric material disposed within said semiconductor material, said dielectric material layer being parallel to a first surface of said substrate, said substrate including at least one active region disposed within said first surface of said substrate wherein a portion of said semiconductor material is removed down to said dielectric layer;
a plurality of thermally-responsive junctions between dissimilar materials, at least one of said thermally-responsive junctions being a hot junction that is disposed within or over said active region; and
means for thermally isolating said at least one hot junction from said substrate.

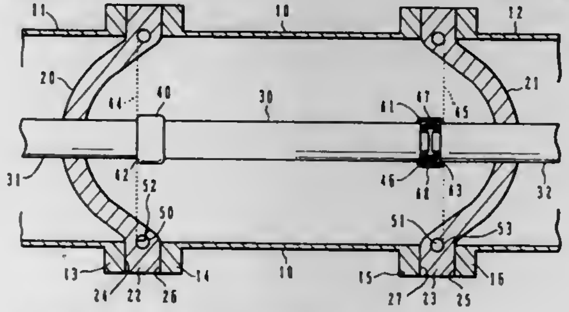


5,689,088

GAS INSULATED DEVICE, GAS INSULATED SWITCHGEAR, GAS INSULATED BUS LINE, AND CABLE DIRECT-COUPLED GAS INSULATED SWITCHGEAR

Toshiaki Rokunohe; Fumihiro Endo; Tokio Yamagiwa, and Kenji Anno, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 575,157
Claims priority, application Japan, Dec. 22, 1994, 6-319951
Int. Cl.^{6} H01B *9/06;* **H02G** *15/24*
U.S. Cl. 174—21 C **12 Claims**



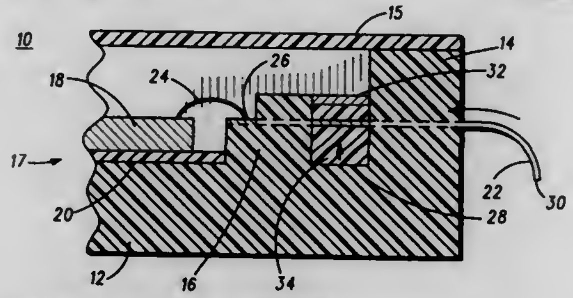
1. A gas insulated device comprising:
a grounded tank filled with an insulating gas;
a conical insulator spacer securely mounted in said grounded tank and defining an interior space of said grounded tank;
a through-type electric conductor extending through and supported by said insulator spacer;
an electric conductor electrically connected to said through-type electric conductor; and
a conductor connector for electrically connecting said electric conductor with said through-type electric conductor and for supporting said electric conductor,
wherein the conductor connector is positioned closest to said insulator spacer such that electric flux lines exiting from said conductor connector intersect with the surface of said insulator spacer in a region in which an electric field has a strength equal to or less than 70% of the strength of the strongest electric field on the surface of said insulator spacer generated by a lightning impulse applied to said gas insulated device.

5,689,089

ELECTRONIC CONTROL MODULE HAVING FLUID-TIGHT SEALS OF A POLYMER MATERIAL WHICH EXPANDS WHEN WET

Anthony J. Polak, Lake Zurich; Charles Vandommelen, Villa Park, and Fred E. Ostrem, Long Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 20, 1996, Ser. No. 717,048
Int. Cl.^{6} H01L *23/02*
U.S. Cl. 174—52.4 **15 Claims**



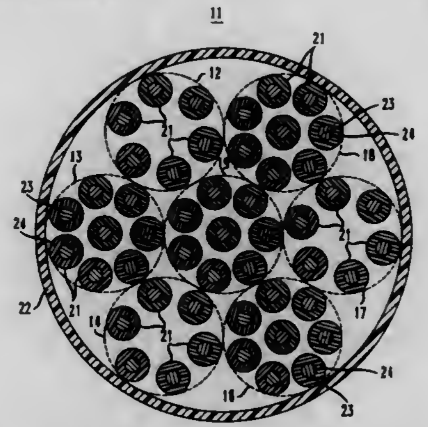
1. An electronic module comprising:
a housing configured for immersion in a fluid;
a first cavity within the housing;
a leadframe mounted within the housing and having a plurality of leads extending from the first cavity through an exterior wall of the housing;
an electronic component electrically coupled to the leadframe;
a second cavity intermediate to the first cavity and the exterior wall,
wherein a portion of the plurality of leads traverse the second cavity; and
a silicone-based polymer within the second cavity,
wherein the silicone-based polymer expands upon contact with the fluid and fills the second cavity sealing the plurality of leads within the second cavity and preventing the fluid from entering the first cavity.

5,689,090

FIRE RESISTANT NON-HALOGEN RISER CABLE

Larry Lynn Bleich, Omaha, Nebr., and Tommy Glenn Hardin, Lilburn, Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 13, 1995, Ser. No. 542,767
Int. Cl.^{6} H01B *7/28*
U.S. Cl. 174—121 A **9 Claims**



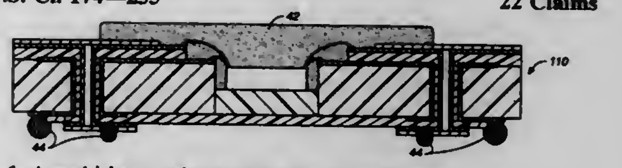
1. A communication cable comprising:
a core having at least one pair of signal transmitting members of a communication transmission medium, each of said members having disposed thereabout a single, relatively uniform insulation layer of a non-fire retardant polyolefin material; and
an outer jacket surrounding said core, said outer jacket comprising a fire retardant non-halogenated polyolefin material that comprises a base resin of an acetic acid ethenyl ester polymer with ethene having flame retardant and smoke suppressant materials therein.

5,689,091

MULTI-LAYER SUBSTRATE STRUCTURE

Ahmad Hamzehdoost, Sacramento, and Kamran Manteghi, Manteca, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 19, 1996, Ser. No. 715,806
Int. Cl.^{6} H05K *1/18;3/32*
U.S. Cl. 174—255 **22 Claims**



1. A multi-layer substrate structure comprising:
a non-conductive layer having top and bottom sides;
a first thin metal foil being laminated on the top side of said non-conductive layer;
a second thin metal foil being laminated on the bottom side of said non-conductive layer, said non-conductive layer being sandwiched between said first and second metal foils so as to form a laminated substrate;
said laminated substrate being formed with a plurality of plated-through holes which are filled with an epoxy;
said laminated substrate being patterned and etched;
epoxy layers being disposed on both sides of the laminated substrate;
said laminated substrate being formed with a plurality of smaller through holes extending through said epoxy layers and said epoxy filled through holes, and with a cavity to receive an integrated-circuit die;
said laminated substrate and the through holes being metallized with a conductive layer;
said laminated substrate being patterned and etched again;
a solder mask being applied on both sides of the laminated substrate so as to form selective wire bondable areas and selective solderable areas;
an integrated-circuit die being disposed in the center of said cavity and having a plurality of bonding pads;
a plurality of bonding wires connected between corresponding selective wire bondable areas on said laminated substrate and associated bonding pads on said die;
said integrated-circuit die and said plurality of bonding wires being encapsulated with a plastic molding material; and
a plurality of solder balls being attached to the selective solderable areas.

5,689,092

CONVEYOR FRICTION SCALE

Albert Wurz, Doylestown; William Scott, Sellersville, and Richard Skokowski, Green Lane, all of Pa., assignors to Accu-Sort Systems, Inc., Telford, Pa.

Continuation of Ser. No. 179,422, Jan. 10, 1994, Pat. No. 5,547,034. This application Jun. 12, 1996, Ser. No. 662,683
Int. Cl.^{6} G01G *19/00;19/22;13/02;* **G01N** *3/56*
U.S. Cl. 177—145 **10 Claims**

1. A device for weighing an article on a moving conveyor belt comprising:
sensor means which contacts the underside of the moving conveyor belt and measures the friction force between the sensor means and the conveyor belt; and

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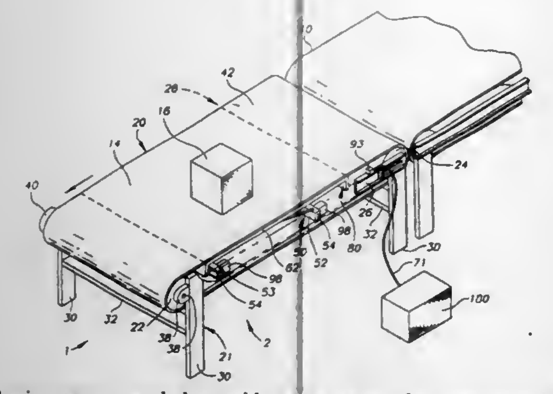
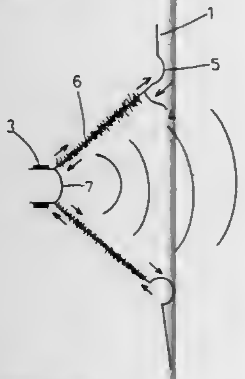


logic means coupled to said sensor means for determining the weight of the article based upon said measured friction force.

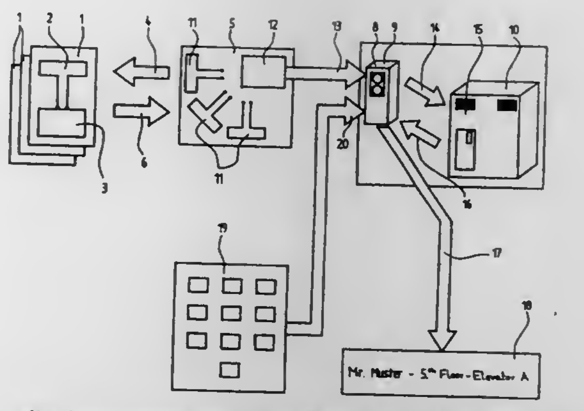
5,689,093
CONE OF A SPEAKER
Cheng-Yuan Sun, P.O. Box 82-144, Taipei, Taiwan
Filed Jan. 29, 1996, Ser. No. 593,707
Int. Cl.⁶ G10K *13/00*
U.S. Cl. 181—157 **5 Claims**



1. A speaker comprising:
a casing;
a cone having a peripheral flanged connected to said casing;
a diaphragm connected to a center of said cone; and
a plurality of fibers perpendicularly fastened to at least one side of said cone to eliminate reflection of transverse waves between said diaphragm and said peripheral flanged.

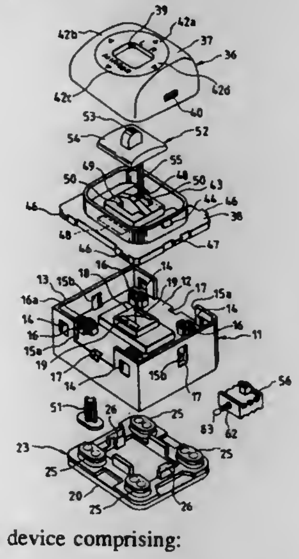
5,689,094
ELEVATOR INSTALLATION
Paul Friedli, Remetschwil; Karl Schneeberger, Root, and Hans Peter Bornhauser, Buchrain, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland
Filed Aug. 28, 1995, Ser. No. 519,787
Claims priority, application Switzerland, Aug. 30, 1994, 02645/94
Int. Cl.⁶ B66B *1/20*
U.S. Cl. 187—384 **14 Claims**

1. An elevator installation having a plurality of elevators comprising:
a recognition device for recognizing elevator calls entered at an entry location by an information transmitter carried by an elevator user, initializing the entry location as a starting floor of a journey;
a control device receiving the recognized elevator call and allocating an elevator to respond to the elevator call, through a predetermined allocating algorithm;



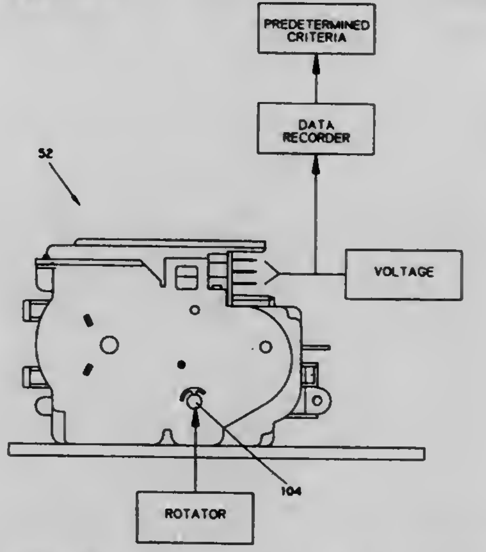
a call acknowledging device comprising one of a display device and an acoustic device to acknowledge recognition of the elevator call and to communicate a proposed destination floor to the elevator user;
the recognition device, mounted in the access area in the vicinity of the elevators and spatially located away from elevator doors, actuating the information transmitter and comprising a unit that independently reads data transmitted from the information transmitter carried by the elevator user and a storage device coupled between the unit and the control device:
the recognition device one of transmitting proposed destination floor data, based upon the data transmitted from the information transmitter, to the control device, and, transmitting elevator user specific data. based upon individual features of the elevator user stored in the storage device, to the control device.

5,689,095
SWITCHING DEVICE
Toshihiro Kawase, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan
Filed Sep. 19, 1994, Ser. No. 305,980
Claims priority, application Japan, Sep. 20, 1993, 5-050956; Sep. 20, 1993, 5-050957
Int. Cl.⁶ H01H *13/70*
U.S. Cl. 200—5 R **8 Claims**



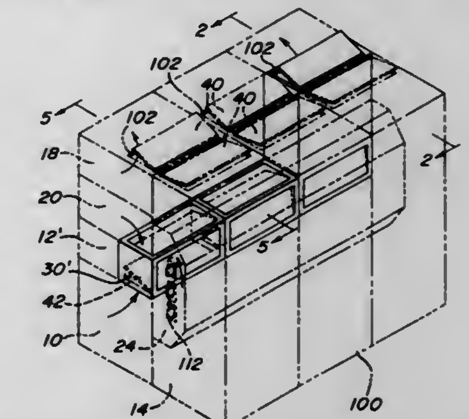
1. A switching device comprising:
a switch body;
a push-type operation knob in the switch body, the operation knob having an approximate rectangular shape to provide four adjacent corner areas, the operation knob further having operation parts between each of the adjacent corner areas; and
each of the corner areas having a switching member, the switching members being disposed and electrically connected to one another so that in response to depressing one of the operation parts the switching members at the adjacent corner areas of the operation part are operated and a normal switching operation occurs, and in response to depressing the operation knob in such a manner that only one of the switching members is operated a normal switching operation is prevented.

5,689,096
CAM-OPERATED TIMER TEST PROCEDURE
Robert Francis Weaver; James E. Sering, both of Hendricks County, and Daniel Keith Amonett, Marion County, all of Ind., assignors to Emerson Electric Co., St. Louis, Mo.
Filed May 28, 1996, Ser. No. 653,874
Int. Cl.⁶ H01H *1/00;43/10*
U.S. Cl. 200—38 R **11 Claims**



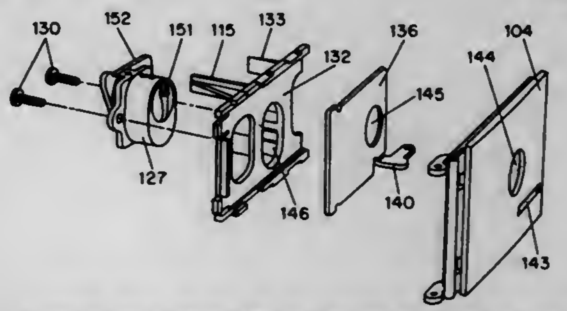
1. A method for testing a cam-operated timer, comprising the steps of:
(a) providing a cam-operated timer that comprises,
(1) a housing having housing details,
(2) a camstack drive having a drive cam received by housing details,
(3) a motor carried in the housing having an output gear that rotates independently from the camstack drive,
(4) a camstack having program blades carried in the housing for rotation, and,
(5) blade switches received by the housing and placed in working relationship with the program blades;
(b) placing the cam-operated timer in a test fixture that has a rotator and a data recorder;
(c) connecting the rotator to the drive cam though a housing detail to rotate the drive cam independently of the motor;
(d) connecting the data recorder to the blade switches for recording blade switches operating data;
(e) rotating the drive cam with the rotator causing the blade switches to operate according to the camstack program blades;
(f) collecting data from the blade switches during operation according to the camstack with the data recorder; and
(g) comparing collected data from the data recorder with predetermined criteria to determine whether the camstack and blade switches are functioning properly.

5,689,097
ARC-RESISTANT SWITCHGEAR ENCLOSURE WITH ARCING CHAMBER VENTING STRUCTURE
Albert H. Aufermann, Ratingen, Germany, and Robert S. Karnbach, Lake Mary, Fla., assignors to ABB Power T&D Company Inc., Raleigh, N.C.
Filed Oct. 3, 1995, Ser. No. 538,448
Int. Cl.⁶ H01H *9/00;* **H05K** *7/20*
U.S. Cl. 218—157 **12 Claims**



1. An arc-resistant enclosure for electrical components comprising:
compartments for housing said electrical components; and
an internal arc chamber, said arc chamber providing a path for releasing from said enclosure pressure and hot gases produced by an electrical arc fault associated with an electrical component in one of said compartments;
said arc chamber comprising:
a first section for providing an exit path to the top of the said enclosure; and
a second section for permitting a portion of said arc chamber to be situated beneath one of said compartments, said second section communicating with said first section whereby pressure and hot gases produced within a compartment within which an electrical arc fault occurs are controllably released from said enclosure via said arc chamber.

5,689,098
POSTAGE METER WITH IMPROVED POSTAL LOCK
Christian Gillieron, Fraubrunnen, Switzerland, assignor to Ascom Hasler Mailing Systems AG, Bern, Switzerland
Filed May 26, 1995, Ser. No. 451,511
Int. Cl.⁶ G07G *1/00*
U.S. Cl. 235—101 **5 Claims**



1. A postage meter having a secure housing and a printing means and accounting register within the secure housing, the secure housing further comprising a postal lock, the postal lock comprising:
a door movable between first and second positions, the door in said first position rendering a cavity inaccessible and in said second position rendering the cavity accessible; said door comprising a latch movable between first and second positions, said latch in said first position engaging a first feature in

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the housing whereby the door is held in its first position, said latch in said second position engaging a second feature in the housing, said second feature disposed to urge said door toward its second position.

5,689,099
SPEED/DISTANCE MEASURING ASSEMBLY FOR RUNNER

Nicolaas Domburg, Saffraanplein 24, NL-2215 WC, Voorhout, Netherlands

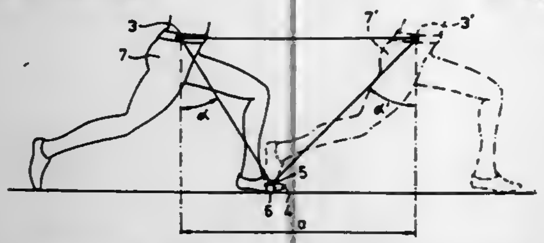
PCT No. PCT/NL95/00026, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/19548, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 18, 1995, Ser. No. 676,281

Claims priority, application Netherlands, Jan. 18, 1994, 9400085

Int. Cl.⁶ G01C *22/00;* G08B *23/00;* A63B *71/00*

U.S. Cl. 235—105 **11 Claims**



1. Speed/distance meter assembly for a runner/walker, comprising angular speed-measuring means for determining the speed of the angle change in the straight line drawn between the foot of the runner and a point near the pivot point of the leg in question in the pelvis relative to a reference, distance-measuring means for constantly measuring the current distance of the trunk from a further reference, and processing means which on the basis of the angular speed and the current distance determine the distance travelled and/or the speed achieved.

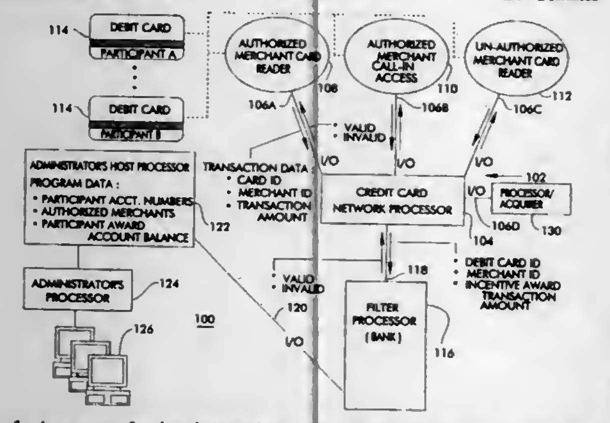
5,689,100
DEBIT CARD SYSTEM AND METHOD FOR IMPLEMENTING INCENTIVE AWARD PROGRAM

David C. Carrithers; Steven G. Rapp; Gayla L. Stone; Jody A. Storey-Waller; Kim A. Resch; Kelly K. McGulre; Toni L. Ashby; Mark Jackson, and Lowell Huff, all of St. Louis County, Mo., assignors to Martiz, Inc., Fenton, Mo.

Continuation-in-part of Ser. No. 408,960, Mar. 21, 1995, abandoned. This application Mar. 21, 1996, Ser. No. 620,041

Int. Cl.⁶ G06K *5/00;* G06F *7/08;7/04*

U.S. Cl. 235—380 **16 Claims**



1. A system for implementing an incentive award program for a customer having participants, said program permitting the participants to obtain as an award products and/or services from authorized merchants who are part of the incentive award program and who are part of a credit/debit card network, which credit/debit card network also includes unauthorized merchants who are not part of the incentive award program and who are part of the credit/debit card network, each merchant having access via an input/output (I/O) port to a credit/debit card network processor of the credit/debit card network, said system comprising:

a. a plurality of debit cards, each assigned to one participant and having a unique account number corresponding to an award account of the participant;

b. a filter processor accessing the following program data:
  (1) data identifying the authorized unique account numbers of the participants,
  (2) data identifying the authorized merchants, and
  (3) data indicating the balance in each participant's award account,

said filter processor interfacing with the credit/debit card network processor;

c. means, responsive to a transaction initiated by a merchant using an initiating card having an initiating account number, for transmitting from the credit/debit card network processor to the filter processor the following transaction data:
  (1) the initiating account number of the card initiating the transaction,
  (2) merchant identification data of the initiating merchant, and
  (3) data regarding the amount of the initiated transaction;

d. said filter processor including means for evaluating the transaction data transmitted to the filter processor by the credit/debit card network processor by comparing the transaction data to the program data;

e. said filter processor evaluating means including means for generating validating data for the transaction when the evaluated transaction data indicates that the transaction has been initiated by an authorized merchant using the unique account number of one of the participants having a sufficient balance in the participant's corresponding award account to cover the transaction:

f. said filter processor evaluating means including means for generating invalidating data for the transaction when the evaluated transaction data indicates that the initiating account number is not one of the authorized account numbers;

g. said filter processor evaluating means including means for generating invalidating data for the transaction when the evaluated transaction data indicates that the initiating merchant is not one of the authorized merchants;

h. said filter processor evaluating means including means for generating invalidating data for the transaction when the evaluated transaction data indicates that the balance in the award account corresponding to the initiating account number is insufficient to cover the amount of the initiated transaction;

i. said filter processor including means for transmitting the validating or invalidating data to the credit/debit card network processor so that the credit/debit card network processor provides the validating or invalidating data for the evaluated transaction to the initiating merchant.

5,689,101
POS SYSTEM

Kaoru Kikuchi, Hachioji; Miyuki Sato, and Shinichi Yoshinaga, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 273,787, Jul. 12, 1994, abandoned. This application Jul. 31, 1995, Ser. No. 509,420

Claims priority, application Japan, Nov. 29, 1993, 5-298382

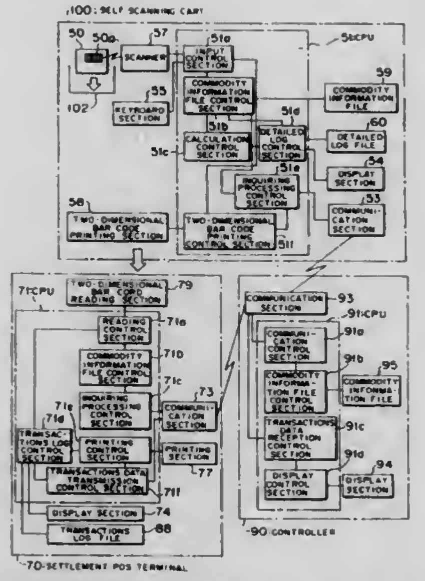
Int. Cl.⁶ G06K *15/00*

U.S. Cl. 235—383 **2 Claims**

1. A purchased commodity accommodating and transporting apparatus having a self scanning function, comprising:

a commodity code reading section for reading a commodity code applied to a commodity;

an accommodation section for accommodating therein a commodity whose commodity code has been read by said commodity code reading section;


100: SELF SCANNING CART
50
50a
57
SCANNER
51a
INPUT CONTROL SECTION
51: CPU
102
55
KEYBOARD SECTION
COMMODITY INFORMATION FILE CONTROL SECTION
59
COMMODITY INFORMATION FILE
51b
51d
CALCULATION CONTROL SECTION
51c
DETAILED LOG CONTROL SECTION
60
DETAILED LOG FILE
54
DISPLAY SECTION
51e
INQUIRING PROCESSING CONTROL SECTION
53
COMMUNICATION SECTION
58
TWO-DIMENSIONAL BAR CODE PRINTING SECTION
TWO-DIMENSIONAL BAR CODE PRINTING CONTROL SECTION
51f
71: CPU
TWO-DIMENSIONAL BAR CODE READING SECTION
79
READING CONTROL SECTION
71a
COMMODITY INFORMATION FILE CONTROL SECTION
71b
71c
INQUIRING PROCESSING CONTROL SECTION
73
COMMUNICATION SECTION
71e
71d
TRANSACTIONS LOG CONTROL SECTION
PRINTING CONTROL SECTION
PRINTING SECTION
77
TRANSACTIONS DATA TRANSMISSION CONTROL SECTION
71f
DISPLAY SECTION
74
TRANSACTIONS LOG FILE
88
70: SETTLEMENT POS TERMINAL
COMMUNICATION SECTION
93
91: CPU
COMMUNICATION CONTROL SECTION
91a
91b
95
COMMODITY INFORMATION FILE CONTROL SECTION
COMMODITY INFORMATION FILE
TRANSACTIONS DATA RECEPTION CONTROL SECTION
91c
91d
94
DISPLAY CONTROL SECTION
DISPLAY SECTION
90: CONTROLLER

a price retrieval section for retrieving prices of the commodities accommodated in said accommodation section in accordance with commodity code information read by said commodity code reading section;

a calculation section for calculating a total value of the prices of the commodities in accordance with a result of the retrieval by said price retrieval section;

a detailed log production section for producing a detailed log of the purchased commodities in accordance with the result of the retrieval by said price retrieval section and a result of the calculation by said calculation section; and

a two-dimensional bar code printing section for printing the detailed log produced by said detailed log production section as a two-dimensional bar code.

5,689,102
PORTABLE MULTI-DIRECTIONAL BAR CODE SCANNER

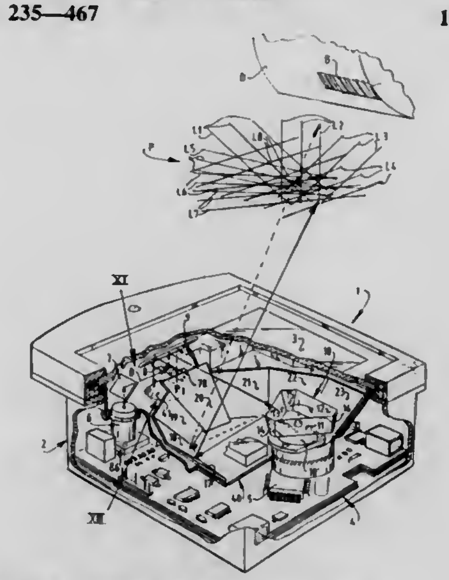
Cornelis Reinler Johannes Schonenberg, Hoofddorp, and Laurentius Wilhelmus Nunnink, Deventer, both of Netherlands, assignors to Scantech B.V., Netherlands

Filed Aug. 11, 1995, Ser. No. 514,031

Claims priority, application Netherlands, Aug. 11, 1994, 9401302

Int. Cl.⁶ G06K *7/10*

U.S. Cl. 235—467 **14 Claims**



1. A bar code scanning apparatus comprising:

a) a housing provided with a window;

b) a laser light source arranged to generate and transmit a laser beam, said laser light source being disposed in said housing;

c) a first mirror flexibly disposed in said housing and positioned to reflect said laser beam;

d) a rotating drive member mounted in the housing, said rotating drive member being operatively connected to a rotatable mirror;

e) a detector arranged to receive light from said first laser beam reflected from a bar code, said laser beam having been guided to said bar code by said first mirror and said rotatable mirror via said window; and

f) control means for manipulating said laser beam and said rotating drive member to form
  an oval, tube-like area of scan lines arranged in eight groups of triple lines in the form of an inverted U-shape so that six different angles of said scan lines are formed with respect to a selected side of said window, each said scan line being approximately ½ the length of said selected side of said window, said scan lines are diverging along a first distance of an axis extending perpendicular to said window, and converging along a second distance of said axis.

5,689,103
APPARATUS FOR AND METHOD OF READING A BAR CODE

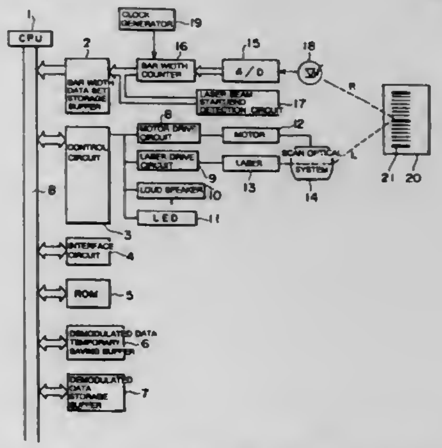
Mitsuo Watanabe, and Ichlro Shinoda, both of Kanagawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 8, 1996, Ser. No. 676,476

Claims priority, application Japan, Sep. 8, 1995, 7-231497

Int. Cl.⁶ G06K *7/10*

U.S. Cl. 235—462 **10 Claims**



1. A bar code reading apparatus for scanning a bar code interposed between distinguishing bars having fixed patterns, detecting a bright/dark pattern along a scan trajectory, and demodulating the bright/dark pattern into a data set encoded into the bar code, said apparatus comprising:

first demodulating means for demodulating both of a first bright/dark pattern along the scan trajectory that passes through only one of the distinguishing bars and a second bright/dark pattern along the scan trajectory that passes through both of the distinguishing bars;

second demodulating means for demodulating only the second bright/dark pattern;

whole data set acquiring means for acquiring whole data sets corresponding to the whole bar code on the basis of the data set demodulated by said first demodulating means or said second demodulating means; and

control means for making only said first demodulating means execute the demodulation before said whole data set acquiring means acquires the whole data sets on the basis of only the second bright/dark pattern, and making only said second demodulating means perform the demodulation after acquiring the whole data sets on the basis of the second bright/dark pattern.

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5,689,104

OPTICAL CODE READER WITH DEVICES TO LOCATE A CODE IN A READING WINDOW

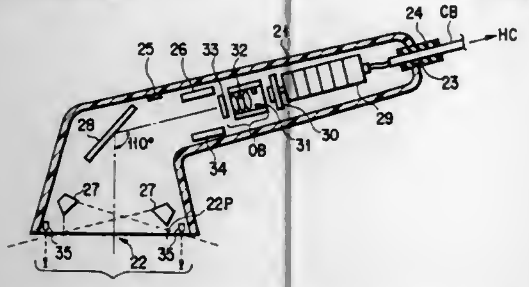
Masashi Suzuki, Mishima, and Mitsuo Uchimura, Numazu, both of Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, Japan

Continuation of Ser. No. 212,702, Mar. 14, 1994, abandoned. This application Sep. 15, 1995, Ser. No. 528,950

Claims priority, application Japan, Mar. 15, 1993, 5-054408

Int. Cl.⁶ G06K *7/10*

U.S. Cl. 235—472 **11 Claims**



1. An optical code reader which is held in a hand of an operator and which is brought near an article having a 2-dimensional code affixed thereto at a time of reading of the code, said 2-dimensional code occupying an area, the optical code reader comprising:

a read window;

an illumination light source which emits an illumination light to simultaneously illuminate at least all of said area on the article via said read window;

a guide beam light source, separate and independent of said illumination light source, for emitting guide beams independently of said illumination light source, said guide beam light source including a plurality of light-emitting elements arranged along a frame of said read window, which light-emitting elements respectively emit parallel guide beams through said read window independently of a light intensity of said illumination light; and

a detector arranged to receive light reflected by the article via said read window and to detect the 2-dimensional code from an image corresponding to the reflected light; and

wherein said guide beams are perpendicular to a read window plane, said guide beams indicating a read range corresponding to a size of said read window on a plane substantially parallel to the read window plane, and wherein said illumination light source is located inside the frame of said read window, and the plurality of light-emitting elements of said guide beam light source are located between said illumination light source and the frame of said read window.

5,689,105

MAGNETIC CARD DATA PROCESSING DEVICE

Atushi Mizoguchi, Hikone; Ichiro Kubo; Mashairo Seguchi, both of Ohtsu, and Sumiaki Adachi, Kustatsu, all of Japan, assignors to Omron Corporation, Japan

Continuation of Ser. No. 188,334, Jan. 25, 1994, abandoned. This application Aug. 20, 1996, Ser. No. 700,089

Claims priority, application Japan, Jan. 25, 1993, 5-010039; Jul. 30, 1993, 5-189688

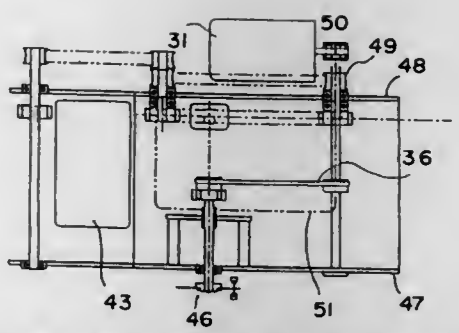
Int. Cl.⁶ G06K *7/08*

U.S. Cl. 235—475 **19 Claims**

1. A magnetic card data processing device for processing data on a card having a magnetic strip, comprising:

a base;

a magnetic head for processing data on the magnetic strip of the card, said magnetic head is supported by said base;



a card driving device for moving the card relative to said magnetic head and along a card path located adjacent to said magnetic head, said card driving device is supported by said base, said card driving device comprising two pairs of driving rollers with each pair of driving rollers defined by one driving roller located above the card path and another driving roller located below the card path, said magnetic head and said two pairs of driving rollers are aligned with the magnetic strip of the card to prevent skewing of the card during movement; and

a card detecting device including a pair of rollers whose peripheral surfaces come in contact with the card and are positioned above and below the card path in a manner so as to squeeze the card therebetween, said pair of rollers of said card detecting device are driven by a drive belt also driving said two pairs of driving rollers of said card driving device, said pair of rollers of said card detecting device are provided with elastic roller covers to prevent slipping, and one roller of said pair of rollers of said card detecting device is spring biased on one side of the card forcing the card into contact with an opposite roller Of said pair of rollers of said card detecting device.

5,689,106

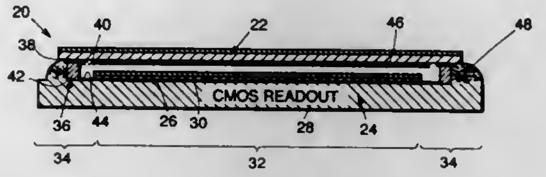
OPTICAL DEVICE ASSEMBLY HAVING A METALLIC BUMP BONDING TOGETHER TWO PLANAR OPTICAL COMPONENTS, AND ITS PREPARATION

Michael J. Dahlin, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 22, 1994, Ser. No. 361,622

Int. Cl.⁶ G01J *3/50*

U.S. Cl. 250—226 **19 Claims**



1. An optical device assembly, comprising:

a planar optical filter having a first face;

a planar sensor having a second face and an optically active area;

means for joining the optical filter to the sensor with a gap therebetween, the means for joining comprising

a cold-weldable metallic bump extending between the first face of the optical filter and the second face of the sensor,

a first bond between the metallic bump and the first face of the optical filter, and

a second bond between the metallic bump and the second face of the sensor, the second bond being at a location outside of the optically active area of the planar sensor.

5,689,107

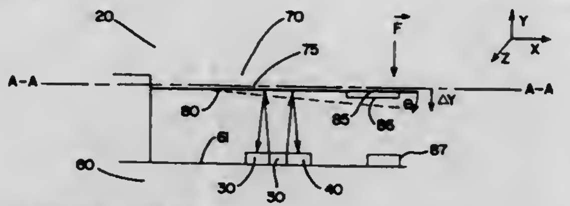
DISPLACEMENT-BASED OPTO-ELECTRONIC ACCELEROMETER AND PRESSURE SENSOR

Tsung-Yuan Hsu, Westlake Village, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 1, 1995, Ser. No. 522,877

Int. Cl.⁶ G01D *5/34*

U.S. Cl. 250—231.1 **24 Claims**



1. A sensor comprising:

a substrate;

a light source on said substrate;

a plurality of light detectors comprising a first light detector and a second light detector on said substrate;

a cantilever beam spaced from said substrate; said cantilever beam comprising:

a reflective portion such that light from said light source is reflected to said first light detector and said second light detector; and

a flexible portion such that an applied force effects a displacement of said cantilever beam; and

means for determining a quantity representative of a magnitude of said applied force by comparing light collected by said first light detector with light collected by said second light detector.

5,689,108

INTEGRATED OPTICAL PICK-UP

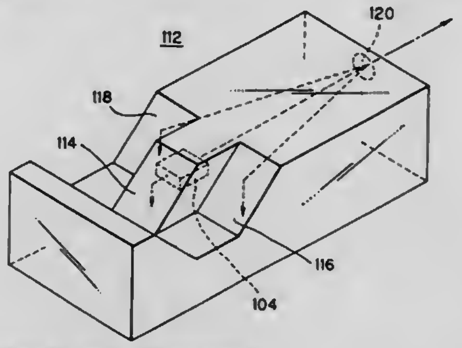
Minoru Ohyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,629

Claims priority, application Japan, May 27, 1995, 7-152458

Int. Cl.⁶ H01J *5/02*

U.S. Cl. 250—239 **11 Claims**



1. An optical pick-up comprising:

a laser diode for generating a light beam said light beam reaching to an information storage means and reflected thereby to form a return beam,

a mirror for directing said return beam;

diffraction means for diffracting said return beam;

photo detecting means for detecting said return beam diffracted by said diffraction means and directed by said mirror to said photodetecting means;

said mirror being provided only in a path of said return beam, said laser diode being provided on a substrate on which said photo detecting means is provided;

transparent plastic means for covering and sealing said substrate, said photo detecting means, and said laser diode, and

said mirror being provided on said transparent plastic means.

5,689,109

APPARATUS AND METHOD FOR THE MANIPULATION, PROCESSING AND OBSERVATION OF SMALL PARTICLES, IN PARTICULAR BIOLOGICAL PARTICLES

Raimund Schütze, Sudetenstrasse 22, Wolfratshausen, Germany, 82515

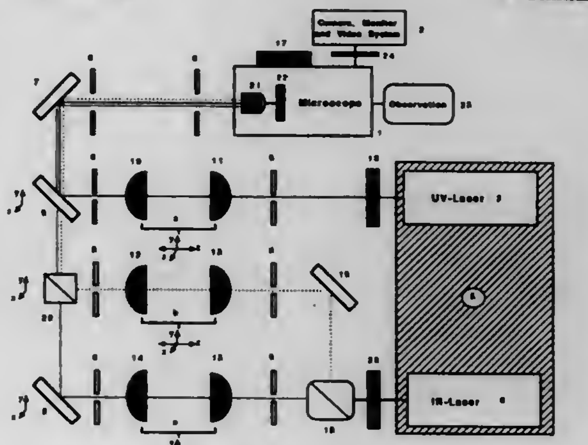
PCT No. PCT/EP94/00090, § 371 Date Aug. 30, 1994, § 102(e) Date Aug. 30, 1994, PCT Pub. No. WO94/16543, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 13, 1994, Ser. No. 295,740

Claims priority, application Germany, Jan. 13, 1993, 43 00 698.1

Int. Cl.⁶ H05H *3/04*

U.S. Cl. 250—251 **24 Claims**



1. Apparatus for the manipulation, processing and observation of small particles, comprising

at least one first laser (4) that generates light beams in a first wavelength range,

a first optical device (12, 13, 14, 15, 21) for focusing the beams in said first wavelength range with sufficient convergence to form an optical trap in a predetermined region,

an object holder (22) to contain particles,

a light source (17) for observation light, and

observation and recording devices (1, 2, 23) with which to observe particles in the object holder (22) and to record their behavior, and

at least one second laser (3) to generate light beams in a second wavelength range, and a second optical device (10, 11, 21) for focusing the beams in said second wavelength range with sufficient convergence to manipulate particles present in the object holder (22),

wherein for each of the light beams from the first laser (4) and the second laser (3) its own diverging optic (12, 13, 14, 15, 10, 11) is provided, which in each case is adjustable in three dimensions, including along three orthogonal coordinates (x, y, z), in such a manner that the optical devices (10, 11, 12 to 15, 21) for the beams in the first wavelength range, for the beams in the second range, and for the beams of the observation light can each be positioned and focused separately and independently of one another; and wherein the beams in the first wavelength range, the beams in the second wavelength range and the beams of the observation light are focused at the beginning of manipulation and observation in the same object plane (x-y plane) of the object holder (22), regardless of their wavelengths, wherein the respective beams can be influenced independently of one another in order to achieve movements of the particles within the object holder (22) and to process them at a specifically targeted position within their three-dimensional extent, and wherein the focusing can be preserved for the visible observation light.

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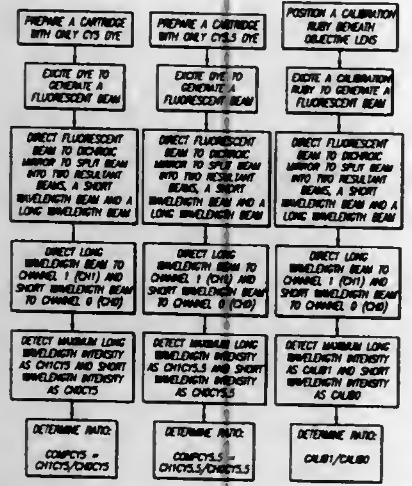
CALIBRATION METHOD AND APPARATUS FOR OPTICAL SCANNER

Louis J. Dietz, and Thomas M. Baer, both of Mountain View, Calif., assignors to Biometric Imaging, Inc., Mountain View, Calif.

Division of Ser. No. 300,160, Sep. 2, 1994, abandoned. This application Jun. 27, 1996, Ser. No. 670,540

Int. Cl.^{6} G01J *3/443*

U.S. Cl. 250—252.1 A **15 Claims**


PREPARE A CARTRIDGE WITH ONLY CY5 DYE
PREPARE A CARTRIDGE WITH ONLY CY5.5 DYE
POSITION A CALIBRATION RUBY BENEATH OBJECTIVE LENS
EXCITE DYE TO GENERATE A FLUORESCENT BEAM
EXCITE DYE TO GENERATE A FLUORESCENT BEAM
EXCITE A CALIBRATION RUBY TO GENERATE A FLUORESCENT BEAM
DIRECT FLUORESCENT BEAM TO DICHROIC MIRROR TO SPLIT BEAM INTO TWO RESULTANT BEAMS, A SHORT WAVELENGTH BEAM AND A LONG WAVELENGTH BEAM
DIRECT FLUORESCENT BEAM TO DICHROIC MIRROR TO SPLIT BEAM INTO TWO RESULTANT BEAMS, A SHORT WAVELENGTH BEAM AND A LONG WAVELENGTH BEAM
DIRECT FLUORESCENT BEAM TO DICHROIC MIRROR TO SPLIT BEAM INTO TWO RESULTANT BEAMS, A SHORT WAVELENGTH BEAM AND A LONG WAVELENGTH BEAM
DIRECT LONG WAVELENGTH BEAM TO CHANNEL 1 (CH1) AND SHORT WAVELENGTH BEAM TO CHANNEL 0 (CH0)
DIRECT LONG WAVELENGTH BEAM TO CHANNEL 1 (CH1) AND SHORT WAVELENGTH BEAM TO CHANNEL 0 (CH0)
DIRECT LONG WAVELENGTH BEAM TO CHANNEL 1 (CH1) AND SHORT WAVELENGTH BEAM TO CHANNEL 0 (CH0)
DETECT MAXIMUM LONG WAVELENGTH INTENSITY AS CH1CY5 AND SHORT WAVELENGTH INTENSITY AS CH0CY5
DETECT MAXIMUM LONG WAVELENGTH INTENSITY AS CH1CY5.5 AND SHORT WAVELENGTH INTENSITY AS CH0CY5.5
DETECT MAXIMUM LONG WAVELENGTH INTENSITY AS CALIB1 AND SHORT WAVELENGTH INTENSITY AS CALIB0
DETERMINE RATIO: COMPCY5 = CH1CY5/CH0CY5
DETERMINE RATIO: COMPCY5.5 = CH1CY5.5/CH0CY5.5
DETERMINE RATIO: CALIB1/CALIB0

1. In a method for calibrating two channels of a fluorescence spectrometer, the steps comprising:

providing a fluorescence spectrometer having a first channel and a second channel;

exciting a calibration standard to generate a fluorescent calibration beam;

separating said fluorescent calibration beam into a resultant first beam and a resultant second beam;

detecting said resultant first beam in said first channel to generate a first intensity value; and

detecting said resultant second beam in said second channel to generate a second intensity value, wherein a current ratio is determined from said first intensity value and said second intensity value, and a calibration factor is determined by comparing said current ratio to a predetermined ratio.

5,689,111
ION STORAGE TIME-OF-FLIGHT MASS SPECTROMETER

Thomas Dresch, Berlin, Germany; Erol E. Gulcicek, Cheshire, and Craig Whitehouse, Branford, both of Conn., assignors to Analytica of Branford, Inc., Branford, Conn.

Filed Aug. 9, 1996, Ser. No. 689,459

Int. Cl.^{6} H01J *49/40*

U.S. Cl. 250—287 **10 Claims**

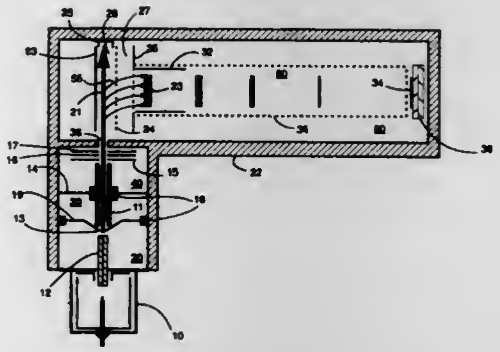
1. An apparatus for analyzing ionic species using a time-of-flight mass analyzer comprising:

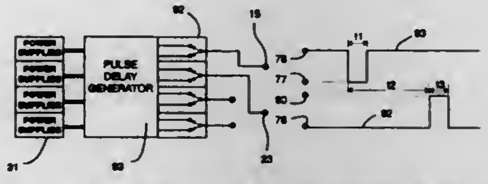
an atmospheric pressure ionization source which produces ions for transmission to a time-of-flight mass analyzer;

a two dimensional ion guide for enhancing the transmission efficiency of said ions, said ion guide operating between said atmospheric pressure ion source and said time-of-flight mass analyzer,

said ion guide having a set of equally spaced, parallel, multipole rods and operating in the RF-only mode of operation,

said ion guide having an ion entrance section where said ions enter said ion guide and an ion exit section where said ions exit said ion guide, and having an ion entrance lens placed at said ion entrance section and an ion exit lens placed at said ion exit section,





said ion guide being positioned such that said ion entrance section is placed in a region where background gas pressure is at viscous flow, and such that the pressure along said ion guide at said ion exit section drops to molecular flow pressure regimes without a break in the structure of said ion guide,

said ion guide being operated in the ion storage mode using a fast voltage switching device to switch voltage levels of said ion guide exit lens;

a time of flight acceleration region where said ions are pulsed out momentarily to be mass analyzed, said ions being pulsed in said time of right acceleration region by an acceleration field and being injected into said acceleration region orthogonal to the direction of said acceleration field;

a detector where said ions are mass analyzed according to their arrival times; and,

an accurate timing device that controls said voltage switching device for synchronizing said voltage levels of said ion guide exit lens and voltage levels of a time-of-flight acceleration electrode, and which determines the respective voltage levels and the duration of said voltage levels of said ion guide exit lens and said time-of-flight acceleration field to each other.

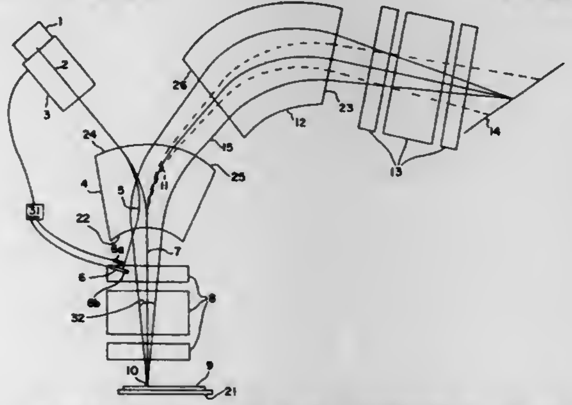
5,689,112
APPARATUS FOR DETECTION OF SURFACE CONTAMINATIONS ON SILICON WAFERS

Harald A. Enge, 20 Nason Hill Rd., Sherborn, Mass. 01770-0201, and William A. Lanford, P.O. Box 53, Malden Bridge, N.Y. 12115

Filed Apr. 12, 1996, Ser. No. 631,059

Int. Cl.^{6} H01J *49/44*

U.S. Cl. 250—309 **10 Claims**



1. Apparatus for analyzing surface contaminations on silicon wafers in which charged particles originating from a source are

deflected so as to form trajectories which define a central plane, comprising in combination:

a source of ions,

means for supporting a silicon wafer transverse to said central plane,

a combined beam-deflecting magnet and magnetic spectrometer system, said beam-deflecting magnet directing ions from said source having a single charge state and the same energy to said silicon wafer, said magnetic spectrometer system momentum-analyzing and focusing those of said ions which are back-scattered from said silicon wafer, said system including means for producing a substantially homogeneous and uniform magnetic field perpendicularly across at least one region of said central plane,

said silicon wafer being outside said magnetic field near a first boundary thereof,

a focal-plane detector transverse to said central plane outside said magnetic field near a second boundary thereof,

means for accelerating said ions from said source to an energy of the order of 10^5 eV and for delivering said ions as a beam into said magnetic field along said central plane at a third boundary thereof, whereby said beam is deflected by said magnetic field and emerges from said magnetic field through said first boundary thereof and strikes said wafer substantially perpendicular thereto and is scattered back by Rutherford scattering caused by atoms in said wafer and on a surface of said wafer, whereby said ions which strike said wafer have the same charge state and energy,

said system being so positioned and said boundaries being so shaped that said back-scattered ions re-enter said magnetic field at said first boundary thereof, are momentum-analyzed and focused thereby, and emerge therefrom through said second boundary so as to be directed to said detector, and

a first electrostatic Einzel lens between said first boundary and said wafer which provides a retarding electrostatic field strong enough to reject lower energy ions back-scattered from light nuclei such as silicon nuclei in the wafer, but not the ions back-scattered from heavier nuclei on the surface of the wafer,

wherein said first Einzel lens providing a focusing of the back-scattered ions transverse to said central plane so as to increase a solid angle of acceptance of said back-scattered ions.

5,689,113

Patent Not Issued For This Number

5,689,114
GAS ANALYZING APPARATUS

Tadashi Miyazaki, and Kazuhiro Kawasaki, both of Hachioji, Japan, assignors to Jasco Corporation, Hachioji, Japan

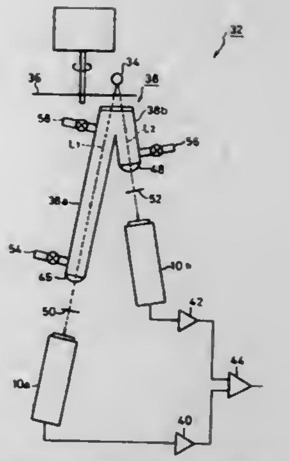
Filed Apr. 16, 1996, Ser. No. 632,881

Claims priority, application Japan, Apr. 28, 1995, 7-129042

Int. Cl.^{6} G01N *21/61*

U.S. Cl. 250—343 **17 Claims**

1. A gas analyzing apparatus comprising a light source emitting an infrared luminous flux; a sample cell which is arranged such that a sample gas is introduced therein and the infrared luminous flux emitted from said light source is transmitted therethrough; and a detection means which contains an absorber and is arranged such that the infrared luminous flux transmitted through said sample cell passes through said absorber and an increase in pressure according to a temperature within an absorber container raised upon absorption of the infrared luminous flux by said absorber is optically detected so as to measure, based on said increase in pressure, a concentration of an ingredient to be measured in said sample gas, wherein, as the absorber contained in said detection means, a gas



having an ingredient identical to said ingredient to be measured is used.

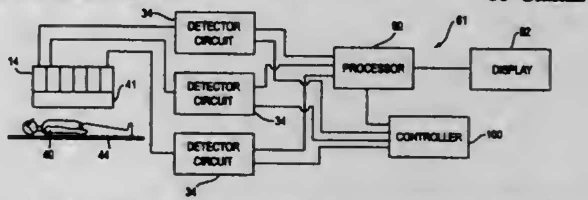
5,689,115
ADVANCED NUCLEAR MEDICINE SYSTEM

Adi Balan; Gideon Berlad; Alex Fishler; Doy Maor, and Alex Silberklang, all of Haifa, Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Nov. 24, 1995, Ser. No. 562,375

Int. Cl.^{6} G01T *1/166*

U.S. Cl. 250—363.07 **35 Claims**



1. A method of acquiring an analog electrical pulse signal caused by a radiation event impinging on a detector crystal and viewed by a plurality of detector units, for forming an image based on a plurality of said events, each of which is captured by some of said detector units, comprising:

adding a linearity enhancement signal to said analog signal; and

converting said analog signal, after adding said linearity enhancement signal, to a digital signal,

wherein, said linearity enhancement signal is slowly varying relative to a duration of a pulse in said analog signal and wherein said linearity enhancement signal enhances the linearity of said analog to digital conversion.

5,689,116
SYSTEMS AND METHODS FOR CALIBRATING A GAMMA CAMERA

Floribertus Philippus Heukensfeldt Jansen, Brookfield, Wis., assignor to General Electric Company, Milwankee, Wis.

Filed Jun. 5, 1996, Ser. No. 658,381

Int. Cl.^{6} G01T *1/164*

U.S. Cl. 250—363.09 **13 Claims**

1. A method for operating a gamma camera, the gamma camera including a scintillation crystal responsive to radiation stimuli for producing light events in the crystal at locations where the stimuli interact with the crystal and an array of photomultiplier tubes which responds to the light events for producing individual electrical signal outputs, the camera further including a plurality of analog-to-digital converters for converting the electrical signal outputs from the photomultiplier tube array to digital signals, said method comprising the steps of:

obtaining image data by performing at least one flood exposure using a phantom having a plurality of openings;

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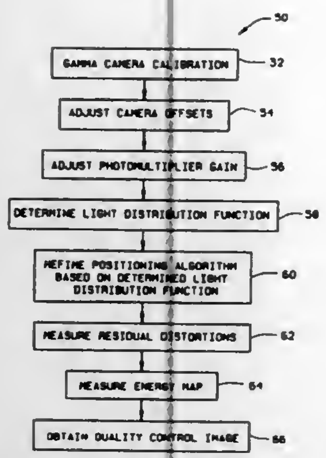
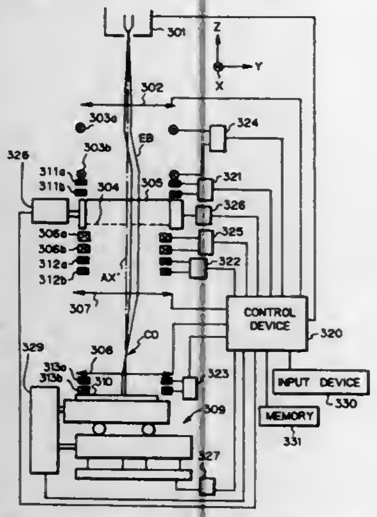

50
GAMMA CAMERA CALIBRATION
32
ADJUST CAMERA OFFSETS
34
ADJUST PHOTOMULTIPLIER GAIN
36
DETERMINE LIGHT DISTRIBUTION FUNCTION
58
REFINE POSITIONING ALGORITHM BASED ON DETERMINED LIGHT DISTRIBUTION FUNCTION
60
MEASURE RESIDUAL DISTORTIONS
62
MEASURE ENERGY MAP
64
OBTAIN QUALITY CONTROL IMAGE
66

determining positions of individual openings as represented in the image data;
corresponding the image data representative of the openings to actual openings in the phantom;
generating a hit map
generating a histogram representative of signal strength received, and distance from, an event for at least one photomultiplier tube; and
determining residual displacement errors by performing flood exposures at selected energy levels.

5,689,117
APPARATUS FOR IMAGE TRANSFER WITH CHARGED PARTICLE BEAM, AND DEFLECTOR AND MASK USED WITH SUCH APPARATUS

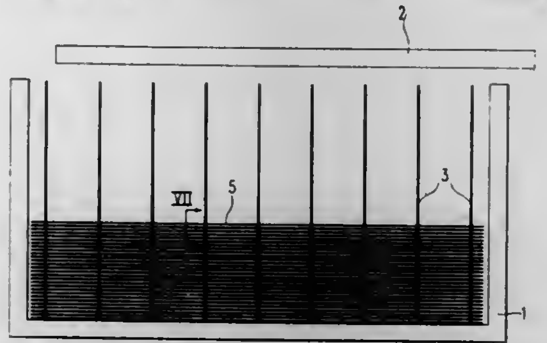
Mamoru Nakasuji, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Oct. 26, 1995, Ser. No. 548,616
Claims priority, application Japan, Nov. 22, 1994, 6-288057; Dec. 15, 1994, 6-311975; Dec. 28, 1994, 6-329094; Dec. 28, 1994, 6-329095
Int. Cl.^{6} H01J *37/30*
U.S. Cl. 250—492.23 **8 Claims**



1. An image transferring apparatus using a charged particle beam for transferring a pattern of a mask onto a target by using a charged particle beam, comprising:
a charged particle beam optical system having a first lens and a second lens defining a cross-over therebetween, said first lens being disposed on the side of the mask with respect to said cross-over and said second lens being disposed on the side of the target with respect to said cross-over; and
an angle adjusting deflector for deflecting the charged particle beam so that the main light path of the charged particle beam incident on said mask substantially perpendicularly thereto passes through said cross-over, said deflector being disposed between said mask and the principal plane of said first lens.

5,689,118
GRID AND METHOD OF MANUFACTURING SUCH GRID

Hendrik Frans van Beek, Driebergen, Netherlands, assignor to Technische Universiteit Delft, Netherlands
PCT No. PCT/NL94/00078, § 371 Date Nov. 16, 1995, § 102(e) Date Nov. 16, 1995, PCT Pub. No. WO94/24676, PCT Pub. Date Oct. 27, 1994
PCT Filed Apr. 15, 1994, Ser. No. 535,221
Claims priority, application Netherlands, Apr. 16, 1993, 9300654
Int. Cl.^{6} G02B *5/00;* **G21K** *1/00*
U.S. Cl. 250—505.1 **8 Claims**

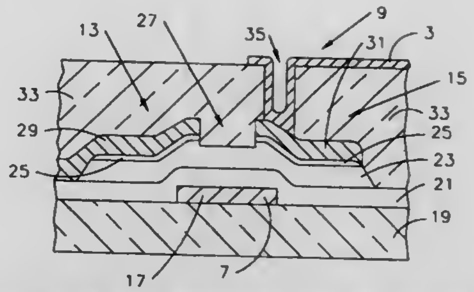


1. Apparatus for providing a grid for use in collimating incident radiation, said apparatus comprising:
a plurality of laminations, each of which is relatively opaque to said radiation and has planar horizontally oriented top and bottom surfaces, all of said laminations being arranged in a spaced-apart vertically stacked configuration and oriented such that successive ones of the laminations have a predefined spacing therebetween, so as to define a plurality of spacings, with the planar surfaces of said laminations being horizontally parallel both to each other and to a direction of said incident radiation,
a plurality of guides, each of which has a vertical length, distributed horizontally along a length of each of said laminations perpendicular to the direction of the incident radiation, wherein each of the guides longitudinally extends in a vertical direction perpendicular to both the planar surfaces of the laminations and to the incident radiation,
a frame, affixed to top and bottom portions of said guides, and positionable and fixable to said guides along said perpendicular direction;
each of the guides having a plurality of reference faces formed therein distributed along the vertical length thereof wherein a predefined number of spacers are receivable between successive ones of the reference faces, each of said laminations being abuttingly situated between a different predefined corresponding pair of said spacers; and
wherein the laminations and the spacings therebetween collectively form the grid.

5,689,119
LCD WITH INCREASED PIXEL OPENING SIZES

Tleer Gu, and Willem den Boer, both of Troy, Mich., assignors to OIS Optical Imaging Systems, Inc., Northville, Mich.
Filed Jun. 6, 1995, Ser. No. 470,271
Int. Cl.^{6} H01L *24/04;31/036;31/0376;31/20*
U.S. Cl. 257—59 **17 Claims**

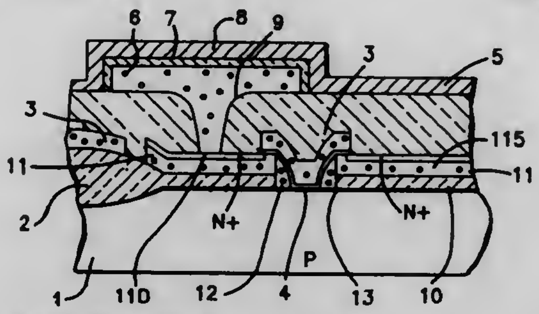
1. A liquid crystal display with a large pixel aperture ratio comprising:



a liquid crystal layer sandwiched between first and second substrates;
an array of thin film transistors and corresponding pixel electrodes mounted on said first substrate, each of said thin film transistors including a semiconductor layer, a gate electrode connected to a gate address line, a drain electrode connected to a drain address line, and a source electrode in communication with one of said corresponding pixel electrodes, and wherein said pixel electrode connected to said source electrode overlaps said gate and drain address lines along longitudinal edges thereof; and
a substantially continuous insulating layer at least about 1.5 μm thick, said insulating layer having a dielectric constant ϵ no greater than about 3.0 and being disposed between said pixel electrode and said address lines in order to reduce capacitive cross-talk in the display by reducing the pixel electrode-address line parasitic capacitance C_{PL} in the areas of overlap.

5,689,120
MOS FIELD EFFECT TRANSISTOR IN A DYNAMIC RANDOM ACCESS MEMORY DEVICE AND METHOD FOR FABRICATING THE SAME

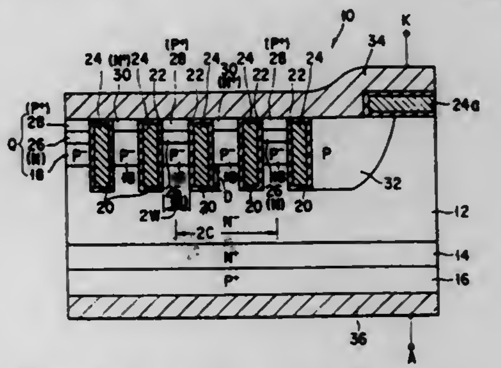
Kaoru Narita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 15, 1996, Ser. No. 730,273
Claims priority, application Japan, Oct. 14, 1995, 7-292086
Int. Cl.^{6} H01L *29/76*
U.S. Cl. 257—67 **2 Claims**



1. A field effect transistor comprising:
a semiconductor substrate;
an insulation film provided on said semiconductor substrate, said insulation film having an opening positioned on a predetermined region of said semiconductor substrate;
a first polysilicon film provided over said insulation film;
a second polysilicon film provided in contact with said first polysilicon film, said second polysilicon film extending on inside walls of said opening of said insulation film and over a peripheral portion of said predetermined region of said semiconductor substrate so that said first polysilicon film is connected through said second polysilicon film to said peripheral portion in said predetermined region of said semiconductor substrate;
a gate insulation film selectively provided, which extends on said predetermined region, except on said peripheral portion, of said semiconductor substrate and further extends on said second polysilicon film and a part of said first polysilicon film around said second polysilicon film;
a gate electrode provided on said gate insulation film to define a composite channel region under said gate insulation film so that said composite channel region extends through said first and second polysilicon films under said gate insulation film as well as through said semiconductor substrate under said gate insulation film; and
source and drain regions selectively provided in said first polysilicon film except under said .gate insulation film so that said source and drain regions are connected through said composite channel region.

5,689,121
INSULATED-GATE SEMICONDUCTOR DEVICE

Mitsuhiko Kitagawa, Tokyo; Ichiro Omura, Yokohama; Akio Nakagawa, Hiratsuka; Norio Yasuhara, Yokohama, and Tomoki Inoue, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 261,384, Jun. 15, 1994, Pat. No. 5,448,083, which is a continuation-in-part of Ser. No. 925,870, Aug. 7, 1992, Pat. No. 5,329,142. This application Jun. 7, 1995, Ser. No. 480,389
Claims priority, application Japan, Aug. 8, 1991, 3-199343; Dec. 20, 1991, 3-354303; Sep. 17, 1993, 5-231572; Mar. 15, 1994, 6-070151
Int. Cl.^{6} H01L *29/74;31/111*
U.S. Cl. 257—139 **19 Claims**



1. A semiconductor device comprising:
a first semiconductor layer of a second conductivity type;
a second semiconductor layer of a first conductivity type formed in a surface of said first semiconductor layer, for allowing first type charge carriers to be injected into said first semiconductor layer;
a third semiconductor layer of said second conductivity type formed in a surface of said first semiconductor layer, for allowing second type charge carriers to be injected into said first semiconductor layer to cause a conductivity modulation to occur therein;
a fourth semiconductor layer of the said conductivity type formed in said first semiconductor layer, for allowing said first type charge carriers contained in said first semiconductor layer to move externally out of said first semiconductor layer;
a MOS channel for selectively connecting said first semiconductor layer and said third semiconductor layer in order to thereby turn on and turn off said device;
a gate electrode facing said MOS channel;
first injection enhancer means for locally controlling a flow capability of the first type charge carriers in order to thereby increase an ability to inject the second type charge carriers into said first semiconductor layer, said first injection enhancer means comprising a first narrow current path connecting said first semiconductor layer and said fourth semiconductor layer such that a resistance to a flow of the first type charge carriers is locally increased in said first narrow current path;
a first main electrode connected to said second semiconductor layer; and
a second main electrode connected to said third and fourth semiconductor layers, said first and second main electrodes being arranged on one side of said device.

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5,689,122

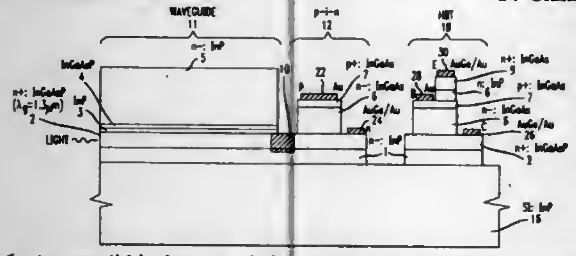
INP/INGAAS MONOLITHIC INTEGRATED DEMULTIPLEXER, PHOTODETECTOR, AND HETEROJUNCTION BIPOLAR TRANSISTOR

S. Chandrasekhar, Matawan, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 14, 1995, Ser. No. 514,707

Int. Cl.^{6} H01L *31/0328;31/0336;31/072;31/109*

U.S. Cl. 257—184 **14 Claims**



1. A monolithic integrated demultiplexing photoreceiver comprising:

a semi-insulating InP substrate;

a frequency routing device formed on said substrate including a first plurality of InP/InGaAs semiconductor layers;

at least one p-i-n photodiode formed on said substrate including a second plurality of InP/InGaAs semiconductor layers;

at least one single heterostructure bipolar transistor formed on said substrate including a third plurality of InP/InGaAs semiconductor layers, at least two layers of said first, second, and third plurality of layers being substantially identical to one another.

5,689,123

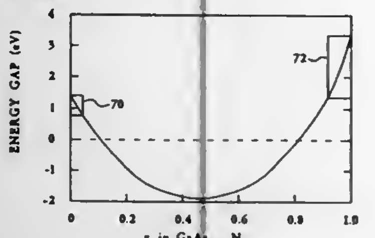
III-V ARESENIDE-NITRIDE SEMICONDUCTOR MATERIALS AND DEVICES

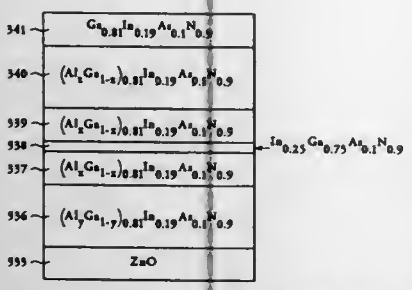
Jo S. Major, San Jose; David F. Welch, Menio Park, and Donald R. Scifres, San Jose, all of Calif., assignors to SDL, Inc., San Jose, Calif.

Continuation of Ser. No. 373,362, Jan. 17, 1995, abandoned, which is a continuation-in-part of Ser. No. 224,027, Apr. 7, 1994, abandoned. This application Oct. 1, 1996, Ser. No. 724,321

Int. Cl.^{6} H01L *29/205*

U.S. Cl. 257—190 **60 Claims**




341
$Ga_{0.81}In_{0.19}As_{0.1}N_{0.9}$
340
$(Al_xGa_{1-x})_{0.81}In_{0.19}As_{0.1}N_{0.9}$
339
$(Al_xGa_{1-x})_{0.81}In_{0.19}As_{0.1}N_{0.9}$
338
$In_{0.25}Ga_{0.75}As_{0.1}N_{0.9}$
337
$(Al_xGa_{1-x})_{0.81}In_{0.19}As_{0.1}N_{0.9}$
336
$(Al_yGa_{1-y})_{0.81}In_{0.19}As_{0.1}N_{0.9}$
335
ZnO

1. A III-V compound semiconductor material having at least nitrogen and arsenic disposed at Group V lattice sites wherein concentration of nitrogen to arsenic in said material is either less than about 5% or greater than about 90% comprising misicible regions for said material when utilizing MOCVD, said nitrogen and arsenic being proportioned at said Group V lattice sites of said material within said concentration so that said material is substantially lattice matched to a semiconductor substrate upon which said material is deposited while providing a direct bandgap level lower than the case where either the nitrogen or the arsenic is absent from the material.

5,689,124

SEMICONDUCTOR DEVICE

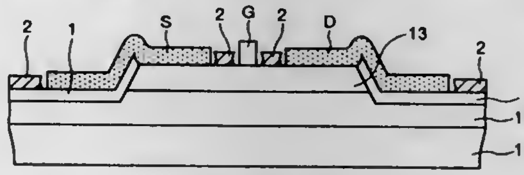
Yoji Morikawa, and Takashi Aigo, both of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 30, 1995, Ser. No. 453,397

Claims priority, application Japan, May 31, 1994, 6-119034; May 31, 1994, 6-119035; Aug. 19, 1994, 6-195591; Dec. 7, 1994, 6-303928

Int. Cl.^{6} H01L *31/0328*

U.S. Cl. 257—192 **25 Claims**



1. A semiconductor device comprising:

a main substrate including a semiconductor substrate, a compound semiconductor layer, which is formed on said semiconductor substrate and having a composition different from said semiconductor substrate, and an interfacial conductive layer formed in a hetero junction interface between said semiconductor substrate and said compound semiconductor layer; and

a transistor element formed on said main substrate; wherein: equations (1) and/or (2) below are satisfied:

$$1\ \mu m \leqq X \leqq T \tag{1}$$

$$1\ \mu m \leqq Y \leqq T \tag{2}$$

where X and Y are lengths of portions of source and drain electrodes of said transistor element which are in contact with said compound semiconductor layer along a running direction of carriers respectively, and T is a shortest distance from said source and drain electrodes to said interfacial conductor layer.

5,689,125

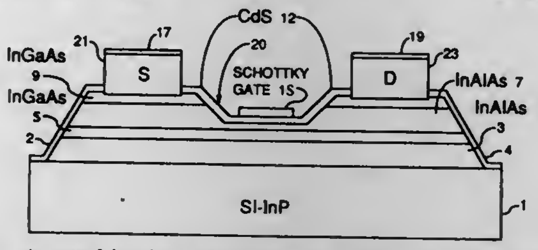
CADMIUM SULFIDE INTERFACE LAYERS FOR IMPROVING III-V SEMICONDUCTOR DEVICE PERFORMANCE AND CHARACTERISTICS

Kenneth Vaccaro, Acton; Andrew Davis, Boston; Helen M. Dauplaise, Brockton, and Joseph P. Lorenzo, Stow, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 12, 1995, Ser. No. 489,601

Int. Cl.^{6} H01L *29/778;31/0328*

U.S. Cl. 257—200 **6 Claims**



1. A metal-insulator-semiconductor (MIS) electronic device comprising:

(a) an InP substrate;

(b) an electrically conductive gate;

(c) an insulator positioned under said gate; and

(d) an additional CdS interface control layer having a thickness of less than 70 angstroms, formed between said insulator and said InP substrate.

5,689,126

SEMICONDUCTOR MEMORY DEVICE HAVING STACKED CAPACITOR

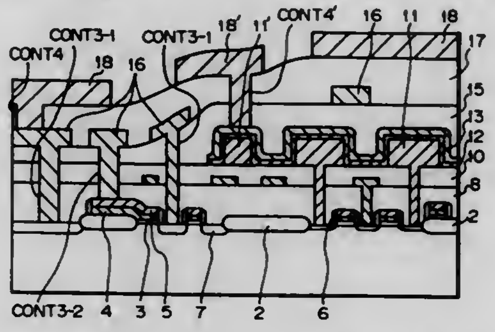
Yoshihiro Takaishi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 6, 1995, Ser. No. 499,038

Claims priority, application Japan, Jul. 7, 1994, 6-177734

Int. Cl.^{6} H01L *27/108;29/76;29/94;31/119*

U.S. Cl. 257—306 **10 Claims**



1. A stacked capacitor type semiconductor memory device comprising:

a semiconductor substrate;

first and second impurity doped regions formed within said semiconductor substrate;

a first insulating layer, formed on said semiconductor substrate and having a first contact hole leading to said second impurity doped region;

a capacitor lower electrode layer, formed on said first insulating layer and connected via said first contact hole to said second impurity doped region;

a capacitor insulating layer formed on said capacitor lower electrode layer;

a capacitor upper electrode layer formed on said capacitor insulating layer;

a second insulating layer formed on said first insulating layer and said capacitor upper electrode layer, a second contact hole formed in said second and first insulating layers and leading to said first impurity region;

a first wiring layer, formed on said second insulating layer and connected via said second contact hole to said first impurity region;

a third insulating layer formed on said first wiring layer and said second insulating layer, a third contact hole formed in said third and second insulating layers and leading to said capacitor upper electrode layer; and

a second wiring layer, being formed on said third insulating layer and connected via said third contact hole to said capacitor upper electrode layer, said third contact hole being formed simultaneously with at least one other contact hole which do not lead to said first and second impurity doped regions;

wherein a single electrode layer constitutes both said capacitor upper electrode layer and a dummy capacitor upper electrode.

5,689,127

VERTICAL DOUBLE-GATE FIELD EFFECT TRANSISTOR

Jack Oon Chu, Astoria; Louis Lu-Chen Hsu, Fishkill; Jack Allan Mandelman, Stormville; Yuan-Chen Sun, Katonah, and Yuan Taur, Bedford, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

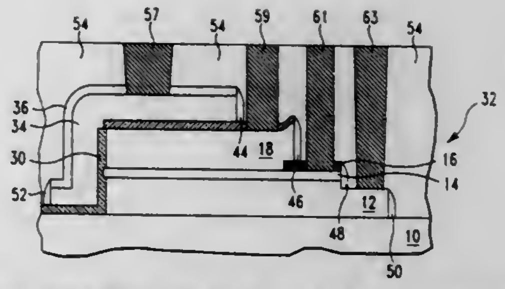
Filed Mar. 5, 1996, Ser. No. 610,949

Int. Cl.^{6} H01L *29/76;29/94*

U.S. Cl. 257—329 **9 Claims**

1. A vertical double-gate field effect transistor comprising:

a substrate;



a source layer disposed on the substrate, the source layer having a first peripheral edge;

a channel layer disposed on the source layer, the channel layer having a thickness approximately defining a channel length of the transistor, the channel layer further having a second peripheral edge;

a drain layer disposed on the channel layer, the drain layer having a third peripheral edge;

a top dielectric layer disposed on the drain layer, having a fourth peripheral edge substantially coincident the first, second and third peripheral edges;

a vertical gate dielectric layer surrounding a portion of the source, channel and drain layers and in contact with the portion of the source, channel and drain layers at the respective first, second and third peripheral edges; and

a conductive gate surrounding and in contact with the vertical gate dielectric layer and the top dielectric layer.

5,689,128

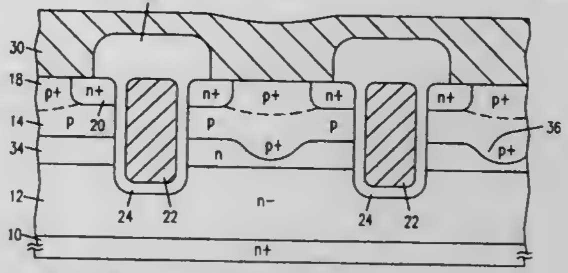
HIGH DENSITY TRENCHED DMOS TRANSISTOR

Fwu-Iuan Hshieh, Saratoga; Mike F. Chang, Cupertino; Kuo-In Chen, Los Altos; Richard K. Williams, Cupertino, and Mohamed Darwish, Saratoga, all of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Filed Aug. 21, 1995, Ser. No. 533,814

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—331 **7 Claims**



1. A field effect transistor comprising:

a substrate of a first conductivity type;

a first drift region of the first conductivity type having a lower dopant concentration than the substrate and formed on the substrate;

a second drift region of the first conductivity type having a dopant concentration intermediate that of the substrate and the first drift region, and overlying the first drift region;

a body region of a second conductivity type and overlying the second drift region;

a conductive gate electrode extending from a principal surface of the body region into the first drift region; and

a source region of the first conductivity type adjacent the conductive gate electrode at the principal surface of the body region.

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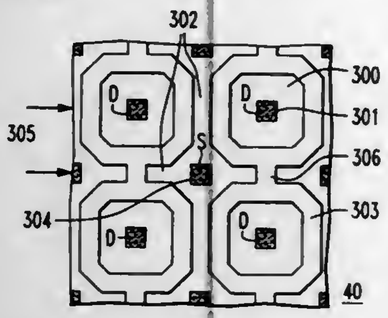
5,689,129
HIGH EFFICIENCY POWER MOS SWITCH
Lawrence George Pearce, Palm Bay, Fla., assignor to Harris Corporation, Palm Bay, Fla.

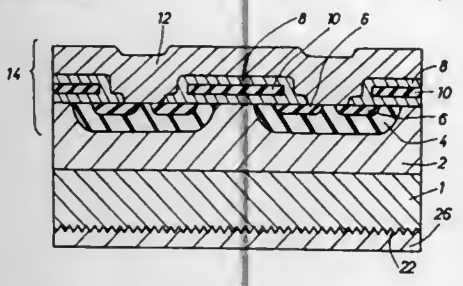
Filed Jun. 7, 1995, Ser. No. 483,691
Int. Cl.^{6} H01L *29/76;29/94*
U.S. Cl. 257—341 **15 Claims**



1. A power MOS switch comprising:
- an array of repeating alternating drain columns and source columns;
- each drain column being closely spaced one from another and comprising a plurality of separate drain regions closely spaced one from another;
- each source column comprising a continuous narrow elongated source distribution region extending the length of the column and a plurality of narrow source distribution branch regions intersecting and connected to said continuous narrow elongated source distribution region and extending transversely from said continuous narrow elongated source distribution region at least partially between each separate drain region in each drain column adjacent to said source column, said source distribution regions being narrower than each said separate drain region; and
- a gate region separating the drain regions in each said drain column from the adjacent source distribution regions.

5,689,130
VERTICAL SEMICONDUCTOR DEVICE WITH GROUND SURFACE PROVIDING A REDUCED ON RESISTANCE
Yoshifumi Okabe, Nagoya; Masami Yamaoka, Anjo, and Akira Kuroyanagi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 953,766, Sep. 30, 1992, abandoned, which is a division of Ser. No. 652,920, Feb. 8, 1991, Pat. No. 5,242,862. This application Mar. 22, 1995, Ser. No. 409,900
Claims priority, application Japan, Feb. 14, 1990, 2-33367
Int. Cl.^{6} H01L *29/76;29/94;23/48;23/52*
U.S. Cl. 257—342 **51 Claims**

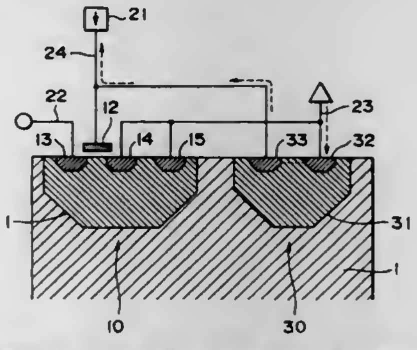


1. A semiconductor device which comprises:
- an N-type semiconductor substrate consisting only of a single layer including arsenic as an impurity and having a ground surface formed on one surface thereof, said ground surface having concavo-convex irregularities;
- an epitaxial layer grown on another surface other than said one surface of said N-type semiconductor substrate;
- a semiconductor element formed in said epitaxial layer;
- a first electrode coupled to said semiconductor element; and
- a second electrode formed on said ground surface and ohmically-contacted with said N-type semiconductor substrate through said ground surface, wherein an electric current flows between said first electrode and said second electrode during an ON-state of said semiconductor element, and
- wherein a surface roughness of said concavo-convex irregularities is in a range between 0.2–0.6 μm so that a contact resistance between said N-type semiconductor substrate and said second electrode is reduced.

5,689,131
Patent Not Issued For This Number

5,689,132
PROTECTIVE CIRCUIT FOR SEMICONDUCTOR INTEGRATED CIRCUIT
Tsutomu Ichikawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1996, Ser. No. 585,874
Claims priority, application Japan, Jan. 17, 1995, 7-004577
Int. Cl.^{6} H01L *23/62*
U.S. Cl. 257—357 **11 Claims**

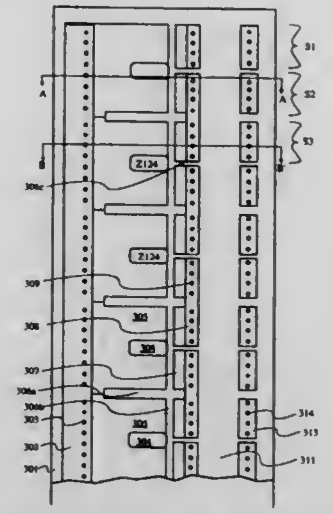


1. A protective circuit for a semiconductor integrated circuit, comprising:
- at least one transistor provided on a substrate;
- a first conducting type of region provided on said substrate; and
- a second conducting type first diffused part and second diffused part provided in a surface of said region;
- wherein said first diffused part is connected to a power line for said at least one transistor, and said second diffused part is connected to an external terminal.

5,689,133
ESD PROTECTION CIRCUIT
Sheau-Suey Li; Randy T. Ong, both of Cupertino; Samuel Broydo, Los Altos Hills, and Khue Duong, San Jose, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.

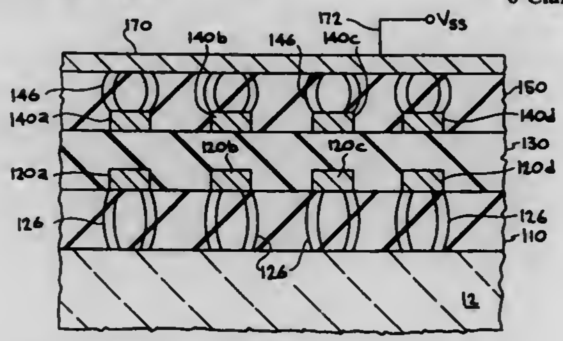
Continuation of Ser. No. 469,082, Jun. 5, 1995, abandoned, which is a division of Ser. No. 58,189, May 3, 1993, Pat. No. 5,477,414. This application Sep. 9, 1996, Ser. No. 709,611
Int. Cl.^{6} H01L *23/62*
U.S. Cl. 257—361 **8 Claims**

1. A split bipolar transistor for an ESD protection circuit comprising
- a plurality of adjacent collector regions, adjacent base regions, and adjacent emitter regions;
- at least one collector region separated partly from an adjacent collector region by a Zener diode which extends in the direction of current flow, said Zener diode for reducing lateral current flow between adjacent collector regions to prevent current hogging in any one particular collector region during an ESD event, said Zener diode also for triggering snap-back action to dissipate high current to protect said split bipolar transistor during said ESD event.



5,689,134
INTEGRATED CIRCUIT STRUCTURE HAVING REDUCED CROSS-TALK AND METHOD OF MAKING SAME
Nicholas F. Pasch, Pacifica, and Aldona M. Butkus, Santa Clara, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 370,492, Jan. 9, 1995, abandoned. This application Jul. 24, 1996, Ser. No. 685,772
Int. Cl.^{6} H01L *23/522;23/552*
U.S. Cl. 257—659 **6 Claims**

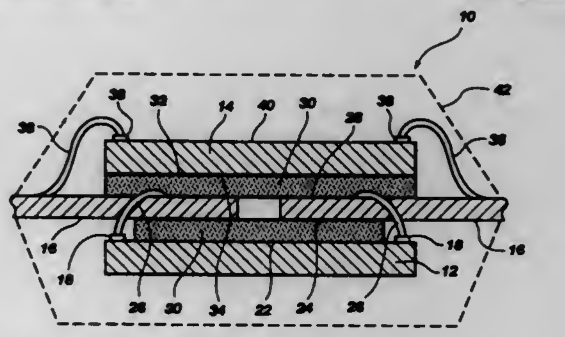


1. An integrated circuit structure comprising:
- a) one or more first insulation portions formed over a semiconductor substrate;
- b) a first metal layer comprising one or more first metal lines formed over said one or more of said first insulation portions;
- c) one or more second insulation portions formed over said one or more first metal lines;
- d) a second metal layer comprising one or more second metal lines formed over said one or more second insulation portions, without any intervening conductive shields between said first and second metal lines;
- e) one or more third insulation portions formed over said one or more second metal lines;
- f) a passivation layer formed over said one or more third insulation portions;
- g) an electrically conductive plate selected from the group consisting of a metal silicide and polysilicon formed over said passivation layer and said one or more third insulation portions formed beneath said passivation layer and;
- h) an electrical connector formed between said electrically conductive plate formed over said passivation layer and either a ground or power bus;

whereby said electrically conductive plate is insulatively spaced above said one or more first and second metal lines and is capable of terminating at least a portion of electrical field lines emanating from at least some of said one or more first and second metal lines beneath said passivation layer and said electrically conductive plate.

5,689,135
MULTI-CHIP DEVICE AND METHOD OF FABRICATION EMPLOYING LEADS OVER AND UNDER PROCESSES
Michael B. Ball, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 19, 1995, Ser. No. 574,994
Int. Cl.^{6} H01L *23/495;23/34*
U.S. Cl. 257—676 **21 Claims**



1. A multi-die semiconductor die assembly, comprising:
- a plurality of leads, each lead of the plurality of leads having a first side and a second side thereof;
- a first dielectric layer of material secured to the first side of at least one lead of said plurality of leads;
- a second dielectric layer of material secured to the second side of at least on lead of said plurality of leads;
- a first die having a size, a face, and a back, with said face secured to at least one of said plurality of leads on the first side thereof by the first dielectric layer of material secured to the first side of at least one lead of said plurality of leads, the first dielectric layer of material located between at least a portion of said face and the at least one lead of said plurality of leads;
- a second die having a size substantially the same as the size of said first die, a face, and a back, with said back secured to at least one of said plurality of leads on the second side thereof opposite said first die by the second dielectric layer of material secured to the second side of at least one lead of said plurality of lead, the second dielectric layer of material located between at least a portion of said back and said plurality of leads;
- at least one conductor of a first plurality of conductors extending between said face of said first die and at least one lead of said plurality of leads on the second side of said plurality of leads; and
- at least one conductor of a second plurality of conductors extending said face of said second die and at least one lead of said leads on said second side of said plurality of leads.

5,689,136
SEMICONDUCTOR DEVICE AND FABRICATION METHOD
Mitsuo Usami, Akishima, and Takashi Tase, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 280,935
Claims priority, application Japan, Aug. 4, 1993, 5-193267
Int. Cl.^{6} H01L *23/02;* **H05K** *1/14;* **G06K** *19/06*
U.S. Cl. 257—679 **16 Claims**

1. An IC card comprising:
- a flexible upper card substrate,
- a flexible lower card substrate to be bonded with the upper card substrate for structuring an IC card substrate, wherein the thickness of the lower card substrate is substantially the same as the thickness of the upper card substrate, and

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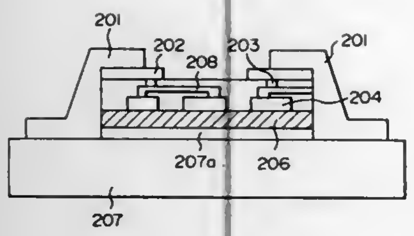
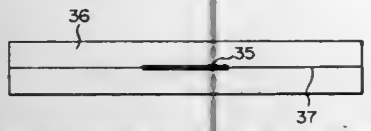




a thin-film semiconductor device having at least a semiconductor element and wiring, and a thin film of a protective insulating material formed on the lower surface of said semiconductor element, wherein said thin-film semiconductor device is placed between the upper card substrate and lower card substrate to be located on a neutral plane of the IC card,

wherein the thickness of the thin-film semiconductor device and the thickness of the IC card are set at a predetermined ratio relative to one another such that the thickness of the thin-film semiconductor device is a finite value not greater than 110 microns for the IC card having a thickness equal to or greater than 760 microns.

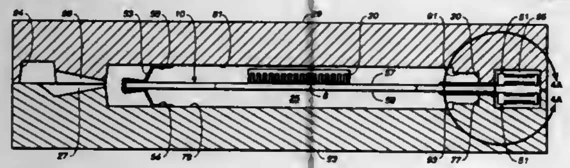
5,689,137
METHOD FOR TRANSFER MOLDING STANDARD ELECTRONIC PACKAGES AND APPARATUS FORMED THEREBY

Patrick O. Weber, San Jose, Calif., assignor to Hestia Technologies, Inc., Sunnyvale, Calif.

Filed Oct. 16, 1995, Ser. No. 543,762

Int. Cl.^{6} H01L *23/02;23/495*

U.S. Cl. 257—679 **21 Claims**



12. A transfer-molded standard electronic package, comprising:

a substrate having an electronic component on a surface of the substrate and a plurality of electrical contacts along a side of the substrate, each of the electrical contacts having an attachment portion connected to the electronic component by metallized paths; and

a transfer-molded encapsulant covering the substrate, the electronic component, and at least a part of the metallized paths such that the electrical contacts and at least a part of each of the attachment portions extend beyond the surface of the encapsulant and the encapsulant forms a seal with the substrate and the attachment portion of the electrical contacts.

5,689,138
INTEGRATED MICROWAVE SEMICONDUCTOR DEVICE WITH ACTIVE AND PASSIVE COMPONENTS

Ronald Dekker; Henricus G. R. Maas, and Wilhelmus T. A. J. Van Den Einden, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

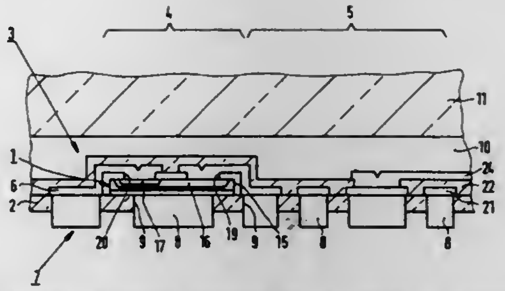
Filed Oct. 26, 1995, Ser. No. 548,932

Claims priority, application European Pat. Off., Oct. 31, 1994, 94203161

Int. Cl.^{6} H01L *23/34*

U.S. Cl. 257—728 **20 Claims**

1. A semiconductor device for microwave frequencies, comprising a substrate which is provided, at a first side, with a semiconductor element, a passive element, and a pattern of conductive elements and, at the opposed, second side, with a metallization connected to the elements present at the first side through windows formed in the substrate, the substrate being formed by a layer of silicon which is present on a layer of insulating material, the semiconductor element being formed in the silicon layer and the metallization being formed on a side of the layer of insulating material which is remote from the silicon layer.



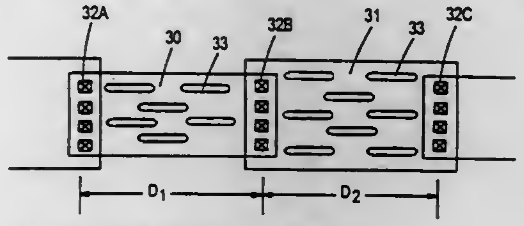
5,689,139
ENHANCED ELECTROMIGRATION LIFETIME OF METAL INTERCONNECTION LINES

Nguyen Duc Bui, San Jose, and Donald L. Wollesen, Saratoga, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 11, 1995, Ser. No. 526,189

Int. Cl.^{6} H01L *23/528;23/535*

U.S. Cl. 257—758 **8 Claims**



1. A semiconductor device comprising:

a conductive pattern having features;

a first insulating layer formed on the conductive pattern;

a first metal interconnection line formed on the first insulating layer;

a second insulating layer formed on the first metal interconnection line; and

at least two longitudinally spaced apart first conductive vias formed through the second insulating layer in electrical contact with the first metal interconnection line at first contact points separated by a first longitudinal distance which is less than the length corresponding to the minimum Backflow Potential Capacity for the first metal interconnection line; wherein:

the metal interconnection line comprises one or more slots through the metal interconnection line to the insulating layer;

each slot has a length greater than its width;

each slot has a maximum width less than the minimum spacing between the conductive lines; and

the minimum width of each slot is equal to the limit of etching or photolithography technology, further comprising a second metal interconnection line formed on the second insulating layer and in electrical contact with one of the first conductive vias at a second contact point,

wherein the width of the first metal interconnection line is essentially the same as the width of the second metal interconnection line,

a third insulating layer formed on the second metal interconnection line; and

at least one second conductive via formed through the third insulating layer in electrical contact with the second metal interconnection line at a third contact point longitudinally spaced apart from the second contact point on the second metal interconnection line by a second iongitudinal distance which is less than the length corresponding to the minimum Backflow Potential Capacity for the second metal interconnection line.

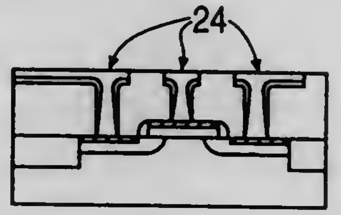
5,689,140
METHOD FOR FORMING STUDS AND INTERCONNECTS IN A MULTI-LAYERED SEMICONDUCTOR DEVICE

Naohiro Shoda, Wappingers Falls, N.Y., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 429,148, Apr. 26, 1995, abandoned, which is a division of Ser. No. 321,896, Oct. 14, 1994, Pat. No. 5,529,953. This application Dec. 18, 1996, Ser. No. 768,394

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—774 **14 Claims**



1. An interconnection structure for a semiconductor device comprising:

a substrate;

a dielectric layer formed on said substrate;

a first opening portion formed in said dielectric layer exposing a first surface on a first level;

a second opening portion formed in said dielectric layer exposing a second surface on a second level different from the first level, said second opening portion communicating with said first opening portion;

a first layer of a first material formed on said first surface;

a second layer of a second material formed on said second surface, said second material being different from said first material; and

a conductive layer formed on said first layer and said second layer, said conductive layer filling said first and second opening portions and said conductive layer being in direct contact with said first layer on said first surface and with said second layer on said second surface.

5,689,141
COMPRESSOR DRIVE SYSTEM FOR A NATURAL GAS LIQUEFACTION PLANT HAVING AN ELECTRIC MOTOR GENERATOR TO FEED EXCESS POWER TO THE MAIN POWER SOURCE

Yoshitsugi Kikkawa; Osamu Yamamoto; Yasuhiro Naito, and Junichi Sakaguchi, all of Kanagawa-ken, Japan, assignors to Chiyoda Corporation, Japan

Filed Jun. 6, 1995, Ser. No. 458,322

Claims priority, application Japan, Feb. 14, 1995, 7-048994

Int. Cl.^{6} F25B *11/02;* **F25J** *3/00;* **F02C** *6/00*

U.S. Cl. 290—52 **4 Claims**

1. A compressor drive system for a natural gas liquefaction plant including:

a pair of gas turbines, each of said gas turbines being installed in a corresponding one of a pair of different refrigeration systems using a propane refrigerant and mixed refrigerant. respectively, each of said refrigerants circulating in a respective independent closed loop, and each of said gas turbines being adapted to drive an associated compressor for pressurizing the corresponding refrigerant,

a pair of electric motors, each of said electric motors being associated with a respective one of said gas turbines so as to serve both as an AC generator and as an auxiliary motor for generating a startup torque for the associated gas turbine and the associated compressor,

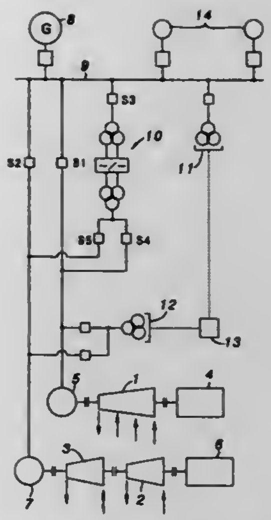
a single frequency converter,

switching means for selectively connecting a main power line to either of said motors via said single frequency converter for starting up said gas turbines,

at least one of said electric motors being operated as s generator for converting any excess power output of the corresponding gas turbine into electric power when power produced from said corresponding gas turbine is greater than power required by the associated compressor,

synchronizing means for synchronizing said at least one electric motor to a prevailing phase and frequency carried by said main electric power line, and

means for feeding said electric power converted from said excess power output by said at least one electric motor into said main electric power line.



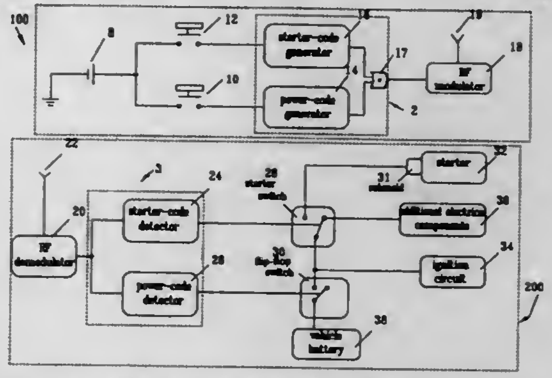
5,689,142
KEYLESS MOTOR VEHICLE STARTING SYSTEM WITH ANTI-THEFT FEATURE

Chunyan Liu, Elizabeth, N.J., assignor to Continocean Tech Inc., Montville, N.J.

Filed May 24, 1996, Ser. No. 653,496

Int. Cl.^{6} B60R *25/04*

U.S. Cl. 307—10.5 **9 Claims**



1. A keyless motor vehicle starting system comprising:

a motor starter;

a solenoid on said motor starter;

an ignition circuit;

a vehicle battery;

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additional motor vehicle electrical components which are not relied-upon to energize/enable said motor starter and said ignition circuit;

a portable wireless transmitter which comprises:

(a) a battery;

(b) a power-code switch connected to said battery;

(c) a starter-code switch connected to said battery;

(d) a power-code generator which is connected to said power-code switch and generates a power-code when said power-code switch is turned on;

(e) a starter-code generator which is connected to said starter-code switch and generates a starter-code when said starter-code switch is turned on;

(f) an OR-gate which combines said starter-code and said power-code;

(g) an electromagnetic-wave modulator which generates an electromagnetic-wave signal modulated by the output of said OR-gate;

(h) an electromagnetic-wave transmitting means connected to the output-pin of said electromagnetic-wave modulator;

a receiver/controller board which comprises:

(a) an electromagnetic-wave receiving means which generates a received electromagnetic-wave signal;

(b) an electromagnetic-wave demodulator whose input-pin is connected to said electromagnetic-wave receiving means;

(c) a starter-code detector which generates a detected-starter-code-signal and has an input-pin which is connected to the output-pin of said electromagnetic-wave demodulator;

(d) a power-code detector which generates a detected-power-code-signal and has an input-pin which is connected to the output-pin of said electromagnetic-wave demodulator;

(e) a power switch which is controlled by said detected-power-code-signal and is connected between said vehicle battery and said ignition circuit;

(f) a starter switch which is controlled by said detected-starter-code-signal and is connected between said power switch and said starter solenoid and between said power switch and said additional motor vehicle electrical components;

wherein said portable wireless transmitter and said receiver/controller board are used to replace an ignition lock, an ignition key and an ignition switch in a conventional motor vehicle.

5,689,143

ARRANGEMENT OF RESISTORS FOR SWITCHING OF CAPACITIVE LOADS IN AN ELECTROMAGNETIC SWITCHING DEVICE

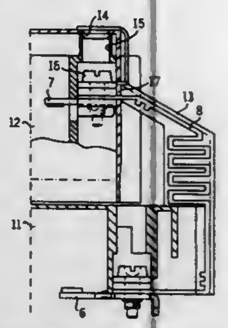
Rudolf Nikles, Oberentfelden AG, Switzerland, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 5, 1996, Ser. No. 658,328

Claims priority, application Switzerland, Jun. 9, 1995, 01711/95

Int. Cl.^{6} H01H *33/14*

U.S. Cl. 307—109 **6 Claims**



1. An electromagnetic switching device used to switch capacitive loads comprising:

a main contact, said main contact comprising a first main contact terminal and a second main contact terminal;

an auxilary contact, said auxilary contact comprising a first auxilary contact terminal and a second auxilary contact terminal, said first main contact terminal located proximal said first auxiliary contact terminal and said second main contact terminal connected to said second auxiliary contact terminal;

a rigid unitary planar resistor connected between said first main contact terminal and said second auxiliary contact terminal;

whereby in use said auxiliary contact closes before the main contact and opens after the main contact.

5,689,144

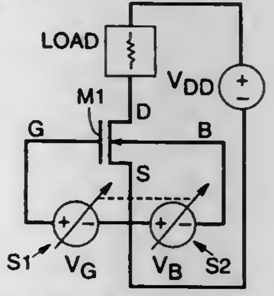
FOUR-TERMINAL POWER MOSFET SWITCH HAVING REDUCED THRESHOLD VOLTAGE AND ON-RESISTANCE

Richard K. Williams, Cupertino, Calif., assignor to Siliconix incorporated, Santa Clara, Calif.

Filed May 15, 1996, Ser. No. 649,747

Int. Cl.^{6} H03K *17/687*

U.S. Cl. 307—130 **28 Claims**



1. A method of switching a current on and off comprising the steps of:

providing a MOSFET, the MOSFET comprising first and second regions of a first conductivity type formed in a semiconductor substrate and separated by a body region of a second conductivity type, and a gate separated from channel region within the body region by a dielectric layer, neither of the first and second regions being shorted to the body region;

applying a voltage V_{DS} across the first and second regions;

applying a voltage V_G(on) to the gate so as to cause a current to flow between the first and second regions through the channel region;

applying a voltage V_B to the body region so as to forward-bias a PN junction between the body region and the second region, the voltage V_G being set at a level such that a resulting forward-bias across the PN junction is not sufficient to cause a substantial current to flow across the PN junction;

applying a voltage V_G(off) to the gate so as to terminate the flow of current between the first and second regions through the channel region; and

removing the voltage V_B from the body region.

5,689,145

STATOR STRUCTURE THAT REMOVES METAL PARTICLES FROM THE STATOR STRUCTURE

Kunitake Matsushita, Toyohashi; Takayuki Yamawaki, Kakegawa; Hideki Matsuura, Iwata, and Hiroshi Sano, Iwata-gun, all of Japan, assignors to Minebea Co., Ltd., Nagano, Japan

Filed Jul. 3, 1995, Ser. No. 497,979

Claims priority, application Japan, Jul. 1, 1994, 6-173218

Int. Cl.^{6} H02K *15/00*

U.S. Cl. 310—42 **5 Claims**

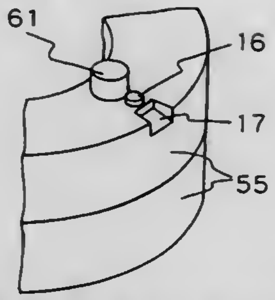
1. An electrical rotating machine, comprising:

a stator;

positioning protrusions extending from one end of said stator;

an end plate having positioning apertures engaged to said positioning protrusions and fixed to one end of said stator by resistance welding at a welding point, each said welding point being located substantially on a straight line extending from a center of rotation across said positioning protrusion and outer side of said positioning protrusion;

a rotor rotatably supported by bearings mounted on said end plate; and



slits for removal of metal particles are provided substantially along each said straight line extending from a center of rotation across said positioning protrusion and an outer side of said positioning protrusion.

5,689,146

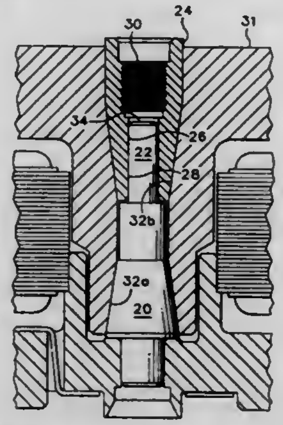
CONICAL BEARING SYSTEM FOR SPINDLE MOTORS

Charles J. Cheever, Beaverton, Oreg., assignor to Synektron Corporation, Portland, Oreg.

Filed Nov. 5, 1996, Ser. No. 740,927

Int. Cl.^{6} H02K *7/08;7/14;* **F16C** *32/06;25/02*

U.S. Cl. 310—90 **9 Claims**



1. A bearing clearance setting system for conical bearings in spindle motors, said setting system comprising:

(a) providing a first conical bearing having an integral shaft;

(b) providing a second conical bearing defining a bore having a first bore section and a second bore section;

(c) applying adhesive to said shaft;

(d) inserting said shaft into said first bore section;

(e) screwing a threaded screw into said second bore section until said screw abuts said shaft;

(f) applying torque to said screw to push against said shaft thereby causing said second conical bearing to move axially; and

(g) curing said adhesive.

5,689,147

BRUSHLESS MOTOR

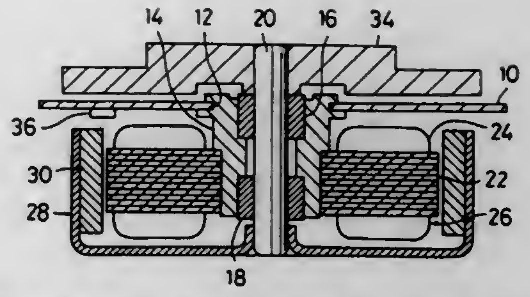
Isao Kaneda, Moriyama; Masanobu Chuta, Omihachiman, and Tetsuya Tsuji, Shiga-ken, all of Japan, assignors to Nidec Corporation, Kyoto, Japan

Filed Feb. 6, 1995, Ser. No. 383,813

Claims priority, application Japan, Feb. 7, 1994, 6-035325; Feb. 22, 1994, 6-049897

Int. Cl.^{6} H02K *1/16*

U.S. Cl. 310—216 **16 Claims**



7. A brushless motor comprising a stator core having a plurality of tooth portions disposed peripherally at spaced intervals, a coil means wound in a required manner on the plurality of tooth portions, an annular rotor magnet disposed in opposition to the stator core and having N poles and S poles disposed alternately, and a position detecting sensor for detecting the rotating angular position of the rotor magnet, wherein

the stator core is formed by laminating an anistropic steel plate in which the easily magnetizable axis of the core is substantially in agreement with a specified tooth portion of the plurality of tooth portions.

5,689,148

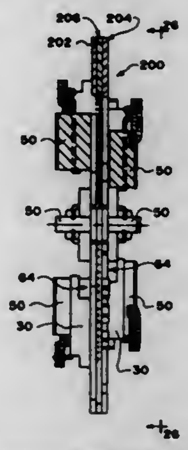
MULTI-POLE, TWO-SPEED BRUSH HOLDER ASSEMBLY

Ilya Rubinchik, London, Canada, assignor to Siemens Electric Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 495,135, Jun. 19, 1995, which is a continuation-in-part of Ser. No. 234,737, Apr. 19, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 608,457

Int. Cl.^{6} H02K *39/38;15/00*

U.S. Cl. 310—239 **23 Claims**



1. A multi-pole, two-speed brush holder assembly comprising:

a high-speed brush holder assembly and a low-speed brush holder assembly;

said high-speed brush holder assembly comprising a non-electrically conductive brush card having two sides, namely a first side and a second side, and a central aperture extending between said sides, a plurality of brush holders disposed on said card's first side and spaced circumferentially around said aperture, electrically conductive brushes guided by said brush holders for motion radially of said aperture, spring means for urging each of said brushes radially inward toward said aperture, and an electric conductor disposed on the card's second side and electrically connecting the brush of a first of said brush holders with the brush of a second of said brush holders;

said low-speed brush holder assembly comprising a non-electrically conductive brush card having two sides, namely a first side and a second side, and a central aperture extending

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between said sides of said low-speed brush holder assembly's brush card, a plurality of brush holders disposed on the first side of said low-speed brush holder assembly's brush card and spaced circumferentially around said aperture of said low-speed brush holder assembly's brush card, electrically conductive brushes guided by said brush holders on said low-speed brush holder assembly's brush card for motion radially of said aperture of said low-speed brush holder assembly's brush card, spring means for urging each of said brushes of said low-speed brush holder assembly's brush card radially inward toward said aperture of said low-speed brush holder assembly's brush card, and an electric conductor disposed on the second side of said low-speed brush holder assembly's brush card and electrically connecting the brush of a first of said brush holders on said low-speed brush holder assembly's brush card with the brush of a second of said brush holders on said low-speed brush holder assembly's brush card;

means joining said brush cards together with said second sides of said brush cards mutually confronting and with said electric conductors mutually abutting to establish electric continuity between said electric conductors, wherein the brushes of brush holders on the high-speed brush holder assembly's brush card, other than the brushes of the first and second brush holders on the high-speed brush holder assembly's brush card, do not have electric continuity with the brushes of any brush holders on the low-speed brush holder assembly's brush card, and wherein the brushes of brush holders on the low-speed brush holder assembly's brush card, other than the brushes of the first and second brush holders on the low-speed brush holder assembly's brush card, do not have electric continuity with the brushes of any brush holders on the high-speed brush holder assembly's brush card.

5,689,149

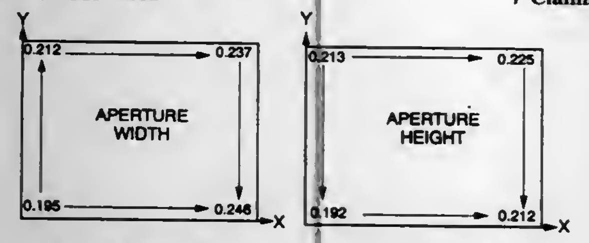
COLOR PICTURE TUBE HAVING SHADOW MASK WITH IMPROVED APERTURE SHAPES

Thomas Dickson Welles, Jr., York, and Craig Clay Eshleman, Pequea, both of Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Nov. 14, 1995, Ser. No. 557,471

Int. Cl.^{6} H01J *29/80*

U.S. Cl. 313—402 **7 Claims**



1. In a color picture tube having a shadow mask, a dot screen and an electron gun for producing and directing a plurality of electron beams through said mask to said screen, said mask having two long sides and two short sides, said long sides paralleling a central major axis of said mask, and said short sides paralleling a central minor axis of said mask, and said mask including an array of apertures, the improvement comprising

each of said shadow mask apertures being substantially rectangular with four sides, two of said aperture sides approximately paralleling said major axis and establishing aperture height and two of said aperture sides approximately paralleling said minor axis and establishing aperture width, the widths and heights of said apertures increasing at a first rate and a second rate, respectively, from the center to the sides of said mask, along said major axis, and the widths and heights of said apertures increasing at a third rate and a fourth rate, respectively, from the center to the top and bottom of said mask, along said minor axis.

5,689,150

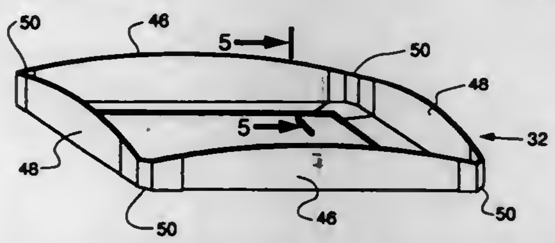
COLOR PICTURE TUBE HAVING IMPROVED SHADOW MASK FRAME

Frank Rowland Ragland, Jr., Lancaster, Pa., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Nov. 14, 1995, Ser. No. 557,472

Int. Cl.^{6} H01J *29/07*

U.S. Cl. 313—402 **2 Claims**



1. In a color picture tube including a evacuated envelope having a rectangular faceplate panel, said panel including a viewing screen on an inner surface thereof and a shadow mask frame assembly mounted therein, and said shadow mask frame assembly including an aperture shadow mask and a peripheral frame to which said mask is attached, said peripheral frame having an L-shaped cross-section, the improvement comprising:

said peripheral frame including eight sections; two identical long side sections, two identical short side sections, and four corner sections, that are attached together edge-to-edge, and

said two long side sections and said two short side sections being thinner than said four corner sections, said attached eight sections shaped in to said L-shaped cross-section from a flat condition by pressing.

5,689,151

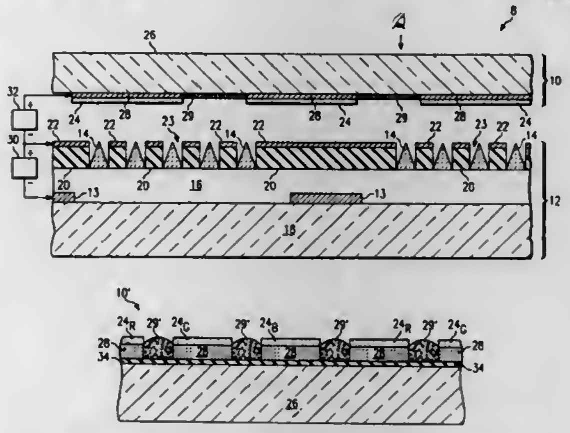
ANODE PLATE FOR FLAT PANEL DISPLAY HAVING INTEGRATED GETTER

Robert M. Wallace; John M. Anthony, both of Richardson; Bruce E. Gnade, Dallas, and Chih-Chen Cho, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1995, Ser. No. 535,506

Int. Cl.^{6} H01J *17/24*

U.S. Cl. 313—495 **14 Claims**



1. An anode plate for use in a display device, comprising:

a substantially transparent substrate;

a plurality of spaced-apart, electrically conductive regions on the substrate;

a luminescent material adjacent to the conductive regions; and

means for adsorbing gases comprising getter material disposed on the substrate and between the conductive regions, said getter material comprising an electrically nonconductive, high porosity and low density material.

5,689,152

ELECTRON MULTIPLIER FOR A MULTI-CHANNEL PHOTOMULTIPLIER TUBE

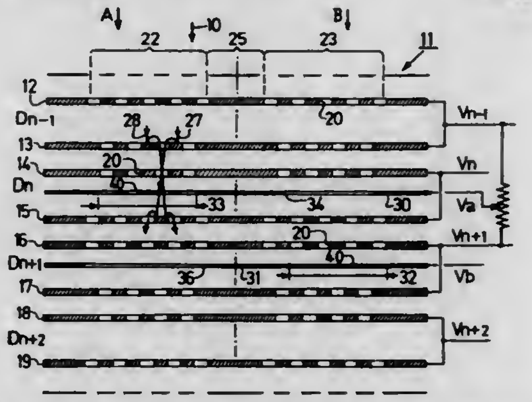
Jean-Pierre Boutot, and Pierre L'Hermite, both of Brive, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1996, Ser. No. 622,486

Claims priority, application France, Apr. 26, 1995, 95 04979

Int. Cl.^{6} H01J *43/18*

U.S. Cl. 313—532 **9 Claims**



1. A multi-channel electron multiplier of the type comprising a plurality of conductive sheets stacked parallel to each other, in which two adjacent sheets intended to convey the same voltage constitute, in accordance with the direction of displacement of the electrons, a focusing half-dynode and a multiplying half-dynode, respectively, jointly constituting a dynode which has different channels in common, each sheet comprising active zones in a number which is equal to the number of channels, which are perforated by a regular configuration of apertures, and comprising unapertured separation zones, characterized in that, for controlling the gain of a given channel, the multiplier comprises a control electrode in the form of a sheet which is situated between the sheets of a dynode, having a window provided with a grating which is highly transparent to the electrons and the area of which is situated opposite the active zone of said given channel, while said electrode has apertures opposite the active zones of the other channels, and in that the control electrode is provided with connection means for applying an adjustable voltage.

5,689,153

ELECTRO-OPTICAL PLASMA DISPLAY DEVICE WITH ELECTRODE HAVING INSULATING LAYERS

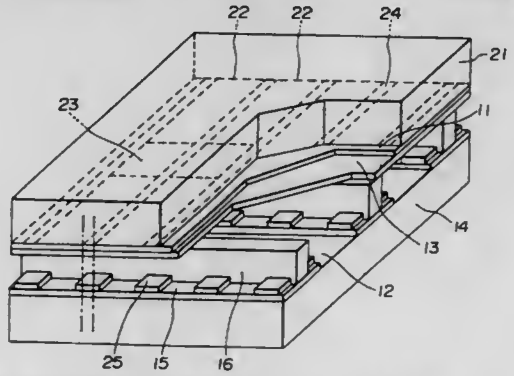
Shoichi Tanamachi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1995, Ser. No. 538,361

Claims priority, application Japan, Oct. 5, 1994, 6-241072

Int. Cl.^{6} H01J *17/49*

U.S. Cl. 313—586 **12 Claims**



1. A plasma addressed display device, comprising:

a first substrate having a plurality of stripe-shaped first electrodes arranged in parallel to one another so as to form stripe-shaped interstices between neighboring ones of said first electrodes;

a second substrate having a plurality of parallel stripe-shaped second electrodes extending perpendicularly to said first electrodes;

a dielectric sheet provided between the first substrate and the second substrate,

a plurality of barrier ribs provided on the second substrate substantially parallel to said second electrodes to form a plurality of plasma channels between neighboring ones of said second electrodes;

an electro-optical layer provided between the first substrate and the dielectric sheet;

an ionizable gas sealed between the second substrate and the dielectric sheet; and

a plurality of insulating layers formed on the second electrode, each insulating layer being formed on a part of the second electrode at a position opposed interstices between neighboring ones of said first electrodes.

5,689,154

METAL HALIDE GAS DISCHARGE LAMP FOR PROJECTION PURPOSES

Clemens Barthelmes; Thomas Dittrich, and Ralf Seedorf, all of Berlin, Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Germany

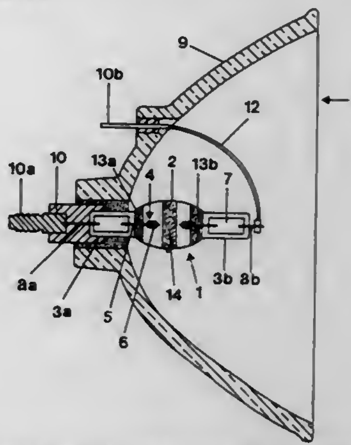
PCT No. PCT/DE95/00067, § 371 Date May 30, 1996, § 102(e) Date May 30, 1996, PCT Pub. No. WO95/20822, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 20, 1995, Ser. No. 656,220

Claims priority, application Germany, Jan. 28, 1994, 94 01 436.1

Int. Cl.^{6} H01J *61/30;61/35*

U.S. Cl. 313—635 **9 Claims**



1. A metal halide gas discharge lamp (1) for projection purposes, having a translucent discharge vessel (2) closed on two ends (3);

an ionizable fill within the vessel;

two opposed electrodes (4) in the vessel, separated by an interelectrode gap, connected to power supply leads (8) carried to the outside; and

a frosting forming a strip-like portion (14) on the circumference of the outer surface of the discharge vessel (2),

characterized in that

the frosted portion (14) is located in alignment with the interelectrode gap, and has a width which is less than or at most equal to the electrode spacing defining said interelectrode gap; and

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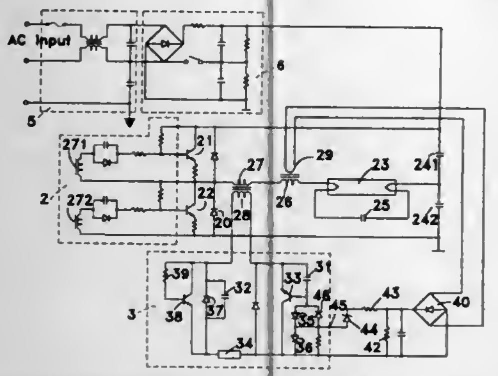
regions of clear surface of said vessel (2) adjoin each of the edges of the strip-like portion of the frosted outer surface.

5,689,155
ELECTRONIC STABILIZER HAVING A VARIABLE FREQUENCY SOFT START CIRCUIT

Eric Chung, Hsin Tien, and Charles Chang, San Chung, both of Taiwan, assignors to Yao Shung Electronic Co., Ltd., Taipei, Taiwan

Filed Oct. 25, 1996, Ser. No. 738,448
Int. Cl.^{6} G05F ***1/00***
U.S. Cl. 315—199 **7 Claims**

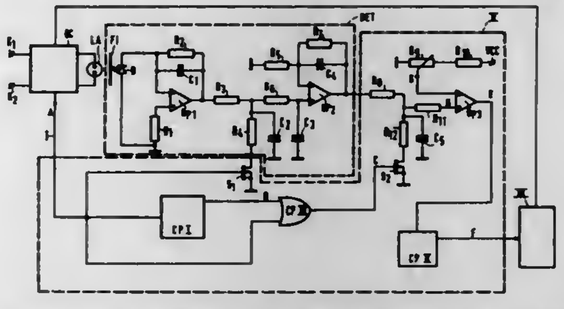


1. An electronic stabilizer with a variable frequency soft start circuit, comprising:
- a protective and power factor improving circuit for receiving power supply from the outside;
- a filtering and rectifying circuit for filtering and rectifying the power output from said protective and power factor improving circuit and then supplying the power required by said electronic stabilizer;
- a drive transformer for driving two secondary induction coils of opposite polarities;
- an LC oscillating circuit including an inductor and a plurality of capacitors connected in series and connected to a fluorescent lamp; and
- a high frequency switching control loop for controlling a first transistor and a second transistor which are connected or disconnected by means of said secondary induction coils so as to maintain sustained oscillation to cooperate with said LC oscillating circuit to supply the energy required by said fluorescent lamp for excitation; wherein
- said drive transformer has a secondary side having a secondary coil for supplying an induced voltage to a variable frequency soft start circuit;
- said variable frequency soft start circuit comprises: an inductance element paralleled to said secondary coil;
- a primary transistor provided at a charging side between said secondary coil and said inductance element and having a first capacitor connected to a base electrode of said primary transistor, whereby at the initial stage when said first transistor is connected and charges said fluorescent lamp, said first capacitor will immediately obtain the induced voltage and may, prior to being fully charged, supply a forward voltage to said primary transistor, so that said secondary coil paralleled to said inductance element may reduce the total inductance, and the operating frequency of said LC oscillating circuit may consequently increase to reduce the energy obtainable by said fluorescent lamp to achieve a soft start; and
- a secondary transistor provided at a discharging side between said secondary coil and said inductance element, said secondary transistor forming a discharge loop with said secondary coil, said first capacitor and said inductance element, said discharge loop having a plurality of diodes connected in series for discharging of said first capacitor.

5,689,156
CIRCUIT ARRANGEMENT FOR DETECTING THE AMOUNT OF DEPOSITED ELECTRODE MATERIAL ON THE WALL OF A LAMP VESSEL

Günther H. Derra, Aachen; Hanns E. Fischer; Hans G. Ganser, both of Stolberg, all of Germany, and Holger Mönch, Vaals, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1996, Ser. No. 583,687
Claims priority, application European Pat. Off., Jan. 9, 1995, 95200030.5
Int. Cl.^{6} H05B ***37/00***
U.S. Cl. 315—225 **18 Claims**

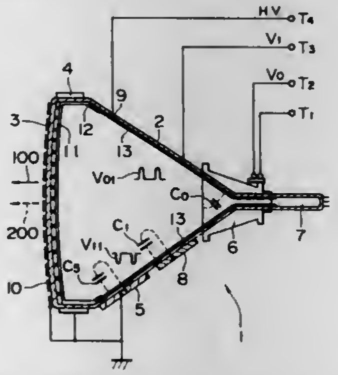


1. Method for measuring the mount of deposited electrode material on the wall of a lamp vessel of a discharge lamp, comprising heating the discharge lamp to an elevated temperature and measuring the power of infrared radiation radiated by the discharge lamp within a specific wavelength range, characterized in that the measuring is done while no discharge is present in the discharge lamp.

5,689,157
CATHODE-RAY TUBE DISPLAY UNIT IN WHICH UNWANTED RADIANT ELECTRIC FIELD FROM FACE PLATE OF CATHODE-RAY TUBE IS DECREASED

Hiroshi Jitsukata; Katsuyuki Kawakami; Soichi Sakurai, all of Yokohama; Hiroshi Yoshioka, Mobara, and Yoshio Satoh, Chiba-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 460,110, Jun. 2, 1995, which is a continuation of Ser. No. 26,757, Mar. 5, 1993, Pat. No. 5,475,287. This application Oct. 18, 1995, Ser. No. 544,923
Claims priority, application Japan, May 8, 1992, 4-115895; Aug. 7, 1992, 4-211209; Oct. 19, 1994, 6-253208; Dec. 7, 1994, 6-303808
Int. Cl.^{6} G09G ***1/04;*** **H01J** ***29/06;*** **H04N** ***5/65***
U.S. Cl. 315—370 **19 Claims**



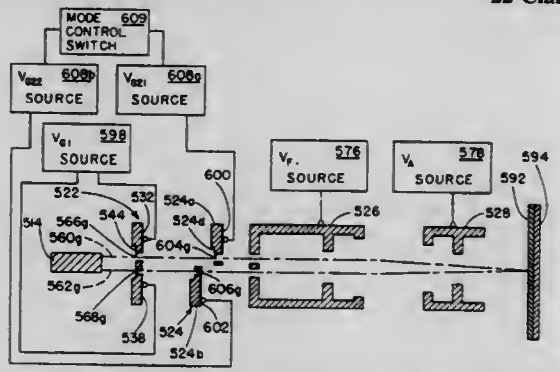
1. A cathode-ray tube display unit comprising:
- voltage supplying means for supplying at least a high voltage to an anode of a cathode-ray tube;
- deflection yoke means having a horizontal deflection coil and a vertical deflection coil;
- an interior conductive coating formed on the inside of a glass vessel of said cathode-ray tube;

- a conductive film electrode formed on an external wall surface of the glass vessel of a funnel portion of the cathode-ray tube, said conductive film electrode being electrically separated from an exterior graphite coating formed on an external wall surface of said cathode-ray tube, said exterior graphite coating being electrically connected to ground; and
- means connected to said conductive film electrode for generating a reverse pulse voltage V_1 having a polarity reverse to that of a voltage generated in said interior conductive coating due to an electrostatic coupling generated by a flyback pulse voltage V_0 supplied to said deflection yoke means, wherein a value of said reverse pulse voltage V_1 is set so that an equation $V_{01}-V_{11}\approx 0$ is satisfied, where V_{01} is a first alternating voltage proportional to a product $(V_0 \times C_0)$, C_0 is an electrostatic capacity between said horizontal deflection coil and said interior conductive coating, V_{11} is a second alternating voltage proportional to a product $(V_1 \times C_1)$, and C_1 is an electrostatic capacity between said conductive film electrode and said interior conductive coating means.

5,689,158
MULTI-MODE, HYBRID-TYPE CRT AND ELECTRON GUN THEREFOR WITH SELECTABLE DIFFERENT SIZED GRID APERTURES

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan

Filed Aug. 28, 1996, Ser. No. 697,626
Int. Cl.^{6} G09G ***1/04;*** **H01J** ***29/50;29/46***
U.S. Cl. 315—382.1 **22 Claims**

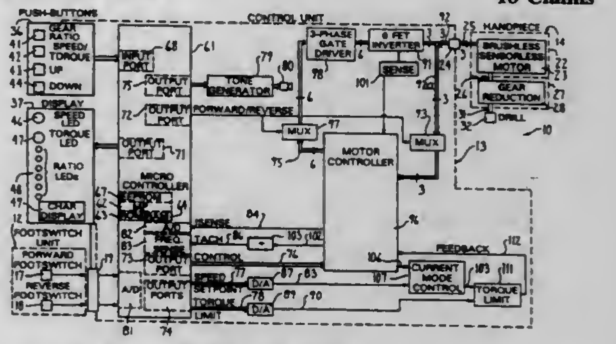


1. An electron gun for use in a multi-mode cathode ray tube (CRT) including a display screen whereon a video image is formed by sweeping an electron beam over a plurality of vertically spaced, horizontal scan lines in a raster-like manner, said electron gun comprising:
- cathode means for providing energetic electrons;
- a beam forming region (BFR) including first and second spaced, charged grids disposed adjacent said cathode means and further including:
  - first beam forming means for forming said energetic electrons into a first electron beam having a cross-section A_1 when the CRT is used as a television receiver; and
  - second beam forming means for forming said energetic electrons into a second electron beam having a cross-section A_2 when the CRT is used as a high resolution video monitor, where $A_1>A_2$;
- said BFR further including a G1 control grid and first and second G2 screen grids, wherein said first and second G2 screen grids are separate and detached from one another and respectively include a first beam passing aperture having a diameter D_1 for passing said first electron beam and a second beam passing aperture having a diameter D_2 for passing said electron beam, where $D_1>D_2$;
- switch means coupled to said first and second G2 screen grids for allowing a user to select either said first electron beam in a television receiver mode of operation or said second electron beam in a high resolution video monitor mode of operation; and
- lens means disposed intermediate said BFR and the CRT's display screen for focusing either said first electron beam or said second electron beam on the display screen.

5,689,159
SURGICAL TOOL SYSTEM WITH BRUSHLESS, SENSORLESS MOTOR

Jerry A. Culp, Oshtemo Township, and Kevin J. Schemansky, Portage, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 369,170, Jan. 5, 1995, Pat. No. 5,543,695, which is a continuation of Ser. No. 167,737, Dec. 15, 1993, abandoned. This application Mar. 27, 1996, Ser. No. 625,396
Int. Cl.^{6} H02P ***1/18***
U.S. Cl. 318—254 **18 Claims**



1. A surgical tool assembly including:
- a handpiece adapted to receive a cutting accessory, said handpiece including a brushless, sensorless DC motor, said motor having: three windings that are adapted to be selectively tied between a power source and ground so as to allow a commutation current to flow through a selected two of said windings; and a magnetized rotor shaft positioned between said windings so as to be rotated in response to commutation current flow through said windings and to cause a back electromotive signal to develop across the one selected winding through which the commutation current is not flowing, said rotor shaft being configured so that the cutting accessory is coupled thereto; and
- a control unit connected to said windings of said motor of said handpiece for supplying the commutation current thereto and to receive said back electromotive signals therefrom, said control unit including:
  - an input processor including a speed control switch, said input processor being configured to generate a varying speed-set signal representative of an operator-selected variable tool speed entered through said speed control switch;
  - a power source and a ground;
  - a switch unit for selectively tying motor windings of said motor to said power source and ground so as to apply the commutation current through said windings, said switch unit being configured to selectively connect each said motor winding to said power source or ground based on switch control signals applied thereto; and
  - a motor control assembly connected to receive said varying speed-set signal and said back electromotive signals and to generate said switch control signals, said motor control assembly being configured to generate said switch control signals for application to said switch unit based on said varying speed-set signal and the speed of said motor as indicated by said back electromotive signals, wherein said motor control assembly is configured to regulate the application of the commutation current through said windings of said motor by selectively generating said switch control signals so that said regulation of the application of the commutation current through said windings causes said rotor shaft of said motor to rotate at the tool speed represented by said varying speed-set signal.

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5,689,160
VEHICLE WINDOW LIFT CONTROL

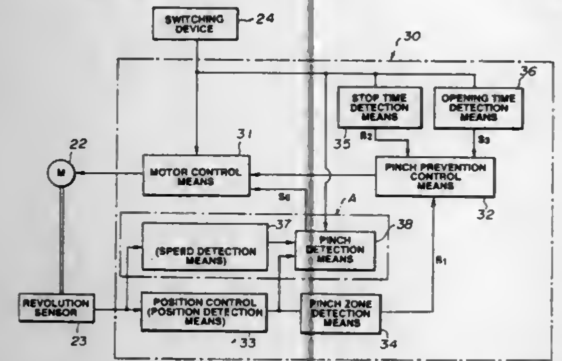
Kouichi Shigematsu, and Osamu Kawanobe, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Feb. 28, 1995, Ser. No. 395,983

Claims priority, application Japan, Feb. 28, 1994, 6-30690; Feb. 28, 1994, 6-30691

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—281 **5 Claims**


SWITCHING DEVICE
24
30
36
STOP TIME DETECTION MEANS
OPENING TIME DETECTION MEANS
35
31
22
M
MOTOR CONTROL MEANS
PINCH PREVENTION CONTROL MEANS
32
A
37
38
(SPEED DETECTION MEANS)
PINCH DETECTION MEANS
REVOLUTION SENSOR
POSITION CONTROL (POSITION DETECTION MEANS)
PINCH ZONE DETECTION MEANS
23
33
34

1. A device for controlling movement of a window, comprising:

a motor adapted to move the window in opening and closing directions in response to a control signal;

an up switch shiftable between one position and an opposite position;

a down switch;

a control device adapted to develop the control signal in response to a state of an up relay connected to the up switch and a state of a down relay connected to the down switch, said control device being operative to develop the control signal in response to determination that the window is positioned within a pinch monitoring zone; and

a timer triggered to start counting time in response to one shift of the up switch from the one position to the opposite position thereof, said timer being urged to cease counting time in response to another shift of the up switch from the opposite position to the one position thereof if the time counted does not reach a predetermined period of time although the timer ceases counting time upon expiration of the predetermined period of time,

said control device closing the down relay temporarily regardless of position of the down switch in response to the another shift of the up switch under conditions where the timer has ceased counting time prior to expiration of the predetermined period of time and the window is positioned within the pinch monitoring zone.

5,689,161
MOTION CONTROLLER WITH REMOTE LINKING

Michael A. Fugere, and David E. Halpert, both of Windsor, Vt., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

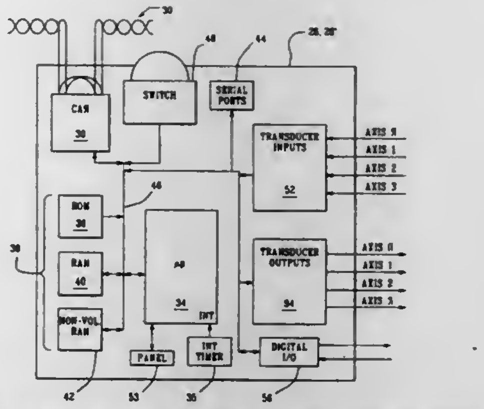
Continuation of Ser. No. 523,877, Sep. 6, 1995, which is a continuation of Ser. No. 85,998, Jun. 30, 1993, Pat. No. 5,463,296. This application Dec. 9, 1996, Ser. No. 763,450

Int. Cl.^{6} G05B *19/10*

U.S. Cl. 318—563 **5 Claims**

1. A motion controller operating in conjunction with a servo motor unit having a shaft, the motor receiving motor commands from the motion controller controlling a motion of the shaft, a shaft sensor providing a position signal indicating the position of the motor shaft, and an asynchronous link for communicating messages including axis position report messages, the motion controller comprising:

a position signal input for receiving the position signal from the shaft sensor;



a control means responsive to the received position signal for providing the motor commands controlling the motion of the motor shaft, the control means having a local clock for time stamping the axis position report messages received over the asynchronous link;

an asynchronous link transceiver for receiving and transmitting messages on the asynchronous link;

an address generator for producing a numerical address uniquely identifying the position signal input and the motion controller; and

a message generator communicating with the asynchronous link transceiver and address generator for periodically transmitting the position signal.

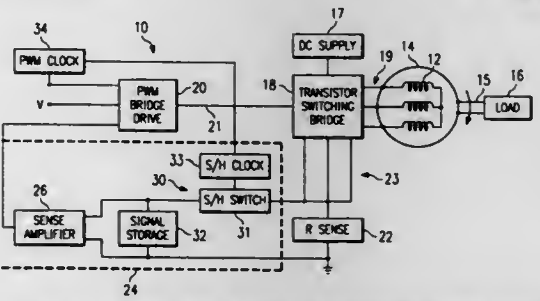
5,689,162
APPARATUS AND METHOD FOR CURRENT SENSING FOR MOTOR DRIVER IN PWM MODE

Larry B. Li, Plano, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 7, 1995, Ser. No. 477,193

Int. Cl.^{6} G05B *11/28*

U.S. Cl. 318—599 **18 Claims**



1. A circuit for providing a signal proportional to the average current flowing through coils of a motor operated in a PWM control mode, comprising:

a sense resistor across which a voltage representing drive current supplied to the coils is developed;

a sense amplifier having an input and an output;

a signal storage capacitor connected in parallel with the sense resistor and connected to the input of the sense amplifier;

a sample-hold switch connected between the sense resistor and the signal storage capacitor for (a) connecting the sense amplifier and the signal storage capacitor with the sense resistor at times t_m mid-way between times t_1 of initiation of PWM drive pulses to the coils and times t_2 of termination of PWM drive pulses to the coils, when voltage developed across the sense resistor is at a middle value representing average coil current for a PWM drive pulse, and (b) disconnecting the sense amplifier and the signal storage capacitor from the sense resistor at other times, whereby the sense amplifier is provided a signal substantially proportional to the coil current during operation in the PWM control mode.

5,689,163
MOTOR CONTROLLER

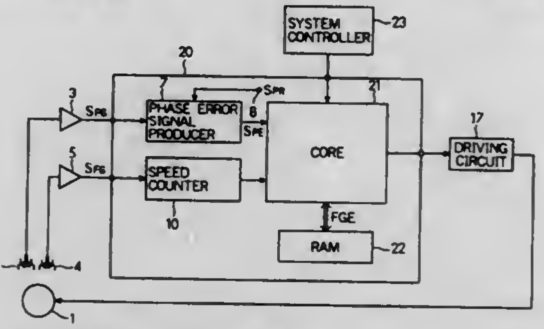
Yasuyuki Ohnishi, Kyoto, Japan, assignor to Rohm Co. Ltd., Kyoto, Japan

Filed Oct. 24, 1995, Ser. No. 547,237

Claims priority, application Japan, Oct. 25, 1994, 6-259962

Int. Cl.^{6} G05B *19/29*

U.S. Cl. 318—603 **5 Claims**



1. A motor controller comprising:

a frequency generator means for generating, in accordance with a rotation of a motor, a predetermined number of pulses every time the motor makes one rotation;

a counter means for outputting a speed value of the motor by counting reference clocks between pulses supplied from the frequency generator means;

speed error determining means for determining a speed error of the motor by subtracting the speed value from a predetermined value;

storing means for storing the speed error at a predetermined address;

filter means for filtering the speed error so that a speed error component, due to a magnetic error, is eliminated from the speed error;

a servo means for controlling the motor based on an input speed error;

control means for operating in three modes, a first mode being a mode in which, when the speed error exceeds a predetermined range, the control means deactivates the filter means and the storing means so that the speed error is directly fed to the servo means, a second mode being a mode in which, when the speed error is within the predetermined range, the control means activates both the filter means and the storing means so that the speed error is first subjected to filtering and then fed to the servo means, and a third mode being a mode in which, when the speed error is within the predetermined range and the speed value is a predetermined value, the control means deactivates the filter means and subtracts from the speed error a speed error that was previously stored in the storing means in the second mode so that a difference between the speed error and the stored speed error is fed to the servo means.

5,689,164
RESONANT POWER ELECTRONIC CONTROL OF SWITCHED RELUCTANCE MOTOR

Richard Gibson Hoft, Columbia, Mo., and Tatsuya Uematsu, Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

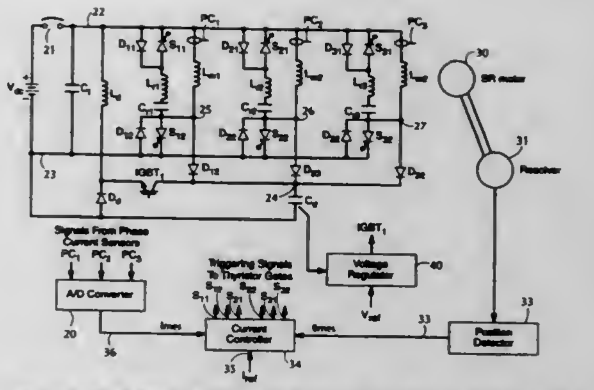
Filed Dec. 8, 1995, Ser. No. 569,460

Int. Cl.^{6} H02P *7/05*

U.S. Cl. 318—701 **6 Claims**

1. An electronic power converter for delivering power to and controlling a switched reluctance motor having a plurality of stator phase windings, said converter comprising in combination: first and second terminals for connection, respectively, to the positive and negative terminals of a source of DC power; for each of said stator phase windings:

a respective resonant network in which an inductor is connected in series with a capacitor to form a series resonant circuit which is connected in series with a first unidirectionally conductive semiconductor switch, and a first diode is connected in parallel across said first semiconductor switch poled in the inverse direction to that of the first semiconductor switch;



means for connecting said resonant network in parallel to a respective one of said motor stator windings; and

a second unidirectionally conductive semiconductor switch connected in inverse parallel to a second diode;

said first semiconductor switch having anode or drain, cathode or source, and gate electrodes, with said anode or drain being connected to a first end of said series resonant circuit, and said cathode or source being coupled to said first terminal;

said second semiconductor switch having anode or drain, cathode or source, and gate electrodes, with said second semiconductor anode or drain being connected to a second end of said series resonant circuit that is remote from said first semiconductor switch, and said second semiconductor cathode or source being coupled to said second terminal;

and means coupled to said gate electrodes for controlling the conductivity of said semiconductor switches.

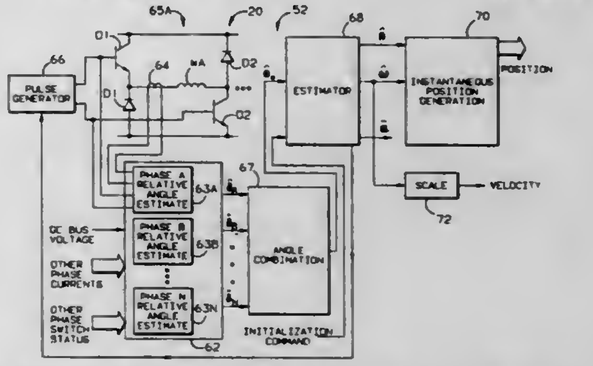
5,689,165
ESTIMATOR INITIALIZATION CIRCUIT AND METHOD FOR A SENSORLESS SWITCHED RELUCTANCE MACHINE SYSTEM

Stephen R. Jones, Winnebago, and Barry T. Drager, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 9, 1996, Ser. No. 629,698

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—701 **16 Claims**



1. Apparatus for developing an initial estimate of a condition of a machine having a plurality of phase windings each coupled to a power converter, wherein a first circuit is coupled to the phase windings for developing a plurality of phase relative angle estimates and a second circuit is coupled to the first circuit and combines the plurality of phase relative angle estimates into a single estimate, comprising:

means for pulsing the phase windings during an initialization period such that the second circuit develops a sequence of phase relative angle estimates; and

means coupled to the second circuit for deriving the initial estimate of the machine condition from the sequence of phase relative angle estimates.

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5,689,166
METHOD AND APPARATUS FOR CONTROLLING HYBRID EXCITATION TYPE PERMANENT MAGNET SYNCHRONOUS MOTOR

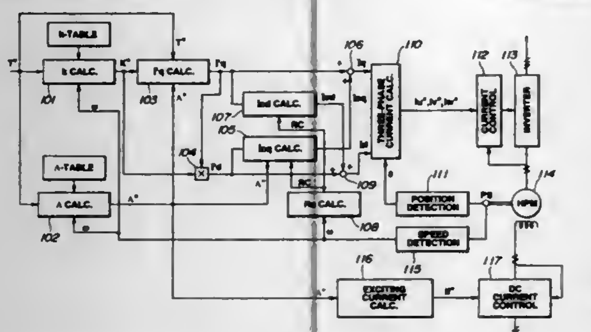
Kazutoshi Nagayama; Takayuki Mizuno, and Tadashi Ashikaga, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Continuation of Ser. No. 243,888, May 17, 1994. This application May 13, 1996, Ser. No. 647,263

Claims priority, application Japan, May 18, 1993, 5-115629; Jan. 31, 1994, 6-9469; Apr. 13, 1994, 6-75049

Int. Cl.^{6} H02P *5/00*

U.S. Cl. 318—721 **36 Claims**



1. A method of controlling a hybrid excitation type synchronous motor, the hybrid excitation type synchronous motor having a field of a permanent magnet and a dc excitation coil, magnetic flux of the field being controlled by adjusting dc electric current of the dc excitation coil, said method comprising the steps of:

selecting at least one of steps (a) and (b) to control the motor, wherein

step (a) includes the step of adjusting the dc electric current of the dc excitation coil to keep constant the magnetic flux of the field when a rotation speed of the motor is smaller than a predetermined base speed and to change the magnetic flux of the field in inverse proportion with the rotation speed of the motor when the rotation speed is larger than the predetermined base speed; and

step (b) includes the steps of adjusting the dc electric current of the dc excitation coil to vary the magnetic flux of the field and controlling electric current and voltage at an armature coil of the motor such that a current ratio of a direct-axis component and a quadrature-axis component, which components are obtained by dividing an electric current at the armature coil into the direct-axis component and the quadrature-axis component relative to the voltage induced in the armature coil, is kept constant.

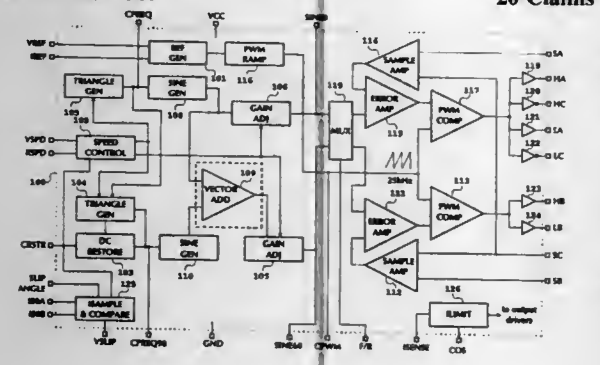
5,689,167
TWO-PHASE ELECTRONIC CONTROL OF A THREE-PHASE INDUCTION MOTOR

Mark Robert Vitunic, San Jose, Calif., assignor to Micro Linear Corporation, San Jose, Calif.

Filed Oct. 24, 1995, Ser. No. 547,592

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—767 **20 Claims**



1. A circuit for controlling power to a three-phase induction motor, the circuit comprising:

a. first means for generating a first signal having the form Vdc+A sin (2πft−0°);

b. second means for generating a second signal having the form Vdc+A sin (2πft+60°) coupled to the first means for generating;

c. means for forming a third signal by pulse-width modulating a fourth signal representative of a difference between a first difference between two motor winding voltages and the first signal;

d. means for forming a fifth signal by pulse-width modulating a sixth signal representative of a difference between a second difference between two motor winding voltages and the second signal; and

e. means for driving the motor coupled to receive the third signal and the fifth signal for generating six motor drive control signals.

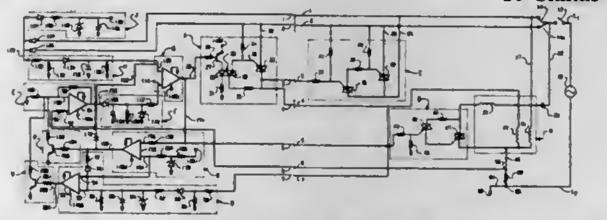
5,689,168
CONTROL CIRCUIT FOR TWO SPEED MOTORS

Robert R. Bogwicz, Rochester; John E. Durkee, Wayland, and Jason S. Anderson, Rochester, all of N.Y., assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Oct. 31, 1996, Ser. No. 741,567

Int. Cl.^{6} H02P *5/40*

U.S. Cl. 318—772 **10 Claims**



1. In a control circuit for a two speed electric motor having a start winding, a low speed run winding and a high speed run winding, a speed selector switch having high and low speed positions, a low speed electronic switch in series with said low speed run winding, a high speed electronic switch in series with said high speed run winding, and said high speed electronic switch being biased off when said low speed electronic switch is biased on.

8. A control circuit for an electric motor having high and low speed run windings, a low speed electronic switch in series with said low speed run winding, a high speed electronic switch in series with said high speed run winding, and a connection between said high and low speed electronic switches to bias said high speed electronic switch off through said low speed electronic switch when said low speed electronic switch is on.

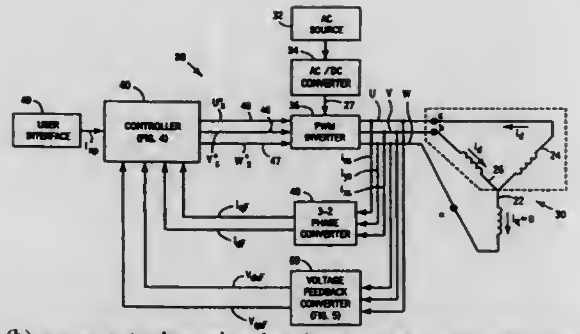
5,689,169
TRANSIENT INDUCTANCE IDENTIFIER FOR MOTOR CONTROL

Russel J. Kerkman, Milwaukee; Jerry Thunes, Greenfield; David Schlegel, Saukville, and Timothy Rowan, Wauwatosa, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Mar. 10, 1995, Ser. No. 402,288

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—807 **18 Claims**



1. A transient inductance estimator for use with a three phase motor controller in which d and q-axis stator feedback voltages are used for motor control purposes, the estimator comprising:

(a) a regulator for driving a single phase of the motor with an excitation current at an operating frequency;

(b) a sensor to determine d and q-axis stationary frame stator feedback voltages;

(c) a rotator to convert the stator feedback voltages from the stationary frame of reference to synchronous frame of reference; and

(d) a calculator to mathematically combine the operating frequency, a synchronous forward current component of the excitation current, and q-axis stator feedback voltage to produce the transient inductance estimate.

5,689,170
FAIL-SAFE CONTROL APPARATUS FOR ELECTRIC VEHICLE DRIVING MOTOR

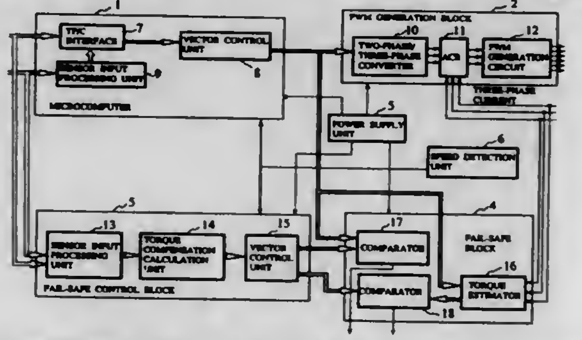
Yasuki Ishikawa, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa-ken, Japan

Filed Dec. 27, 1995, Ser. No. 579,130

Claims priority, application Japan, Dec. 27, 1994, 6-325962

Int. Cl.^{6} B06L *3/00*

U.S. Cl. 318—811 **8 Claims**



1. A fail-safe control apparatus for an electric vehicle driving motor, comprising:

first control means for

calculating and outputting an absolute value of amplitude and a phase angle of a motor primary current and a motor primary frequency in response to an accelerator signal corresponding to the position of an accelerator and a speed signal representing a speed of the vehicle driving motor; and

outputting a torque current and an exciting current which are intermediate results of the calculation;

pulse width modulation control means for

receiving and two-phase/three-phase-converting the torque current and the exciting current; and

in response to the converted three-phase torque and exciting currents and a three-phase current for driving and controlling the drive motor, outputting a PWM signal for controlling said drive motor by a pulse width;

torque estimation means for

receiving the same three-phase current as that of said three-phase current input to said pulse width modulation control means; and

three-phase/two-phase-converting the three-phase current by using the phase angle output from said first control means to calculate and output an estimation value of the torque current and an estimation value of the exciting current;

second control means for

calculating and outputting an absolute value of amplitude and a phase angle of a motor primary current and a motor primary frequency in response to an accelerator signal corresponding to the position of an accelerator and a speed signal representing a speed of the vehicle driving motor; and

outputting a torque current and an exciting current which are intermediate results of the calculation;

first comparison means for

comparing the absolute value of amplitude and the phase angle of the motor primary current and the motor primary frequency which are output from said first control means with the absolute value of amplitude and the phase angle of the motor primary current and the motor primary frequency which are output from said second control means, respectively; and

outputting a fail-safe signal when said first comparison means determines that magnitudes of differences between the outputs from said first and second control means have values not less than a predetermined value for a predetermined period of time; and

second comparison means for

comparing the estimation value of the torque current and the estimation value of the exciting current which are output from said torque estimation means with the torque current and the exciting current which are output from said second control means, respectively; and

outputting a fail-safe signal when the second comparison means determines that the magnitudes of the differences have values not less than a predetermined value for a predetermined period of time.

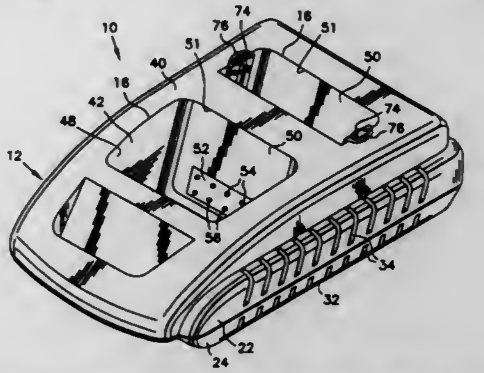
5,689,171
BATTERY CHARGER

Christopher J. Ludewig, Northfield, Minn., assignor to E.F. Johnson Company, Burnsville, Minn.

Filed Apr. 21, 1995, Ser. No. 426,229

Int. Cl.^{6} H02M *10/46*

U.S. Cl. 320—2 **11 Claims**



1. A battery charger for use with a portable battery powered device having a housing and two battery charger ports defined therein, each of said battery charger ports having a first open end at a surface of the housing and a second closed end within the housing and including at least two sets of spaced apart battery engaging electrodes disposed therein, the second closed end of a first charging port having a stepped configuration defining a plurality of steps adapted to receive and hold selected batteries having dimensional differences in electrical contact with a set of electrodes as a function of the dimensional differences thereof, the second closed end of a second charging port having a stepped configuration defining a plurality of steps adapted to receive and hold selected batteries having dimensional differences and having a selected battery powered device mated thereto in electrical contact with a set of electrodes as a function of the dimensional differences thereof.

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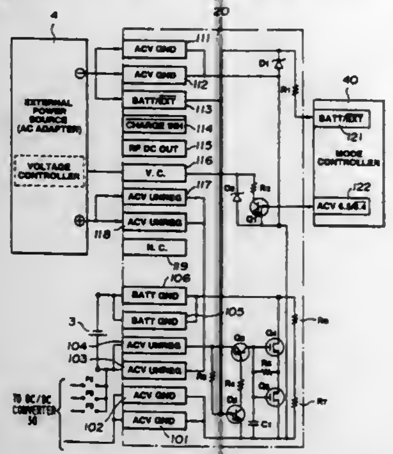
5,689,172
CHARGING BATTERY SYSTEM FOR VIDEO CAMERA

Toshio Koyama, Kanagawa, and Hiroyuki Arakawa, Tochigi, both of Japan, assignors to Sony Corporation, Japan
Continuation of Ser. No. 115,715, Sep. 3, 1993, abandoned. This application Sep. 4, 1996, Ser. No. 709,324
Claims priority, application Japan, Sep. 18, 1992, 4-250108; Mar. 31, 1993, 5-094991
Int. Cl.^{6} H02J *7/04*; H02M *10/44*
U.S. Cl. 320—15 **9 Claims**

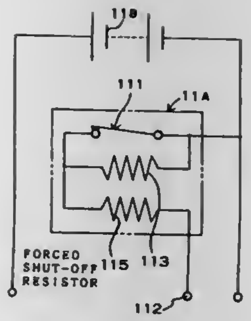


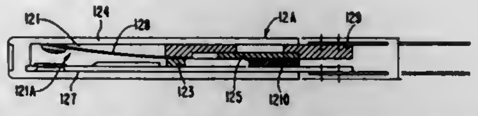
1. A power system for electronic equipment comprising:
a power source adapter; and
electronic equipment having a rechargeable battery detachably mounted thereon;
said power source adapter comprising:
first battery securing means for securing a first rechargeable battery;
charging voltage generating means for generating a charging voltage for charging said first rechargeable battery and a second rechargeable battery secured on said electronic equipment;
first charging means for charging said first rechargeable battery secured on said first battery securing means using said charging voltage;
switching means for switching between supplying said charging voltage to said first charging means and supplying said charging voltage to said electronic equipment;
detection means for detecting completion of charging of said first rechargeable battery; and
switching control means for controlling the switching of said switching means responsive to an output of said detection means;
said electronic equipment comprising:
second securing means for securing said second rechargeable battery as an internal supply for powering said electronic equipment; and
second charging means for receiving the charging voltage from said power source adapter for charging said second rechargeable battery;
wherein, when the charging voltage from said charging voltage generating means is supplied to said first rechargeable battery by the operation of said switching means, said electronic equipment is supplied with a voltage on which current limiting is performed; and
wherein said current limiting prevents charging of the battery in the electronic equipment.

5,689,173
BATTERY PACK

Kazuo Oosaki, Mihara-gun, and Takamasa Yamazoe, Sumoto, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Continuation of Ser. No. 386,054, Feb. 7, 1995, abandoned. This application Apr. 29, 1996, Ser. No. 638,856
Int. Cl.^{6} H02J *7/04;7/06*; H01M *10/50;2/10*
U.S. Cl. 320—35 **7 Claims**

1. A battery pack comprising:



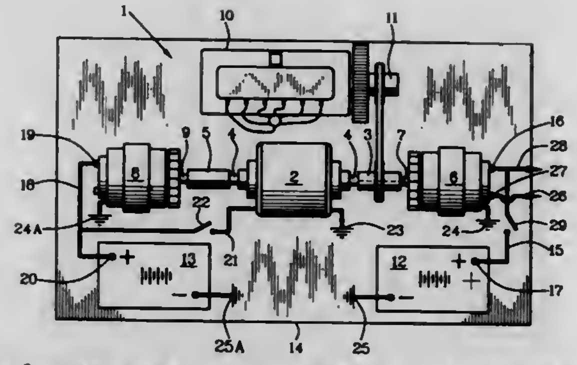


(a) at least first and second cylindrical batteries, said first and second cylindrical batteries extending side by side and contacting each other in a lengthwise direction;
(b) an outside shell that contains said first and second batteries so as to define within said outside shell a generally triangular elongate trough having walls defined by said first and second cylindrical batteries and said outside shell;
(c) a heat sensitive cut-off device electrically connected in series with said first and second cylindrical batteries that switches to an off state when a battery temperature exceeds a set temperature;
(d) an elongate inside case, contained lengthwise within said elongate trough, which contains said heat sensitive cut-off device, and which conducts heat from said first and second cylindrical batteries to said heat sensitive cut-off device contained therein; and
(e) a heating resistor, electrically connected in parallel with said heat sensitive cut-off device and contained within said inside case so as to be covered by both said inside case and said outside shell for double thermal insulation, said heating resistor being thermally connected to said heat sensitive cut-off device such that Joule heat generated by current passing through said heating resistor and bypassing said heat sensitive cut-off device when said heat sensitive cut-off device is in the off state is used to heat said heat sensitive cut-off device and hold said heat sensitive cut-off device in the off state;
(f) a forced shut-off resistor, electrically connected in series with said heat sensitive cut-off device and contained within said inside case so as to be covered by both said inside case and said outside shell for double thermal insulation, which forces said heat sensitive cut-off device to switch off by generating Joule heat due to current flow to said batteries;
wherein said elongate inside case includes first and second inclined outer walls substantially conforming to and contacting surfaces of said first and second cylindrical batteries, respectively, lengthwise within said elongate trough;
wherein said inside case is a closed structure and further includes a flat bottom wall conforming to and contacting a flat surface of said outer shell; and
wherein said inside case is made of plastic.

5,689,174
ELECTRICAL POWER SYSTEM

Angel Luis Pacheco, Sr., 1221 Pinetree Dr., Indian Harbour Beach, Fla. 32937
Continuation-in-part of Ser. No. 106,354, Aug. 13, 1993, abandoned. This application Jun. 27, 1996, Ser. No. 675,431
Int. Cl.^{6} H02J *7/00*
U.S. Cl. 322—16 **23 Claims**

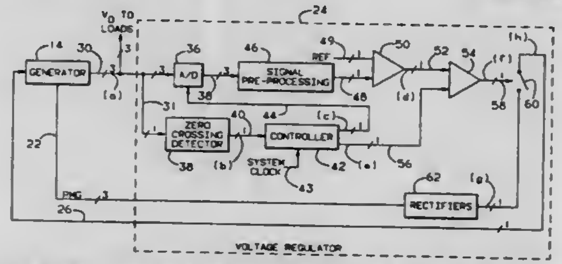
1. An electrical power plant comprising:
a rotator means having an electrical motor as a rotational-power component;



a first rotator shaft extended from a first end of a motor shaft of the electrical motor;
a first alternator having a first-alternator rotor shaft;
the first rotator shaft being connected to the first-alternator rotor shaft;
a first electrical storage battery;
a first-alternator power line in electrical communication between an output pole of the first alternator and a positive pole on the first electrical storage battery;
a second rotator shaft extended from a second end of a motor shaft of the electrical motor;
a second alternator having a second-alternator rotor shaft;
the second rotator shaft being connected to the second-alternator rotor shaft;
a second electrical storage battery;
a second-alternator power line in electrical communication between an output pole of the second alternator and a positive pole on the second electrical storage battery; and
a motor power line in electrical communication between the second-alternator power line and the electrical motor.

5,689,175
VOLTAGE REGULATOR FOR AN ELECTRICAL POWER SYSTEM

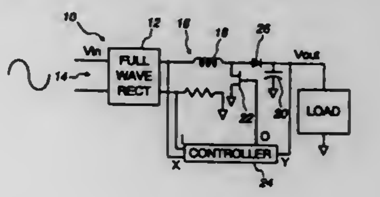
Michael J. Hanson, Loves Park; Scott R. Myers, Rockford; Frank Joseph Ludlcky, Machesney Park, and Donald G. Kilroy, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.
Filed May 31, 1996, Ser. No. 657,919
Int. Cl.^{6} H02J *7/24*
U.S. Cl. 322—28 **16 Claims**

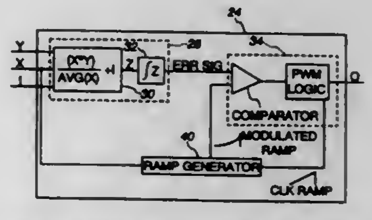


1. A voltage regulator for an electrical power system including a permanent magnet generator (PMG) having at least one armature winding for generating a PMG voltage, an exciter having an exciter field winding, and a main generator for providing a main generator output voltage, said voltage regulator comprising:
a clock signal source for providing a system clock signal;
a controller for multiplying the frequency of the main generator output voltage by a predetermined value to provide a sampling signal having the multiplied frequency and synchronized with the main generator output voltage, and for providing a first sawtooth voltage signal having a repetition rate equal to the frequency of the sampling signal and synchronized with the main generator output voltage and having an incrementing rate dependent upon the system clock signal;
a reference voltage source for providing a reference voltage;
means for sampling the main generator output voltage at the frequency of the sampling signal and providing a representation of the sampled voltage; a first comparator for providing a difference signal when the reference voltage is greater than the representation of the sampled voltage;
a second comparator for providing a switching signal when the difference signal is greater than the first sawtooth voltage signal;
means responsive to the switching signal for switching the PMG voltage; and
means for providing the switched PMG voltage to the exciter field winding.

5,689,176
POWER FACTOR/HARMONICS CORRECTION CIRCUITRY AND METHOD THEREOF

Jeff J. Deloy, 1638 Park Towne La. NE., Cedar Rapids, Iowa 52402
Filed Aug. 7, 1996, Ser. No. 693,762
Int. Cl.^{6} G05F *1/10;1/44*; H02M *1/12*
U.S. Cl. 323—222 **23 Claims**





1. A power factor/harmonic compensation circuitry for a power supply having a voltage input, said power supply includes a boost converter connected to the voltage input, the boost converter including an inductance coil and a storage capacitor, and further including a power switch connected between the inductance coil and the storage capacitor, and a control circuit connected to the power switch for providing a switch control signal for the boost converter, said control circuit including an error compensation circuit which produces an error signal, a pulse width modulator compares the error signal to a modulated ramp signal and provides the switch control signal during each switching cycle, said power factor/harmonic compensation module comprising:
a modulated ramp circuit connected to the voltage input, said modulated ramp circuit receives an input voltage and adds a constant value that is proportional to the input voltage to a ramp signal to produce the modulated ramp signal.

5,689,177
METHOD AND APPARATUS TO REGULATE A VOLTAGE CONTROLLER

Michael H. Nielsen, The Woodlands, Tex.; Alan D. Berger, and Vinton P. Coffman, both of Pittsburgh, Pa., assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Jan. 11, 1996, Ser. No. 584,195
Int. Cl.^{6} G06F *1/10*
U.S. Cl. 323—241 **20 Claims**

1. A method of controlling electrical power in a device subject to electrical breakdowns, comprising the steps of:

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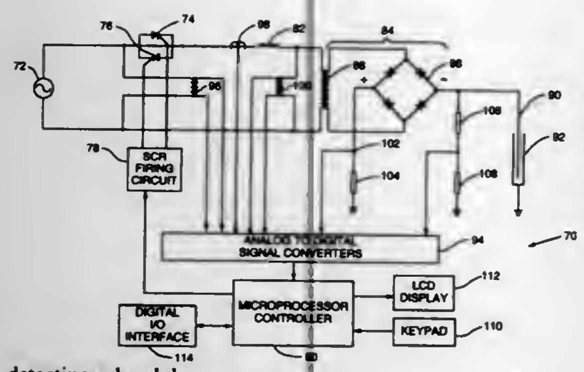


detecting a breakdown;

reducing the power after the breakdown is detected;

collecting data associated with the detected breakdown;

adding the collected data associated with the detected breakdown to a database; and

restoring the power based on the collected data and data from a plurality of previous breakdowns.

5,689,178
SELF-OSCILLATION TYPE DC-DC CONVERTER HAVING A DRIVING TRANSISTOR CONNECTED IN PARALLEL TO A CIRCUIT ELEMENT FOR STARTING A SWITCHING ELEMENT

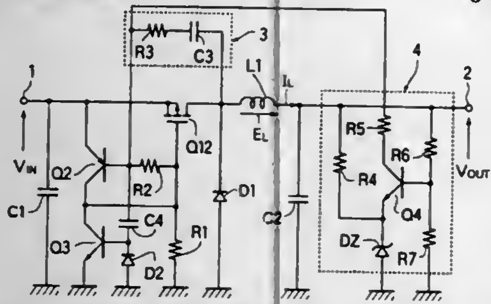
Tetsushi Otake, Tokyo, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Jul. 16, 1996, Ser. No. 680,772

Claims priority, application Japan, Jul. 25, 1995, 7-209210

Int. Cl.^{6} G05F *1/40;1/42;1/607*

U.S. Cl. 323—282 **8 Claims**



1. In a non-isolated self-oscillation type DC-DC converter for turning on and off an inputted dc voltage by means of a switching element and supplying a stabilized dc output voltage to a load through a smoothing circuit including a diode, a choke coil and a smoothing capacitor connected to a current output terminal of the switching element, the self-oscillation type DC-DC converter comprising:

wherein said switching element is a MOSFET, a control terminal of said switching element being connected to ground through a starting resistor;

a first driving transistor, a current input terminal of which is connected to a current input terminal of said switching element and a current output terminal of which is connected to a control terminal of said switching element;

a feedback circuit, the feedback circuit being connected between said current output terminal of said switching element and a control terminal of said first driving transistor; and

a second driving transistor, a main current path of which is connected in parallel to said starting resistor, and a control terminal of which being connected to said feedback circuit through a capacitor element.

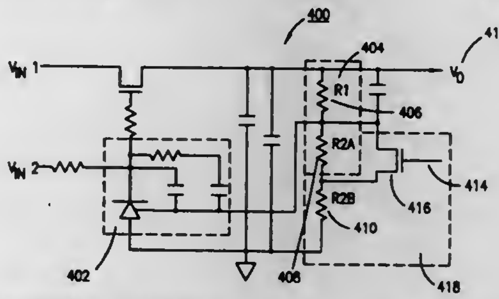
5,689,179
VARIABLE VOLTAGE REGULATOR SYSTEM

Richard E. Walker, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 590,771, Jan. 24, 1996. This application Apr. 5, 1996, Ser. No. 628,469

Int. Cl.^{6} G05F *1/44*

U.S. Cl. 323—283 **9 Claims**



1. A computer comprising:

one of a first microprocessor and a second microprocessor wherein said first microprocessor requires a different supply voltage than said second microprocessor, and

a variable voltage regulator circuit electrically connected to said one of said first microprocessor and said second microprocessor, comprising:

a voltage regulation circuit; and

a circuit for varying the output of said voltage regulation circuit, connected to said voltage regulation circuit, said circuit for varying includes a plurality of resistors, connected to said voltage regulation circuit, connected in series such that at least one of said plurality of resistors is shunted by a transistor such that a source of said transistor is connected to a first side of said one of said plurality of resistors and a drain of said transistor is connected to a second side of said one of said plurality of resistors.

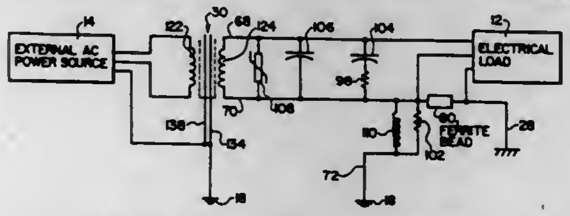
5,689,180
ISOLATED ELECTRICAL POWER SUPPLY

Curt S. Carlson, 1360 Minard, Green Oaks, Ill. 60048

Filed Dec. 13, 1995, Ser. No. 571,331

Int. Cl.^{6} H01F *40/04;* **H02H** *9/04;* **H02M** *3/22*

U.S. Cl. 323—359 **15 Claims**



1. An isolated power supply for suppressing high voltage currents from an external three-wire alternating current power source having an earth ground, the alternating isolated power supply comprising:

an isolation transformer having a primary and a secondary winding, each of said windings having respective source, neutral, and a shield leads,

said primary leads being electrically coupled to the alternating current power source;

said secondary leads being electrically coupled to the electrical load;

said secondary shield lead and said primary shield lead being electrically coupled together to the earth ground;

isolation means, electrically coupled between said secondary neutral lead and the earth ground, for maintaining a lowest impedance fault current path through the secondary neutral lead, and means for attenuating high frequency signals electronically coupled between the earth ground and said secondary neutral lead; and

means for equalizing potential difference between a load equipment ground and said secondary neutral lead.

5,689,181
BRUSHLESS MOTOR SPEED DETECTING APPARATUS FOR REDUCING GENERATION OF SPIKE VOLTAGE

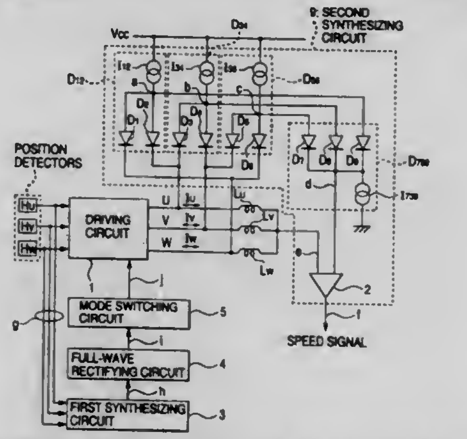
Hayato Naito, and Nobuki Kokubo, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Jan. 11, 1996, Ser. No. 584,271

Claims priority, application Japan, Jan. 13, 1995, 7-020959; Nov. 16, 1995, 7-322137

Int. Cl.^{6} H02P *6/02;* **G01P** *3/46;3/42*

U.S. Cl. 324—177 **14 Claims**



1. A brushless motor speed detecting apparatus comprising:

a stator having three-phase driving coils which are energized reciprocally in the positive and negative directions;

a rotor having magnetic poles;

three position detectors for obtaining three-phase signals corresponding to the rotation of the rotor;

a first synthesizing circuit for synthesizing output signals from the three phase signals;

mode switching means for forming an energizing mode switching signal according to the output signal of the first synthesizing circuit;

a driving circuit for supplying currents to the driving coils and during supplying currents switching an energizing mode from a first energizing mode to a second energizing mode and vice versa according to the energizing mode switching signal; and

a second synthesizing circuit for detecting induced electromotive voltages generated in the driving coils as the rotor rotates in non-energizing section of the first energizing mode and synthesizing a speed signal based on the induced electromotive voltages.

5,689,182
MAGNETIC SENSOR WITH BOBBIN, SLEEVE AND TERMINAL BED FOR DETECTING A CHANGE IN MAGNETIC FLUX

Ichiro Togo, and Yasuyoshi Hatazawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 442,176, May 16, 1995, abandoned. This application Apr. 9, 1996, Ser. No. 629,845

Claims priority, application Japan, May 17, 1994, 6-102985

Int. Cl.^{6} G01P *3/488;* **G01B** *7/30;* **H01F** *27/29*

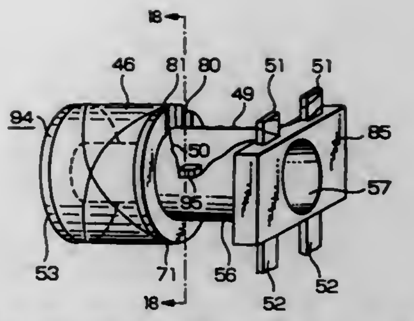
U.S. Cl. 324—207.15 **3 Claims**

1. A magnetic sensor comprising:

a sensor assembly; and

a resin molding surrounding said sensor assembly and defining a housing;

said sensor assembly comprising a magnet for generating a magnetic flux, a magnetic core for defining a magnetic circuit,



a coil for detecting the change in the magnetic flux flowing through said magnetic core and a support member for supporting an assembly of said magnet, said magnetic core and said coil;

said support member comprising a coil bobbin for receiving therein said magnetic core, a sleeve connected at its said one end to said coil bobbin and having a bore for receiving said magnet therein, a terminal bed disposed at the other end of said sleeve and a terminal connected to said terminal bed and electrically connected to said coil; and

said terminal bed having formed therein a cavity portion, laterally spaced from said bore of said sleeve, for receiving a portion of said resin molding therein, thereby increasing contact area between said resin molding and said terminal bed.

5,689,183
ELECTROMAGNETIC-INDUCTION TYPE INSPECTION DEVICE EMPLOYING TWO INDUCTION COILS CONNECTED IN OPPOSITE PHASE RELATION

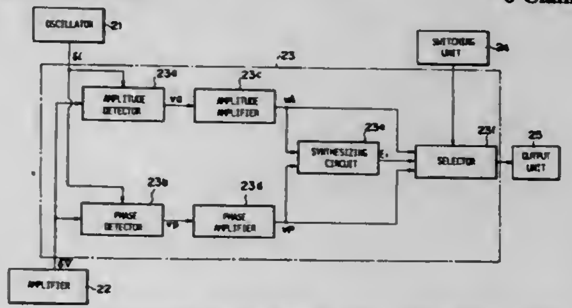
Hiroaki Kohama, Tokyo, Japan, assignor to Kaisei Engineer Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1995, Ser. No. 513,626

Claims priority, application Japan, Aug. 11, 1994, 6-189306

Int. Cl.^{6} G01N *27/90;* **G01R** *33/12*

U.S. Cl. 324—233 **6 Claims**



1. An electromagnetic-induction type inspection device comprising:

an oscillator for generating an alternating current adjusted to a specific frequency and for generating a synchronous signal which is synchronized with said alternating current,

an electromagnetic induction sensor unit having first and second exciting coils for producing respective first and second electromagnetic fields upon application thereto of said alternating current and first and second induction coils located in said respective first and second electromagnetic fields to induce therein respective first and second induction currents, wherein said induction coils are connected in an opposite phase relationship so as to cause said first and second induction currents to be subtracted from one another to obtain a corresponding differential current having phase and amplitude components, and

a signal processor, receiving said differential current and said synchronous signal, and including a phase detection means for synchronously rectifying said differential current with said synchronous signal to detect said phase component of said differential current and to produce a phase signal, an amplitude detection means for synchronously rectifying said differ-

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ential current with said synchronous signal to detect said amplitude component of said differential current and to produce an amplitude signal, synthesizing means for synthesizing said phase end amplitude signals to produce a composite signal indicative of a composite of said phase and amplitude components, and a selector means for selectively outputting one of said phase, amplitude and composite signals,

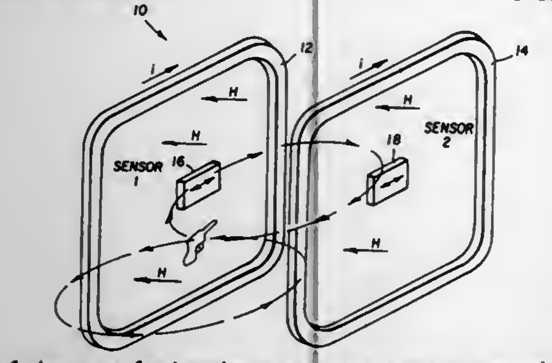
wherein said differential current varies with conditions of a specimen placed in one of said first and second electromagnetic fields, and wherein said one of said phase, amplitude and composite signals is indicative of at least one condition of the specimen.

5,689,184
LARGE SCALE METALLIC OBJECT DETECTOR
Frederick John Jeffers, Escondido, and Tomasz Marek Jagielinski, Carlsbad, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 22, 1996, Ser. No. 681,002

Int. Cl.^{6} G01N *27/72*; G08B *13/24*

U.S. Cl. 324—243 **5 Claims**



1. Apparatus for detecting a magnetizable object comprising:

first and second spaced coils for producing a magnetic field between said spaced coils;

first and second magnetic field detectors respectively located within said coils with their sensitive axes parallel to the direction of passage of a magnetizable object between said spaced coils and perpendicular to the field of said coils; and

electrical circuitry coupled to said first and second magnetic field detectors for producing a detection signal in which common mode field noise and thermally induced noise is substantially eliminated.

5,689,185
COMPACT DEVICE FOR MEASURING MAGNETIC FIELDS HAVING MAGNETORESISTORS AND AN AUXILIARY MAGNETIC FIELD GENERATOR
Franciscus P. Widdershoven, and Gerjan F.A. Van De Walle, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

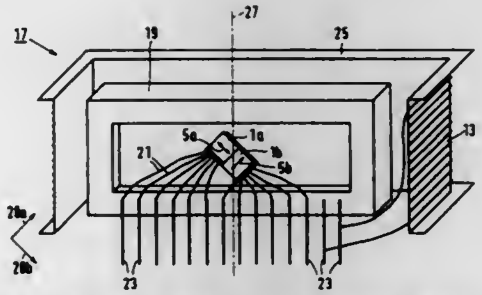
Filed Feb. 16, 1995, Ser. No. 389,361

Claims priority, application Netherlands, Feb. 28, 1994, 94200506.7

Int. Cl.^{6} G01R *33/02;33/06;33/09*

U.S. Cl. 324—252 **14 Claims**

1. A device for measuring magnetic fields, comprising: an assembly of at least two magnetic field sensors, each of which comprises a number of magnetoresistive sensor elements situated in one plane and which have the same privileged directions of magnetization, said sensor elements including means for connection to a power supply circuit and to a signal processing circuit, the privileged directions of magnetization of the sensor elements of the at least two magnetic field sensors being different, said assembly of magnetic field sensors being arranged within a magnetization coil comprising an electric conductor having a number of turns and which extends around a central axis and which is arranged to generate an auxiliary magnetic field extending parallel to the central axis, the magnetic field sensors being arranged within the magnetization coil in a manner such that the angle enclosed by the central axis relative to a normal to the plane of the sensor elements is the same for each of the magnetic field sensors and so that the auxiliary magnetic field at the area of each of the magnetic field sensors contains a component which extends parallel to the privileged direction of magnetization of the sensor elements of the relevant magnetic field sensor, wherein the direction of the auxiliary magnetic field encloses the same angle α relative to the privileged direction of magnetization of the sensor elements of each of the magnetic field sensors, where 0°<α<90°.

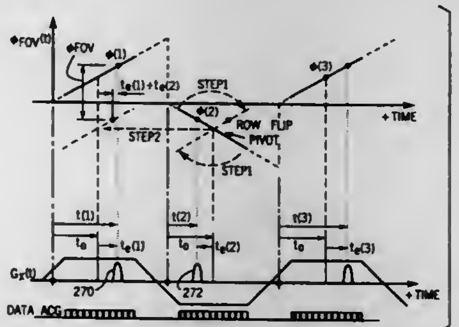


5,689,186
METHOD FOR PRODUCING AN OFF-CENTER IMAGE USING AN EPI PULSE SEQUENCE
Joseph Kenneth Maier, Milwaukee; Frederick Howard Epstein, Elm Grove; Xiaohong Zhou, Franklin; Lawrence Edward Ploetz, Brookfield, and Paul E. Licato, Wauwatosa, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 26, 1995, Ser. No. 577,000

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 324—309 **8 Claims**



1. Method for correcting phase errors produced by an NMR system during the acquisition of an NMR image data array using an echo-planar pulse sequence, the steps comprising:

a) calculating a phase shift (ϕ) for each NMR echo signal in the echo-planar pulse sequence;

b) performing the echo-planar pulse sequence by

i) producing an RF excitation pulse using an RF reference signal;

ii) producing a readout magnetic field gradient which alternates in value to produce a corresponding series of NMR echo signals;

iii) receiving each of said NMR echo signals and demodulating each with an RF reference signal that has been shifted in phase in synchronism with the alternating readout magnetic field gradient by its corresponding calculated phase shift (ϕ); and

iv) storing each demodulated NMR echo signal to form an NMR data set; and

c) reconstructing an image from the NMR data set.

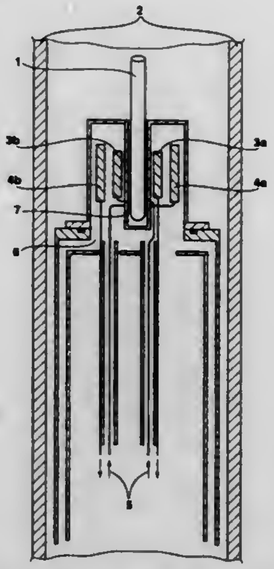
5,689,187
RF RECEIVER COIL CONFIGURATION FOR AN NMR SPECTROMETER
Daniel Marek, Möriken, Switzerland; Frank Laukien, Lincoln, Mass., and Oskar Schett, Uster, Switzerland, assignors to Spectrospin AG, Switzerland

Filed Mar. 15, 1996, Ser. No. 616,961

Claims priority, application European Pat. Off., Mar. 25, 1995, 95104449

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 324—318 **10 Claims**



1. A susceptibility compensated RF receiver system for receiving a first and a second NMR resonance signal from a sample located in homogeneous magnetic field, the system being at least partially cooled to a cryogenic temperature and comprising: a first superconducting coil for detecting the first signal and having a first coil member symmetrically arranged about the sample, said first superconducting coil having a first radial separation from the sample and a first material composition, said first material composition having a substrate and a superconducting layer introduced onto said substrate said layer having a thickness corresponding to an RF skin depth; and

a second coil for detecting the second signal and having a second coil member symmetrically arranged about the sample, said second coil member coaxial with said first coil member, said second coil having a second radial separation from the sample which is greater than said first radial separation, said second coil having a second material composition, wherein said first and second coils are disposed and each of said first and second compositions is selected to minimize an influence of a susceptibility of said first coil on the homogeneous magnetic field at the sample and to minimize an influence of a susceptibility of said second coil on the homogeneous magnet field at the sample.

5,689,188
MAGNETIC RESONANCE APPARATUS
Tatjana Claasen-Vujcic, Zoetermeer, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

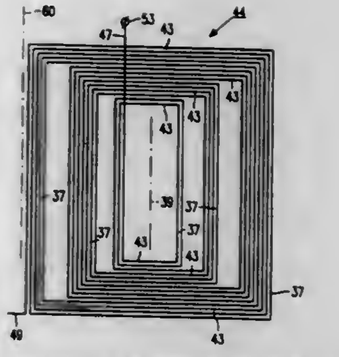
Filed Apr. 15, 1996, Ser. No. 632,236

Claims priority, application European Pat. Off., Apr. 18, 1995, 95200963

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 324—318 **20 Claims**

1. A magnetic resonance apparatus comprising a mainly cylindrical RF coil which has a central axis extending in its longitudinal direction and is formed by a series connection of one or more coil elements, each composed of a number of turns of an elongate continuous electrical conductor, said coil elements together comprising a number of axial conductor elements which extend parallel to the central axis across a mainly cylindrical surface and a plurality of loop conductor segments interconnecting corresponding ends of different pairs of the axial conductor elements and forming two end conductor elements which extend around the central axis near the ends of the axial conductor elements, the axial conductor elements being distributed across the circumference of the cylinder in such a manner that they occupy more than four different axial conductor element positions relative to a zero position and that they are arranged to generate a substantially sinusoidal current density distribution as a function of the angle of their position on the circumference of the cylinder relative to the zero position, in order to enable a RF magnetic field, oriented perpendicularly to the cylinder axis, to be generated and/or received.

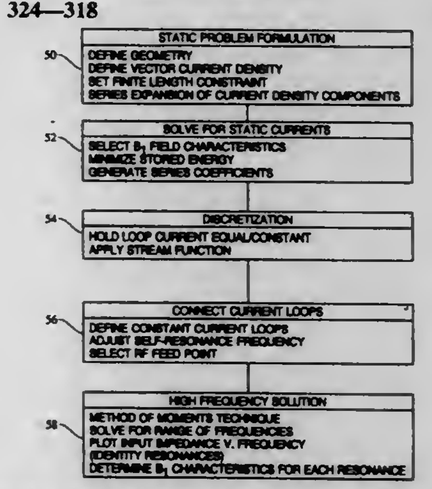


5,689,189
TECHNIQUE FOR DESIGNING DISTRIBUTED RADIO FREQUENCY COILS AND DISTRIBUTED RADIO FREQUENCY COILS DESIGNED THEREBY
Michael A. Morich, Mentor; Labros S. Petropoulos, Solon; Hiroyuki Fujita, Cleveland Heights; Shmaryu Shvartsman, Mayfield Heights, and Robert W. Brown, Solon, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Apr. 26, 1996, Ser. No. 638,203

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 324—318 **19 Claims**


STATIC PROBLEM FORMULATION
50
DEFINE GEOMETRY
DEFINE VECTOR CURRENT DENSITY
SET FINITE LENGTH CONSTRAINT
SERIES EXPANSION OF CURRENT DENSITY COMPONENTS
SOLVE FOR STATIC CURRENTS
52
SELECT B1 FIELD CHARACTERISTICS
MINIMIZE STORED ENERGY
GENERATE SERIES COEFFICIENTS
DISCRETIZATION
54
HOLD LOOP CURRENT EQUAL/CONSTANT
APPLY STREAM FUNCTION
CONNECT CURRENT LOOPS
56
DEFINE CONSTANT CURRENT LOOPS
ADJUST SELF-RESONANCE FREQUENCY
SELECT RF FEED POINT
HIGH FREQUENCY SOLUTION
58
METHOD OF MOMENTS TECHNIQUE
SOLVE FOR RANGE OF FREQUENCIES
PLOT INPUT IMPEDANCE V. FREQUENCY
(IDENTITY RESONANCES)
DETERMINE B1 CHARACTERISTICS FOR EACH RESONANCE

1. A method of magnetic resonance imaging in which a temporally constant magnetic field is generated through a cylindrical bore of a magnetic resonance imaging system, a localized coil which carries at least a radio frequency coil designed to receive magnetic resonance signals from a region contiguous thereto, a patient and the localized coil are inserted into the bore, magnetic resonance is excited within a portion of the patient contiguous to

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the localized coil and encoded with magnetic field gradients, the encoded magnetic resonance is received with the localized coil, demodulated, and reconstructed into an image representation, the method further comprising designing the radio frequency coil including:

a static problem formulation step in which static coil geometry and vector current density components are defined;

a static current solution step in which a set of current density expansion coefficients which define preselected B_1 field characteristics of the radio frequency coil are obtained, the set of current density expansion coefficients defining a continuous current density function;

a discretization step in which the continuous current density function is discretized;

a loop connection step in which current loops are defined which mimic the discretized current density function; and,

a high frequency solution step in which current carrying monopoles or V-dipoles are defined along the current loops, reactive elements are added to adjust resonance frequencies and matching characteristics, and a feed point from which received resonance signals are conveyed for demodulation and reconstruction is selected.

5,689,190

MAGNETIC RESONANCE IMAGING APPARATUS INCLUDING A MAIN MAGNET HAVING OPPOSED POLE FACES WHICH ARE INCLINED WITH RESPECT TO VERTICAL

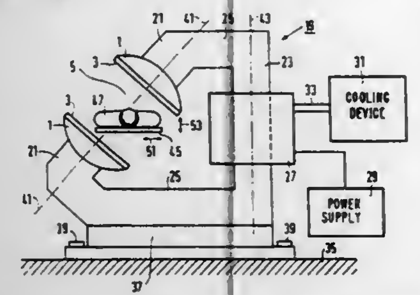
Johannes J. M. Cuppen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 670,038, Jun. 25, 1996, Pat. No. 5,666,056, which is a continuation of Ser. No. 284,967, Aug. 2, 1994, abandoned. This application Nov. 8, 1996, Ser. No. 745,762

Claims priority, application Netherlands, Feb. 8, 1993, 93202277.5

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 324—319 **4 Claims**



1. A magnetic resonance imaging apparatus including a main magnet comprising a frame connected between two magnetic elements having substantially parallel faces that face each other so as to define a gap between the magnetic elements, said magnetic elements comprising magnetic poles of opposite polarities for generating a static magnetic field in the gap, a supporting member for supporting said frame in a predetermined position relative to a substantially horizontal floor, and patient supporting means for supporting a patient so that a part of the patient that is to be examined is located in the gap, wherein the supporting member is arranged so as to support the frame in such a position that the normals to the planes of the substantially parallel faces of the magnetic elements extend in a direction that encloses an angle between 30° and 60° with the vertical direction, and wherein the patient supporting means is arranged for supporting the patient in a sitting position with only a portion of the legs of the patient located in the gap.

5,689,191

TERMINAL-IN-CONNECTOR CHECKING DEVICE

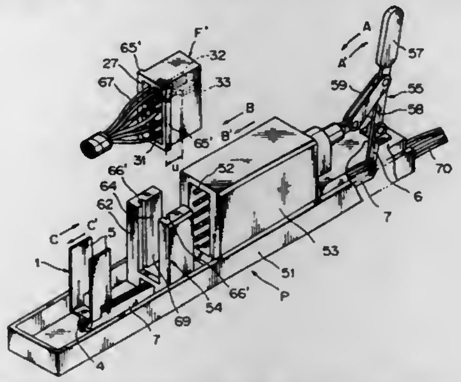
Motohisa Kashiyama, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 630,760

Claims priority, application Japan, Apr. 13, 1995, 7-088137

Int. Cl.^{6} H01H *32/04*

U.S. Cl. 324—538 **5 Claims**



1. A terminal-in-connector checking device comprising:

a mount,

a connector holder rigidly fixed on said mount, said connector holder being opened upwardly for receipt therein of a connector as well as forwardly and rearwardly,

a continuity checking member for a terminal in said connector, provided on a first side of said connector holder and movable on said mount to and from said connector holder,

a terminal pressing member provided on a second side of said connector holder opposite said first side, movable on said mount to and from said connector holder, and including a pressing portion for advancing into said connector and moving a terminal from incompletely-inserted position to fully-inserted position when said terminal pressing member is moved to said connector holder, and

an operating member on one of said first and second sides of the connector holder, with said checking member or said terminal pressing member between said connector holder and said operating member, said operating member including an operating lever coupled via links to said checking member and to said terminal pressing member and pivotally supported on said mount for moving said checking member and said terminal pressing member to and from said connector holder.

5,689,192

METHOD FOR SIMULATING A CONTROLLED VOLTAGE FOR TESTING CIRCUITS FOR ELECTROMAGNETIC SUSCEPTIBILITY

Wesley A. Rogers, Grosse Pointe Park, Mich., assignor to Electronic Development, Inc., Grosse Pointe Park, Mich.

Division of Ser. No. 388,194, Feb. 13, 1995, Pat. No. 5,552,715, which is a division of Ser. No. 44,219, Apr. 7, 1993, Pat. No. 5,414,345, which is a continuation-in-part of Ser. No. 692,719, Apr. 29, 1991, abandoned. This application Jun. 7, 1996, Ser. No. 659,221

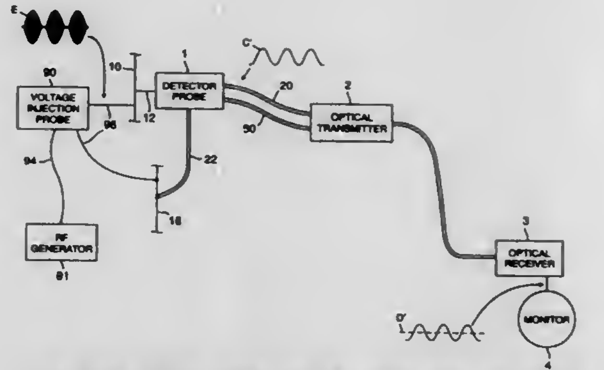
Int. Cl.^{6} G01R *27/28*

U.S. Cl. 324—627 **12 Claims**

10. A method for use in testing a circuit for electromagnetic susceptibility comprising the steps of:

(a) connecting a probe having a detector diode to a wire in the circuit under test and monitoring a first signal produced in the circuit while the circuit is in a radiation field, the radiation field having a plurality of frequencies, and thereafter

(b) monitoring the first signal while the circuit is in the radiation field at the plurality of frequencies; and



(c) injecting a second signal into the circuit while the circuit is no longer in the radiation field to simulate the effect of the radiation field on the circuit.

5,689,193

PROBE HEAD, METHOD FOR MANUFACTURING THE SAME, AND INSPECTING METHOD USING THE SAME

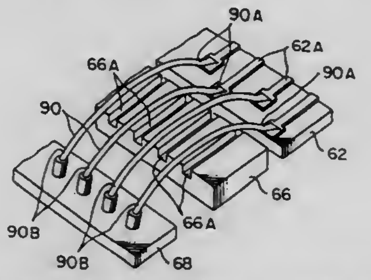
Kaoru Matsuda, Sakai, Japan, assignor to Tokyo Electron Limited, Japan

Filed Jul. 20, 1995, Ser. No. 504,558

Claims priority, application Japan, Jul. 2, 1994, 6-192117

Int. Cl.^{6} G01R *1/04;31/28*

U.S. Cl. 324—754 **14 Claims**



1. A probe head for inspecting electrical properties of an object, said probe head comprising:

an insulating substrate with a plurality of electrically conductive patterns formed thereon;

a plurality of probes, each of the probes including a proximal end electrically connected to a corresponding one of said conductive patterns of said insulating substrate and a free end for contacting an electrode pad of the object; and

a head body for accommodating the probes, the head body defining therein a plurality of concave grooves for holding the probes such that, when the probes are brought into contact with electrode pads of the object, the probes can buckle within the concave grooves so that the probes contact the electrode pads under a predetermined contact pressure.

5,689,194

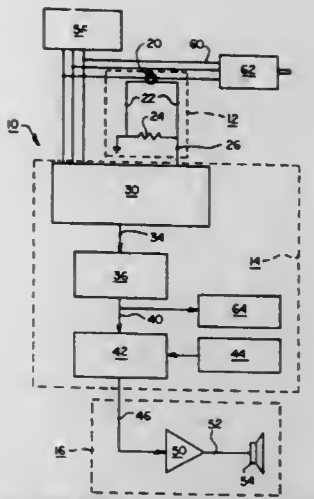
ACOUSTIC MOTOR CURRENT SIGNATURE ANALYSIS SYSTEM WITH AUDIO AMPLIFIED SPEAKER OUTPUT

Reginald D. Richards, II; Robert T. Proffitt, both of Lynchburg, and Anthony F. Lexa, Forest, all of Va., assignors to Framatome Technologies, Inc., Lynchburg, Va.

Filed Apr. 19, 1996, Ser. No. 635,360

Int. Cl.^{6} G01R *23/16*

U.S. Cl. 324—772 **25 Claims**



1. A motor current signature analysis system comprising:

(a) a motor current sensor for sensing motor current and providing a motor current noise signal, said sensor having an motor current noise signal output;

(b) a signal processor having a means for selecting a portion of said motor current noise signal and a means for converting said portion of said motor current noise signal into an audio signal within an audible frequency range, said signal processor having an input for receiving said motor current noise signal and an audio signal output; and

(c) an audio section including an amplifier and a speaker coupled to said amplifier, said amplifier having an input for receiving said audio signal, wherein said amplifier amplifies said audio signal and transfers the amplified audio signal to said speaker for playing said selected frequencies of said motor current noise signal.

5,689,195

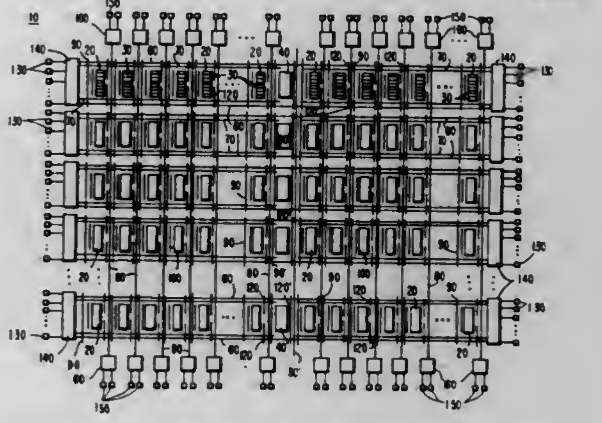
PROGRAMMABLE LOGIC ARRAY INTEGRATED CIRCUIT DEVICES

Richard G. Cliff, Milpitas; Srinivas T. Reddy, Santa Clara; Rina Raman, Fremont; L. Todd Cope, San Jose; Joseph Huang, San Jose, and Bruce B. Pedersen, San Jose, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed May 17, 1995, Ser. No. 442,795

Int. Cl.^{6} H03K *19/177*

U.S. Cl. 326—41 **19 Claims**



1. A programmable logic array integrated circuit device comprising:

a plurality of regions of programmable logic disposed on the device in a two-dimensional array of intersecting rows and columns, each of said regions having a plurality of input terminals and an output terminal and being programmable to perform any of a plurality of logic functions on signals applied to its input terminals in order to produce an output signal applied to its output terminal;

a plurality of interconnection conductors associated with each of said rows and including a first subplurality of full-length conductors which extend continuously adjacent to and along the entire length of the associated row, a second subplurality of half-length conductors which extend continuously adjacent

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to and along approximately a first half of the length of the associated row, and a third subplurality of half-length conductors which are separate from the half-length conductors in said second plurality and which extend continuously adjacent to and along approximately a second half of the length of the associated row, said first and second halves being substantially mutually exclusive;

a plurality of input connectors associated with each of said regions for programmably selectively connecting each input terminal of said region to any one of a multiplicity of said conductors associated with said region, said multiplicity including at least some of the full-length and some of the half-length conductors adjacent to said region; and

a plurality of output connectors associated with each of said regions for programmably selectively connecting the output terminal of said region to any of a further multiplicity of said conductors associated with said region, said further multiplicity including at least one of the full-length and one of the half-length conductors adjacent to said region to permit the output of any region in a particular row to be applied to an input of substantially any region in said particular row via said interconnection conductors associated with said particular row.

5,689,196
CIRCUIT COMPRISING A DATA COMMUNICATION BUS

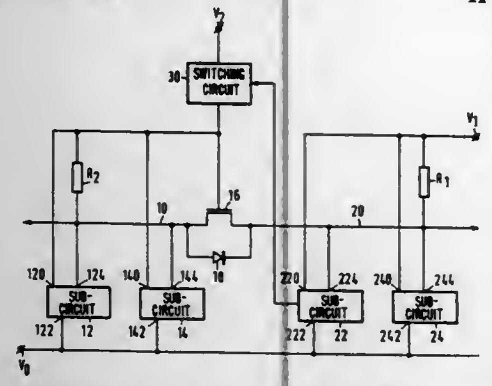
Herman Schutte, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1995, Ser. No. 565,774

Claims priority, application European Pat. Off., Dec. 2, 1994, 94203510

Int. Cl.^{6} H03K *19/175*

U.S. Cl. 326—86 **11 Claims**



1. A circuit comprising a communication bus whereto a plurality of sub-circuits are connected, each sub-circuit being arranged to transmit data by driving the bus alternatively in a dominant or recessive manner, the bus to enter a dominant state when any one of the sub-circuits drives the bus in a dominant manner and to enter a recessive state when all sub-circuits drive the bus in a recessive manner, the sub-circuits being arranged to receive data by detecting the state of the bus, said bus comprising a first and a second bus line which are interconnected via a repeater interface, in which circuit each of the first and second bus lines has at least one of the sub-circuits connected to it, the dominant and the recessive state corresponding to a dominant and a recessive level, respectively, of potentials on the first and the second bus line, the repeater interface being arranged to provide logically corresponding levels of the potentials on the first and the second bus line, characterized in that the circuit comprises means which are arranged to make the potentials on the first and the second bus line assume a respective recessive level in the absence of dominant driving and independently of one another, and that the repeater interface renders a connection between the first and the second bus line conductive when the potential on the first at least one of bus line and the second bus line is between the dominant level and a reference level of the relevant bus line, and to render the connection isolating when the potential on the first and the second bus line is between the reference level of the relevant bus line and the respective recessive level of the relevant bus line.

5,689,197
BIMOS-TYPE CURRENT SWITCH APPARATUS

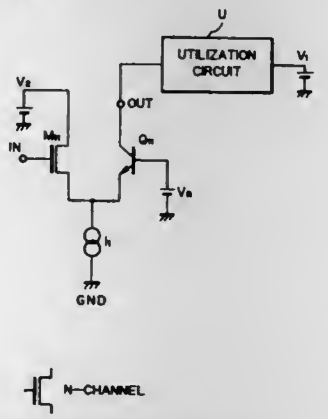
Mitsutoshi Sugawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 8, 1995, Ser. No. 569,691

Claims priority, application Japan, Dec. 8, 1994, 6-305132

Int. Cl.^{6} H03K *19/01*

U.S. Cl. 326—110 **33 Claims**



1. A current switch apparatus comprising:

a logic signal input terminal;

an output terminal;

a power supply terminal;

a reference voltage terminal;

a bipolar transistor having a collector connected to said output terminal, a base connected to said reference voltage terminal, and an emitter;

a MOS transistor, connected between said power supply voltage terminal and the emitter of said bipolar transistor and having a gate connected to said logic signal input terminal; and

a constant current source connected to the emitter of said bipolar transistor,

wherein said MOS transistor is of an N-channel type.

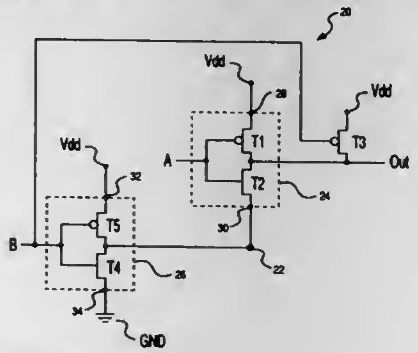
5,689,198
CIRCUITRY AND METHOD FOR GATING INFORMATION

Lawrence Joseph Merkel, and John Stephen Muhich, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1995, Ser. No. 574,085

Int. Cl.^{6} H03K *9/003*

U.S. Cl. 326—121 **5 Claims**



1. Circuitry, comprising:

first and second input nodes;

an output node;

a voltage supply node having a first logic state;

a voltage reference node having a second logic state;

a first inverter including:

a first input connected to said first input node;

a first output connected to said output node;

a first supply node connected to said voltage supply node; and

a first reference node;

a second inverter including:

a second input connected to said second input node;

a second output connected to said first reference node;

a second supply node connected to said voltage supply node; and

a second reference node connected to said voltage reference node; and

a p channel field effect transistor ("FET") transistor including:

a gate coupled to said second input node;

a source coupled to said voltage supply node; and

a drain coupled to said output node.

5,689,199
COMPARATOR WITH HYSTERESIS IN BIPOLAR TECHNOLOGY

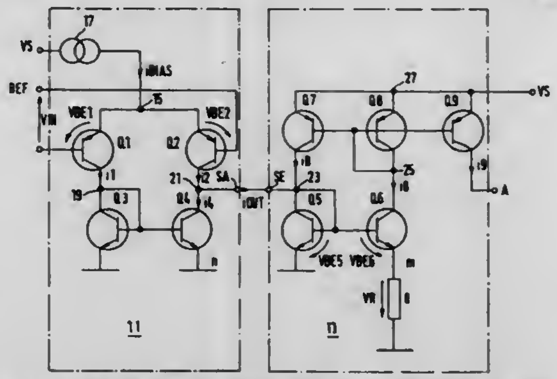
Ricardo Erckert, Bad Albling, Germany, assignor to SGS-Thomson Microelectronics GmbH, Grasbrunn, Germany

Filed Aug. 24, 1995, Ser. No. 518,765

Claims priority, application Germany, Aug. 24, 1994, 44 30 032.8

Int. Cl.^{6} H03K *5/153;3/037*

U.S. Cl. 327—76 **3 Claims**



1. A comparator with hysteresis in bipolar technology, comprising:

a voltage/current converter with a voltage input forming the comparator input connection, a reference input and a current output;

a bistable current source with a current feeding connection coupled with the current output of the voltage/current converter and a current output connection forming the comparator output; whereby the bistable current source is currentless in a first stable state and consumes current only in the second stable state;

a firing current of the current output which must be fed to the current feeding connection to switch the bistable current source from the currentless state to the power-consuming state is different from a quenching current of the current output which must be fed to the current feeding connection to switch the bistable current source from the power-consuming state to the currentless state, to obtain a hysteresis of the comparator; wherein

the bistable current source has first and second current source current mirror circuits which jointly form three circuit branches of which a first and second are connected between positive and negative poles of the supply voltage source;

the first of these circuit branches has a series connection with a first current mirror diode of the first current source current mirror circuit and a first current mirror transistor of the second current source current mirror circuit;

the second of these circuit branches has a series connection with a first current mirror transistor of the first current source current mirror circuit and a current mirror diode of the second current source current mirror circuit;

the third circuit branch has a second current mirror transistor of the second current source current mirror circuit, whose main path is connected between the positive of the supply voltage source and the comparator output;

a resistor is connected between the main path of the current mirror transistor of the first current source current mirror circuit and the negative pole of the supply voltage source located on the side of this current mirror transistor; and

a connection point between the current mirror diode of the first current source current mirror circuit and the first current mirror transistor of the second current source current mirror circuit forms the current feeding connection of the bistable current source.

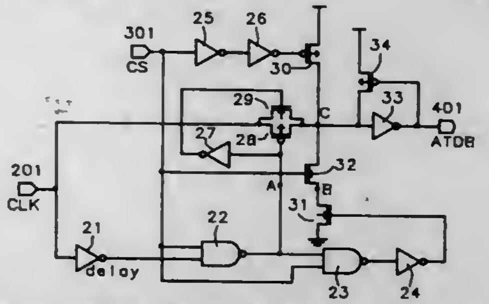
5,689,200
HIGH SPEED GLITCH-FREE TRANSITION DETECTION CIRCUIT WITH DISABLE CONTROL

Tah-Kang Joseph Ting; Jeng-Tzong Shih, and Yung-Ching Hsieh, all of Hsinchu, Taiwan, assignors to Etron Technology, Inc., Hsin-chu, Taiwan

Filed Jul. 17, 1996, Ser. No. 682,456

Int. Cl.^{6} H03K *5/153*

U.S. Cl. 327—78 **17 Claims**



1. An edge detection circuit comprising:

a logic section having a first and a second signal input and a first output of the logic section and a second output of the logic section, said logic section outputs providing signal gating;

a conditioning section coupled to said first and second signal inputs and a third input, said third input connected to said first output of said logic section, and an output, said output of said conditioning section connected to a terminal C, said conditioning section determining the voltage level at said terminal C;

an output section with an input and an output, said input of said output section connected to said terminal C, said output of said output section providing a disable control; and an N-channel transistor section having a source terminal, a drain terminal and a gate terminal, said drain terminal connected to said terminal C, said source terminal connected to said second output of the login section, and said gate terminal connected to the second signal input, said N-channel transistor section inhibiting a glitch from propagating through to said terminal C.

5,689,201
TRACK-AND-HOLD CIRCUIT UTILIZING A NEGATIVE OF THE INPUT SIGNAL FOR TRACKING

Gabor Charles Temes; Yunteng Huang, both of Corvallis, Oreg., and Paul Francis Ferguson, Jr., Dracut, Mass., assignors to Oregon State University, Corvallis, Oreg.

Filed Aug. 8, 1995, Ser. No. 512,318

Int. Cl.^{6} G11C *27/02*

U.S. Cl. 327—95 **18 Claims**

10. A track-and-hold circuit switchable between a track mode of operation wherein an output signal tracks an input signal and a hold mode of operation wherein the output signal holds its value, comprising:

an amplifier having at least one input node and at least one output node;

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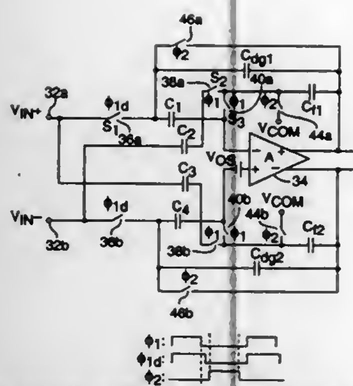


first and second signal paths for combining the input signal and its negative at an input node of the amplifier during the track mode;

a third signal path connecting the input node to an output node of the amplifier during the track mode to produce an output signal that tracks the input signal;

a storage device for storing the input signal during the track mode; and

a fourth signal path for coupling the storage device to the output node of the amplifier during the hold mode to provide the stored input signal as the output signal.

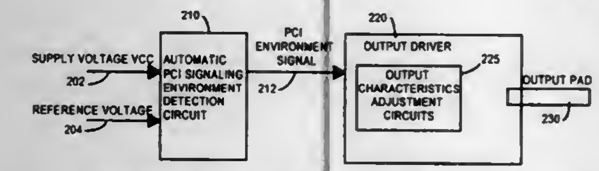
5,689,202
INTEGRATED CIRCUIT FOR AUTOMATIC DETERMINATION OF PCI SIGNALING ENVIRONMENT—EITHER 3.3V OR 5V

Cheryl A. Ranson, Ft. Collins, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Dec. 28, 1995, Ser. No. 580,402

Int. Cl.^{6} H03L *7/00*

U.S. Cl. 327—142 **11 Claims**



1. An integrated Circuit for automatically detecting a Peripheral Component Interconnect signaling environment and for matching output voltage and output current characteristics of an output pad signal of the integrated circuit with Peripheral Component Interconnect signal specifications, the signaling environment being based on either a first voltage or a second voltage, the integrated circuit comprising:

a signaling environment detection circuit connected to receive an integrated circuit supply voltage and a reference voltage, wherein the reference voltage represents a nominal value between the first voltage and the second voltage, to compare the integrated circuit supply voltage with the reference voltage and to produce a detected environment signal representative of the signaling environment; and

an output driver circuit connected to receive the detected environment signal for producing a pullup signal on an output pad when the output driver circuit is enabled to drive the output pad to a logical high state, and for producing a pulldown signal on the output pad when the output driver circuit is enabled to drive the output pad to a logical low state;

wherein the output driver circuit comprises an output characteristics adjustment circuit for adjusting the output voltage and output current of the output pad signal to match the Peripheral Component Interconnect signal specifications based on the detected environment signal,

the output characteristics adjustment circuit comprising an extra-pullup circuit and an extra-pulldown circuit, wherein the extra-pullup circuit is connected to be enabled by the pullup signal and is connected to receive the detected environment signal to source additional current to the output pad to match the Peripheral Component Interconnect signal specifications when the detected environment signal indicates that the signaling environment is based on the first voltage, and wherein the extra-pulldown circuit is connected to be enabled by the pulldown signal and is connected to receive the detected environment signal to sink additional current from the output pad to match the Peripheral Component Interconnect signal specifications when the detected environment signal indicates that the signaling environment is based on the second voltage.

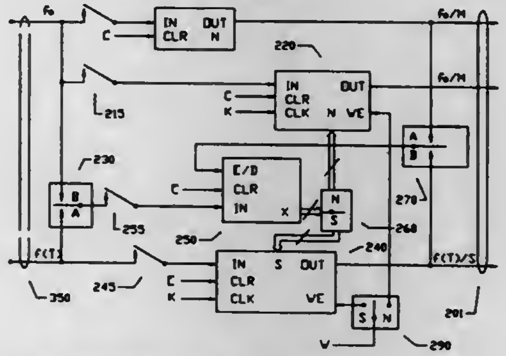
5,689,203
SELF-CALIBRATION CIRCUIT FOR PULSE-TRAIN TRANDUCER SIGNALS

Jon Geist, 4008 Fulford St., Olney, Md. 20832

Filed Nov. 20, 1995, Ser. No. 560,980

Int. Cl.^{6} H01J *15/04*

U.S. Cl. 327—187 **12 Claims**



1. A self-calibration circuit, comprising

(a) a first frequency-divider circuit comprising a pulse-train input port and a reduced-frequency output port,

(b) a count-until-disabled counter comprising a pulse-train input port, a enable-disable input port, and an accumulated-count output-bus port,

(c) a second frequency-divider circuit comprising a pulse-train input port, a set-divisor input-bus port, a write-divisor-clock input port, and a reduced-frequency output port,

(d) a line means connecting said reduced-frequency output port of said first frequency-divider circuit to said enable-disable input port of said count-until-disabled circuit,

(e) a bus means for connecting said accumulated-count output-bus port of said count-until-disabled circuit to said set-divisor input-bus port of said second frequency-divider circuit,

wherein a count accumulated by said count-until-disabled counter during a period of time defined by the signal on said reduced-frequency output port of said first frequency-divider counter is read from said set-divisor input-bus port and stored by said second frequency-divider circuit when triggered by a pulse on said write-divisor-clock input.

5,689,204
CLIPPER CIRCUIT FOR CLIPPING AN UPPER OR LOWER PORTION OF A UNI-DIRECTIONAL SINUSOIDAL VOLTAGE SIGNAL

Ui Ho Song, Seoul, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Kyungki-do, Rep. of Korea

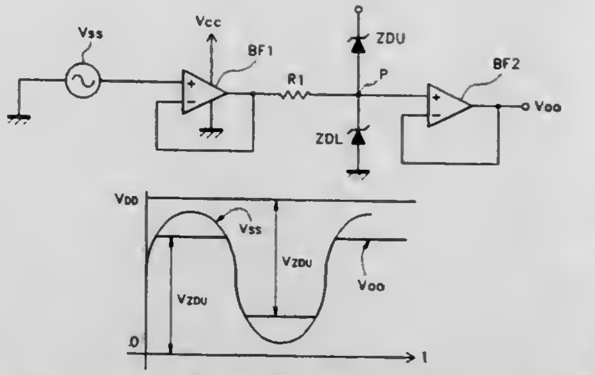
Filed Dec. 28, 1995, Ser. No. 580,415

Claims priority, application Rep. of Korea, Dec. 30, 1994, U94-38307

Int. Cl.^{6} H03K *5/08*

U.S. Cl. 326—325 **6 Claims**

1. A clipper circuit comprising:



a uni-directional buffer amplifier biased to either a (+) or (−) voltage for taking a sinusoidal voltage signal with only a (+) or a (−) band value as an input voltage signal;

a first Zener diode whose anode is connected to an output port of said uni-directional buffer amplifier and whose cathode is connected to a predetermined voltage source for clipping a lower portion of the input voltage signal as a predetermined setting value; and

a second Zener diode whose cathode is connected to the output port of the uni-directional buffer amplifier and whose anode is grounded for clipping a upper portion of the input voltage signal as a predetermined setting value.

5,689,205
SWITCHED CURRENT DIFFERENTIATOR

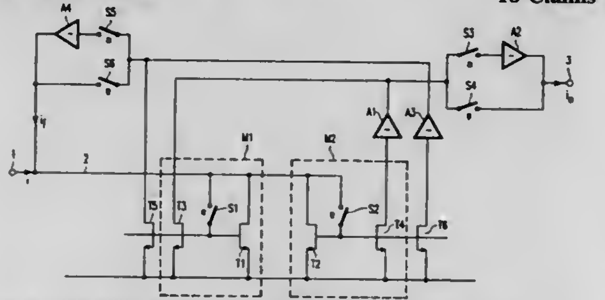
John B. Hughes, Hove, and Kenneth W. Moulding, Horley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1996, Ser. No. 586,445

Claims priority, application United Kingdom, Jan. 13, 1995, 9500648

Int. Cl.^{6} G06G *7/18*

U.S. Cl. 327—335 **18 Claims**



1. A switched current bilinear differentiator comprising:

a first current memory cell having an input for receiving a current signal, and an output, said first current memory cell being arranged to sample the current at its input during a first period of a clock signal;

a second current memory cell interconnected with said first current memory and having an input for receiving said current signal, and an output, said second current memory cell being arranged to sample the current at its input during a second period of said clock signal;

means for feeding an input current to be differentiated to said inputs of said current memory cells as the current signal;

summing means having inputs connected to said outputs of said current memory cells for summing a first current related to the sampled current in said first current memory cell and a second current being an inverted version of the current related to the sampled current in said second current memory cell, said summing means having an output for providing a summed current signal;

connection means for connecting the summed current signal to an output of the differentiator during the first period of the clock signal; and

inversion means for feeding an inverted version of the summed current signal to the differentiator output during a second period of the clock signal, wherein the current at said output is the differentiated current.

5,689,206
SC-INTEGRATOR WITH SWITCHABLE POLARITY

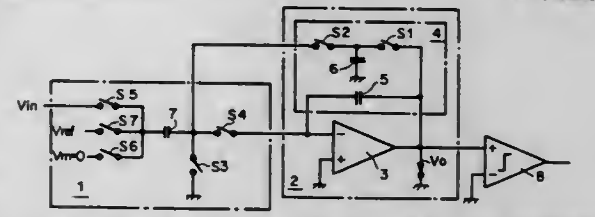
Michel Schaller, Baar, Switzerland, assignor to Landis & Gyr Technology Innovation AG, Zug, Switzerland

Filed Apr. 29, 1996, Ser. No. 639,687

Claims priority, application Switzerland, Jun. 7, 1995, 1662/95

Int. Cl.^{6} G06G *7/64*

U.S. Cl. 327—337 **6 Claims**



1. An SC-integrator with reversible polarity, said integrator comprising at least a first switch arrangement and an integration arrangement;

wherein said integration arrangement comprises an amplifier having an inverting input and a non-inverting output Vo, and at least a first circuit network to which said amplifier is connected, said first circuit network comprising an integration capacitor C_i, a storage capacitor C_s having first and second terminals, and first and second switches, said non-inverting output Vo of said amplifier being connected via said integration capacitor C_i to said inverting input of said amplifier, said first terminal of said storage capacitor C_s being connected to ground and said second terminal of said storage capacitor C_s being connected on the one hand to said non-inverting output Vo of said amplifier via said first switch, and on the other hand to said first switch arrangement via said second switch;

wherein said first switch arrangement comprises a circuit capacitor C_f having first and second terminals, and third, fourth, fifth, sixth and seventh switches, said first terminal of said circuit capacitor C_f being connected to ground via said third switch and connected via said fourth switch to said inverting input of said amplifier, said second terminal of said circuit capacitor C_f being connected via said fifth switch to an input voltage Vin and via said sixth switch to a further voltage potential Vm, and said first switch arrangement being connected via said seventh switch to a reference voltage Vref; and

wherein said second terminal of said storage capacitor C_s is connected directly to said first terminal of said circuit capacitor C_f via said second switch, such that the polarity of the voltage across said integration capacitor C_i is reversed by the action of said storage capacitor C_s connected in parallel with said circuit capacitor C_f.

5,689,207
FRONT-END CIRCUIT

Tadayoshi Nakatsuka, Toyonaka, and Jyunji Itoh, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 12, 1996, Ser. No. 631,791

Claims priority, application Japan, Apr. 12, 1995, 7-086842

Int. Cl.^{6} G06G *7/12*

U.S. Cl. 327—355 **16 Claims**

1. A front-end circuit which receives a first input signal and a second input signal, and outputs an output signal having a differential frequency between the first input signal and the second input signal comprising:

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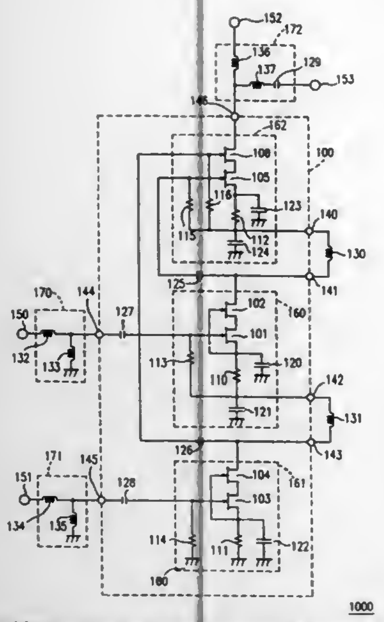


a first amplifier having an input terminal, a power supply terminal and a virtual ground; a second amplifier having an input terminal, a power supply terminal and a ground; and a mixer having a first and a second input terminals, a power supply terminal and a virtual ground, wherein

the virtual ground of the mixer is dc-coupled to the power supply terminal of the first amplifier; the virtual ground of the first amplifier is dc-coupled to the power supply terminal of the second amplifier; the power supply terminal of the first amplifier and the second amplifier are ac-coupled to the first and the second input terminals, respectively, and wherein

the input terminal of the first amplifier and the input terminal of the second amplifier receive the first and the second input signals, respectively; and a power supply voltage is supplied to the power supply terminal of the mixer and the ground.

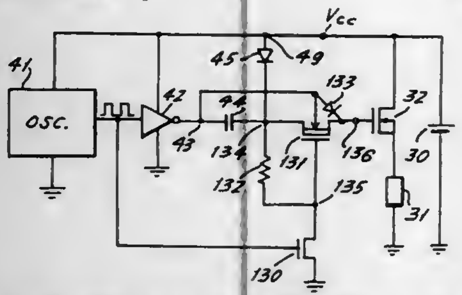
5,689,208
CHARGE PUMP CIRCUIT FOR HIGH SIDE SWITCH

Bruno C. Nadd, Puyvert, France, assignor to International Rectifier Corporation, El Segundo, Calif.

Division of Ser. No. 420,301, Apr. 11, 1995. This application Jun. 12, 1996, Ser. No. 662,821

Int. Cl.⁶ H03K *17/60*

U.S. Cl. 327—390 **11 Claims**



1. A charge pump circuit for a gate controlled MOS power semiconductor device; said gate controlled MOS power semiconductor device having a V_{CC} input voltage terminal, a ground terminal and a control terminal; said charge pump circuit comprising, in combination: a square wave oscillator having an output terminal; an inverter buffer connected to said oscillator output terminal; a charge storage capacitor coupled to the output of said inverter buffer; a first coupling circuit for coupling said capacitor to said control terminal of said gate controlled MOS power semiconductor device; a second coupling circuit for coupling said V_{CC} input voltage terminal to the node between said capacitor and said first coupling circuit whereby, when the output of said inverter buffer is low, said capacitor is charged from the voltage at said V_{CC} terminal and through said second coupling circuit and, when said output of said inverter buffer is high, the voltage of said capacitor plus the voltage of said V_{CC} terminal are applied in series through said first coupling circuit to said control terminal of said gate controlled MOS power semiconductor device; and wherein said first coupling circuit comprises a depletion mode MOSFET having source and drain terminals connected to said capacitor and said control terminal of said gate controlled MOS power semiconductor device respectively and having its substrate connected to the output of said inverter buffer, a resistive circuit connected from said capacitor to the gate of said depletion mode MOSFET, and a first control MOSFET connected between said gate of said depletion mode MOSFET and said ground terminal and having a gate connected to said oscillator output terminal.

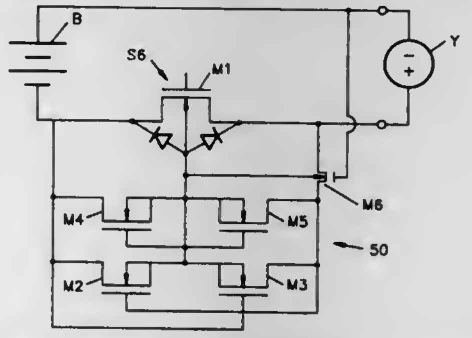
5,689,209
LOW-SIDE BIDIRECTIONAL BATTERY DISCONNECT SWITCH

Richard K. Williams, and Robert G. Blattner, both of Cupertino, Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Dec. 30, 1994, Ser. No. 367,515

Int. Cl.⁶ H03K *17/56*

U.S. Cl. 327—425 **17 Claims**



1. A battery disconnect switch comprising:

a first MOSFET comprising a first terminal, a second terminal, a body and a gate;

a second MOSFET connected between said first terminal and said body and having a gate connected to said second terminal;

a third MOSFET connected between said body and said second terminal and having a gate connected to said first terminal; and

a fourth MOSFET connected between said first terminal and said body, a gate of said fourth MOSFET being connected to said body.

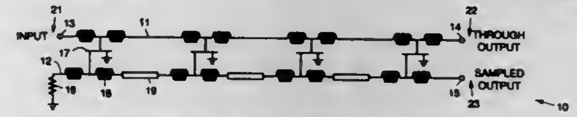
5,689,210
ACTIVE DISTRIBUTED SIGNAL SAMPLER

Julius Lange, 10952 Sweet Oak St., Cupertino, Calif. 95014

Filed Sep. 20, 1995, Ser. No. 531,078

Int. Cl.⁶ H03F *3/60*

U.S. Cl. 330—54 **6 Claims**



1. An active distributed signal sampler comprising:

a first transmission line;

a second transmission line;

an input port coupled to a first end of the first transmission line;

a through signal output port coupled to a second end of the first transmission line;

a termination coupled to a first end of the second transmission line;

a sampled signal output port coupled to the second end of the second transmission line;

a plurality of high impedance amplifiers bridging between the first and second transmission lines; and

a plurality of inductors respectively disposed along the first and second transmission lines between each of the high impedance amplifiers.

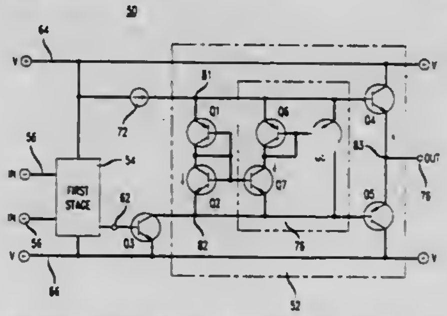
5,689,211
QUIESCENT CURRENT CONTROL FOR THE OUTPUT STAGE OF AN AMPLIFIER

Milton Luther Embree, Muhlenberg Township, Berks County, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 14, 1996, Ser. No. 601,414

Int. Cl.⁶ H03F *3/26*

U.S. Cl. 330—266 **14 Claims**



1. An integrated circuit having an amplifier with an output stage, said output stage for use with a constant current source, said output stage comprising:

an output side having at least one drive transistor; and

a quiescent current control side through which substantially all of the current from said constant current source flows, said quiescent current control side operably connected to said output side in such a way that causes a quiescent current flowing through said output side to be maintained at a value that is substantially proportional to the current that flows through said quiescent current control side,

said quiescent current control side having

- a quiescent current control section including at least one control transistor, said quiescent current control section connected to said output side in such a way as to maintain quiescent current within said output stage at said value notwithstanding changes in temperature, and
- a current diverter operably connected to said quiescent current control section that alters current flow through said quiescent current control section in such a way that allows said quiescent current control side to be fabricated with transistors having characteristic sizes that are substantially smaller than the characteristic size of said at least one output side drive transistor, said current diverter including
  - a first current diverter branch having a first amplifying transistor, said first branch operably coupled to said control transistor in such a way that causes at least a portion of the current flowing from said constant current source to flow through said first branch in such a way that the amount of current flowing through said first branch as compared to that flowing through said control transistor is related to the characteristic size of said first amplifying transistor as compared to the characteristic size of said control transistor, and
  - a second current diverter branch having a second amplifying transistor, said second branch operably coupled to said first branch in such a way that causes at least a portion of the current flowing from said constant current source to flow through said second branch in such a way that the amount of current flowing through said second branch is related to the characteristic size of said second amplifying transistor.

5,689,212
LARGE-SCALE INTEGRATION MONOLITHIC MICROWAVE AMPLIFIER WITH TREE-LIKE DISTRIBUTED TOPOLOGY

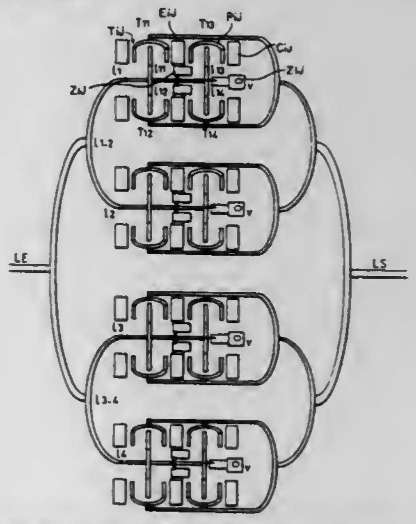
Didier Floriot, Chatenay Malabry; Sylvain Delage, Bures S/Yvette; Pascal Roux, Vauhallan, and Juan Obregon, St Priest Taurion, all of France, assignors to Thomson-CSF, Paris, France

Filed Nov. 22, 1995, Ser. No. 562,153

Claims priority, application France, Nov. 25, 1994, 94 14148

Int. Cl.⁶ H03F *3/60;3/68;3/195*

U.S. Cl. 330—286 **4 Claims**



1. A power semiconductor component comprising:

at least one input line extending in a longitudinal direction and having first and second sides;

a first plurality of at least four elementary transistors having inputs coupled to the first side of the at least one input line at specific locations along the longitudinal direction of the at least one input line, said first plurality of at least four elementary transistors forming at least two adjacent power transistors each including an adjacent two of the at least four elementary transistors having output collectors connected together to form an output for each of the at least two adjacent power transistors;

a second plurality of at least four elementary transistors having inputs connected to the second side of the at least one input line at said specific locations, said second plurality of at least four elementary transistors forming at least two further adjacent power transistors each including an adjacent two of the at least four additional elementary transistors having output collectors connected together to form an output for each of the at least two further adjacent power transistors;

the first and second pluralities of at least four elementary transistors each further including at least two adjacent elementary transistors not cooperating to form a power transistor but sharing an emitter electrode;

a first set of a pair of compensating impedance matching networks placed in a free space on each side of the at least one input line between the shared emitter electrode and each side of the at least one input line; and

at least one further compensating impedance matching circuit placed in a free space formed between an emitter electrode of each of the last of the four elementary transistors of the first and second pluralities of elementary transistors and a termination of the at least one input line.

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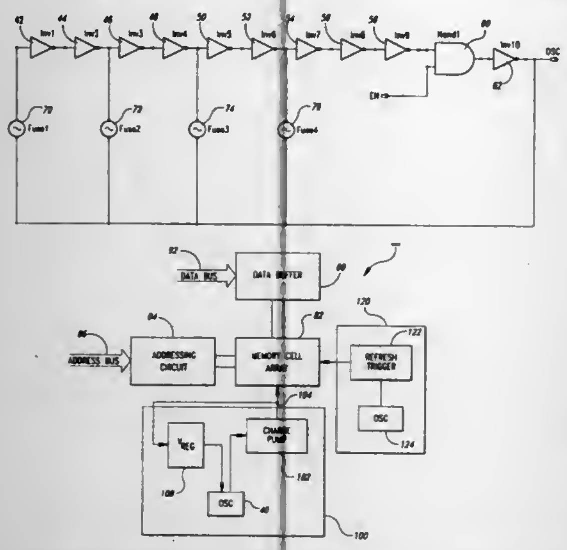
5,689,213
POST-FABRICATION PROGRAMMABLE INTEGRATED CIRCUIT RING OSCILLATOR

Joseph C. Sher, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Aug. 23, 1995, Ser. No. 518,544
Int. Cl.^{6} G11C *7/00;* H03K *5/13*
U.S. Cl. 331—57 **37 Claims**



1. A programmable ring oscillator fabricated on a substrate of a DRAM integrated circuit for use in a charge pump or refresh circuit, comprising:

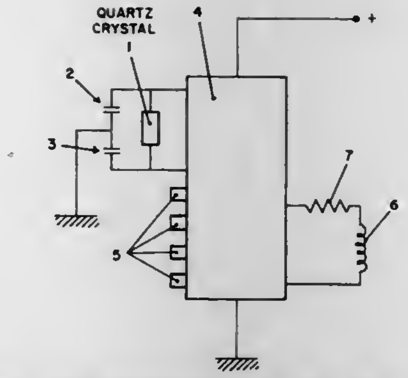
2N−1 inverting circuits fabricated on said integrated circuit substrate, N being an integer equal to or greater than 2, said inverting circuits being connected in series with each other; and

a plurality of programmable connections fabricated on said integrated circuit substrate, said programmable connections extending from an output of one of said inverting circuits to an input of a respective other of said inverting circuits located an odd number of inverting circuits away from the output of said one inverting circuit, said programmable connections being programmable after fabrication of said integrated circuit to short circuit a selected programmable connection and open circuit all but said selected programmable connection thereby placing 2M−1 of said inverting circuits in a loop after fabrication of said integrated circuit, M being an integer between 1 and N, whereby the oscillation frequency may be programmed after fabrication of the integrated circuit.

5,689,214
ELECTROMAGNETIC WAVE GENERATOR FOR INFLUENCING BIOMAGNETIC FIELDS

Juan Oses Navaz, Pamplona, Spain, assignor to Psycho Chrono, S.L., Pamplona, Spain

Filed Nov. 16, 1995, Ser. No. 559,028
Claims priority, application Spain, Jun. 8, 1995, 9501554 U
Int. Cl.^{6} H03B *5/36;* H04B *1/034*
U.S. Cl. 331—158 **3 Claims**



1. Perfected wave generator, comprising:

a microcontroller means for generating selected frequencies,

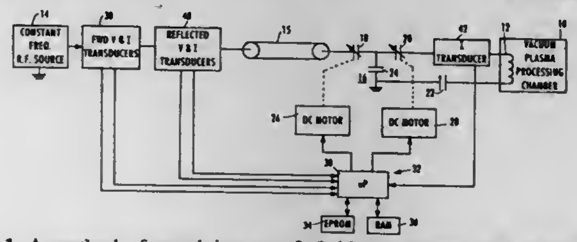
an oscillator circuit, coupled to said microcontroller means, including a quartz crystal and two capacitors,

a transmitting antenna means formed by a coil, which is coupled to an output of said microcontroller by means of a current-limiting resistor, said transmitting antenna means for transmitting an electromagnetic field to an animal.

5,689,215
METHOD OF AND APPARATUS FOR CONTROLLING REACTIVE IMPEDANCES OF A MATCHING NETWORK CONNECTED BETWEEN AN RF SOURCE AND AN RF PLASMA PROCESSOR

Brett Richardson, San Ramon; Tuan Ngo, Milpitas, and Michael S. Barnes, San Francisco, all of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed May 23, 1996, Ser. No. 652,037
Int. Cl.^{6} H03H *7/40*
U.S. Cl. 333—17.3 **35 Claims**

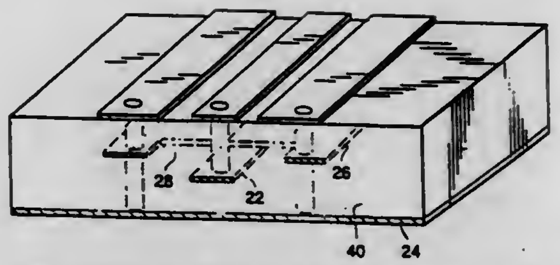

CONSTANT FREQ. R.F. SOURCE
FWD V & I TRANSDUCERS
REFLECTED V & I TRANSDUCERS
TRANSDUCER
VACUUM PLASMA PROCESSING CHAMBER
DC MOTOR
DC MOTOR
µP
SPROM
RAM

1. A method of supplying an r.f. field to a plasma in a vacuum plasma chamber processing a workpiece, the r.f. field being supplied to the plasma by a reactive impedance element connected via a matching network to an r.f. source, the r.f. field having a frequency and power level sufficient to ignite the gas into the plasma and to maintain the plasma, the matching network including first and second variable reactances that control loading of the source and tuning a load including the reactive impedance element and the plasma to the source, the method comprising (1) determining the amount the first variable reactance is to change for each unit change of the second variable reactance to attain the best match between the impedances seen looking into and out of output terminals of the r.f. source by changing the values of the first and second variable reactances, and (2) then varying the values of the first and second variable reactances based on the determination made in step (1) until the best impedance match between the impedances seen looking into and out of output terminals of the r.f. source is attained.

5,689,216
DIRECT THREE-WIRE TO STRIPLINE CONNECTION

Rick L. Sturdivant, Placentia, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Apr. 1, 1996, Ser. No. 625,956
Int. Cl.^{6} H01P *5/08*
U.S. Cl. 333—33 **12 Claims**



1. A microwave circuit comprising:

a dielectric substrate;

a stripline transmission line buried in said dielectric substrate below a surface of the substrate, said stripline transmission line comprising a stripline conductor strip, an electrically conductive lower ground plane, and an electrically conductive upper ground plane buried in said substrate between said stripline conductor strip and said substrate surface;

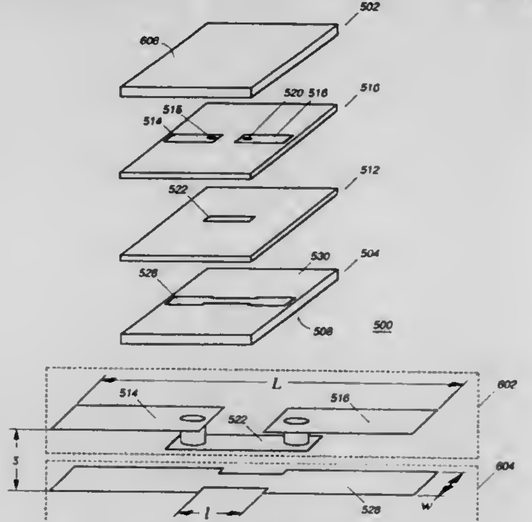
a three-wire transmission line connected to and extending transversely to said stripline transmission line and extending through said substrate between said stripline transmission line and said substrate surface, said three-wire line consisting of a first conductor wire connected to said stripline conductor strip, a second conductor wire connected to said upper and lower stripline ground planes and a third conductor wire connected to said upper and lower stripline ground planes; and

wherein said upper ground plane has an open area formed therein to allow said first wire to extend through a plane defined by the upper ground plane without contacting the upper ground plane.

5,689,217
DIRECTIONAL COUPLER AND METHOD OF FORMING SAME

Wang-Chang Albert Gu, Coral Springs, and Feng Niu, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1996, Ser. No. 616,138
Int. Cl.^{6} H01P *5/18*
U.S. Cl. 333—116 **21 Claims**



1. A directional coupler, comprising:

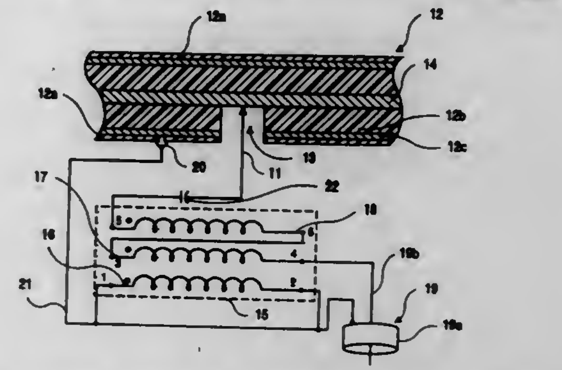
a multi-layer substrate having top and bottom layers with opposing substrate layers therebetween, each of the top and bottom layers having ground planes disposed thereon; and

first, second and third striplines disposed between the ground planes, the first and second striplines forming a segmented stripline within the opposing substrate layers and the third stripline being a planar mirror image of the segmented stripline, the third stripline being disposed on another opposing substrate layer.

5,689,218
TAP FOR EXTRACTING ENERGY FROM TRANSMISSION LINES

Richard P. Stein, Princeton, and Wesley R. Paxman, Richardson, both of Tex., assignors to Andrew Corporation, Orland Park, Ill.

Filed Feb. 1, 1996, Ser. No. 595,362
Int. Cl.^{6} H03H *7/38*
U.S. Cl. 333—125 **25 Claims**



7. A tapping system for coupling electromagnetic energy between first and second coaxial cables said tapping system comprising:

a pair of coupled transmission lines;

means for connecting said transmission lines to said first cable;

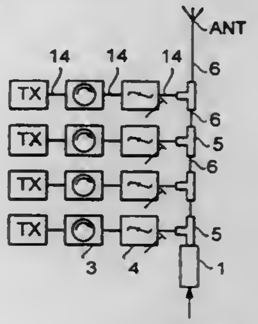
means for connecting said transmission lines to said second cable; and

wherein the center frequency of operation is set by the length of said coupled transmission lines.

5,689,219
SUMMING NETWORK

Risto Piirainen, Oulu, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI95/00372, § 371 Date Feb. 13, 1996, § 102(e) Date Feb. 13, 1996, PCT Pub. No. WO96/00989, PCT Pub. Date Jan. 11, 1996
PCT Filed Jun. 27, 1995, Ser. No. 596,298
Claims priority, application Finland, Jun. 30, 1994, 943150
Int. Cl.^{6} H01P *5/12;* H04B *1/02*
U.S. Cl. 333—127 **8 Claims**



1. A summing network for combining and feeding radio frequency signals supplied by a plurality of radio transmitters to common antenna means, said summing network comprising:

a plurality of radio transmitters and a common antenna means;

a corresponding plurality of conductors for receiving and forwarding radio frequency signals fed by respective ones of said radio transmitters;

a corresponding plurality of connectors; respective ones of said connectors being coupled to respective ones of said conductors, to said common antenna means, and in succession to each other, for receiving signals forwarded from said radio transmitters via said conductors and for forwarding such received signals to said common antenna means; and

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a stub which is connected to one of said connectors, said stub comprising adjusting means for changing the electrical length of the summing network as a response to a control signal fed to the stub.

5,689,220
LATERALLY COUPLED PIEZOELECTRIC RESONATOR LADDER-TYPE FILTER WITH AT LEAST ONE WIDTH EXPANSION MODE RESONATOR

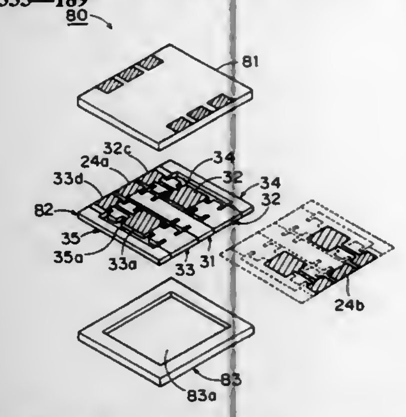
Hiroaki Kaida, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 17, 1994, Ser. No. 292,244

Claims priority, application Japan, Aug. 17, 1993, 5-203426; Sep. 2, 1993, 5-218585; Sep. 30, 1993, 5-244569; Sep. 30, 1993, 5-244570; Oct. 1, 1993, 5-247183; Dec. 16, 1993, 5-316282

Int. Cl.^{6} H03H *7/075;9/54*

U.S. Cl. 333—189 **14 Claims**



1. A ladder-type filter comprising:
- at least one series resonator forming a series arm and at least one parallel resonator forming a parallel arm,
- at least two of said series and parallel resonators being laterally coupled with each other with respect to a mounting surface,
- at least one of said series and parallel resonators including a substantially rectangular plate-type piezoelectric vibrator having a ratio b/a being set in a range of +/−10% from the following value:

$$b/a=n(-1.47\sigma+1.88)$$

wherein a and b respectively represent lengths of shorter and longer sides of said piezoelectric vibrator, σ represents the Poisson's ratio of the material forming said piezoelectric vibrator and n represents an integer.

5,689,221
RADIO FREQUENCY FILTER COMPRISING HELIX RESONATORS

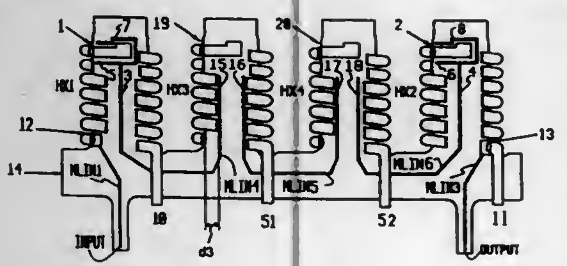
Erkki Niiranen, Saukonkuja, and Jari Pelkonen, Tuomioja, both of Finland, assignors to LK Products Oy, Kempele, Finland

Filed Oct. 6, 1995, Ser. No. 539,820

Claims priority, application Finland, Oct. 7, 1994, 944701

Int. Cl.^{6} H01P *1/20*

U.S. Cl. 333—202 **8 Claims**



1. A radio frequency filter comprising at least two discrete helix resonators placed at a distance from each other, each of which is wound of metal wire into a cylindrical coil, the radio frequency filter comprising:
- at least one microstrip line conductor having first and second ends, the at least one microstrip line extending between the at least two resonators whereby the first end extends within an inner portion of one of the resonators and the second end extends within an inner portion of another one of the resonators such that the first end of the microstrip line conductor is connected electromagnetically to one resonator and the second end of the microstrip line conductor is connected electromagnetically to the other resonator.

5,689,222
ELECTROMAGNETIC RELAY AND METHOD FOR THE PRODUCTION THEREOF

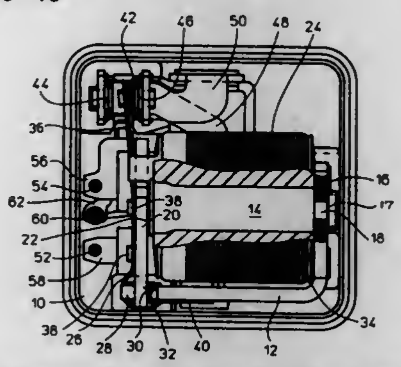
Siegfried Schneider, Leutershausen; Manfred Mitsch, Ansbach, and Theodor Sturm, Sachsen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 12, 1995, Ser. No. 542,202

Claims priority, application Germany, Oct. 12, 1994, 44 36 404.0

Int. Cl.^{6} H01H *51/22*

U.S. Cl. 335—78 **12 Claims**



1. An electromagnetic relay having a coil core, which carries a surrounding coil with one end of said coil core connected to a magnet yoke (12), wherein a length (l) of the coil core (14) between a bearing face (16) of the coil core (14) on the magnet yoke (12) and a pole face (22) remote from the bearing face (16) corresponds with a height h of the pivot shaft (32) of a hinged armature (26) of the relay above a base surface (34), formed by a short leg of the magnet yoke (12) in which surface the coil core (14) rests with the bearing face (16), and wherein this length (l) of the coil core (14) remains unchanged when the magnet yoke, the coil core, a coil and the armature of the relay are connected to one another.

5,689,223
SUPERCONDUCTING COIL

Anton Demarmels, Lenzburg, Switzerland; Sven Hörnfeldt, Västerås, Sweden; Friedrich König, Oberbözber, Switzerland; Jakob Rhyner, Zürich, Switzerland, and José Maria Rivera, Lausanne, Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland

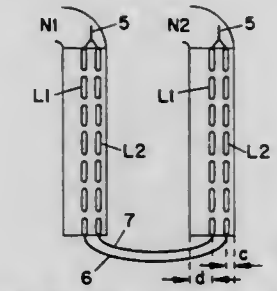
Filed Apr. 22, 1996, Ser. No. 635,470

Claims priority, application Germany, Apr. 24, 1995, 195 15 003.1

Int. Cl.^{6} H01F *7/22*

U.S. Cl. 335—216 **17 Claims**

1. A superconducting coil
- a) having at least one layer of winding elements made of a superconductor,
- b) in which the superconductor is enclosed by at least one electrically insulating fiber and
- c) is embedded in an electrically insulating, fiber-reinforced epoxy resin or in a plastic, wherein
- d) the superconductor is a high-temperature superconductor, and
- e) the coil has at least two coil subunits with high-temperature superconductors, which are electrically connected in series by at least one normal conductor.



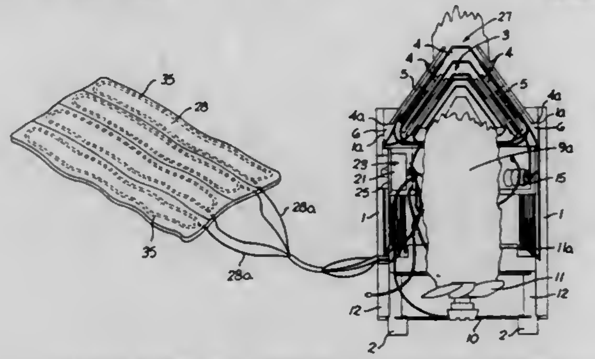
5,689,224
REACTOR TO MODIFY ENVIRONMENT AND CREATE ELECTRO-MAGNETIC FIELDS

Estanislao Martinez-Lara, Trinidad #322 Col. Vista Hermosa 64620, Monterrey, Nuevo Leon, Mexico

Filed Dec. 14, 1995, Ser. No. 572,011

Int. Cl.^{6} H01F *1/00;* **B01J** *19/08;* **A61N** *1/00*

U.S. Cl. 335—219 **7 Claims**



7. A reactor system for positioning users in the presence of electromagnetic energy and a turbulent air flow path, comprising in combination:
- an enclosure of dielectric material presenting walls and an upper opening formed of alternating glass and metal plates forming a pyramid arrangement with an air flow path directed between said plates toward an exit apex;
- a transformer located in said enclosure beneath the apex;
- an electric fan located in said enclosure beneath the transformer for passing a turbulent flow of air toward said apex;
- a set of sockets for connecting external electrically actuated accessories;
- a pattern of electrical cables connecting an electrical power source to said fan, transformer and sockets;
- an on-off electrically operated movable massaging accessory electrically coupled with one of the sockets, and
- a body positioning cushion for supporting a user person in a position to breath air emitted by said exit apex and to use said accessory.

5,689,225
METHOD FOR DRIVING MAGNETO-RESISTIVE ELEMENT

Yutaka Soda, Kanagawa; Munekatsu Fukuyama, Miyagi; Jin Sato, Miyagi, and Kiyoshi Ota, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

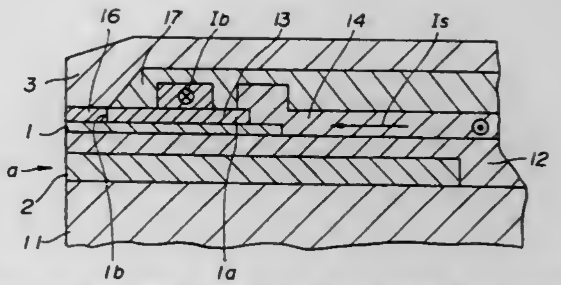
Filed Feb. 27, 1996, Ser. No. 607,563

Claims priority, application Japan, Feb. 28, 1995, 7-040966

Int. Cl.^{6} H01F *7/08*

U.S. Cl. 335—228 **4 Claims**

1. A method for driving a magneto-resistive effect element in which a bias magnetic field is applied by a bias conductor fed with a bias current to a magneto-resistive effect element whose resistivity is changed with an impressed magnetic field, wherein the improvement comprises:
- supplying to said bias conductor a pulsed initial current having a pulse crest value that is higher than the bias current value prior to supplying said bias current; and
- thereafter supplying said bias current to said bias conductor.



5,689,226

Patent Not Issued For This Number

5,689,227
CIRCUIT BOARD MATERIAL WITH BARRIER LAYER

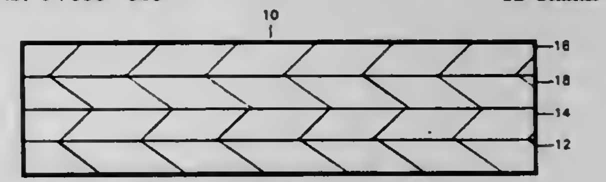
Phong Xuan Nguyen, Encino, and Steven Russell Nissen, Culver City, both of Calif., assignors to Ohmega Electronics, Inc., Culver City, Calif.

Continuation of Ser. No. 94,778, Jul. 21, 1993, abandoned.

This application Jan. 17, 1996, Ser. No. 587,490

Int. Cl.^{6} H01C *1/012;1/142;1/14;* **B32B** *3/00*

U.S. Cl. 338—308 **12 Claims**



1. A circuit board material comprising
- (a) a support layer;
- (b) an electrical resistance layer adhered to said support layer;
- (c) a barrier layer adhered to said electrical resistance layer, wherein said barrier layer has a thickness of less than about 0.1 μm, is different in composition from said resistance layer and is capable of protecting said resistance layer from attack by alkaline ammoniacal copper etchants;

and
- (d) a conductive layer adhered to said barrier layer.

5,689,228
PARALLEL MAGNITUDE COMPARISON USING MANCHESTER CARRY CHAINS

Jeffry D. Yetter, Loveland, and Paul L. Perez, Fort Collins, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 15, 1996, Ser. No. 731,632

Int. Cl.^{6} G06F *7/02*

U.S. Cl. 340—146.2 **20 Claims**

1. A method of generating a mask word of up to 2^N mask bits, wherein each mask bit is referenced by a position marker of N bits, the method comprising the steps of:
- a) generating a number of N bit mask markers;
- b) defining a number of mask conditions in terms of the mask markers and position markers;
- c) performing a plurality of mask marker and position marker comparisons in parallel, thereby determining whether particu-

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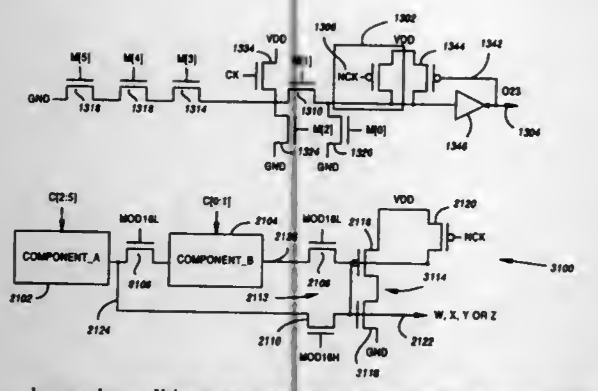


lar mask conditions are true with respect to a particular mask marker and particular position marker; and

d) setting or clearing mask bits of the mask word based on the truth of the plurality of mask marker and position marker comparisons.

5,689,229

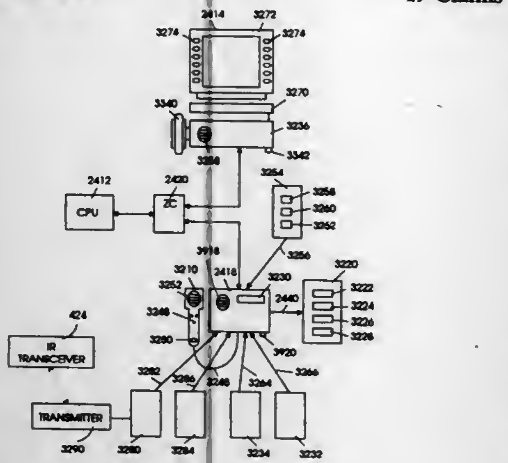
PATIENT CARE AND COMMUNICATION SYSTEM

John Chaco, Seymour; Israel Hersh, Fairfield; Dmitry Orlovsky, Danbury; Joe Vincens, Prospect, and Yaron Ram, Stamford, all of Conn., assignors to Executone Information Systems Inc., Milford, Conn.

Division of Ser. No. 203,909, Feb. 28, 1994, Pat. No. 5,594,786, which is a continuation-in-part of Ser. No. 87,394, Jul. 2, 1993, Pat. No. 5,455,851, and Ser. No. 33,287, Mar. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 924,101, Aug. 3, 1992, Pat. No. 5,465,082, which is a continuation-in-part of Ser. No. 559,196, Jul. 27, 1990, Pat. No. 5,291,399. This application Dec. 14, 1995, Ser. No. 572,130

Int. Cl.^{6} G08B *5/00*

U.S. Cl. 340—286.07 **19 Claims**



1. A patient control unit, which comprises:

a housing;

at least one switch positioned at least partially within said housing and accessible from an exterior surface of said housing;

a plurality of conductors extending from said housing for electrically coupling said at least one switch to remote processing circuitry, said plurality of conductors including a test conductor;

wherein said at least one switch has a first terminal coupled to a first of said plurality of conductors and said at least one switch has a second terminal coupled to a first voltage reference; and

at least one self-test switch positioned within said housing, said at least one self-test switch having a first terminal coupled to said test conductor and a second terminal coupled to said first of said plurality of conductors, such that when said remote processing circuitry provides a test signal to said test conductor said at least one self-test switch actuates to enable a continuity test of at least one connection between the control unit and other electronic equipment to be performed by the remote processing circuitry.

5,689,230

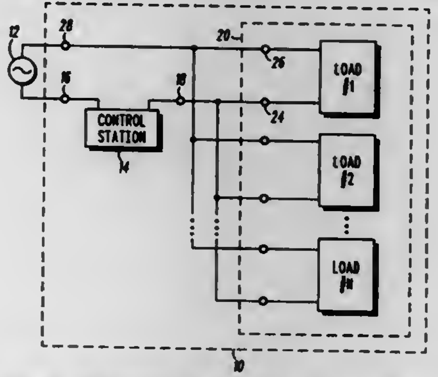
ENERGY MONITORING AND CONTROL SYSTEM USING REVERSE TRANSMISSION ON AC LINE

Jeffrey D. Merwin, Buffalo Grove; Philip D. Gunderson, Arlington Heights; Dennis L. Stephens, Niles, and Steven J. Purdy, Lake Zurich, all of Ill., assignors to Motoral, Inc., Schamburg, Ill.

Filed Nov. 9, 1995, Ser. No. 555,627

Int. Cl.^{6} H04M *11/04*

U.S. Cl. 340—310.01 **14 Claims**



1. An energy monitoring and control system for use with a conventional AC source having at least one phase with a hot wire and a neutral wire, comprising:

a control station having an input terminal and an output terminal, the input terminal being couplable to the hot wire of the AC source and the output terminal being couplable to at least one of a plurality of controllable loads;

each of the plurality of loads having an address and a hot connection and a neutral connection, the hot connection being coupled to the output terminal of the control station, the neutral connection being coupled to the neutral wire of the AC source, the plurality of loads being operable to draw a supply current from the AC source;

the control station and each load being operably coupled such that the control station is operable to send a control command to at least one address corresponding to a desired load, and upon reception of the control command the desired load executes the control command, resulting in a threshold change in the supply current drawn by the loads from the AC source;

the control station including an interface for accepting user commands and translating user commands into control commands, and a transmitter for sending control commands to the desired load;

each load including a receiver for accepting and executing the control commands sent by the control station; and

the control station further including a monitor for monitoring a threshold change in the supply current drawn by at least one load, whereby execution of the control command is confirmed.

5,689,231

BRAKE MONITOR

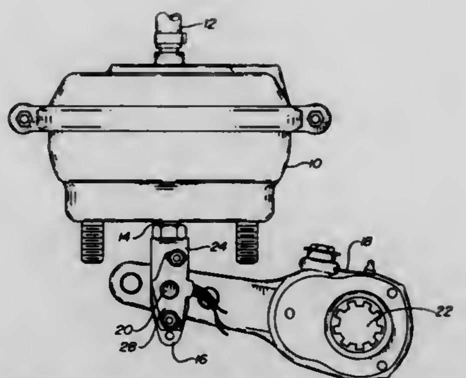
Ronald E. Olson, 7945 Eight Mile Creek Rd., Pensacola, Fla. 32526

Filed Apr. 25, 1996, Ser. No. 637,451

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—453 **7 Claims**

1. A brake monitor for installation on a brake system, the brake system includes an air chamber, a push rod having one end secured within the air chamber and having a push rod clevis on the opposing end, and a slack adjuster, comprising:



a clevis pin, having a first end and a second end, fixedly secured to the slack adjuster, for rotatable attachment of the slack adjuster to the clevis;

a transducer for receiving the first end of the clevis pin, wherein the output of the transducer is responsive to the rotation of the first end of the clevis within the transducer; and

output means, in communication with the transducer, for communicating the output of the transducer in a user-understandable form.

5,689,232

VEHICLE SIGNALLING DEVICE

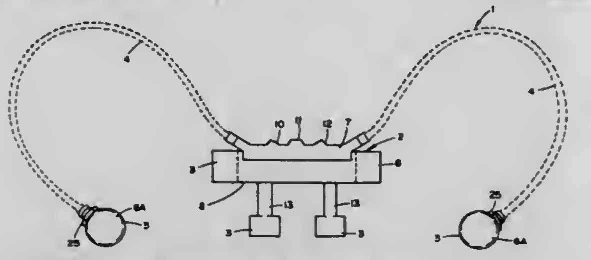
Michael Francis O'Shaughnessy, Athanor, Kiltymon, Newcastle County Wicklow, and Donal McDonald, 145 Carrigwood, Firhouse, Dublin 24, both of Ireland

Continuation of Ser. No. 64,359, May 8, 1993, abandoned, which is a continuation of Ser. No. 854,374, Mar. 19, 1992, abandoned. This application Jan. 27, 1994, Ser. No. 187,822

Claims priority, application Ireland, Mar. 19, 1991, 903/91

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—468 **5 Claims**



1. A bicycle turn signaling device comprising:

a holder;

mounting means on the holder for providing releasable engagement with handlebars on a bicycle;

a pair of separate, elongate pliant arms, each arm having an inner end and an outer end, the inner end of each arm being connected to the holder, the outer end of each arm being universally movable in any direction relative to the holder;

a pair of lamps, each lamp being mounted at the outer end of each arm;

means for connecting each lamp to an electric power supply, said connecting means including switch means for operation of the lamps, said switch means being mounted on the holder;

an audible indicator mounted on the holder, said audible indicator being connected to the electric power supply and to said switch means;

a flashing means for individually flashing each lamp to provide a flashing visual signal; and

a sounding means for intermittently sounding the audible indicator to provide an intermittent sound signal, said flashing means being synchronized with said sounding means so that said flashing visual signal corresponds to said intermittent sound signal,

wherein each separate, pliant arm is universally bendable in a three-dimensional range so that each lamp can be placed in a desired signaling position at which it will remain.

5,689,233

EMERGENCY INFORMATION OFFERING SYSTEM

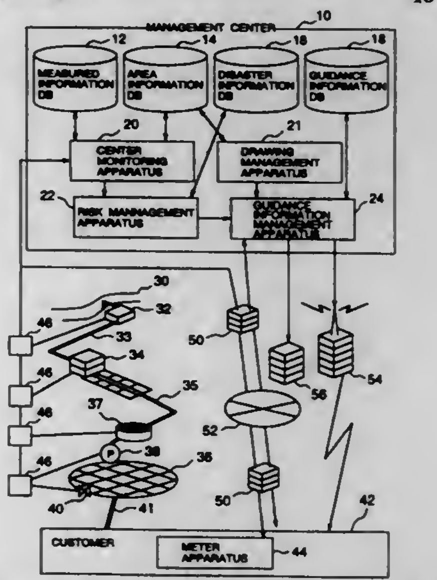
Hiromitsu Kurisu, Sagamihara, and Fuminobu Komura, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 507,944

Claims priority, application Japan, Jul. 29, 1994, 6-177979

Int. Cl.^{6} G08B *29/00*

U.S. Cl. 340—506 **18 Claims**



1. An emergency area information offering system for monitoring situations at predetermined places in lifeline facilities and offering information relative to the lifeline facilities upon emergency on the basis of the monitored results, comprising:

monitoring means located in a plurality of places distributed in an area where the lifeline facilities exist to monitor the facilities and transmitting information representative of results of the monitor;

measured information memory means for storing measured information transmitted from said monitoring means;

area information memory means for storing area information unique to the area where the facilities exist;

central monitoring means combined with said measured information memory means and said area information memory means, for detecting abnormality on the basis of said transmitted information and said information unique to the area;

disaster information memory means for storing disaster information relative to abnormality having occurred in the past;

risk management means for grasping abnormal states and determining countermeasures of abnormality on the basis of said measured information, said area information and said disaster information;

guidance information management means for preparing and offering guidance information for users of lifelines upon emergency on the basis of information relative to abnormality issued from said risk management means; and

guidance information memory means combined with said guidance information management means for storing said prepared guidance information.

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5,689,234

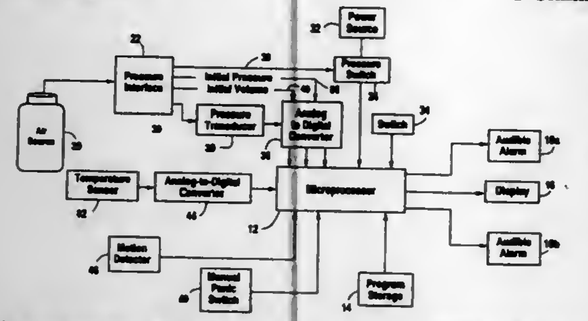
INTEGRATED FIREFIGHTER SAFETY MONITORING AND ALARM SYSTEM

L. Herbert Stumberg, Bexar County, Tex., and James A. Fulton, Chester County, Pa., assignors to North-South Corporation, San Antonio, Tex.

Continuation of Ser. No. 348,762, Dec. 2, 1994, abandoned, which is a continuation of Ser. No. 200,908, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 79,670, Jun. 18, 1993, abandoned, which is a continuation of Ser. No. 963,098, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 741,269, Aug. 6, 1991, Pat. No. 5,157,378. This application Jun. 7, 1995, Ser. No. 474,516

Int. Cl.^{6} G08B *19/00*

U.S. Cl. 340—521 **1 Claim**



1. A monitoring and alarm system for use in conjunction with a firefighter's pressurized breathing system comprising:

means for measuring air pressure in said breathing system;

means for detecting motion of a firefighter; and

means for providing an audible alarm when said air pressure falls below a predetermined pressure level or failure to detect motion of said firefighter for a predetermined length of time.

5,689,235

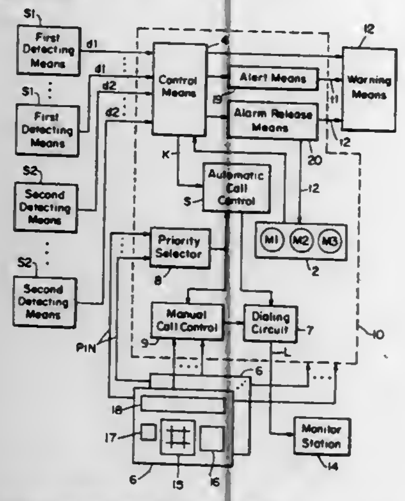
ELECTRONIC SECURITY SYSTEM

Tadashi Sugimoto; Masahiko Shibata, and Yoshihiro Imuro, all of Otsu, Japan, assignors to Optex Co., Ltd., Shiga, Japan

Filed Apr. 2, 1996, Ser. No. 626,416

Int. Cl.^{6} G08B *13/00*

U.S. Cl. 340—541 **6 Claims**



1. A security system which comprises:

detecting means for detecting entry of a trespasser into a predetermined outdoor area or an indoor area and for generating a detection signal indicative of the entry of the trespasser;

mode setting means operable by an input operation to select one of an alert mode, in which any possible entry into the predetermined outdoor area or the indoor area is monitored, and a non-alert mode in which the possible entry into the predetermined outdoor area or the indoor area is not monitored;

control means for preferentially transmitting a warning through a telephone line upon receipt of the detection signal generated during the alert mode and for transmitting no warning during the non-alert mode;

warning means for acknowledging dispatch of the warning; and

priority selector means operable when the warning is preferentially transmitted to the telephone line for switching from the preferential transmission of the warning over to a normal telephone communication by means of an input operation performed by an operator informed of the warning.

5,689,236

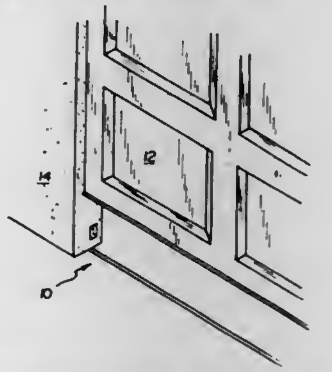
REMOTE GARAGE DOOR POSITION INDICATOR

Candie Kister, 2222 Tortuga St., Acton, Calif. 93510

Filed Aug. 8, 1996, Ser. No. 695,114

Int. Cl.^{6} G08B *13/08*

U.S. Cl. 340—545 **1 Claim**



1. A remote garage door position indicating system comprising, in combination:

an automatic garage door and garage door frame formed in a generally rectangular configuration, the garage door and garage door frame each having a lower extent, the garage door being vertically retractable, wherein the garage door is in a closed orientation when the lower extent of the garage door abuts the lower extent of the garage door frame;

a sensor device including a planar rectangular plate with two circular apertures positioned therethrough, a circular shaped magnetic sensor being positioned through each circular aperture, in an operative orientation the sensor plate being coupled to the lower extent of the garage door frame with a plurality of screws;

a transmitter device having a range of 100 miles being positioned adjacent to the garage door frame, the transmitter device being electrically powered and operatively coupled to the magnetic sensors by a pair of electrical wires, the transmitter device including means to transmit electronic signals;

a signal interruption device including an inner plate and an outer plate, the inner plate being affixed to the garage door adjacent to it's lower most extent, the inner plate including a central recess with a spherical inner end and a cylindrical outer end, the outer plate being formed in a generally planar rectangular configuration with an inner surface including a projection member extending therefrom, the projection member having a spherical outboard section and a cylindrical inboard section, the outer plate adapted to be coupled to the inner plate by coupling the projection member within the recess, the configuration of the projection member and recess being such that in a coupled orientation the outer plate extends a short distance from the inner plate, in closed orientation the outer plate of signal interruption device engaging the magnetic sensors of the sensor device thereby closing the electrical circuit and causing the transmitter device to cease sending electronic signals; and

a garage door position indicator formed in a generally rectangular configuration and including a power source and a light, the position indicator including receiver means capable of receiving electronic signals from the transmitter device, the receiver means being operatively coupled to the power source and light, when receiving electronic signals from the transmitter the receiver means causing the light to illuminate, in the closed orientation the transmitter device does not emit electronic signals thereby preventing the receiver means from illuminating the light, users viewing the light of the position indicator to determine whether their garage door is opened or closed.

5,689,237

ANTITHEFT SECURITY TAG AND ELECTRONIC ARTICLE SURVEILLANCE SECURITY SYSTEM

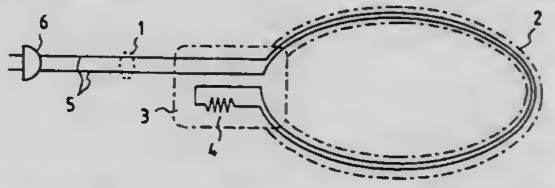
Shinichi Sasagawa; Seishi Namioka; Nobuyuki Ichimiya, and Shin Kinouchi, all of Miyagi-ken, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1996, Ser. No. 609,811

Claims priority, application Japan, Oct. 3, 1995, 7-051214

Int. Cl.^{6} G08B *13/14*

U.S. Cl. 340—568 **12 Claims**



1. An antitheft security tag to be used in combination with an article surveillance security system, said antitheft security tag comprising;

a tagging part to be tagged to an article, formed by looping a two-core cable;

a connecting part formed out of a cable, to be connected to the article surveillance security system;

a joining part for joining the tagging part to the connecting part; and

a resistor contained in the joining part and connected in series to the wires of the two-core cable forming the tagging loop,

wherein said foregoing components are connected so as to form a single electrical loop.

5,689,238

OBJECT LOCATOR SYSTEM AND METHODS THEREFOR

Thomas C. Cannon, Jr., East Hanover; Theodore Sizer, Little Silver; Giovanni Vannucci, Middletown; Robert W. Wilson, Holmdel, and Gregory A. Wright, Colts Neck, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Mar. 8, 1996, Ser. No. 612,650

Int. Cl.^{6} G08B *13/14*

U.S. Cl. 340—568 **8 Claims**

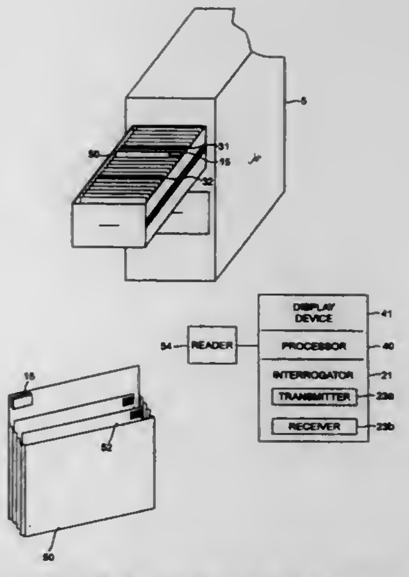
1. A document locator system comprising:

an electronic tag identifiable by a response code and physically adapted to be attached to a document;

an interrogator having a transmitter and a receiver the transmitter operable to transmit the response code; and

a location marker, wherein,

in response to the interrogator transmitting the response code, the electronic tag sends a first signal to the location marker and a second signal is transmitted to the interrogator, in which the second signal is indicative of the proximity of the electronic tag to the location marker



and, hence, the location of a document attached to the electronic tag.

5,689,239

IDENTIFICATION AND TELEMETRY SYSTEM

Leigh Holbrook Turner, Singapore, Singapore, and Peter Harold Cole, South Australia, Australia, assignors to Integrated Silicon Design Pty. Ltd., South Australia, Australia

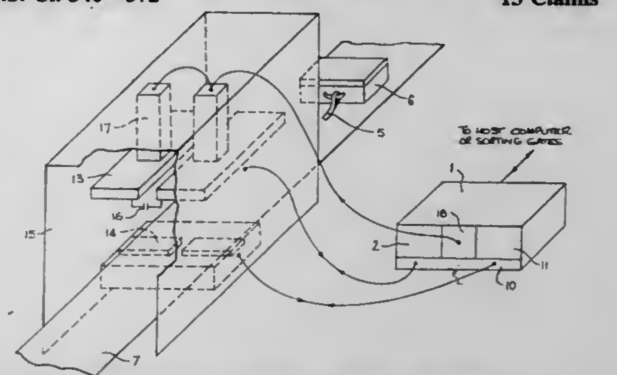
PCT No. PCT/AU92/00477, § 371 Date Mar. 8, 1994, § 102(e) Date Mar. 8, 1994, PCT Pub. No. WO93/05489, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 9, 1992, Ser. No. 204,271

Claims priority, application Australia, Sep. 10, 1991, PK8276

Int. Cl.^{6} H04Q *9/00*

U.S. Cl. 340—572 **13 Claims**



1. An identification and telemetry system comprising:

a transmitter for generating an interrogation signal and a receiver for detecting and decoding a reply signal;

an interrogation field creation means for generating, within a scanned region, from said interrogation signal, an interrogation electromagnetic field through which an object possessing a code responding label may pass;

an auxiliary illumination system for generating within said scanned region an auxiliary illumination field;

a code responding label including a receiving antenna for receiving from the interrogation electromagnetic field a label interrogation signal, and sensing means for receiving from the auxiliary illumination field an auxiliary illumination signal, microcircuit means for generating from information stored within the label and from said auxiliary signal a label reply signal, and means within the label for generating from the label reply signal a label reply electromagnetic field; and

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a receiver antenna connected to said receiver for receiving from the label reply electromagnetic field a system reply signal;
said label reply signal containing information indicative of the auxiliary illumination signal detected by the label.

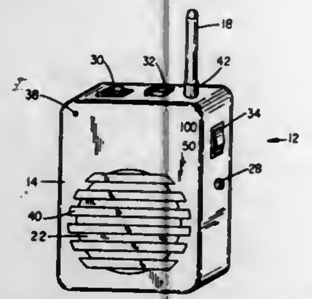
5,689,240
CHILD MONITOR SYSTEM

Norbert B. Traxler, Prior Lake, Minn., assignor to C.O.P. Corp., Mankato, Minn.

Filed Jun. 5, 1996, Ser. No. 658,708

Int. Cl.⁶ G08B *23/00*

U.S. Cl. 340—573 **8 Claims**



1. A child monitoring system adapted to activate an alarm when the child strays from the supervisor, comprising:

(a) a master unit including a power supply, first alarm means for emitting an audible alarm, transmitting means for transmitting a first encoded signal, and detecting means for detecting a second encoded signal all of which are electrically coupled to an electronic circuit contained within said master unit;

(b) a remote unit including a power supply, second alarm means for emitting an audible alarm, transmitting means for transmitting the second encoded signal, and detecting means for detecting the first encoded signal, whereby the first alarm means is activated when the master unit fails to receive the second encoded signal for more than a first predetermined time interval and the second alarm means is activated when the remote unit fails to receive the first encoded signal for more than a second predetermined time interval;

(c) key means electrically coupled to said remote unit, wherein the transmitting means of the second encoded signal is activated when the key means is removed from the remote unit and

(d) wherein the transmitting means of the first encoded signal is activated when the key means is inserted into a corresponding receptacle of the master unit.

5,689,241
SLEEP DETECTION AND DRIVER ALERT APPARATUS

James Russell Clarke, Sr., and Phyllis Maurer Clarke, both of 184 Homestead Pl., Bridgeton, N.J. 08302

Continuation-in-part of Ser. No. 432,419, Apr. 24, 1995, abandoned. This application May 31, 1996, Ser. No. 656,053

Int. Cl.⁶ G08B *21/00*

U.S. Cl. 340—575 **11 Claims**

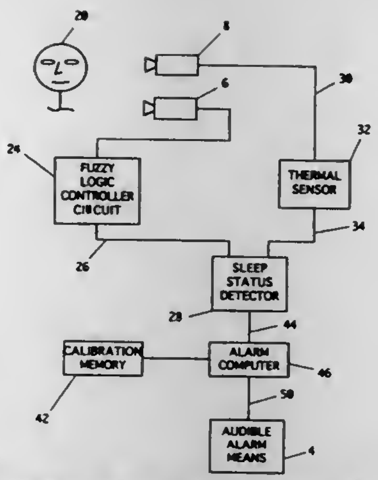
1. A sleep detection and driver alert apparatus for sensing sleep or drowsiness in a driver of a motor vehicle or the like, comprising:

a. a containing housing suited to be attached to the rear view mirror or attached to the dashboard of an automobile;

b. an infrared, digital, auto-focus image stabilization zoom camera type lens;

c. thermal sensing means for sensing ambient heat output pixel color changes from a driver's facial mouth and eye area;

d. an optical motion detection circuit for sensing absence of motion from the output of said digital infrared auto-focus image stabilization zoom camera type lens;



e. digital, infrared thermal imaging means for determining changes in infrared thermal output between open and closed eye color pixel changes;

f. sleep status detection means for comparing the output of said optical motion detection circuit, and said thermal sensing means;

g. an auto calibration memory for storing alarm limit and range data for users of differing size, height, and other physical characteristics;

h. an alarm circuit for comparing the output of said sleep status detection means with previously stored calibration information; and

i. an audible alarm means for sounding an audible alarm.

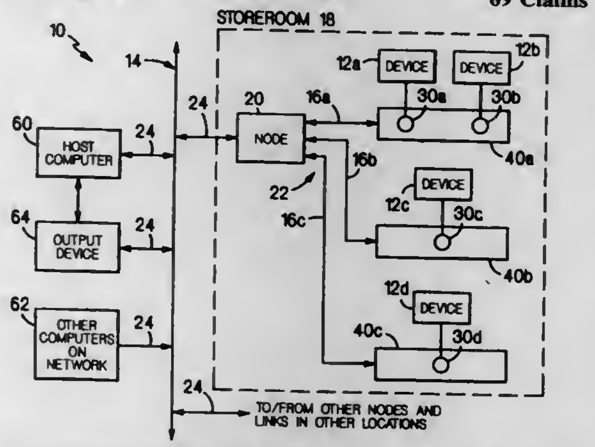
5,689,242
CONNECTING A PORTABLE DEVICE TO A NETWORK

Nathaniel M. Sims, Wellesley Hills, Mass.; Steven P. Kadner, Albuquerque, N. Mex.; Kevin Ferguson, Albuquerque, N. Mex.; Chris Martinez, Albuquerque, N. Mex., and Robert Rajala, Albuquerque, N. Mex., assignors to The General Hospital Corporation, Boston, Mass., and Aquila Technologies Group, Inc., Albuquerque, N. Mex.

Filed Jul. 28, 1994, Ser. No. 282,051

Int. Cl.⁶ G08B *21/00*

U.S. Cl. 340—652 **69 Claims**



1. A connector for use with a tag that is associated with a device and that identifies the device with respect to other devices, said connector comprising

an element for engaging a corresponding element of an electrical power connector to establish an electrical power path between said connector and said electrical power connector, and

another element electrically insulated from said element for establishing a data path between said tag and said electrical power connector that is separate from said electrical power path when said element is engaged with said corresponding element.

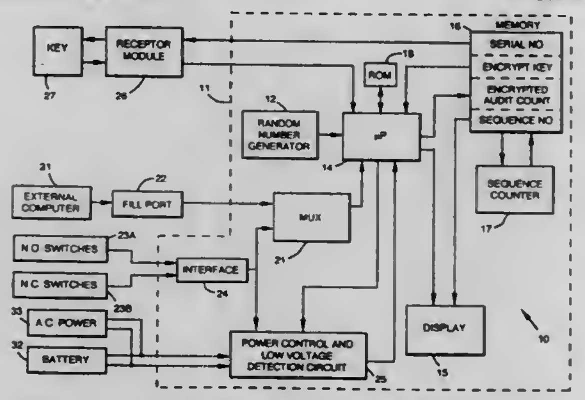
5,689,243
SYSTEM AND METHOD FOR TAMPER DETECTION

Mark E. Blanco, Diamond Bar, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 994,439, Dec. 21, 1992, abandoned, which is a continuation of Ser. No. 674,823, Mar. 22, 1991, abandoned. This application Jan. 11, 1996, Ser. No. 585,325

Int. Cl.⁶ G06F *7/04*

U.S. Cl. 340—825.3 **5 Claims**



1. Intrusion detection apparatus for use with a system, said apparatus comprising:

sensing means for sensing a physical intrusion into the system and for generating an intrusion indication signal in response thereto;

a random number generator for generating a random number comprising an audit count value in response to the intrusion indication signal;

computer means coupled to the sensing means and random number generator that comprises a predetermined electronic encryption key for encrypting the audit count value using the predetermined electronic encryption key in combination with a predetermined encryption algorithm to provide an encrypted audit count value;

a sequence counter coupled to the computer means for incrementing a sequence number in response to the intrusion indication signal to provide an incremented sequence number that indicates a total number of physical intrusions into the system;

memory means coupled to the computer means and the sequence counter for storing the predetermined electronic encryption key, the encrypted audit count value, and the incremented sequence number;

a physically removable device that is couplable to the computer means and that comprises a predetermined electronic decryption key that is distinct from the predetermined electronic encryption key and that operates in combination with a predetermined decryption algorithm that runs on the computer to (1) decrypt the encrypted audit count value and cause the display of expected values of the incremented sequence number and decrypted audit count value to an authorized user that should be displayed the next time physical access is gained to the system and to (2) subsequently decrypt the encrypted audit count value and cause the display of the incremented sequence number and decrypted audit count value to an authorized user that is compared with the expected values thereof to determine whether physical access has been gained to the system; and

a display coupled to the computer means and the memory means for displaying the decrypted audit count value and the incremented sequence number each time the electronic decryption key is used.

5,689,244
COMMUNICATION SYSTEM AND ELECTRONIC APPARATUS

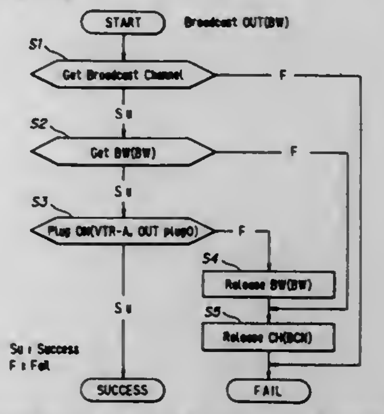
Yuko Iijima; Hisato Shima, both of Kanagawa; Harumi Kawamura, and Makoto Sato, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1995, Ser. No. 491,076

Claims priority, application Japan, Jun. 24, 1994, 6-165883; Aug. 26, 1994, 6-225757

Int. Cl.⁶ H04J *3/02*

U.S. Cl. 340—825.07 **8 Claims**



1. A communication method for connecting a plurality of electronic apparatuses by a communication between said electronic apparatuses comprising the steps of:

executing a connection control command during connection control by each of the electronic apparatuses by reading existing connection control information from a predetermined storage means of its own or another electronic apparatus;

transmitting write instructions from electronic apparatuses which are going to write new connection control information to the storage means;

executing only the earliest write instruction received at the storage means which has received multiple ones of said write instructions; and

transmitting, for each write instruction, responses indicating whether the execution of the write instruction has been successful.

5,689,245
INTEGRATED COMMUNICATIONS TERMINAL

Gary Noreen, La Cañada Flintridge, Calif.; Theodore R. Harper, Apex, N.C., and Ken Renshaw, Manhatten Beach, Calif., assignors to Radio Satellite Corporation, La Canada Flintridge, Calif.

Continuation-in-part of Ser. No. 963,233, Oct. 19, 1992, Pat. No. 5,455,823. This application Jun. 6, 1995, Ser. No. 469,608

Int. Cl.⁶ H04Q *1/00*

U.S. Cl. 340—825.49 **22 Claims**

1. An electronic device for use as a communications terminal, comprising:

means for receiving a communications control channel signal through which said electronic device receives a list of operating information, including location information on a location of said electronic device, a plurality of channel names, a plurality of data rates, and a plurality of frequencies, for a plurality of selectable channel signals, each of said plurality of channel names associated with a frequency and a data rate as a channel name association, with channel name associations modifiable through updating of the list of operating information;

means for storing the location of said electronic device as a stored location;

means for selecting, by a user, a selectable channel signal by selecting a name of the selectable channel signal as a

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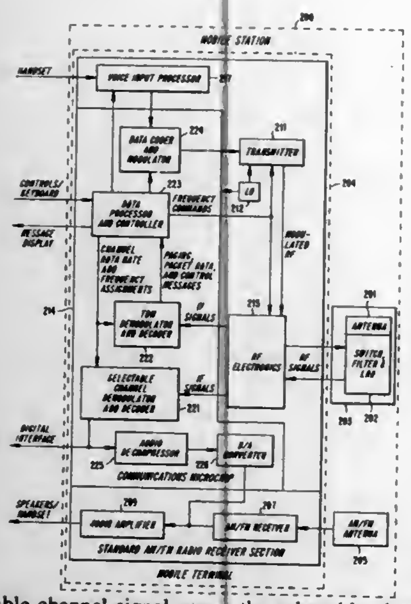


selectable-channel-signal-name, the selectable channel signal selected dependent on the stored location;

means for identifying a particular frequency and a particular data rate associated with the selectable-channel-signal name from the list of operating information;

means for tuning to the particular frequency and the particular data rate associated with the selectable-channel-signal name; and

means for receiving, simultaneously with receipt of said communications control channel signal, the selectable channel signal.

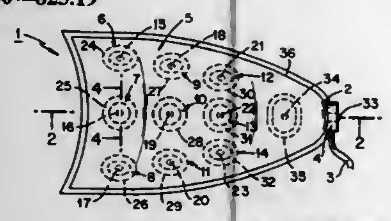
5,689,246
INTRAORAL COMMUNICATION SYSTEM

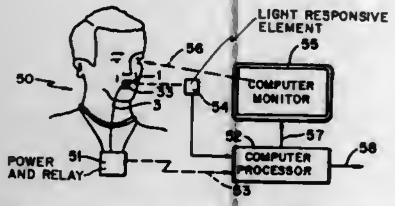
Rowan L. Dordick, Briarcliff Manor, N.Y., and Edwin J. Selker, Palo Alto, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 414,410, Mar. 31, 1995, abandoned. This application Nov. 14, 1996, Ser. No. 749,044

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 340—825.19 **7 Claims**





1. An intraoral communication mouthpiece comprising in combination:

a laminated portion of edge sealed, mouth environment resistant material that fits in the mouth of a communicating human and a communication portion extending through the teeth of said communicating human,

said laminated portion having first and second faces, said first face of said laminated portion conforming to the shape of the roof of the human mouth in the region behind the upper teeth, and,

said second face of said laminated portion having an array of rows of tongue locatable and pressure responsive bumps, each having a first shape, and a separately positioned tongue locatable and pressure responsive bump having a second shape that is different from said first shape

said laminated portion having within the laminations thereof, pressure responsive, signal members, corresponding to said array of bumps, each of said signal members having conductor means extending to said communication portion, and,

said communication portion having a light with actuation of said light being by a separate conductor from said second shaped bump.

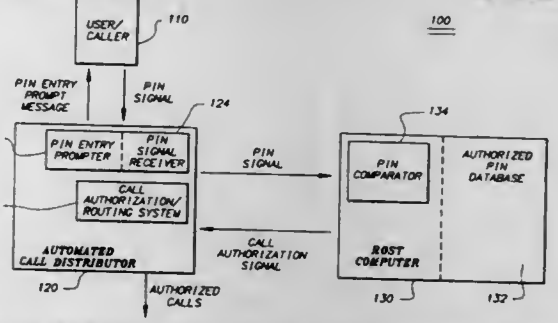
5,689,247
AUTOMATED SYSTEM FOR IDENTIFYING AUTHORIZED SYSTEM USERS

Stephen Weiner, Martinsville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 30, 1994, Ser. No. 367,535

Int. Cl.^{6} H04L *9/32*

U.S. Cl. 340—825.31 **24 Claims**



13. An apparatus for identifying authorized users of a secure system, comprising:

(A) user prompting means for prompting a user of said secure system to enter a personal identification code into said secure system;

(B) personal identification code receiving means, coupled to said user prompting means, for receiving into said secure system a first digital signal representative of said personal identification code entered by said user;

(C) storage means, coupled to said personal identification code receiving means, for storing a list of authorized personal identification codes;

(D) comparing means, coupled to said storage means, for comparing said personal identification code entered by said user against said list of authorized personal identification codes; and

(E) user authorizing means, coupled to said comparing means, for receiving a second digital signal identifying whether said user is an authorized user of said secure system, said user being identified as an authorized user of said secure system only if said personal identification code entered by said user is present in said list of authorized personal identification codes;

wherein each personal identification code on said list of authorized personal identification codes is arranged in a personal identification code format that includes a plurality of core digits and a plurality of check digits, and wherein a first of said check digits has a value that is dependent upon a first group of two or more core digits, and a second of said check digits has a value that is dependent upon a second group of two or more core digits, said first group of two or more core digits being different from said second group of two or more core digits.

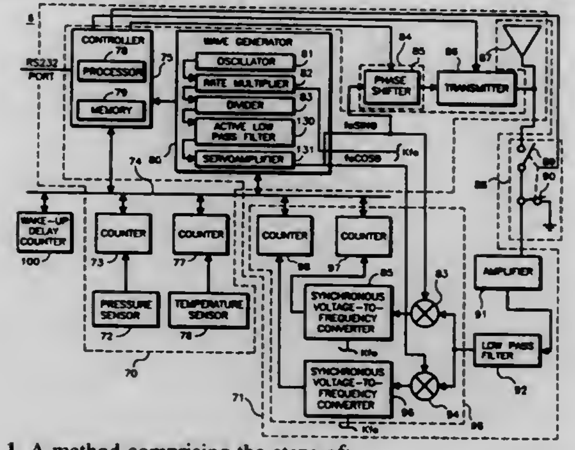
5,689,248
METHODS FOR REDUCING POWER CONSUMPTION IN REMOTE SENSING APPLICATIONS

Farhad Esfahani, Dallas, Tex., and James Lloyd Davis, Marlow, Okla., assignors to Gas Research Institute, Chicago, Ill.

Filed Dec. 15, 1994, Ser. No. 358,069

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 340—853.1 **28 Claims**



1. A method comprising the steps of:

sensing a first amount of a physical characteristic at a first time;

sensing a second amount of a the physical characteristic subsequent to said first time;

storing said second amount of said physical characteristic as an absolute measurement;

determining a difference between the first and second amounts;

choosing a data transmission frame based upon said difference;

transmitting said difference in a format of said frame; and

simultaneously transmitting said absolute measurement sequentially in said frame.

5,689,249
OFF-LANE ALARM APPARATUS

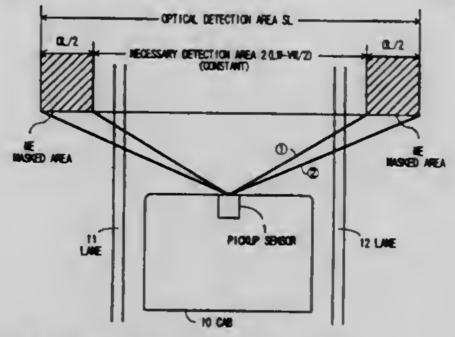
Hirofumi Sakamoto, and Toshifumi Koshizawa, both of Fujisawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 23, 1995, Ser. No. 577,708

Claims priority, application Japan, Dec. 26, 1994, 6-322876

Int. Cl.^{6} G08G *1/00*

U.S. Cl. 340—901 **6 Claims**


OPTICAL DETECTION AREA SL
QL/2
NECESSARY DETECTION AREA 2(LW-WL/2) (CONSTANT)
QL/2
MASKED AREA
MASKED AREA
①
②
11 LANE
PICKUP SENSOR
12 LANE
10 CAB

1. An off-lane alarm apparatus comprising

an image pickup sensor mounted on a roof of a car;

means for generating a turn signal for said car;

means for generating an alarm;

input means; and

an image processing device in which an image signal provided from said image pickup sensor is converted into corresponding binary data to extract a lane on a road surface, whereby an off-lane state of said car is detected on the basis of a mounted height of said image pickup sensor provided from said input means, a distance between a road position right beneath said image pickup sensor and a predetermined sensing position in front of said car, a predetermined lane width, and a predetermined car width, said alarm generating means being then energized by said image processing device when the off-lane state is detected unless said turn signal is being generated,

when said mounted height of said image pickup sensor is increased, said image processing device being provided with the increased portion of the height from said input means and determining a necessary outside area of said predetermined lane width by using the inputs provided from said input means, so that an image portion corresponding to said necessary outside area is masked for detecting the off-lane state of said car.

5,689,250
ULTRASOUND OBSTACLE DETECTING PROCESS

Johann Kremser, Bruck a.d. Mur, Austria, assignor to Mayser GmbH & Co., Inc., Germany

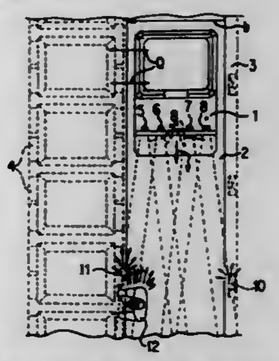
PCT No. PCT/EP95/03705, § 371 Date Aug. 14, 1996, § 102(e) Date Aug. 14, 1996, PCT Pub. No. WO96/09559, PCT Pub. Date Mar. 28, 1996

PCT Filed Sep. 20, 1995, Ser. No. 649,630

Claims priority, application Germany, Sep. 23, 1994, 44 33 957.7

Int. Cl.^{6} G08G *1/00*

U.S. Cl. 340—904 **13 Claims**



1. Process for detecting obstacles by means of emitted radiation pulses, comprising the steps of:

emitting at least a radiation pulse during successive measuring cycles, from at least one ultrasound emitter unit;

detecting reflected radiation by means of at least a corresponding receiver unit, and forming measured echograms in successive measuring cycles; and

forming analysis echograms based on evaluation of said measured echograms, each of said analysis echograms being formed by modification of a previous analysis echogram in response to information contained in a newly formed measured echogram;

wherein echo envelope curve amplitudes in a preceding analysis echogram are increased at points at which amplitudes in a newly formed measured echogram are higher than a first threshold value, and are decreased at points at which said amplitudes are less than a second threshold value.

5,689,251
AIRSPEED PREDICTION FILTER

Andrew W. Houck, Woodinville, and Melville D. W. McIntyre, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 30, 1996, Ser. No. 715,350

Int. Cl.^{6} G01C *21/00*

U.S. Cl. 340—978 **9 Claims**

1. In a method of displaying the airspeed of an aircraft to a pilot, which method includes:

measuring the airspeed of the aircraft;

generating a data stream indicative of measured airspeed; and

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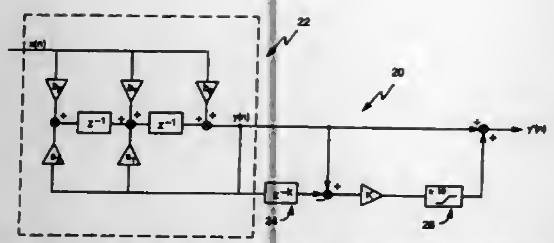


using the data stream to control a cockpit display of airspeed, wherein a delay occurs between measurement and cockpit display of the airspeed;

the improvement which comprises:

calculating a correction factor indicating a predicted change in the airspeed of the aircraft during the delay;

combining the correction factor with the data stream of measured airspeed to obtain a signal of the predicted airspeed of the aircraft at the time of the display; and

using the combined signal to display the predicted airspeed to the pilot.

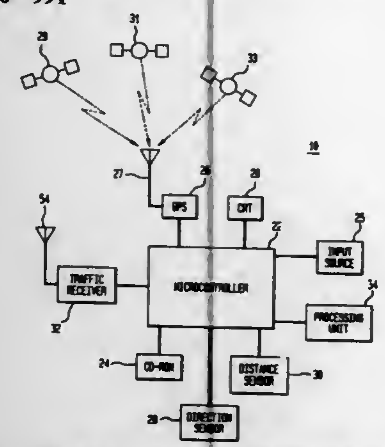
5,689,252
NAVIGATION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Ender Ayanoglu, Red Bank, and Krishan Kumar Sabnani, Westfield, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 334,658, Nov. 4, 1994. This application Mar. 7, 1996, Ser. No. 612,203

Int. Cl.⁶ G08G *1/123*

U.S. Cl. 340—991 **22 Claims**



1. A vehicle navigation system for identifying a desired map route between a first position of a vehicle and a second position, which comprises:

(a) map means for storing a plurality of road maps and speed limit values for roads therein;

(b) input means for enabling a user to select said first and second positions;

(c) selecting means for selecting a road map from those stored in said map means on the basis of said selected first and second positions of said vehicle;

(d) traffic receiving means for receiving traffic information including speed rates transmitted in a data representation format of variable length differences from said stored speed limit values for respective roads contained on said selected road map over a wireless channel from a centrally located database to said vehicle; and

(e) means for determining a route of shortest duration between said first position and said second position from said selected road map on the basis of said speed rates received by said traffic receiving means and the length of travel between said first and second positions of said vehicle.

5,689,253
ERGONOMIC KEYBOARD APPARATUS

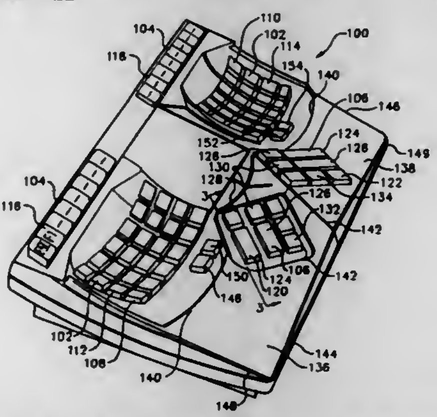
William R. Hargreaves, Bellevue, and Shirley A. Lunde, Seattle, both of Wash., assignors to Kinesis Corporation, Bothell, Wash.

Continuation-in-part of Ser. No. 683,980, Apr. 10, 1991, abandoned. This application Apr. 9, 1993, Ser. No. 46,584

Claims priority, application WIPO, Apr. 10, 1992, PCT/US92/02957

Int. Cl.⁶ H03K *17/94*

U.S. Cl. 341—22 **8 Claims**



1. A keyboard for interfacing the fingers of an operator's hand with a data processing device, comprising:

first and second laterally spaced apart alphanumeric key arrays having a plurality of alphanumeric key means for identifying alphanumeric characters to the data processing device by a non-pivoting linear movement in a direction of actuation, said key means including a home row having home keys wherein the home keys have keycaps, orientated to be manipulated by the fingers of the operator, said home key keycaps defining a reference surface substantially perpendicular to the direction of actuation of said home keys, said alphanumeric key array having a first end and a second opposed end positioned on opposite sides of said reference surface wherein said first end is closer to the operator when the keyboard is being used than the second end, a hand of the operator defining a reference position when the fingers of the operator are adjacent the reference surface; and

first and second laterally spaced apart function key arrays having a plurality of function key means for identifying functions to be performed by the data processing device, said first and second laterally spaced apart function key arrays being substantially aligned, respectively, with said first and second spaced apart alphanumeric key arrays, said plurality of function key means being farther from said operator than said second end of the alphanumeric key array, said function keys having function key keycaps for manipulation by the fingers of the operator vertically displaced above said reference surface, all of said function key keycaps oriented at an angle, with respect to a support surface, of between about 20° and about 60° and accessible to the fingers of the operator without moving the hand of the operator a substantial distance from the reference position.

7. Data input apparatus for interfacing the fingers of the hand of an operator with a data processing device comprising:

first and second key arrays having a plurality of key means constructed for manipulation by the fingers of the operator for providing input to the data processing device, said plurality of key means including home keys having surfaces that define a reference surface, said home keys further defining a reference position for a hand of the operator wherein the index finger of the operator defines a reference line when said hand of the operator is positioned in the reference position; and

first and second auxiliary key arrays including a plurality of auxiliary key means constructed for manipulation by the thumb of said hand of the operator for providing input to the data processing device by depressing said activation key means and with no substantial lateral movement of said auxiliary key means, said auxiliary key means being vertically displaced from the reference surface defined by said home keys and positioned so that the fingers of the operator extend downward from the thumbs when said first and second auxiliary key arrays including first and second elongated keys positioned at an angle between about 60° and about 80° with respect to the reference line so that the thumb of the operator may be positioned along the surface of said elongated key; and

palm rest means for receiving the palms of the operator.

8. A method for data input, comprising:

providing a data input device having first and second laterally spaced apart alphanumeric key arrays and first and second laterally spaced apart function key arrays, said first and second function key arrays being substantially aligned with said first and second alphanumeric key arrays, said alphanumeric key array comprising home keys, said function key arrays having a plurality of function keys oriented at an angle with respect to a support surface of between about 20° and about 60° and aligned in a substantially linear row, each having a keycap;

actuating said home keys by movement in a non-pivoting fashion in a first linear direction of actuation, said first linear direction of actuation defining a reference surface perpendicular thereto; and

actuating said function keys by moving the surface of said function key keycaps, in a direction different from said first linear direction.

5,689,254
DECODING CIRCUIT FOR RUNLENGTH CODES

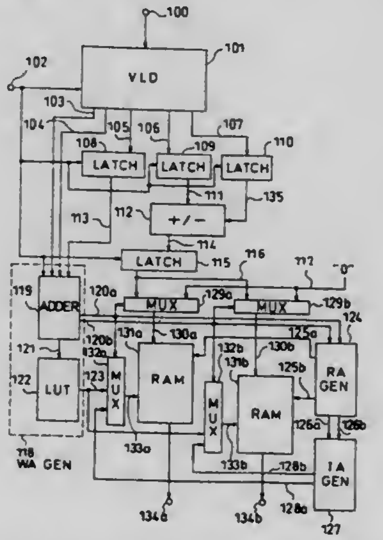
Mikio Fujiwara, Kyoto; Yoshiyuki Goi, and Hideki Ishii, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 11, 1995, Ser. No. 540,763

Claims priority, application Japan, Oct. 12, 1994, 6-246014

Int. Cl.⁶ H04N *1/41*

U.S. Cl. 341—59 **3 Claims**



1. A decoder for decoding a runlength-coded data stream having a plurality of data sets each composed of (i) a zero runlength data word representing the number of zero components preceding a non-zero component, and (ii) a level data word representing a value of said non-zero component, said decoder comprising:

means for latching a given zero runlength data word and a corresponding level data word in said data stream;

memory means for storing each of a series of data words in a predetermined position for scan transform, wherein said memory means comprises two dual-port RAMs (Random Access Memories) arranged such that, while said latched level data word is written in one of said two dual-port RAMs, data words stored in the other dual-port RAM is read and initialized

initializing means for initializing all the data words stored in said memory means, to zero data words;

writing means for writing said latched level data word in said memory means such that one of said zero data words in said memory means is overwritten based on said latched zero runlength data word; and

reading means for successively reading data words thus stored in said memory means.

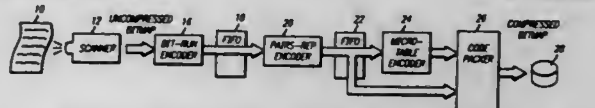
5,689,255
METHOD AND APPARATUS FOR COMPRESSING AND DECOMPRESSING IMAGE DATA

Allen L. Frazier, and Brent M. Bradburn, both of Wichita, Kans., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 22, 1995, Ser. No. 518,031

Int. Cl.⁶ H03M *7/46*

U.S. Cl. 341—63 **8 Claims**



1. A method of compressing a binary input data stream comprised of binary bits, comprising the steps of:

(a) bit-run encoding the binary input data stream to produce a first compressed data stream, the bit-run encoding step comprising the substeps of:

(a1) replacing a first run comprising a number of consecutive identical bits in the input data stream, with a first symbol representing a number of bits in the first run; and

(a2) replacing a second run comprising a number of consecutive identical bits in the input data stream, with a second symbol representing a number of bits in the second run, the second run immediately following the first run within the input data stream, the second run having bits of opposite polarity from the bits in said first run; and

(b) pairs-rep compressing the first compressed data stream to produce a second compressed data stream, the pairs-rep compression step comprising the substeps of:

(b1) identifying a consecutively repeating pair of symbols in the first compressed data stream;

(b2) determining a number of times the pair of symbols consecutively repeats; and

(b3) generating a first set of values corresponding to the repeating symbol pair and the number of times the symbol pair repeats.

5,689,256
TREE DECODER

Nathan Elnathan, 9 Pines St., Rehovot, Israel

Filed Aug. 2, 1995, Ser. No. 510,168

Int. Cl.⁶ H03M *7/40*

U.S. Cl. 341—79 **13 Claims**

1. Apparatus for decoding information which has been coded with a tree code comprising:

a tree decoder including:

a tree input port at which a token enters the tree decoder;

a plurality of tree output ports from one of which the token exits the tree decoder; and

a plurality of nodes forming a tree connected between the tree input port and the tree output ports, each of the nodes comprising:

an token input port;

two token output ports;

a code input port; and

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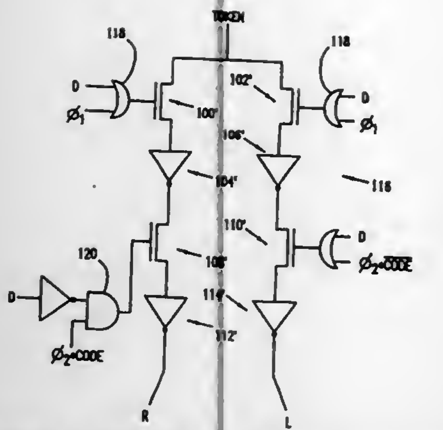


means for operating the node in a first mode wherein the token passes from the token input port to one of the token output ports in response to the code input and a second mode wherein the token passes from the input port to one of the output ports independent of the code output.

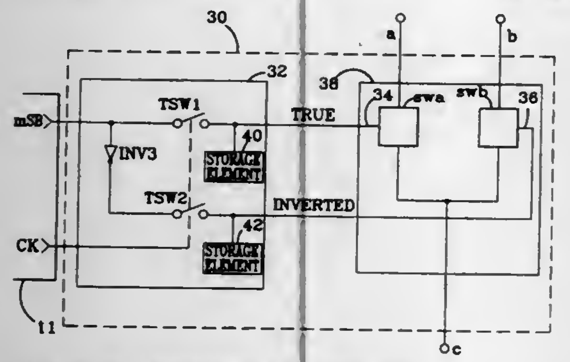
5,689,257
SKEWLESS DIFFERENTIAL SWITCH AND DAC EMPLOYING THE SAME

Douglas A. Mercer, Bradford; David Reynolds, Georgetown; David H. Robertson, Boxford, all of Mass., and Ernest T. Stroud, Greensboro, N.C., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Jan. 5, 1996, Ser. No. 583,410

Int. Cl.^{6} H03K *3/2885*

U.S. Cl. 341—133 **20 Claims**



1. A skewless differential switch, comprising:

a control input for receiving a control signal,

an inverter that is coupled to said control input to produce a complement of said control signal which is skewed with respect to said control signal,

an enable input for receiving a clock signal,

a plurality of storage elements,

a pair of transfer switches responsive to said clock signal that are connected between said control input and said inverter, respectively, and said storage elements to isolate said control input from said storage elements and, once per clock period, simultaneously transfer the control signal and its complement through the respective switches to the storage elements, said storage elements also connected to store said signals and to provide a pair of de-skewed complementary output signals having the same binary values as the control signal and its complement stored within said storage elements, and

a differential switch pair having complementary control inputs that are connected to receive said pair of de-skewed complementary output signals from said storage elements so that said differential switch pair is controlled by said control signal without skew.

5,689,258
MULTIPLE CURRENT DIGITAL-ANALOG CONVERTER CAPABLE OF REDUCING OUTPUT GLITCH

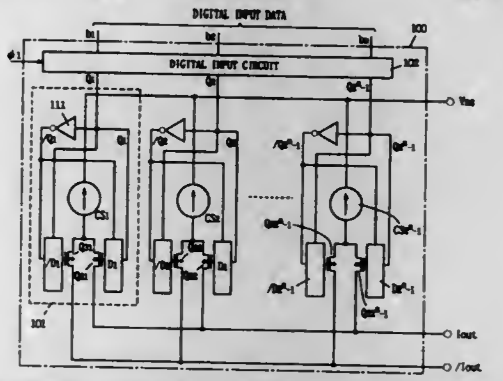
Yasuyuki Nakamura; Hiroyuki Kouno, and Takahiro Miki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1995, Ser. No. 532,315

Claims priority, application Japan, Nov. 18, 1994, 6-285233

Int. Cl.^{6} H03M *1/66*

U.S. Cl. 341—136 **16 Claims**



1. A multiple current digital-analog converter for converting a digital input signal to a corresponding analog value current for output, comprising:

a plurality of unit current source cells; and

current summing means for summing output currents from said unit current source cells;

wherein each of said unit current source cells includes:

- a differential switch circuit including a first switch and a second switch;
- a constant current source for outputting a constant current to said current summing means via said differential switch circuit;
- a first driving circuit controlled by a corresponding bit signal of said digital input signal so as to open and close said first switch of said differential switch circuit;
- an inverter for generating an inverted bit signal by inverting said corresponding bit signal; and
- a second driving circuit for closing and opening said second switch of said differential switch circuit in a complementary manner with respect to said first switch;
- wherein the driving operation to open said second switch is controlled by said corresponding bit signal and the driving operation to close said second switch is controlled by said inverted bit signal.

5,689,259
DIFFERENTAL D/A CONVERTER WITH N-BITS PLUS SIGN

Ismail H. Ozguc, Sunnyvale, Calif., assignor to Exar Corporation, Fremont, Calif.

Filed Jul. 21, 1995, Ser. No. 505,812

Int. Cl.^{6} H03M *1/66*

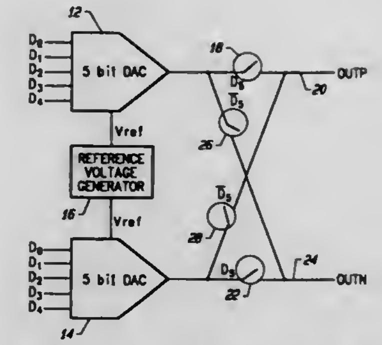
U.S. Cl. 341—144 **8 Claims**

1. A differential digital to analog converter comprising:

a first digital to analog converter for converting n digital bits on n input lines to a first analog value on a first output;

a second digital to analog converter for converting said n digital bits on said n input lines to a second analog value on a second output; and

switching means, having a control input coupled to an n+1 digital bit input line, for switching said first and second



outputs, said first and second outputs providing a differential output.

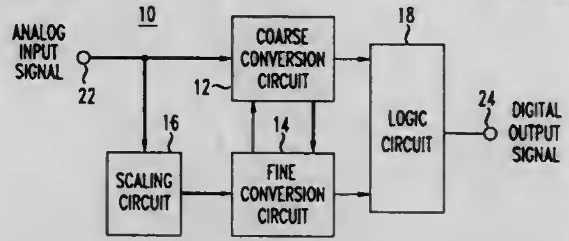
5,689,260
ANALOG-TO-DIGITAL CONVERTER USING SCALED SIGNAL TO INITIALIZE COARSE CONVERSION CIRCUIT

David Gerard Vallancourt, Macungie, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 22, 1995, Ser. No. 532,857

Int. Cl.^{6} H03M *1/14*

U.S. Cl. 341—156 **25 Claims**



1. A method of converting an analog input signal into a digital output signal, comprising the steps of:

applying the input signal to a scaling circuit to provide an analog scaled signal with a smaller amplitude than the input signal;

applying the scaled signal to a fine conversion circuit to provide a digital control signal;

applying the digital control signal to a coarse conversion circuit to initialize the coarse conversion circuit, said coarse conversion circuit including N substantially matched current sources and a switching circuit including N switches for coupling and decoupling respective current sources to and from a summing node;

applying the input signal to the coarse conversion circuit after initializing the coarse conversion circuit to provide a first digital code and an analog reference signal associated with the first digital code;

providing an analog remainder signal determined at least in part by a difference between the input signal and the reference signal;

applying the remainder signal to the fine conversion circuit to provide a second digital code; and

applying at least the first and second digital codes to a logic circuit to provide the output signal,

wherein providing the first digital code includes applying the input signal to the summing node, coupling P current sources to the summing node, where P is corresponds to the digital control signal, and coupling a voltage source to the summing node, to provide a difference signal between the voltage source and the summing node representing a difference between the input signal and the P current sources.

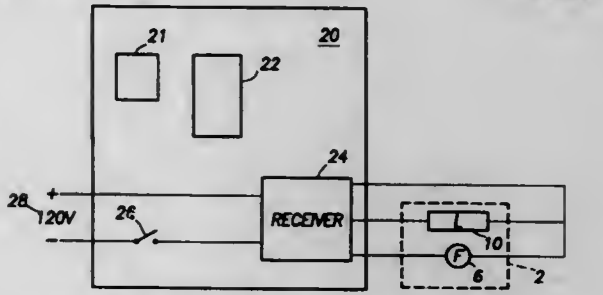
5,689,261
REMOTE CONTROL SYSTEM FOR CEILING FAN AND LIGHT

Vinay Mehta, Germantown, and Robert E. Beasley, Jr., Memphis, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Continuation of Ser. No. 273,964, Jul. 12, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,472

Int. Cl.^{6} G08C *19/12*

U.S. Cl. 341—173 **5 Claims**



1. A remote control system for operating a ceiling fan assembly adapted to be connected to a power supply and having a ceiling fan motor and light, said system comprising:

an RF receiver;

a fan speed control having an output electrically connected to the ceiling fan motor and having an input electrically connected to the RF receiver;

a light level control having an output electrically connected to the light and having an input electrically connected to the RF receiver, the light level control able to operate the light at a range of power levels ranging from a highest power level to a lowest power level;

a first remote controller having a first plurality of control buttons each of which, when depressed, initiates a corresponding one of a first set of control signals for setting power levels, said first remote controller having a first RF transmitting means for sending the first set of control signals to said receiver;

a second remote controller having a second plurality of control buttons each of which, when depressed, initiates a corresponding one of a second set of control signals for setting power levels, said second remote controller having a second RF transmitting means for sending the second set of control signals to said receiver; and

wherein the first set of control signals and the second set of control signals are different and said RF receiver operates the fan speed control and the light level control in response to the first and second sets of control signals, wherein the light level control is operable to turn the light from an OFF state to an ON state at a previous power level in response to the first set of control signals, and wherein the light level control is operable to turn the light from an OFF state to an ON state at a preset power level in response to the second set of control signals, such that the light level control is operated differently according to whether a control signal is received from the first remote controller or the second remote controller.

5,689,262
ELECTRONIC BAFFLE AND BAFFLE CONTROLLED MICROWAVE DEVICES

Jesse Clopton James, Huntsville, Ala., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Division of Ser. No. 353,189, Dec. 9, 1994, Pat. No. 5,596,324, which is a continuation-in-part of Ser. No. 273,576, Jul. 11, 1994. This application Jun. 26, 1996, Ser. No. 670,662

Int. Cl.^{6} H01Q *9/40*

U.S. Cl. 342—5 **4 Claims**

1. In an antenna having at least one radiating element for radiating RF energy of a predetermined frequency and a back plane reflector for said radiating element, the improvement comprising:

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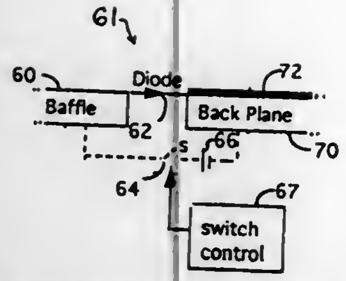


an extension element spaced from and located adjacent to said back plane reflector, said extension element extending outwardly from an edge of said back plane reflector to thereby effectively extend said back plane upon electrical connection of said extension element to said back plane, said extension element being one half wave length in length at said predetermined frequency; and

means for alternately electrically connecting and disconnecting said extension element to said back plane reflector, to thereby reduce generation of back lobes at said predetermined frequency.

5,689,263
ANTIPILFERAGE MARKERS

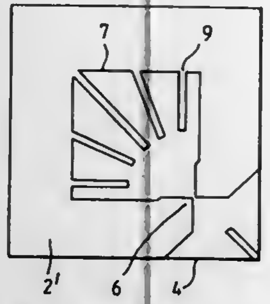
Andrew Dames, Milton, Great Britain, assignor to Esselte Meto International GmbH, Heppenheim, Germany

Filed Jan. 7, 1994, Ser. No. 178,571

Claims priority, application United Kingdom, Jul. 9, 1991, 9114793

Int. Cl.^{6} G01S *13/08;* **G08B** *13/14;* **B32B** *31/00;* **B05D** *5/12*

U.S. Cl. 342—51 **24 Claims**



1. A method of making a self-adhesive tag, the tag comprising: a first side and a second side; a first material disposed on the first side; a second material disposed on the second side; an intermediate supporting layer disposed between the first material and the second material; the intermediate layer having a first side disposed towards the first material and a second side disposed towards the second material; means for adhering the second material to the second side of the intermediate layer; an adhesive layer disposed on the second material, the adhesive layer being configured for bonding the tag to a product; release paper material disposed on the adhesive layer, the release paper material being configured for preventing adhesion of the adhesive layer to undesired surfaces; said method comprising the steps of:

providing the first material, the first material comprising metal;
providing the second material;
providing the intermediate layer;
configuring the intermediate layer to have a first side and a second side;
providing the adhering means;
providing the adhesive layer;
providing the release paper material;
said method further comprising the steps of:
applying the second material to the second side of the intermediate layer with the adhering means;
disposing portions of the first material in different amounts and at different times on the first side of the intermediate layer;
said step of disposing comprising providing a layer of the first material on the first side of the intermediate layer, the layer of the first material having a thickness less than 1 micron;
forming predetermined patterns in the first material and the second material;
coating the second material with the adhesive layer; and
disposing the release paper on the adhesive layer.

5,689,264
OBSTACLE DETECTING SYSTEM FOR VEHICLES

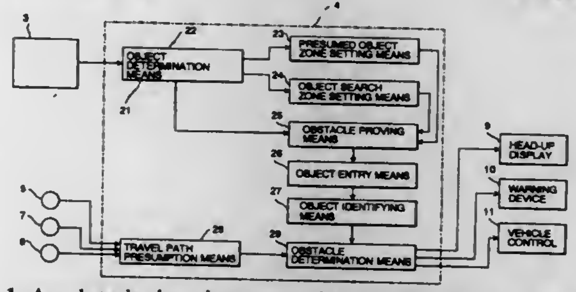
Toshihiro Ishikawa; Ayumu Doi; Kenichi Okuda; Yasunori Yamamoto; Tomohiko Adachi, and Tooru Yoshioka, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 5, 1995, Ser. No. 539,181

Claims priority, application Japan, Oct. 5, 1994, 6-241289

Int. Cl.^{6} G01S *13/93*

U.S. Cl. 342—70 **26 Claims**


3
4
22
21
OBJECT DETERMINATION MEANS
23
PRESUMED OBJECT ZONE SETTING MEANS
24
OBJECT SEARCH ZONE SETTING MEANS
25
OBSTACLE PROVING MEANS
26
OBJECT ENTRY MEANS
27
OBJECT IDENTIFYING MEANS
28
TRAVEL PATH PRESUMPTION MEANS
29
OBSTACLE DETERMINATION MEANS
5
7
8
9
HEAD-UP DISPLAY
10
WARNING DEVICE
11
VEHICLE CONTROL

1. An obstacle detection system for a vehicle for detecting an obstacle in the forward path of travel of the vehicle, said obstacle detection system comprising:

object detecting means equipped in a vehicle for detecting kinetic attributes relative to the vehicle of an object present in a forward path of travel of said vehicle at predetermined regular intervals;
object zone setting means for setting a presumed object zone into which said object at a preceding detection is presumed to enter at a latest detection of said object based on said kinetic attributes provided during said preceding detection of said object; and
object proving means for proving an object of said latest detection as said object of said preceding detection when said object of said latest detection is determined to be one that has moved into said presumed object zone based on comparison of kinetic attributes provided during said latest detection of said object with said presumed object zone.

5,689,265
DEVICE FOR MEASURING A LEVEL OF MATERIAL USING MICROWAVES

Johanngeorg Otto, Hausen; Stefan Burger, Freiburg, and Peter Gerst, Weil, all of Germany, assignors to Endress & Hauser GmbH & Co., Maulburg, Germany

Continuation of Ser. No. 284,430, Aug. 3, 1994, abandoned.

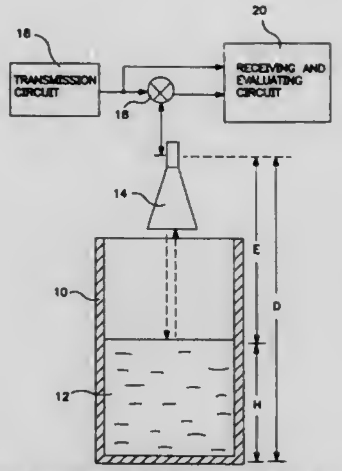
This application Oct. 9, 1996, Ser. No. 728,535

Claims priority, application Germany, Dec. 11, 1992, 42 41 910.7

Int. Cl.^{6} G01S *13/08*

U.S. Cl. 342—124 **24 Claims**

1. A level measuring device using microwaves comprising an antenna for sending transmitted waves toward the surface of a material whose level is to be measured and for receiving echo waves resulting from reflection of the transmitted waves at the surface, a receiving and evaluating circuit adapted to derive from the echo waves received by the antenna an echo function representative of the echo amplitudes as a function of the distance between the antenna and the surface of the material and to determine from the echo function the transit time of the microwaves from the antenna to the surface of the material and therefrom the distance of the surface of the material from the antenna, a reference reflection point situated in at least one of the antenna and the vicinity of the antenna, and an arrangement for comparing a section of the echo function originating from said reference reflection point with a predetermined threshold value in order to detect a condition of the antenna.



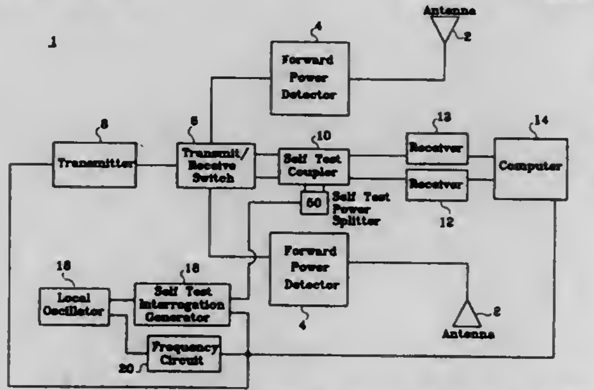
5,689,266
TESTING APPARATUS FOR ATC TRANSPONDER FAR COMPLIANCE

Desi D. Stelling, Phoenix; Charles L. Dosdall, Scottsdale, and James R. Troxel, Glendale, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 29, 1995, Ser. No. 564,511

Int. Cl.^{6} G01S *7/40*

U.S. Cl. 342—165 **5 Claims**



1. A transponder testing system for an aircraft to test that the transponder is operating correctly in the aircraft comprising:

a transponder having a microprocessor; and
a testing apparatus residing in the transponder to test that the transponder is operating correctly, said testing apparatus comprising:
  a self test interrogation generator connected to the microprocessor to create a first set of signals for testing;
  a transmit frequency circuit connected to the microprocessor to create a second set of signals, different from the first set of signals, for testing; and
  a local oscillator connected to the self test interrogation generator and the transmit frequency circuit to generate the first and second set of signals and connected to the transmitter for testing.

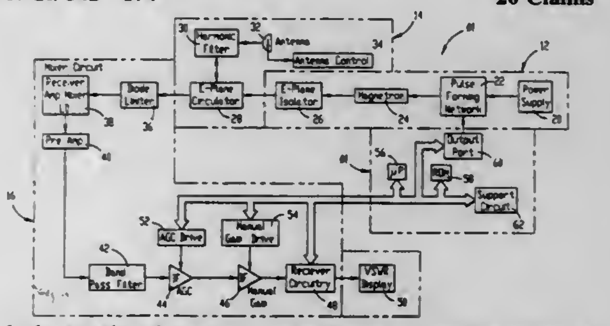
5,689,267
AUTOMATIC VSWR SENSING FOR AIRCRAFT-MOUNTED PULSE RADAR SYSTEMS

Warren Bruce Cope, 12102 S. Hagan St., Olathe, Kans. 66062, and Mark G. Roos, 11926 W. 49th Ter., Shawnee, Kans. 66216

Filed Nov. 22, 1995, Ser. No. 561,775

Int. Cl.^{6} G01S *7/40*

U.S. Cl. 342—174 **20 Claims**



1. In an aircraft-mounted, radar frequency unit including a transmitter operable for transmitting a radar frequency output signal at a nominal energy level, a receiver operable for receiving and processing a return signal resulting from transmission of the output signal, and control means for controlling the energy level of the output signal, a method of operating the unit comprising the steps of:

(a) preceding transmission of an output signal at a nominal energy level, transmitting a test output signal presenting an energy level such that the maximum energy level of a resulting test return signal is less than a maximum allowable level;
(b) for a test return signal, determining whether the energy level of said test return signal exceeds a predetermined threshold, such being indicative that a nominal energy level output signal would result in a return signal energy level exceeding said allowable level; and
(c) if said test return signal energy level exceeds said threshold, preventing transmission of a nominal energy level output signal.

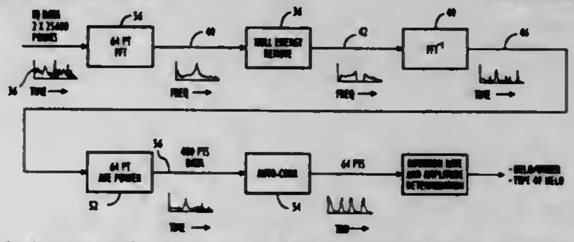
5,689,268
RADAR DETECTION AND CLASSIFICATION OF HELICOPTERS

Nai K. Shi, Hnntington Beach, and Henry F. Williams, Temecula, both of Calif., assignors to Boeing North American, Inc., Seal Beach, Calif.

Filed Aug. 2, 1996, Ser. No. 691,729

Int. Cl.^{6} G01S *13/52*

U.S. Cl. 342—196 **16 Claims**



1. A method for detecting a helicopter, the method comprising the steps of:

(a) sensing a radar return from a target;
(b) digitizing the radar return to produce a time series;
(c) taking a plurality of piece-wise Fourier transforms of the time series to produce a like plurality of frequency spectra;
(d) within each frequency spectrum, setting to zero the frequencies near a DC bin and a main body peak bin to produce a zeroed spectrum;
(e) inverse transforming the zeroed spectra to form a plurality of time sections;
(f) removing end samples from each time section to produce a filtered time section;
(g) assembling the filtered time sections to produce a filtered time series;

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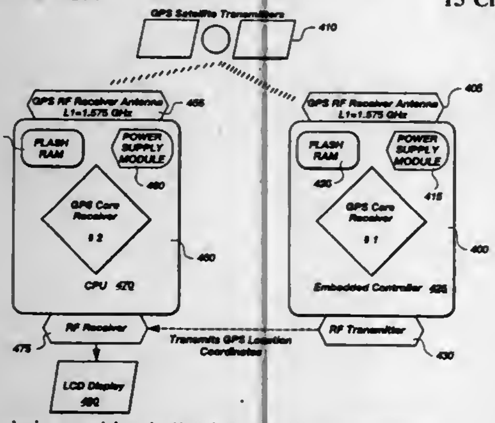
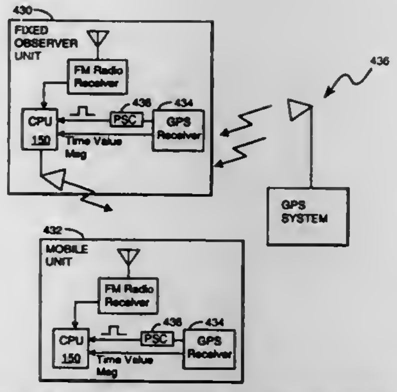
(h) taking a moving average of the filtered time series to produce an averaged time series;
(i) auto-correlating the averaged time series to produce an auto-correlated time series; and
(k) outputting a "helicopter detected" signal if the auto-correlated time series shows significant non-zero-time-delay peaks.

5,689,269
GPS RELATIVE POSITION DETECTION SYSTEM
Elwood G. Norris, Poway, Calif., assignor to American Technology Corporation, Poway, Calif.
Filed Jan. 25, 1995, Ser. No. 377,973
Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*
U.S. Cl. 342—357 **13 Claims**



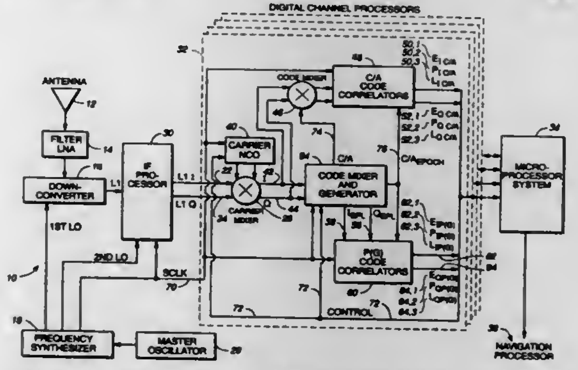
1. A relative position indicating system comprising:
a first GPS receiver including means for receiving a plurality of GPS signals from different sources and means for determining a geographical location of the first receiver;
a transmitter associated with the first GPS receiver for sending telemetry data as to the geographical location of the first GPS receiver;
a second GPS receiver including means for receiving a plurality of GPS signals from different sources and means for determining a geographical location of the second receiver;
receiver means associated with the second receiver for receiving the telemetry data from the first GPS receiver;
calculating means associated with the second GPS receiver for comparing the geographical locations represented by the first GPS receiver telemetry data and the geographical location determined by the second GPS receiver, and for calculating an approximate direction, a distance, and a relative height variance between said first GPS and said second GPS receivers; and
a display associated with the second GPS receiver for indicating the approximate distance, the direction and the relative height variance between the first GPS and the second GPS receivers.

5,689,270
NAVIGATION AND POSITIONING SYSTEM AND METHOD USING UNCOORDINATED BECON SIGNALS
David C. Kelley, Orange; Joseph Cisneros, Glendora, and Louis A. Greenbaum, Redondo Beach, all of Calif., assignors to Pinterra Corporation, Garden Grove, Calif.
Continuation of Ser. No. 168,851, Dec. 15, 1993, Pat. No. 5,499,032, which is a continuation-in-part of Ser. No. 994,670, Dec. 22, 1992, Pat. No. 5,280,295, which is a continuation of Ser. No. 745,154, Aug. 15, 1991, Pat. No. 5,173,710. This application Mar. 12, 1996, Ser. No. 614,093
Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*
U.S. Cl. 342—357 **22 Claims**



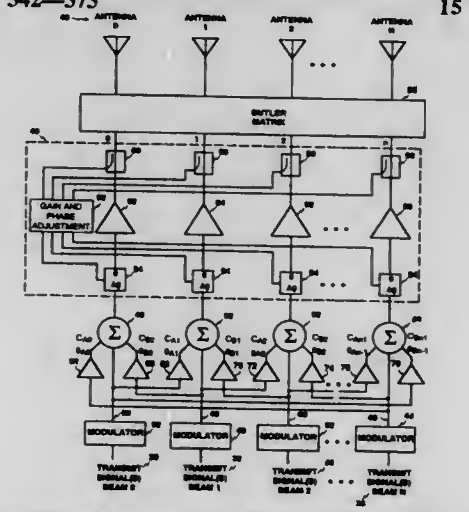
1. In a positioning system that makes use of a multiplicity of transmitters, at known fixed locations, each of which transmits a beacon signal having a phase that is un-synchronized with the phases of the beacon signals of the other transmitters; each of said beacon signals having a frequency that is approximately equal to a predetermined target frequency;
the combination comprising:
a first receiver, at a known location relative to the locations of said multiplicity of transmitters, which (A) receives said beacon signals, (B) determines the relative phases of said beacon signals, and (C) transmits data representing said relative phases;
a second receiver, at an unknown location, which receives said transmitted data from said first receiver and at least three of said beacon signals, said second receiver including phase detection circuitry for detecting the phases of said beacon signals at the location of said second receiver, and computation means for computing the location of said second receiver based on said transmitted data and said detected phases; and
initialization means for providing a common timing signal to said first and second receivers in order to establish a common time basis therebetween, said initialization means including means for determining an initial estimate of said unknown location using said common time basis.

5,689,271
METHOD AND APPARATUS FOR CIVILIAN RECEIVER OPERATION WITH P(Y) CODE IN SATELLITE POSITIONING SYSTEM RECEIVER
Gary R. Lennen, Cupertino, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.
Filed May 3, 1996, Ser. No. 642,629
Int. Cl.^{6} G01S *5/02*
U.S. Cl. 342—357 **17 Claims**



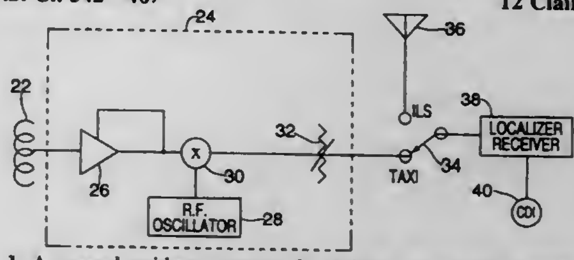
1. A system for employing certain characteristics of the P(Y) code in the civilian Satellite Positioning System (SATPS) receiver, said system comprising:
a RECEIVING MEANS for receiving a known C/A code modulated on L1 carrier frequency, for receiving an unknown Y code modulated on L1 carrier frequency signal, and for receiving an unknown Y code modulated on L2 carrier frequency signal from at least one satellite; wherein said received L1, and L2 signals contain propagation noise; and wherein said Y code comprises a known P code and an unknown W code; and
at least one DIGITAL CHANNEL PROCESSING MEANS for:
(1) locally generating replica of said C/A code modulated on L1 carrier frequency signal;
(2) locally generating replica of said P code modulated on L1 carrier frequency signal;
(3) locally generating replica of said P code modulated on L2 carrier frequency signal;
(4) locally generating replica of a L1 G code whose power spectrum characteristics are similar to the unknown W code modulated on L1 carrier frequency signal;
(5) locally generating replica of a L2 G code whose power spectrum characteristics are similar to the unknown W code modulated on L2 carrier frequency signal;
(6) correlating a locally generated replica of C/A code with the received L1 code for obtaining an estimate of L1 group delay (L1 pseudo-range) and L1 carrier phase; and
(7) demodulating the satellite data stream.

5,689,272
METHOD AND SYSTEM FOR PRODUCING ANTENNA ELEMENT SIGNALS FOR VARYING AN ANTENNA ARRAY PATTERN
Robert Mark Harrison, Grapevine; Mark Van Horn, Arlington, and Walter Joseph Rozanski, Jr., Hurst, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 29, 1996, Ser. No. 681,772
Int. Cl.^{6} H01Q *3/22;3/24;3/26*
U.S. Cl. 342—373 **15 Claims**


ANTENNA
BUTLER MATRIX
GAIN AND PHASE ADJUSTMENT
MODULATOR
TRANSMIT SIGNAL(S) BEAM 0
TRANSMIT SIGNAL(S) BEAM 1
TRANSMIT SIGNAL(S) BEAM 2
TRANSMIT SIGNAL(S) BEAM N

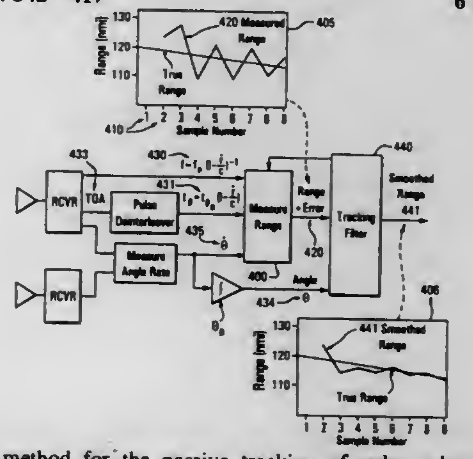
1. A method for producing a plurality of antenna element signals for producing a selected antenna array pattern, said method comprising the steps of:
modifying the amplitude of a first input signal according to a first factor to produce a first modified signal;
modifying the amplitude of a second input signal according to a second factor to produce a second modified signal;
combining said first input signal and said second modified signal to produce a first combined signal;
combining said second input signal and said first modified signal to produce a second combined signal;
measuring a gain and phase of a first and second amplifier;
modifying the gain and phase of at least one of said first and second combined signals in response to said measured gain and phase to produce first and second amplifier input signals;
amplifying said first and said second amplifier input signals to produce amplified signals;
coupling each of said amplified signals to an input of a transform matrix; and
transforming said amplified signals using said transform matrix to produce said antenna element signals.

5,689,273
AIRCRAFT SURFACE NAVIGATION SYSTEM
Charles Gary Bailey, Phoenix, and John Edward Hieber, Bel Air, both of Md., assignors to AlliedSignal, Inc., Morris Township, N.J.
Filed Jan. 30, 1996, Ser. No. 594,099
Int. Cl.^{6} G01S *1/08*
U.S. Cl. 342—407 **12 Claims**



1. A ground guidance system for guiding an aircraft equipped with an Instrument Landing System (ILS) along a defined path comprising:
a pair of inductive loops, the first loop disposed around the right side half of the path and the second loop disposed around the left side half of the path;
a first audio amplifier for driving the first loop at a first audio frequency;
a second audio amplifier for driving the second loop at a second audio frequency;
an inductive sensor mounted on the aircraft for receiving the composite magnetic field induced by the pair of inductive loops;
signal processing means connected to said inductive sensor for converting the signal received by said inductive loop to an RF signal compatible with the aircraft ILS; and,
indicator means in the ILS display responsive to the radio frequency signal from said signal processing means for providing an indication of deviation of the aircraft from the center line of the path for providing both lateral position guidance to the pilot of a taxiing aircraft.

5,689,274
DOPPLER RATE AND ANGLE RATE PASSIVE EMITTER LOCATION
Conrad M. Rose, Dahlgren, Va., assignor to Litton Systems, Inc., Woodland Hills, Calif.
Filed Feb. 20, 1996, Ser. No. 603,367
Int. Cl.^{6} G01S *5/02;1/24;13/08*
U.S. Cl. 342—417 **6 Claims**



1. A method for the passive tracking of pulse echo radars, comprising the steps of:

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- first, measuring the emitter relative bearing,
- second, measuring emitter pulse carrier frequency (f)
- third, measuring emitter pulse time of arrival (TOA),
- storing the results of said firsts, second and third measurements in a dwell set, the set containing measurements made over a time period comprising multiple contiguous pulses together with the system time at which each individual measurement was made,
- deriving a fundamental time period (t_p) from said third measurements in a said dwell set,
- differencing the values, respectively, of said first and second measurements and the values of said time periods (t_p) between two dwells,
- combining the values of said first measurement differences and the time over which they occurred to obtain a bearing rate value,
- adjusting, using recorded system time at which the measurements were made, the differences to provide simultaneous estimates Of the frequency and time difference,
- multiplying the simultaneous (t_p) and frequency values realized from said adjusting step,
- interpolating, by using recorded system times at which the measurements were made, frequency (f) and fundamental time period (t_p) values to obtain simultaneous estimates thereof
- multiplying the simultaneous values obtained in said interpolating step and averaging the product to obtain an estimate of N_c, where N_c is the number of cycles of RF carrier occurring in a fundamental repetitive time interval (t_p) derived from the pulse repetition intervals, where this time interval is a recurring time difference in the emitter signal when measured in the coordinate system moving with the observer,
- valuing the relative acceleration along the signal angle of arrival (AOA) using the products of said first multiplying step and the product of said second multiplying step and
- determining the emitter range from the observer using the result of said combining step, the result of said valuing step and the bearing rate measurement step.

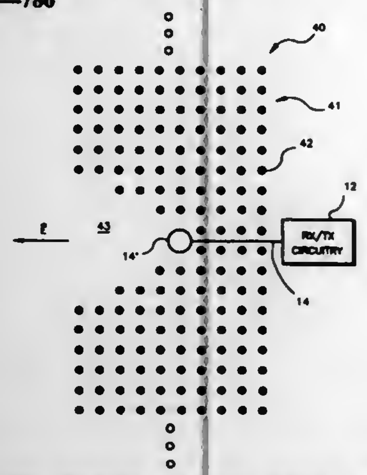
5,689,275
ELECTROMAGNETIC ANTENNA AND TRANSMISSION LINE UTILIZING PHOTONIC BANDGAP MATERIAL

Ricky Lamar Moore, Smyrna; Morris Philip Kesler, Douglasville; James Geoffrey Maloney, and Brian Leon Shirley, both of Marietta, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed May 16, 1995, Ser. No. 442,482

Int. Cl.^{6} H01Q *13/00*

U.S. Cl. 343—786 **20 Claims**



1. An antenna comprising a photonic bandgap material that is adapted to transmit or receive electromagnetic waves encoded with information.

5,689,276
HOUSING FOR ANTENNA DEVICE

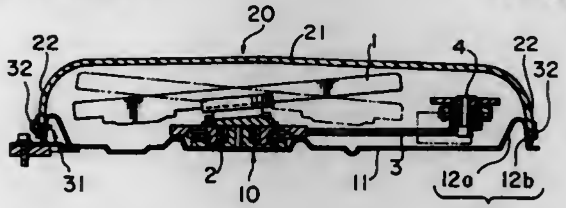
Masahiro Uematsu; Nobuharu Takahashi; Motonobu Moriya, and Takashi Ojima, all of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,095

Claims priority, application Japan, Apr. 7, 1994, 6-093647; Apr. 11, 1994, 6-096913; Apr. 11, 1994, 6-096914

Int. Cl.^{6} H01Q *1/32;1/42*

U.S. Cl. 343—872 **6 Claims**



1. A housing for a satellite antenna device for mounting on a moving body, the antenna device including a satellite antenna body and an automatic tracking mechanism, said housing comprising:

- a lower portion made of metal and including a bottom wall on which said antenna device is fixedly secured, and a side wall of a generally inverted U-shaped cross-section which extends upwardly outwardly from a peripheral edge of said bottom wall, and then extends obliquely downwardly;
- an upper portion releasably connected to said lower portion in a watertight manner, said upper portion being made of a dielectric material and including a generally flat top wall, and a side wall extending from a peripheral edge of said top wall obliquely downwardly outwardly to be held in contact with the obliquely downwardly-extending portion of said inverted U-shaped side wall of said lower portion, thus forming a contact surface therebetween; and
- fastening means for releasably fastening said side walls of said upper and lower portions together while firmly maintaining watertight contact at said contact surface which is formed by contacting said inverted U-shaped side wall of the lower portion with a side surface of said upper portion, said fastening means surely holding a distance between said upper portion and a surface of said antenna body so as to receive electric wave from a satellite in a state of maximum gain at said contact surface.

5,689,277

Patent Not Issued For This Number

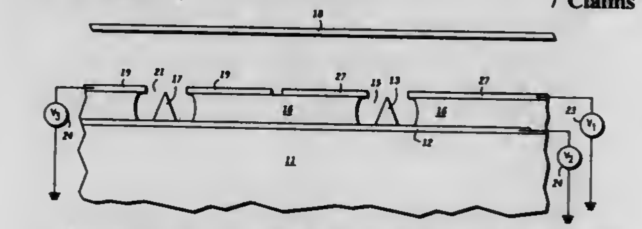
5,689,278
DISPLAY CONTROL METHOD

Dean Barker, Chandler, and Ralph Cisneros, Tempe, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Apr. 3, 1995, Ser. No. 415,971

Int. Cl.^{6} G09G *3/22*

U.S. Cl. 345—74 **7 Claims**



1. A method of controlling a field emission display comprising:

- providing a field emission display having a first row, a second row, and a column, the first row overlying a first emitter and the second row overlying a second emitter;
- applying a first voltage to the first row for a first time period;
- applying a second voltage to the column near an end of the first time period for initiating electron emission from the first emitter during the first time period; and
- maintaining the second voltage on the column while applying a third voltage to the second row for a second time period for initiating electron emission from the second emitter near a beginning of the second time period wherein the second time period occurs after the end of the first time period.

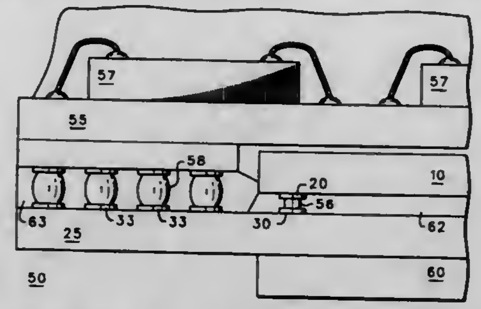
5,689,279
INTEGRATED ELECTRO-OPTICAL PACKAGE

Ronald J. Nelson, Scottsdale, and John W. Stafford, Phoenix, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Division of Ser. No. 216,995, Mar. 24, 1994, Pat. No. 5,432,358. This application Apr. 3, 1995, Ser. No. 415,286

Int. Cl.^{6} G09G *3/32;* H01L *33/00*

U.S. Cl. 345—82 **17 Claims**



1. A portable electronic device with visual display comprising:

- a portable electronic device having a data output terminal; and
- a miniature virtual image display having a viewing aperture, the display being operably attached to the receiver and including a semiconductor chip having a major surface with a plurality of light emitting devices formed on the major surface, each of the light emitting devices having first and second electrodes for activating the light emitting devices, the light emitting devices defining a plurality of pixels positioned in rows and columns and cooperating to generate a complete real image, when activated, at a central portion of the major surface, the semiconductor chip further having external connection/mounting pads adjacent outer edges thereof and outside of the central portion of the major surface with the first electrodes of the light emitting devices being connected to a first plurality of the external connection/mounting pads defining rows of pixels and the second electrodes of the light emitting devices being connected to a second plurality of the external connection/mounting pads defining columns of pixels;
- a window frame substrate having a major surface and defining a central optically transparent light passage therethrough substantially coextensive with the real image at the central portion of the major surface of the semiconductor chip, the window frame substrate further having a plurality of electrical conductors formed therein, each extending from a mounting pad adjacent an edge of the central passage to a connection pad on the major surface of the window frame substrate, the major surface of the semiconductor chip being mounted on the major surface of the window frame substrate with the first and second pluralities of external connection/mounting pads being in electrical contact with the mounting pads of the window frame substrate and real image at the central portion of the major surface of the semiconductor chip being axially aligned and coextensive with the central passage in the major surface of the window frame substrate;
- a plurality of driver and controller circuits having data input terminals connected to the data output terminal of the electronic device and further having control signal output terminals adapted to be connected to the first and second terminals of the light emitting devices for activating the light emitting devices to generate real images in accordance with data signals applied to the data input terminals; and
- a mounting board having first and second opposed major surfaces with first electrical connection pads on the first major surface, second electrical connection pads on the second major surface and electrical connections formed in the mounting board between the first and second electrical connection pads, the plurality of driver and controller circuits being mounted on the first side of the mounting board with the control signal output terminals electrically contacting the first electrical connection pads, the window frame substrate being mounted on the second major surface of the mounting board with the second electrical connection pads in electrical contact with the first and second pluralities of external connection/mounting pads; and
- optics mounted in the electronic device and axially aligned with the central passage in the window frame substrate for defining the aperture and providing a virtual image from the real image generated by the array of light emitting devices, the real image being easily viewable by an operator of the electronic device.

5,689,280
DISPLAY APPARATUS AND A DRIVING METHOD FOR A DISPLAY APPARATUS

Goro Asari, Yokohama; Yutaka Nakagawa, Isehara, both of Japan; Temkar N. Ruckmongathan, Bengalore, India, and Takeshi Kuwata, Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 219,926, Mar. 30, 1994, abandoned. This application Sep. 16, 1996, Ser. No. 714,493

Claims priority, application Japan, Mar. 30, 1993, 5-095575; Jul. 23, 1993, 5-202926

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—89 **12 Claims**

1. A display apparatus for effecting a gray shade display in which a light transmittance of a pixel selected by a scanning electrode and a data electrode is changed in correspondence with a difference of voltages applied to the scanning electrode and the data electrode, comprising:

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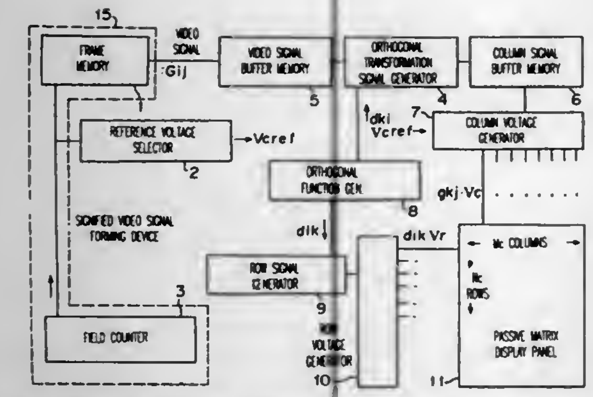


an input for receiving digital video signals having a predetermined number of bits;

a display panel having a plurality of scanning electrodes and a plurality of data electrodes;

a signified video signal forming device for forming signified video signals by distributing digital video signals in a picture to subpictures whose number is equal to the predetermined number of bits of the inputted digital video signals, each subpicture baving a bit significance value directed to a number of gradation levels in the gray shade display;

an orthogonal function generator for generating orthogonal function signals having substantial orthogonality;

an orthogonal transformation signal generator for receiving the signified video signals and the orthogonal function signals to operate and output data signals;

a scanning voltage generator for receiving scanning signals to apply scanning voltages to the scanning electrodes of the display panel; and

a data voltage generator for receiving data signals to apply data voltages to the data electrodes of the display panel, wherein the scanning voltage generator and the data voltage generator are such ones that a peak value of a driving voltage, in each of the subpictures, applied to the display panel as a voltage difference between the scanning voltage and the data voltage corresponds to the significance value of a respective bit of the digital video signals.

5,689,281

LIQUID CRYSTAL DISPLAY APPARATUS

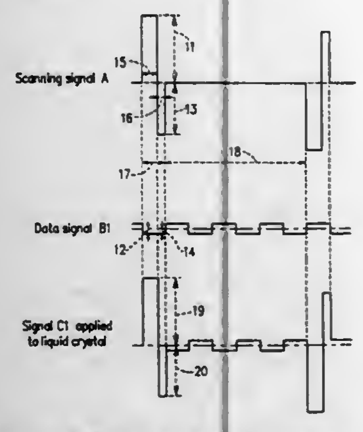
Takao Nomura, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1995, Ser. No. 456,868

Claims priority, application Japan, Jun. 28, 1994, 6-146486

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—94 **4 Claims**



1. A liquid crystal display apparatus comprising:

a pair of substrates and a liquid crystal layer sandwiched therebetween;

a plurality of scanning lines arranged parallel to each other, the scanning signal lines being formed on one of the pair of substrates;

a plurality of data signal lines arranged parallel to each other, the data signal lines being formed on the other of the pair of substrates;

a plurality of pixel electrodes formed on the one of the pair of substrates corresponding to portions in which the scanning signal lines cross the data signal lines, wherein the pixel electrodes, the data signal lines opposed to the pixel electrodes and portions of the liquid crystal layer between the pixel electrodes and the data signal lines constitute picture elements; and

a nonlinear resistive two-terminal device provided between at least one of the pixel electrodes and scanning signal lines,

wherein scanning signals each including a selection period and a non-selection period are applied to the scanning signal lines, data signals are applied to the data signal lines,

wherein said scanning signals and said data signals cause liquid crystal application signals to be applied across the liquid crystal layer and the nonlinear resistive two-terminal device,

wherein each of the liquid crystal application signals has a first voltage in a writing period as a first portion of the selection period and a second voltage in a regulating period as a latter portion of the selection period, the first voltage being a voltage determined in accordance with video data so that electric charge corresponding to the first voltage of the each of the liquid crystal application signals is charged into a corresponding one of the portions of the liquid crystal layer in the writing period, and the second voltage being only a single pulse of voltage,

wherein a voltage level of said single pulse remains substantially constant during said regulating period and at least one of said second voltage and said regulating period is selected to provide substantially uniform charge associated with each picture element across which said liquid crystal application signal is applied and to release part of the electric charge in the corresponding one of the portions of the liquid crystal layer, and

wherein at least one of said second voltage and said regulating period of each picture element is selected according to an electrical characteristic of the corresponding nonlinear resistive two-terminal device so that a difference in said electrical characteristic of each said two terminal device from a corresponding electrical characteristic of each of said other two terminal devices is substantially compensated for so that the effect of said electrical characteristic difference on said electric charge in the corresponding one of the portions of the liquid crystal layer is reduced.

5,689,282

DISPLAY DEVICE WITH COMPENSATION FOR STRAY CAPACITANCE

Peter B. A. Wolfs, and Karel E. Kuijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

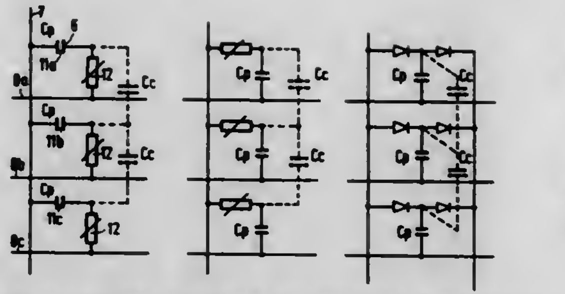
Filed Jun. 15, 1992, Ser. No. 898,985

Claims priority, application European Pat. Off., Sep. 7, 1991, 91201789

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—100 **16 Claims**

1. A display device comprising: a system of pixels arranged in rows and columns, a line selection circuit coupled to the pixels via a system of row electrodes and which, during operation, selects rows of pixels by means of selection voltages applied to the rows of pixels via the row electrodes, and a circuit for presenting, via a system of column electrodes, column or data voltages to the pixels during row selection, characterized in that the line selection circuit selects in sequence consecutive rows of pixels within groups of at least two rows of pixels during operation and charges consecutive groups of pixels in the opposite sense, and wherein the line selection circuit applies a selection voltage to at least one row electrode or selection electrode at the beginning or the end of a group of rows during operation, which selection voltage differs from the other selection voltages applied within said group of rows.



5,689,283

DISPLAY FOR MOSAIC PATTERN OF PIXEL INFORMATION WITH OPTICAL PIXEL SHIFT FOR HIGH RESOLUTION

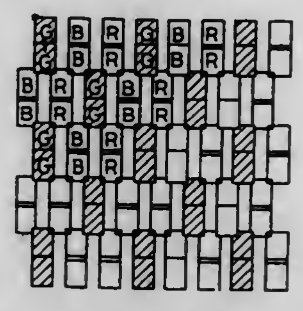
Yoshiki Shirochi, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 177,553, Jan. 5, 1994, abandoned. This application Jul. 14, 1995, Ser. No. 502,583

Claims priority, application Japan, Jan. 7, 1993, 5-016955; Jan. 14, 1993, 5-196973

Int. Cl.⁶ G09G *3/02*

U.S. Cl. 345—132 **10 Claims**



1. A method of increasing resolution of an image displayed to a viewer on an image display system having a matrix of pixels arranged in horizontal rows and vertical columns and selectively energizable to display an image composed of a plurality of pixel patterns in alternate fields, comprising the steps of:

providing an optical path changer formed of a light refractive member;

positioning the optical path changer between the image display system and the viewer so that the viewer views the image through the optical path changer and for shifting the optical path between the display system and the viewer to optically shift a pixel pattern;

operating said optical path changer to shift said optical path by refraction; and

displaying the pixel pattern on said image display system to be shifted in every field in synchronism with the shifting of said optical path by said optical path changer by shifting a horizontal clock signal of said image display system out of phase with a horizontal synchronizing signal of image information supplied thereto in conformity with sampled positions on the displayed image when the optical path is shifted horizontally, and

shifting a vertical clock signal of said image display system out of phase with a vertical synchronizing signal of image information supplied thereto in conformity with sampled positions on the displayed image when the optical path is shifted vertically.

5,689,284

METHOD FOR DIRECT MANIPULATION OF IMAGES ON A MONITOR WITH A MOUSE

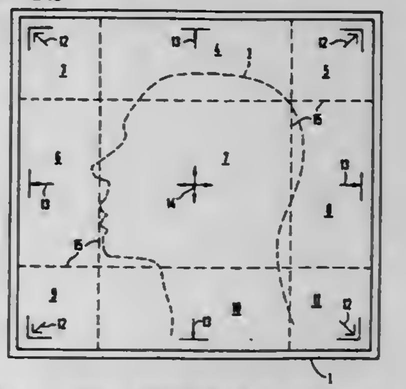
Martin Herget, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 20, 1995, Ser. No. 575,594

Claims priority, application Germany, Dec. 23, 1994, 44 46 431.2

Int. Cl.⁶ G09G *5/08*

U.S. Cl. 345—145 **7 Claims**



1. A method for direct manipulation of images on a computer monitor with a mouse, comprising the steps of:

dividing an image displayed on a monitor into nine regions, including four corner regions respectively disposed at corners of the displayed image, four middle edge regions respectively disposed between said corner regions, and a central region disposed inside said corner regions and said middle edge regions;

displaying a mouse cursor in one of said nine regions;

when said mouse cursor is located in one of said four corner regions and when said mouse cursor is displaced, downsizing or enlarging said image after activation corresponding to displacement of said mouse cursor;

when said mouse cursor is located in said central region and when said mouse cursor is displaced, shifting a position of said displayed image, after activation, corresponding to displacement of said mouse cursor; and

when said mouse cursor is located in one of said four middle edge regions and when said mouse cursor is displaced, scrolling said displayed image, after activation, corresponding to displacement of said mouse cursor.

5,689,285

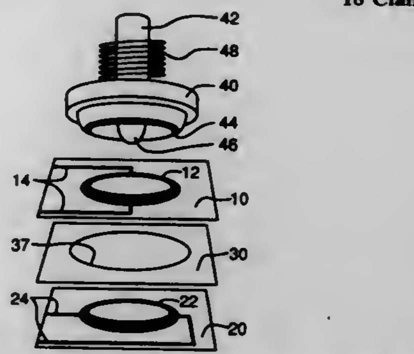
JOYSTICK WITH MEMBRANE SENSOR

David J. Asher, P.O. Box 8748, Albany, N.Y. 12208

Continuation of Ser. No. 120,723, Sep. 13, 1993, abandoned. This application May 2, 1995, Ser. No. 434,456

Int. Cl.⁶ G09G *5/08*

U.S. Cl. 345—161 **18 Claims**



1. A joystick for generating directional control signals, said joystick comprising:

first and second insulating substrates, each of said first and second insulating substrates having a first surface region, said

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first and second insulating substrates being positioned to place said first surface regions of said first and second substrates in spaced apart substantially parallel relationship with one another;

a first resistor defined by a closed-loop conductive pattern on said first surface region of said first insulating substrate;

first and second electrical conductors, said first and second electrical conductors being in electrical contact with said first resistor at spaced apart locations of said closed-loop conductive pattern that defines said first resistor to partition said closed-loop conductive pattern into first and second electrically parallel resistance paths; each of said first and second parallel resistance paths of said first resistor extending between said first and second electrical conductors;

a second resistor defined by a closed-loop conductive pattern of substantially the same geometry as the geometry of said closed-loop conductive pattern that defines said first resistor, said second resistor being located on said first surface region of said second insulating substrate and being in spaced apart substantial spatial registration with said first resistor;

third and fourth electrical conductors, said third and fourth electrical conductors being in electrical contact with said second resistor at first and second spaced apart locations of said closed-loop conductive pattern that defines said second resistor to partition said closed-loop conductive pattern into first and second electrically parallel resistance paths; each of said first and second parallel resistance paths of said second resistor extending between said third and fourth electrical conductors;

a pressure-sensitive resistive material, interposed between said first surfaces of said spaced apart first and second substrates, said pressure-sensitive resistive material exhibiting a resistance value representative of an applied contacting force; and

an actuator positioned for operative interaction with one of said first and second insulating substrates, said actuator being radially deflectable to apply a localized pressure on said one of said first and second insulating substrates; said localized pressure acting on said pressure sensitive resistive material to establish a resistive signal path at the location of said localized pressure and extending between said first and second resistors, the resistance of said resistive signal path to thereby establish a first resistance value between said first and second conductors of said first resistor and a second resistance value between said third and fourth conductors of said second resistor, said first and second resistance values being representative of the direction of radial deflection of said actuator.

5,689,286

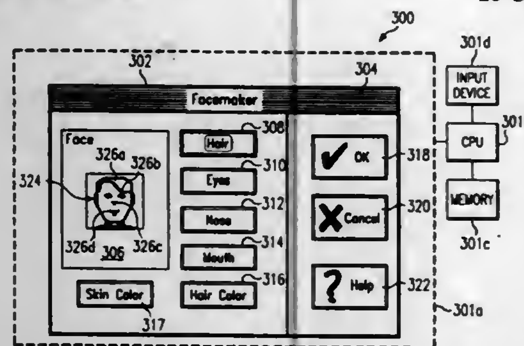
COMPONENT-BASED ICON CONSTRUCTION AND CUSTOMIZATION SYSTEM

Theodore D. Wugofski, Fort Worth, Tex., assignor to AST Research, Inc., Irvine, Calif.

Division of Ser. No. 449,893, May 23, 1995, Pat. No. 5,559,947. This application Jul. 1, 1996, Ser. No. 673,009

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 345—348 **28 Claims**



1. A method of operating a computer system having a display screen, the method comprising the computer implemented steps of:

displaying an icon comprising at least two icon components on said display screen, wherein at least one of said at least two icon components is a user-modifiable non-text icon component;

for each said user-modifiable non-text icon component, selecting an object from a set of objects for representing said user modifiable non-text icon component by selecting a graphical display element associated with said user-modifiable non-text icon component, wherein only one object from said set of objects is displayed on said display screen during said selecting; and

for each said user-modifiable non-text icon components, responsive to said selecting step, modifying said icon by overlaying said selected object on said icon, wherein said modifying occurs automatically without additional input from a user following said selecting;

wherein said modifying each said user-modifiable non-text icon component does not effect a modification of any other ones of said at least two icon components.

5,689,287

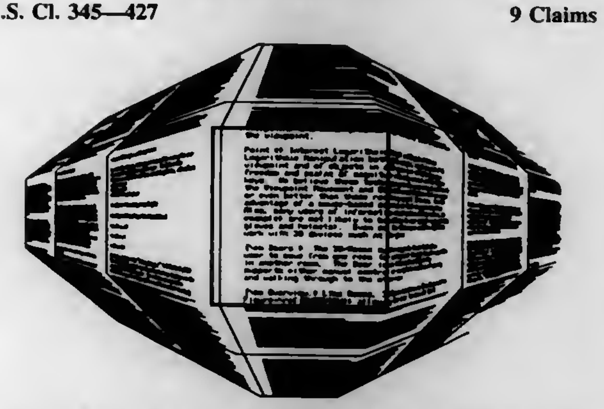
CONTEXT-PRESERVING DISPLAY SYSTEM USING A PERSPECTIVE SHEET

Jock D. Mackinlay, Palo Alto, and George G. Robertson, Foster City, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 144,238, Oct. 27, 1993, abandoned. This application Jan. 22, 1996, Ser. No. 589,433

Int. Cl.^{6} G06T *15/00*

U.S. Cl. 345—427 **9 Claims**



1. A method for presenting an interactive navigation of an image where context and detail information are preserved even when the image contains too much detail to be displayed all at once on a display surface, the method comprising the steps of:

a) defining a display extent on the display surface within which extent the image is to be displayed;

b) defining a 3-D space and a viewpoint in the 3-D space;

c) accepting user input to determine an extent and a position of a focus panel in the 3-D space wherein said focus panel is a panel positioned within boundaries of a representation of the display surface;

d) calculating a transform matrix for each of said focus panel, four edge panels and four corner panels, wherein an edge panel is a rectangle in the 3-D space with one edge coincident with the focus panel and an opposite edge coincident with an edge of the display extent and wherein a corner panel is a parallelogram in the 3-D space with two adjacent edges coincident with edges of two edge panels, thereby forming a continuous, nine-panel surface in the 3-D space with a transformation matrix for a panel defining a mapping of points on the image to points on the nine-panel surface;

wherein calculating the transform matrix for each of said four corner panels comprises the steps of:

(1) calculating a shearing transform of a corner panel from a rectangle to a quadrilateral, said shearing transform resulting in an angle between side edges of said corner panel equal to a fitting angle for said quadrilateral, wherein said

fitting angle is an angle formed by edges of the two side panels adjacent to the corner panel for which the shearing transform is calculated; and

(2) calculating a rotation transform of the quadrilateral in said layout plane, the rotation transform being a transform of a rotation by a rotation angle which would rotate the quadrilateral into alignment with the two side panels;

e) rendering a display image of the continuous, nine-panel surface from the viewpoint using the transformation matrices calculated in step d), the step of rendering using as its input a plurality of object representations providing the context and detail information; and

f) repeating at least steps c), d) and e) in real-time to provide interactive navigation of the image by a user inputting the user input.

5,689,288

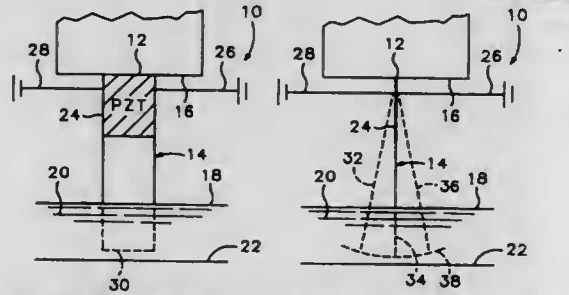
INK LEVEL SENSOR

Guenther W. Wimmer; Richard S. Meissner, both of Portland, and David L. Knierim, Wilsonville, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Jun. 17, 1994, Ser. No. 261,589

Int. Cl.^{6} B41J *2/195*

U.S. Cl. 347—7 **18 Claims**



1. A device for sensing a level of ink in a reservoir in a print head of a printer, the ink having an exposed upper surface and an opposing bottom surface, comprising:

a flexible bar fastened to a mounting surface within the print head and suspended within the reservoir extending through the exposed upper surface of the ink toward the opposing bottom surface;

a PZT actuator and detector connected to the flexible bar for providing motion to the flexible bar;

a signal generator connected to the PZT actuator for generating a measured voltage signal waveform representative of the motion of the flexible bar, the signal having a frequency;

the PZT detector processing a measured voltage signal waveform representative of the motion of the flexible bar; and

an analyzer associated with the PZT actuator and detector analyzing the frequency of the signal waveform across the PZT actuator and detector for converting the signal waveform into an ink level indication by defining a degree of immersion of the bar in the ink.

5,689,289

IMAGE RECORDING APPARATUS

Naoya Watanabe, Yokohama; Makoto Kobayashi, Tama; Junji Iguchi, Musashino; Yasuyuki Shinada; Yukio Nohata, both of Yokohama, and Yuji Shimahara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

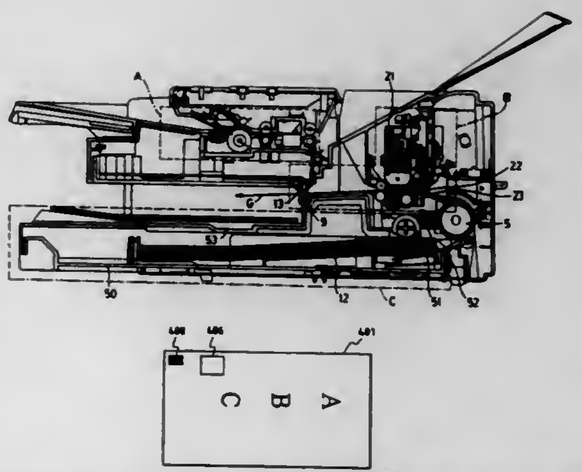
Filed Nov. 28, 1994, Ser. No. 348,223

Claims priority, application Japan, Nov. 30, 1993, 5-299915; Mar. 10, 1994, 6-039856

Int. Cl.^{6} B41J *2/195;2/205*

U.S. Cl. 347—7 **8 Claims**

1. An image recording apparatus having a first recording mode of recording with a means for recording an image on a recording medium at a predetermined recording density, and a second recording mode of recording with the recording means an image on the recording medium at a lower recording density than said first recording mode, the image recording apparatus comprising:



selecting means for selecting said first recording mode or said second recording mode;

recording control means for controlling the recording means to record a predetermined image on the recording medium after recording of a predefined amount of image in said first recording mode or said second recording mode which is selected by said selecting means;

detecting means for detecting said predetermined image; and

processing means for performing a predetermined process based on a detected result of said detecting means;

wherein said recording control means controls the recording means to record said predetermined image in said first recording mode, without regard to the recording mode selected by said selecting means.

5,689,290

LIQUID LEVEL DETECTING MECHANISM AND INK JET RECORDING APPARATUS HAVING THE MECHANISM

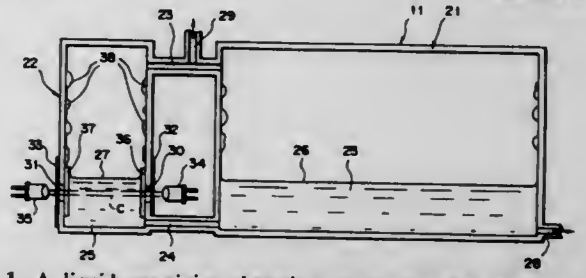
Atsushi Saito, Yokohama; Akio Okubo, Tokyo, and Yasuhiko Ikeda, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 484,909, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 74,465, Jun. 10, 1993, abandoned. This application May 9, 1996, Ser. No. 647,285

Claims priority, application Japan, Jun. 11, 1992, 4-176033

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—7 **40 Claims**



1. A liquid remaining detecting mechanism for detecting a remaining amount of liquid in a container for storing the liquid, comprising:

a light emitting section and a light receiving section provided within the container or a member communicating with the container, said light receiving section detecting the presence or absence of a predetermined liquid in the container based on an amount of light received from said light emitting section; and

light permeable liquid guiding means, having a directional component, for guiding the liquid in a direction of liquid level change in the container as the liquid in the container is reduced, said liquid guiding means having high wettability relative to the liquid in a light path from said light emitting section to said light receiving section.

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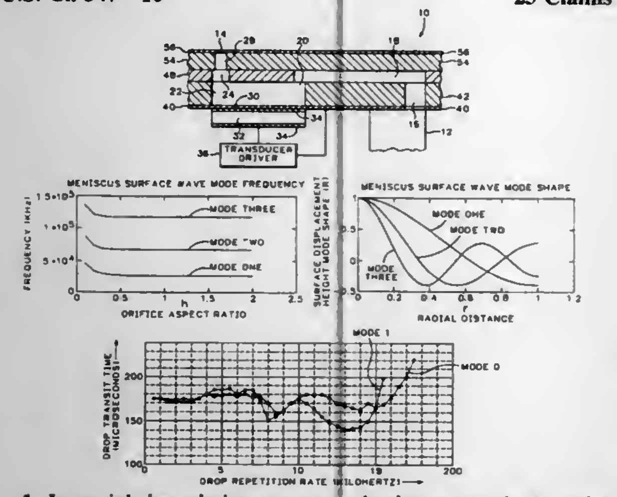
5,689,291
METHOD AND APPARATUS FOR PRODUCING DOT SIZE MODULATED INK JET PRINTING

David A. Tence, Tigard; Sharon S. Berger, Salem, and Ronald F. Burr, Wilsonville, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation-in-part of Ser. No. 100,504, Jul. 30, 1993, Pat. No. 5,495,270. This application Jan. 11, 1995, Ser. No. 371,197

Int. Cl.^{6} B41J *2/045*; **G01D** *15/16*

U.S. Cl. 347—10 **25 Claims**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TRANSDUCER DRIVER
MENISCUS SURFACE WAVE MODE FREQUENCY
FREQUENCY (KHz)
MODE THREE
MODE TWO
MODE ONE
ORIFICE ASPECT RATIO
MENISCUS SURFACE WAVE MODE SHAPE
SURFACE DISPLACEMENT HEIGHT MODE SHAPE
MODE ONE
MODE TWO
MODE THREE
RADIAL DISTANCE
MODE 1
MODE 0
DROP TRANSIT TIME (MICROSECONDS)
DROP REPETITION RATE (KILOHERTZ)

1. In an ink jet printing apparatus, having a transducer and a transducer driver, said transducer coupled to a pressure chamber that is fluidicallly coupled to an orifice in which an ink forms a meniscus and the orifice and an image receiving medium move at selectable scanning speeds relative to one another, and the orifice deposits at a first resolution on the image receiving medium ink dots of a first diameter by moving the orifice and the image receiving medium at a first scanning speed relative to one another and ejecting from the orifice ink drops each having a first volume, an improvement comprising:

the transducer driver generating at least a first and a second selectable energy input that actuates a transducer coupled to the pressure chamber to excite in the meniscus at least respective first and second mode shapes, the at least first and second selectable energy inputs causing ejection of ink drops having respectively at least the first volume and a second volume, the first energy input generated in association with the first scanning speed further having at least a first spectral energy distribution that excites the meniscus in a first mode shape to eject from the orifice ink drops having the first volume; and

the transducer driver further selecting the second energy input in association with a second scanning speed, the second energy input having at least a second spectral energy distribution that excites the meniscus in a second mode shape to eject from the orifice ink drops having at least a second volume less than the first volume, the second energy input and the second scanning speed cooperating to deposit ink dots of the second diameter on the image receiving medium at a second resolution.

5,689,292
MULTI-STEP HEATING OF A RECORDING HEAD

Naobisa Suzuki, Yokohama; Kazuhisa Kawakami, Kawasaki, and Junichi Yoshikawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

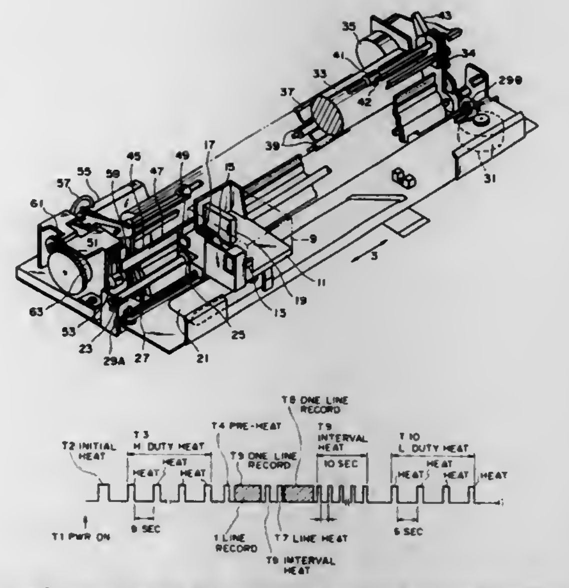
Continuation of Ser. No. 967,390, Oct. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 744,704, Aug. 13, 1991, Pat. No. 5,307,093. This application Jun. 18, 1996, Ser. No. 665,771

Claims priority, application Japan, Aug. 14, 1990, 2-214646; Aug. 14, 1990, 2-214647; Aug. 14, 1990, 2-214648; Aug. 14, 1990, 2-214649; Oct. 29, 1991, 3-282416

Int. Cl.^{6} B41J *2/05*

U.S. Cl. 347—17 **32 Claims**

1. A recording apparatus for recording an image on a recording material, the apparatus comprising:



record control means for controlling a recording head to effect a recording operation;

a heat generating element for controlling a temperature of the recording head;

driving means for driving said heat generating element to generate heat; and

control means for controlling said driving means to generate heat with said heat generating element with plural steps, each generating heat a plurality of times in a predetermined heat generating period, after completion of a recording operation, wherein energy applied to said heat generating element in a later step is smaller than energy applied to said heat generating element in an earlier step.

5,689,293
INK JET HEAD CAPPING DEVICE

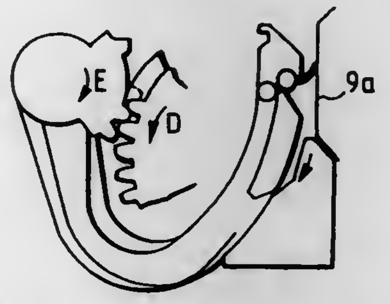
Hirofumi Hirano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 55,757, May 3, 1993, which is a continuation of Ser. No. 735,114, Jul. 24, 1991, abandoned, which is a continuation of Ser. No. 455,131, Dec. 21, 1989, abandoned. This application Dec. 1, 1993, Ser. No. 159,623

Claims priority, application Japan, Jan. 23, 1989, 1-13492; Jan. 23, 1989, 1-13493; Jan. 23, 1989, 1-13494; Jan. 23, 1989, 1-13495; Jan. 23, 1989, 1-13496; Jan. 23, 1989, 1-13497; Feb. 28, 1989, 1-47412; Jun. 2, 1989, 1-139309; Jun. 2, 1989, 1-139319

Int. Cl.^{6} B41J *2/165*

U.S. Cl. 347—33 **15 Claims**



1. An ink jet recording apparatus comprising:

a recording head having a surface with a discharge port therein for discharging ink;

a carrier having said recording head thereon and movable through a recording region and a region adjacent to said recording region;

a cap arranged in said adjacent region and capable of movement between a capping position wherein said cap contacts said surface and covers said discharge port and a release position wherein said cap is spaced from said surface; and

a wiping member for wiping said surface, wherein said wiping member is arranged at a position overlapping said cap and is movable in front of said cap to wipe said surface when said cap is in said release position and is movable to a retreat position when said cap is in said capping position.

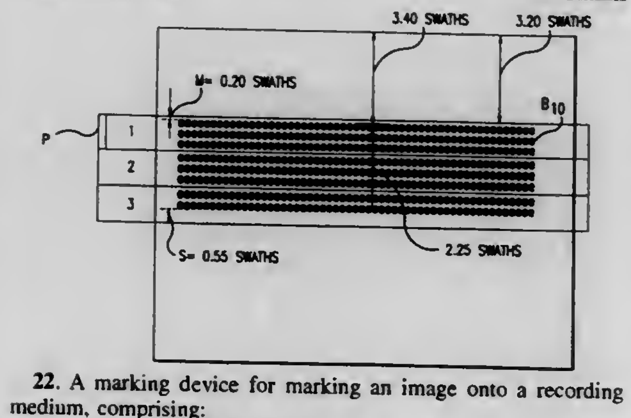
5,689,294
METHOD AND APPARATUS FOR SKIPPING WHITE SPACES IN MARKING DEVICES

Robert S. Karz, Webster, and Thomas N. Taylor, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1995, Ser. No. 367,612

Int. Cl.^{6} B41J *2/145;2/15;29/38*

U.S. Cl. 347—40 **23 Claims**



22. A marking device for marking an image onto a recording medium, comprising:

means for analyzing said image;

means for determining a number of complete swaths required to mark the image which was analyzed;

means for positioning a marking element to mark the image which was analyzed; and

means for marking the image which was analyzed in the number of complete swaths determined.

5,689,295
MULTICOLOR INK JET PRINTING METHOD, PRINT HEAD HAVING PARTICULAR ORIFICE ARRANGEMENT, AND HEAD MANUFACTURE METHOD INCLUDING REMOVAL AND ASSEMBLY OF LAYERS

Jury Grigorievich Eremin; Sergei Nikolaevich Maximovsky, and Grigory Avramovich Radutsky, all of Moscow, Russian Federation, assignors to Samsung Electronics Co., Ltd., Seoul, Rep. of Korea

PCT No. PCT/SU91/00107, § 371 Date Apr. 13, 1992, § 102(e) Date Apr. 13, 1992, PCT Pub. No. WO91/19956, PCT Pub. Date Dec. 26, 1991

PCT Filed May 30, 1991, Ser. No. 847,983

Claims priority, application U.S.S.R., Jun. 12, 1990, 4829820

Int. Cl.^{6} B41J *2/21;2/015;2/06*

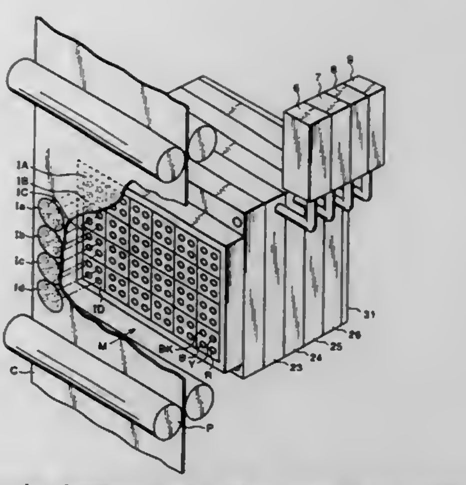
U.S. Cl. 347—43 **4 Claims**

4. A jet print head for multicolor jet printing comprising:

an ink supply system for supplying ink for multicolor printing,

a row of ink sources for supplying said supply system, each source of said row of ink sources supplying one of a plurality of ink colors,

a substrate comprising a main layer and a group of layers, wherein each layer of said group of layers receives ink of one of said plurality of ink colors from one source of said row of ink sources,



a row of feeder channels of said supply system, each channel of said row of feeder channels being connected to one of said ink sources and being located in one of said layers of said substrate for feeding an ink color of said plurality of ink colors intended for said layer,

a plurality of capillary orifices combined into capillary orifice groups, said capillary orifice groups being arranged on a plurality of parallel rows perpendicular to a plane in which said substrate is located,

each capillary orifice of said plurality of capillary orifices having a geometric axis and intended to apply ink of one color,

inlets of said capillary orifices intended to apply the ink of one color in all said groups arranged in one layer of said group of layers in accordance with the ink color intended for said layer connected to each of said feeder channels arranged in said one of said layers of said substrate,

first electrodes of one polarity, each of said first electrodes being associated with one of said plurality of rows and being common for the orifices of said one of said plurality of rows,

second electrodes of polarity opposite to that of said first electrodes, each of said second electrodes being associated with one of said capillary orifices,

said first electrodes and said second electrodes being located in one plane perpendicular to geometric axes of said capillary orifices, and

a system for supplying electric current connected to said first electrodes and connected to said second electrodes and located in a plane parallel to said one plane, whereby ink jets of each group of orifices form points of ink of each color which together appear to be substantially of a single color,

wherein each of said capillary orifice groups comprises four capillary orifices disposed in a square arrangement.

5,689,296
DIGITAL PRINTING APPARATUS

Kjell A. Heitmann, Norwalk, and Bruce E. Inpyn, Hamden, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 2, 1995, Ser. No. 556,785

Int. Cl.^{6} B41J *2/05*

U.S. Cl. 347—50 **15 Claims**

1. In a digital printing apparatus including a print head having an ink jet module assembly containing a plurality of ink ejecting devices and a control electronics component including a printed circuit board for controlling the sequence of activation of the ink ejecting devices, a circuit connecting device for connecting the printed circuit board to the ink ejecting devices, said circuit connecting device comprising:

A. a pair of generally planar plates formed of relatively rigid dielectric material and having a pair of spaced apart electrical input and output sections and at least one intermediate control section, and mutually complementary means for securing said plates together in aligned face to face relationship,

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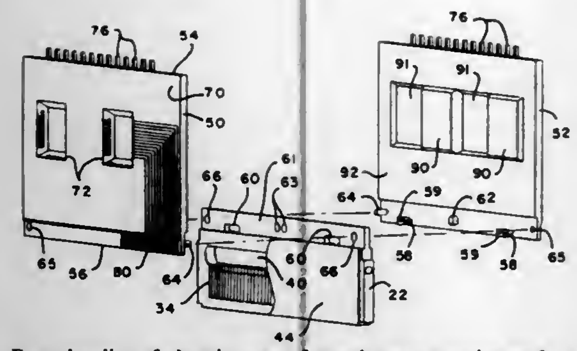


- B. a plurality of electric traces formed on an exterior surface of each of said plates and communicating between said electrical input section and said intermediate control section, and said intermediate control section and said out section respectively,
- C. means mounted on said electrical input and output sections for connecting said plurality of electric traces to the control electronics component and the ink ejecting devices of the print head respectively, and
- D. an electronic driver chip having electrical input and output sections mounted at said intermediate control section on each of said plates, said electrical input and output sections having means for connecting said driver chip to said plurality of electric traces,

whereby said circuit connecting device forms an integral part of the electrical circuitry between the control electronics component and the ink ejecting devices without the use of any conventional electric wiring therebetween.

5,689,297
THERMOSENSITIVE STENCIL PRINTER CAPABLE OF CONTROLLING IMAGE DENSITY

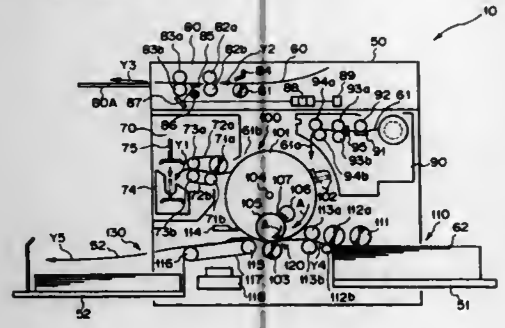
Yasumitu Yokoyama, and Satoshi Kato, both of Kakuda, Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi-ken, Japan

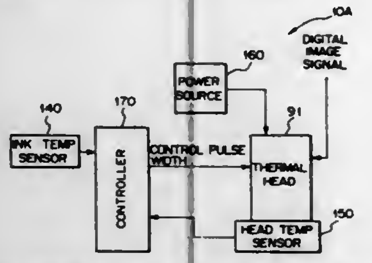
Filed May 11, 1994, Ser. No. 240,571

Claims priority, application Japan, May 11, 1993, 5-109341; Aug. 18, 1993, 5-204272

Int. Cl.^{6} B41J *2/36;2/37;2/365*

U.S. Cl. 347—188 **17 Claims**





1. A device included in a thermosensitive stencil printer for controlling a density of an image to be formed on a sheet by a thermal head in association with a change in a temperature of ink, said device comprising:

ink temperature sensing means for sensing the temperature of the ink and outputting a corresponding ink temperature signal;

head temperature sensing means for sensing a temperature of the thermal head and outputting a corresponding head temperature signal; and

control means, receiving said ink temperature signal, and said head temperature signal for adjusting cutting energy being applied to the thermal head according to a predetermined energy, included in said control means, for cutting a thermosensitive stencil in response to the ink temperature signal and the head temperature signal.

5,689,298
METHOD AND APPARATUS FOR MULTIPLE READOUT OF DIGITAL VIDEO DATA WITH FASTER PLAYBACK MODE SWITCHING

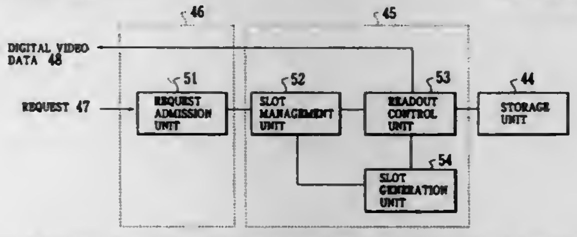
Kazutoshi Nishimura, Tokyo; Yutaka Ishibashi, Aichi-ken, and Tatsuo Mori, Chiba-ken, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Nov. 24, 1993, Ser. No. 157,615

Claims priority, application Japan, Nov. 26, 1992, 4-317062

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 348—7 **14 Claims**



1. A method for multiple readout of digital video data stored in a storage device, in response to requests from a plurality of user terminals, comprising the steps of:

forming a cycle for a readout operation by a plurality of slots, each slot representing a unit time for reading a unit amount of the digital video data for each channel assigned to each user terminal;

allocating at least one of said plurality of slots forming each cycle to each channel and additionally allocating at least one of said plurality of slots not yet used for any channel in each cycle to a user terminal which is requesting a playback mode switching; and

carrying out the readout operation to read the digital video data for each channel from the storage device at every slot allocated to each channel at the allocating step in each cycle, by cyclically repeating the cycle for the readout operation formed at the forming step.

5,689,299
PICTURE DISTRIBUTION METHOD AND DEVICE COMPRISING COPYING OF PICTURE INFORMATION FROM A FIRST FILE TO PLURAL SECOND FILES

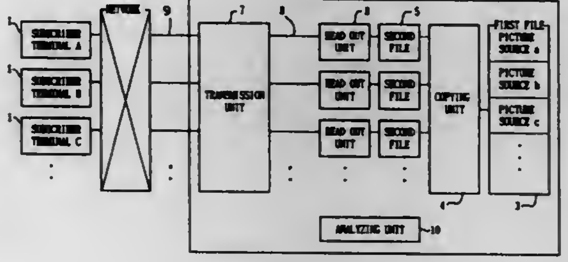
Osamu Isono, and Tsudoi Kubo, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 271,196, Jul. 7, 1994, abandoned. This application Dec. 11, 1996, Ser. No. 763,822

Claims priority, application Japan, Dec. 22, 1993, 5-324469

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 348—7 **6 Claims**



1. A picture distribution method for a picture supply device which comprises a first file for storing plural kinds of picture sources and plural second files for temporarily storing picture sources, and is connected to a network, comprising the steps of:

determining a particular address in the first file for a picture source demanded by a first subscriber terminal when a supply demand for the picture source is made from the first subscriber terminal;

determining a particular empty second file in the plural second files;

first identifying a first subscriber circuit which is connected to the first subscriber terminal;

first copying the picture source at the address determined at said address determining step into the empty second file which is determined at said empty second file determining step;

first reading out the picture source copied at said first copying step from said second file;

first transmitting the picture source read out at said first reading out step to the first subscriber circuit

determining another particular empty second file in the plural second files when a supply demand for the picture source is made from a second subscriber terminal during transmission of the picture source to the first subscriber terminal;

second identifying second subscriber circuit which is connected to the second subscriber terminal;

second copying the picture source stored at the address determined at said address determining into the another empty second file which is determined at said another empty second file determining step;

second reading out the picture source copied at said second copying step from said another second file; and

second transmitting the picture source read out at said second reading out step to the second subscriber circuit.

5,689,300
PICTURE CODEC AND TELECONFERENCE TERMINAL EQUIPMENT

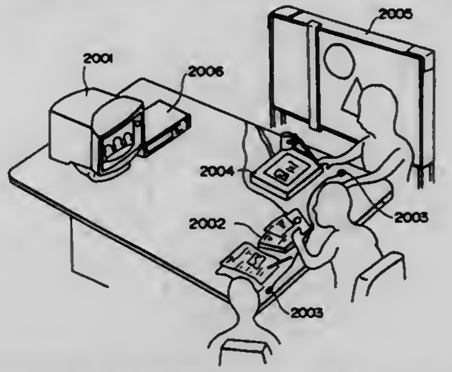
Yoji Shibata, Yokosuka; Masaaki Takizawa, Tokyo; Hitoshi Matsushima, Tachikawa; Hiroshi Yoshikawa, Fujisawa; Atsuo Yoshida, Kokubunji; Toru Ebihara, Higashimurayama; Jun Furuya, Kokubunji; Yukinobu Maruyama, Tokyo, and Takehiko Yamada, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 913,402, Jul. 15, 1992, and a continuation-in-part of Ser. No. 384,955, Feb. 7, 1995, which is a continuation of Ser. No. 838,348, Feb. 20, 1992, Pat. No. 5,396,269. This application Jul. 31, 1995, Ser. No. 509,591

Claims priority, application Japan, Jul. 15, 1991, 3-174049; Jan. 24, 1992, 4-011196

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 348—15 **5 Claims**



2. An equipment for a teleconference in which a few persons utilize the equipment, and for exchanging pictures and video of persons in real time through a digital communication channel, comprising:

communication control means for transmitting and receiving multiplexed video data, user data, facsimile data and audio data through said digital communication channel;

multiplex/demultiplex means for multiplexing and demultiplexing the video data, user data, facsimile data and the audio data to be transmitted by said communication control means and having been received by the same, respectively;

a picture codec which decodes a picture signal from said video data demultiplexed by said multiplex/demultiplex means and then delivers said picture signal as an output, and which codes an input picture signal to-be-coded into said video data and then transfers said vide data to said multiplex/demultiplex means;

a camera which includes a lens having an approximately 60° field of view, and which supplies said picture codec with a picture signal of picked-up-picture as the picture signal to-be-coded;

an external video input terminal which receives a video signal from outside of the equipment and which supplies said picture codec with the video signal as the picture signal to-be-coded;

a display unit which displays a picture represented by the picture signal decoded by said picture codec;

an external video output terminal which outputs the picture signal decoded by said picture codec to outside of the equipment;

an audio codec which decodes a speech signal form said audio data demultiplexed by said multiplex/demultiplex means and then delivers said speech signal as an output, and which codes an input speech signal to-be-coded into said audio data and then transfers said audio data to said multiplex/demultiplex means;

a loud speaker which emits speech based on said speech signal decoded by said audio codec;

an external audio output terminal which outputs said speech signal decided by said audio codec to outside of the equipment;

an external data input/output terminal which receives user data from outside of the equipment and which transfers the received user data to the multiplex/demultiplex means, said external data input/output terminal outputting user data demultiplexed by said multiplex/demultiplex means to outside of the equipment;

an external facsimile signal input/output terminal which receives facsimile signal form outside of the equipment and which transfers the facsimile data represented by the received facsimile signal to the multiplex/demultiplex means, said external facsimile signal input/output terminal outputting facsimile signal represented by the facsimile data demultiplexed by said multiplex/demultiplex means to outside of the equipment; and

a housing in which said communication control means, said multiplex/demultiplex means, said picture codec, said camera, said display unit, said audio codec, said loudspeaker, said external video input terminal, said external audio output terminal, said external video output terminal, said external data input/output terminal and said external facsimile signal input/output terminal are housed, and which has a size permitting said equipment to be placed on a table and removed by a person.

5,689,301
METHOD AND APPARATUS FOR IDENTIFYING VIDEO FIELDS PRODUCED BY FILM SOURCES

Todd J. Christopher, Indianapolis, Ind., and Carlos Correa, Schwenningen, Germany, assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 30, 1994, Ser. No. 366,791

Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—97 **8 Claims**

1. A method of film mode detection of an interlaced video signal, comprising:

concurrently providing selected pixels comprising a first pixel from a given field and second and third vertically aligned pixels of the same horizontal position from a temporally adjacent field;

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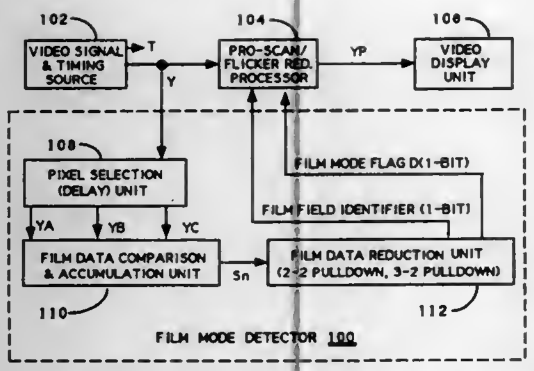

102
104
106
VIDEO SIGNAL & TIMING SOURCE
PRO-SCAN/ FLICKER RED. PROCESSOR
VIDEO DISPLAY UNIT
T
Y
YP
108
PIXEL SELECTION (DELAY) UNIT
FILM MODE FLAG D(1-BIT)
FILM FIELD IDENTIFIER (1-BIT)
YA
YB
YC
FILM DATA COMPARISON & ACCUMULATION UNIT
Sn
FILM DATA REDUCTION UNIT (2-2 PULLDOWN, 3-2 PULLDOWN)
110
112
FILM MODE DETECTOR 100

comparing values of said selected pixels to produce for each first pixel, a pixel difference signal having a value of zero if the value of said first pixel is intermediate the values of said second and third pixels, said pixel difference signal otherwise having a value equal to an absolute value of a pixel difference between the value of said first pixel and the value of one of said second and third pixels having a value closest to the value of said first pixel;

accumulating non-zero values of said pixel difference signals over a predetermined portion of one field period of said interlaced video signal to provide a field difference signal;

analyzing said accumulated field difference signals for a pattern indicative of a film source of said video signal; and wherein

said pattern in said analyzing step comprises two selectable patterns including a 2-2 pull down pattern and a 3-2 pull down pattern.

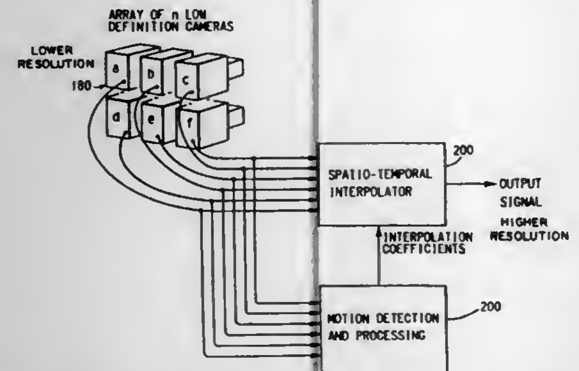
5,689,302
HIGHER DEFINITION VIDEO SIGNALS FROM LOWER DEFINITION SOURCES

Arthur Howard Jones, Horsham, United Kingdom, assignor to British Broadcasting Corp., London, England

Continuation of Ser. No. 446,787, May 31, 1995. This application Sep. 30, 1996, Ser. No. 721,755

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—218 **11 Claims**


ARRAY OF n LOW DEFINITION CAMERAS
LOWER RESOLUTION
180
a
b
c
d
e
f
200
SPATIO-TEMPORAL INTERPOLATOR
OUTPUT SIGNAL HIGHER RESOLUTION
INTERPOLATION COEFFICIENTS
200
MOTION DETECTION AND PROCESSING

1. A method of generating a video signal of a scene at a first, higher, definition from a video source sampling the scene at a second, lower, definition comprising steps of:

acquiring with the source, video data at the second lower definition relating to a first portion of an image of the scene to be televised,

storing the acquired video data in a higher definition store at locations appropriate to the position of the first image portion in the image of the scene to be televised,

acquiring video data relating to further portions of the image of the scene at the lower definition by moving the video signal source,

determining the relative positions in the image of further image portions acquired and acquired video data held in the store by deriving movement information from the video data,

storing the further video data in the higher definition store at storage locations related to the storage locations of the video data representing the first image portion in accordance with the relative positions in the image to be televised of the first portion and the further portions, and

reading from the store video data representing the image of the scene to be televised at the higher definition.

5,689,303
ELECTRONIC STILL CAMERA UTILIZING UPDATABLE FRAME CATENA INFORMATION TO MAINTAIN FRAME SEQUENCE

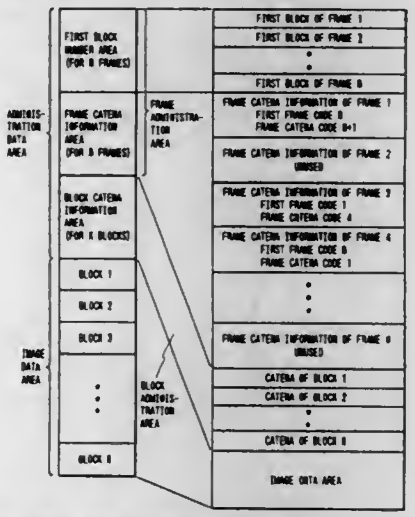
Toshihisa Kuroiwa, Miura, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 500,110, Jul. 10, 1995, abandoned, which is a continuation of Ser. No. 95,918, Jul. 23, 1993, abandoned. This application Jun. 5, 1996, Ser. No. 658,302

Claims priority, application Japan, Jul. 28, 1992, 4-200044; Jun. 18, 1993, 5-147194

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—232 **30 Claims**


FIRST BLOCK NUMBER AREA (FOR n FRAMES)
FIRST BLOCK OF FRAME 1
FIRST BLOCK OF FRAME 2
FIRST BLOCK OF FRAME n
ADMINISTRATION DATA AREA
FRAME CATENA INFORMATION AREA (FOR n FRAMES)
FRAME ADMINISTRATION AREA
FRAME CATENA INFORMATION OF FRAME 1
FIRST FRAME CODE 0
FRAME CATENA CODE 0+1
FRAME CATENA INFORMATION OF FRAME 2
UNUSED
FRAME CATENA INFORMATION OF FRAME 3
FIRST FRAME CODE 1
FRAME CATENA CODE 4
BLOCK CATENA INFORMATION AREA (FOR k BLOCKS)
FRAME CATENA INFORMATION OF FRAME 4
FIRST FRAME CODE 0
FRAME CATENA CODE 1
BLOCK 1
BLOCK 2
BLOCK 3
IMAGE DATA AREA
FRAME CATENA INFORMATION OF FRAME n
UNUSED
BLOCK ADMINISTRATION AREA
CATENA OF BLOCK 1
CATENA OF BLOCK 2
CATENA OF BLOCK k
BLOCK k
IMAGE DATA AREA

1. An electronic still camera, comprising:

a designation device for designating, according to the choice of a user, a used frame of image data in a memory, said memory recording image data in a plurality of frames, administration data in association with each frame which indicates whether or not the frame is used, and frame catena data in association with each frame which identifies a next frame, if any, in one of a forward or backward time sequence of use of used frames in said memory;

an erase device for changing the administration data associated with the designated frame to indicate that the designated frame is not used; and

an updating device operating in association with the operation of said erase device for updating the frame catena data associated with a used frame, if any, immediately preceding the designated frame in sequence, by changing the frame catena data of said preceding frame to the frame catena data of the designated frame.

5,689,304
INDOOR/OUTDOOR SURVEILLANCE HOUSING

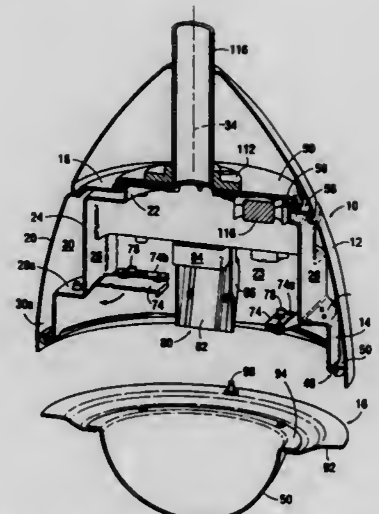
Theodore Leroy Jones, Akron, and Kathleen Elaine Arnold, York, both of Pa., assignors to Philips Electronic North America Corporation, New York, N.Y.

Filed Mar. 4, 1996, Ser. No. 610,320

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—373 **14 Claims**

1. A surveillance housing assembly for use in housing surveillance equipment, said surveillance housing comprising:



an outer shell having a top wall portion and side wall portion, the side wall portion extending in a downward direction from the top wall portion thereby defining a first cavity;

an inner shell having a top wall portion for mounting engagement with an underside of the top wall portion of said outer shell within the first cavity, said inner shell further having a side wall portion, the side wall portion extending in a downward direction from the top wall portion thereby defining a second cavity, wherein the side wall portion of said inner shell further comprises a sequence of wall surfaces and plateau surfaces arranged for securing components of the surveillance equipment thereto in a prescribed manner such that first components of the surveillance equipment are disposed inbetween the underside of said outer shell and an outerside of said inner shell, and second components of the surveillance equipment are disposed within the second cavity; and

a window assembly for mounting engagement with a bottom of the side wall portion of said inner shell.

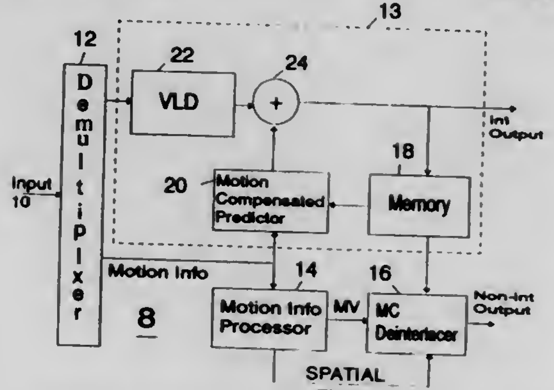
5,689,305
SYSTEM FOR DEINTERLACING DIGITALLY COMPRESSED VIDEO AND METHOD

Sheau-Bao Ng, Cranbury, N.J., and Mikhail Tsinberg, Riverdale, N.Y., assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 248,001, May 24, 1994. This application Aug. 3, 1994, Ser. No. 285,555

Int. Cl.^{6} H04N *7/01;7/36*

U.S. Cl. 348—416 **53 Claims**



SPATIAL FLAG

1. A system for deinterlacing encoded video data comprising:

a demultiplexer for receiving the encoded video data and extracting motion information and compressed video data corresponding to the encoded video data, the compressed video data including residual data;

a motion compensated predictor for generating predicted image data based on the motion information corresponding to the encoded video data;

a variable length decoder for decoding the compressed video data corresponding to the encoded video data received through the demultiplexer to produce the residual data;

means for combining the residual data and the predicted image data to generate an interlace field;

a memory for storing picture data corresponding to the interlace field;

a controller for processing the motion information and generating motion vectors and at least one control signal corresponding to the motion information; and

a motion compensated deinterlacer for manipulating the picture data corresponding to the interlace field received as output from the memory according to the motion vectors and the control signal to generate a corresponding deinterlaced picture;

wherein the controller includes means for scaling the motion vectors, including horizontal and vertical components, by converting the motion vectors from a first frequency to a second frequency.

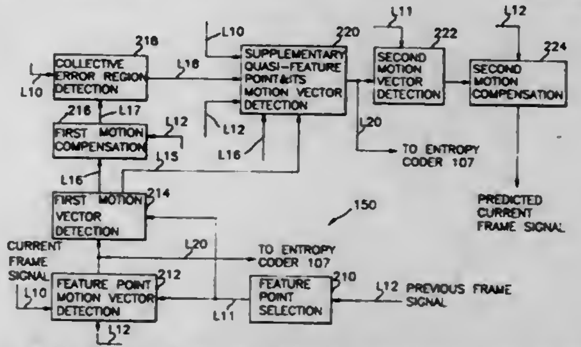
5,689,306
METHOD AND APPARATUS FOR ENCODING A VIDEO SIGNAL USING PIXEL-BY-PIXEL MOTION PREDICTION

Hae-Mook Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 23, 1995, Ser. No. 393,296

Int. Cl.^{6} H04N *7/32*

U.S. Cl. 348—416 **6 Claims**


L10
218
220
L11
222
L12
224
COLLECTIVE ERROR REGION DETECTION
L18
SUPPLEMENTARY QUASI-FEATURE POINT&ITS MOTION VECTOR DETECTION
SECOND MOTION VECTOR DETECTION
SECOND MOTION COMPENSATION
L10
216
L17
FIRST MOTION COMPENSATION
L12
L15
L16
L20
TO ENTROPY CODER 107
L16
214
FIRST MOTION VECTOR DETECTION
150
PREDICTED CURRENT FRAME SIGNAL
CURRENT FRAME SIGNAL
L20
TO ENTROPY CODER 107
212
FEATURE POINT MOTION VECTOR DETECTION
L10
210
FEATURE POINT SELECTION
L11
L12
PREVIOUS FRAME SIGNAL
L12

1. An apparatus, for use in a motion-compensated video signal encoder, for determining a predicted current frame based on a current frame and a previous frame of a digital video signal, comprising:

means for selecting a number of pixels from the pixels contained in the previous frame;

means for detecting a first set of motion vectors between the current and the previous frames, each of the first set of motion vectors representing a motion for each of the selected pixels;

means for producing a second set of motion vectors for all of the pixels contained in the current frame by using said first set of motion vectors and by determining a set of motion vectors for quasi-feature points and non-quasi-feature points;

means for assigning the value of each of the pixels in the previous frame, which corresponds to one of the pixels in the current frame through one of the second set of motion vectors, as the value of said one of the pixels in the current frame, to thereby determine a preliminary predicted current frame;

means for finding the difference between the current frame and the preliminary predicted current frame to detect collective error regions;

means for selecting one pixel from the pixels contained in each of the collective error regions;

means for detecting a third set of motion vectors for the selected pixels from the collective error regions; means for producing supplementary quasi-feature points through the use of the means for selecting one pixel;

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means for producing a fourth set of motion vectors for all of the pixels contained in the current frame through the use of the quasi-feature points and the supplementary quasi-feature points; and

means for assigning the value of each of the pixels in the previous frame, which corresponds to said one of the pixels in the current frame through one of the fourth set of motion vectors, as the value of said one of the pixels in the current frame, to thereby determine the predicted current frame.

5,689,307
ENCODING AND DECODING SYSTEMS FOR TRANSMITTING MOVING PICTURES

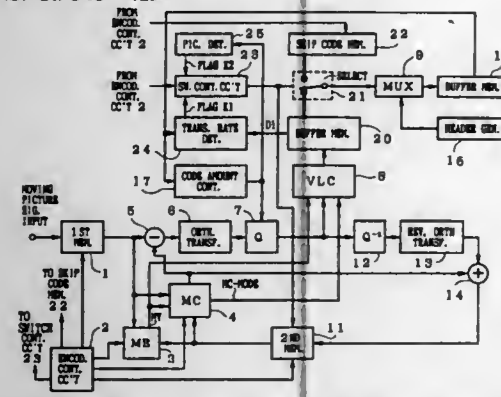
Takayuki Sugahara, and Ichiro Ando, both of Yokosuka, Japan, assignors to Victor Company of Japan, Ltd., Tokyo, Japan

Continuation of Ser. No. 88,762, Jul. 8, 1993, abandoned. This application Oct. 18, 1995, Ser. No. 544,471

Claims priority, application Japan, Jul. 10, 1992, 4-207430

Int. Cl.^{6} H04N *17/18*

U.S. Cl. 348—419 **4 Claims**



1. Moving picture coding system for coding a series of moving pictures including current and preceding pictures using a scheme of inter-picture prediction coding, said current picture being preceded by the preceding picture, said moving picture coding system comprising;

coding means for producing coded data of said moving pictures by said inter-picture prediction coding;

first memory means for storing said coded data;

skip code memory means for holding a skip code indicating skip of said moving pictures from transmission;

switching means connected to said first memory means, for selectively outputting one of said coded data stored in said first memory means and said skip code in response to a switching control signal such that when said coded data is skipped from transmission, said skip code is selected to be outputted therefrom for transmission in place of said coded data which is skipped;

second memory means connected to said switching means for buffering at skip-subjected coded data outputted from said switching means and for transmitting said skip-subjected coded data with said skip code into a transmission line;

switching control signal generating means responsive to said coded data and skip-subjected coded data for generating said switching control signal so as to preliminary prevent an excess of transmission rate of said coded data from a predetermined value before being transmitted into said transmission line; and

control means responsive to said switching control signal for controlling said coding means so that said preceding picture not being skipped becomes a prediction reference picture instead of said current picture.

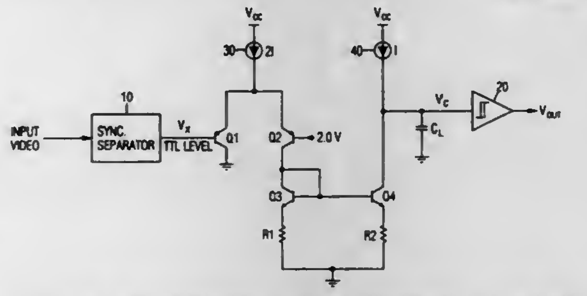
5,689,308
VERTICAL RESET GENEREATOR CIRCUIT

Mehrdad Nayebi, Palo Alto, and Duc Ngo, San Jose, both of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jan. 11, 1996, Ser. No. 585,441

Int. Cl.^{6} H04N *5/10*

U.S. Cl. 348—529 **18 Claims**



1. A vertical reset generator circuit for generating a vertical reset signal representing a vertical reset time period within a video system, the circuit comprising:

a. a receiving circuit configured for receiving a composite video signal including equalizing pulses and serration pulses, wherein each of the equalizing and serration pulses have a first level and a second level;

b. a storage element for storing a level of charge;

c. a charging and discharging circuit coupled to the storage element for raising and lowering the level of charge within the storage element, wherein the level of charge is raised during the first level and lowered during the second level; and

d. a signal generating circuit coupled to the storage element for activating a vertical reset signal when the level of charge reaches a first threshold level and deactivating the vertical reset signal when the level of charge reaches a second threshold level, wherein the second threshold level is different than the first threshold level.

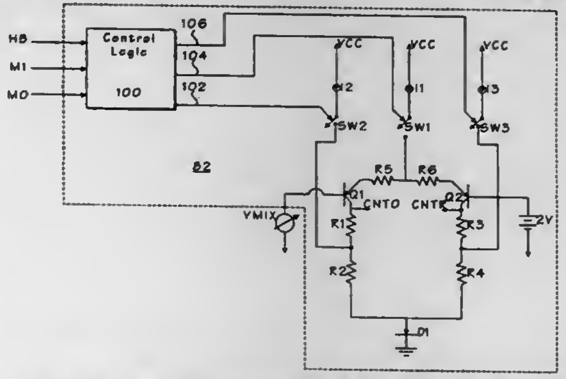
5,689,309
CONTROL CIRCUIT FOR MIXING TWO VIDEO SIGNALS

Mehrdad Nayebi, Palo Alto; Duc Trong Ngo, and Steve Edwards, both of San Jose, all of Calif., assignors to Sony Corporation, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jan. 11, 1996, Ser. No. 584,924

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—584 **23 Claims**



1. A mixer control circuit for generating a plurality of content control signals used to control mixing of a plurality of input signals into an output signal, wherein each content control signal corresponds to one of the plurality of input signals and represents a percentage of the output signal which is to include the corresponding input signal, the mixer control circuit comprising:

a. a control logic circuit configured to receive a plurality of control signals specifying a selected one of a plurality of states, including a plurality of separate states, each for including only a corresponding one of the plurality of input signals separately as the output signal and a mixing state for mixing the plurality of input signals in a predetermined ratio into the output signal;

b. an output circuit configured for receiving an external control voltage and generating the plurality of content control signals, wherein the external control voltage represents the predetermined ratio during the mixing state; and

c. a switching network controlled by the control logic circuit and coupled to the output circuit for controlling the generation of the plurality of content control signals depending on the state selected.

5,689,310
FADER DEVICE

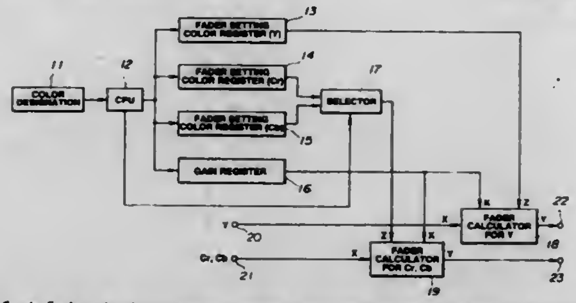
Hirofumi Murase, Kanagawa; Masato Kajimoto, and Akihiro Kikuchi, both of Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 23, 1995, Ser. No. 546,805

Claims priority, application Japan, Oct. 31, 1994, 6-266789

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—595 **3 Claims**


13
FADER SETTING COLOR REGISTER (Y)
14
FADER SETTING COLOR REGISTER (Cr)
11
12
17
COLOR DESIGNATION
CPU
SELECTOR
FADER SETTING COLOR REGISTER (Cb)
15
GAIN REGISTER
16
22
FADER CALCULATOR FOR Y
18
20
21
FADER CALCULATOR FOR Cr, Cb
19
23

1. A fader device for processing a digital picture formed of input picture data with fade-in or fade-out processing comprising:

color designating means for designating a background color for the fade-in or fade-out processing;

designated color picture data forming means for forming color picture data of the background color designated by said color designating means and outputting the color picture data of the designated color;

gain control means for gradually varying a gain of the input picture data in dependence upon a selected speed of the fade-in or fade-in processing; and

calculating means for amplifying the input picture data with a gain variably controlled by said gain control means, adding the amplified picture data to the color picture data of the designed color from said designated color picture data forming means and outputting a resultant addition picture data,

wherein said gain control means outputs a coefficient gradually variable controlled in dependence upon the speed of the fade-in or fade-out processing; and wherein

said calculating means includes subtraction means for subtracting the color picture data formed by said designated color picture data forming means from the input picture data;

multiplication means for multiplying picture data from said subtraction means with the coefficient from said gain control means; and

addition means for adding picture data from said multiplication means to the color picture data from said designated color picture data forming means for producing said addition picture data.

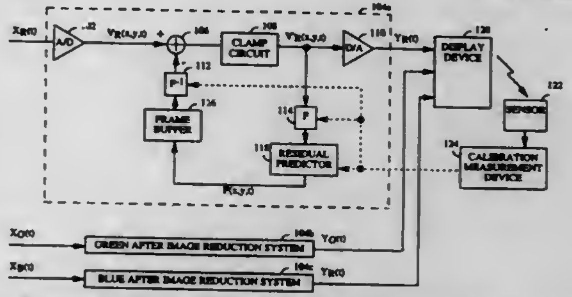
5,689,311
AFTER IMAGE REDUCER

Chong U. Lee, San Diego, Calif., assignor to QUALCOMM Incorporated, San Diego, Calif.

Filed Sep. 15, 1995, Ser. No. 528,579

Int. Cl.^{6} H04N *5/213*

U.S. Cl. 348—674 **30 Claims**



1. A motion video processing apparatus, comprising:

reduction means for receiving a frame of motion video data and processing said frame of motion video data in accordance with an after image estimate to provide an after image reduced frame of video data; and

after image prediction means for receiving said processed frame of video data and for generating said after image estimate in accordance with a predetermined after image prediction format.

5,689,312
BLOCK MATCHING MOTION ESTIMATION METHOD

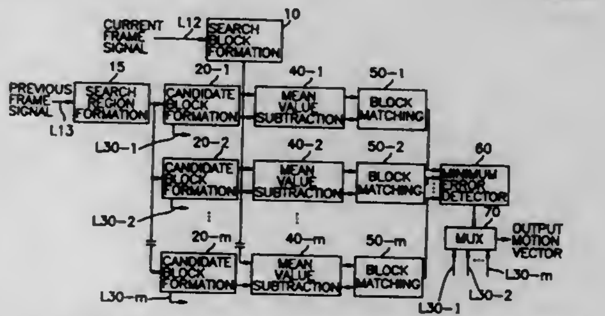
Sang-Ho Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronic Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 26, 1995, Ser. No. 578,768

Claims priority, application Rep. of Korea, Dec. 30, 1994, 94-39976

Int. Cl.^{6} H04N *7/30*

U.S. Cl. 348—699 **3 Claims**



1. A method for detecting motion vectors between a current frame and a previous frame of video signals by using a block matching motion estimation technique, wherein the current frame is divided into a plurality of search blocks of an identical size and the previous frame is divided into a corresponding number of search regions, each search region being divided into a multiplicity of candidate blocks of a size identical to that of the search block, which comprises the steps of:

(a) producing a plurality of differential search blocks, wherein each differential search block includes differential pixels, each differential pixel in said each differential search block having a difference value between a luminance level of each pixel in a search block and a mean luminance level of the pixels in the search block;

(b) producing a multiplicity of differential candidate blocks, wherein each differential candidate block includes differential pixels, each differential pixel in said each differential candidate block having a difference value between a luminance level of each pixel in a candidate block and a mean luminance level of the pixels in the candidate block;

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(c) motion-estimating a search block with respect to each of the candidate blocks associated with a corresponding search region to produce displacement vectors corresponding thereto and motion-estimating a differential search block with respect to each of the differential candidate blocks associated with a corresponding search region to produce error functions corresponding thereto, each of the displacement vectors representing displacements between the pixels in the search block and their corresponding pixels in each of the candidate blocks, and each of the error functions being calculated based on differences between luminance levels of the differential pixels in the differential search block and those of their corresponding differential pixels in each of the differential candidate blocks; and

(d) choosing a minimum error function to define a displacement vector corresponding to the minimum error function as a motion vector for the search block.

5,689,313

BUFFER MANAGEMENT IN AN IMAGE FORMATTER

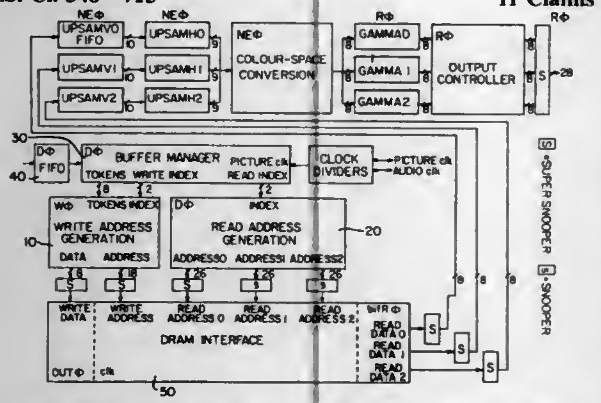
Martin William Sotheran, Dursley, Great Britain, assignor to Discovision Associates, Irvine, Calif.

Division of Ser. No. 399,801, Mar. 7, 1995. This application Jun. 7, 1995, Ser. No. 485,242

Claims priority, application United Kingdom, Mar. 24, 1994, 9405914

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 348—715 **11 Claims**



1. An image formatter for processing encoded video data comprising:

an input element for receiving encoded data representing video frames, said data arriving as a sequence of tokens at an encoded frame rate for output or display at a display frame rate;

a memory defining at least three buffers for storage of the encoded data, wherein said received data is initially stored in a first said buffer;

a write address generator for generating addresses for data being stored in said first buffer;

a read address generator for generating addresses for reading data stored in said first buffer;

a presentation number counter;

an output interface linked to said read address generator that produces output data at said display frame rate; and

a buffer manager responsive to control information in said tokens, to said encoded frame rate, and to said display frame rate, said buffer manager dynamically allocating and deallocating said at least three buffers as arrival buffers for reference by said write address generator, and as display buffers for reference by said read address generator, said buffer manager clearing said buffers for occupation by subsequently arriving data, and maintaining status information of said buffers, wherein said status information comprises a state VACANT, wherein a said buffer is available, a state IN USE, wherein a said buffer can be referenced by said write address generator, a state FULL, wherein a said buffer is occupied by data, and a state READY wherein a said buffer is reallocated as a display buffer;

wherein responsive to said presentation number counter and a current picture number contained in the encoded data said buffer manager asserts a late arrival signal indicating that a buffer in said state READY is not in synchronization with said display frame rate;

a state machine for controlling said buffer manager, said state machine transitioning among a plurality of states, including:

a first transition from a first state PRES0, to a second state PRES1, wherein said status information of said buffers are evaluated;

a second transition from said state PRES1 to a third state DRQ wherein a pending request for said display buffer is evaluated; and

a third transition from said stage DRQ to a fourth state TOKEN, wherein tokens of received data are examined; whereby a status of said arrival buffer can be updated; and

a plurality of 2-wire Interfaces each comprising: a sender a receiver, and a clock connected to said sender and said receiver, wherein data is transferred from said sender to said receiver upon a transition of said clock only when said sender is ready and said receiver is ready, wherein said buffer manager communicates with said read address generator, and with said write address generator via said 2-wire interfaces.

5,689,314

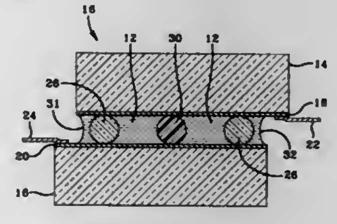
COMMON PATH POINT DIFFRACTION INTERFEROMETER USING LIQUID CRYSTAL PHASE SHIFTING

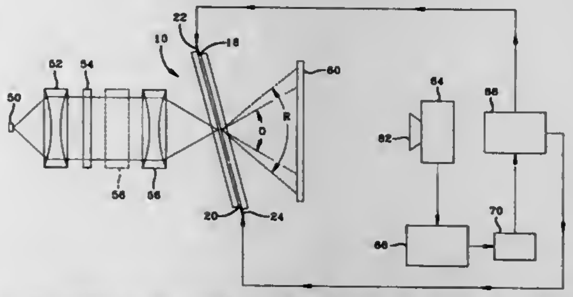
Carolyn R. Mercer, Cleveland, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 14, 1995, Ser. No. 490,250

Int. Cl.^{6} G02F *1/13;* **G01B** *9/02;11/00*

U.S. Cl. 349—1 **16 Claims**





1. A common path, point diffraction interferometer for forming interferograms from simultaneously produced object and reference beams derived from a single incident light beam which comprises a liquid crystal cell having a pair of transparent, parallel and opposing substrates and enclosing within a liquid crystal layer containing at least one microsphere whose diameter is equal to the distance between said substrates, each said substrate having a transparent electrode adjacent an opposing surface.

5,689,315

LIGHT VALVE APPARATUS WHICH IS EMPLOYED IN A PROJECTION DISPLAY SYSTEM AND IN A VIEW-FINDER SYSTEM

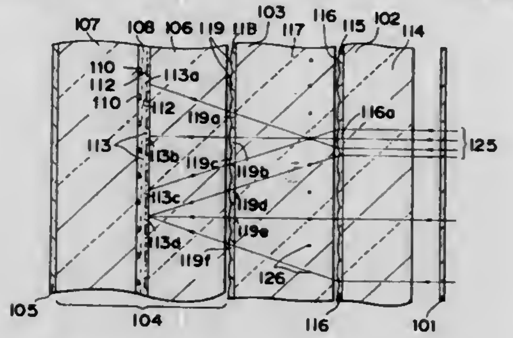
Yoshimasa Fushimi, Hirakata, and Yoshito Miyatake, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 14, 1993, Ser. No. 91,191

Claims priority, application Japan, Jul. 15, 1992, 4-187813; Oct. 9, 1992, 4-271334; Oct. 9, 1992, 4-271335

Int. Cl.^{6} G02F *1/1335;* **G02B** *6/08*

U.S. Cl. 349—5 **10 Claims**



1. A light valve apparatus comprising:

a light valve in which a plurality of pixels are arranged in a first matrix pattern;

a first lens array in which a plurality of microlens elements are arranged in a second matrix pattern similar to the first matrix pattern of the pixels of said light valve, and which is located at an incident side of said light valve; and

a second lens array in which a plurality of microlens elements are arranged in a third matrix pattern similar to the first matrix pattern of the pixels of said light valve, and which is located between said light valve and said first lens array;

wherein a focal length of each of the microlens elements of said first lens array is equal to or shorter than a focal length of each of the microlens elements of said second lens array, the respective microlens elements of said second lens array being adapted to form real images of a virtual light source at focal points of said first lens array on the corresponding pixels of said light valve,

wherein said first lens array is formed on the face of an emitting side or in the vicinity of a surface of a transparent substrate disposed at an incident side of said light valve, and said second lens array is formed on an incident face or in the vicinity of a surface of another transparent substrate disposed at an incident side of said light valve.

5,689,316

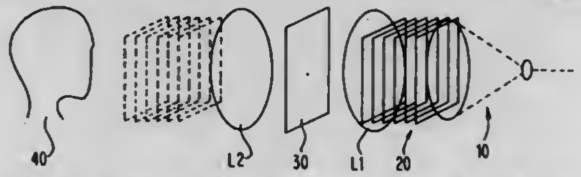
DEPTH SAMPLING THREE-DIMENSIONAL IMAGE DISPLAY APPARATUS

Tomohiko Hattori, Nagoya, Japan; David F. McAllister, Cary, N.C., and Sadayuki Sakuma, Nagoya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 245,073, May 17, 1994, abandoned, which is a continuation of Ser. No. 816,497, Jan. 8, 1992, abandoned. This application Jan. 18, 1996, Ser. No. 588,364

Int. Cl.^{6} G02F *1/1347;1/1333*

U.S. Cl. 349—74 **9 Claims**



1. A depth sampling three-dimensional image real-time display apparatus, comprising:

collimated light projecting means configured to project substantially collimated monochromic light;

a stack of liquid crystal elements, each of which passes substantially all components of the collimated light from the collimated light projecting means without inducing refraction or diffraction, wherein an object of observation has written therein information for causing scattering of said collimated light representative of a three-dimensional image, and wherein:

D is the probability that a liquid crystal element passes light without inducing refraction or diffraction when no external voltage is applied to the liquid crystal element,

d is the probability that light is scattered by the liquid crystal element, and

each liquid crystal element satisfies the relations $D+d=1$ and $D>>d$;

condenser means for concentrating light passed by the stack of liquid crystal elements;

filter means for eliminating a direct-flow component of light projected thereon through the condenser means; and

focalizing lens means for forming a three-dimensional image in an empty space from light passed through the filter means.

5,689,317

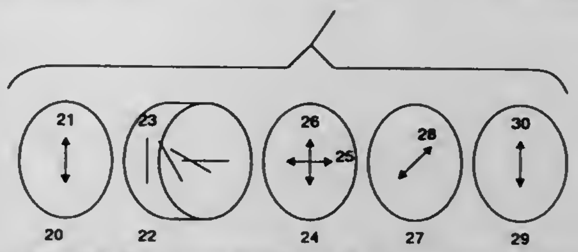
TUNABLE COLOR FILTER

Peter Miller, Cambridge, Mass., assignor to Cambridge Research Instrumentation, Inc., Cambridge, Mass.

Filed Mar. 22, 1995, Ser. No. 408,378

Int. Cl.^{6} G02F *1/1335;1/1347*

U.S. Cl. 349—97 **54 Claims**



1. A tunable filter system for filtering light, comprising in optical alignment:

(a) a first neutral linear polarizer;

(b) an optical switch;

(c) a color-selective polarizer;

(d) an optical retarder; and

(e) a second neutral linear polarizer, said elements being arranged in a series order selected from a group of orders consisting of (a) through (e) and (e) through (a).

5,689,318

COLOR LIQUID CRYSTAL DISPLAY DEVICE COMPOSED OF COLOR FILTER WITH A LAYER OF THREE PRIMARY COLOR ARRAY PATTERNS FABRICATED BY THERMAL DYE TRANSFER TECHNOLOGY

Shigeru Matsuyama, and Yoshifumi Tomita, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1995, Ser. No. 415,942

Claims priority, application Japan, Apr. 6, 1994, 6-068321

Int. Cl.^{6} G02F *1/1335;1/1333;* **G03F** *9/00*

U.S. Cl. 349—106 **6 Claims**

5. A method of fabricating a color liquid crystal display device, comprising:

applying a transparent dye receiving layer made from photosensitive resin over a substrate;

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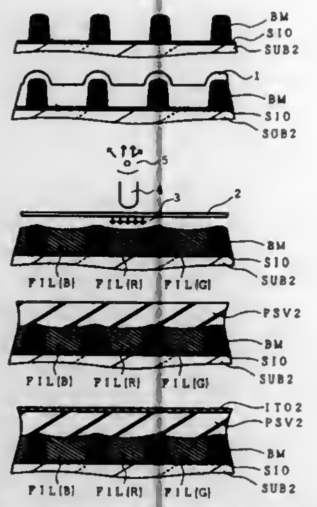


exposing the dye receiving layer to a single light exposure process and a single development process, so as to form patterns of the dye receiving layer, the patterns being divided by gaps;

coloring the patterns into three primary colors by a thermal dye transfer method, so as to form colored patterns;

and forming a protective overcoat on the colored patterns.

5,689,319

ELECTRO OPTIC DISPLAY DEVICE WITH POROUS SUB-LAYER AND METHOD

Teunis J. Vink, and Willem Walrave, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

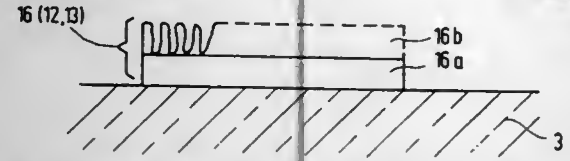
Division of Ser. No. 116,381, Sep. 2, 1993, Pat. No. 5,592,316.

This application Jun. 11, 1996, Ser. No. 661,515

Claims priority, application European Pat. Off., Sep. 8, 1992, 92202711.5

Int. Cl.^{6} G02F *1/1335;1/13*

U.S. Cl. 349—110 **27 Claims**



1. A display device comprising an electro-optical display medium between two support plates, at least one support plate being provided with a metal pattern which is light-reflecting at the side remote from the electro-optical display medium, wherein the metal pattern has a porous sub-layer at least at the side facing the electro-optical display medium, the porous sub-layer being formed by increasing pressure during sputter deposition thereof.

5,689,320

LIQUID CRYSTAL DISPLAY APPARATUS HAVING A FILM LAYER INCLUDING POLYANILINE

Shinjiro Okada, Isehara; Shuzo Kaneko, Yokohama; Yutaka Inaba, Kawaguchi; Katsuhiko Shinjo, Isehara; Hirokatsu Miyata, Yokohama, and Kazunori Katakura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 233,818, Apr. 26, 1994, Pat. No. 5,592,190.

This application May 3, 1995, Ser. No. 433,066

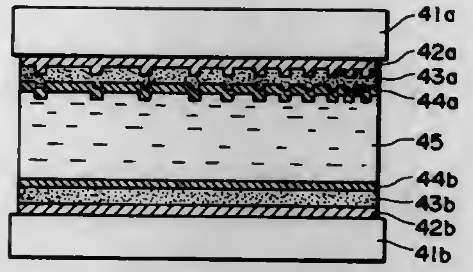
Claims priority, application Japan, Apr. 28, 1993, 5-123233; May 21, 1993, 5-141268

Int. Cl.^{6} G02F *1/141;1/13*

U.S. Cl. 349—135 **2 Claims**

1. A liquid crystal apparatus, comprising a liquid crystal device of the type comprising a pair of oppositely disposed electrode plates having thereon a group of scanning electrodes and a group of data electrodes, respectively, and a ferroelectric liquid crystal layer disposed between the pair of electrode plates so as to form a pixel at each intersection of the scanning electrodes and data electrodes; and drive means including scanning signal application means and data signal application means for writing plural times in each pixel to form a domain wall separating regions of different optical states in the pixel to effect a desired gradational display,

wherein a film layer comprising polyaniline and having a volume resistivity of 10^4–10^8 ohm.cm is disposed between the ferroelectric liquid crystal layer and at least one of the scanning electrodes and the data electrodes.



5,689,321

DISPLAY APPARATUS

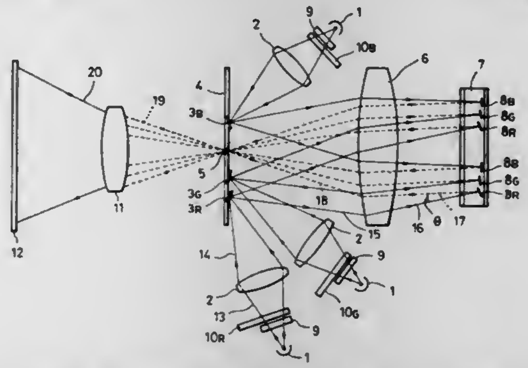
Tetsunobu Kochi, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1996, Ser. No. 629,747

Claims priority, application Japan, Apr. 13, 1995, 7-088423

Int. Cl.^{6} G02F *1/1343;1/1335*

U.S. Cl. 349—143 **15 Claims**



1. A display apparatus comprising a reflective type device displaying an image by reflecting the light from at least one light source, wherein each of pixel electrodes of said reflective type device is composed of a reflective electrode and at least one of said pixel electrodes has a different inclination angle from others.

5,689,322

LIQUID CRYSTAL DISPLAY DEVICE HAVING REGIONS WITH DIFFERENT TWIST ANGLES

Mitsuaki Hirata; Akihiro Nammatsu, both of Tenri; Noriko Watanabe, Nara; Shigeaki Mizushima, Ikoma; Seiji Makino, Tenri; Hiroko Iwagoe, Yamatokoriyama, and Kei Oyobe, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1994, Ser. No. 278,952

Claims priority, application Japan, Jul. 30, 1993, 5-190498; Aug. 27, 1993, 5-213226; Aug. 27, 1993, 5-213227; Aug. 27, 1993, 5-213230; Aug. 31, 1993, 5-216696; Oct. 14, 1993, 5-257265; Dec. 15, 1993, 5-315619

Int. Cl.^{6} G02F *1/13;1/1337*

U.S. Cl. 349—180 **9 Claims**

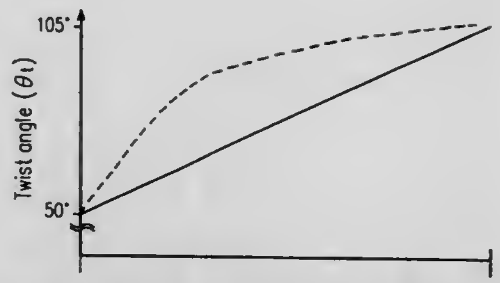
1. A liquid crystal display device, comprising:

a pair of substrates;

a liquid crystal layer sandwiched between the pair or substrates; and

an electrode for applying a voltage to the liquid crystal layer, wherein

the liquid crystal layer includes a plurality of regions having different twist angles from one another, and the twist angles in the plurality of regions change in a step-like manner in an increasing pattern along the entire liquid crystal layer.



5,689,323

DECENTERED NONCORRECTIVE LENS FOR EYEWEAR

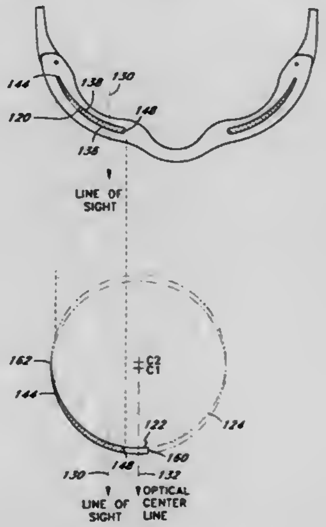
Malcolm Neal Houston, Foothill Ranch, Calif.; James H. Jannard, Double Island, Wash., and Carlos D. Reyes, Mission Viejo, Calif., assignors to Oakley, Inc., Foothill Ranch, Calif.

Division of Ser. No. 567,434, Dec. 5, 1995, Pat. No. 5,648,832.

This application Sep. 5, 1996, Ser. No. 706,564

Int. Cl.^{6} G02C *13/00*

U.S. Cl. 351—41 **15 Claims**



1. A method of manufacturing a right lens for dual lens optically corrected eyewear exhibiting wrap and downward rake, the method comprising:

providing a lens blank, the lens blank having a thickness which is vertically tapered symmetrically on either side of a central equatorial line and horizontally tapered from a relatively greater thickness at an optical center located between the geometric center of the blank and a medial edge of the blank to a relatively lesser thickness at a lateral edge of the blank, the equatorial line dividing the lens blank into an upper half and a lower half; and

cutting the right lens from the lens blank such that greater than 50% of the right lens is cut from the lower half.

5,689,324

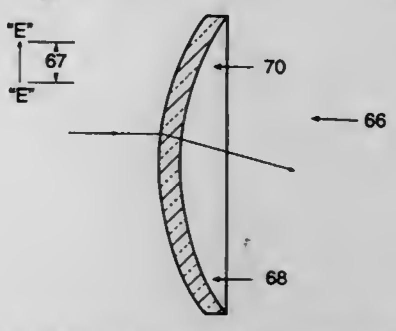
PROGRESSIVE LENS

Loren C. Lossman, Lewisville, Tex.; Larry H. Joel, Prospect, Ky., and James S. Carr, Highland Village, Tex., assignors to Q2100, Inc., Louisville, Ky.

Filed Aug. 18, 1992, Ser. No. 932,812

Int. Cl.^{6} B29D *11/00*

U.S. Cl. 351—169 **18 Claims**



1. A cast prescription plastic progressive eyeglass lens comprising a front face, a back face, a near vision correction zone, a far vision correction zone, and a vision transition zone between the near vision correction zone and the far vision correction zone, the lens being prescription-cast and having a vertical prism of less than about 1.5 prism diopter, and the lens having a from face cast from and shaped by the back face of a mold, the back face of the mold including (1) a centrally located concave surface having a near vision correction zone adapted to cast the near vision correction zone of the lens, a far vision correction zone adapted to cast the far vision correction zone of the lens, and a vision transition zone adapted to cast the vision transition zone of the lens, and (2) an annular surface which tapers at an angle from the edges of the back face of the mold to the edges of the concave surface in the back face of the mold.

5,689,325

OPHTHALMOLOGIC APPARATUS WITH EASE OF OPERATION

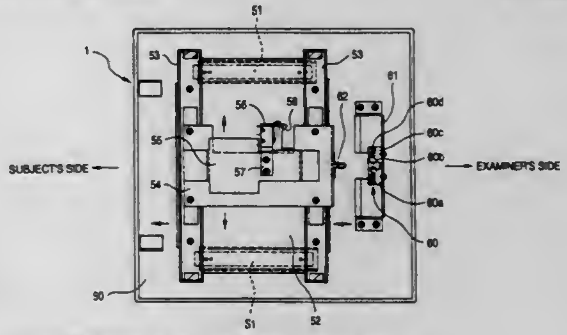
Naoki Isogai, and Masamichi Suzuki, both of Aichi, Japan, assignors to Nidek Co., Ltd., Gamogori, Japan

Filed Apr. 19, 1996, Ser. No. 634,616

Claims priority, application Japan, Apr. 19, 1995, 7-119220; Apr. 19, 1995, 7-119221

Int. Cl.^{6} A61B *3/14;3/00*

U.S. Cl. 351—208 **8 Claims**



1. An ophthalmologic apparatus comprising:

measuring means for measuring an eye of a subject;

a movable stage on which the measuring means is mounted;

moving means for moving the movable stage horizontally relative to a fixed base stage;

recognizing means for recognizing whether the measuring means has been moved by the moving means so as to go out of a predetermined range; and

transition means for starting supply of power to the measuring means based on a recognition result of the recognizing means, to thereby render the measuring means operational.

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5,689,326
PHOTOGRAPHIC PRINTING APPARATUS

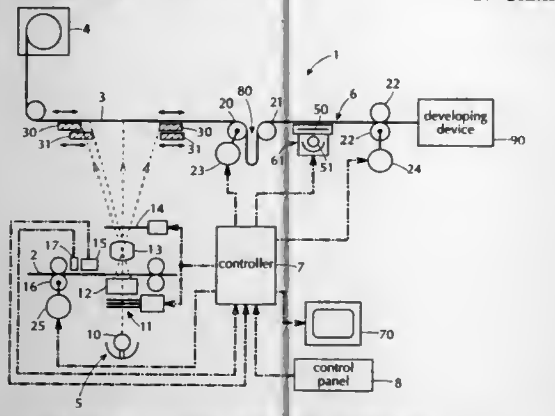
Junji Yamada, and Toru Tanibata, both of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd, Wakayama-Ken, Japan

Filed Sep. 5, 1996, Ser. No. 706,503

Claims priority, application Japan, Sep. 6, 1995, 7-228758

Int. Cl.^{6} G03B *27/32;27/46;27/52*

U.S. Cl. 355—39 **17 Claims**



1. A photographic printing apparatus comprising:

exposing means for printing an image of a photographic film on a photographic sensitive material;

supplementary information exposing means for printing supplementary information on part of said photographic sensitive material; and

dimming means for suppressing light projected to a selected region within a print region when said image of said photographic film is printed on said photographic sensitive material;

wherein said supplementary information exposing means is operable to print said supplementary information in said selected region.

5,689,327
LASER PROCESSING DEVICE

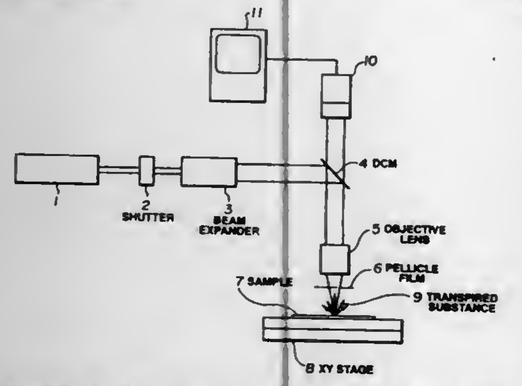
Minoru Takeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 520,703

Claims priority, application Japan, Aug. 30, 1994, 6-205276

Int. Cl.^{6} B23K *26/00;* **G01C** *3/08*

U.S. Cl. 356—4.01 **3 Claims**



1. A laser processing device for collecting a laser beam from laser beam radiating means using an objective lens and irradiating a surface of a sample with the collected laser beam to form a fine pattern thereon, the device further comprising a uniform pellicle film having high transmittance to the wavelength of the laser beam, said pellicle film being provided between the objective lens and the surface of the sample.

5,689,328
OPTICAL TYPE RANGE FINDER APPARATUS FOR MOTOR VEHICLE

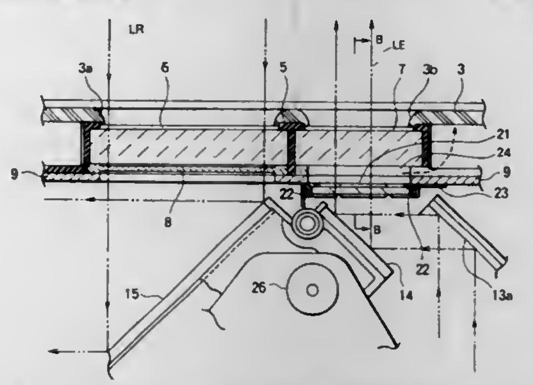
Koji Katayama, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1996, Ser. No. 618,198

Claims priority, application Japan, Oct. 9, 1995, 7-261762

Int. Cl.^{6} G01C *3/08;* **G02B** *7/00*

U.S. Cl. 356—4.01 **4 Claims**



1. An optical type range finder apparatus for a motor vehicle, comprising:

a light emission source mounted on said motor vehicle;

an irradiation window for projecting outwardly from said motor vehicle an irradiation light beam generated by said light emission source in response to a light beam sending signal;

a reflected light beam receiving window for receiving an echo light beam resulting from reflection of said irradiation light beam at an object existing in environment of said motor vehicle;

arithmetic processing means for detecting a distance from said motor vehicle to said object on the basis of a relation between said light beam sending signal and a light beam reception signal generated in response to reception of said reflection light beam;

wherein said irradiation window includes:

a first light-transmissive panel having a surface exposed to the exterior of said optical type range finder apparatus;

a second light-transmissive panel having a surface exposed to the interior of said optical type range finder apparatus; and

a heat insulation space formed by an air layer confined between said first light-transmissive panel and said second light-transmissive panel.

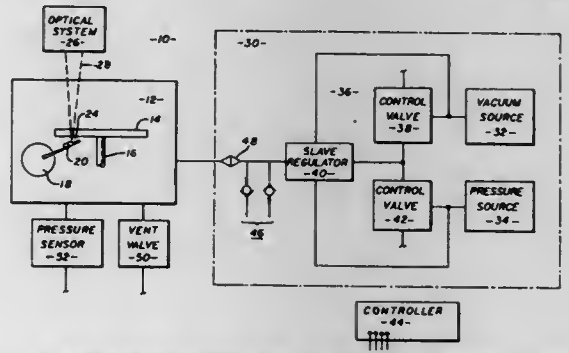
5,689,329
FLYING HEIGHT ALTITUDE SIMULATOR

David Rose, San Diego, Calif., assignor to Phase Metrics, San Diego, Calif.

Filed Aug. 16, 1996, Ser. No. 698,793

Int. Cl.^{6} G01B *11/14*

U.S. Cl. 356—72 **18 Claims**



1. A flying height tester that measures an air bearing height between a slider and a substrate, comprising:

an enclosed chamber that is larger than the slider, said chamber having an inner pressure;

a substrate located within said enclosed chamber;

a loader which places the slider adjacent to said substrate;

an optical system which reflects a light beam off of the slider to measure the air bearing height; and,

a pressure control system which varies the inner pressure of said chamber.

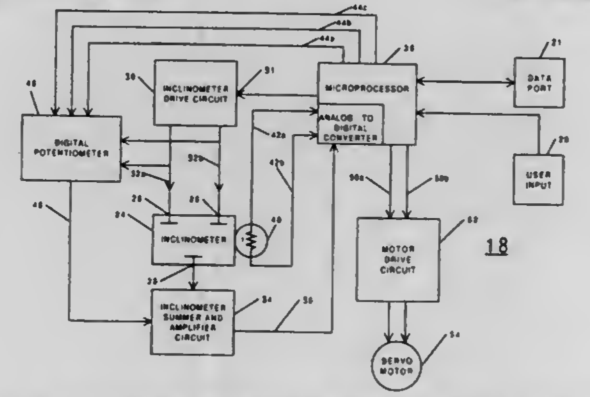
5,689,330
LASER PLANE GENERATOR HAVING SELF-CALIBRATING LEVELLING SYSTEM

Philip O. Gerard, Lowell; David M. Falb, Grand Rapids, and Bruce A. Boersma, Middleville, all of Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.

Filed Apr. 3, 1995, Ser. No. 415,344

Int. Cl.^{6} G01B *11/26*

U.S. Cl. 356—138 **28 Claims**



1. A self-levelling laser generator apparatus having a housing and a light source in said housing which produces a beam of collimated light, comprising:

an inclination sensor, mounted to incline with said light source about an axis, said inclination sensor producing an output signal that is an indication of the magnitude of inclination of said beam about said axis;

a levelling mechanism that is responsive to a drive signal in order to adjust the inclination of said beam about said axis;

a control having a computer and a digitally controllable signal source which responds to a command from said computer to produce an offset signal that is a function of the received command, said control further including a summing circuit which combines said offset signal with said output signal of said inclination sensor in order to produce a compensated inclination signal which is provided as a compensated inclination input to said computer; and

a calibration input to said control for entering data indicative of a deviation between the inclination of said beam and a predetermined grade, said control being responsive to said compensated inclination input and to said calibration input in order to produce said command as a function of the value of any deviation entered through said calibration input and in order to produce said drive signal as a function of the compensated inclination signal to change the orientation of said beam to align said beam with said predetermined grade.

5,689,331
LASER APPARATUS WITH WANDER CORRECTION

Phillip Randall Staver, Hagaman, N.Y., assignor to General Electric Company, Schenectady, N.Y.

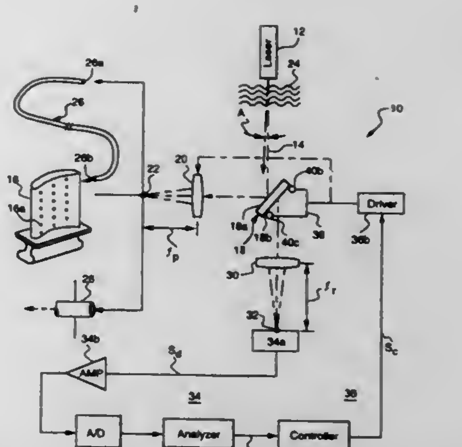
Filed Dec. 8, 1995, Ser. No. 569,889

Int. Cl.^{6} G01J *1/00;* **G01N** *21/41;* **G01B** *11/14*

U.S. Cl. 356—153 **11 Claims**

1. A laser apparatus comprising:

a laser for emitting a laser beam;



a primary mirror aligned with said laser for reflecting said beam from a front face thereof and leaking a portion thereof through a back face;

a primary lens aligned with said mirror front face for focusing said reflected beam at a primary focus spot, with said laser, mirror, and primary lens defining a primary optical path of said laser beam from said laser to said primary spot;

a reference lens aligned with said mirror back face for focusing said leakage beam at a reference focus spot in a reference optical path;

means aligned with said reference lens for measuring lateral position of said reference spot; and

means coupled to said measuring means for correcting lateral wander of said primary spot in response to lateral movement of said reference spot due to angular wander of said laser beam on said mirror front face.

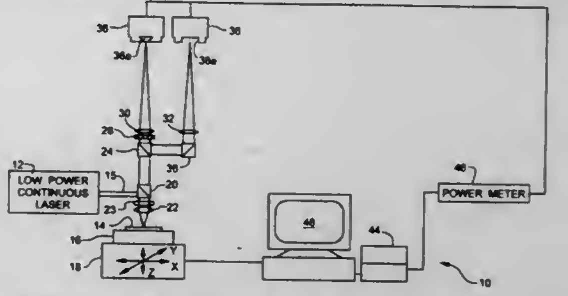
5,689,332
AUTOMATED REAL-TIME DETECTION OF DEFECTS DURING MACHINING OF CERAMICS

William A. Ellingson, Naperville, and Jiangang Sun, Westmont, both of Ill., assignors to The University of Chicago, Chicago, Ill.

Filed Sep. 13, 1996, Ser. No. 713,833

Int. Cl.^{6} G01N *21/00;* **G01J** *4/00*

U.S. Cl. 356—237 **15 Claims**



1. Apparatus for the detection and display of surface and near-surface defects in a ceramic body during machining of a surface of said ceramic body, wherein various types of defects may be introduced in a surface and near-surface portion of said ceramic body during said machining, said apparatus comprising:

a light source for providing a polarized laser beam;

optical means for focussing and directing said polarized laser beam onto the surface of the ceramic body;

displacement means for providing relative displacement between the ceramic body and said light source whereby said polarized laser beam scans the surface of the ceramic body;

a plurality of detectors responsive to said polarized laser beam reflected from the surface and near-surface portions of the ceramic body for detecting various types of surface and near-surface defects in the ceramic body; and

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display means coupled to said plurality of detectors for providing a video image of said various types of surface and near-surface defects in the ceramic body.

5,689,333
SPECTROSCOPIC APPARATUS AND METHODS

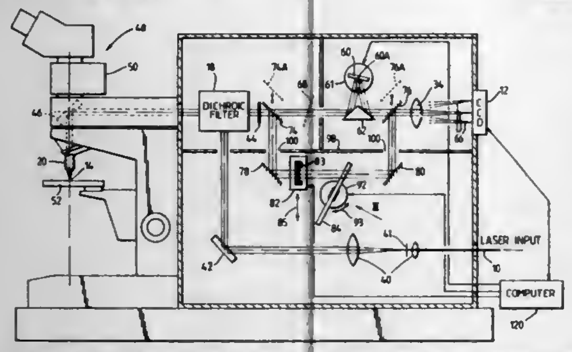
David N. Batchelder, London; Chunwei Cheng, Yorkshire; Brian J. E. Smith, London, and Raymond J. Chaney, Gloucestershire, all of United Kingdom, assignors to Renishaw plc, Gloucestershire, England

Continuation of Ser. No. 976,513, Nov. 13, 1992, Pat. No. 5,442,438, which is a continuation-in-part of Ser. No. 543,729, Aug. 6, 1990, Pat. No. 5,194,912. This application May 10, 1995, Ser. No. 438,270

Claims priority, application United Kingdom, Dec. 22, 1988, 8830039; Nov. 16, 1991, 9124408; Nov. 16, 1991, 9124409; Feb. 7, 1992, 9202588; Jun. 20, 1992, 9213120; Jun. 20, 1992, 9213121

Int. Cl.^{6} G01J *3/44*

U.S. Cl. 356—301 **11 Claims**



1. A method of operating a spectroscopic apparatus, the apparatus comprising means for illuminating a sample so as to produce therefrom a spectrum of scattered light; a detector for detecting the scattered light, the detector comprising at least one column or row of detector elements each of which accumulate data in accordance with the intensity of light incident thereon; and a dispersive device for analysing the spectrum received from the sample and dispersing it along the column or row of detector elements, the method comprising:

reading data sequentially from one end of the column or row of detector elements with data from each element passing sequentially along the column or row from one element to the next; and

simultaneously causing relative traversal of the dispersed spectrum along the column or row synchronously with the passing of the data, the data continuing to accumulate during said relative traversal.

5,689,334
INTRACAVITY LASER SPECTROSCOPE FOR HIGH SENSITIVITY DETECTION OF CONTAMINANTS

George H. Atkinson, Tucson, Ariz.; Yehoshua Kalisky, Beer-Sheva, Israel; Jiamin Zhang, Painsboro, N.J.; Max F. Hineman, Boise, Id.; Esmail Mehdizadeh, and Markus Wolperdinger, both of Tucson, Ariz., assignors to Innovative Lasers Corporation, Tucson, Ariz.

Filed Sep. 1, 1995, Ser. No. 522,963

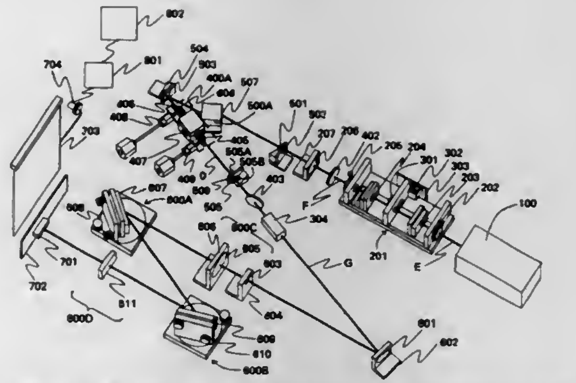
Int. Cl.^{6} G01J *3/10;3/42;* **G01N** *21/35*

U.S. Cl. 356—326 **7 Claims**

1. A detection system for detecting the presence of a contaminant in a sample, comprising:

a chamber suitably configured to be evacuated of contaminants to be detected in the sample, said chamber including therewithin an intracavity laser comprising a laser crystal contained within an intracavity resonator, and a sample system for containing the sample suitably placed within an astigmatically compensated region of said resonator;

a spectrometer assembly; and



a detector assembly suitably connected to a computer system programmable to interpret the spectral resolution of said spectrometer assembly and provide an output indicative of the presence and/or concentration of contaminant in the sample.

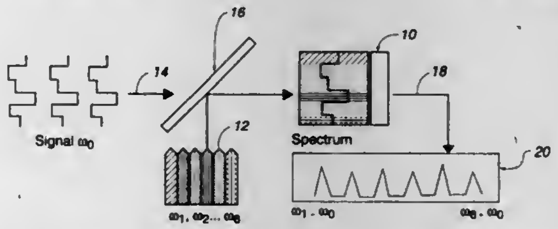
5,689,335
APPARATUS AND METHOD FOR HETERODYNE-GENERATED TWO-DIMENSIONAL DETECTOR ARRAY USING A SINGLE ELEMENT DETECTOR

Charlie E. Strauss, Santa Fe, N. Mex., assignor to The Regents of the University of California, Los Alamos, N. Mex.

Filed Oct. 10, 1995, Ser. No. 540,434

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—349 **4 Claims**



1. A synthetic-array apparatus for heterodyne detection of an optical signal, which comprises in combination:

a. a detector for receiving the optical signal, said detector having a single electrical output;

b. means for illuminating the surface of said detector with at least two substantially distinct optical frequencies having sufficient spatial separation therebetween, such that a chosen portion of the surface of said detector has associated with it a chosen, substantially distinct frequency; and

c. means for receiving and measuring the beat frequencies generated between the at least two distinct optical frequencies and the optical signal on the single electrical output of said detector; whereby the intensity profile for the optical signal incident on said detector is generated.

5,689,336
PHOTOELECTRIC POSITION MEASURING SYSTEM

Walter Huber, Traunstein, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

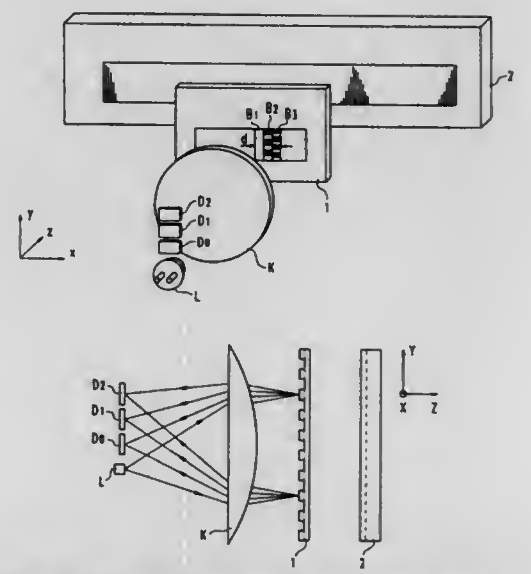
Filed Jun. 6, 1996, Ser. No. 659,336

Claims priority, application Germany, Jun. 10, 1995, 195 21 295.9

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—356 **14 Claims**

1. A photoelectric position measuring system wherein light from a light source is modulated as a function of position by a plurality of gratings, which can be displaced in the measuring direction relative to one another, wherein light beams are diffracted on at least one of the gratings and interfere with each other where a plurality of photo-detectors are provided for detecting position-dependent signals which are phase-shifted with respect to each other, the measuring system comprising:



at least one of the gratings having at least three areas within each one of its graduation periods (d) oriented in the measuring direction (X) the areas disposed behind each other in the measuring direction and essentially extending perpendicularly with respect to the measuring direction, wherein each one of these areas has different directionally selective properties, and that each signal light beam deflected from these areas impacts an associated photo-detector, wherein the photo-detectors are disposed essentially transversely with respect to the measuring direction.

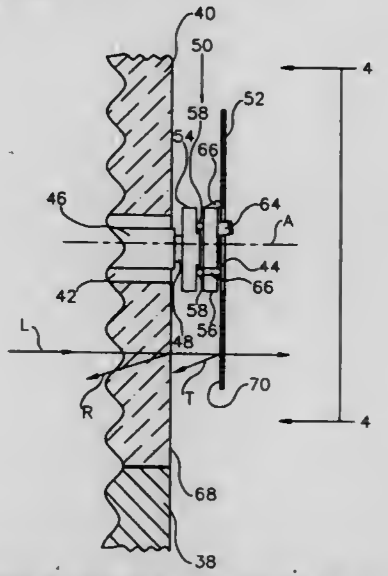
5,689,337
COAXIAL DISC-MOUNT FOR MEASURING FLATNESS OF COMPUTER-DRIVE DISCS BY INTERFEROMETRY

Joseph A. Lamb, Jr., and Chiayu Ai, both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Filed Aug. 15, 1996, Ser. No. 698,547

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—359 **31 Claims**



1. A mounting mechanism for an interferometric device to scan a test surface of a structure containing a hole, wherein said test surface is aligned along an optical axis of the device, said mechanism comprising:

(a) a reference surface having an opening therewithin substantially aligned with said optical axis;

(b) support means for supporting said test surface, said support means having a proximal end connected to the device and a distal end protruding through said opening in the reference surface in substantial alignment with said optical axis; and

(c) mounting means for mounting and holding in place said test surface on said distal end of the support means, such that the test surface is in substantial alignment with said optical axis and said hole is substantially aligned with said opening in the reference surface, whereby a test beam of light transmitted through the reference surface illuminates said test surface.

5,689,338

Patent Not Issued For This Number

5,689,339
ALIGNMENT APPARATUS

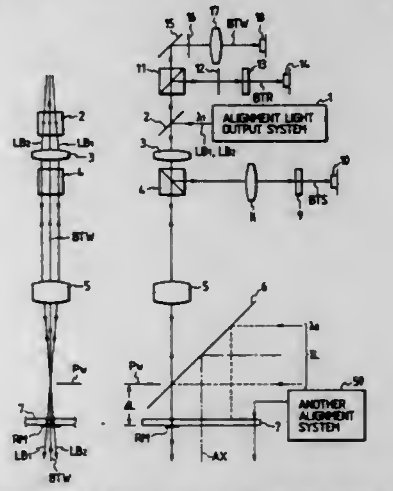
Kazuya Ota; Kouichirou Komatsu, both of Tokyo; Hideo Mizutani, and Nobutaka Magome, both of Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 325,638, Oct. 19, 1994, abandoned, which is a continuation of Ser. No. 148,537, Nov. 8, 1993, abandoned, which is a continuation of Ser. No. 963,399, Oct. 16, 1992, abandoned. This application Jul. 24, 1995, Ser. No. 506,132

Claims priority, application Japan, Oct. 23, 1991, 3-275273; Nov. 30, 1991, 3-342439; Dec. 25, 1991, 3-343258; Dec. 26, 1991, 3-345195

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—401 **18 Claims**



1. An alignment apparatus for an exposure apparatus which includes a projection optical system for focusing and projecting a pattern image on a mask onto a photosensitive substrate under exposure light, comprising:

a beam radiation system for radiating two first beams onto a diffraction grating-like mask mark formed on said mask, and radiating two second beams which are discrete from the first beams on an incident side of said mask, onto a diffraction grating-like substrate mark formed on said photosensitive substrate;

said mask having a region transparent to the two second beams at an adjacent position in a direction perpendicular to a grating period direction of said mask mark or a position neighboring said mask mark;

said beam radiation system including:

- a first beam output system for forming the two first beams, which cross at a predetermined angle, so as to radiate said mask mark,
- a second beam output system for forming the two second beams, which cross at a predetermined angle, so as to radiate said substrate mark through the transparent region of said mask, and

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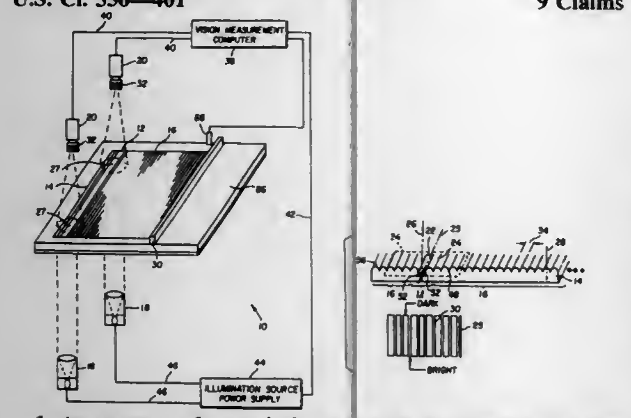
- an objective optical system for receiving the two first beams and the two second beams, and outputting the two first beams and the two second beams, so that radiation regions of the first and second beams are separated from each other on said mask;
- a photoelectric detecting device for receiving diffracted light components of the first beams from said mask mark and receiving diffracted light components of the second beams from said substrate mark and transmitted through said projection optical system, and for outputting photoelectric signals according to intensities of the diffracted light components; and
- means for detecting a relative position shift between said mask and said photosensitive substrate on the basis of the photoelectric signals.

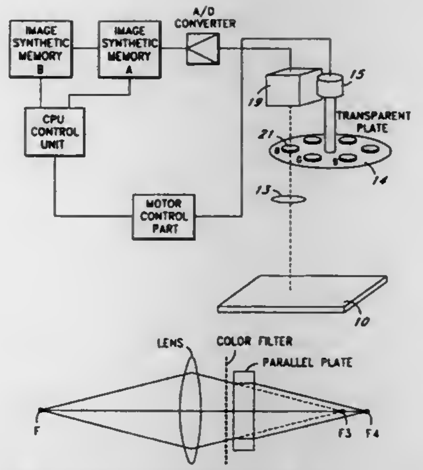
5,689,340
APPARATUS AND METHOD FOR MEASURING ALIGNMENT IN LENTICULAR MEDIA
Richard Dean Young, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 6, 1995, Ser. No. 567,827
Int. Cl.^{6} G01B *11/00*
U.S. Cl. 356—401 **9 Claims**



1. An apparatus for precisely measuring the location of a first portion relative to a second portion in a single sheet of lenticular media, wherein said first portion is adjacent to said second portion within said media, and wherein said lenticular media is coplanarly adjacent to said first and second portions, the apparatus comprising:
- a light source for illuminating at least the first portion adjacent to said second portion within said single sheet of said lenticular media;
- at least one sensor for receiving light from the illuminated first portion, said sensor producing a signal corresponding to said first portion;
- a processing means for analyzing said signal and for determining the location of said first portion, said signal comprising spatially dependent data corresponding to the location of said first portion.

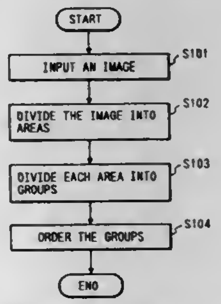
5,689,341
LCD PANEL TEST SYSTEM
Masaki Hayashi, Hanyu, Japan, assignor to Advantest Corp., Tokyo, Japan
Filed Jan. 24, 1996, Ser. No. 590,594
Claims priority, application Japan, Jan. 24, 1995, 7-027434
Int. Cl.^{6} G01N *21/25*
U.S. Cl. 356—418 **5 Claims**

1. An LCD test system, comprising:
- a camera section (**19**) having a built-in image element for capturing image contrast data of a display panel (**10**) to be inspected;
- a rotation plate (**14**) having a plurality of types of optical filters for passing images on said display panel (**10**) therethrough;
- an optical lens (**13**) for forming an image on said camera section (**19**);



- a motor (**15**) for rotating said plate (**14**); and
- a plurality of parallel plates (**21**) provided corresponding to said plurality of optical filters for compensating differences in focal point lengths caused by a chromatic aberration of said optical lens, said parallel plates (**21**) having different thickness from the others depending on colors of said optical filters.

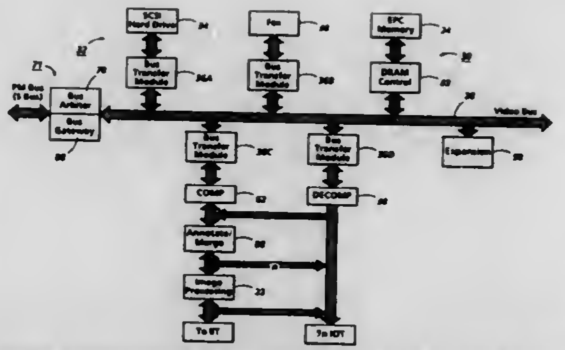
5,689,342
IMAGE PROCESSING METHOD AND APPARATUS WHICH ORDERS TEXT AREAS WHICH HAVE BEEN EXTRACTED FROM AN IMAGE
Tadanori Nakatsuka, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 15, 1995, Ser. No. 558,184
Claims priority, application Japan, Nov. 17, 1994, 6-283387; Nov. 17, 1994, 6-283388; Dec. 21, 1994, 6-318285; Jan. 31, 1995, 7-013897
Int. Cl.^{6} H04N *1/387;* **G06K** *9/00*
U.S. Cl. 358—296 **14 Claims**



1. An image processing method, including the steps of:
inputting an image;
extracting text areas from the input image;
dividing the text areas into groups; and
determining the ordering of the text areas within the groups.

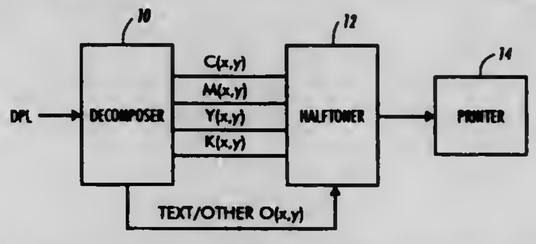
5,689,343
AREA MAPPING EMPLOYING REFERENCE CLUSTERS FOR HIGH QUALITY NONINTEGER RESOLUTION CONVERSION WITH ENHANCEMENT
Robert P. Loce, Webster; Ronald E. Jodoin, Pittsford, and Ying-wei Lin, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 26, 1995, Ser. No. 451,376
Int. Cl.^{6} H04N *1/40;* **G06K** *9/62;9/42;15/00*
U.S. Cl. 358—298 **13 Claims**

1. A method, operating in an image processing system, for mapping a plurality of first resolution input image signals representing a two-dimensional image to produce a plurality of second resolution image signals for rendering as a two-dimensional output image on an image output device, where the second resolution is higher than the first resolution, including the steps of:



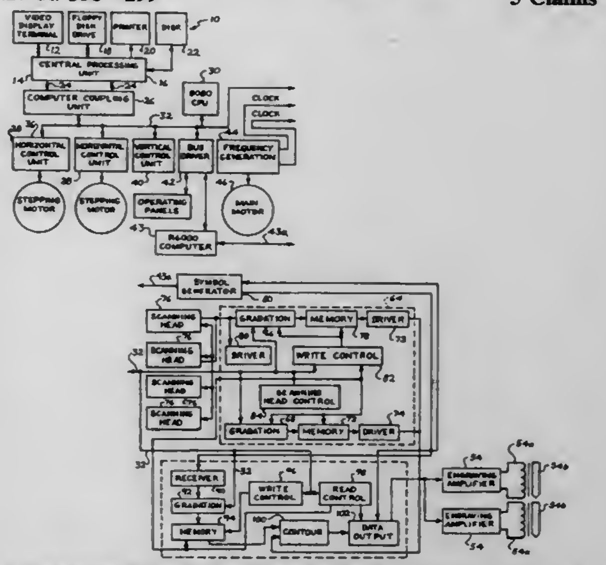
- defining a cluster of output pixel positions, wherein the cluster is a set of pixel positions having a size and two-dimensional shape encompassing a predetermined number of output pixel positions at the second resolution;
- identifying a first reference value equal to an input image signal level of a reference pixel position;
- setting the image signal level of the cluster of output pixels to the first reference value;
- comparing image signals of a set of first dimension pixel positions within a window encompassing the reference pixel position to a template-based filter to identify a match; and
- modifying, only in response to a template-based filter match, the image signal level of at least one of the cluster of output pixels.

5,689,344
MITIGATION OF TENTING DELETIONS IN COLOR XEROGRAPHIC PRINTERS
Fritz F. Ebner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 29, 1996, Ser. No. 638,656
Int. Cl.^{6} H04N *1/40;1/46*
U.S. Cl. 358—298 **11 Claims**



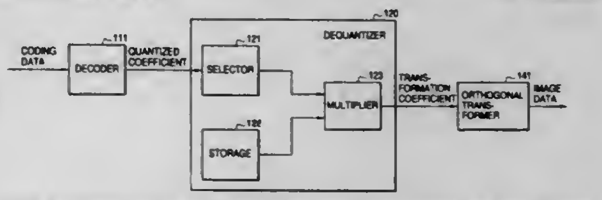
1. A method of altering an image representation to prevent tenting deletions in a color printing system receiving image signals represented at d possible levels, by generating printer signals that retain original color characteristics and provide significantly reduced colorant coverage upon printing, where the color printing system includes a halftoning system that generates printer signals adapted to drive a printer to generate a mark on a substrate at one of c possible levels of colorant, where d>c, said halftoning system using a desired screen matrix have N number of thresholds and N number of threshold values in a K×L matrix, each threshold corresponding to a printer signal in an image to be printed, said method comprising the steps of:
- determining a percentage of coverage reduction required to mitigate tenting deletions;
- multiplying N number of thresholds by M, a number related to the coverage reduction percentage, to obtain an increase in the number of thresholds in the screen matrix, thereby obtaining M×N number of thresholds, while retaining N number of threshold values in the screen matrix;
- setting a percentage of the M×N thresholds to a system value preventing printing of corresponding image signals, said percentage related to the coverage reduction percentage;
- printing a image signal for each threshold value which is exceeded in the screen matrix.

5,689,345
APPARATUS FOR TESTING AMPLIFIER FOR ELECTROMECHANICAL GRAVURE ENGRAVING MACHINE
Lester H. Harton, Newton, N.C., assignor to R. R. Donnelley & Sons, Chicago, Ill.
Filed Jan. 31, 1996, Ser. No. 594,821
Int. Cl.^{6} B41C *1/04;* **G01R** *31/00*
U.S. Cl. 358—299 **5 Claims**



1. Apparatus for generating test signals for an engraving amplifier of the type used in an electromechanical gravure engraving apparatus, comprising:
- means for generating a first engraving head vibration signal;
- means during a first state for generating a static data signal;
- means during a second state for toggling between two data states;
- means during a third state for generating a digitized ramp data signal; and
- means for generating a serial data stream representative of at least one of the data signals, a clock signal and a load signal for supply to a digital engraving controller.

5,689,346
IMAGE DATA PROCESSING SYSTEM
Tsugio Noda; Masahiro Fukuda, both of Isehara, and Kimitaka Murashita, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 671,208, Mar. 18, 1991, abandoned. This application Nov. 18, 1994, Ser. No. 343,973
Claims priority, application Japan, Mar. 16, 1990, 2-066302; Mar. 19, 1990, 2-069451; Mar. 20, 1990, 2-071601; Mar. 20, 1990, 2-071602; Jul. 10, 1990, 2-180471; Jul. 10, 1990, 2-180473
Int. Cl.^{6} H04N *1/41;1/415*
U.S. Cl. 358—426 **21 Claims**



1. A dequantizer in an image data processor using an image data restoration method for generating image data by normalizing transformation coefficients generated by said dequantizer which

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dequantizes quantized coefficients obtained by decoding inputted code data generated by coding the quantized coefficients generated through quantization of the transformation coefficients obtained by normalizing image data in a block of a plurality of picture elements divided from an image, said dequantizer comprising:

selecting means for selecting non-zero significant elements from quantized coefficients obtained by decoding the inputted code data represented by an index indicating a non-zero quantized coefficient and a run indicating the number of zeros, if any, preceded by the non-zero quantized coefficient;

a memory, coupled to said selecting means, storing quantization thresholds corresponding to respective elements of the quantized coefficients and for outputting selected quantization thresholds corresponding to the non-zero significant elements selected by said selecting means; and

multiplying means for multiplying the non-zero significant elements selected by said selecting means by the selected quantization thresholds corresponding to the non-zero significant elements and for outputting resultant products as elements of transformation coefficients corresponding to the non-zero significant elements.

5,689,347
SIGNAL PROCESSING APPARATUS

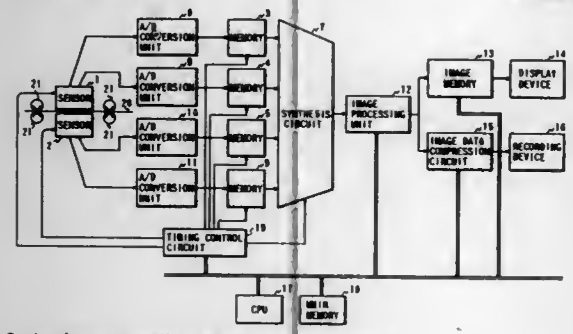
Masaaki Naoi, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1996, Ser. No. 609,952

Claims priority, application Japan, Mar. 3, 1995, 7-044183

Int. Cl.^{6} H04N *1/04;1/203*

U.S. Cl. 358—444 **9 Claims**



1. An image reading apparatus comprising:

two line sensors;

reading means for reading out outputs of said two line sensors through different channels, respectively;

memory means for storing image signals read out by said reading means, respectively; and

control means for controlling so that the image signals stored in said memory means are read out at a speed higher than that upon storage,

wherein said reading means reads out the outputs of said two line sensors from said different channels while deviating said outputs by a predetermined time, respectively.

5,689,348
BOOK DOCUMENT READING DEVICE

Hiroshi Takahashi, Kawasaki; Kazunori Bannai, Tokyo; Tetsuya Fujioka, Yokohama; Kazushige Taguchi, Warabi, and Susumu Shiina, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

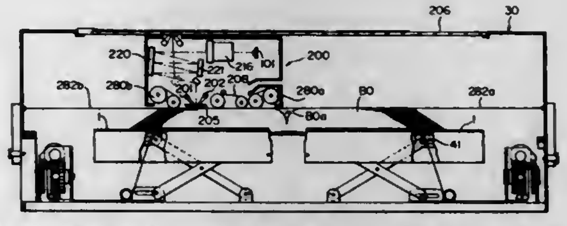
Division of Ser. No. 203,316, Mar. 1, 1994. This application Jun. 7, 1995, Ser. No. 474,245

Claims priority, application Japan, Mar. 1, 1993, 5-40180

Int. Cl.^{6} H04N *1/04;1/00;* **G03B** *27/32;27/52*

U.S. Cl. 358—475 **6 Claims**

1. An image reading device comprising:



a document table for supporting a bound book document in a spread open condition that exposes an inside surface area of the book document including an inside binding area;

an image scanning mechanism including an image reading portion and an illuminating portion for forming an illuminated scanning area which is moved to perform an optical scan of said inside surface area of the book document including the inside binding area, said image reading portion providing an image signal which includes irregularities which are caused by said inside binding area as a result of said optical scan;

an image signal amplifier which receives said image signal and provides amplification thereof; and

an image signal amplifier compensation controller which controls a level of gain of said amplifier so as to compensate at least in part said image signal for said irregularities therein.

5,689,349
METHOD AND A DEVICE FOR GENERATING PRINTING DATA IN A COLOR SPACE DEFINED FOR NON-STANDARD PRINTING INKS

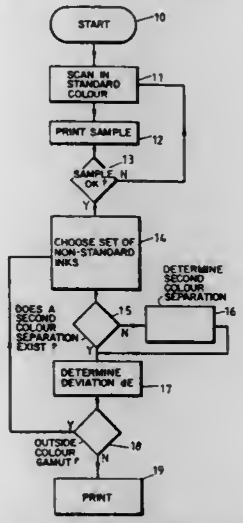
Lieven Plettinck, Wingene, and Jean-Pierre Van De Capelle, Ghent, both of Belgium, assignors to Barco Graphics N.V., Ghent, Belgium

Filed Apr. 29, 1994, Ser. No. 235,671

Claims priority, application Belgium, Apr. 30, 1993, 09300442

Int. Cl.^{6} H04N *1/46*

U.S. Cl. 358—500 **16 Claims**



1. A method for generating printing data for a picture to be printed, said picture being comprised of pixels, said method comprising:

defining a first n-dimensional device dependent colour space in which colour contributions expressed in terms of coordinates in said first colour space correspond to those of n colours of standard printing inks;

determining within said first colour space a first colour coordinate for each of said pixels of said picture;

defining a second m-dimensional device dependent colour space in which colour contributions expressed in terms of coordinates in said second colour space correspond to those of m colours of non-standard printing inks, said second colour space having a colour gamut;

selecting a set of p ($p \geqq n$) different colours among said colour gamut of said second colour space, each of said p colours being separated by at least a predetermined colour distance from each other;

determining a first colour table representing, for each colour of said selected set of p different colours, colour contributions expressed in terms of coordinates in said first colour space;

determining a second colour table representing, for each colour of said selected set of p different colours, colour contributions expressed in terms of coordinates in said second colour space;

forming a first p by p matrix having as a p_{ij}^{th} ($1 \leqq i \leqq p$; $1 \leqq j \leqq p$) matrix coefficient a j^{th} colour coordinate of an i^{th} colour within said first table;

forming a second m by p matrix by first inverting said first matrix and by forming m third p by 1 matrices, each of said third matrices having as coefficients a respective q^{th} ($1 \leqq q \leqq m$) one of said colour coordinates in said second colour space of each of said colours belonging to said selected set of p different colours, said second matrix having as q_{th} ($1 \leqq q \leqq m$) row coefficients the transposed result of multiplying said inverted first matrix with a respective one of said third matrices; and

determining a second colour coordinate within said second colour space for each of said pixels of said picture by multiplying said second matrix by said first colour coordinate.

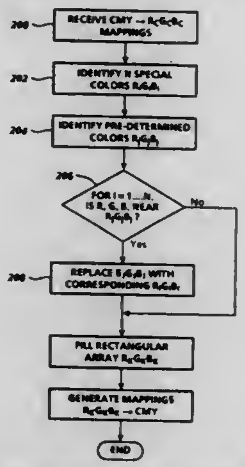
5,689,350
COLOR PRINTER CALIBRATION METHOD FOR ACCURATELY RENDERING SELECTED COLORS

Robert J. Rolleston, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1994, Ser. No. 354,306

Int. Cl.^{6} H04N *1/46;* **G03F** *3/08*

U.S. Cl. 358—504 **12 Claims**


200
RECEIVE CMY → RcGcBc MAPPINGS
202
IDENTIFY N SPECIAL COLORS RsGsBs
204
IDENTIFY PRE-DETERMINED COLORS RpGpBp
206
FOR i = 1...N, IS RsGsBs NEAR RpGpBp?
YES
NO
208
REPLACE RpGpBp WITH CORRESPONDING RsGsBs
FILL RECTANGULAR ARRAY RfGfBf
GENERATE MAPPINGS RfGfBf → CMY
END

1. A color printer calibration method for improving printer accuracy for specific colors includes the steps of:

a) empirically deriving a set of mappings, each mapping indicating a conversion from a printer color space color to colorimetric color space color;

b) identifying a first set of colors in colorimetric color space, for which mappings without interpolation from colorimetric space to device independent space are desired;

c) identifying a second set of colors in colorimetric color space, dispersed through said space in accordance with a predetermined spacing function;

d) identifying from said first and second sets, colors which are near each other in color space, and replacing identified second set colors with corresponding identified first set colors, to generate a new final set of colors;

e) deriving from said empirically derived set of mappings an inverted set of mappings required for printer calibration at each of the colors in said final set of colors.

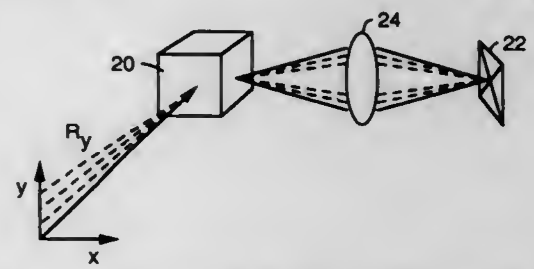
5,689,351
HOLOGRAPHIC MEMORY READOUT WITH REDUCED SPECKLE

John H. Hong, Thousand Oaks, Calif., assignor to Rockwell International Corporation, Thousand Oaks, Calif.

Filed Dec. 7, 1995, Ser. No. 574,464

Int. Cl.^{6} G03H *1/10;1/12;1/22;* **G11C** *7/00*

U.S. Cl. 359—10 **16 Claims**



1. A method of reducing speckle noise in images read out from a holographic memory exhibiting a Bragg effect along a horizontal axis, comprising the steps of:

providing a readout reference beam having a plurality of plane wave components, each of said plane wave components having the same angle along the horizontal axis, a unique angle along a vertical axis substantially perpendicular to the horizontal axis, and a unique temporal frequency;

illuminating the holographic memory with said plurality of plane wave components; and

generating a plurality of coincident, aligned, and mutually incoherent image reconstructions at an output plane, said plurality of image reconstructions averaging coherent noise and thereby reducing speckle.

5,689,352
LIQUID CRYSTAL DISPLAY DEVICE AND PROCESS FOR PRODUCING SAME

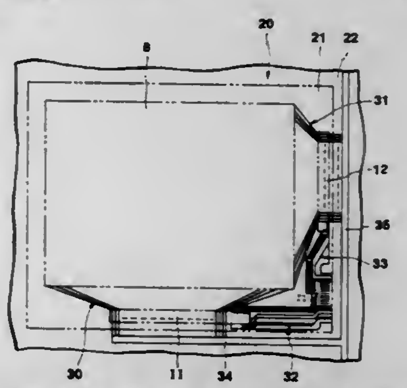
Masamitsu Kishigami, Kokubunji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1995, Ser. No. 491,318

Claims priority, application Japan, Jun. 21, 1994, 6-160772

Int. Cl.^{6} G02F *1/1333;1/1345;1/13*

U.S. Cl. 359—88 **29 Claims**



10. A process for producing a liquid crystal display device including first and second substrates arranged to face each other and a liquid crystal material interposed therebetween, said process comprising the steps of:

providing a first base plate to be formed into the first substrate;

providing a second base plate having a first portion to be formed into the second substrate and a second portion, the first portion and the second portion being defined on one surface of the second base plate by a boundary line, and the first portion including a first area to be covered with the first substrate and a second area not to be covered with the first substrate;

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- forming a plurality of display elemental devices on the first area of the first portion of the second base plate;
- forming a conductive pattern on the second base plate, the conductive pattern including a connecting pattern and a plurality of conductive lines coupled to the connecting pattern, the connecting pattern being located on the second portion of the second base plate, and the conductive lines being extended from the connecting pattern to the first area of the first portion through the second area of the first portion so as to be connected at ends thereof respectively to the display elemental devices formed on the first area of the first portion;
- forming an orientation film on the first area of the first portion of the second base plate;
- subjecting the orientation film formed on the second base plate to an orientation process such that a surface of the orientation film orients molecules of the liquid crystal material in a predetermined direction;
- arranging a sealing member on at least one of the first base plate and the second base plate, the sealing member forming a frame;
- bonding the first base plate and the second base plate together by means of the sealing member so that the sealing member surrounds the first area of the first portion of the second base plate, wherein a cavity is defined by the first base plate, the second base plate, and the sealing member;
- cutting the first base plate along an outer peripheral line of the sealing member so as to separate the first base plate into two portions by the outer peripheral line, whereby the first substrate is formed;
- cutting the second base plate along the boundary line between the first portion and the second portion thereof so as to separate the first portion from the second portion by the boundary line, whereby the first portion is formed into the second substrate; and
- injecting the liquid crystal material into the cavity defined by the first substrate, the second substrate, and the sealing member.

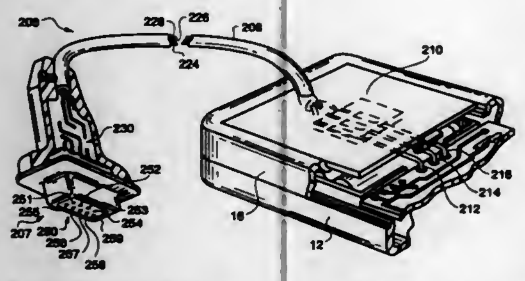
5,689,353
REMOTE CONTROL WITH TWO-WAY DATA COUPLING

Paul V. Darbee, Santa Ana; Richard E. Ellis, Garden Grove; Louis Steven Jansky, Long Beach, and Avram S. Grossman, Santa Ana, all of Calif., assignors to Universal Electronics Inc., Twinsburg, Ohio

Continuation of Ser. No. 314,970, Sep. 29, 1994, Pat. No. 5,552,917, which is a division of Ser. No. 93,512, Jul. 16, 1993, abandoned, which is a continuation of Ser. No. 586,957, Sep. 24, 1990, which is a division of Ser. No. 127,999, Dec. 2, 1987, Pat. No. 4,959,810, which is a continuation-in-part of Ser. No. 109,336, Oct. 14, 1987, abandoned. This application Sep. 3, 1996, Ser. No. 706,794

Int. Cl.^{6} H04B *10/24*

U.S. Cl. 359—148 **1 Claim**



1. A remote control for use in connection with a consumer electronics device and a computer, the remote control comprising:

- a central processing unit;
- a set of buttons linked to the central processing unit;
- a first circuit linked to the central processing unit for facilitating the transmission of signals to the consumer electronic device in response to activation of at least one of the set of buttons; and
- a second circuit linked to the central processing unit for facilitating the transmission and reception of signals to and from the computer.

5,689,354
OPTICAL SPACE COMMUNICATION APPARATUS

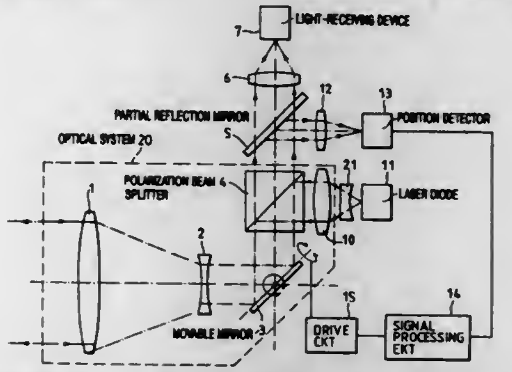
Kanjo Orino, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 383,325, Feb. 3, 1995, abandoned. This application Oct. 8, 1996, Ser. No. 727,214

Claims priority, application Japan, Feb. 4, 1994, 6-032031

Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—172 **14 Claims**



1. An optical space communication apparatus comprising:

- light-emitting means for emitting an elliptic light beam; and
- a light-projecting optical system for converting the elliptic light beam emitted by said light-emitting means into a transmission light beam, said light-projecting optical system comprising a plurality of optical elements, said system shaping a cross section of said transmission light beam into an elliptic shape immediately after having left said light-projecting optical system, and shaping the cross section of said transmission light beam at a farthest distance in a transmissible distance range such that a first width of said cross section along a first axis is substantially the same as a second width of said cross section along a second axis that is perpendicular to said first axis.

5,689,355
REPEATER USING OPTICAL CABLES FOR RADIO PAGING SYSTEM

Yoichi Okubo, Tokorozawa; Michio Norichika, Tachikawa; Takashi Yokote, Hamura; Hiroshi Suzuki, Hamura; Tadashi Akiyama, Hamura, and Jun Suganuma, Yokosuka, all of Japan, assignors to Kokusai Electric Co., Ltd., and NTT Mobile Communications Network Inc., both of Tokyo, Japan

Continuation of Ser. No. 407,415, Mar. 17, 1995, abandoned. This application Jul. 1, 1996, Ser. No. 674,213

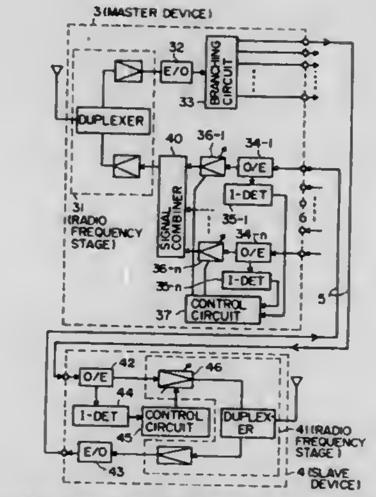
Claims priority, application Japan, Mar. 24, 1994, 6-076306; Oct. 3, 1994, 6-260933

Int. Cl.^{6} H04B *10/16;10/00*

U.S. Cl. 359—179 **6 Claims**

5. A repeater for repeating RF electric waves between a radio basic station and portable stations comprising:

- a master device;
- a plurality of slave devices;
- a plurality of pairs of optical cables connected between said master device and each of said slave devices, each pair of said optical cables comprising a down-link optical cable and an up-link optical cable;
- said master device comprising a first radio frequency stage having a first antenna for receiving one of said RF electric waves from said radio base station and for transmitting one of said RF electric waves to said radio base station, a first electro-optic transducer for transducing one of said RF electric waves received via said first radio frequency stage into a light intensity-modulated signal, a branching circuit for branching said light intensity-modulated signal into a plurality of branched optical outputs, a plurality of first output terminals each connected to one end of said down-link optical cable to send out therethrough one of said branched optical outputs to a corresponding one of said slave devices, a plurality of first input terminals providing one to one correspondence to a plurality of said first output terminals and each connected to one end of said up-link optical cable to receive up-link optical signals respectively transmitted from corresponding ones of said slave devices, a plurality of first opto-electric transducers connected respectively to said first input terminals for transducing respectively said up-link optical signals into up-link electric signals, a plurality of first variable-gain amplifiers for amplifying respectively said up-link electric signals, a plurality of first current detectors for detecting respectively direct-current values of said first opto-electric transducers, a first control circuit for comparing, respectively, first detected values from a plurality of said first current detectors with first preset references values and for applying each of first control signals to corresponding one of said first variable gain amplifiers to change an amplification factor thereof to reduce a corresponding first difference between a corresponding one of the first detected values to zero, a signal combiner for combining said up-link electric signals amplified into a composite RF electric signal to said first radio frequency stage to transmit one of said RF electric waves to said radio base station;
- said slave device comprising a second input terminal connected to another end of said down-link optical cable of said one pair of said optical cables, a second opto-electric transducer connected to said second input terminal for transducing one of said branched outputs of said light intensity-modulated signal transmitted via said down-link optical cable into a down-link RF electric signal, a second current detector for detecting a direct-current value of said second opto-electric transducer, a second variable gain amplifier for amplifying said down-link RF electric signal from said second opto-electric transducer, a second control circuit for comparing a second detected value from said second current detectors with a second preset reference value and for applying and second control signal to said second variable gain amplifier to change a gain thereof to reduce a second difference between the second detected value and the second preset reference value to zero, a second radio frequency stage including said second variable gain amplifier and having a second antenna for transmitting one of said RF electric waves to said portable stations and for receiving one of said R electric waves from at least one of said portable stations to provide an up-link RF electric signal, a second electro-optic transducer for transducing said up-link RF electric signal into an up-link light intensity-modulated signal, and a second output terminal connected to another end of said up-link optical cable to send out said up-link light intensity-modulated signal to said master device;
- the levels of said branched outputs of said light intensity-modulated signals for transmission from said master device to said slave devices being constant regardless of the lengths of a plurality of pairs said optical cables respectively interconnecting said master device and said slave devices.



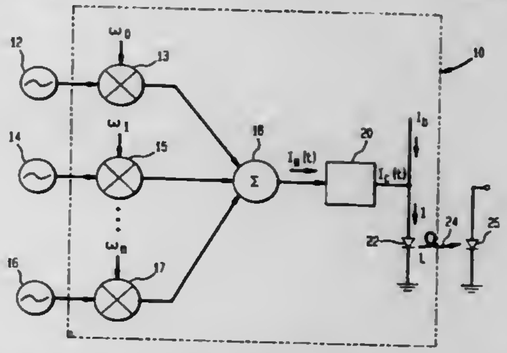
5,689,356
SYSTEM AND METHOD FOR MINIMIZING NONLINEAR DISTORTION IN OPTICAL COMMUNICATION SYSTEMS EMPLOYING LASER INTENSITY MODULATION

Attilio Joseph Rainal, Morristown, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 382,552, Feb. 2, 1995, abandoned. This application Jul. 26, 1996, Ser. No. 687,764

Int. Cl.^{6} H04B *10/04*

U.S. Cl. 359—181 **10 Claims**



1. An optical transmitter system comprising:

- an electronically adjustable amplitude limiting means for receiving and processing a multiplexed composite modulated electrical input signal representative of a plurality of multiplexed communication channels and for transmitting in response thereto a limited composite modulated electrical signal; and
- an optical output means for receiving the limited composite electrical signal and for generating modulated optical signal in response thereto, the optical signal having an output power being substantially linearly proportional to the received limited composite modulated electrical signal between a lower electrical clipping level and an upper electrical clipping level;
- wherein the limited composite modulated electrical signal transmitted by said electronically adjustable amplitude limiting means is adjusted and processed so as to be between the lower electrical clipping level and the upper electrical clipping level of the optical output means for all possible multiplexed composite modulated electrical input signal values.

5,689,357
NONLINEAR OPTICAL ELEMENT FOR EXTREMELY HIGH BIT RATES

Domenico Campi, Turin, Italy, assignor to Cselt- Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 21, 1995, Ser. No. 531,852

Claims priority, application Italy, Dec. 23, 1994, TO94A1064

Int. Cl.^{6} H01L *27/14;* **G02F** *1/015;1/23*

U.S. Cl. 359—245 **8 Claims**

1. A nonlinear optical element for extremely high bit rates, comprising a plate of semiconductor material formed with a sequence of variously doped layers through which at least one light radiation passes, said doped layers comprising a sequence of

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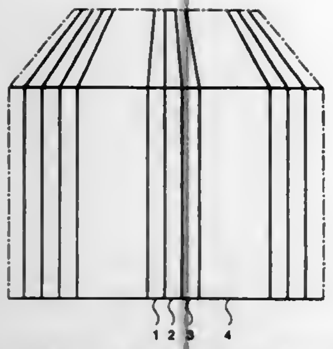


structures with excitonic nonlinearities and geometrically close to layers of larger sizes, which act as dilution/recombination tanks for carriers eliminated by the structures of excitonic nonlinearities, said structures being composed of a first quantum well delimited by confinement layers and said layers of larger sizes being second quantum wells, the layers of larger sizes having higher energy optical thresholds than the layers of said structures of excitonic nonlinearities.

5,689,358

OPTICAL FUNCTIONAL DEVICES AND INTEGRATED OPTICAL DEVICES HAVING A RIDGED MULTI-QUANTUM WELL STRUCTURE

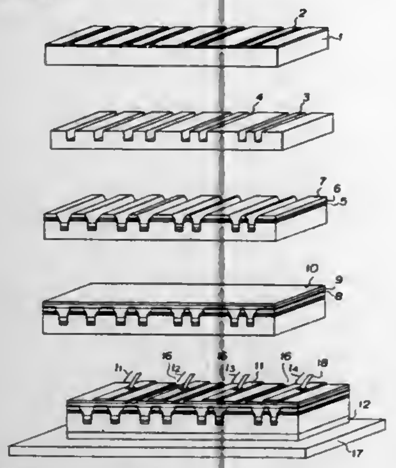
Masashi Nakao, Atsugi; Yasuhiro Suzuki, Yokohama; Osamu Mitomi; Kazuo Kasaya, both of Isehara; Junichi Nakano, Atsugi, and Kiyoyuki Yokoyama, Isehara, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 216,610, Mar. 23, 1994, Pat. No. 5,585,957. This application Sep. 27, 1996, Ser. No. 722,802

Claims priority, application Japan, Mar. 25, 1993, 5-66525; Mar. 25, 1993, 5-66527; Mar. 25, 1993, 5-66844; Mar. 25, 1993, 5-67032

Int. Cl.^{6} H01L *27/14*

U.S. Cl. 359—248 **18 Claims**



1. An optical functional device comprising:
a semiconductor substrate;
an optical functional layer provided on said semiconductor substrate and selected from the group consisting of a light emitting layer, a light absorbing layer, and an optical waveguide layer;
said optical functional layer comprising a multi-quantum well layer; and
said semiconductor substrate being a nonplanar semiconductor substrate having a ridge and two grooves adjacent said ridge, said ridge having a ridge width of from 1 to 10 μm, a ridge height of from 1 μm to 5 μm, and a gap distance of from 1 μm to 10 μm.

5,689,359

POLARIZATION INDEPENDENT OPTICAL ISOLATOR

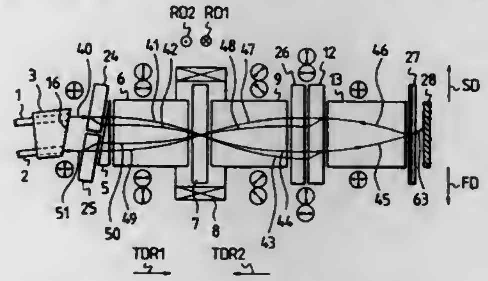
Noboru Kurata, Ikoma; Masaaki Tojo, Nara-ken, and Hironori Souda, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 3, 1993, Ser. No. 160,787

Claims priority, application Japan, Dec. 8, 1992, 4-327947

Int. Cl.^{6} G02B *5/30;27/28;* **G02F** *1/09*

U.S. Cl. 359—281 **24 Claims**



1. A polarization independent optical isolator comprising:
(a) a first birefringent plate for separating a signal ray passing therethrough into first and second rays wherein the first ray has a polarization that is orthogonal to a polarization of the second ray, wherein said second ray experiences a first spatial displacement as it passes through said first birefringent plate in a first transmitting direction;
(b) non-reciprocal rotating means for rotating said first and second rays about $\pi/4+n\pi/2$ in a first rotational direction of said first transmitting direction, wherein n is an integer
(c) a second birefringent plate for combining said rotated first and second rays from said non-reciprocal rotating means to produce a combined ray wherein the rotated first ray experiences a second spatial displacement as it passes through said second birefringent plate in said first transmitting direction, a distance of said first spatial displacement being equal and opposite in direction to a distance of said second spatial displacement;
(d) reflection means for reflecting said combined ray, said second birefringent plate separating said reflected combined ray passing therethrough into third and fourth rays wherein the third ray has a polarization that is orthogonal to a polarization of the fourth ray, wherein said third ray experiences a third spatial displacement as it passes through said second birefringent plate in a second transmitting direction, said non-reciprocal rotating means rotating said third and fourth rays about $\pi/4+\pi/2$ in a first rotational direction of said second transmitting direction; and
(e) a third birefringent plate for combining said rotated third and fourth rays from said non-reciprocal rotating means to produce a combined output ray wherein the rotated third ray experiences a fourth spatial displacement as it passes through said third birefringent plate in said second transmitting direction, a distance of said fourth spatial displacement being equal and in a same direction to that of said third spatial displacement;
wherein said first birefringent plate is adjacent to said third birefringent plate.

5,689,360

POLARIZATION INDEPENDENT OPTICAL ISOLATOR

Noboru Kurata, Ikoma; Masaaki Tojo, Nara-ken, and Hironori Souda, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

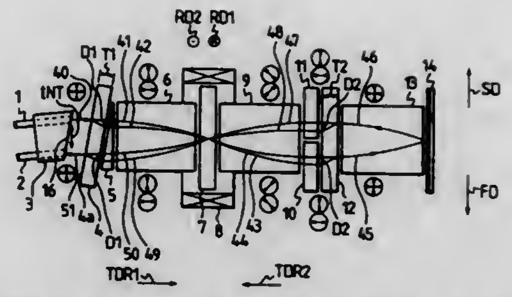
Division of Ser. No. 160,787, Dec. 3, 1993. This application Jun. 7, 1995, Ser. No. 475,344

Claims priority, application Japan, Dec. 8, 1992, 4-327947

Int. Cl.^{6} G02B *5/30;27/28;* **G02F** *1/09*

U.S. Cl. 359—281 **26 Claims**

1. A polarization independent optical isolator comprising:
(a) a first birefringent plate for separating a signal ray passing therethrough into first and second rays having first and second orthogonal polarizations wherein the first ray of the first orthogonal polarization experiences a first spatial displacement as it passes through said first birefringent plate in a first transmitting direction;



(b) non-reciprocal rotating means for rotating said first and second rays about $\pi/4+n\ \pi/2$ in a first rotational direction of said first transmitting direction, wherein n is an integer;
(c) a second birefringent plate for combining said first and second rays from said non-reciprocal rotating means to produce a combined ray wherein the first ray experiences a second spatial displacement as it passes through said second birefringent plate in said first transmitting direction, a distance of said first spatial displacement being substantially equal and opposite in directing to that of said second spatial displacement;
(d) first reciprocal rotating means provided between said first and second birefringent plates so as to intercept said first and second rays for rotating said first and second rays about $\pi/4$ in a second rotational direction of said first transmitting direction that is opposite to said first rotational direction of said first transmitting direction;
(e) reflection means for redirecting said combined ray in a second transmitting direction into said second birefringent plate, said second birefringent plate separating said redirected combined ray into third and fourth rays, said non-reciprocal rotating means rotating said third and fourth rays about $\pi/4+n\ \pi/2$ in a first rotational direction of said second transmitting direction; and
(f) second reciprocal rotating means provided between said first and second birefringent plates so as to intercept said third and fourth rays for rotating said third and fourth rays about $\pi/4$ in a second rotational direction of said second transmitting direction that is opposite to said first rotational direction of said second transmitting direction;
wherein said first birefringent plate combines said third and fourth rays from said non-reciprocal rotating means to produce a combined output ray; and
wherein said first reciprocal rotating means is located adjacent to said second reciprocal rotating means.

5,689,361

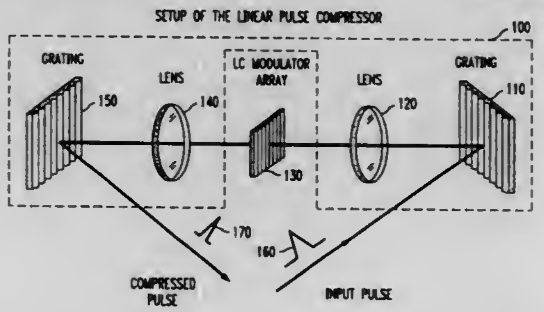
APPARATUS AND METHOD FOR FEMTOSECOND PULSE COMPRESSION BASED ON SELECTIVE ATTENUATION OF A PORTION OF AN INPUT POWER SPECTRUM

Theodoor Charlouis Damen, Colts Neck, and Martin C. Nuss, Fair Haven, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 22, 1996, Ser. No. 589,224

Int. Cl.^{6} G02F *1/09*

U.S. Cl. 359—284 **21 Claims**



1. An apparatus for decreasing a temporal duration of an optical input pulse having an input power spectrum associated therewith, said apparatus operative on at least unchirped optical input pulses, said apparatus comprising:
a zero-dispersion pulse shaper for receiving said optical input pulse and spectrally spreading said optical input pulse to produce a spectrally-spread pulse;
a modulator array interposed within said zero-dispersion pulse shaper for receiving said spectrally-spread pulse; and
control circuitry, coupled to said modulator array, that selectively drives individual pixels of said modulator array to a finite gray-level, whereby said modulator array selectively attenuates a portion of said power spectrum of said spectrally-spread pulse by a predetermined amount to produce a selectively-attenuated spectrally-spread pulse, said zero-dispersion pulse shaper focusing and recombining said selectively-attenuated spectrally-spread pulse to produce an output pulse having a broader power spectrum than said input pulse, said output pulse further having a temporal duration less than said input pulse, regardless of whether said input pulse is chirped.

5,689,362

ACOUSTO-OPTIC DEFLECTOR DEVICE

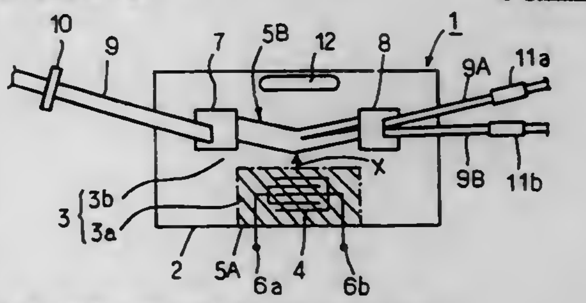
Michio Kadota, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 13, 1996, Ser. No. 662,928

Claims priority, application Japan, Jun. 15, 1995, 7-148462

Int. Cl.^{6} G02F *1/33*

U.S. Cl. 359—305 **8 Claims**



1. An acousto-optic deflector device comprising:
a substrate;
a first piezoelectric thin film formed on the substrate and an interdigital transducer formed in contact with the first piezoelectric thin film to define a SAW generator region, said interdigital transducer being adapted to generate surface acoustic waves which are propagated through said first piezoelectric film along a propagation direction when an exciting voltage is applied thereto;
a second piezoelectric thin film formed on the substrate in a light waveguide region which receives surface acoustic waves generated by the interdigital transducer;
the first piezoelectric thin film exhibiting better piezoelectric characteristics and higher specific resistance than the second piezoelectric thin film, and the second piezoelectric thin film exhibiting less light propagation loss than the first piezoelectric thin film.

5,689,363

LONG-PULSE-WIDTH NARROW-BANDWIDTH SOLID STATE LASER

C. Brent Dane, and Lloyd A. Hackel, both of Livermore, Calif., assignors to The Regents of the University of California, Oakland, Calif.

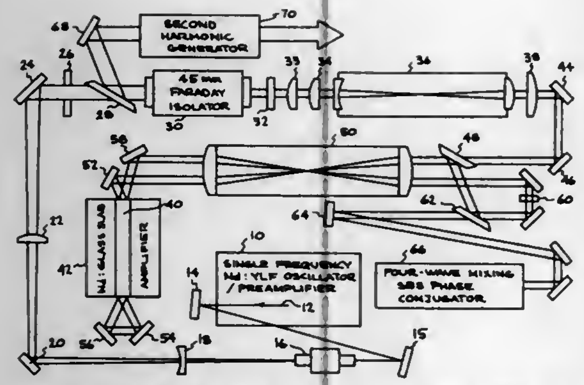
Filed Jun. 12, 1995, Ser. No. 489,402

Int. Cl.^{6} H01S *3/10;3/098;3/08;3/23*

U.S. Cl. 359—334 **36 Claims**

1. An apparatus for producing a long-pulse-width, narrow-bandwidth, near diffraction limited quality output beam, comprising:

VOL 1204 ISS 3 NO 18 1997 UMI


SECOND HARMONIC GENERATOR
45 mm FARADAY ISOLATOR
Nd : GLASS SLAB
AMPLIFIER
SINGLE FREQUENCY Nd : YLF OSCILLATOR / PREAMPLIFIER
FOUR-WAVE MIXING SBS PHASE CONJUGATOR
70
68
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56
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54

means for producing a polarized low power laser beam with an exponentially rising leading edge having a time constant τ determined from the formula

$\tau=1/(dG(t)/dt)-(P_o n/E_{sat}A)$;

at least one optical amplifier;

means for providing multiple amplification passes of said polarized low power laser beam, said multiple amplification passes propagating through said at least one optical amplifier to produce at least one amplified beam with nearly constant output power determined by said time constant of said exponentially rising leading edge of said polarized low power laser beam;

means for reversing the phase of said polarized low power laser beam and its propagation direction after half of said multiple amplification passes through said at least one optical amplifier, said reversing means including stimulated-Brillouin-scattering (SBS), wherein said amplified beam retraces its path and relative polarization through said at least one optical amplifier; and

means for converting said at least one amplified beam into at least one output beam by passively switching the polarization of said at least one amplified beam.

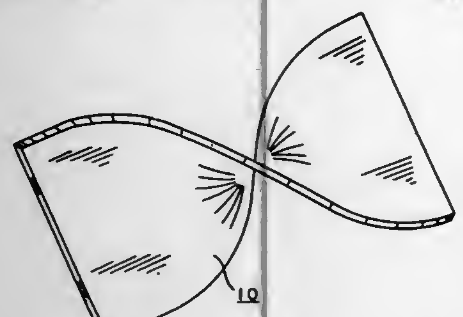
5,689,364
LIGHT REFLECTANT SURFACE FOR PHOTOINDUCTION CHAMBERS

Gordon L. McGregor, Landenberg, Pa.; Raymond B. Minor, Elkton, Md.; Gregory E. Hannon, Newark, and Robert Lyon Henn, Wilmington, both of Del., assignors to W.L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 369,850, Jan. 6, 1995, Pat. No. 5,596,450. This application Dec. 6, 1995, Ser. No. 569,411

Int. Cl.^{6} G02B *5/08;5/02*

U.S. Cl. 359—350 **10 Claims**



1. A method of providing improved reflectivity of light in a photoinduction chamber incorporating a UV lamp, which comprises:

providing a reflectant material comprising an expanded polytetrafluoroethylene having polymeric nodes interconnected by fibrils defining microporous voids therein; and

mounting the (reflectant material such that light from the UV lamp can strike and reflect from the reflectant material.

5,689,365
STEREOSCOPIC-VISION ENDOSCOPE

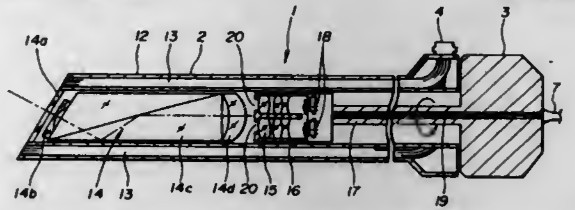
Susumu Takahashi, Iruma, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Filed Sep. 11, 1995, Ser. No. 526,103

Claims priority, application Japan, Sep. 13, 1994, 6-219028

Int. Cl.^{6} G02B *21/36;21/20;21/22;21/00*

U.S. Cl. 359—362 **16 Claims**



1. A stereoscopic-vision endoscope including a rigid insertional part, comprising:

an objective optical system comprising a front optical system having a single optical axis fixedly mounted within said insertional part including a field conversion optical system, and a rear optical system including optical systems that have a plurality of optical axes which receive a light beam from said front optical system so as to form images on said optical axes, and thus form a plurality of images, said front optical system and said rear optical system being relatively rotatable, said rear optical system being wholly contained within said insertional part.

5,689,366
COARSE AND FINE ADJUSTMENT FOCUSING APPARATUS FOR A MICROSCOPE

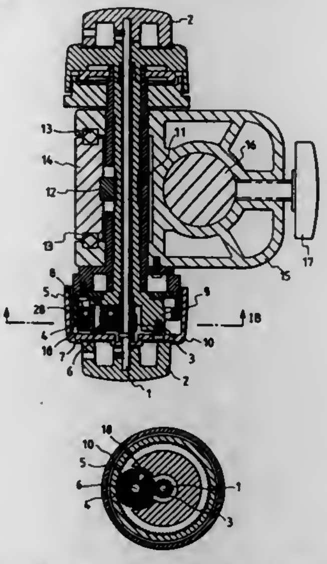
Shinobu Sakamoto, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Nov. 3, 1995, Ser. No. 553,029

Claims priority, application Japan, Nov. 4, 1994, 6-270088; Oct. 23, 1995, 7-273784

Int. Cl.^{6} G02B *21/26;21/00*

U.S. Cl. 359—392 **5 Claims**



1. A coarse and fine adjustment focusing apparatus secured to a microscope body for moving a movable member, comprising:

a sun gear secured to a fine adjustment knob shaft;

an internal gear unrotatably provided on a same axis as said fine adjustment knob shaft;

a first planetary gear disposed on a rotary shaft and meshing with both said sun gear and said internal gear;

a second planetary gear being equal in number of teeth and module to said first planetary gear and disposed on said rotary shaft and meshing with said sun gear;

a first resilient member for imparting rotational forces in opposite directions to said first planetary gear and said second planetary gear, respectively;

a third planetary gear being equal in number of teeth and module to said first planetary gear and disposed on said rotary shaft and meshing with said internal gear;

a second resilient member for imparting rotational forces in opposite directions to said first planetary gear and said third planetary gear, respectively; and

a power transmitting shaft to which is secured said rotary shaft and which is rotatable on the same axis as said fine adjustment knob shaft, said power transmitting shaft having a pinion for moving said movable member.

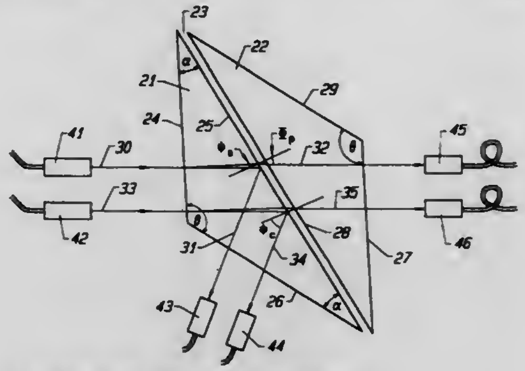
5,689,367
POLARIZATION BEAM SPLITTER

J. J. Pan, Milpitas; Kai Zhang, San Jose, and Yonglin Huang, Milpitas, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Filed Oct. 13, 1995, Ser. No. 542,871

Int. Cl.^{6} G02B *5/30;27/28;27/14*

U.S. Cl. 359—495 **1 Claim**



1. A polarization beam splitter comprising

a GRIN lens for introducing collimated light;

a first birefringent crystal prism having first, second and third faces, said collimated light incident upon said first face, said collimated light incident upon said second face at an angle ϕ with respect to a line normal to said second face so that light polarized perpendicularly to a plane of incidence upon said second face is reflected toward said third face and refracted at said third face from said first prism cross-sectionally undistorted with respect to a cross-section of said collimated light incident at said first face, and light polarized in said plane of incidence is refracted at said second face; and

a second birefringent crystal prism having a second face parallel to, and in close proximity with, said second face of said first birefringent prism so that light refracted at said second face of said first prism is refracted at said second face of said second prism and into said second prism, and a first face positioned with respect to said second face so that light refracted into said second prism is refracted at said first face from said second prism cross-sectionally undistorted with respect to a cross-section of said light polarized in said plane of incidence at said second face of said first prism;

wherein said first prism comprises $LiNbO_3$, said first and third faces forming an angle of 125° with respect to each other, and said first and third faces each forming an angle of 27.5° with respect to said second face.

5,689,368
APPARATUS FOR SCANNING DRUM INNER FACE AND METHOD OF SCANNING THEREFOR

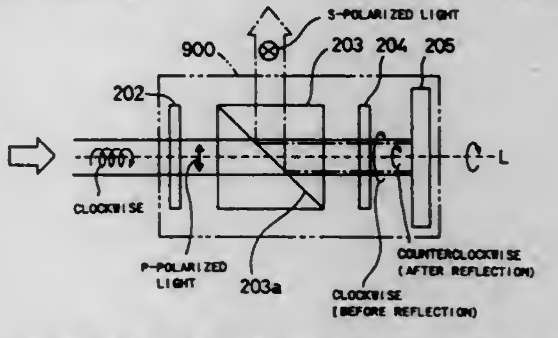
Masahide Okazaki, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Division of Ser. No. 353,953, Dec. 12, 1994, Pat. No. 5,504,619, which is a continuation of Ser. No. 780,355, Oct. 22, 1991, abandoned. This application Jan. 29, 1996, Ser. No. 592,997

Claims priority, application Japan, Oct. 31, 1990, 2-296690; Nov. 26, 1990, 2-324001; Aug. 29, 1991, 3-244633

Int. Cl.^{6} G02B *5/30;26/08*

U.S. Cl. 359—497 **7 Claims**


S-POLARIZED LIGHT
900
203
204
205
202
L
CLOCKWISE
P-POLARIZED LIGHT
203a
COUNTERCLOCKWISE (AFTER REFLECTION)
CLOCKWISE (BEFORE REFLECTION)

5. A light deflector for deflecting a circularly polarized light beam having a principal ray, comprising:

deflection means having two reflecting planes facing each other at a predetermined angle, for deflecting a light beam at a predetermined deflection angle;

conversion means for converting the circularly polarized light beam to a linearly polarized light beam; and

rotation means for integrally rotating said deflection means and said conversion means around said principal ray of said circularly polarized light beam.

5,689,369
ANGULAR DEVIATION DETECTION APPARATUS

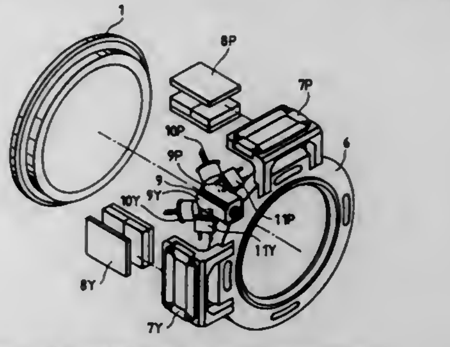
Kazuhiro Noguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 364,724, Dec. 27, 1994, abandoned. This application Dec. 11, 1996, Ser. No. 763,444

Claims priority, application Japan, Dec. 8, 1993, 5-334361; Jul. 26, 1994, 6-192688

Int. Cl.^{6} G02B *27/64;* **H04N** *5/228*

U.S. Cl. 359—557 **38 Claims**



1. An image blur prevention apparatus comprising:

a movable member which moves for preventing an image blur;

a first driving apparatus which inclinedly moves said movable member in a first direction, said first driving apparatus being disposed in the vicinity of a first portion of said movable member;

a second driving apparatus which inclinedly moves said movable member in a second direction different from the first direction, said second driving apparatus being disposed in the vicinity of a second portion of said movable member different from the first portion;

a detection device which detects at least one of inclined movement along the first direction and inclined movement along

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the second direction of said movable member, said detection device being disposed in the vicinity of a third portion of said movable member which is disposed between the first portion and the second portion.

5,689,370

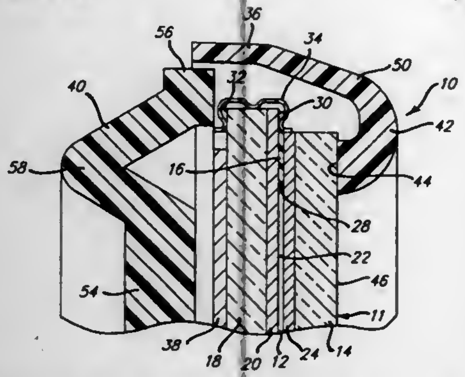
IMAGE/INFORMATION DISPLAYS ON ELECTRO-OPTIC DEVICES

William L. Tonar, and Lyman G. Wakeman, both of Holland, Mich., assignors to Gentex Corporation, Zeeland, Mich.

Filed Dec. 21, 1995, Ser. No. 576,704

Int. Cl.^{6} G02B *27/00;5/08*

U.S. Cl. 359—603 **4 Claims**



1. An electro-optically dimming rearview mirror for motor vehicles, said mirror comprising, in combination, front and rear spaced elements, said front element and said rear element defining a chamber therebetween, said front element being transparent, one side of such front element confronting said rear element including transparent electrically conductive means, one side of said rear element confronting said front element including means providing both light reflective and electrically conductive functions, said chamber containing an electro-optic reversibly variable transmittance medium in contact with said transparent electrically conductive means on said front element and said means providing both light reflective and electrically conductive functions on said rear element, said means providing both light reflective and electrically conductive functions on said rear element being effective to reflect light through said medium and through said front element when said light reaches said means providing both light reflective and electrically conductive functions after passing through said medium and through said front element, said mirror including indicia means formed of electrically conductive material and projecting partially into said chamber from and beyond said means providing both light reflective and electrically conductive functions on said one side of said rear element confronting said front element, said indicia means terminating in spaced relationship with respect to said transparent electrically conductive means on said one side of said front element, said indicia means being visible through said medium and through said front element, and means including said indicia means for applying electrical potential to said electro-optic medium to cause variations in the light transmittance of said electro-optic medium.

5,689,371

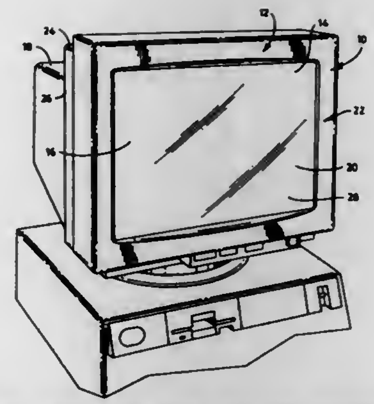
FILTER ASSEMBLY

William F. Butterfield, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1995, Ser. No. 521,345

Int. Cl.^{6} G02B *27/00;7/02*

U.S. Cl. 359—609 **4 Claims**



1. An optical filter assembly for use on a visual display device comprising: a frame assembly defining a viewing aperture; said frame assembly being mountable on a visual display device such that said aperture is in registry with a visual display screen of the visual display device; an optical filter for coveting said aperture, and thereby the visual display area; said frame assembly includes a plurality of sidewalls which extend a distance sufficient for reducing the passage of room light to behind the optical filter; means on said frame assembly for releasably holding the optical filter to said frame assembly; and, means associated with said frame assembly for spacing the optical filter from the display screen; said spacing means includes protrusion means integral with said frame assembly for contacting the display screen for physically spacing the mounted optical filter from the display screen; and, means on said frame assembly for centering the optical filter when the latter is being mounted to said frame assembly; wherein said means for centering said filter includes a plurality of ribs which act to engage and guide the optical filter into registry with said aperture.

5,689,372

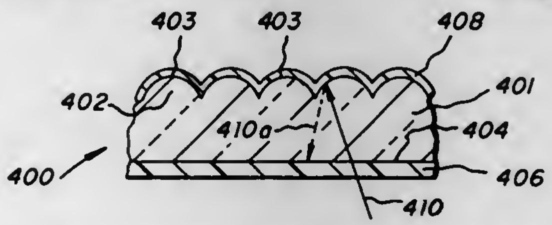
INTEGRAL IMAGING WITH ANTI-HALATION

Roger Roy Morton, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1995, Ser. No. 577,633

Int. Cl.^{6} G02B *27/10*

U.S. Cl. 359—623 **25 Claims**



1. A method of exposing an integral imaging element having: an integral lens sheet with opposed front and back surfaces; and a light sensitive layer positioned behind the back surface;

the method comprising the steps of:

exposing the light sensitive layer with light from behind the back surface;

wherein the element additionally has an anti-halation layer on at least a portion of the front surface of the lens sheet which anti-halation layer, during exposure, reduces the amount of exposing light which would otherwise be reflected back toward the light sensitive layer from the front surface.

5,689,373

EYEPIECE LENS

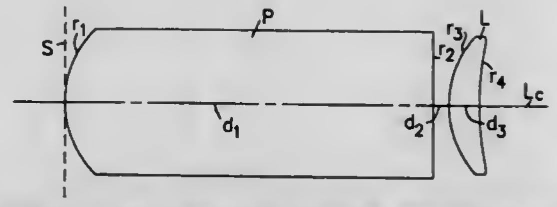
Hideyasu Takato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1996, Ser. No. 587,382

Claims priority, application Japan, Jan. 19, 1995, 7-006554

Int. Cl.^{6} G02B *25/00;3/02;17/00;9/00*

U.S. Cl. 359—646 **11 Claims**



1. An eyepiece lens for observing an image formed by an objective lens and correctly erected by a correctly erect image forming system, the eyepiece lens consisting essentially of a positive meniscus lens convex on the object side, wherein the positive meniscus lens has an object side surface and a pupil side surface, each of which is aspherical, and wherein the eyepiece lens is configured so as to satisfy the following condition (1):

$$-1\times10^{-3}<X_1/f<0 \qquad (1)$$

where f is the focal length of the eyepiece lens, and X_1 is the amount of displacement of the object side surface of the eyepiece lens from its reference sphere at a height of 0.12f from its optical axis, wherein the diameter ø of the exit pupil of the eyepiece lens satisfies the following condition:

$$\o \geqq 5\ \text{(mm)}.$$

5,689,374

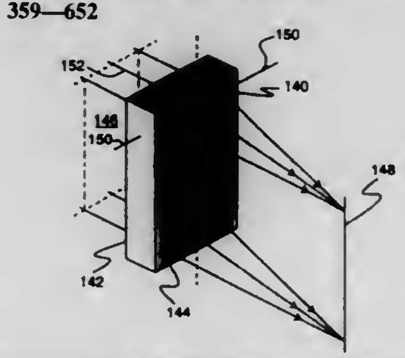
GRIN LENS AND METHOD OF MANUFACTURING

Xiaojle Xu, and Michael E. Savard, both of Tucson, Ariz., assignors to LightPath Technologies, Inc., Albuquerque, N. Mex.

Filed Mar. 8, 1995, Ser. No. 400,804

Int. Cl.^{6} G02B *3/00*

U.S. Cl. 359—652 **9 Claims**



1. A substantially spectrally invariant gradient optical element formed of optical material having front and back faces and an optical axis, said optical material having a refractive index varying symmetrically about a central plane containing said optical axis, said refractive index being substantially constant in directions parallel to said central plane, said central plane passing from one of said front and back faces to the other of said faces, said element having an Abbe Number greater than 100.

5,689,375

OPTICAL APPARATUS

Tatsuya Satoh, and Masaharu Eguchi, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 133,977, Oct. 8, 1993, abandoned.

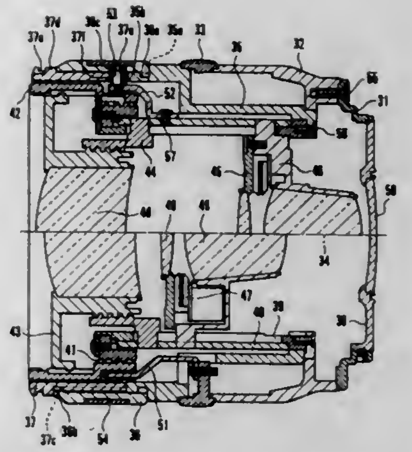
This application Dec. 17, 1996, Ser. No. 768,194

Claims priority, application Japan, Oct. 19, 1992, 4-306559; Oct. 30, 1992, 4-314412

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—699 **21 Claims**

1. An optical apparatus, comprising:



a holding member for holding an optical element;

driving means;

a moving mechanism for moving said holding member by said driving means; and

an adjusting mechanism for adjusting the position of said holding member by using said moving mechanism and not using said driving means, said adjusting by said adjusting mechanism being an adjustment during the assembling of said holding member.

5,689,376

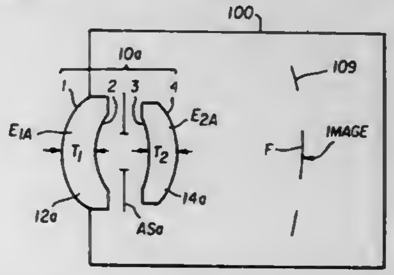
TWO ELEMENT OPTICAL SYSTEM, A CAMERA USING IT AND METHOD OF MAKING THE CAMERA

Alan E. Lewis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1995, Ser. No. 427,552

Int. Cl.^{6} G02B *9/08*

U.S. Cl. 359—717 **24 Claims**



1. An optical system for use in a low-cost camera having a photosensitive material with an image surface curved toward said optical system, said optical system comprising only two single lens components and an aperture stop located therebetween, wherein one of said lens components is biaspheric, said optical system forming a curved image corresponding substantially to the curved image surface of the camera through a full field angle θ of at least 62.5 degrees, and wherein said optical system is not sensitive to aspheric surface decenter of ±0.025 mm of said biaspheric lens component, so that the heterochromatic MTF values of the optical system are

$$MTF>58,$$

where MTF represents sagittal and tangential MTF values at the spatial frequency of 12.5 lines/mm, from zero to about 70% field of view.

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5,689,377
CATADIOPTRIC OPTICAL SYSTEM AND EXPOSURE APPARATUS HAVING THE SAME

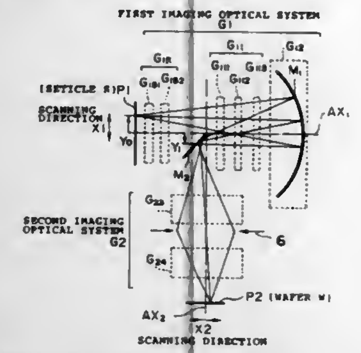
Tomowaki Takahashi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 5, 1996, Ser. No. 628,165

Claims priority, application Japan, Apr. 7, 1995, 7-082380; Feb. 19, 1996, 8-030978

Int. Cl.^{6} G02B *17/00*

U.S. Cl. 359—727 **32 Claims**



1. A catadioptric optical system comprising:

a first imaging optical system forming an intermediate image of a pattern provided on a first surface, said first imaging optical system including a first lens group with a positive refracting power and a second lens group which includes a concave mirror having a concave surface facing said first surface, said second lens group having a negative lens component;

a second imaging optical system forming an image of said intermediate image upon a second surface, a composite magnification of said first and second imaging optical systems being a reduction magnification; and

a first optical path deflecting member disposed in an optical path from said first imaging optical system to said second imaging optical system so as to guide light from said first imaging optical system to said second imaging optical system,

wherein a part of the first lens group of said first imaging optical system is positioned between said first optical path deflecting member and said second lens group, in a space through which both light directed from said first surface to said second lens group and light directed from said second lens group to said first optical path deflecting member pass, and

wherein the first lens group includes, in the following order from said first surface toward said second lens group, a front lens group having a positive refracting power, an intermediate lens group having a negative refracting power, and a rear lens group having a positive refracting power.

5,689,378
LASER DIODE MODULE

Yuichirou Takashima; Kozo Yamazaki; Mitsuharu Ishii; Toshimitsu Kumagai, and Masanori Ohkawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 88,647, Jul. 9, 1993, abandoned. This application Sep. 26, 1996, Ser. No. 718,651

Claims priority, application Japan, Jul. 10, 1992, 4-183968

Int. Cl.^{6} G02B *27/02*

U.S. Cl. 359—813 **38 Claims**

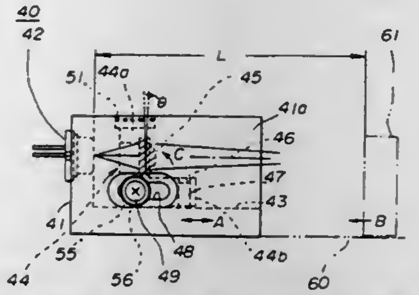
1. A laser diode module comprising:

a laser diode emitting a laser beam along an optical axis;

a base which holds the laser diode and has a mounting surface parallel to the optical axis of the laser diode;

a lens for collimating the laser beam and having a lens axis;

a lens holder slidably mounted on the mounting surface of the base and which holds the lens with the lens axis thereof aligned substantially with the optical axis, the lens, further, having a transverse axis passing through the center of the lens, transverse to and forming an intersection with the optical axis, the optical and transverse axes defining a first reference plane, a second transverse axis, transverse to the reference plane, passing through the intersection;



a mechanism mounted on the base and which selectively tilts the lens holder with respect to the mounting surface of the base thereby to selectively adjust the tilt angle of the lens; and

said lens being selectively tilted about the first transverse axis to a selected tilt angle, relative to the second transverse axis, at which a minimum beam spot of the laser beam, at a focus position along the optical axis, is achieved at the focus position of the beam spot in both first and second directions, each thereof perpendicular to the optical axis and respectively parallel to the first and second transverse axes.

5,689,379
INNER GEAR, CYLINDRICAL PRODUCT WITH INNER GEAR, MOLD FOR INNER GEAR, MOLD FOR CYLINDRICAL PRODUCT WITH INNER GEAR, METHOD OF MANUFACTURING INNER GEAR, AND METHOD OF MANUFACTURING CYLINDRICAL PRODUCT WITH INNER GEAR

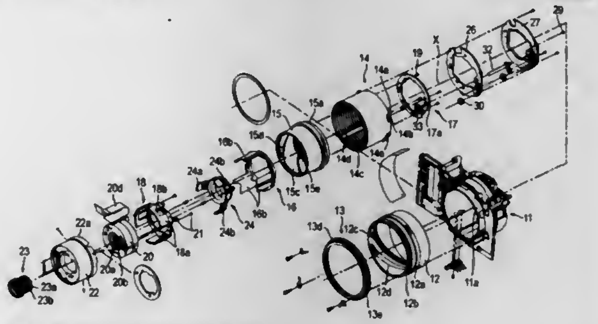
Hiroshi Nomura, and Takamitsu Sasaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,812

Claims priority, application Japan, Dec. 20, 1993, 5-320481; Feb. 18, 1994, 6-021632; Mar. 2, 1994, 6-032663; Mar. 2, 1994, 6-032664

Int. Cl.^{6} G02B *7/02*

U.S. Cl. 359—829 **12 Claims**



1. A molded product comprising:

a cylindrical base member;

a spiral inner gear formed on an inner peripheral surface of said cylindrical base member so as to be inclined with respect to a circumferential direction of said cylindrical base member; and,

a spiral relief groove formed on said inner peripheral surface of said cylindrical base member adjacent to said spiral inner gear, said spiral relief groove having a radius from a center of said cylindrical base member to a bottom of said spiral relief groove greater than a radius of a dedendum circle of said spiral inner gear; and

said spiral relief groove having a width that is wider than a tooth width of said spiral inner gear.

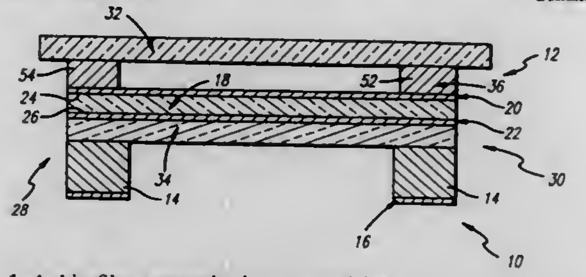
5,689,380
THIN FILM ACTUATED MIRROR ARRAY FOR PROVIDING DOUBLE TILT ANGLE

Gregory Um, Torrance, Calif., assignor to Aura Systems, Inc., El Segundo, Calif.

Continuation-in-part of Ser. No. 200,861, Feb. 23, 1994, Pat. No. 5,481,396. This application Apr. 17, 1995, Ser. No. 424,149

Int. Cl.^{6} G02B *7/182;26/08;* **H01L** *41/08*

U.S. Cl. 359—846 **7 Claims**



1. A thin film actuated mirror comprising:

a pedestal, said pedestal including a first pedestal section and a second pedestal section;

at least one piezoelectric structure mounted to said pedestal, said piezoelectric structure further comprising a piezoelectric material layer having two opposing surfaces, and two metal electrodes, each of said electrodes being mounted on a respective one of said opposing surfaces of said piezoelectric material, wherein an electrical signal applied across said piezoelectric material between said electrodes causes horizontal deformation of said piezoelectric material layer and further wherein said structure is being mounted to said first pedestal section at a proximal end of said piezoelectric material layer, and further wherein said structure is divided into a first portion and a second portion, said first portion being mounted to said first pedestal section at a proximal end of said piezoelectric structure and said second portion being mounted to said second pedestal section at a distal end of said piezoelectric structure; and

a mirror surface, said mirror surface being interconnected to both said proximal and distal ends of said piezoelectric structure such that said mirror surface tilts at a double angle in response to the deformation of said piezoelectric material layer.

5,689,381

Patent Not Issued For This Number

5,689,382
METHOD AND APPARATUS FOR DETERMINING HEAD PARAMETER FOR HELICAL SCAN RECORDER

Timothy C. Hughes, Boulder, Colo., assignor to Exabyte Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 150,733, Nov. 12, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,370

Int. Cl.^{6} G11B *5/596*

U.S. Cl. 360—70 **7 Claims**

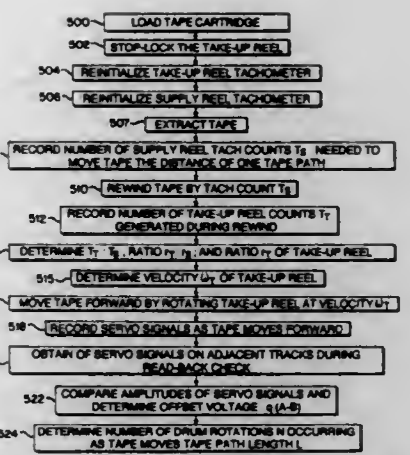
1. A helical scan recorder apparatus which records information on a magnetic tape, the magnetic tape being transported in a tape path between a supply reel and a take-up reel in the helical scan recorder, the recorder apparatus comprising:

a tape system for conducting a tape extraction operation for extracting the tape into the tape path;

means for imparting linear velocity to the tape;

a rotating drum upon which a plurality of heads are adjustably mounted, the plurality of heads including a first head for recording information on the tape and a second head for reading servo information from the tape;

a supply reel sensor for determining a degree of supply reel rotation;


500 LOAD TAPE CARTRIDGE
502 STOP-LOCK THE TAKE-UP REEL
504 REINITIALIZE TAKE-UP REEL TACHOMETER
506 REINITIALIZE SUPPLY REEL TACHOMETER
507 EXTRACT TAPE
508 RECORD NUMBER OF SUPPLY REEL TACH COUNTS TS NEEDED TO MOVE TAPE THE DISTANCE OF ONE TAPE PATH
510 REWIND TAPE BY TACH COUNT TS
512 RECORD NUMBER OF TAKE-UP REEL COUNTS TT GENERATED DURING REWIND
514 DETERMINE TT · TS, RATIO rT rS; AND RATIO rT OF TAKE-UP REEL
515 DETERMINE VELOCITY ωT OF TAKE-UP REEL
516 MOVE TAPE FORWARD BY ROTATING TAKE-UP REEL AT VELOCITY ωT
518 RECORD SERVO SIGNALS AS TAPE MOVES FORWARD
520 OBTAIN OF SERVO SIGNALS ON ADJACENT TRACKS DURING READ-BACK CHECK
522 COMPARE AMPLITUDES OF SERVO SIGNALS AND DETERMINE OFFSET VOLTAGE q(A-B)
524 DETERMINE NUMBER OF DRUM ROTATIONS N OCCURRING AS TAPE MOVES TAPE PATH LENGTH L

a take-up reel sensor for determining a degree of take-up reel rotation;

a processor which uses the degree of supply reel rotation obtained from the supply reel sensor during the tape extraction operation and the degree of take-up reel rotation obtained from the take-up reel sensor during a tape rewind operation, and which uses servo information on two adjacent tracks of the tape during a read-after-record operation, to adjust positioning of at least one of the heads of the helical scan recorder.

5,689,383
APPARATUS AND METHOD FOR CORRECTING CAPSTAN LOAD IN SLOW SPEED REPRODUCTION MODE

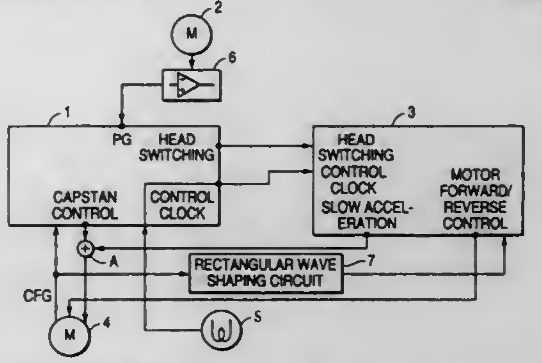
Yong Jae Kim, Incheon, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 30, 1994, Ser. No. 366,773

Claims priority, application Rep. of Korea, Dec. 30, 1993, 31636

Int. Cl.^{6} G11B *15/52*

U.S. Cl. 360—73.11 **19 Claims**


M
2
6
1
PG
HEAD SWITCHING
CAPSTAN CONTROL
CONTROL CLOCK
3
HEAD SWITCHING CONTROL CLOCK
SLOW ACCEL-ERATION
MOTOR FORWARD/REVERSE CONTROL
A
RECTANGULAR WAVE SHAPING CIRCUIT
7
CFG
M
4
S

1. A method for correcting a capstan load in a slow speed reproduction mode, comprising the steps of:

outputting initial values of first, second, third, fourth, and fifth operational time intervals for a capstan motor;

obtaining a sixth operational time interval for the capstan motor by summing the first through fifth operational time intervals;

detecting the number of capstan frequency generating signals generated from the capstan motor during the obtained sixth operational time interval;

comparing the detected number of the capstan frequency generating signals with a predetermined number for each speed mode;

calculating a new sixth operational time interval for the capstan motor based on the comparison result; and

correcting the capstan load based on the calculation result.

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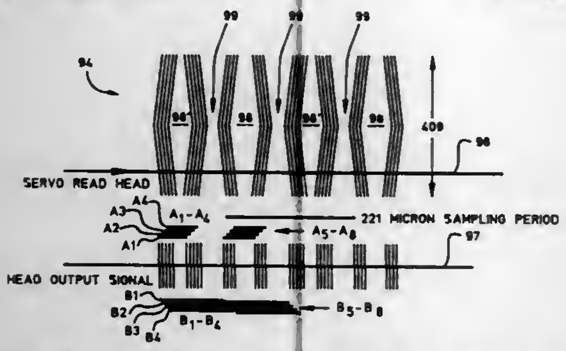
5,689,384
TIMING BASED SERVO SYSTEM FOR MAGNETIC TAPE SYSTEMS

Thomas Robert Albrecht; Robert Carl Barrett, both of San Jose, and James Howard Eaton, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1994, Ser. No. 270,207
Int. Cl.^{6} G11B *5/584*
U.S. Cl. 360—77.12 **43 Claims**



1. A servo control system for positioning a magnetic head adjacent a surface of a moving magnetic storage medium for reading a servo pattern recorded in at least one track on the storage medium surface, the system comprising:

a head assembly having at least one servo read head for reading the servo pattern on the storage medium in a transducing direction and generating a read head signal representative of the servo pattern;

a servo decoder that receives the read head signal and decodes it to generate a position signal that indicates the position of the read head relative to the servo pattern;

a translation assembly that is activated to position the head assembly relative to the storage medium; and

a servo controller that activates the translation assembly in accordance with the position signal;

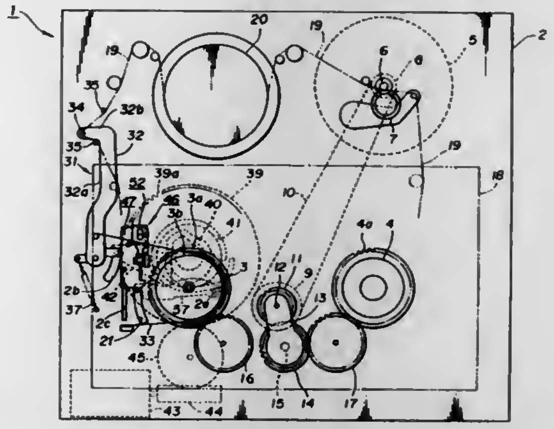
the servo decoder including means for decoding a read head signal produced from a servo pattern that comprises a cyclic sequence of magnetic flux transitions that extend continuously across the width of the track and define servo pattern stripes such that the servo read head signal varies as the magnetic head is moved across the width of the track, the stripes including at least a first azimuthal orientation and a second azimuthal orientation, such that the first azimuthal orientation is not parallel to the second azimuthal orientation, and the servo decoder includes means for determining time intervals between a plurality of predetermined pairs of transitions in the servo pattern and generating a substantially speed invariant position signal that is a function of the time intervals.

5,689,385
RECORDING AND/OR REPRODUCING APPARATUS HAVING TAPE TRAVEL DIRECTION CONTROL ARRANGEMENT WHICH PREVENTS TAPE SLIPPAGE AND SLACK GENERATION

Toshinari Koguchi, Saitama-ken; Toshiyuki Yamazaki, and Mitsunori Matsumura, both of Tokyo, all of Japan, assignors to Sony Corporation, Japan

Division of Ser. No. 122,184, Sep. 17, 1993, Pat. No. 5,438,466, which is a continuation of Ser. No. 495,988, Mar. 20, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 468,142
Claims priority, application Japan, Mar. 31, 1989, 1-80466; Apr. 18, 1989, 1-96352; Apr. 26, 1989, 1-106439
Int. Cl.^{6} G11B *15/43*
U.S. Cl. 360—96.1 **7 Claims**

1. A system for regulating tension applied to a tape in an apparatus wherein the tape is selectively driven in one of first and second directions by a tape drive means, comprising:



tension applying means for applying tension to the tape when the tape travels in the second direction, and for releasing the application of tension to the tape when the tape travels in the first direction;

control means for controlling said tension applying means to regulate the tension applied to the tape when the tape travels in the second direction; and

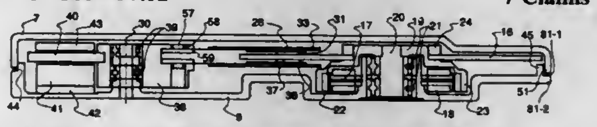
slack take-up means, operatively connected with said control means, for taking up slack in the tape before the drive means causes the tape to travel in the second direction, and for preventing the tape from becoming loose when the traveling direction of the tape is switched from the first direction to the second direction,

wherein the apparatus has a first reel, supported by a first reel table, onto which the tape traveling in the first direction is wound, and a second reel, supported by a second reel table, onto which the tape traveling in the second direction is wound, the first and second reel tables being driven by the drive means, and wherein said slack take-up means causes the first reel table to rotate by a predetermined amount in a direction which causes a small portion of the tape to be wound onto the first reel immediately before the drive means causes the tape to travel in the second direction.

5,689,386
MINIATURE HARD DISK DRIVE WITH EMI PROTECTION AND SINGLE PERMANENT MAGNET ROTARY ACTUATOR HAVING AN IMPROVED HOUSING SEAL

James H. Morehouse, Jamestown; James A. Dunckley, Boulder; David M. Furay, Boulder; John H. Blagaila, Boulder; Steven B. Volk, Boulder; James F. Hopper, Louisville; Michael R. Utenick, Englewood, and Thomas A. Klein, Boulder, all of Colo., assignors to Integral Peripherals, Inc., Boulder, Colo.

Continuation of Ser. No. 579,455, Dec. 27, 1995, abandoned, which is a continuation of Ser. No. 401,328, Mar. 9, 1995, abandoned, which is a continuation of Ser. No. 121,135, Sep. 14, 1993, abandoned, which is a division of Ser. No. 629,948, Dec. 19, 1990, abandoned. This application Nov. 1, 1996, Ser. No. 741,583
Int. Cl.^{6} G11B *5/012*
U.S. Cl. 360—97.02 **7 Claims**



1. A disk drive information storage device comprising:

disk means for recording and reproducing information;

a housing having a first external dimension of about 51 mm. wherein said housing comprises a baseplate and a cover, said baseplate having a peripheral portion which includes a lip extending circumferentially around said peripheral portion,

said lip terminating in a free edge, wherein said peripheral portion of said baseplate further includes a laterally extending ledge, said ledge defining a peripheral extent of said peripheral portion of said baseplate, and further wherein said lip is positioned within said peripheral extent of said baseplate, and wherein said cover includes a peripheral portion adapted to cooperate with the peripheral portion of said baseplate to provide an enclosure for said disk drive, wherein when said cover is positioned on said baseplate to form said enclosure a portion of said peripheral portion of said cover overlaps said lip at all locations around the periphery of said baseplate, said peripheral portion of said cover further including a free edge at the periphery thereof such that when said cover is engaged with said baseplate said free edge of said cover overlaps said free edge of said lip;

a resilient seal positioned in contact with and interposed between a portion of said laterally extending ledge and a portion of said free edge of said cover at all locations around the peripheral portion of the baseplate when said cover is positioned on said baseplate to form said enclosure;

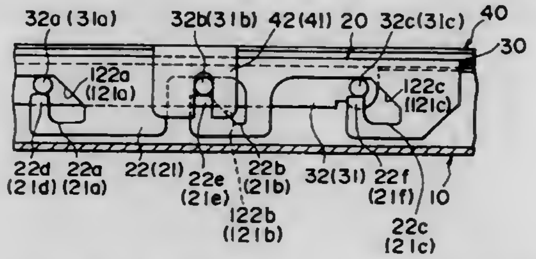
a spin motor supported by said housing for rotating said disk means, said spin motor including a rotor for receiving said disk means and rotating said disk means about a first axis; and

actuator means including a body portion rotatably supported on said housing for rotation about a second axis, said actuator means further including an actuator drive motor coupled to said body portion for providing rotary motion to said body portion, wherein said actuator drive motor is comprised of a coil coupled to said body portion, said coil having first and second sides, said actuator drive motor further including a single permanent magnet positioned on said first side of said coil and a flux plate having a first portion coupled to said magnet on said first side of said coil and a second portion which extends adjacent to said second side of said coil.

5,689,387
DISK DRIVE APPARATUS HAVING IMPROVED DISK LOADING MECHANISM

Hisateru Komatsu; Takashi Watanabe, and Makoto Takahashi, all of Yamagata, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 593,932
Claims priority, application Japan, Jan. 31, 1995, 7-013719
Int. Cl.^{6} G11B *17/04*
U.S. Cl. 360—99.06 **11 Claims**



1. A disk drive apparatus having an improved disk loading mechanism comprising:

a mainframe having a disk table which is rotated by a spindle motor;

a disk holder in which a cartridge having a disk therein is adapted to be held, said disk holder having a pair of side plates provided in parallel with an insertion direction of the cartridge, and said disk holder is movable vertically with respect to the mainframe between a first position at which the cartridge can be inserted into or removed from the disk holder and a second position, that is moved downwardly from the first position, at which the disk housed within the inserted cartridge can be placed on the disk table;

an eject plate having a pair of side plates which are provided so as to correspond to said side plates of said disk holder, respectively, said eject plate being slidably movable on said mainframe along the cartridge insertion direction between a first position and a second position which is shifted from the first position toward a removal direction of the cartridge; and

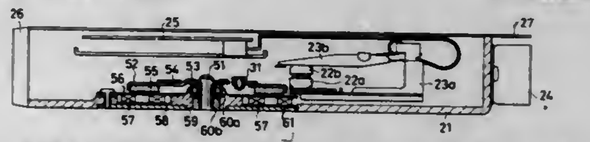
means for downwardly moving said disk holder from its first position to its second position when said eject plate is moved from its first position to its second position, and for upwardly moving said disk holder from its second position to its first position when said eject plate is moved from its second position to its first position;

wherein said disk holder moving means comprises at least three guide means which are provided on each of said side plates of said eject plate so as to correspond to the pins of said disk holder, respectively, in such a manner that these guide means are cooperatively engaged with the corresponding pins, respectively, and said at least three guide means in each of said side plates of said eject plate include at least one first guide portion which has a slanting cam surface which acts on the corresponding pin so as to push it downwardly when said eject plate is moved from its first position to its second position, and at least one second guide portion which has a slanting cam surface which acts on the corresponding pin so as to push it upwardly when said eject plate is moved from its second position to its first position.

5,689,388
REDUCED-HEIGHT MAGNETIC DISK DRIVE UNIT, AND DISK MOUNTING DEVICE FOR THE UNIT

Hiroshi Oka; Takeshi Shiga, both of Chichibu, and Shigeki Koizumi, Chichibu-gun, all of Japan, assignors to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Continuation of Ser. No. 921,438, Jul. 31, 1992, abandoned, which is a continuation of Ser. No. 536,345, Jun. 11, 1990, abandoned. This application Jan. 12, 1994, Ser. No. 180,509
Claims priority, application Japan, Jun. 15, 1989, 1-150455; Jul. 18, 1989, 1-183750; Jul. 28, 1989, 1-194240
Int. Cl.^{6} G11B *17/03;19/20;33/12*
U.S. Cl. 360—99.12 **23 Claims**



1. A disk mounting device for a disk drive unit which writes information on and/or reads information from a disk having a recording medium, comprising:

(a) a disk drive motor means, arranged on a chassis of said disk mounting device, for providing a rotational force to rotate said disk, said disk drive motor means including a rotatable drive shaft and a rotor yoke which is fixed to said drive shaft and which rotates with said drive shaft, said rotor yoke having a top surface which receives said disk and having a bottom surface, said disk drive motor means additionally including a drive magnet which is arranged at an outer peripheral portion of said bottom surface of said rotor yoke to generate said rotational force of said disk drive motor means, said disk drive motor means having a stator yoke which is disposed in a concave portion of said chassis, said concave portion encompassing a thickness of said stator yoke by a depth of said concave portion;

(b) an attracting magnet means for magnetically holding said disk on said rotor yoke, said attracting magnet means being mounted directly on said top surface of said rotor yoke; and

(c) chucking means for transmitting rotation of said disk drive motor means to said disk, said chucking means being arranged at an inner portion defined between said drive magnet and said drive shaft, and disposed in a plane defined by an upper surface of said drive magnet, said chucking means including a drive pin and a drive pin arm which is movably supported at the inner portion on the bottom surface of said rotor yoke and which mounts said drive pin for movement with respect to said top and bottom surfaces of said rotor yoke, said drive pin being engageable with said disk received on said top surface of said rotor yoke.

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5,689,389

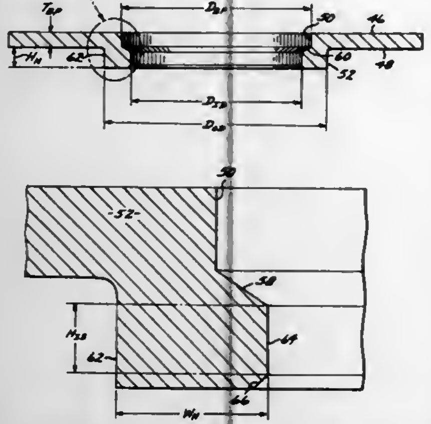
LOW PROFILE SWAGE MOUNT

Stephen T. Braunheim, Santa Barbara, Calif., assignor to Intri-Plex Technologies, Inc., Santa Barbara, Calif.

Filed Jan. 22, 1996, Ser. No. 589,863

Int. Cl.^{6} G11B *5/48;21/16*

U.S. Cl. 360—104 **9 Claims**



1. A low profile swage mount for connecting a disc drive actuator arm to a load beam, said actuator arm and load beam formed with respective swage openings adapted for close fitting engagement with said swage mount and connected by mounting said swage mount to one of said actuator arm or said load beam, and forming an interference fit with said swage opening of the other of said actuator arm or said load beam by swaging a swaging element therethrough, said swage mount comprising:

- a base plate of a predetermined thickness and having a planar mounting surface and formed with a base plate opening having a first diameter; and
- a hollow hub depending from said base plate and adapted for closely fitting within either of said swage openings and formed centrally with an aperture opening into a cylindrical open ended passage, defined by a wall of said hub having a radial width greater than said baseplate thickness, and in communication with said base plate opening to form a swaging channel, said hub passage bounded cylindrically by an inner swaging surface having a second diameter at least 85% as great as said first diameter, but not greater than said first diameter, said diameters sufficient to, after said swaging element is staked through said swaging channel, cause said hub to deform radially outwardly to engage said closely fitted swage opening and exert a frictional force of a magnitude sufficient to form a torque retaining interference fit.

5,689,390

SCANNING DEVICE FOR A MAGNETIC-TAPE APPARATUS

Werner Maack, Seeheim, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1995, Ser. No. 420,251

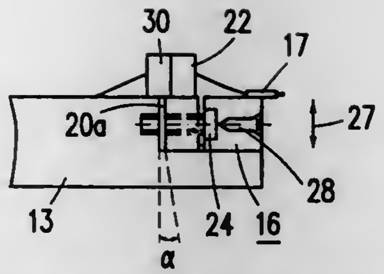
Claims priority, application Germany, Apr. 28, 1994, 44 14 842.9

Int. Cl.^{6} G11B *5/56;21/29;5/027;5/52*

U.S. Cl. 360—109 **19 Claims**

1. A scanning device for a magnetic tape apparatus, said scanning device comprising:

- an upper drum and a lower drum each having an outer cylindrical surface substantially parallel to an axis of rotation,
- a head disc rotatably mounted between the upper and the lower drums, said head disc having a periphery adjacent to the upper and lower drums, and being rotatable about said axis of rotation,



- and one or more head supports, each head support carrying one or more magnetic heads,

characterized in that:

- said upper and lower drums comprise a mounting aperture in said outer cylindrical surface for receiving therethrough each of said head supports,
- wherein said head supports and head disc include means for fixing the head supports to the head disc and for adjusting the position of the head supports on the head disc, and are constructed so as to allow said head supports to be fixedly mounted and adjusted on said head disc through said mounting aperture only, without removal of the scanning device from the magnetic tape apparatus.

5,689,391

MAGNETO-OPTIC MULTITRACK READING HEAD HAVING A PLURALITY OF REFLECTIVE RAYS

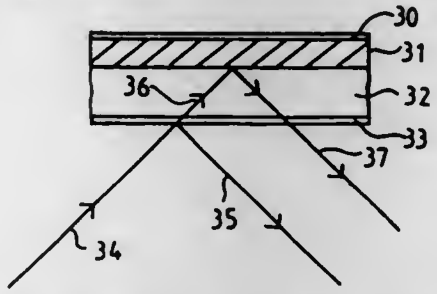
François Maurice, Verrieres le Buisson, France, assignor to Thomson Consumer Electronics, Courbevoie, France

Continuation of Ser. No. 433,031, May 3, 1995, abandoned, which is a continuation of Ser. No. 741,517, Aug. 9, 1991, abandoned. This application Oct. 18, 1996, Ser. No. 732,730

Claims priority, application France, Dec. 28, 1989, 89 17313

Int. Cl.^{6} G11B *11/10*

U.S. Cl. 360—114 **20 Claims**



1. A magneto-optic multitrack reading head on which an incident light beam impinges, comprising:

- a first layer of magnetic material exhibiting a Kerr effect and which partially reflects the incident light beam to generate a first reflection ray and which partially transmits the incident light to generate an internal ray;
- a second layer of magnetic material;
- a layer of non-magnetic material formed between the first and second layers of magnetic material and through which the internal ray passes;
- means for reflecting the internal ray, wherein the internal ray is reflected off the means for reflecting after passing through the layer of non-magnetic material to generate a second reflection ray parallel to and in phase with the first reflection ray;
- wherein a thickness of the layer of non-magnetic material is one-half of a wavelength of the incident light.

5,689,392

TAPE CASSETTE

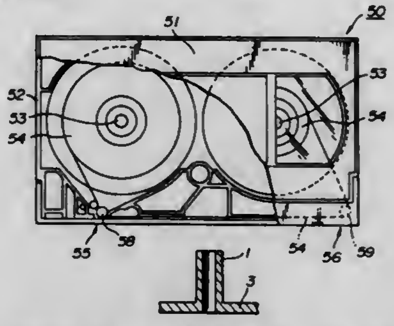
Shinya Sato, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 14, 1991, Ser. No. 715,779

Claims priority, application Japan, Jun. 15, 1990, 2-155278

Int. Cl.^{6} G11B *23/02*

U.S. Cl. 360—132 **4 Claims**



1. A tape cassette in which a pair of tape reels are accommodated in a main cassette body formed by an upper cassette half and a lower cassette half abutted and connected to each other, and in which a magnetic tape is placed around said tape reels and adapted to be reeled out of said main cassette body by means of an aperture formed in the front side of said main cassette body,

comprising the improvement of:

- a tape guide, provided within said main cassette body in the vicinity of said aperture for guiding said magnetic tape being reeled out of said aperture, is molded integrally with said lower cassette half, both said lower cassette half and said tape guide comprising an ultra high molecular synthetic resin material having a molecular weight ranging from 500,000 to 1,000,000.

5,689,393

MAGNETIC DISK CARTRIDGE HAVING AN OPENING FOR A MAGNETIC HEAD ON A SIDE THEREOF

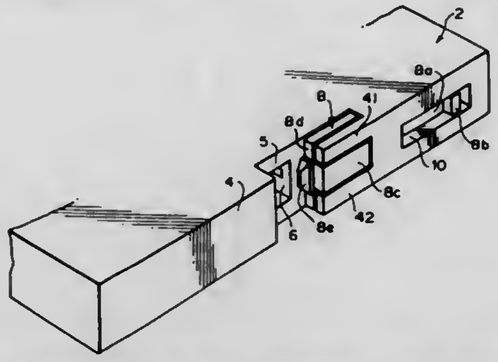
Seiichi Watanabe, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan, and Iomega Corporation, Roy, Utah

Filed Nov. 20, 1995, Ser. No. 560,649

Claims priority, application Japan, Jan. 25, 1995, 7-010061

Int. Cl.^{6} G11B *23/03*

U.S. Cl. 360—133 **6 Claims**



1. A magnetic disk cartridge comprising a cassette shell and a magnetic disk, which is incorporated in the cassette shell such that it rotates, wherein the cassette shell is provided with an opening for insertion of a magnetic head, through which the magnetic head for magnetically recording and reproducing signals is to be inserted from the exterior such that the magnetic head is brought into contact with the surfaces of the magnetic disk or is brought to positions close to the surfaces of the magnetic disk, said opening for insertion of the magnetic head being formed in a side surface of the cassette shell, said side surface being parallel to an axis of rotation of the magnetic disk, and

- a shutter member for opening and closing said opening for insertion of the magnetic head by moving along said side surface of the cassette shell in a direction parallel to said side surface, said shutter member being located only in said side surface of the cassette shell,
- wherein a recess is formed in said side surface of the cassette shell, said recess including the region of said opening for insertion of the magnetic head, and said shutter member is located in said recess such that said shutter member slides in said recess, and
- further wherein a guide slot is located which communicates with said recess and which extends on the side inward from said side surface of the cassette shell and along said side surface of the cassette shell, and a portion of said shutter member, which is located in said recess such that said shutter member slides in said recess, is fitted into said guide slot such that said portion of said shutter member slides in said guide slot.

5,689,394

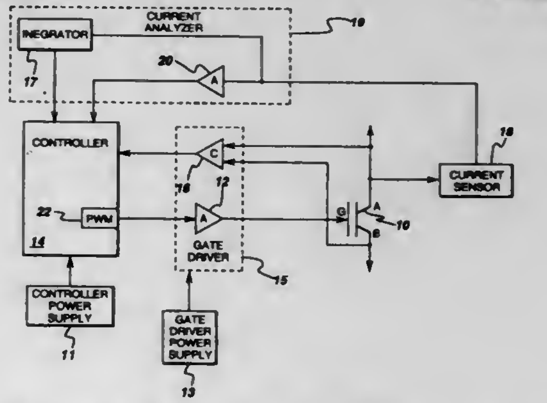
GATE VOLTAGE MODULATION FOR TRANSISTOR FAULT CONDITIONS

Albert Andreas Maria Esser, Niskayuna, N.Y.; Lee Burton Silverthorn, Roanoke, and Lyle Thomas Keister, Daleville, both of Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1995, Ser. No. 566,494

Int. Cl.^{6} H02H *9/00*

U.S. Cl. 361—56 **10 Claims**



1. A power device control system comprising:

- a power device having an input gate and first and second output terminals;
- a controller;
- a gate driver for supplying current to the input gate of the power device, comparing a voltage difference between the first and second output terminals, and providing a comparator signal to the controller if the voltage difference is greater than or equal to a predetermined maximum voltage difference;
- the controller being capable of providing a command signal to the gate driver and pulse width modulating the command signal upon receiving a comparator signal from the gate driver.

5,689,395

OVERCURRENT PROTECTION CIRCUIT

Hugh Duffy, Cupertino; Craig Wynn, Palo Alto; St. Elmo Nickols, III, Los Gatos, and Brian Thomas, San Francisco, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 29, 1995, Ser. No. 564,831

Int. Cl.^{6} H02H *3/00*

U.S. Cl. 361—93 **19 Claims**

1. An electrical system which can be connected between an electrical power supply and an electrical load to form an operating

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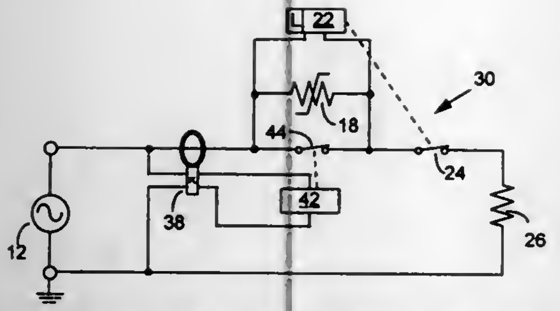


circuit and which when so connected protects the circuit from overcurrents, the system having a normal operating condition and a fault condition, and comprising:

a. a circuit interruption element having,
  (1) a normal state which permits the flow of a normal current, I_{NORMAL}, when the system is in the normal operating condition, and
  (2) a fault state which permits the flow of at most a reduced current, substantially less than I_{NORMAL}, when the system is in the fault condition; and
b. a control element, which is connected in series with the circuit interruption element, the control element having a variable resistance which
  (1) is low when the current in the system does not exceed the normal current, I_{NORMAL}, by a predetermined current amount, and
  (2) increases by at least a predetermined resistance amount when the current in the system exceeds the normal current I_{NORMAL}, by the predetermined current amount;
  and comprising a series combination of:
  (a) a current sensing means having
    (i) a current deenergized state, when the current in the system does not exceed the normal current, I_{NORMAL}, by the predetermined current amount, and
    (ii) a current energized state, when the current in the system has exceeded the normal current, I_{NORMAL}, by the predetermined current amount; and
  (b) a parallel combination of
    (i) a first circuit switch, coupled with the current sensing means, wherein the first circuit switch is
      (ia) closed when the current sensing means is in the current deenergized state, and
      (ib) open when the current sensing means is in the current energized state,
    (ii) a voltage sensing means having
      (iia) a voltage deenergized state when the voltage across the voltage sensing means does not exceed a predetermined voltage amount, and
      (iib) a voltage energized state when the voltage across the voltage sensing means exceeds the predetermined voltage amount, and
    (iii) a PTC device;

the circuit interruption element changing from its normal state to its fault state, thereby causing the system to change from its normal operating condition to its fault condition, when the resistance of the control element has increased by the predetermined resistance amount.

5,689,396

SIGNAL INPUT UNIT FOR SEMICONDUCTOR MEMORY DEVICE

Jae Jin Lee, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries, Co., Ltd., Kyoungki-Do, Rep. of Korea

Filed Nov. 20, 1995, Ser. No. 559,605

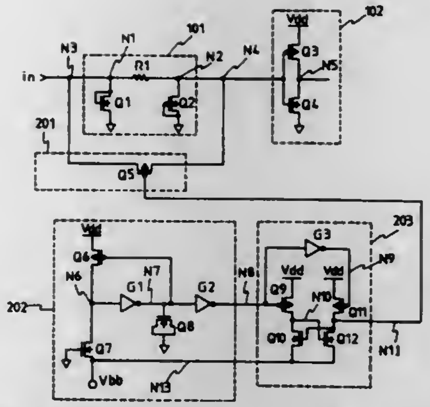
Claims priority, application Rep. of Korea, Nov. 21, 1994, 94-30633

Int. Cl.^{6} H02H ***9/00***

U.S. Cl. 361—111 **10 Claims**

1. A signal input unit for a semiconductor memory device comprising:

a signal input terminal;



electrostatic discharge protection means for discharging an electrostatic signal of high level from said input terminal to a ground voltage source;

signal transfer means connected in parallel to said electrostatic discharge protection means, for switching a normal input signal from said input terminal;

signal transfer control means for controlling a switching operation of said signal transfer means, said signal transfer control means including supply voltage sensing means for sensing the application of a supply voltage from a supply voltage source to the semiconductor memory device and voltage conversion means for level-shifting an output signal from said supply voltage sensing means and supplying the resultant signal to said signal transfer means; and

signal input means for buffering an output signal from said electrostatic discharge protection means or said signal transfer means and transferring the buffered signal to an internal circuit of the semiconductor memory device.

5,689,397

ARRANGEMENT FOR DISCONNECTING BRANCHES OF A LOW VOLTAGE SUPPLY NETWORK UNDER SHORT CIRCUIT CONDITIONS

Fritz Pohl, Hemhofen, and Wilfried Jaehner, Nürnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

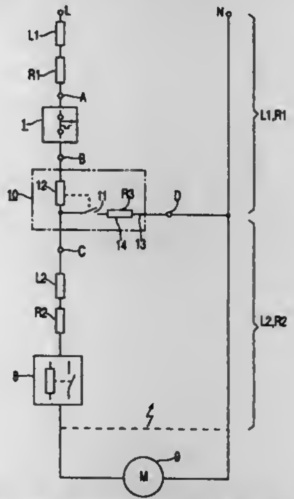
PCT No. PCT/DE94/00296, § 371 Date Sep. 25, 1995, § 102(e) Date Sep. 25, 1995, PCT Pub. No. WO94/22197, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 17, 1994, Ser. No. 525,676

Claims priority, application Germany, Mar. 25, 1993, 43 09 794.4

Int. Cl.^{6} H02H ***3/00***

U.S. Cl. 361—115 **12 Claims**



1. An apparatus for disconnecting branches of a low voltage supply network under short circuit conditions, wherein consumers

are coupled in one branch to a phase conductor and to a corresponding neutral conductor, the apparatus comprising:

a switching element coupled in an incoming circuit to the consumer in order to switch the switching element to at least one of an on state and an off state;
a single circuit-breaker disposed in the phase conductor; and
a bridging circuit positioned on a load side of the single circuit-breaker and disposed in at least one of the phase conductor and the neutral conductor, the bridging circuit including a first magnetic drive and a bridging switch, the bridging switch having a magnetically driven switching contact for closing a bridging current branch leading to the neutral conductor, the bridging current branch including a resistor having a resistance value between 25% and 50% of a value of a smallest expected load-circuit impedance,
wherein the bridging current branch conducts a part of a short-circuiting current through the magnetically driven switching contact in the bridging circuit so that the magnetically driven switching contact leading to the neutral conductor is closed.

5,689,398

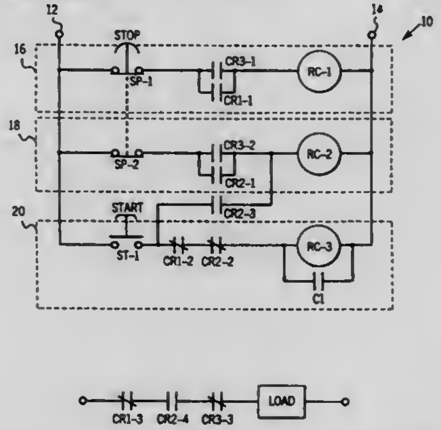
REDUNDANT CONTROL RELAY CIRCUITS

James P. Miller, Waukesha, and Douglas P. Cleereman, Greendale, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jan. 3, 1996, Ser. No. 582,248

Int. Cl.^{6} H01H ***47/00***

U.S. Cl. 361—189 **9 Claims**



1. An improved control relay circuit for connecting a power source to a load, said circuit comprising:

a first parallel branch comprising a first coil in series combination with a first parallel combination of a first self-checking contact and a first cross-monitoring contact;
a second parallel branch comprising a second coil in series combination with a second parallel combination of a second self-checking contact and a second cross-monitoring contact;
a third parallel branch comprising a third coil in series combination with a third cross-monitoring contact, a fourth cross-monitoring contact and a start switch contact, said third coil in parallel with a delay element;
a cross-linking contact, said cross-linking contact connected at a first point between said start switch contact and said fourth cross-monitoring contact and a second point between said second coil and said second parallel branch;
a first load circuit contact mechanically driven by said first coil;
a second load circuit contact mechanically driven by said second coil; and
a third load circuit contact mechanically driven by said third coil;
wherein said first, second, and third load circuit contacts are connected between said power source and said load.

5,689,399

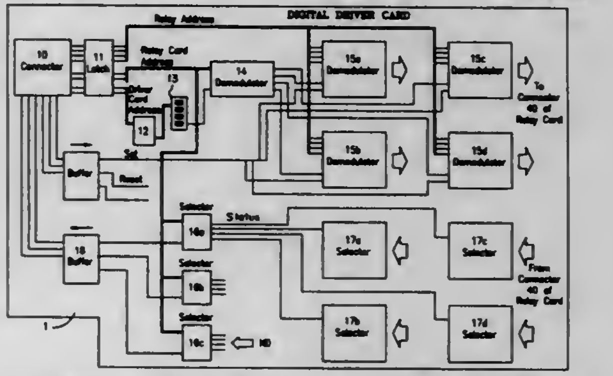
VERSATILE SWITCHING MODULE

Sal Hoi Tsao, Ottawa, Canada, and Forest Shih-Sen Chien, Sanchung, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 22, 1994, Ser. No. 215,695

Int. Cl.^{6} H01H ***47/22***

U.S. Cl. 361—191 **6 Claims**



1. A switching module to control a switching operation of a plurality of relays in a plurality of relay cards, comprising:

a driving card to control the switching operation of a plurality of relays positioned in a plurality of relay cards comprising an interface arranged to accept at least address data input from an external device, a latch arranged to latch said input address data comprising at least address of one relay and address of one relay card, a first selector arranged to activate at least one of the relay cards and a second selector arranged to activate at least one of the relays of the relay cards, both according to the input address data of said latch;
a plurality of relay cards connected with and arranged to be activated by said first selector, each comprising a plurality of relays connected with and being able to be enacted by said second selector, wherein all relays are parallel connected with one another and each relay is connected to at least one testing terminal;
wherein each of said relays comprises at least one relay switch and at least one status signal generator.

5,689,400

PORTABLE ELECTRONIC APPARATUS INCLUDING SPACE-SAVING COMPONENT MOUNTING FEATURES

Keizo Ohgami, and Hajime Gushiken, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed May 4, 1995, Ser. No. 434,668

Claims priority, application Japan, May 31, 1994, 6-118005; May 31, 1994, 6-118006; Jun. 20, 1994, 6-137613; Mar. 3, 1995, 7-044593

Int. Cl.^{6} G06F ***1/16;*** **H05K** ***5/00***

U.S. Cl. 361—683 **14 Claims**

8. A portable electronic apparatus comprising:

a base unit including a lower housing having a bottom wall and a rear opening, and an upper housing having a hollow ridge;
a printed circuit board mounted on the bottom wall of the lower housing;
a connector panel attached to the printed circuit board, and including a support portion and an expansion connector electrically connected to the printed circuit board, the expansion connector exposed through the rear opening;
a holder disposed on the support portion of the connector panel, and beneath the hollow ridge to form a storing portion

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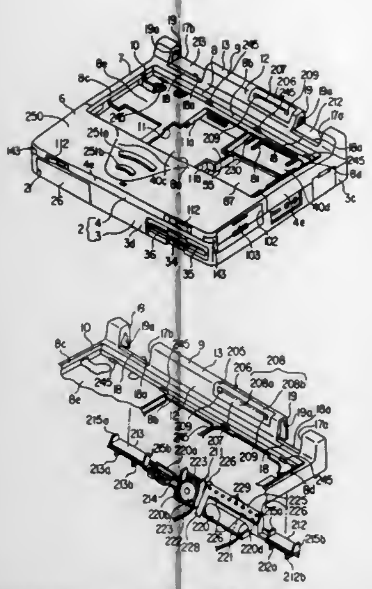


between the holder and the hollow ridge, the holder having a plurality of engaging pieces; and

a plurality of functional components detachably held by the engaging pieces within the storing portion, and electrically connected to the printed circuit board.

5,689,401
DISK DRIVE APPARATUS HAVING DUAL I/O CONNECTORS

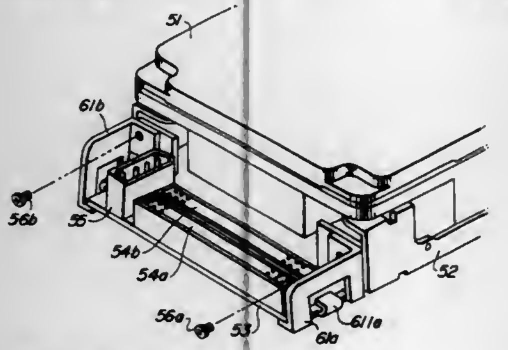
Kazunori Shikano, Higashine, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 22, 1995, Ser. No. 493,707

Claims priority, application Japan, Oct. 24, 1994, 6-258567

Int. Cl.^{6} G06F *1/16;* **H05K** *7/04*

U.S. Cl. 361—685 **9 Claims**



1. A disk drive comprising:

a disk enclosure containing at least a reproducing head and a mechanism for moving the reproducing head;

a printed circuit board having circuitry located in the enclosure, said printed circuit board having a circuit controlling transfer of at least reproduced data to an external device, a portion of said printed circuit board extending outside of said enclosure; and

a pair of connectors, each said connector having a longitudinal direction, said connectors being secured to said outside portion of said printed circuit board such that said longitudinal direction of each said connector is mutually parallel, said longitudinal direction orthogonally crossing said printed circuit board.

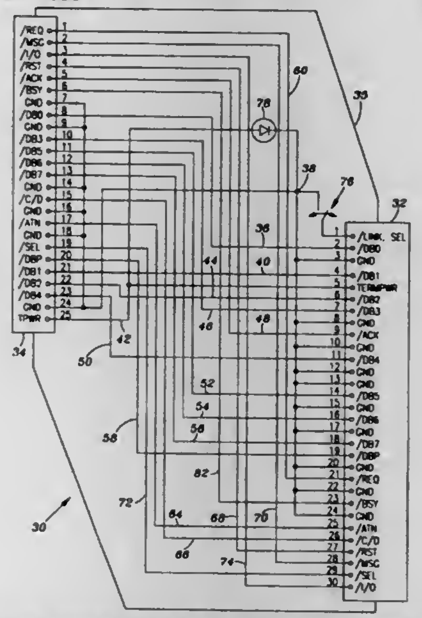
5,689,402
SCSI DOCKING ADAPTER

Richard Anthony Ralston, Jr., Shawnee Mission, Kans., assignor to APS Technologies, Kansas City, Kans.

Continuation of Ser. No. 220,168, Mar. 30, 1994, abandoned. This application Aug. 2, 1996, Ser. No. 691,430

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 361—686 **11 Claims**



1. A docking adapter for a portable computer comprising:

a first connector configured for connection to a portable computer, the first connector having a plurality of function pins including a docking mode select pin, the first connector being connected to the portable computer;

a second connector configured for connection to a communications bus, the second connector including a plurality of function pins;

a plurality of electrical wiring connections interconnecting the function pins of the first connector to the function pins of the second connector in a selected pattern;

a common ground; and

a switch connected into the electrical wiring connection to the docking mode select pin, said switch having a first position connecting the docking mode select pin to the common ground to place the portable computer connected to the first connector in a docking mode with a personal computer via the communications bus, and a second position disconnecting the docking mode select pin from the common ground connecting an external storage device for data access by the portable computer via the communications bus.

5,689,403
INTERCOOLED ELECTRONIC DEVICE

William H. Robertson, Jr., Plantation; David E. Reiff; Richard A. Ceraldi, both of Ft. Lauderdale; Sivakumar Muthuswamy, Plantation; Craig K. Gygi, Sunrise; Jesse E. Galloway, Miami; Andrzej T. Guzik, Pompano Beach, and MacWilliam Branan, Ft. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1994, Ser. No. 363,789

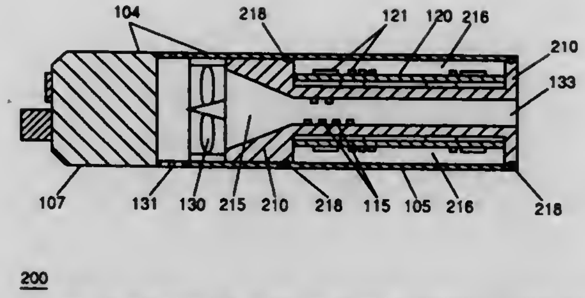
Int. Cl.^{6} H05H *7/20*

U.S. Cl. 361—695 **7 Claims**

1. An intercooled electronic device, comprising:

a thermally conductive chassis having first and second sealed compartments formed therein, and a cooling duct formed between the first and second sealed compartments;

a substrate mounted within the first sealed compartment of the thermally conductive chassis, the substrate carrying electrical



circuitry including at least one heat-generating component which is thermally coupled to the thermally conductive chassis;

a housing formed around the thermally conductive chassis; and

a cooling fan mounted internally within the housing and oriented to direct air across the thermally conductive chassis;

wherein the cooling fan is oriented to direct air through the cooling duct.

5,689,404
HEAT SINK HAVING AIR MOVEMENT DEVICE POSITIONED AMONG TINS AND BETWEEN HEATING ELEMENTS

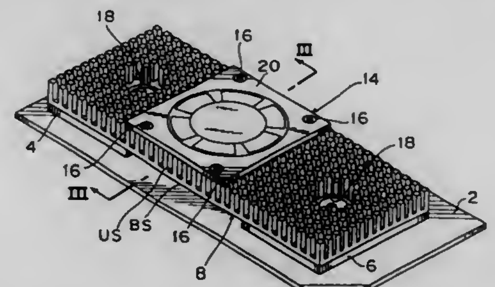
Tadashi Katsui, Kawasaki, Japan, assignor to Fujitsu, Ltd., Kawasaki, Japan

Filed Oct. 26, 1995, Ser. No. 548,475

Claims priority, application Japan, Mar. 17, 1995, 7-059545

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—697 **17 Claims**



1. A heat sink for removing heat from at least two heating elements mounted on a printed wiring board, comprising:

a base member having a lower surface and an upper surface, said lower surface being mounted on said first and second heating elements, said upper surface having a blowing region located between said first and second heating elements, and a plurality of upwardly projecting radiation fins formed on the upper surface except at said blowing region; and

an air blower provided in said blowing region for circulating air through said radiation fins.

5,689,405
IC CARD REAR BOARD SUPPORT

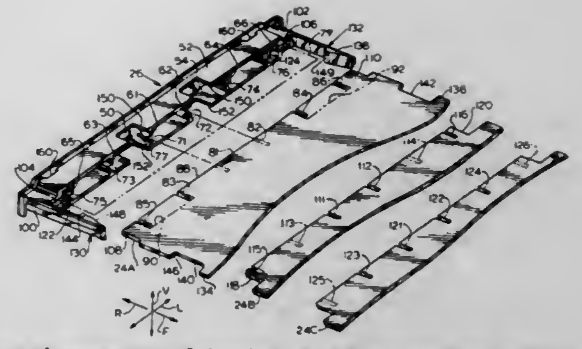
Gary Cain Bethurum, Laguna Niguel, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Sep. 25, 1996, Ser. No. 719,856

Int. Cl.^{6} H05K *1/14*

U.S. Cl. 361—737 **17 Claims**

1. An IC card which includes a circuit board having front and rear ends and a laterally-extending row of contact pads at its front end, front and rear board supports coupled respectively to said circuit board front and rear ends, wherein said front board support



has at least one row of electrical contacts engaged with said row of contact pads, and a sheet metal cover having upper and lower portions lying respectively over and under said circuit board, said cover having front and rear portions coupled respectively to said front and rear board supports, wherein:

said rear board support has a rear wall, laterally spaced opposite sides, upper and lower flanges, and a plurality of laterally-spaced vertically-extending ribs lying forward of said rear wall and merging with said upper and lower flanges, said rear board support having an imaginary horizontal centerplane, and a first set of said ribs each having a first horizontally-extending groove that receives said board rear end and that is spaced a first predetermined distance from said centerplane.

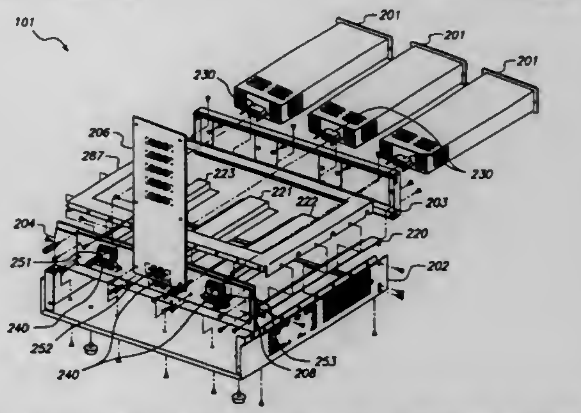
5,689,406
EXPANDABLE DATA PROCESSING CHASSIS AND METHOD OF ASSEMBLY THEREOF

Samuel F. Wood, Los Altos Hills, and John F. Wakerly, Mountain View, both of Calif., assignors to Alantec, San Jose, Calif.

Continuation of Ser. No. 414,771, Mar. 31, 1995, Pat. No. 5,557,506. This application Sep. 6, 1996, Ser. No. 709,038

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 361—796 **17 Claims**



1. An expandable chassis for receiving a plurality of circuit boards in a plurality of circuit board slots including a central slot and having a plurality of connector positions for each slot, the connector positions being aligned in columns including a central column, comprising:

a circuit board housing having a plurality of circuit board slots; and

a plurality of backplanes mounted to the chassis, each backplane having:

a first connector aligned in the central slot and aligned in any one of the column positions;

a second connector aligned in the central column and aligned in a slot other than the central slot and;

a bus electrically coupling the first connector and the second connector.

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5,689,407
SWITCHED-MODE POWER SUPPLY

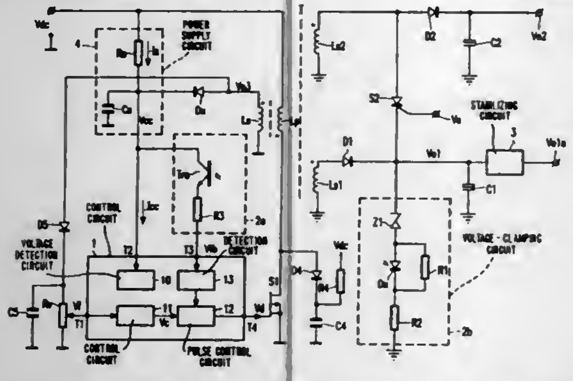
Antonius A. M. Marinus; Guy L. P. De Bondt, and Patrick E. G. Smeets, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 2, 1996, Ser. No. 626,528

Claims priority, application European Pat. Off., Apr. 5, 1995, 95200860; Feb. 5, 1996, 96200248

Int. Cl.^{6} H02M *3/335*

U.S. Cl. 363—21 **20 Claims**



1. A switched-mode power supply circuit adapted to operate in a normal operating mode and a standby mode, said switched-mode power supply circuit comprising:

a switch;

a control circuit for controlling the switch, said control circuit comprising a voltage-detection means coupled to receive a power supply voltage for bringing the control circuit to an off-state if the power supply voltage has decreased to an off-level, and for bringing the control circuit to an on-state if the power supply voltage has increased to a starting level;

a transformer having a primary winding and being incorporated in a series arrangement with the switch, said series arrangement being coupled to a DC input voltage source, the transformer further having a power supply winding coupled to the voltage-detection means, the power supply winding supplying a take-over voltage in the normal operating mode at a value at which the control circuit is in the on-state; and

power supply means coupled to the DC input voltage source for receiving an input current for applying a power supply current to the control circuit; characterized in that

the switched-mode power supply circuit further comprises means for decreasing the take-over voltage in the standby mode and, in response to a standby mode indication signal, to a value at which the control circuit may be alternately in the on-state and in the off-state.

5,689,408
MAGNETIC AMPLIFIER

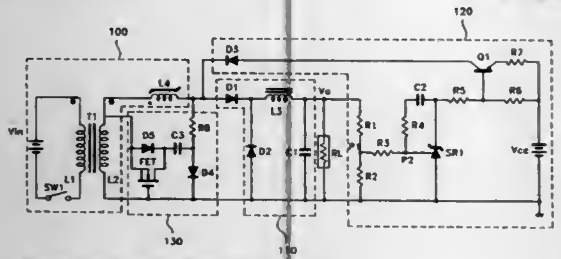
Ui Ho Song, Seoul, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 29, 1995, Ser. No. 580,905

Claims priority, application Rep. of Korea, Dec. 31, 1994, 94-40344

Int. Cl.^{6} H02H *7/10*

U.S. Cl. 363—50 **9 Claims**



1. A magnetic amplifier comprising:

a voltage converting means for inducing a pulse signal having a predetermined period and voltage level and converting this pulse signal to a sinusoidal voltage signal;

an output voltage adjusting means for rectifying and smoothing an output voltage of said voltage converting means and supplying it for a load;

an overvoltage detecting means for detecting an output voltage of said output voltage adjusting means and comparing it with a predetermined reference voltage, and, when an overvoltage is detected, supplying an overvoltage controlling current to adjust the overvoltage for the output of said voltage converting means; and

an overcurrent damping means connected between said voltage converting means and said output voltage adjusting means for forming a discharge loop in which, when a sinusoidal voltage to be outputted from said voltage converting means has positive value, a flowing current is charged, and when the sinusoidal voltage to be outputted from said voltage converting means has negative value, the flowing current is discharged, while a discharge path is in direction opposite to a direction of the overvoltage controlling current,

wherein said overcurrent damping means comprises:

a first diode for rectifying an output voltage of said voltage converting means when the output voltage has positive band; a capacitor for charging and discharging the current passed through said first diode;

a switching transistor with its drain connected to the input of said first diode for conducting when the output voltage of said voltage converting means has negative value and switchably controlling a discharge current of said capacitor to be flowed into the output of said voltage converting means; and

a resistor connected between the output of said voltage converting means and capacitor for providing a path along which the discharge current is fed back.

5,689,409
SWITCHED-MODE POWER SUPPLY

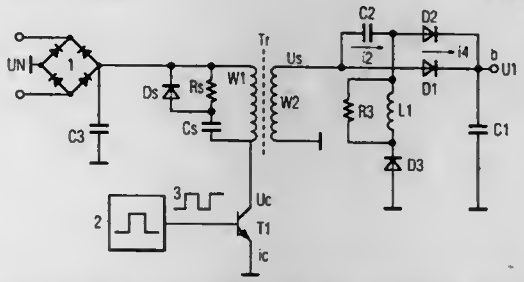
Peter Scharlach, and Jean-Paul Louvel, both of Villingen-Schwenningen, Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

Filed Jul. 10, 1995, Ser. No. 500,389

Claims priority, application European Pat. Off., Jul. 27, 1994, 94111713

Int. Cl.^{6} H02H *7/122;* **H02M** *3/335*

U.S. Cl. 363—56 **2 Claims**



1. Switched-mode power supply having a switching transistor in series with the primary winding of a transformer,

the secondary winding of which is connected, via a diode, to a charging capacitor which delivers an operating voltage,

a network for reducing voltage spikes being connected to a winding

the secondary winding is connected to the charging capacitor via the series circuit of a capacitor and a second diode, and

the centre point of the series circuit is connected to earth via a third diode and an inductance in series with said third diode.

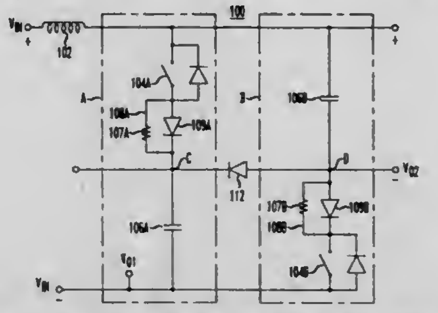
5,689,410
SPLIT-BOOST CIRCUIT HAVING IMBALANCE PROTECTION CIRCUITRY

Yimin Jiang, Plano, Tex., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 21, 1996, Ser. No. 668,173

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 363—56 **11 Claims**



1. A split-boost circuit having imbalance protection circuitry, comprising:

first and second input terminals to receive a voltage source;

first and second electrical branches coupled together in parallel between said first and second input terminals;

said first and second electrical branches each comprising:

(a) a switch,

(b) a capacitor, and

(c) a resistor-diode pair coupled in parallel and inserted between said switch and capacitor to form a series connection;

wherein after said switches are closed, any circulating current flowing in said first and second branches is limited by at least one resistor-diode pair in at least one of said electrical branches.

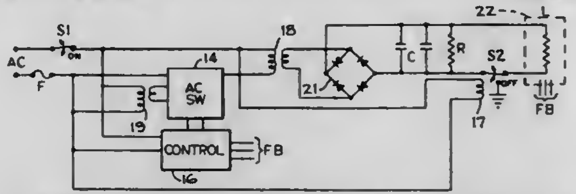
5,689,411
PROPORTIONAL DC POWER CONTROL SYSTEM AND METHOD

Kenneth Michael Chabraya, 732 Omega Ct., San Jose, Calif. 95127

Division of Ser. No. 254,058, Jun. 3, 1994. This application Dec. 6, 1996, Ser. No. 761,393

Int. Cl.^{6} G01R *31/26;* **H02M** *7/12*

U.S. Cl. 363—74 **13 Claims**



1. A control system for low electrical noise semiconductor testing at predetermined temperature using an AC power supply, comprising

AC switching means controllable between and "off" nonconducting state and an "on" conducting state, said switching means being connected to the AC power supply and providing a time proportional AC power output during said "on" conducting state,

rectifying means connected to receive said time proportional AC power output and providing DC power output,

at least at 300 watt DC heater connected to receive said DC power output,

semiconductor test mounting chuck having a semiconductor mounting surface thereon and being thermally connected to said DC heater,

temperature sensing means positioned proximate to said semiconductor mounting surface for providing a temperature indicative output signal,

control means for receiving said temperature indicative output signal and providing a control signal output, and

switch control means within said AC switching means for receiving said control signal output and controlling said time proportional AC power output to provide the predetermined temperature at said semiconductor mounting surface.

4. A temperature controllable low electrical noise DC power heated semiconductor test chuck, comprising

a top plate having an exterior semiconductor mounting surface and an opposing interior surface,

a depending skirt on said top plate surrounding said opposing interior surface,

a dielectric wafer having an upper surface abutting said top plate interior surface and a lower wafer surface,

a DC heater blanket abutting said lower wafer surface on one side and having a lower heater blanket side,

heat reflecting means in contact with said DC heater blanket on said lower heater blanket side,

bottom clamping and chuck mounting means adjacent said heat reflecting means on the side thereof remote from said DC heater blanket contact, whereby heat from said DC heater blanket is directed toward said semiconductor mounting surface and away from said bottom clamping and chuck mounting means, and whereby said semiconductor mounting surface is electrically isolated from said DC heater blanket, is maintained substantially flat over operating temperature range, and is substantially free of radiated electrical noise.

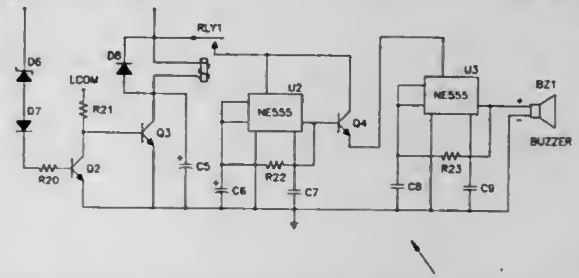
5,689,412
UNIVERALLY ADAPTABLE MULTI-FUNCTION PORTABLE POWER SUPPLY UNIT FOR AC/DC CONVERSION WHICH INCLUDING BACKUP BATTERY AND BATTERY CHARGER

James Chin-Ming Chen, Tao-Yuan, Taiwan, assignor to Delta Green Energy, Inc., Hsinchu, Taiwan

Filed Apr. 14, 1995, Ser. No. 422,993

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 363—125 **7 Claims**



1. A portable multi-function power supply apparatus for providing DC input to a portable electronic device operable with a rechargeable battery, said power supply apparatus comprising:

an AC/DC power supply for converting an AC input current to an external DC operation current suitable for operating said portable electronic device;

a backup battery pack connected to said AC/DC power supply for receiving a backup battery charging current for charging said backup battery pack wherein said backup battery pack further providing a backup DC current to said portable electronic device;

said backup battery pack being connected in parallel to said AC/DC power supply thus serving as an equivalent capacitor for regulating and stabilizing said external DC operation current output from said AC/DC power supply whereby said AC/DC power supply being provided to operate without requiring a separate current regulator for providing said DC operation current suitable for operating said portable electronic device; and

said AC/DC power supply and said backup battery being integrated as a separate unit-body portable power supply apparatus independent from and suitable for portable operation with said portable electronic device.

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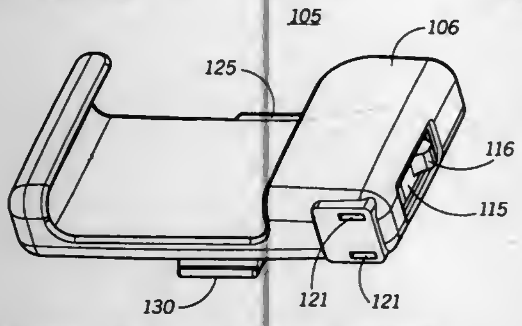
5,689,413
VOLTAGE CONVERTOR FOR A PORTABLE ELECTRONIC DEVICE

Giovanni Jaramillo, Plantation, and Jose M. Aleman, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1996, Ser. No. 610,037

Int. Cl.^{6} H02M *1/00*

U.S. Cl. 363—146 **5 Claims**



1. A portable electronic device holster, comprising:

a holster housing for carrying a portable electronic device by a user and for holding the portable electronic device while the portable electronic device is being charged; and

an AC voltage convertor captured within said holster housing, said AC voltage convertor comprising:

a convertor housing;

at least two AC prongs for connecting to a standard AC power socket extending from said convertor housing;

a voltage down convertor circuit mounted within said convertor housing for generating a down converted voltage from a standard AC voltage coupled from the standard AC power socket by the at least two AC prongs; and

at least two low voltage contacts coupled to said voltage down convertor circuit for coupling the down converted voltage to battery charging contacts on the portable electronic device, wherein

said battery charging contacts and said at least two low voltage contacts are connected when the portable electronic device is inserted into said holster housing, and wherein

said AC voltage convertor can be extended for charging the portable electronic device and can be retracted otherwise.

5,689,414
ARITHMETIC AND LOGIC UNIT

Frank-Thomas Eltrich, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

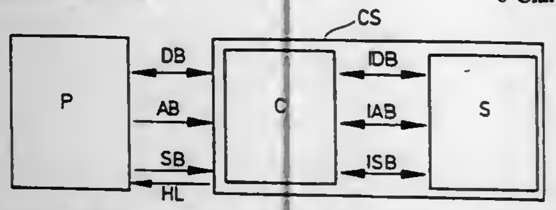
PCT No. PCT/DE94/01222, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO95/12756, PCT Pub. Date May 11, 1995

PCT Filed Oct. 15, 1994, Ser. No. 491,886

Claims priority, application Germany, Oct. 30, 1993, 43 37 132.9

Int. Cl.^{6} G05B *19/042*

U.S. Cl. 364—136 **6 Claims**



1. A controller system comprising a control logic device and a controller connected between a processor and the control logic device,

wherein said control logic device includes a stored initiation value for initiating a task to be activated by the control logic device, means for making a comparison between the stored initiation value residing in the control logic device and an incrementally changing time value and means for initiating the task when the stored initiation value therein corresponds to the incrementally changing time value; and

the controller includes means for making a comparison of a new initiation value transferred thereto from the processor, the stored initiation value and the time value with each other to obtain additional information, means for transferring the new initiation value to the control logic device for storage as the stored initiation value after the comparison in the controller and means for transmitting said additional information to the control logic device according to results of the comparison in the controller.

5,689,415
CONTROL OF PAINT SPRAYING MACHINES AND THE LIKE

Jean Andre Calotychos, London; Mark Miles, Witham, and John Mather McBride, Emmer Green, all of England, assignors to Ducost Engineering Ltd., Kent, England

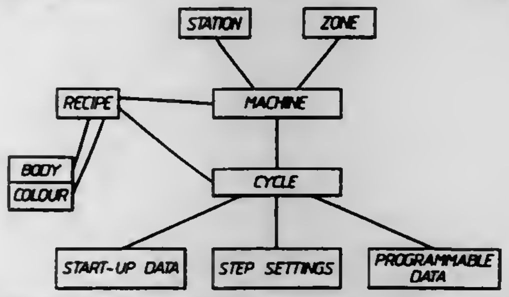
PCT No. PCT/GB93/01155, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/24870, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 1, 1993, Ser. No. 343,454

Claims priority, application United Kingdom, Jun. 1, 1992, 9211539

Int. Cl.^{6} G05B *11/32*

U.S. Cl. 364—172 **12 Claims**



1. Intelligent data storing apparatus for use in a control system comprising at least one programmable logic controller (PLC) for controlling one or more devices to perform a process, the process having a number of variants, the apparatus comprising:

receiving means for receiving a data request from said PLC, said data request including (i) a code designating a process variant and (ii) a code indicative of one or more designated devices requiring control in order to implement the process variant;

database means comprising (i) a database holding operational data elements, and (ii) a database dictionary defining (a) a tree structure relating operational data elements to particular variants of the process and particular devices and (b) a structure of one or more cycles by which each device performs the process, the structure of the each cycle being constant regardless of which process variant is designated;

the database holding the operational data elements grouped into files corresponding to particular combinations of device, process variant and cycle; and

retrieving means, responsive to said receiving means, for identifying the applicable cycle(s), for retrieving operational data elements from files in the database applicable to the designated device, process variant and cycle(s) using pathnames corresponding to the tree structure specified in the database dictionary and for formatting the retrieved data elements into a block having a predetermined structure for outputting to the PLC.

5,689,416
COMPUTER SYSTEM MONITORING APPARATUS

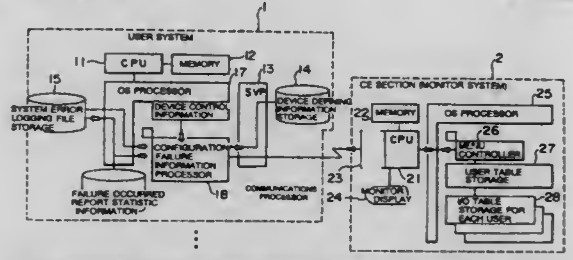
Takanori Shimizu; Chidori Yoshida, and Toshihiro Morimoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 1, 1995, Ser. No. 457,476

Claims priority, application Japan, Jul. 11, 1994, 6-158863

Int. Cl.^{6} G05B *9/02;23/02*

U.S. Cl. 364—185 **6 Claims**


1
USER SYSTEM
11
CPU
MEMORY
12
17
13
14
15
OS PROCESSOR
SVP
DEVICE DEFINING INFORMATION STORAGE
SYSTEM ERROR LOGGING FILE STORAGE
DEVICE CONTROL INFORMATION
CONFIGURATION FAILURE INFORMATION PROCESSOR
FAILURE OCCURRED REPORT STATISTIC INFORMATION
18
COMMUNICATIONS PROCESSOR
2
CE SECTION (MONITOR SYSTEM)
25
22
MEMORY
OS PROCESSOR
CPU
26
MENU CONTROLLER
27
USER TABLE STORAGE
23
21
24
MONITOR DISPLAY
I/O TABLE STORAGE FOR EACH USER
28

1. A computer system monitoring apparatus comprising:

status detecting means, provided for each of a plurality of target systems, for detecting an occurrence of a failure and a preventive maintenance, both associated with constituting devices in said computer system, and outputting failure/maintenance information via a transmission system;

system display means for displaying a list of said target systems;

first selecting means for selecting one of said target systems of interest from said target systems displayed by said system display means;

configuration layout display means for generating and displaying a system configuration layout of said one target system selected by said first selecting means;

second selecting means for selecting a constituting device of interest from said system configuration layout displayed by said configuration layout display means;

statistics information display means for generating and displaying statistics information of a history of failure information of said constituting device selected by said second selecting means;

first warning display means for, when informed of an occurrence of a failure satisfying a predetermined condition in a constituting device in a target system based on said failure/maintenance information, indicating an alarm by altering a display attribute of an associated target system name among names of said target systems displayed by said system display means; and

second warning display means for, when informed of an occurrence of a failure satisfying a predetermined condition of a target system based on said failure/maintenance information, indicating an alarm by altering a display attribute of an associated constituting device among individual constituting devices displayed by said configuration layout display means.

5,689,417
MEDIUM-VOLTAGE CABLE EXPERT SYSTEM

Tina Renee Shockley; Eddie Lee Adams, and Wayne Buford Johnson, all of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation of Ser. No. 209,126, Mar. 11, 1994, abandoned. This application May 17, 1995, Ser. No. 446,888

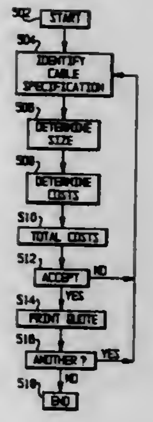
Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—401 R **16 Claims**

1. An expert system for identifying and selecting from a group of medium-voltage cable construction specifications a desired medium-voltage cable construction specification meeting a set of medium-voltage cable requirement specifications and producing a price quotation therefor, comprising:

a data storage unit including stored data in at least one database;

a knowledgebase including rules for selecting and pricing cables according to respective cable construction specifications;



a computer;

a program instruction set;

means for entering data in response to inquiries from the program instruction set and the knowledgebase;

means for calculating a price quotation for a selected, desired medium-voltage cable of specified length; and means for outputting the price quotation in human cognizable form; wherein the program instruction set is adapted for rule-based selection of the desired medium-voltage cable, for determination of the costs of manufacture of the selected medium-voltage cable, and for output of the price quotations,

wherein the stored data includes medium-voltage cable construction specifications, raw and intermediate materials information and prices from which the desired medium-voltage cable is constructed, and availability and production data for various medium-voltage cable construction specifications.

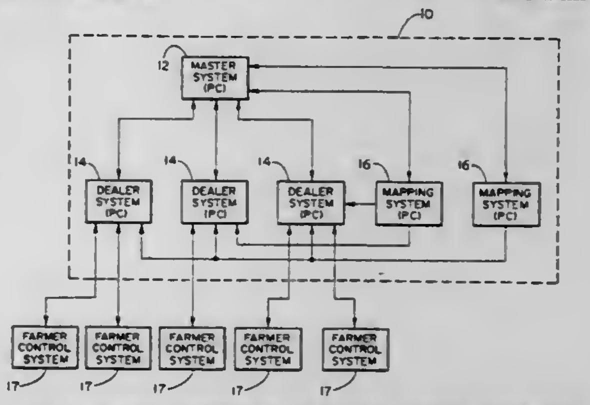
5,689,418
AGRICULTURAL COMMUNICATION NETWORK

Robert J. Monson, St. Paul, Minn., assignor to Ag-Chem Equipment Co., Inc., Minnetonka, Mich.

Continuation of Ser. No. 95,909, Jul. 22, 1993, abandoned. This application Jan. 3, 1995, Ser. No. 367,952

Int. Cl.^{6} G01V *1/00;* **G06F** *17/00;* **G06G** *7/48;* **G01W** *1/10*

U.S. Cl. 364—420 **8 Claims**



3. An agricultural communication network system, comprising:

(a) master processing means comprising memory means having a plurality of individual digital maps contained therein, each of said digital maps characterized as comprising agricultural-related data geo-referenced to an individual one of a plurality of agricultural fields, said master processing means comprising analyzing means for analyzing said digital maps stored in said memory means and providing an output indicative of said analyzed digital maps, whereby said analyzing means analyzes selected said digital maps as a function of at least one preselected parameter to provide said output, said master

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processing means comprising transmitting means for transmitting said output;

(b) at least one electronic dealer station geographically located remote from said master processing means having receiving means for receiving said output from said master processing means;

(c) communication means for electronically communicating said output from said master processing means to said dealer station; and

(d) wherein said analyzing means analyzes selected of said plurality of digital maps stored in said memory means to provide said output by correlating selected of said digital maps as a function of said selected parameter.

5,689,419

APPARATUS INCLUDING COMPUTER CONTROL AND VOICE REPETITION OF DIGITAL SETTING MESSAGES

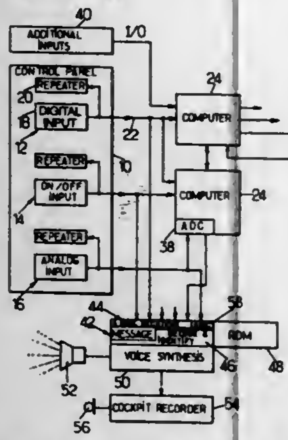
Jean-Claude Massat, Tournefeuille, France, assignor to Intertechnique, Plaisir, France

Filed Jan. 12, 1995, Ser. No. 371,700

Claims priority, application France, Jan. 12, 1994, 94 00270

Int. Cl.⁶ G06F *17/21*

U.S. Cl. 364—424.06 **1 Claim**



1. Control apparatus for an aircraft having an automatic pilot comprising:

at least one digital computer,

a plurality of order-issuing devices carried by a control panel of the automatic pilot and provided with means for manually inputting settings and for issuing the settings in the form of digital messages each comprising a data portion and a label word identifying a nature of the digital message, the messages being in standardized ARINC format;

a plurality of actuators for executing the settings under the control of said digital computer;

decoding means for decoding the digital messages issued by the order-issuing devices and providing decoded versions of said digital messages, said decoding means including storage means containing a correspondence table defining the nature of a controlled parameter and a meaning of the data portion from said label word, and defining a value of said controlled parameter from contents of said data portion; and

voice synthesis means, connected to receive said decoded versions, for providing a voice announcement specifying, in plain language, any one of said settings as actually inputted responsive to inputting thereof into said order-issuing devices, said voice synthesis means forming said voice announcement by combining a plurality of language elements including an element indicating said value; and

a cockpit sound recorder, whereby maneuvers displayed on the order-issuing devices of the control panel of the automatic pilot are recorded in voice form.

5,689,420

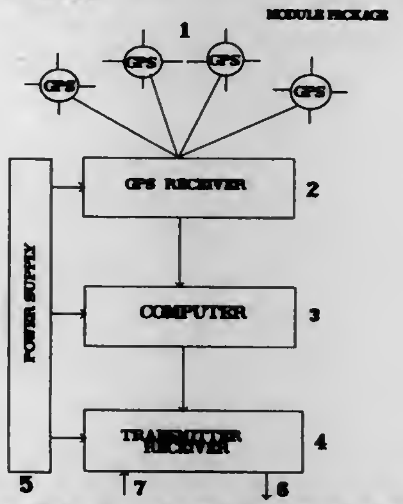
RANGE SAFETY TRACKING AND DATA PROCESSING SYSTEM

Robert J. Brewster, 2107 Cox Rd., Cocoa, Fla. 32926

Continuation-in-part of Ser. No. 300,925, Sep. 6, 1994, abandoned. This application Oct. 23, 1995, Ser. No. 546,608

Int. Cl.⁶ H04B *7/185;* **G01S** *5/02*

U.S. Cl. 364—424.06 **13 Claims**



1. A system for providing status information of an airborne vehicle to control flight, initiate destruct commands, and provide data to ground stations, said system comprising:

a receiver on board said airborne vehicle for receiving navigation signals from global positioning satellites (GPS);

at least one computer on board said airborne vehicle, connected to said receiver and interfaced with preexisting on board computers, sensors, and data packages, for determining status information of said airborne vehicle and formatting said status information into EFG ÉFG earth centered coordinates; and

a "C" band transceiver on board said airborne vehicle and connected to said at least one computer for transmitting said formatted status information to a ground station.

5,689,421

VEHICLE SAFETY SYSTEM

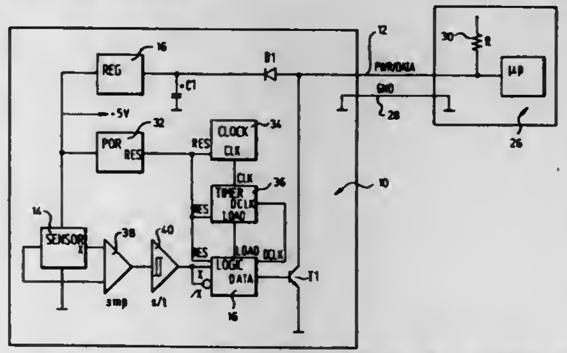
Thomas Görnig, Bahnweg 21, 85229 Markt Indersdorf, Germany

Continuation of Ser. No. 344,714, Nov. 18, 1994, abandoned. This application Jan. 29, 1997, Ser. No. 790,523

Claims priority, application Germany, Nov. 19, 1993, 9317678 U

Int. Cl.⁶ B60R *21/32*

U.S. Cl. 364—424.055 **34 Claims**



1. A vehicle safety system comprising an air bag operating unit and at least one sensor component for sensing a current status of a vehicle occupant,

said current status corresponding to whether said vehicle occupant is seated in a respective seat or how said vehicle occupant is seated on said respective seat or also corresponding to whether a seat belt associated with said vehicle occupant is fastened,

the air bag operating unit being located apart from said respective seat, said air bag operating unit including a digital processing device and being connected with said at least one sensor component by a transmission line,

said at least one sensor component being located at said respective seat and arranged so as to repeatedly send digital information from said respective seat to the air bag operating unit at predetermined time intervals, said digital information being indicative of said current status.

5,689,422

CONVERTER FOR CRUISE CONTROL SYSTEM

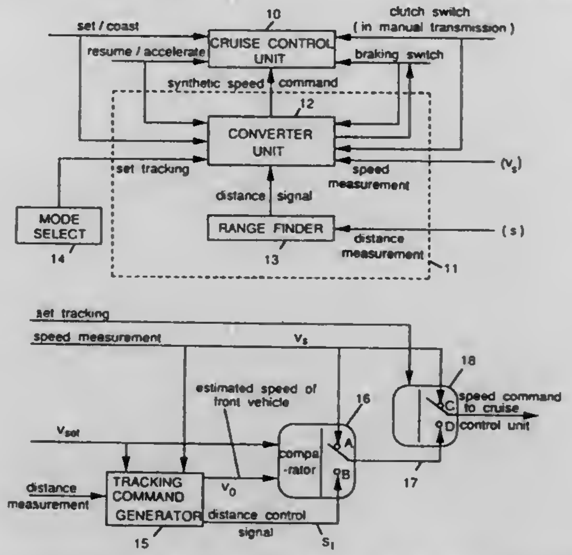
Michael Heymann, and Arie Feuer, both of Haifa, Israel, assignors to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Apr. 18, 1995, Ser. No. 423,359

Claims priority, application Israel, Apr. 18, 1994, 109332

Int. Cl.⁶ B60K *31/04;* **G08G** *1/16;* **G01S** *13/60*

U.S. Cl. 364—426.041 **10 Claims**



1. For use with an off-the-shelf constant speed vehicle cruise control system, comprising:

self speed setting means for specifying the required set speed of the vehicle,

self speed determination means for determining a self speed of the vehicle and generating a corresponding self speed signal, and

speed adjustment means coupled to the self speed determination means and responsive to the self speed signal for maintaining the self speed of the vehicle at the required set speed;

a self-contained converter for intercepting the self speed signal of the cruise control system and for converting the cruise control system to a constant distance system without requiring modification to the cruise control system, the converter comprising:

- a rangefinder for determining a distance of said vehicle from a front vehicle and generating a corresponding distance signal, and
- a synthetic-speed signal generation means coupled to the rangefinder and to the self speed determination means for determining a required set speed for maintaining a predetermined speed-dependent distance between the two vehicles and generating a corresponding synthetic-speed signal, and
- a selector means having first and second inputs respectively connected to the self speed signal and the synthetic-speed signal and having an output connected to the speed adjustment means of the cruise control system, for selectively coupling one of said inputs to said output.

5,689,423

VEHICLE NAVIGATION SYSTEM FOR EVALUATING A RETURN ROUTE BASED ON COST

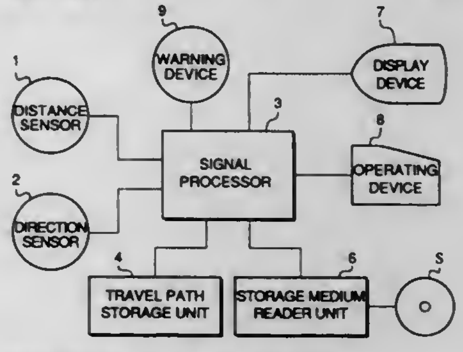
Yasuhiro Sawada, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 400,376

Claims priority, application Japan, Mar. 9, 1994, 6-076274

Int. Cl.⁶ G06F *165/00*

U.S. Cl. 364—444.2 **11 Claims**



1. A vehicle navigation system, comprising:

map displaying means for displaying a road map on a screen;

present position-indicating means for indicating a present position of said vehicle on said road map on said screen;

guide route-determining/indicating means for determining a guide route connecting a start point of said vehicle and a destination of said vehicle which are set in advance, and indicating said guide route on said road map;

return route-selecting means for previously selecting a return route for returning said vehicle to said guide route in response to a possible deviation of said vehicle from said guide route before a deviation occurs;

cost-calculating means for calculating cost required for said vehicle to return to said guide route via said return route; and

prevention means for preventing said vehicle from entering said return route, depending on said cost calculated by said cost-calculating means.

5,689,424

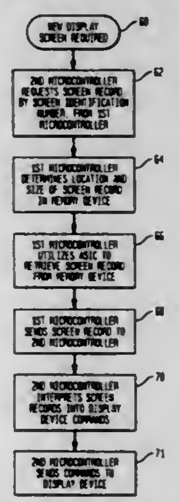
ENCODED SCREEN RECORDS FOR INTERNATIONAL POSTAGE METERS

Robert G. Arsenault, Stratford; William F. Bailey, Guilford, and Dale A. French, Clinton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 23, 1996, Ser. No. 702,079

Int. Cl.⁶ G07B *17/00*

U.S. Cl. 364—464.21 **9 Claims**


NEW DISPLAY SCREEN REQUIRED
60
2ND MICROCONTROLLER REQUESTS SCREEN RECORD BY SCREEN IDENTIFICATION NUMBER FROM 1ST MICROCONTROLLER
62
64
66
68
70
71

1. In a digital postage meter having a housing shell, a display screen mounted in said housing shell, and a removable printhead

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module, a method of transmitting information from the printhead module to the display screen, comprising:
- storing said information in a memory device in said printhead module;
- retrieving said information in a first communication device in said printhead module;
- transmitting said information from said first communication device to a second communication device external to said printhead module, wherein said second communication device interprets said information; and
- transmitting said interpreted information to said display screen.

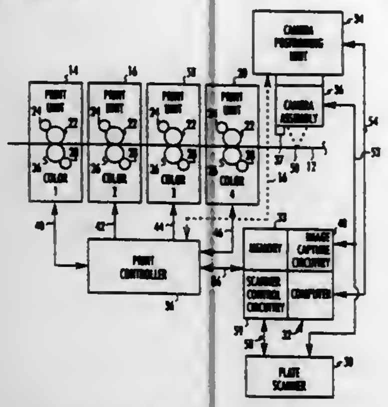
5,689,425
COLOR REGISTRATION SYSTEM FOR A PRINTING PRESS

Jeffrey W. Sainio, Glendale; John C. Seymour, Jefferson; Jeffrey Paul Rappette, Waukesha, and Chia-Lin Chu, Brookfield, all of Wis., assignors to Quad/Tech, Inc., Sussex, Wis.

Continuation-in-part of Ser. No. 967,978, Oct. 28, 1992, Pat. No. 5,412,577. This application Apr. 27, 1995, Ser. No. 429,910

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—469.03 **61 Claims**



1. A system for generating a signal representative of color registration offset between at least first and second colors of an image printed on a web, wherein a first printing unit prints the first color of the image and a second printing unit prints the second color of the image, the system comprising:
- a memory disposed to store a first reference array of digital data representative of the first color of at least a portion of the image and a second reference array of digital data representative of the second color of the portion of the image;
- an imaging device in optical communication with the web to produce a first analog signal representative of the first color of the portion of the image and a second analog signal representative of the second color of the portion of the image;
- a converter circuit, operatively associated with the imaging device and the memory, which converts the first analog signal to a first color array of digital on-press data, and converts the second analog signal to a second color array of digital on-press data; and
- a processing circuit in communication with the converter circuit and the memory, wherein the processing circuit phase correlates the first reference array with the first on-press array to produce first data and phase correlates the second reference array with the second on-press array to produce second data, the processing circuit comparing the first data and the second data to determine a registration offset between the first and second colors and produces a signal representative of the registration offset between the colors.

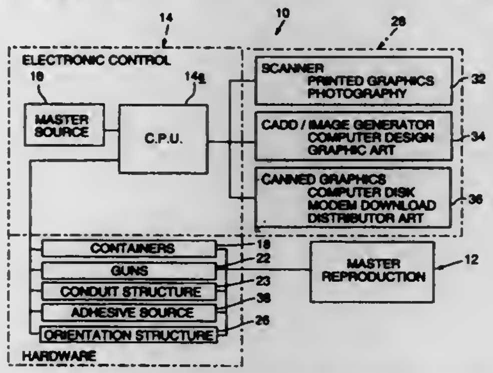
5,689,426
COMPUTER-CONTROLLED MASTER REPRODUCER FOR DEPOSITING A MASTER REPRODUCTION ON A SUBSTRATE, METHOD FOR DEPOSITING THE SAME, AND MASTER REPRODUCTION

Matthias D. Kemeny, 2400 SW. Sheffield, Portland, Oreg. 97201, and Edo Ziring, 7220 87th Ave. SE., Mercer Island, Wash. 98040, assignors to Matthias D. Kemeny, and Edo Ziring, both of Beaverton, Oreg.

Filed May 30, 1995, Ser. No. 453,145

Int. Cl.^{6} G06F *19/00;* **G06G** *7/64;7/66*

U.S. Cl. 364—473.01 **23 Claims**



1. A computer-controlled two-dimensional master reproducer for depositing a two-dimensional master reproduction on a substrate, comprising:
- a master source containing a two-dimensional master in a machine-readable format, and having a shape characteristic and a color characteristic;
- a curable-material source;
- gun structure interconnected with the curable-material source for shooting the curable material toward such substrate to deposit the two-dimensional master reproduction on such substrate, the gun structure being constructed to shoot the curable material in microdroplet form to deposit curable material on the substrate;
- orientation structure for orienting the gun structure with respect to such substrate;
- a curing device for curing the curable-material after the two-dimensional master reproduction is deposited on such substrate; and
- a computer controller in communication with the master source, the curable-material source, the gun structure, and the orientation structure, the computer controller including a set of control instructions for reading the master and, based upon that reading, for transfering the curable material from the curable-material source to the gun structure, and for causing the gun structure to shoot the curable material at the substrate to deposit the two-dimensional master reproduction on such substrate.

5,689,427
METHOD AND APPARATUS FOR OPTIMAL FEEDRATE CONTROL ON WIRE-CUTTING ELECTRIC DISCHARGING MACHINE (WEDM)

Hsi-Pin Li, Hsin Ying; Hsin-Jung Chuang, and Tsuen-Pann Shieh, both of Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

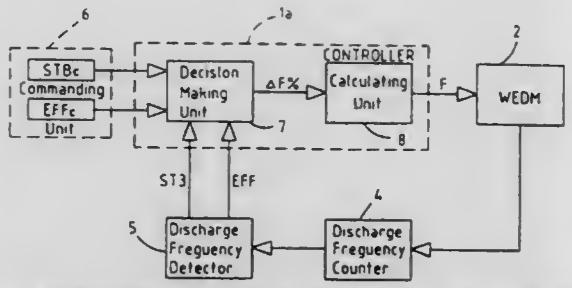
Filed Sep. 1, 1995, Ser. No. 522,900

Int. Cl.^{6} B23H *1/00;7/30*

U.S. Cl. 364—474.04 **6 Claims**

4. An apparatus for controlling feedrate for a wire-cutting electric discharging machine, comprising:

(1) means for counting frequency of normal discharge (f_{normal}) and frequency of abnormal discharge ($f_{abnormal}$);



(2) first arithmetic means for calculating for the value of stability percent (STB) in accordance with the following equation:

$$STB = \left[1 - \frac{|\text{arc }\%\,[k] - \text{arc }\%\,[k-1]|}{\text{arc }\%\,[k]} \right] * 100\%$$

wherein [k] denotes the (k)th sampling, and

$$\text{arc }\% = \frac{f_{abnormal}}{f_{normal} + f_{abnormal}}$$

(3) second arithmetic means for calculating the value of efficiency percent (EFF) in accordance with the following equation:

$$EFF = \frac{f_{normal} * t_{off} + f_{abnormal} * t_{ab\text{-}off}}{\tau * 10^6} * 100\%$$

wherein

t_{off}=idle period during normal discharge (unit: us),
$t_{ab\text{-}off}$=idle period during abnormal discharge (unit: us),
τ=sampling period (unit: see), and
$0<\tau\leqq 2$;

(4) third arithmetic means for obtaining a value of feedrate variation ΔF% selected from a decision table of predetermined values mapped by a combination of the STB and EFF values; and

(5) means for adjusting current feedrate of the WEDM by a variation equal to the selected value of ΔF%.

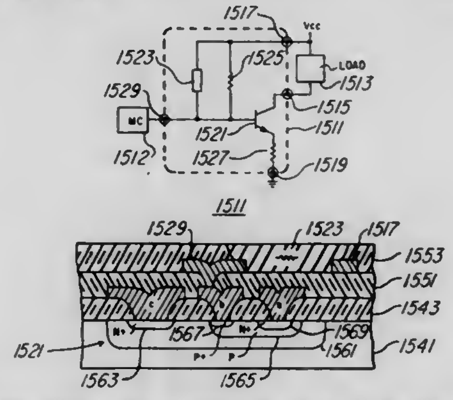
5,689,428
INTEGRATED CIRCUITS, TRANSISTORS, DATA PROCESSING SYSTEMS, PRINTED WIRING BOARDS, DIGITAL COMPUTERS, SMART POWER DEVICES, AND PROCESSES OF MANUFACTURE

Roland Sauerbrey, Houston, and Michael C. Smayling, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1990, Ser. No. 590,259

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 364—480 **31 Claims**



1. A smart power device comprising a microcontroller, a power switching device activated by a signal from said microcontroller, and an electrical resistance body of radiatively dosed radiation sensitive material electrically connected within the power switching device, said electrical resistance body comprising a polymer material.

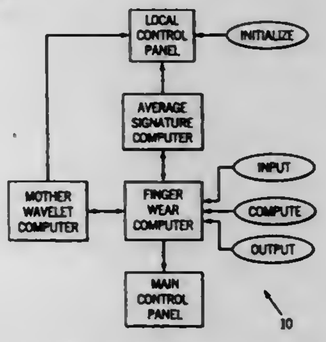
5,689,429
FINGER WEAR DETECTION FOR PRODUCTION LINE BATTERY TESTER

Eduardo V. Depiante, 16 W. 505 Mockingbird La., Apt. 204, Hinsdale, Ill. 60521-6621

Filed May 24, 1996, Ser. No. 653,383

Int. Cl.^{6} G01B *3/00*

U.S. Cl. 364—481 **7 Claims**



1. A method of detecting wear in a battery tester probe, comprising the steps of:
- providing a battery tester unit having at least one tester finger for coupling to a battery to be tested;
- generating a tester signal using said tester fingers and said battery tester unit, the tester signal characteristic of at least one of the electrochemical condition of the battery and said tester finger;
- applying wavelet transformation, including computing a mother wavelet, to the tester signal to produce finger wear indicator signals;
- analyzing the finger wear indicator signals to compute a finger wear index;
- comparing the finger wear index for the tester finger with the index for a new tester finger; and
- generating a tester finger change signal to indicate a threshold wear
- change of the tester finger upon exceeding a preset finger wear index.

5,689,430
INTERNAL STATE DETERMINING APPARATUS

Yasuhiro Ohno, and Yusaku Unno, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1995, Ser. No. 546,374

Claims priority, application Japan, Oct. 27, 1994, 6-263464

Int. Cl.^{6} G01R *19/00*

U.S. Cl. 364—483 **34 Claims**

1. An internal state determining apparatus for use with an accessory card having a plurality of inner circuits, the apparatus comprising:
- detecting means for detecting a change in voltage supplied to the accessory card from an external device and for outputting a detected signal in response to the detected change in voltage;
- a plurality of clock generators for producing clock signals different from one another;
- a plurality of interface circuits for receiving a signal input to the accessory card from the external device and for respectively

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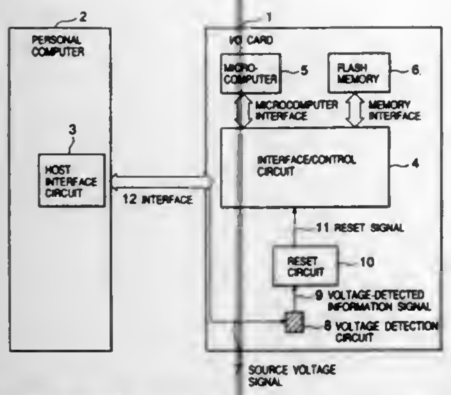


supplying internal signals to said plurality of inner circuits; and

internal state determining means for selecting one of said plurality of interface circuits in response to the detected signal and for causing said plurality of inner circuits to be in an associated predetermined state;

wherein said detecting means selectively receives first and second voltages from the external device and outputs corresponding first and second detected signals in response to the first and second voltages, and

wherein said detecting means detects that the second voltage has been received after receipt of the first voltage, said internal state determining means selects changes from one of said plurality of clock generators to another one of said plurality of clock generators and switches from one of said plurality of interface circuits to another one of said plurality of interface circuits, thereby determining that said inner circuits are in an associated predetermined state.

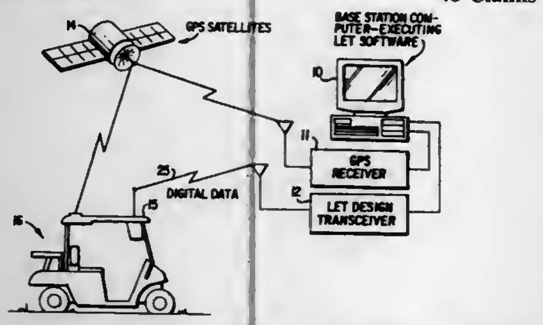
5,689,431
GOLF COURSE YARDAGE AND INFORMATION SYSTEM

Richard W. Rudow, Mesa; John Coffee, Gilbert; Douglas L. Lecker, Chandler; Tuan Pham, Phoenix, and Kirk Bingeman, Chandler, all of Ariz., assignors to Leading Edge Technologies, Inc., Chandler, Ariz.

Filed Apr. 18, 1995, Ser. No. 423,295

Int. Cl.^{6} G01S *5/10;11/02*

U.S. Cl. 364—449.7 **48 Claims**



1. A method for creating a digital map of a golf course, comprising the steps of:

collecting survey data around the outline of each object to be surveyed on the course by collecting Global Positioning System (GPS) position data around the perimeter of each object;

post processing said survey data including the substeps of:

low pass filtering said survey data to reduce noise in said survey data and smooth the outline of each object for which survey data was collected;

removing overlapping segments comprising the outline of each object;

removing crossing segments comprising the outline of each object; and

compressing said survey data by discarding at least some data points collected among the survey data for the outline of an object selected to be surveyed which are within a predetermined permissible error for display of the outline of the selected object.

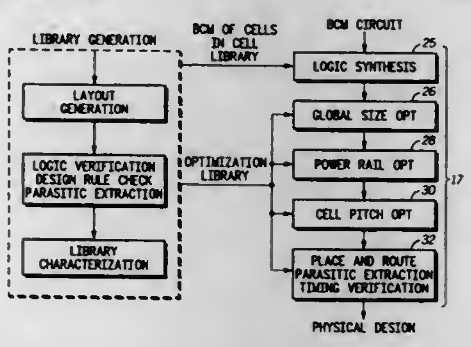
5,689,432
INTEGRATED CIRCUIT DESIGN AND MANUFACTURING METHOD AND AN APPARATUS FOR DESIGNING AN INTEGRATED CIRCUIT IN ACCORDANCE WITH THE METHOD

David T. Blaauw; Robert L. Maziasz; Joseph W. Norton; Larry G. Jones, and Mohankumar Guruswamy, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 17, 1995, Ser. No. 373,695

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—490 **21 Claims**



1. A method for designing a circuit, the method comprising the steps of:

receiving a behavioral circuit model from memory, the behavior circuit model having a plurality of logic functions which collectively define the circuit, the circuit being adapted of perform logic operations within a microprocessor integrated circuit;

receiving circuit device library data from the memory which contains predetermined library-defined logic gates wherein each predetermined library-defined logic gate in the predetermined library-defined logic gates is unique from all other predetermined library-defined logic gales in the predetermined library-defined logic gates;

processing the behavioral circuit model and the circuit device library data to generate a structural circuit model which contains an interconnection of predetermined library-defined logic gates in accordance with the plurality of logic functions;

further processing the structural circuit model wherein each predetermined library-defined logic gate in the structural circuit model is set to a particular drive strength;

further processing the structural circuit model to determine a size of power rails for each predetermined library-defined logic gate in the structural circuit model;

further processing the structural circuit model to determine a physical two-dimensional layout of each predetermined library-defined logic gate in the structural circuit model; and

placing and routing each predetermined library-defined logic gate used in the structural circuit model into an integrated circuit layout form to create a physical design file of said circuit from the structural circuit model.

5,689,433
METHOD AND APPARATUS FOR COMPACTING INTEGRATED CIRCUITS WITH WIRE LENGTH MINIMIZATION

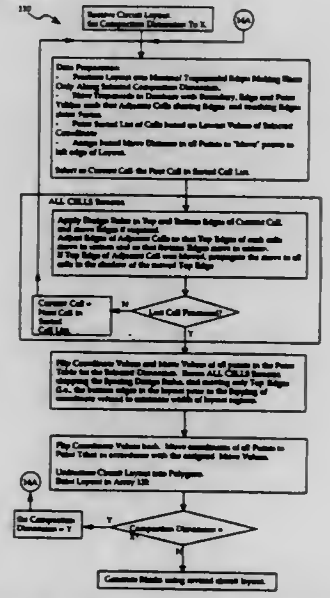
Lawrence B. Edwards, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

PCT No. PCT/US93/11166, § 371 Date Nov. 28, 1995, § 102(e) Date Nov. 28, 1994, PCT Pub. No. WO94/11840, PCT Pub. Date May 26, 1994

Continuation-in-part of Ser. No. 978,558, Nov. 19, 1992, Pat. No. 5,416,722. This PCT application Nov. 17, 1993, Ser. No. 433,438

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—490 **15 Claims**



1. A computer-aided design system for revising a multilayer integrated circuit layout, comprising:

data receiving means for receiving data representing said integrated circuit layout;

a design rule dictionary representing a set of design rules, a first subset of said design rules involving spacing design rules and a second subset of said design rules including width design rules;

a circuit layout database including:

a cell table representing cells, each cell representing a region of an identified layer of said integrated circuit layout, said cell table including cells representing all empty spaces between non-empty regions of each layer of said integrated circuit layout;

edge data representing all edges of all said cells in said cell table, said edge data including point data representing each edge's endpoints such that each point which is an edge endpoint of two or more edges is represented by a single, shared point datum; each said point datum representing a point location and a move value indicating movement of an edge's endpoint;

adjacent cell data indicating adjacent cell data indicating, for each edge of each cell, which other cell is adjacent said cell at said edge;

circuit layout compaction mechanism, said mechanism including:

a circuit layout compaction procedure for adjusting, in accordance with said design rules represented by said design rule dictionary, said point data in said database so as to adjust said cells' positions and sizes; wherein each adjustment of said point data for one edge of one cell automatically adjusts a corresponding edge of said other cell adjacent to said one edge by way of their shared point data in said database;

a wire length minimization procedure for minimizing a width of each non-empty cell whose width is not minimal and that meets a predefined criteria; wherein said wire length minimization procedure readjusts said point data for more than one edge of a selected cell and for those edges adjacent to each readjusted edge; and

revised circuit layout generation mechanism for generating a revised circuit layout in accordance with said adjusted point data in said database.

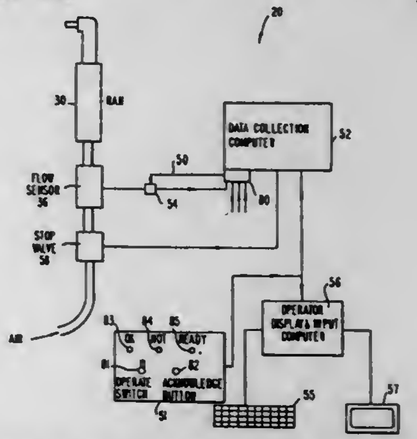
5,689,434
MONITORING AND CONTROL OF FLUID DRIVEN TOOLS

Angelo L. Tambini, County Wicklow, Ireland, and John Linehan, Horsham, Pa., assignors to Ingersoll-Rand Company, Phillipsburg, N.J.

Division of Ser. No. 986,027, Dec. 4, 1992, Pat. No. 5,592,396, which is a continuation-in-part of Ser. No. 927,853, Aug. 10, 1992, abandoned. This application Jun. 28, 1996, Ser. No. 671,833

Int. Cl.^{6} B23Q *5/00*

U.S. Cl. 364—510 **11 Claims**



1. A system for monitoring a fluid driven impact wrench for driving threaded fasteners comprising:

means for measuring the fluid flow rate into the wrench during operation of the tool with the flow measurement representing a cycle of torque application;

means for converting the measured fluid flow rate into an electrical signal;

means for electrically computationally processing said signal to transform said signal into another signal representing as least one parameter corresponding to a condition of said wrench to be monitored which is a function of said fluid flow rate; and

means for displaying said parameter.

5,689,435
SYSTEMS AND METHODS FOR AUTOMATED BRACKET DESIGN

Michael A. Umney, Mason; John J. Wright, Monroe; James S. Hoelle, Hamilton; Michael S. Godbey, Cincinnati; Eric G. V. Hall, Milford, and Kenneth J. Ashton, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 575,372, Dec. 20, 1995, abandoned. This application Feb. 20, 1997, Ser. No. 802,496

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—512 **19 Claims**

1. A design system for designing a bracket for a gas turbine engine, said design system comprising a computer including a part model library and a drawing note library, said computer receiving a bracket model in electronic form as input and having a plurality of executable modules stored therein, said modules comprising:

a bracket intelligence builder module for generating intelligence data for the bracket model, said module configured to prompt a user to select a feature if the model does not have intelli-

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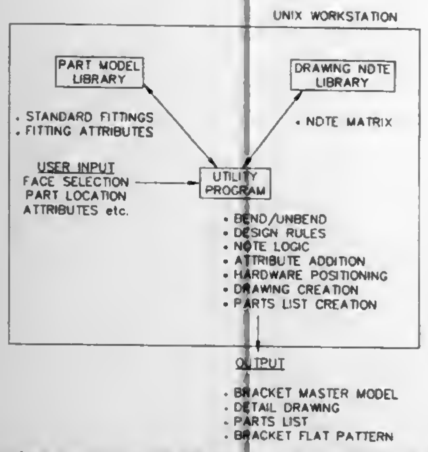


gence data and to automatically attach intelligence data to the model based on the selected feature, said bracket intelligence builder module further configured to generate a consistency table usable for checking consistency of folded and unfolded models;

a bracket unfolding module for unfolding a bracket model to a flat pattern;

a bracket bend relief module for creating bend reliefs in the flat pattern;

a bracket folding module to fold a bracket flat pattern;

a bracket minimum material check module to check for minimum distances between bracket pattern features;

a bracket weld gap check module to identify weld gaps in the bracket model;

a flat pattern wireframe processor module to generate a bracket solid flat pattern;

a library component selection module to aid a user in selecting and orienting bracket components from said part model library;

a bracket assembly identification module for identifying relationships between bracket components to generate a parts list file;

a drawing format and title block annotation module for generating an annotated drawing format;

an item generation and placement module for placing item numbers on a drawing; and

a bracket notes selection and placement module to determine a notes package for placement on a drawing.

5,689,436
APPARATUS FOR COMPRESSING AND DECOMPRESSING VIDEO SIGNAL

Kesatoshi Takeuchi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 29, 1995, Ser. No. 496,676

Claims priority, application Japan, Jul. 20, 1994, 6-190986

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 364—514 A **14 Claims**

1. An apparatus for compressing a video signal, said apparatus comprising:

a display device for displaying a video image;

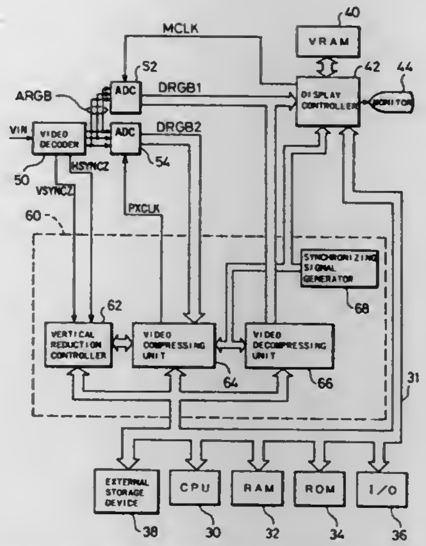
a frame memory for storing a video signal to be supplied to said display device;

receiving means for receiving a video signal representing an image;

a video controller for writing said video signal supplied from said receiving means into said frame memory and reading out said video signal from said frame memory to display said image on said display device as a function of said video signal;

reducing-compressing means for processing said video signal supplied from said receiving means to reduce a size of said image and compressing a video signal representing the reduced image to generate a compressed video signal said processing and said compressing being executed without storing said video signal into said frame memory; and

a memory for storing said compressed video signal.



3. An apparatus for decompressing a compressed video signal, said apparatus comprising:

a displays device for displaying a video image;

a frame memory for storing a video signal to be supplied to said display device;

a memory for storing a compressed video signal;

decompressing-enlarging means for decompressing said compressed video signal stored in said memory to generate a restored video signal, and processing said restored video signal to enlarge a size of an image represented by said restored video signal said decompressing and said processing being executed before supplying said restored video signal or said frame memory; and

a video controller for writing said restored video signal supplied from said decompressing-enlarging means into said frame memory and reading out said restored video signal from said frame memory to display said image on said display device as a function of said restored video signal.

5,689,437
VIDEO DISPLAY METHOD AND APPARATUS

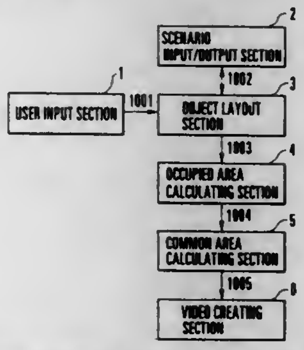
Shigeo Nakagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 31, 1996, Ser. No. 656,636

Claims priority, application Japan, May 31, 1996, 7-133287

Int. Cl.^{6} H04N *9/79*

U.S. Cl. 364—514 A **8 Claims**


2
SCENARIO INPUT/OUTPUT SECTION
1002
1
3
USER INPUT SECTION
1001
OBJECT LAYOUT SECTION
1003
4
OCCUPIED AREA CALCULATING SECTION
1004
5
COMMON AREA CALCULATING SECTION
1005
6
VIDEO CREATING SECTION

1. A video display method of laying out a plurality of objects in a space, and creating images of the objects in units of frames, thereby displaying a series of images, comprising the steps of:

defining geometric attributes of a first object and a second object, respective movements of the first and second objects, including respective changes in the first and second objects, respective first and second start positions of the movements, and respective first and second start times of the movements as respective first and second scenarios;

calculating respective first and second occupied areas occupied when the first and second objects move on the basis of the first and second scenarios by approximating a logical OR of a sequence of areas occupied by the first and second objects when the first and second objects take the movements at the first and second positions and the first and second times on the basis of the first and second scenarios;

calculating a common area where the first and second occupied areas cross each other; and

displaying the first and second occupied areas and the common area as video.

5,689,438
AUDIO BIT STREAM GENERATOR FOR HIGH DEFINITION TELEVISION UTILIZING PERSONAL COMPUTER, AND CONTROL METHOD THEREFOR

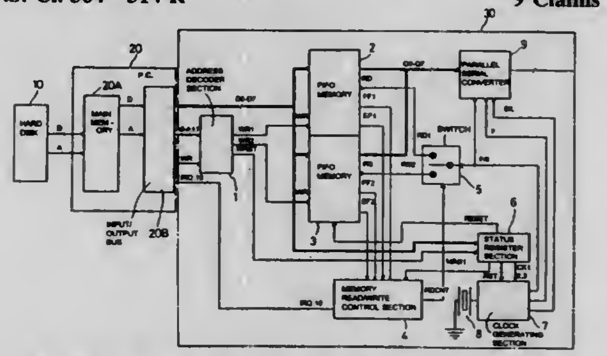
Yong Cheul Goh, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-Do, Rep. of Korea

Filed Mar. 2, 1995, Ser. No. 396,464

Claims priority, application Rep. of Korea, Mar. 7, 1994, 94-4376

Int. Cl.^{6} H04N *7/015;11/24*

U.S. Cl. 364—514 R **9 Claims**



1. An audio bit stream generator for an HDTV utilizing a PC, comprising:

a hard disc for storing an HDTV audio data encoded and prepared through computer stimulations;

an input/output bus;

a first-in first-out (FIFO) memory;

a status register for controlling said input/output bus;

a PC with main memory for reading a certain amount of the audio data to output it to the input/output bus;

an address decoder section for analyzing output addresses of the input/output bus, and for controlling the FIFO memory 2 and 3 and the status register section;

a parallel serial converter;

said FIFO memory for storing 8-bit data from said input/output bus of said PC and for outputting modified 8-bit data to parallel/serial converter;

a memory read/write control section for controlling read/write operations of said FIFO memory;

a switch for controlling a reading operation of said FIFO memory under a control of said memory read/write control section;

said parallel/serial converter for converting the modified 8-bit data to 1-bit serial data; and

a clock generating section for generating transmission clocks used to control said parallel/serial converter and thereby forming the audio bit stream from the 1-bit serial data.

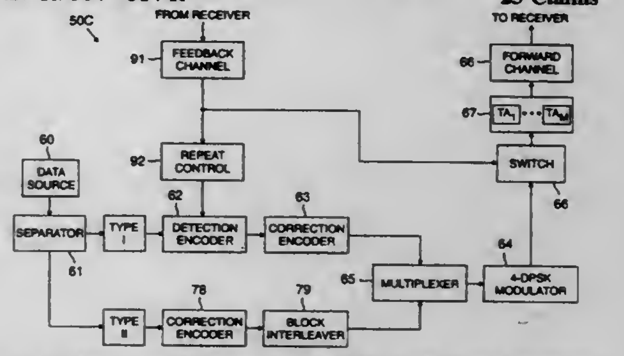
5,689,439
SWITCHED ANTENNA DIVERSITY TRANSMISSION METHOD AND SYSTEM

Vijitha Weerackody, Watchung, N.J., and William Glenn Zeng, Germantown, Md., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Mar. 31, 1995, Ser. No. 414,987

Int. Cl.^{6} G06K *15/00;* **H04L** *1/00;* **H04B** *7/02;7/06*

U.S. Cl. 364—514 R **23 Claims**



11. A transmitter for transmitting a JPEG image over a wireless communication medium to a receiver with unequal error protection, comprising:

a separator for separating the JPEG image into Type-I and Type-II information;

an error detection encoder for encoding the Type-I information with an error detection code;

an error correction encoder for encoding the Type-II information with an error correction code;

a modulator for modulating the encoded Type-I and Type-II information;

a first antenna for transmitting the modulated Type-I and Type-II information over a first forward channel of the communication medium to the receiver;

a second antenna for transmitting the modulated Type-I and Type-II information over a second forward channel of the communication medium to the receiver in place of the first antenna; and

a switch for switching from the first antenna to the second antenna in response to a negative acknowledgment from the receiver transmitted over a feedback channel of the communication medium.

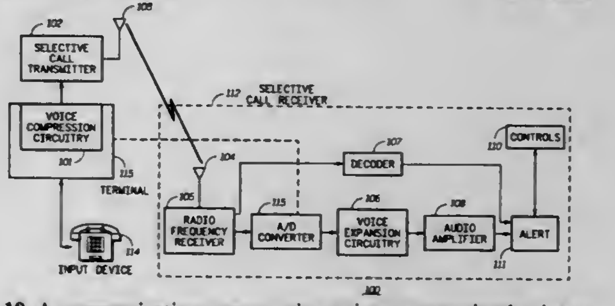
5,689,440
VOICE COMPRESSION METHOD AND APPARATUS IN A COMMUNICATION SYSTEM

Clifford Dana Leitch, Coral Springs; Robert John Schwendeman, Pompano Beach; Kazimierz Siwiak; William Joseph Kuznicki, both of Coral Springs, and Sunil Satyamurti, Delray Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 395,747, Feb. 28, 1995, abandoned. This application Dec. 11, 1996, Ser. No. 764,656

Int. Cl.^{6} H04B *7/00*

U.S. Cl. 364—514 R **20 Claims**



10. A communication system using voice compression having at least one transmitter base station and a plurality of selective call receivers, comprising:

at the transmitter base station:

an input device for receiving an audio signal;

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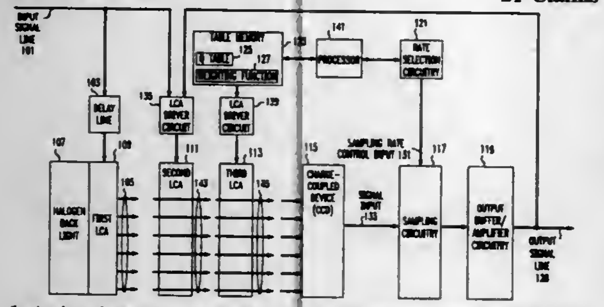
a processing device for compressing the audio signal using time-scale compression and a single side band modulation technique to provide a processed signal; and
a pilot carrier signal generator that generates a pilot carrier for a pair of single side band signals which includes the processed signal, wherein the pilot carrier serves as an amplitude and phase reference for distortion that occurs as a result of channel aberrations; and
a transmitter for transmitting the processed signal;
at each of the plurality of selective call receivers:
a selective call receiver for receiving the transmitted processed signal;
a receiver circuit for detecting, filtering and responding to the amplitude and phase reference generated by the pilot carrier signal generator;
a processing device for demodulating the received processed signal using single side band demodulation and time-scale expansion to provide a reconstructed signal; and
an amplifier for amplifying the reconstructed signal into an reconstructed audio signal.

5,689,441
SIGNAL PROCESSING TECHNIQUES BASED UPON OPTICAL DEVICES

Minakanagurki V. Ranganath, Lincroft, and John Frank Ribera, Howell, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 24, 1995, Ser. No. 409,235
Int. Cl.^{6} G02B *00/00*
U.S. Cl. 364—525 **21 Claims**



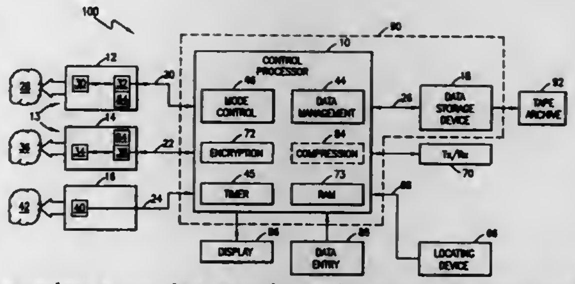
1. A signal processing system for processing signals in real time, the system comprising a first light valve device, a second light valve device, a third light valve device, a substantially fixed-output light source, and a charge-coupled device, wherein the first light valve device is positioned between the light source and the second light valve device, the second light valve device is positioned between the first light valve device and the third light valve device, and the third light valve device is positioned between the second light valve device and the charged-coupled device, so as to enable the first, second, and third light valve devices to selectively control the amount of light from the light source which is incident upon the charge-coupled device;
the signal processing system further comprising a delay line, a first driver circuit for driving a light valve device, and a second driver circuit for driving a light valve device, wherein the first light valve device is driven by the output of the delay line, the second light valve device is driven by the first driver circuit, and the third light valve device is driven by the second driver circuit.

5,689,442
EVENT SURVEILLANCE SYSTEM

Daniel R. Swanson, Dallas; Jerry M. Moen, Plano, and Bradley M. Tate, Carrollton, all of Tex., assignors to Witness Systems, Inc., Lubbock, Tex.

Filed Mar. 22, 1995, Ser. No. 408,901
Int. Cl.^{6} G06F *17/40*
U.S. Cl. 364—550 **38 Claims**

1. A surveillance system, comprising:
an event information capturing device;

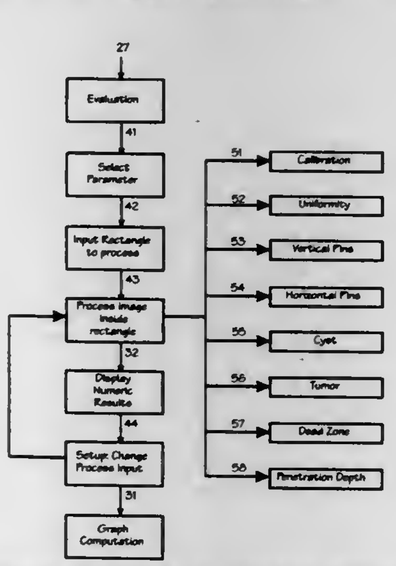


a random access data store for storing event information captured by the event information capturing device; and
a control processor connected to the event information capturing device and to the random access data store, the control processor responsive to an identification of the occurrence of events of interest, and including a data management functionality for dynamically managing the storage of captured event information in the random access data store by identifying, accessing and deleting from storage certain portions of the event information previously captured by the event information capturing device and stored in the random access data store that is not related to the identified events of interest in order to make room for the storage of subsequently captured event information.

5,689,443
METHOD AND APPARATUS FOR EVALUATING SCANNERS

Naganathasastrigal Ramanathan, 37 Bankview Circle, Rexdale, Ontario, Canada, M9W6S6

Filed May 25, 1995, Ser. No. 451,035
Int. Cl.^{6} G01B *17/00;* A61B *8/00*
U.S. Cl. 364—551.01 **20 Claims**



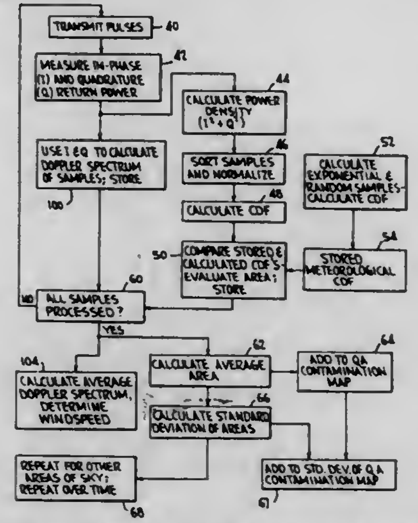
1. An apparatus for quantitatively evaluating image quality of an ultrasound scanner, comprising:
a processor;
a storage device;
at least one output device;
at least one input device; and
software means operative on the processor for:
(a) maintaining in the storage device information on the scanner;
(b) maintaining in the storage device information regarding expected performance standards;
(c) maintaining in the storage device information regarding at least one phantom test object;
(d) inputting via said at least one input device;

(e) interactively specifying said at least one phantom test object in image for processing;
(f) processing said specified phantom test object in image to quantitatively determine image quality characteristics of said scanner to evaluate the scanner for diagnostic purposes;
(g) maintaining in the storage device results of said processing; and
(h) outputting via said at least one output device results of said processing.

5,689,444
STATISTICAL QUALITY CONTROL OF WIND PROFILER DATA

James R. Jordan, and Richard G. Strauch, both of Boulder, Colo., assignors to The United States of America, as represented by the Secretary of Commerce, Washington, D.C.

Filed Jun. 7, 1995, Ser. No. 478,022
Int. Cl.^{6} G06F *17/60*
U.S. Cl. 364—554 **20 Claims**


TRANSMIT PULSES
40
MEASURE IN-PHASE (I) AND QUADRATURE (Q) RETURN POWER
42
CALCULATE POWER DENSITY (I²+Q²)
44
USE I&Q TO CALCULATE DOPPLER SPECTRUM OF SAMPLES; STORE
100
SORT SAMPLES AND NORMALIZE
46
CALCULATE EXPONENTIAL & RANDOM SAMPLES-CALCULATE CDF
52
CALCULATE CDF
48
COMPARE STORED & CALCULATED CDF'S-EVALUATE AREA; STORE
50
STORED METEOROLOGICAL CDF
54
ALL SAMPLES PROCESSED?
60
NO
YES
104
CALCULATE AVERAGE DOPPLER SPECTRUM, DETERMINE WINDSPEED
CALCULATE AVERAGE AREA
62
ADD TO QA CONTAMINATION MAP
64
CALCULATE STANDARD DEVIATION OF AREAS
66
REPEAT FOR OTHER AREAS OF SKY; REPEAT OVER TIME
68
ADD TO STD. DEV. OF QA CONTAMINATION MAP
67

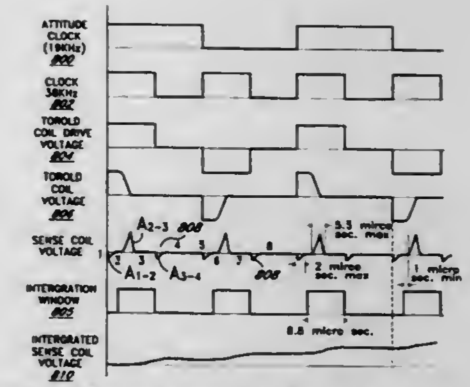
9. A method for identifying non-meteorological contribution to back-scattered radar signals as evaluated for wind profiling, comprising the steps of:
(a) calculating the probability density function (PDF) of a measured characteristic of a number of back-scattered radar signals from a given region used in generation of a wind profiling datum;
(b) comparing said calculated PDF to a stored PDF representative of radar signals reflected by known radar reflectors, to determine a quality assurance value indicative of the contribution of non-meteorological reflectors to the back-scattered radar signals;
(c) repeating said steps (a) and (b) a number of times, to determine a plurality of said quality assurance values; and
(d) evaluating the standard deviation of said plurality of quality assurance values, to identify said non-meteorological reflectors.

5,689,445
ELECTRONIC COMPASS AND ATTITUDE SENSING SYSTEM

Mark A. Vogt, Santee; Blair H. Brumley, La Jolla, and Kent L. Deines, Poway, all of Calif., assignors to Rowe-Deines Instruments Incorporated, San Diego, Calif.

Filed Apr. 5, 1996, Ser. No. 628,843
Int. Cl.^{6} G01C *17/38*
U.S. Cl. 364—559 **6 Claims**

1. A fluxgate sensor drive and sensing circuit, comprising:

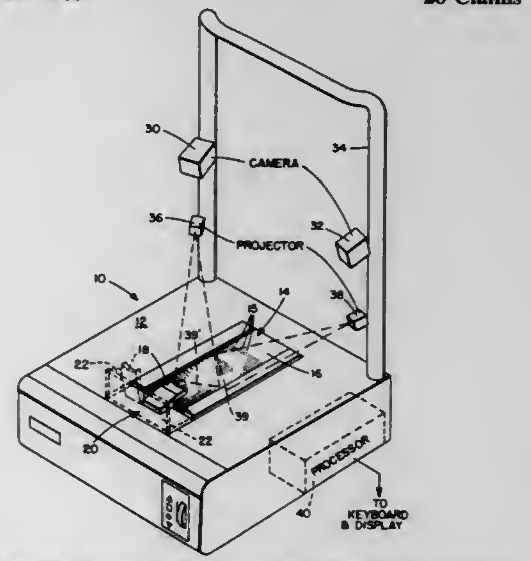


a plurality of fluxgate sensors, each having a core, an excitation coil, and one or more sensing coils;
a drive circuit providing an excitation signal to said excitation coil, said signal having alternating changes in polarity, said changes in polarity being separated by a relaxation period of no excitation current; and
an integrator integrating the output of said sensing coils.

5,689,446
FOOT CONTOUR DIGITIZER

Arjen Sundman, Santa Cruz, Calif.; Brian F. Smithgall, Bozeman, Mont., and Tony G. Tadin, Woodside, Calif., assignors to Amfit, Inc., Santa Clara, Calif.

Filed Nov. 3, 1995, Ser. No. 552,539
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 364—560 **28 Claims**



1. Apparatus for determining a contour of a portion of a person's foot, said apparatus including an array of gauge elements supported by a first support structure and disposed in spaced relation for independent guided movement along longitudinal axes of said gauge elements, from a home position to an extended position, and first control means for urging said gauge elements into extended positions so as to contact said portion of the person's foot, said apparatus further comprising:
camera means for acquiring a reference image of reflections of said gauge elements when said gauge elements are disposed in a reference position, and for further acquiring a contour image of reflections of said gauge elements in extended positions after contact with the person's foot; and
control means for receiving said reference image and contour image and calculating therefrom, a digital value indicative of

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a linear measure of an amount of extension of each said gauge element to enable said determination of said contour.

5,689,447

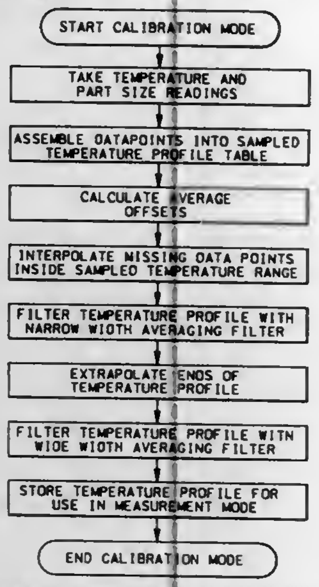
TEMPERATURE-COMPENSATED, SELF-CALIBRATING, CONTACT-TYPE GAGING SYSTEM AND METHOD FOR CALIBRATING THE SAME

Mark Ward, Ypsilanti, Mich., assignor to Control Gaging, Inc., Ann Arbor, Mich.

Filed Dec. 1, 1995, Ser. No. 565,787

Int. Cl.^{6} G01K *5/00*

U.S. Cl. 364—571.03 **10 Claims**


START CALIBRATION MODE
TAKE TEMPERATURE AND PART SIZE READINGS
ASSEMBLE DATAPOINTS INTO SAMPLED TEMPERATURE PROFILE TABLE
CALCULATE AVERAGE OFFSETS
INTERPOLATE MISSING DATA POINTS INSIDE SAMPLED TEMPERATURE RANGE
FILTER TEMPERATURE PROFILE WITH NARROW WIDTH AVERAGING FILTER
EXTRAPOLATE ENDS OF TEMPERATURE PROFILE
FILTER TEMPERATURE PROFILE WITH WIDE WIDTH AVERAGING FILTER
STORE TEMPERATURE PROFILE FOR USE IN MEASUREMENT MODE
END CALIBRATION MODE

1. A self-calibrating, temperature-compensating gaging system for accurately measuring a part size, the system comprising:

at least one gage finger configured to engage the part;

a linear variable differential transformer transducer operably connected to said at least one gage finger for reading a position of said gage finger and producing an LVDT signal indicative of the part size based on said gage finger position;

sensor means for measuring temperature of said gage finger and producing a temperature signal indicative of gage finger temperature;

calibration means for receiving said LVDT signal and said temperature signal and for creating a temperature profile unique to said gaging system while said gaging system is in a calibration mode, wherein said gaging system is zeroed on a pad of known size and subjected to a range of temperatures and said calibration means stores size offsets obtained from said LVDT signal at temperatures within said temperature range thus creating said temperature profile;

correction means for receiving said LVDT signal and said temperature signal and correcting said LVDT signal by reading a size offset corresponding to said temperature signal from said temperature profile and adjusting said LVDT signal by said size offset, while said gaging system is in a measurement mode.

5,689,448

Patent Not Issued For This Number

5,689,449

DECIMATION FILTER

Taplo Saramäki, Kreetarinkuja 4 A, FIN-33950 Pirkkala; Tapani Ritoniemi, Insinöörinkatu 84 B 31, FIN-33720 Tampere; Ville Eerola, Tohlopinkatu 15 A 2, FIN-33310 Tampere; Timo Husu, Kirkkokatu 12 B 23, FIN-80110 Joensuu; Eero Pajarre, Kanjoninkatu 11 C 26, and Seppo Ingalsuo, Orivedenkatu 8 C 66, both of FIN-33720 Tampere, all of Finland

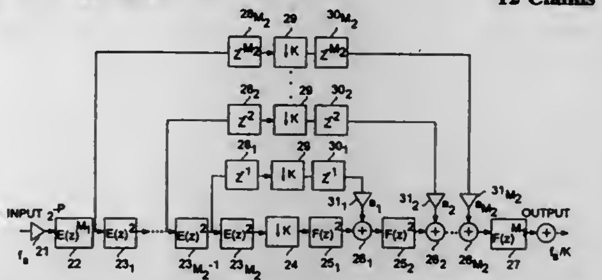
PCT No. PCT/FI94/00125, § 371 Date Sep. 27, 1995, § 102(e) Date Sep. 27, 1995, PCT Pub. No. WO94/23492, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 31, 1994, Ser. No. 522,361

Claims priority, application Finland, Apr. 5, 1993, 931531

Int. Cl.^{6} G06F *17/17*

U.S. Cl. 364—724.1 **12 Claims**



1. A decimation filer comprising a cascade arrangement of the following elements in the given order:

M_1 digital first order integration stages having a clock rate F_s and a delay of one clock cycle,

M_2 digital second order integration stages having a clock rate F_2 and a delay of two clock cycles,

a decimation stage for decreasing the sampling frequency of the output signal from the last integration stage by a predetermined decimation ration K,

M digital derivation stages having a clock rate F_s/K, each comprising a delay element stage for delaying the input signal for one clock cycle and a subtractor element stage for subtracting the input signal from the output signal of the delay element, wherein $M=M_1+2M_2$,

M_2 signal processing branches in such a way that between the input of the i:th second stage integrator subsequent to the M_1-stage integrator and the output of the derivation stage of the i:th second stage subsequent to the decimation block in the main branch a signal processing branch is connected including, in series configuration, a first delay element having a delay of i clock cycles at sampling frequency F_s of the output signal, a decimation stage for decreasing the sampling frequency of the first delay element by a predetermined decimation ratio K, a second delay element having a delay of i clock cycles at sampling frequency F_s/K, and a scaling element having a scaling factor α_i where $i=1,2,3, \ldots, M_2$.

5,689,450

PARALLEL PROCESSOR

Masuyoshi Kurokawa, and Takao Yamazaki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1995, Ser. No. 520,175

Claims priority, application Japan, Aug. 30, 1994, 6-205663; Mar. 31, 1995, 7-075811

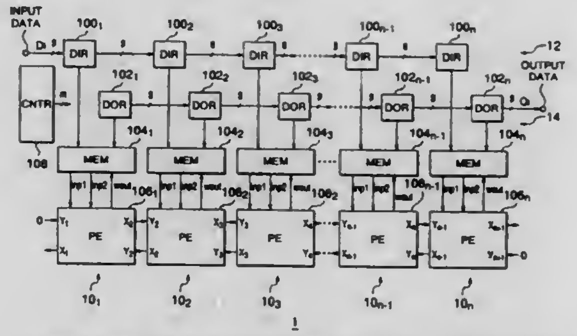
Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—736 **8 Claims**

1. A parallel processor for processing of an input signal comprised of a plurality of pieces of data per period, comprising:

a plurality of unitary processing units provided in parallel in a number corresponding to the plurality of pieces of data and performing processing for each piece of data;

each of said unitary processing units being comprised so as to enable the exchange of data with two adjoining unitary processing units, each of said unitary processing units comprised of a memory circuit and a processor element connected to said memory circuit;



each of said processor elements including:

a full adder;

a logical operation circuit for performing a logical operation on two inputs connected to a first input of said full adder;

a first selector circuit for selecting one of a first data from said memory circuit in said unitary processing unit and a first data from an adjoining memory circuit in an adjoining unitary processing unit;

a second selector circuit for selecting on of a second data from said memory circuit in said unitary processing unit and a second data from another adjoining memory circuit in another adjoining unitary processing unit;

a third selector circuit for selecting one of the second data selected by the second selector circuit, the logical value 1, and the logical value 0 and outputting the same as a first input for said logical operation circuit;

a fourth selector circuit for selecting one of the first data selected by the first selector circuit, the logical value 1, and the logical value 0 and outputting the same as a second input for said logical operation circuit;

a fifth selector circuit for selecting one of the second data selected by the second selector circuit, the logical value 1, and the logical value 0 and outputting the same as a second input for said full adder;

a sixth selector circuit or selecting one of a carrier output of said full adder, the logical value 1, and the logical value 0 and outputting the same as a third input for said full adder.

5,689,451

DEVICE FOR CALCULATING PARITY BITS ASSOCIATED WITH A SUM OF TWO NUMBERS

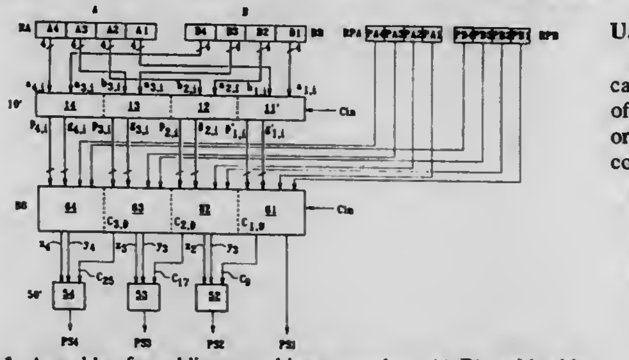
Pascal Delamotte, Rueil Malmaison, and Michel Thill, Les Clayes sous Bois, both of France, assignors to Bull S.A., Puteaux, France

Continuation of Ser. No. 350,189, Nov. 30, 1994, abandoned. This application Sep. 16, 1996, Ser. No. 714,486

Claims priority, application France, Nov. 30, 1993, 93 14287

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 364—738 **10 Claims**



1. An adder for adding two binary numbers (A,B), said adder comprising:

means for generating a carry word (C) and producing a result (S), using K groups, with K≧2, of m consecutive bits extracted from said binary numbers (A,B), carry word (C) and result (S) and formed respectively by bits $a_{i,j}$, $b_{i,j}$, $c_{i,j}$ and $s_i j$, where $i=\{1,2, \ldots, K\}$ and indicates one of said K groups and $i=1$ for the m least significant bits, $j=\{1,2, \ldots, m\}$ and indicates a significance of a bit in a group, $c_{1,1}$, is a first input carry bit for the adder and $c_{i,1}$, with $i=\{2, \ldots, K\}$, are second input carry bits, said generating means calculating, for $i\neq 1$ and $j=\{1,2, \ldots, m\}$, the following values:

$$p_{i,j}=a_{i,j}\oplus b_{i,j}$$

$$g_{i,j}=a_{i,j}\cdot b_{i,j}$$

and, for i=1, the following values:

$$p_{1,j}=a_{1,j}\oplus b_{1,j}$$

for

$$j=\{2, \ldots, m\}$$

$$g_{1,1}=a_{1,1}\cdot b_{1,1}+a_{1,1}\cdot c_{1,1}+b_{1,1}\cdot c_{1,1}$$

$$g_{1,j}=a_{1,j}\cdot b_{1,j}$$

for

$$j=\{2, \ldots, m\};$$

a parity generator circuit (**50'**, **60**) receiving said calculated values and K parity bits of said respective binary numbers (A,B) and calculating K parity bits (PS_i) of said respective K groups extracted from said result (S), said parity generator circuit including a first operator (**61***a*) for calculating a value $G_{1,j}$ of $G_{i,j}$, with i=1, as follows:

$$G_{1,j}=g_{1,j}+p_{1,j}\cdot G_{1,j-1}$$

for

$$j=\{2, \ldots, m\}$$

and with $G_{1,1}=g_{1,1}$

and a second operator (**61***b*) for calculating:

$$Y_1=c_{1,1}\oplus G_{1,1}\oplus G_{1,2}\oplus\ldots\oplus G_{1,j}\ldots\oplus G_{1,m-1}\oplus PA_1\oplus PB_1$$

where PA_1 and PB_1 are values of said parity bits PA_i and PB_i, with i=1 and Y_1 is a value corresponding to a parity bit PS_1 of said parity bits PS_i with i=1.

5,689,452

METHOD AND APPARATUS FOR PERFORMING ARITHMETIC IN LARGE GALOIS FIELD GF(2^N)

Kelly Cameron, Albuquerque, N. Mex., assignor to University of New Mexico, Albuquerque, N. Mex.

Filed Oct. 31, 1994, Ser. No. 332,235

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 364—746.1 **41 Claims**

1. A method of controlling errors in an electronically communicated digital data message by performing at least one of a plurality of predetermined arithmetic operations on the data message in one or more of a plurality of subfields GF(2^{p_i}) of a finite field GF(2^n), comprising steps of:

a. factoring a composite number n into a set of factors p_i wherein the composite number n is a number of bits of each element in the finite field GF(2^n);

b. forming a plurality of primitive polynomials F_i wherein each primitive polynomial is of a degree equal to p_i and defines a subfield GF(2^{p_i}) of the finite field GF(2^n); and

c. performing at least one of the plurality of predetermined arithmetic operations on the data message by utilizing an arithmetic circuit coupled to receive the data message,

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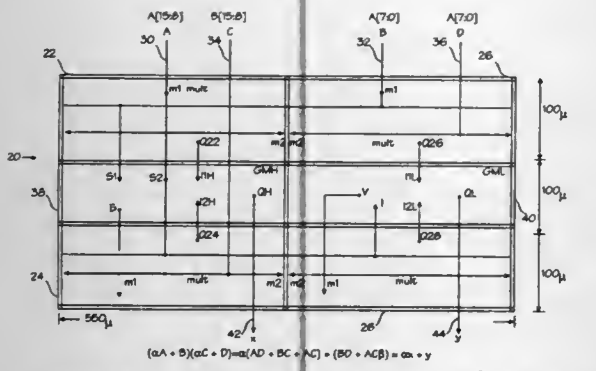


wherein the arithmetic operation is performed in one or more of the plurality of subfields GF(2^{p_i}) of the finite field GF(2^n).

5,689,453
DATA STORING APPARATUS HAVING A MEMORY CAPABLE OF STORING ANALOG DATA

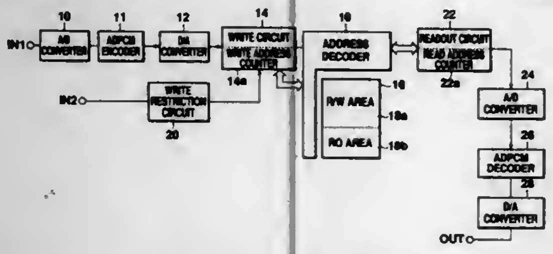
Masaaki Tsukagoshi, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 22, 1995, Ser. No. 493,621

Claims priority, application Japan, Jun. 24, 1994, 6-143388

Int. Cl.^{6} G11C *27/00*

U.S. Cl. 365—45 **7 Claims**



1. A data storing apparatus having a memory capable of writing and reading out analog data, comprising:

a D/A converter for converting digital data represented by a predetermined number of bits into discrete analog data;

a memory divided into a read/write area and a write restricted area, wherein the analog data is stored in at least one of the read/write area and the write restricted area;

an A/D converter for converting said analog data read out from the memory back to digital data represented by said predetermined number of bits; and

a write restriction circuit restricting the writing of said analog data into the write restricted area in the memory and controlling at least one of size and location of the write restricted area.

5,689,454
CIRCUITRY AND METHODOLOGY FOR PULSE CAPTURE

Nital Patwa, Plano, Tex., assignor to Cyrix Corporation, Richardson, Tex.

Filed Jan. 11, 1996, Ser. No. 583,922

Int. Cl.^{6} G11C *15/00*

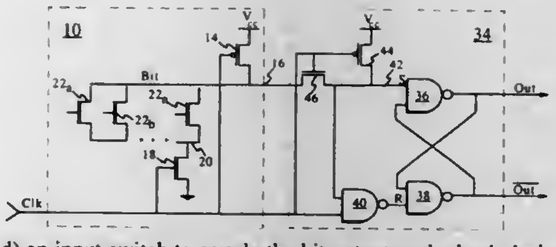
U.S. Cl. 365—49 **2 Claims**

1. A content addressable memory comprising:

(a) at least one memory cell coupled between an address line and a complementary address line;

(b) a comparator coupled to the at least one memory cell and the address line and the complementary address line, and having a hit output to indicate a match between contents of the at least one memory cell and levels driven on the address line and the complementary address line;

(c) a latch having set and reset inputs;



(d) an input switch to couple the hit output to the latch during a second clock phase; and,

(e) a precharge circuit to precharge the set and reset inputs of latch (c) during a first clock phase.

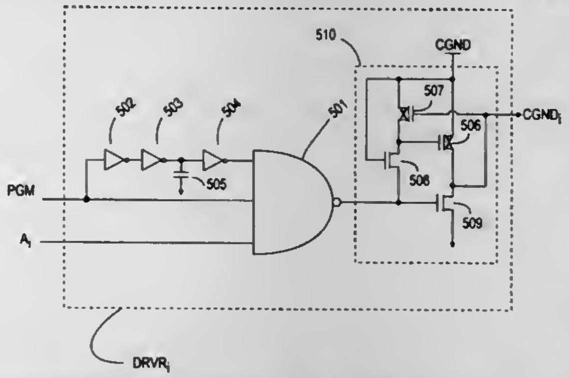
5,689,455
CIRCUIT FOR PROGRAMMING ANTIFUSE BITS

Patrick J. Mullarkey, Meridian; Casey R. Kurth, Eagle; Jason Graalum, and Daryl L. Habersetzer, both of Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 31, 1995, Ser. No. 522,174

Int. Cl.^{6} G11C *17/00*

U.S. Cl. 365—96 **7 Claims**



1. An integrated circuit memory product comprising:

at least one bank containing a plurality of antifuse elements in which top plates of the antifuse elements are joined in a common connection to a programming voltage;

a plurality of selection transistors, with each one of said selection transistors connected in series with one of said antifuse elements in the bank, the enablement of a particular one of said selection transistors resulting in a path being provided for the programming of the antifuse element to which the enabled selection transistor is connected; and

a feedback circuit associated with each antifuse element in the bank to stop the flow of current through the antifuse element with which it is associated once that antifuse element is programmed.

5,689,456
SEMICONDUCTOR NON-VOLATILE FERROELECTRIC MEMORY TRANSISTOR ACCOMPANIED WITH CAPACITOR FOR INCREASING POTENTIAL DIFFERENCE APPLIED TO FERROELECTRIC LAYER

Sota Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 745,848

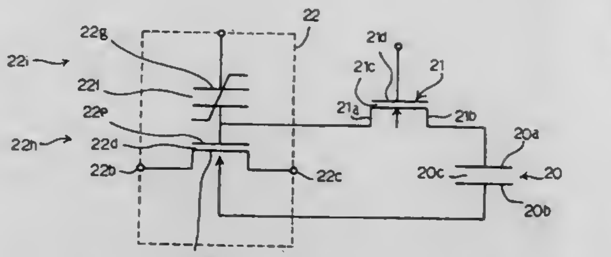
Claims priority, application Japan, Nov. 10, 1995, 7-317262

Int. Cl.^{6} G11C *11/22*

U.S. Cl. 365—145 **8 Claims**

1. A semiconductor non-volatile ferroelectric memory cell fabricated on a semiconductor substrate, comprising:

a memory transistor including source and drain regions formed on both sides of a channel region, a lower gate insulating layer formed of paraelectric material on said channel region, a lower gate electrode laminated on said lower gate insulating layer, an upper gate insulating layer formed of ferroelectric material on said lower gate electrode and an upper gate electrode formed on said upper gate insulating layer, and storing a data bit in the form of remanence in said upper gate insulating layer; and



a paraelectric capacitor including a lower electrode electrically connected to said channel region, an insulating layer formed of paraelectric material on said lower electrode and an upper electrode electrically connected to said lower gate electrode of said memory transistor.

5,689,457
SEMICONDUCTOR MEMORY

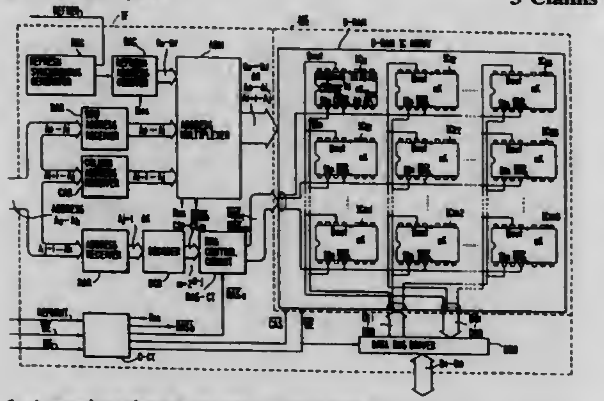
Katsuhiro Shimohigashi, Musashimurayama; Hiroo Masuda, Kodaira; Kunihiko Ikuzaki, Hinode-machi, and Hiroshi Kawamoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 448,138, May 23, 1995, which is a continuation of Ser. No. 306,612, Sep. 15, 1994, Pat. No. 5,448,520, which is a continuation of Ser. No. 193,896, Feb. 9, 1994, Pat. No. 5,365,478, which is a continuation of Ser. No. 115,241, Aug. 18, 1993, which is a continuation of Ser. No. 985,644, Dec. 7, 1992, which is a continuation of Ser. No. 864,934, Apr. 7, 1992, Pat. No. 5,170,374, which is a continuation of Ser. No. 515,345, Apr. 30, 1990, Pat. No. 5,119,332, which is a continuation of Ser. No. 397,119, Aug. 22, 1989, which is a continuation of Ser. No. 230,046, Aug. 9, 1988, Pat. No. 4,860,255, which is a continuation of Ser. No. 120,539, Nov. 13, 1987, abandoned, which is a division of Ser. No. 941,840, Dec. 15, 1986, Pat. No. 4,709,353, which is a division of Ser. No. 854,502, Apr. 22, 1986, Pat. No. 4,646,267, which is a division of Ser. No. 756,707, Jul. 19, 1985, Pat. No. 4,592,022, which is a division of Ser. No. 638,982, Aug. 8, 1984, Pat. No. 4,539,658, which is a division of Ser. No. 377,958, May 13, 1982, Pat. No. 4,472,792. This application Mar. 6, 1996, Ser. No. 611,636

Claims priority, application Japan, May 13, 1981, 56-70733

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—149 **3 Claims**



1. A semiconductor memory comprising:

a pair of data lines which are formed substantially in parallel to each other;

a plurality of word lines, each of which is arranged so as to intersect with both of said pair of data lines;

a plurality of dynamic memory cells, each of which is coupled to one of said word lines and to one of said data lines;

an amplifier having a pair of N-channel MOS transistors and a pair of P-channel MOS transistors, wherein each transistor of said pair of N-channel MOS transistors has a gate cross-coupled to a drain of the other transistor of said pair of N-channel MOS transistors, wherein a drain of one of said pair of N-channel MOS transistors is coupled to one of said pair of data lines and the drain of the other of said pair of N-channel MOS transistors is coupled to the other of said pair of data lines, wherein each transistor of said pair of P-channel MOS transistors has a gate cross-coupled to a drain of the other transistor of said pair of P-channel MOS transistors, and wherein a drain of one of said pair of P-channel MOS transistors is coupled to one of said pair of data lines and the drain of the other of said pair of P-channel MOS transistors is coupled to the other of said pair of data lines, wherein said amplifier provides said data lines with a high-level potential and a low-level potential, respectively; and

a first switching MOS transistor having a source-drain path provided between said pair of data lines,

a second switching MOS transistor having a source-drain path provided between one of said pair of data lines and a terminal being supplied with an intermediate level between said high-level potential and said low-level potential; and

a third switching MOS transistor having a source-drain path provided between the other of said pair of data lines and said terminal,

wherein said first, second and third switching MOS transistors are turned "on" so that said pair of data lines are set at said intermediate level.

5,689,458
SEMICONDUCTOR MEMORY DEVICE HAVING NEGATIVE RESISTANCE ELEMENT OPERATED STABLY WITH SINGLE LOW POWER SOURCE

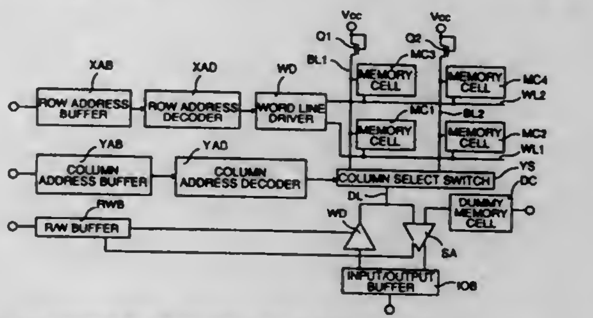
Hirotada Kuriyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1996, Ser. No. 628,200

Claims priority, application Japan, Jun. 8, 1995, 7-141789

Int. Cl.^{6} G11C *11/00*

U.S. Cl. 365—159 **13 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cells arranged in a matrix of a plurality of rows and columns,

a plurality of word lines arranged in a plurality of rows, each word line connected to a plurality of memory cells arranged in a corresponding row,

a plurality of bit lines arranged in a plurality of columns, each bit line connected to a plurality of memory cells arranged in a corresponding column, and

a plurality of bit line load transistors provided corresponding to said plurality of bit lines, each bit line load transistor connected between a first power supply potential node to which a first potential is supplied and a corresponding bit line,

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wherein each of said plurality of memory cells comprises
an access transistor connected between a storage node and a bit line of a corresponding column, and having a gate electrode connected to a word line of a corresponding row, wherein a threshold voltage thereof is smaller than a threshold voltage of said bit line load transistor, and
a negative resistance element connected between said storage node and a second power supply potential node to which a second potential lower than said first potential is supplied, and having a switching initiate voltage greater than a difference between said first potential and the threshold voltage of said bit line load transistor, and smaller than a difference between said first potential and the threshold voltage of said access transistor.

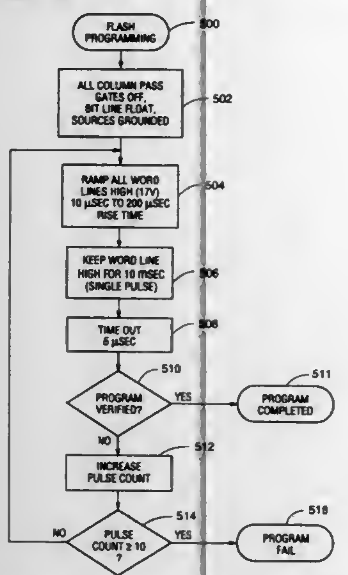
5,689,459
LOW VOLTAGE ONE TRANSISTOR FLASH EEPROM CELL USING FOWLER-NORDHEIM PROGRAMMING AND ERASE

Shang-De Chang, Fremont; Jia-Hwang Chang, Cupertino, and Edwin Chow, Saratoga, all of Calif., assignors to Rohm Corporation, San Jose, Calif.

Continuation of Ser. No. 205,327, Mar. 3, 1994, abandoned. This application Nov. 5, 1996, Ser. No. 744,559

Int. Cl.^{6} H01L *29/78*

U.S. Cl. 365—185.28 **28 Claims**


FLASH PROGRAMMING
500
ALL COLUMN PASS GATES OFF, BIT LINE FLOAT, SOURCES GROUNDED
502
RAMP ALL WORD LINES HIGH (17V) 10 μSEC TO 200 μSEC RISE TIME
504
KEEP WORD LINE HIGH FOR 10 mSEC (SINGLE PULSE)
506
TIME OUT 6 μSEC
508
510
PROGRAM VERIFIED?
YES
NO
511
PROGRAM COMPLETED
INCREASE PULSE COUNT
512
514
PULSE COUNT ≥ 10 ?
NO
YES
516
PROGRAM FAIL

1. An electrically erasable and programmable memory device having a plurality of storage sites, a plurality of row address lines, a plurality of column address lines, and a plurality of source lines, wherein each combination of one of the plurality of row address lines and one of the plurality of column address lines define a different one of the plurality of storage sites, and further wherein each of the plurality of storage sites comprises a single transistor formed on a substrate which is a selected potential and including:
a source coupled to an associated one of the plurality of source lines;
a drain coupled to an associated one of the plurality of column address lines;
a control gate coupled to an associated one of the plurality of row address lines; and
a floating gate positioned between the gate and the source and drain; and further including
first means for inducing Fowler-Nordheim tunneling of electrons from the source to the floating gate when the associated row address line is elevated to a first predetermined potential above that of the associated one of the source lines; and
second means for inducing Fowler-Nordheim tunneling of electrons from the floating gate to the drain when a predetermined negative potential which is below the selected potential of the substrate is supplied to the associated row address line.

5,689,460
SEMICONDUCTOR MEMORY DEVICE WITH A VOLTAGE DOWN CONVERTER STABLY GENERATING AN INTERNAL DOWN-CONVERTED VOLTAGE

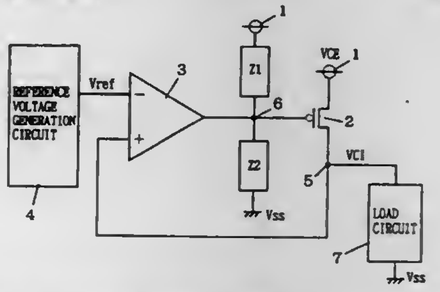
Tsukasa Ooishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1995, Ser. No. 511,497

Claims priority, application Japan, Aug. 4, 1994, 6-183300; Nov. 7, 1994, 6-272537; May 30, 1995, 7-130902

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.07 **56 Claims**



1. A semiconductor device comprising:
comparison means for comparing a voltage on a first node and a predetermined reference voltage,
a drive element connected between a second node to which voltage of a predetermined level is applied and said first node for supplying current from said second node to said first node according to an output signal of said comparison means, and
amplitude suppression means for suppressing a change in amplitude of the output signal of said comparison means.

5,689,461
SEMICONDUCTOR MEMORY DEVICE HAVING VOLTAGE BOOSTER CIRCUIT COUPLED TO A BIT LINE CHARGING/EQUALIZING CIRCUIT OR SWITCH

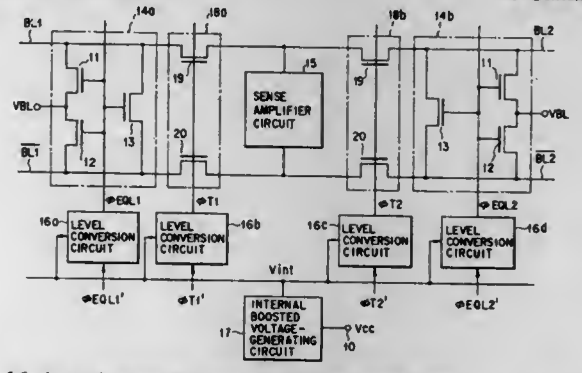
Tetsuya Kaneko, Kawasaki, and Takashi Ohsawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 299,078, Sep. 1, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,696

Claims priority, application Japan, Sep. 10, 1993, 5-225336; May 30, 1994, 6-116761

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.11 **16 Claims**



16. A semiconductor memory device comprising:
first and second bit line pairs, each of said bit line pairs having first and second bit lines;
a boosted voltage generating circuit, connected to a power supply voltage, for constantly generating a boosted voltage having a voltage level higher than a voltage level of said power supply voltage;

a sense amplifier, connected to said first and second bit line pairs, for sensing and amplifying potential differences between the first and second bit lines of said first and second bit line pairs;
a first switch, connected to said first bit line pair and to said sense amplifier, responsive to a first switch control signal for selectively connecting said first bit line pair to said sense amplifier;
a first level converting circuit, connected to said first switch and to said boosted voltage generating circuit, for converting a first input control signal into a first converted control signal at the voltage level of the boosted voltage, and for outputting the first converted control signal as the first switch control signal;
a second switch, connected to said second bit line pair and to said sense amplifier, responsive to a second switch control signal for selectively connecting said second bit line pair to said sense amplifier; and
a second level converting circuit, connected to said second switch and to said boosted voltage generating circuit, for converting a second input control signal into a second converted control signal at the voltage level of the boosted voltage, and for outputting the second converted control signal as the second switch control signal.

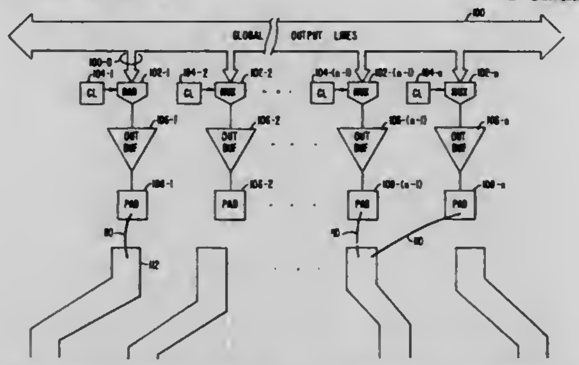
5,689,462
PARALLEL OUTPUT BUFFERS IN MEMORY CIRCUITS

Robert J. Proebsting, Los Altos Hills, Calif., assignor to Townsend and Townsend and Crew, LLP, San Francisco, Calif.

Filed Dec. 22, 1995, Ser. No. 577,525

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **11 Claims**



1. In a memory circuit having 2^n output terminals where n is a programmable integer, a method for configuring the circuit output organization comprising the steps of:
(a) providing 2^m output buffers, where m is equal to a maximum value of n;
(b) coupling an output of each one of said 2^m output buffers to 2^m pins, respectively, for a X2^m organization;
(c) coupling in parallel selected ones of said 2^m output buffers to form one or more sets of parallel output buffers, with an output of each set coupling to a corresponding pin, for a X2^k organization, where k is an integer less than m.

5,689,463
SEMICONDUCTOR MEMORY DEVICE

Hiroaki Murakami, Oita, and Yoshiyuki Tanaka, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

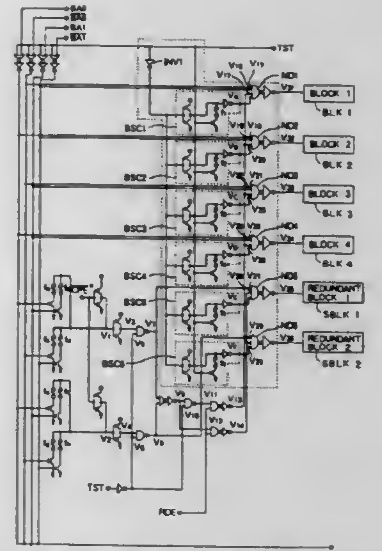
Filed Oct. 4, 1995, Ser. No. 539,237

Claims priority, application Japan, Oct. 4, 1994, 6-240289

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **8 Claims**

1. A semiconductor memory device comprising:



a plurality of memory blocks, each of the memory blocks including a plurality of memory cells;
at least one redundant block to be used in place of a selected memory block of said memory blocks;
switch means for replacing said selected memory block with said redundant block; and
prohibiting means for prohibiting said selected meafoty block, which has been replaced by said redundant block, from being selected in response to a selection inpm signal which simultaneously selects all blocks,
wherein said prohibiting means includes a plurality of block selecting circuits, one of the block selecting circuits being provided for each of the memory blocks, said block selecting circuit including:
a first signal path having a plurality of logic gates;
signal inverter means for inverting a signal passing through said logic gates in response to the selection input signal; and
signal path blocking means for blocking a second signal path between said first signal path and said signal inverter means in response to the replacement by said switch means.

5,689,464
COLUMN REPAIR CIRCUIT FOR INTEGRATED CIRCUITS

Jong Seuk Lee; Seung Min Kim; Jae Hyeoung Kim, and Sang Ho Lee, all of Seoul, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ichonkun Kyoungkido, Rep. of Korea

Continuation of Ser. No. 701,528, May 16, 1991, abandoned. This application Apr. 19, 1994, Ser. No. 600,599

Claims priority, application Rep. of Korea, May 18, 1990, 1990-7170

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **4 Claims**

1. A column repair circuit for use in a semiconductor memory including a matrix of regular memory cells and a spare memory cell, comprising:
a plurality of bit lines and bit bar lines;
a plurality of data bus lines and data bus bar lines;
input/output selecting means for:
selecting one of the data bus lines and one of the data bus bar lines corresponding to a faulty regular memory cell in response to an input control signal;
connecting the selected data bus line and the selected data bus bar line to a spare bit line and a spare bit bar line connected to the spare memory cell;
developing an output signal on a control line corresponding to the selected data bus line and the selected data bus bar line, the output signal having a predetermined level; and

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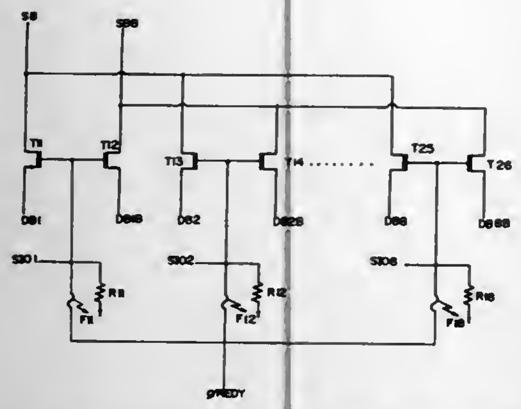


developing additional output signals on additional control lines, each said additional control lines corresponding to one of the non-selected data bus lines and non-selected data bus bar lines, the additional output signals having a level different than the predetermined level;

wherein said input/output switching means further comprises a plurality of fuse elements, each connected between an input line to which the input control signal is applied and one of a plurality of nodes to which the output signals are applied, all of said plurality of fuse elements, except for the one fuse element corresponding to the selected data bus and line and data bus bar line, being cut to thereby disconnect the input control signal from the remaining non-selected data bus and data bus bar lines;

decoding means for decoding address signals and the output signals provided by the input/output selecting means; and

switching means for connecting and disconnecting the bit lines and the bit bar lines to and from the data bus lines and the data bus bar lines respectively in response to decoder output signals from the decoding means.

5,689,465
SEMICONDUCTOR MEMORY DEVICE AND DEFECTIVE MEMORY CELL CORRECTION CIRCUIT

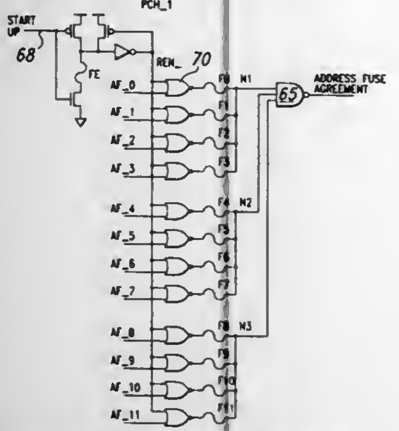
Shunichi Sukegawa, Oume; Takumi Nasu, Tsuchiura, and Hidetoshi Iwai, Oume, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 80,159, Jun. 18, 1993, Pat. No. 5,550,394. This application Aug. 26, 1996, Ser. No. 703,178

Claims priority, application Japan, Jnn. 19, 1992, 4-185926

Int. Cl.^{6} G11C *7/00;29/00*

U.S. Cl. 365—200 **7 Claims**



1. A semiconductor memory device comprising:

a plurality of arrays of memory cells;

each of said arrays of memory cells being arranged in a matrix of rows and columns of individual memory cells;

multiple redundant memory cells for replacement of defective memory cells included in said matrix of rows and columns of individual memory cells for each array of memory cells;

address generating means for providing a memory address signal to selectively drive one of the row and column of memory cells included in an array of memory cells;

multiple programmable fuses having respective input means, each of the input means of said programmable fuses being connected to said address generating means for receiving the memory address signal, said input means for a first one of said programmable fuses coupling one end of said first fuse to a first voltage, said input means for a second one of said programmable fuses coupling one end of said second fuse to a second voltage which is the complement of said first voltage;

an electrical connection node common to each of said fuses each of said fuses having a second end as an output connected to said common node;

address coincidence signal generating means connected to said common node and generating an address coincidence signal in response to outputs received and indicative of a specific defective memory cell; and

means connected to said address coincidence signal generating means for accessing said multiple redundant memory cells and replacing said specific defective memory cell of a memory cell array with a redundant memory cell from said multiple redundant memory cells in response to receiving the address coincidence signal from said address coincidence signal generating means.

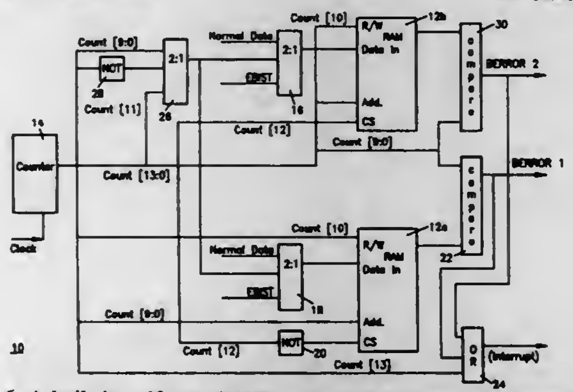
5,689,466
BUILT IN SELF TEST (BIST) FOR MULTIPLE RAMS

Fazal Ur Rehman Qureshi, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 418,499, Apr. 7, 1995, abandoned. This application Jul. 14, 1995, Ser. No. 502,574

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—201 **12 Claims**



6. A built in self test (BIST) method for sequentially testing a plurality of addressable integrated circuit storage devices, the BIST method comprising:

providing a counter that has a utilization as follows for bits of said counter as said counter counts from zero to a full value of said counter: counter bits (N:0) define a full address range of each of said addressable integrated circuit storage devices, counter bit (0) being a least significant bit; counter bit (N+1) determines whether a current operation within a BIST cycle is a write operation or a read operation; counter bit (N+2) determines whether the write address or the inverse write address is provided as input data; counter bits (N+M:N+3) identify which one of the plurality of addressable integrated circuit storage devices is to be operated upon; and counter bit (N+M+1) initiates an end of test interrupt signal, wherein N is an integer greater than zero and M is an integer greater than zero;

initiating said counter to count from zero to the full value of said counter such that,

(a) the full address range of said addressable integrated circuit storage device currently to be operated upon is written with the write address as input data;

(b) following step (a) above, a read operation is performed on the full address range of said addressable integrated circuit storage device and, for each reference read address in the full address range, a read output of said addressable integrated circuit storage device is compared with said reference read address; and

(c) in the event there is a mismatch between said read output and said reference read address, generating an interrupt signal; and

responding to the generation of said interrupt signal by locking up the counter at the reference address that caused said interrupt signal to be generated.

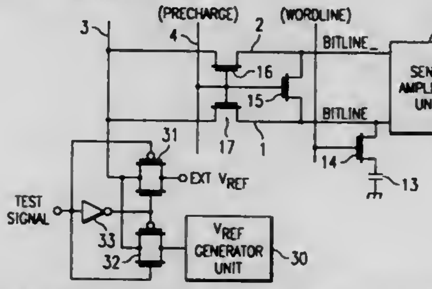
5,689,467
APPARATUS AND METHOD FOR REDUCING TEST TIME OF THE DATA RETENTION PARAMETER IN A DYNAMIC RANDOM ACCESS MEMORY

Masashi Hashimoto, Tsukuba, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1995, Ser. No. 565,495

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 365—201 **9 Claims**



2. A storage cell in a dynamic random access memory, said storage cell comprising:

a sense amplifier;

a first and a second bitline coupled to said sense amplifier, said sense amplifier amplifying a difference in voltage between said first and said second bitline;

a storage cell capacitor for storing a charge;

a switching means for controllably coupling said storage cell capacitor to one of said first and second bitlines; and

a voltage generator charging said first and second bitlines to a first potential during an operational mode, said voltage generator charging said first and said second bitlines to a second potential during a test mode.

5,689,468
SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR DRIVING THE SAME

Makoto Ihara, Nara, Japan, assignor to Sharp Kabushiki Kaisha

Filed Dec. 13, 1995, Ser. No. 571,544

Claims priority, application Japan, Dec. 21, 1994, 6-318717; Oct. 26, 1995, 7-279485

Int. Cl.^{6} G11C *7/00*

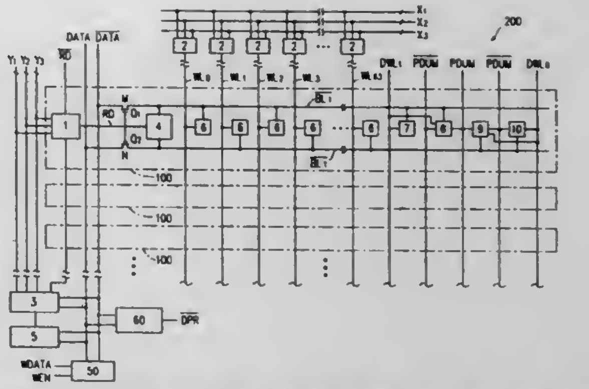
U.S. Cl. 365—203 **21 Claims**

1. A semiconductor memory device including at least one memory block comprising:

a plurality of word lines;

a plurality of bit lines; and

a plurality of memory cells which are disposed at crossings of the word lines and the bit lines, each memory cell including first switching means and a capacitor which is connected to the bit line via the first switching means, the first switching means being turned on and off in accordance with a signal level supplied from the corresponding word line, and data being written to and read from the capacitor by a voltage signal supplied from the bit line,



wherein the semiconductor memory devices includes:

a node comprising capacitance means having a predetermined capacitance;

second switching means for connecting the bit line to the node;

means for precharging the plurality of bit lines to a first voltage potential;

means for precharging the capacitance means to a second voltage potential, wherein the first and second voltage potential are not equal to one another; and

control means for controlling the first switching means so as to connect electrically the memory cell which is coupled to the word line selected in a read operation to the corresponding bit line, and for controlling the second switching means so as to connect electrically the bit line which is selected in the read operation to the node comprising the precharged capacitance means, wherein the electric potential of the selected bit line changes to a third voltage potential which is between the first and second voltage potentials so as to apply the voltage potential to the capacitor of the selected memory cell which is coupled to the selected word line and the selected bit line, thereby reading a data signal corresponding the data stored in the capacitor of the selected memory cell onto the selected bit line and the node.

5,689,469
SEMICONDUCTOR MEMORY DEVICES

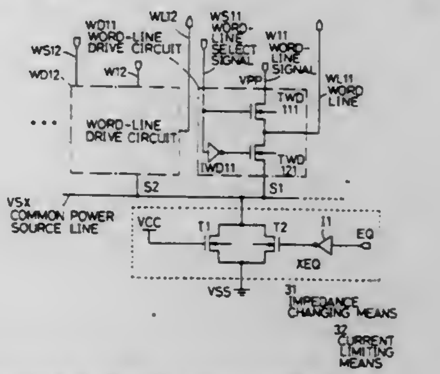
Hideo Asaka, and Hiroyuki Yamauchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 420,875, Apr. 13, 1995, Pat. No. 5,594,701. This application Nov. 1, 1996, Ser. No. 742,537

Claims priority, application Japan, Apr. 15, 1994, 6-077513

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—203 **14 Claims**


WD11 WORD-LINE DRIVE CIRCUIT
WL12
WS11 WORD-LINE SELECT SIGNAL
W11 WORD-LINE SIGNAL
WS12
WD12
W12
VPP
WL11 WORD LINE
TWD 111
WORD-LINE DRIVE CIRCUIT
TWD 121
TWD11
S2
S1
VSX COMMON POWER SOURCE LINE
VCC
T1
T2
I1
EQ
XEQ
VSS
31 IMPEDANCE CHANGING MEANS
32 CURRENT LIMITING MEANS

1. A semiconductor memory device comprising:

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a plurality of memory cells, each consisting of a capacitor and a transistor;

a plurality of word lines for individually controlling the transistors of said memory cells;

plural pairs of bit lines onto which information accumulated in the capacitors of said memory cells is read individually;

a plurality of sense amplifiers for individually amplifying the information read onto the pairs of bit lines;

a plurality of pull-down transistors which are equal in number to said word lines, said pull-down transistors connecting, if the corresponding word lines are not selected, the corresponding word lines to the ground; and

precharge circuits for precharging, during standby during which no word line is selected, said pairs of bit lines to a specified potential, said semiconductor memory device further comprising

a current limiting means for reducing, during standby, a current flowing from each of the word lines to the ground via the pull-down transistor.

5,689,470

SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR ACCESSING A MEMORY IN THE SAME

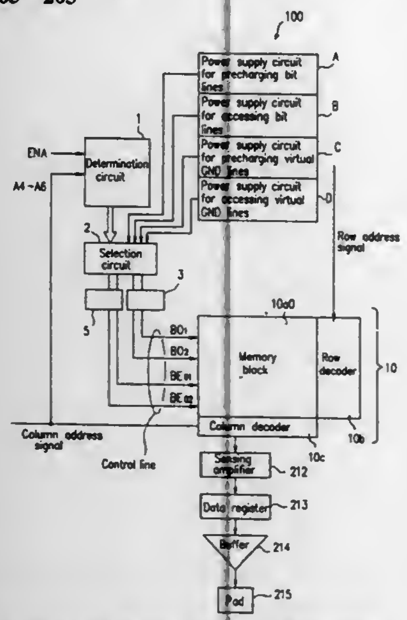
Kouji Inoue, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1996, Ser. No. 757,761

Claims priority, application Japan, Nov. 29, 1995, 7-311439

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—203 **11 Claims**



1. A semiconductor memory device, comprising:

a plurality of memory cells arranged in a matrix, each of which has a gate electrode, a first electrode and a second electrode;

a plurality of word lines, at least one of which is connected to the gate electrode of one of the plurality of memory cells;

a plurality of bit lines, at least one of which is connected to the first electrode of one of the plurality of memory cells;

a plurality of virtual ground lines, at least one of which is connected to the second electrode of one of the plurality of memory cells;

a determination circuit for generating a determination signal based on an address signal; and

a precharge and access circuit for applying one of a first voltage and a second voltage to at least one of the plurality of bit lines and applying one of a third voltage and a fourth voltage to at least one of the plurality of virtual ground lines, based on the determination signal.

5,689,471

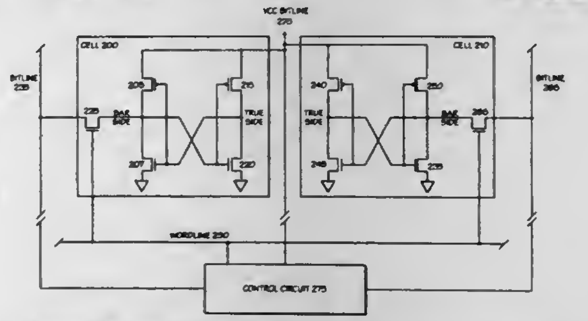
DUMMY CELL FOR PROVIDING A REFERENCE VOLTAGE IN A MEMORY ARRAY

Peter H. Voss, Aromas, and Jeffrey L. Linden, Campbell, both of Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Continuation-in-part of Ser. No. 522,991, Sep. 8, 1995, which is a continuation of Ser. No. 377,952, Jan. 24, 1995, Pat. No. 5,453,950. This application Dec. 22, 1995, Ser. No. 579,079

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—210 **18 Claims**



1. A memory array comprising:

a storage element for storing one of a first state and a second state, wherein said storage element includes a first pass transistor having a first width and a first length;

circuitry coupled to said storage element for reading said one of said first state and said second state from said storage element, said storage element drawing a first current when said first state is read by said circuitry; and

a dummy cell coupled to said storage element and said circuitry, said dummy cell providing a reference voltage when said circuitry reads said one of said first state or said second state from said storage element, said dummy cell drawing a second current when said first state is read from said storage element, wherein the second current is not equal to the first current, and wherein said dummy cell includes a second pass transistor having a second width and a second length.

5,689,472

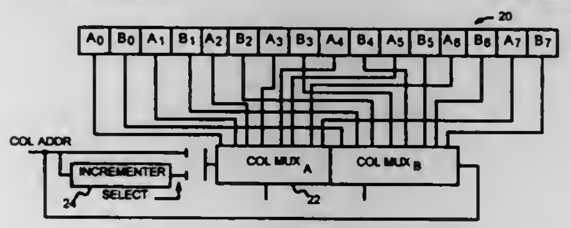
SYSTEM AND METHOD FOR PROVIDING EFFICIENT ACCESS TO A MEMORY BANK

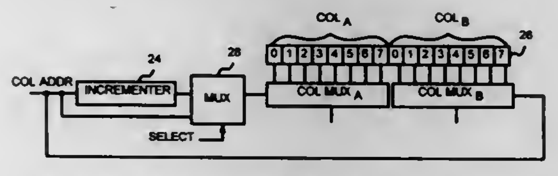
Greg L. Tanaka, Sunnyvale, and Sean H. Kuo, Saratoga, both of Calif., assignors to Silicon Magic Corporation, Cupertino, Calif.

Filed Oct. 31, 1996, Ser. No. 739,868

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—230.02 **22 Claims**





1. An apparatus for providing efficient accesses to memory in a computer system, the computer system including a controller, the apparatus comprising:

a random access memory array having a plurality of rows and columns and being coupled to the controller; and

a column selection mechanism coupled to the memory array and the controller, the column selection mechanism being divided into predetermined portions for providing column selection signals to access chosen portions of a row in the memory array.

5,689,473

MULTI-BANK SYNCHRONOUS MEMORY SYSTEM WITH CASCADE-TYPE MEMORY CELL STRUCTURE

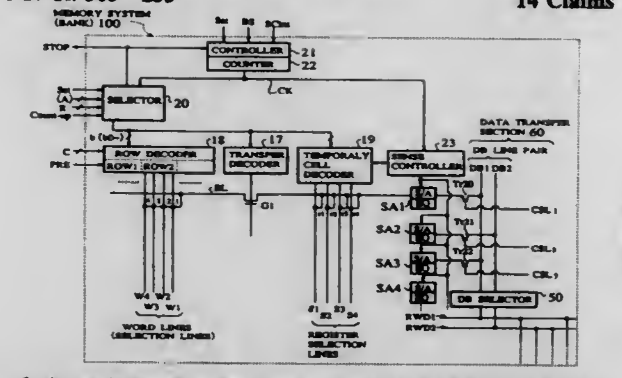
Haruki Toda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Division of Ser. No. 390,551, Feb. 17, 1995, Pat. No. 5,610,872. This application Jul. 31, 1996, Ser. No. 690,479

Claims priority, application Japan, Feb. 17, 1994, 6-020329

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233 **14 Claims**



1. A synchronous memory system with a cascade-type memory cell structure in which receiving of an address for a memory cell to be accessed and readout of data stored from the memory cell is performed in synchronization with a first clock signal supplied from an external device, the synchronous memory system comprising:

a plurality of word lines;

a plurality of bit lines;

a plurality of first memory cells having a cascade-type configuration connected to the plurality of word lines, the plurality of first memory cells forming a first memory cell group in a plurality of first memory cell group in a memory cell array, the first memory cell group being connected to one of the plurality of bit lines;

a sense amplifier for sensing data to be written into the plurality of first memory cells or for sensing data read out from the plurality of first memory cells;

a plurality of second memory cells corresponding to the plurality of first memory cells;

a decoder for receiving an address signal for a target memory cell to be accessed in the plurality of first memory cells in order to perform a sense operation based on the first clock signal, and controlling a transmission of data stored in each of the plurality of first memory cells into each of the plurality of second memory cells in synchronism with a second clock signal generated by using the first clock signal; and

a selector for generating a control signal to select each of the plurality of first memory cells including the target memory cell based on the address signal designating the target memory cell, transmitting the control signal to the decoder, and generating a stop signal in order to halt the sense operation for the plurality of first memory cells when the transmission of data stored in the target memory cell to the sense amplifier is completed, and transmitting the stop signal to the decoder and external devices.

5,689,474

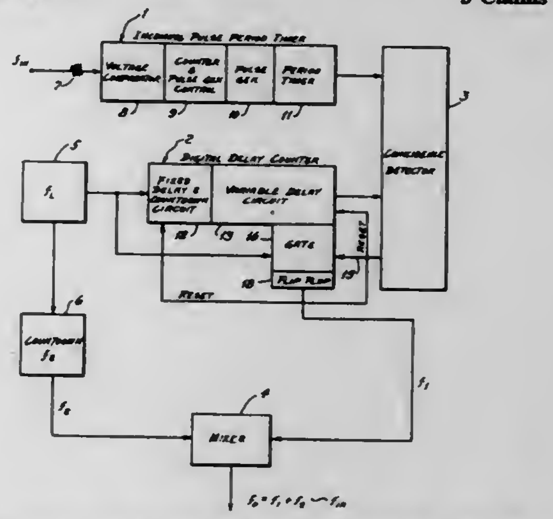
DIGITAL FREQUENCY SYNTHESIZER

Rene N. Foss, and Michael W. Manchester, both of Seattle, Wash., assignors to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 15, 1968, Ser. No. 768,226

Int. Cl.^{6} H04K *3/00*

U.S. Cl. 367—1 **3 Claims**



1. A system for converting an incoming ultrasonic burst produced by a sonar transmitter into a prolonged signal, having a frequency equal to that of the individual cycles making up said burst, comprising

means for generating a first train of pulses having a first predetermined repetition rate;

a first register for counting the number of said pulses which occur during a predetermined fixed number of individual cycles in each ultrasonic burst, thereby producing in said register a number which is directly proportional to the frequency of the individual cycles from each burst;

means for generating a second train of pulses having a second predetermined repetition rate;

a second register;

means for feeding said second train of pulses to said second register;

means for producing a single output pulse and for resetting said second register to a predetermined number each time the counts in said first and second registers are equal, whereby repeated counting cycles produce a series of output pulses having a frequency proportional to that of the cycles in each burst;

means for deriving from said second train of pulses a third train of pulses having a third predetermined repetition rate; and

means for mixing said output pulses with said third pulse train to produce a prolonged signal having a frequency equal to that of the cycles in said ultrasonic burst.

5,689,475

NAUTICAL APPARATUS TO CONDUCT RECONNAISSANCE MISSIONS OF A SITE, PARTICULARLY BATHYMETRIC SURVEYS

Marc Chaumet-Lagrange, Merignac, France, assignor to Port Autonome de Bordeaux, Bordeaux, France

Filed Sep. 1, 1995, Ser. No. 453,704

Claims priority, application France, May 30, 1994, 94 06527

Int. Cl.^{6} G01S *15/89*

U.S. Cl. 367—88 **8 Claims**

1. A nautical apparatus for conducting subsurface bathymetric surveys at a surface site by sounding techniques, said nautical apparatus including a buoyant hull housing a motor and directional elements (19), means of geographic localization of the nautical apparatus, measurement instruments, and computing means for analyzing measurements taken in association with the time of the

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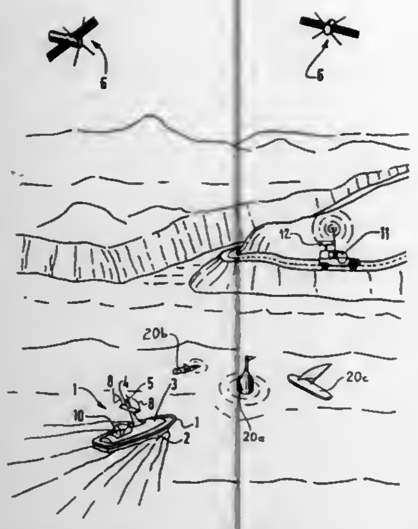


survey and the geographic position of the apparatus at the time of the survey, characterized in that the nautical apparatus has a programmable automatic system (**13**) comprising:

(a) a memory means (**14**) for storing a route traversing the site (**24**) to be surveyed,

(b) processing means (**15**) for making an analysis of the route recorded, considering the current position of the nautical apparatus, and prerecorded information relative to the site to be surveyed, and generating from the analysis made appropriate piloting commands for the nautical apparatus (**1**), and

(c) an interface means (**17**) connected with said processing means (**15**), and with said motor and directional elements (**19**), which interface means (**17**) maneuvers the directional elements (**15**) as a function of piloting commands generated by the processing means (**15**).

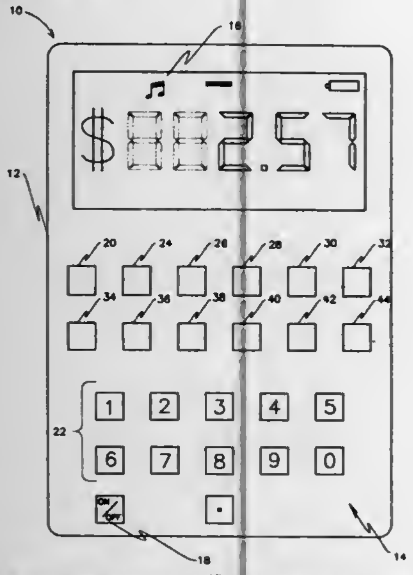
5,689,476
TELEPHONE COST MONITOR

Terrence T. Leach, 9850 Cordoba Ct., Apartment 3A, Orland Park, Ill. 60462

Filed May 16, 1995, Ser. No. 441,987

Int. Cl.^{6} G04B *47/00*

U.S. Cl. 368—10 **1 Claim**



1. A time use cost monitor for determining the cost of using a device for which time use costs accrue during use, said cost monitor comprising:

an elapsed time clock for measuring time elapsing during use of the device, and generating a data signal corresponding to current measured elapsed time;

data memory for storing data relating to both elapsed time and cost basis values;

data entry apparatus for entering operating commands and cost basis values;

a calculator for processing data corresponding to both elapsed time and to said cost basis values, and for deriving data corresponding to current accrued costs responsive to both data relating to elapsed time and data relating to cost basis values, and for generating a second data signal corresponding to said accrued costs, said calculator operating responsive to commands entered in said data entry apparatus;

a display for displaying data relating to said elapsed time data signals and said second data signal corresponding to said accrued costs; and

a power source for operating said monitor, comprising a battery and an on-off switch for conserving power of said battery, said data entry apparatus further including a reset key, for clearing said memory of data relating to current elapsed time and current accrued costs, and for resetting said memory to store new data relating to current accrued costs and current elapsed time,

said data entry apparatus including

a key for entering a command to display cumulative accrued costs,

a key for entering a command to display cumulative elapsed time,

an accumulator key for adding data corresponding to current elapsed time and to current accrued costs to data stored in said memory,

an accumulator reset key for entering a command to clear said memory of cumulative accrued cost data and cumulative elapsed time, and for resetting said memory to store new data relating to cumulative accrued cost data and cumulative elapsed time, and

an advisory key for entering, selectively, a command to signal completion of a predetermined time interval, and a command to signal attainment of a predetermined current accrued cost value, said elapsed time clock having means for generating a signal corresponding to completion of said predetermined time interval responsive to said command to signal completion of said predetermined time interval, and said calculator having means for generating a signal corresponding to attainment of said predetermined current accrued cost value responsive to said command to signal attainment of said predetermined current accrued cost value,

said monitor further comprising an alarm responsive to signalling of completion of a predetermined time interval and to signalling of attainment of a predetermined current accrued cost value.

5,689,477
METHOD AND APPARATUS FOR STORING AND PRESENTING VISUAL AND AUDIBLE INFORMATION TO AN INDIVIDUAL

Richard P. Moran, Issaquah, Wash., assignor to Visionary Technology, Limited, Hong Kong, China

Continuation of Ser. No. 150,354, Oct. 29, 1993, abandoned.

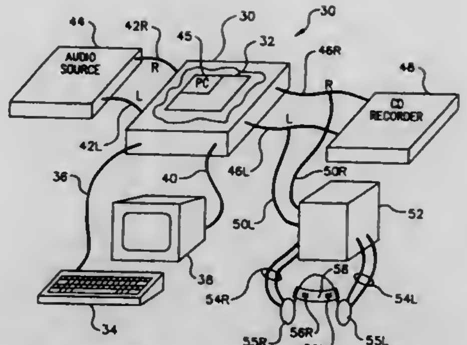
This application Oct. 12, 1995, Ser. No. 541,234

Int. Cl.^{6} H04B *1/20*

U.S. Cl. 369—4 **12 Claims**

1. A method for recording for subsequent retrieval at least one audio signal and at least one control signal onto a storage medium having a frequency response range from a low frequency f_0 to a high frequency f_h, wherein the at least one control signal has a frequency range of f_0 to f_1, and the at least one audio signal has a frequency range from f_0 to f_2, where $f_0<f_1<f_2<f_h$, the method comprising steps of:

a) transforming the at least one audio signal and the at least one control signal to produce a composite transformed signal occupying at least two distinct audio frequency ranges that both fall within the response frequency range f_0 to f_h of the



storage medium, said at least two distinct audio frequency ranges include a lower composite transformed frequency range from f_0 to f_1, and an upper composite transformed frequency range from a value$>f_1$ to f_h;

b) recording the composite transformed audio signal on the storage medium; and

c) the step of transforming the at least one audio signal causing the frequency range occupied by the transformed at least one audio signal to be shifted and inverted, so that the frequency f_0 of the at least one audio signal is transformed to approach a high end f_h of the upper composite transformed frequency range and the frequency f_2 of the at least one audio signal is transformed to approach said value$>f_1$ at a low end of the lower composite transformed frequency range.

5,689,478
MAGNETIC HEAD FOR MAGNETO-OPTICAL RECORDING AND MAGNETO-OPTICAL RECORDING APPARATUS IN WHICH A MAGNETIC CORE MOUNTED TO A SLIDER HAS PARTICULAR DIMENSIONS AND PROPERTIES

Kazuyoshi Ishii, Tokyo, and Shinichi Tachibana, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

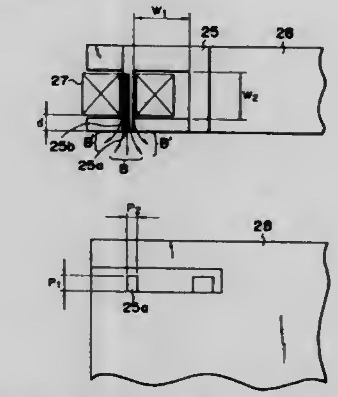
Continuation of Ser. No. 132,338, Oct. 6, 1993, abandoned.

This application Aug. 23, 1995, Ser. No. 518,219

Claims priority, application Japan, Oct. 9, 1992, 4-296591; Dec. 1, 1992, 4-343534

Int. Cl.^{6} G11B *11/00*

U.S. Cl. 369—13 **26 Claims**



1. A magnetic head for magneto-optical recording comprising:

a slider sliding on a magneto-optical recording medium;

a core made of a magnetic material and mounted to said slider, said core having an area of a main magnetic pole end face of from 0.01 mm^2 to 0.039 mm^2, the magnetic material for the core being a Mn—Zn ferrite having a Curie temperature of not less than 140° C., a permeability of not less than 200 at frequency 8 MHz at temperature 25° C., and an effective saturation magnetic flux density B_{10} of not less than 4400 G; and

a coil wound around said core.

5,689,479
MAGNETO-OPTICAL RECORDING APPARATUS

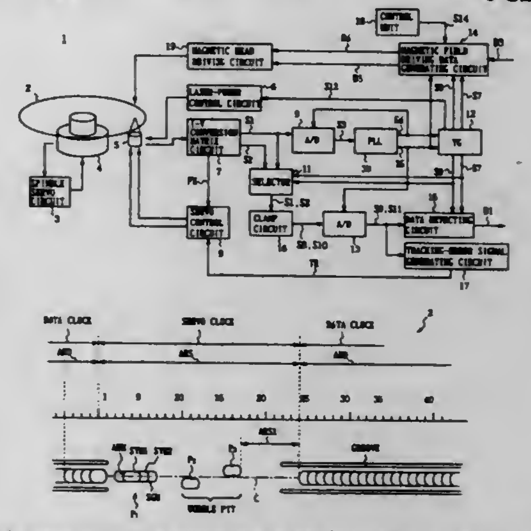
Tadaaki Nomoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 24, 1996, Ser. No. 719,183

Claims priority, application Japan, Sep. 25, 1995, 7-270541

Int. Cl.^{6} G11B *11/00*

U.S. Cl. 369—13 **6 Claims**


CONTROL UNIT
MAGNETIC HEAD DRIVING CIRCUIT
MAGNETIC FIELD DRIVING DATA GENERATING CIRCUIT
LASER-POWER CONTROL CIRCUIT
A/D
PLL
SELECTOR
CLAMP CIRCUIT
DATA DETECTING CIRCUIT
DATA CLOCK
SERVO CLOCK
WOBBLE PIT
GROOVE

1. A magneto-optical recording apparatus which records data on a magnetic field modification system in a magneto-optical recording medium in which a recording possible area which is able to record data and a recording impossible area in which at least one pit is formed not to be deleted and data can not be recorded are successively formed along a track, said magneto-optical recording apparatus comprising:

laser means for emitting a laser beam on one surface of said magneto-optical recording medium;

magnetic field generating means for generating a magnetic field which is supplied on the other surface of said magneto-optical recording medium corresponding to a position where said laser beam of said magneto-optical recording medium is emitted; and

control means for controlling said magnetic field generating means, when information data is recorded in a certain recording possible area, so as to generate the magnetic field in said recording impossible area which exists between a pit located at the latest end side of said recording impossible area and the head of said certain recording possible area, and controlling said magnetic field generating means so as to generate the magnetic field modulated based on said information data in said certain recording possible area, without generating the magnetic field according to said magnetic field generating means during the time of scanning said laser beam from the head of said recording impossible area located just before said certain recording area to said pit located at the latest end side of said recording impossible area.

5,689,480
MAGNETO-OPTIC RECORDING SYSTEM EMPLOYING NEAR FIELD OPTICS

Gordon S. Kino, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Aug. 13, 1996, Ser. No. 696,168

Int. Cl.^{6} G11B *13/00*

U.S. Cl. 369—14 **17 Claims**

1. In a magneto-optic recording system employing near field optics; a read/write head assembly for reading or writing information on an adjacent magnetic recording medium, said read/write head assembly including crossed tapered optical waveguides which terminate in a slit having a length greater than one-half the wave-

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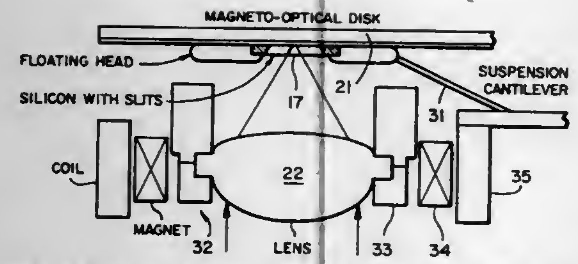


length of light in the media filling the waveguides and a width substantially less than the wavelength of light in the media filling the waveguides.

5,689,481

METHOD OF ACCESSING MULTIFILE STORAGE MEDIUM AND LIBRARY SYSTEM

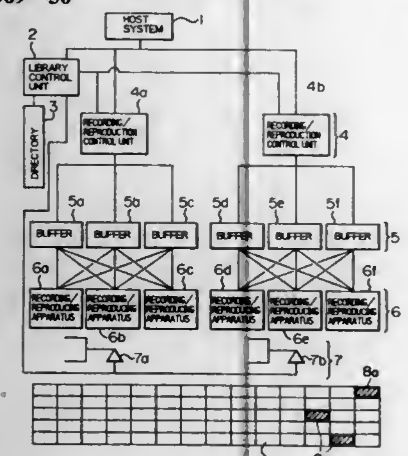
Akiyori Tamura, Hiratsuka; Kazuaki Tanaka, Yokohama; Tatsuo Namba, and Naoki Hirosawa, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Computer Peripherals Co., Ltd., Odawara, both of Japan

Filed Oct. 19, 1993, Ser. No. 137,979

Claims priority, application Japan, Oct. 20, 1992, 4-281407

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—30 **10 Claims**



1. A library system comprising:

at least one portable multifile storage medium storing a plurality of files each file being managed with respective independent identification symbols;

a shelf for housing multifile storage media;

at least one storage medium driving means for performing an information recording/reproducing operation for said multifile storage medium;

handling means for performing transportation of said multifile storage medium between said medium driving means and said shelf;

control information storing means for recording control information indicating correspondence between said identification symbols and said multifile storage medium;

control means for mounting/demounting said multifile storage medium on/from said storage medium driving means on the basis of an identification symbol received from a host system and said control information; and

a plurality of buffers shared by said at least one storage medium driving means, said buffers being capable of being accessed independently of one another;

wherein given one(s) of said plural files are transferred to the individual buffers on a file-by-file basis so that access requests for said plural files are disposed of in parallel with said buffers.

5,689,482

DISC DRIVE DEVICE OPERABLE WITH DIFFERENT DISCS THAT MAY EXHIBIT DIFFERENT LINEAR VELOCITIES OR CIRCUMFERENTIAL RECORDING DENSITIES

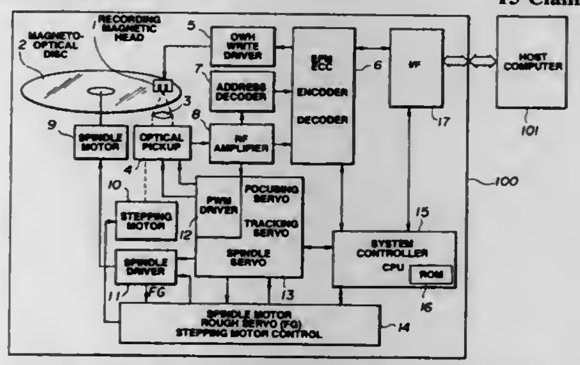
Michihiko Iida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,658

Claims priority, application Japan, Sep. 28, 1994, 6-233097

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—32 **15 Claims**



1. A disc apparatus for performing a seek operation to a target position on one of different disc shaped recording media which may exhibit different linear velocities or circumfereotial recording densities, one from another, said disc apparatus comprising:

rotating means for rotating said disc-shaped recording medium;

servo means for controlling the rotating means to rotationally drive said disc shaped recording medium at a predetermined constant linear velocity;

head means for reproducing data recorded on a recording track formed on said disc-shaped recording medium;

moving means for moving said head means radially in relation to said disc-shaped recording medium;

rotation detection means for detecting a rotation speed of said disc-shaped recording medium;

position detection means for detecting a current position of said head means;

velocity calculating means for calculating a linear velocity of said disc-shaped recording medium as a function of said rotation speed and said current position;

address means for determining a target address corresponding to said target position; and

generating means for generating a number of tracks to said target position on said disc-shaped recording medium from said current position as a function of said current position, said target address and said calculated linear velocity.

5,689,483

CONTROLLING SYSTEM FOR OPTICAL STORAGE APPARATUS USING PULSE WIDTH MODULATOR

Toru Ikeda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 19, 1996, Ser. No. 718,172

Claims priority, application Japan, Oct. 23, 1995, 7-273935

Int. Cl.^{6} G11B *17/22;7/00*

U.S. Cl. 369—32 **15 Claims**

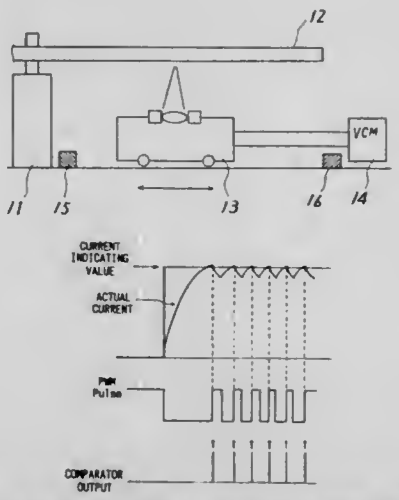
1. An optical storage apparatus for confirming that an optical head for reading data on an optical storage medium reaches a predetermined position, said optical storage apparatus comprising:

a stopper provided in the predetermined position;

moving means for moving said optical head in such a direction as to traverse a track on said optical storage medium;

a drive circuit for driving said moving means;

a pulse width modulation circuit for comparing a value of current flowing across said drive circuit with a current indicating value and modulating a width of the drive pulse given to said drive circuit in accordance with a compared result; and



a control circuit for giving the current indicating value to said pulse width modulation circuit, monitoring the width of the drive pulse, and confirming that said optical head impinges upon said stopper and stops by monitoring said width of the drive pulse.

5,689,484

AUTO-CHANGER AND METHOD WITH AN OPTICAL SCANNER WHICH DISTINGUISHES TITLE INFORMATION FROM OTHER INFORMATION

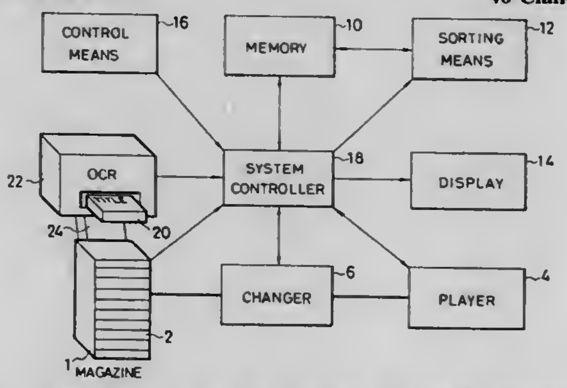
Kazuo Hirasawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 870,213, Apr. 17, 1992, abandoned, which is a continuation of Ser. No. 595,564, Oct. 11, 1990, abandoned. This application Jul. 5, 1994, Ser. No. 267,226

Claims priority, application Japan, Oct. 14, 1989, 1-267142; Oct. 17, 1989, 1-270984; Oct. 30, 1989, 1-283879; Oct. 30, 1989, 1-283880

Int. Cl.^{6} G11B *17/22;31/00*

U.S. Cl. 369—33 **46 Claims**



1. An auto-changer for storing a plurality of recorded media and for selecting and playing one of said media, comprising:

a magazine having a plurality of slots for storing said media;

a changer, mechanically coupled to said magazine and a player, for selecting a slot in said magazine and transferring a medium between said player and the selected slot;

a player for reproducing signals recorded on a medium transferred from a selected slot;

an input means for entering titles of each medium stored in said magazine, the input means including title distinguishing means,

for determining that each medium is correctly oriented so that a plurality of predetermined areas potentially containing title information can be optically scanned;

for optically scanning alphanumeric character information from each of the plurality of predetermined areas potentially containing title information printed on each medium,

for comparing size of the scanned alphanumeric character information from each of the plurality of predetermined areas relative to the size of the scanned alphanumeric character information from each of the other predetermined areas,

for distinguishing title information from other information printed on each medium based on the relative size comparison, and

for subsequently recognizing the scanned alphanumeric character information of the predetermined area containing the distinguished title information, as the title of each medium;

a memory for storing a list of slot numbers with said entered titles of each medium stored in corresponding slots in said magazine;

a sorter for sorting said list in a predetermined manner, based upon said titles;

a display for visually displaying said sorted list of titles of each of the media stored in said magazine;

a control means for selecting one of said titles from said display for subsequent play; and

a system controller, electrically coupled to said magazine, said player, said changer, said input means, said memory, said sorter, said display, and said control means, for receiving said titles from said input means, storing said titles and corresponding slot numbers in a list in said memory, commanding said sorter to sort said list in said predetermined manner, and commanding said changer to select a slot of said magazine corresponding to the title selected by said control means, and transfer a medium stored in the selected slot to said player for subsequent play.

5,689,485

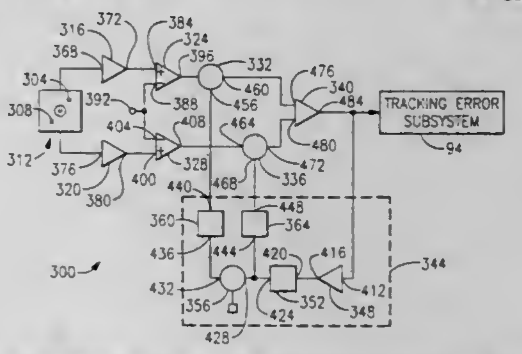
TRACKING CONTROL APPARATUS AND METHOD

Ludwig Ceshkovsky, Fountain Valley, Calif., assignor to Discovision Associates, Irvine, Calif.

Filed Apr. 1, 1996, Ser. No. 625,273

Int. Cl.^{6} G11B *7/095*

U.S. Cl. 369—44.13 **30 Claims**



1. An apparatus for detecting an object using a beam of radiant energy, comprising:

a source for directing a beam of radiant energy onto an object;

a detector of said beam having first and second outputs responsive to a position of said beam relative the object;

a circuit coupled to said outputs of said detector for producing an error signal representing a displacement of said beam from a predetermined position, wherein said error signal has a periodic characteristic relative to said displacement;

a local feedback loop coupled to said outputs of said detector, said loop comprising:

a first periodic function generator responsive to said error signal; and

a second periodic function generator responsive to said error signal, said second periodic function generator having an output that differs from an output of said first periodic function generator by a phase angle;

a first multiplier for multiplying said first output of said detector by said output of said first periodic function generator; and

a second multiplier for multiplying said second output of said detector by said output of said second periodic function generator;

wherein said outputs of said first and second multipliers are provided as inputs of said circuit.

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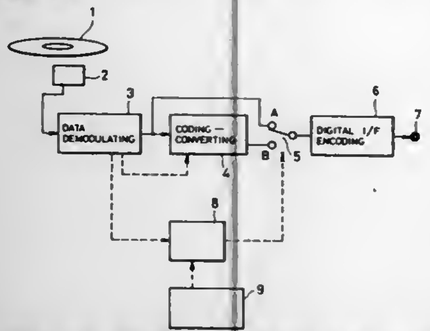
5,689,486
OPTICAL DISC REPRODUCING APPARATUS

Kenji Shimizu, and Manabu Bessho, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 24, 1996, Ser. No. 736,100
Claims priority, application Japan, Oct. 30, 1995, 7-306842
Int. Cl.^{6} G11B *00/00*
U.S. Cl. 369—59 **1 Claim**



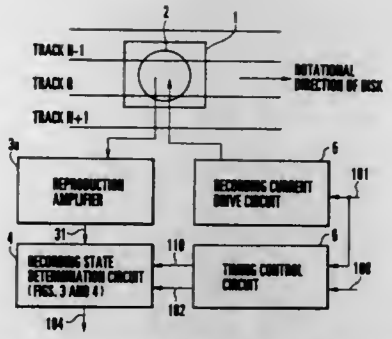
1. An optical disc reproducing apparatus having a capability of reproducing different encoded audio signals from a first optical disc carrying recorded first audio data which is previously digitally converted by a non-compression-encoding and a second optical disc carrying recorded second audio data which is previously digitally converted by a compression-encoding, comprising:
- data extracting means for extracting said first audio data from said first optical disc and extracting said second audio data from said second optical disc;
- disc identifying means for identifying said first and second optical discs and generating an identification signal;
- coding-converting means for converting said second audio data extracted by said data extracting means to digital data by the non-compression-encoding;
- transmission data designating means for designating digital data to be transmitted to digital data by the compression-encoding;
- relay means for selectively relaying and generating an output of said data extracting means and an output of said coding-converting means in accordance with said identification signal;
- synchronized data converting means for converting the digital data which is generated from said relay means to self-synchronous type data; and
- an output terminal to generate said self-synchronous type data to an external apparatus, wherein when said disc identification signal indicates said second optical disc and there is a designation from said designating means, said relay means forcedly relays and generates the output of said data extracting means.

5,689,487
VERIFY-WHILE-RECORDING DEVICE FOR OPTICAL DISK RECORDING APPARATUS

Toshiaki Iwanaga, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 3, 1996, Ser. No. 707,243
Claims priority, application Japan, Sep. 6, 1995, 7-229320
Int. Cl.^{6} G11B *7/08*
U.S. Cl. 369—54 **11 Claims**

1. A verify-while-recording device for an optical recording apparatus, comprising:
- an optical head for recording recording data on an optical disk medium by using a recording beam;
- signal reproducing means for reproducing the recording data from the recording beam that is being recorded on the optical disk and outputting a reproduction signal;
- timing control means for outputting a control signal, a timing of which is controlled based on the recording data, and delayed recording data; and

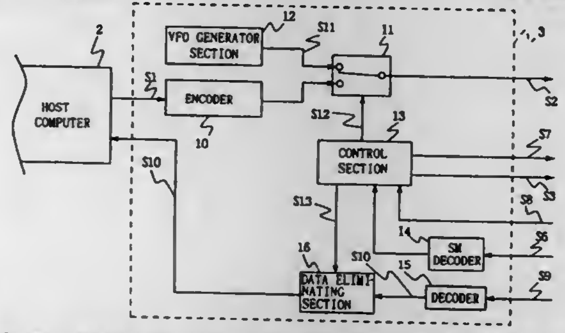

2
1
TRACK N-1
TRACK N
TRACK N+1
ROTATIONAL DIRECTION OF DISK
3a
REPRODUCTION AMPLIFIER
5
RECORDING CURRENT DRIVE CIRCUIT
101
31
4
RECORDING STATE DETERMINATION CIRCUIT (FIGS. 3 AND 4)
110
6
TIMING CONTROL CIRCUIT
100
102
104

- recording state determining means for detecting a state change in reproduction signal corresponding to the recording data and obtained from a start time point to a recording end time point, on the basis of the reproduction signal sent from said signal reproducing means and the control signal and a delayed control signal sent from said timing control means, and outputting a defective recording signal.

5,689,488
OPTICAL DISC SYSTEM, OPTICAL DISC AND RECORDING METHOD

Shigeo Yamaguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1997, Ser. No. 797,035
Claims priority, application Japan, Feb. 28, 1996, 8-067164
Int. Cl.^{6} G11B *5/09*
U.S. Cl. 369—59 **6 Claims**



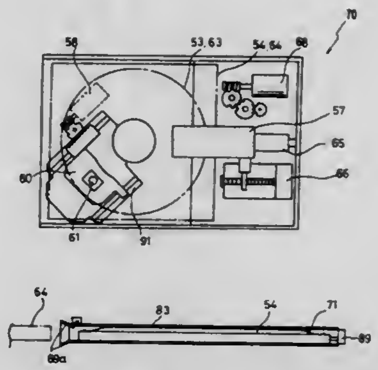
1. An optical disc system for recording, on an optical disc, recording data modulated according to a predetermined encoding restrictive length, said optical disc system comprising:
- switching means for selectively outputting, at predetermined time intervals, synchronization control data which comprises of patterns having a period shorter than said encoding restrictive length and is used for synchronization during readout said data from said optical disc or said recording data; and
- an optical pickup for recording output signals from said switching means on said optical disc.

5,689,489
COMPACT DISC AND FLOPPY DISC COMPATIBLE DRIVE AND A DRIVING METHOD THEREOF

Hyun Ki Shin, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Nov. 1, 1995, Ser. No. 551,614
Claims priority, application Rep. of Korea, Nov. 1, 1994, 28518/1994
Int. Cl.^{6} G11B *25/04*
U.S. Cl. 369—75.2 **2 Claims**

1. A compact disc and floppy disc compatible driver comprising:
- a first guide rail installed to an inner center of one side of a main body;

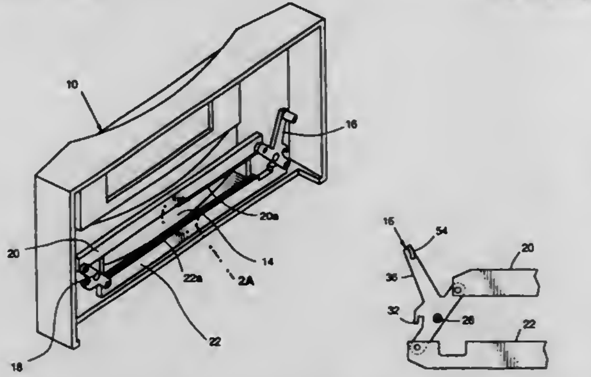


- a magnetic head fitted to said first guide rail to perform a reciprocating motion;
- a stepping motor fixed to one side of said magnetic head while being connected to said magnetic head for driving said magnetic head along said first guide rail;
- a turnable having different steps rotatably attached to an upper portion of a lower side;
- a spindle motor rotatably coupled to a lower plane of said turntable;
- detecting means installed to an inner rear portion of a tray for inserting a floppy disc or compact disc therein;
- two second guide rails spacing from each other by a predetermined distance diagonally installed in an inner central portion;
- a pickup storing an optical head therein and movably coupled to said second guide rails while running across said second guide rails;
- a sled motor fixed while being connected to said optical head for driving said optical head in the radius direction of said compact disc; and
- an elastic member installed to a predetermined portion of an inner upper plane of said troy for evading an imperfect loading resulting from the different thickness of a caddy and a diskette.

5,689,490
MO CARTRIDGE JUKEBOX DOORS WHICH OPEN IN A PLANE PARALLEL TO THE FRONT PANEL OF THE JUKEBOX

Christopher Anthony Pollard, Monument, Colo., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

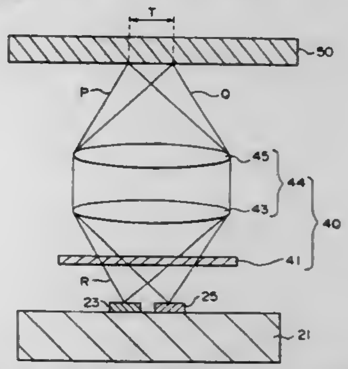
Filed Feb. 6, 1996, Ser. No. 598,205
Int. Cl.^{6} G11B *33/02*
U.S. Cl. 369—77.2 **10 Claims**



1. A door closure mechanism for an insertion slot of a media reproducing device of the type having a housing with a front panel, an insertion slot opening in the front panel of the housing, and a tray for receiving a media cartridge inserted into the insertion slot opening, comprising:
- a first crank and a second crank rotatably mounted to the housing at opposite ends of the insertion slot opening, each of the first crank and the second crank being in the form of an elongated strip which is rotatable about its center;
- a first door panel and a second door panel, wherein the first door panel and the second door panel are pivoted at their opposite ends to opposite ends of the first crank and the second crank, respectively, to form a parallelogram whose width and length vary as the first crank and the second crank are rotated about their centers, the first door panel and the second door panel being positioned juxtaposed to the insertion slot opening so that when the parallelogram formed by the first door panel, the second door panel, the first crank and the second crank has a minimal width so that first door panel and the second door panel have contacting long edges, the insertion slot opening is closed and when the width of the parallelogram so formed is at a maximum, the insertion slot opening is open to receive a media cartridge, wherein the first door panel and the second door panel move in a plane which is parallel to the front panel to open and close the insertion slot opening; and
- a cam and crank assembly moved by the tray for rotating the first crank about its center as the tray moves toward the insertion slot opening to thereby maximize the width of the parallelogram and open the insertion slot opening and for rotating the first crank about its center as the tray moves away from the insertion slot opening to thereby minimize the width of the parallelogram and close the insertion slot opening.

5,689,491
OPTICAL WRITE/READ DEVICE AND AN INFORMATION RECORDING MEDIA

Minoru Isobe, and Yukio Nakamura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Division of Ser. No. 508,514, Jul. 28, 1995, Pat. No. 5,586,096. This application Aug. 30, 1996, Ser. No. 706,418
Claims priority, application Japan, Aug. 1, 1994, 6-180301
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—109 **9 Claims**



1. A method for optically writing/reading information, where information is written onto and read from an information recording medium, the method comprising the steps of:
- emitting light from a light emitting element;
- splitting the emitted light into a zero-order diffracted light and a first-order diffracted light by way of a diffraction grating;
- focusing the zero-order diffracted light and the first-order diffracted light from the diffraction grating onto the information recording medium, at least a portion of at least the first-order diffracted light being reflected from the information recording medium; and
- focusing the reflected first-order diffracted light from the information recording medium onto a light receiving element paired with and positioned adjacent the light emitting element.

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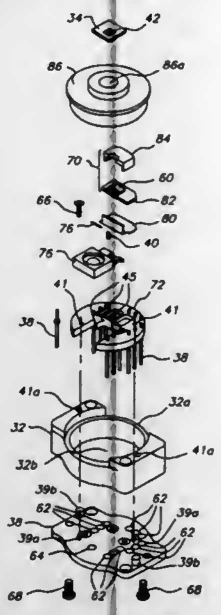
5,689,492
ASSEMBLY USED FOR PRECISELY POSITIONING THE COMPONENT PARTS OF A LASER DETECTOR GRATING UNIT (LDGU)

John C. Brazas, Hilton; David A. Roberts, and Robert J. Schomske, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1996, Ser. No. 693,033

Int. Cl.^{6} G11B *7/135*

U.S. Cl. 369—112 **3 Claims**



1. In an optical system including an LDGU (Laser-Detector-Grating-Unit) having a grating beam splitter and an optical source with an effective aperture for generating a radiation beam to be applied to a data track of an optical storage medium, an LDGU mounting means comprising:

a) a baseplate having a plurality of registration pins and defining a plurality of clearance holes;

b) a body having a ring portion which defines a central opening and having a plurality of registration openings formed in the ring portion;

c) a ceramic header defining alignment openings and having a plurality of contact pins that are aligned in the clearance holes of the baseplate;

d) at least two of the registration pins of the baseplate being aligned in the registration openings in the body and at least two of the registration pins being aligned in the alignment openings in the ceramic header; and

e) means for mounting the detector array and the optical source on the baseplate.

5,689,493
A SUPER-RESOLUTION OPTICAL HEAD WITH SIGNAL CORRECTIVE CIRCUIT

Satoshi Kawasaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 1, 1996, Ser. No. 626,558

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—124 **5 Claims**

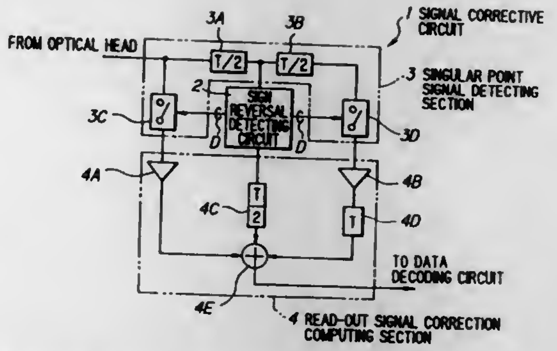
1. An optical disk device, comprising:

a ultra high resolution optical head; and

a signal corrective circuit for correcting a read-out signal form said ultra high resolution optical head;

wherein said signal corrective circuit, comprises:

a sign reversal detecting circuit for detecting a sign reversal information of said read-out signal;


FROM OPTICAL HEAD
3A
3B
1 SIGNAL CORRECTIVE CIRCUIT
T/2
T/2
2
3 SINGULAR POINT SIGNAL DETECTING SECTION
SIGN REVERSAL DETECTING CIRCUIT
3C
3D
D
D
4A
4B
4C
T
2
T
4D
TO DATA DECODING CIRCUIT
4E
4 READ-OUT SIGNAL CORRECTION COMPUTING SECTION

a singular point signal-detecting circuit for detecting read-out signals at a time prior to and after a predetermined time of a sign reversal time as singular point signals; and

a read-out signal correction-computing circuit for computing a corrected read-out signal, said corrected read-out signal being obtained by adding correcting signals to said read-out signal, said correcting signal being obtained by multiplying predetermined coefficients to said singular point signals and exchanging said singular point signals preceding and following said sign reversal time.

5,689,494
SURFACE ATOM FABRICATION METHOD AND APPARATUS

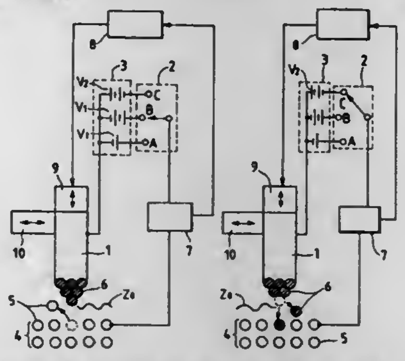
Masakazu Ichikawa, Tokyo; Shigeyuki Hosoki; Fumihiko Uchida, both of Hachioji; Shigeo Kato, Mitaka; Yoshihisa Fujisaki; Sumiko Fujisaki, both of Fuchu; Atsushi Kikugawa, Kokubunji; Ryo Imura, Tokorozawa; Hajime Aoi, Tachikawa; Kiyokazu Nakagawa, Sayama, and Eiichi Murakami, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 934,672, Sep. 11, 1992, Pat. No. 5,416,331. This application May 15, 1995, Ser. No. 441,700

Claims priority, application Japan, Jan. 11, 1991, 3-1912; Jan. 11, 1991, 3-1913; Jan. 11, 1991, 3-1914; Jan. 11, 1991, 3-1915; Jan. 11, 1991, 3-1916; Jan. 11, 1991, 3-1917

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—126 **20 Claims**



1. A recording apparatus for recording information at an atomic scale on a recording surface of a recording medium having a regular surface atomic arrangement, comprising:

recording means for recording information by field-evaporating atoms from the recording surface of said recording medium to form empty atomic positions in the recording surface; and

reproducing means for reproducing information by detecting the empty atomic positions formed in the recording surface;

wherein said empty atomic positions are formed along a regular-arrangement direction of the atoms in the recording surface.

5,689,495
HIGH DENSITY OPTICAL DISC AND OPTICAL DISC PLAYER

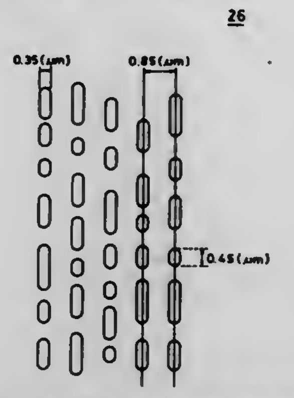
Yoichi Tsuchiya, Hashima; Hitoshi Terasaki, Gifu; Shuichi Ichiura, Hashima; Toshio Ito, Hashima; Yasuyuki Kano, Hashima; Yoshimoto Yamaguchi, Gifu; Seizo Kato, Ogaki, and Osamu Ota, Ibi-gun, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 602,687, Feb. 16, 1996, abandoned, which is a continuation of Ser. No. 285,553, Aug. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 227,641, Apr. 14, 1994, Pat. No. *5,477,527.* **This application Sep. 9, 1996, Ser. No. 709,671**

Claims priority, application Japan, Feb. 2, 1994, 6-11087; Mar. 5, 1994, 6-60019

Int. Cl.^{6} G11B *7/24*

U.S. Cl. 369—275.4 **15 Claims**



1. An optical disc player for reproducing an information signal from one of an optical disc format and an optical disc having a track pitch of 0.7–0.85 μm, a pit width of 0.20–0.35 μm, and a shortest pit length of 0.42–0.49 μm, comprising:

a semiconductor laser having a wavelength of 590–770 nm;

irradiating means for irradiating a beam from said semiconductor laser onto said optical disc with a spot size of 0.85–0.95 μm;

detecting means for detecting reflected light from said optical disc; and

photo-electric conversion means for converting said detected reflected light into an electric signal and outputting said electrical signal as said information signal.

5,689,496
OPTICAL RECORDING MEDIUM HAVING SPIRAL TRACKS FORMED WITH A TURNING ANGLE OF MORE THAN 360°

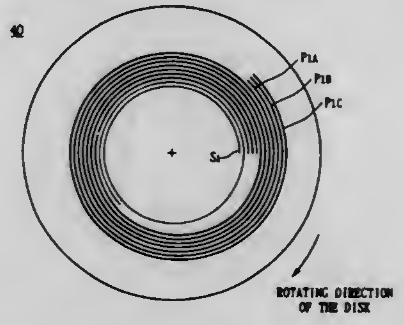
Kenichi Amano, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 17, 1996, Ser. No. 714,974

Claims priority, application Japan, Sep. 30, 1995, 7-276704

Int. Cl.^{6} G11B *7/24;3/70*

U.S. Cl. 369—275.4 **16 Claims**



1. An optical recording medium comprising:

a spiral multitrack formed by multiple windings of a plurality of tracks in a first recording region; and

a spiral track formed with a turning angle of more than 360° in a second recording region adjacent to said first recording region.

5,689,497
OPTICAL REGISTRATION MEDIUM WITH DUAL INFORMATION LAYER

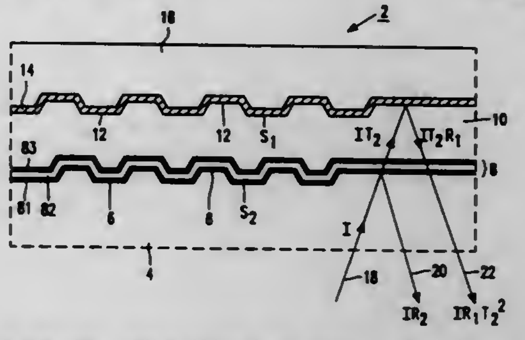
Hermanis J. H. Wilting; Johannes T. H. Thijssen, and Johannes C. N. Rijpers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 11, 1996, Ser. No. 730,688

Claims priority, application European Pat. Off., Oct. 13, 1995, 95202769

Int. Cl.^{6} G11B *7/24;3/74*

U.S. Cl. 369—275.1 **14 Claims**



1. A read-only optical registration medium which successively comprises:

a transparent substrate;

a first registration surface containing localised level variations representing binary data bits;

a protective layer, characterised in that:

between the substrate and the first registration surface, the medium further comprises a dielectric trilayer which contains a first, second and third dielectric layer having respective refractive indices n_1, n_2 and n_3, whereby, at both a first wavelength λ_1 and a second wavelength λ_2:

$n_2<n_1$ and $n_2<n_3$,

the trilayer being constituted so as to be transparent at λ_1 and to be semi-reflective at λ_2;

the surface of the trilayer nearest the substrate contains localised level variations representing binary data bits, thereby forming a second registration surface.

5,689,498

Patent Not Issued For This Number

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5,689,499
METHOD AND APPARATUS FOR MANAGING THE STATISTICAL MULTIPLEXING OF DATA IN DIGITAL COMMUNICATION NETWORKS

John Leslie Hullett, Daglish; Antonio Cantoni, City Beach, and Zigmantas Leonas Budrikis, Dalkeith, all of Australia, assignors to Curtin University of Technology, Bentley, Australia

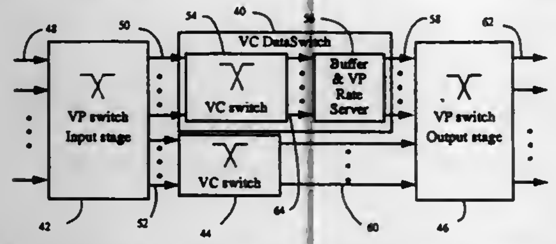
PCT No. PCT/AU94/00150, § 371 Date Aug. 4, 1995, § 102(e) Date Aug. 4, 1995, PCT Pub. No. WO94/23517, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 28, 1994, Ser. No. 500,844

Claims priority, application Australia, Mar. 26, 1993, PL7981

Int. Cl.⁶ H04L *12/56*

U.S. Cl. 370—235 **19 Claims**



1. A method for supporting a plurality of virtual channel connections within a single virtual path in a digital communications network operating in the Asynchronous Transfer Mode (ATM), where said virtual channel connections have no guarantees of rate at which cells on that connection can be transmitted, but also have no constraint on said rate save that inherent on said virtual path connection, said method comprising the steps of:

storing cells arriving for transmission on said virtual path in a buffer for transmission of cells on said virtual path in conformance with said constraint on said rate;

detecting whether buffer overflow is threatened by the storage of further cells arriving for transmission on said virtual path; and,

while buffer overflow is threatened, admitting for storage in said buffer cells only on such of said virtual channel connections on which the previous cell admitted was not indicated by the header of said previous cell as being end of transmission on said virtual channel; and,

at all times not admit for storage in said buffer any cells on said virtual channel connections for which since the previous indication of said end of transmission on said virtual channel connection there has been any rejection of cells for storage.

5,689,500
MULTISTAGE NETWORK HAVING MULTICAST ROUTING CONGESTION FEEDBACK

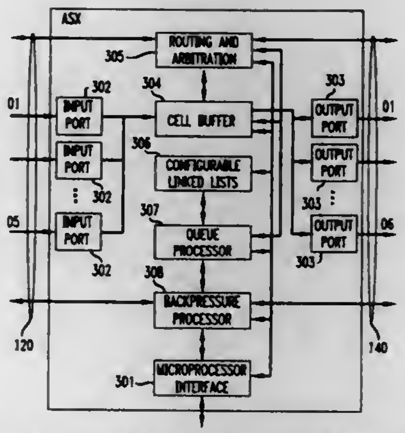
Fabio Massimo Chiussi, Tinton Falls; Joseph George Kneuer, Fair Haven, and Vijay Pochampalli Kumar, Freehold, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Jan. 16, 1996, Ser. No. 584,936

Int. Cl.⁶ H04L *12/56*

U.S. Cl. 370—235 **39 Claims**

1. Apparatus for multicasting an ingress cell received at one of a plurality of input ports, connectable through a multistage network, to a plurality of output ports, comprising:



(a) means for receiving a first ingress cell of a multicast at a first input port of a first stage, the ingress cell including a data payload and information identifying a plurality of routing queues output ports to which a copy of the data payload is to be sent;

(b) means for storing the data payload in memory;

(c) in the first stage, a plurality of routing queues including at least one queue for each of the output ports;

(d) means for identifying a backpressure queue assignment for the first ingress cell, the backpressure queue assignment identifying a backpressure indicator indicative of the congestion level for at least one but not all of destination routing queues of a subsequent stage associated with all output ports of a multicast;

(e) means for determining, using the backpressure indicator, if the first ingress cell is to be outputted from one or more routing queues of the first stage; and

(f) means for outputting the first ingress cell from the one or more routing queues to all destination routing queues of the subsequent stage when the congestion level is below or equal to a first threshold and inhibiting all outputting of the first ingress cell when the congestion level is above the first threshold level.

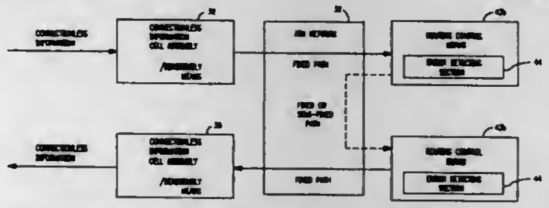
5,689,501
CONNECTIONLESS COMMUNICATION SYSTEM

Tadahiro Takase, Oita; Kazuo Hajikano, Kawasaki; Takeshi Kawasaki, Kawasaki; Toshio Shimoe, Kawasaki; Tetsuo Tachibana, Kawasaki; Teruaki Hagihara, Kawasaki; Satoshi Kakuma, Kawasaki; Masami Murayama, Kawasaki; Ryuichi Takechi, Kawasaki; Satoshi Kuroyanagi, Kawasaki; Jyoei Kamoi, Kawasaki, and Hiroshi Tomonaga, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 378,088, Jan. 25, 1995, which is a continuation of Ser. No. 930,559, Sep. 30, 1992, abandoned. This application May 4, 1995, Ser. No. 434,744

Int. Cl.⁶ H04L *12/56*

U.S. Cl. 370—244 **14 Claims**



1. A communication system for transmitting at least one fixed-length cell converted from a variable-length information including data and a destination of the data, comprising:

at least one cell assembly/disassembly means for performing bi-directional conversion between said variable-length information and said fixed-length cell;

at least one routing control means for receiving said fixed-length cell converted from said variable-length information by said cell assembly/disassembly means, for analyzing the destination of the data and for controlling a routing of said fixed-length cell based on the analyzed destination, said at least one routing control means including error detecting means for detecting an error of said variable-length information in said fixed-length cell; and

a network for connecting said at least one cell aassembly/disassembly means and said at least one routing control means by a fixed capacity path and for connecting said at least one routing control means to each other by one of said fixed capacity path and a variable capacity path.

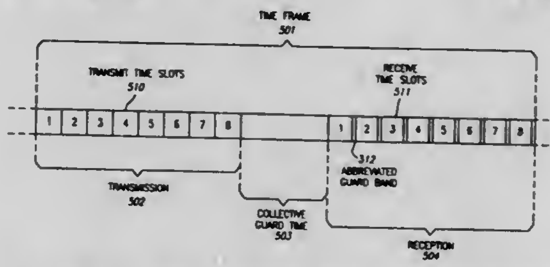
5,689,502
EFFICIENT FREQUENCY DIVISION DUPLEX COMMUNICATION SYSTEM WITH INTERLEAVED FORMAT AND TIMING ADJUSTMENT CONTROL

Logan Scott, Breckenridge, Colo., assignor to Omnipoint Corporation, Colorado Springs, Colo.

Filed Jun. 5, 1995, Ser. No. 463,220

Int. Cl.⁶ H04J *1/00*

U.S. Cl. 370—281 **54 Claims**



1. A method of duplex communication, comprising the steps of

transmitting, over a first frequency band of a plurality of frequency bands, a control pulse preamble from a user station to a base station,

receiving, during a first preamble interval, said control pulse preamble at said base station,

transmitting, over a second frequency band of said plurality of frequency bands and during a base message interval following said first preamble interval, a base-to-user message from said base station to said user station,

receiving said base-to-user message at said user station,

transmitting, over said first frequency band, a user-to-base message from said user station to said base station, and

receiving, during a user message interval following said base message interval, said user-to-base message at said base station.

5,689,503
RANDOM ACCESS SYSTEM OF A MOBILE COMMUNICATION SYSTEM

Azusa Wada; Akihiro Maebara; Ichiro Okajima; Katsumi Kobayashi; Noriko Uchida; Shinji Uebayashi, and Narumi Umeda, all of Yokohama, Japan, assignors to NTT Mobile Communications Network Inc., Japan

PCT No. PCT/JP95/01411, § 371 Date Nov. 16, 1995, § 102(e) Date Nov. 16, 1995, PCT Pub. No. WO96/02985, PCT Pub. Date Feb. 1, 1996

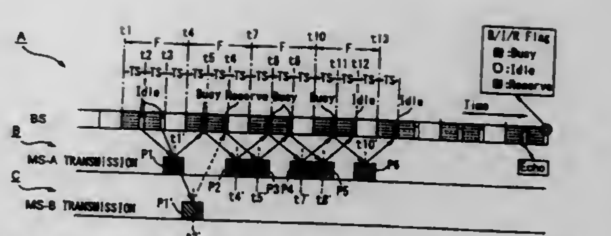
PCT Filed Jul. 14, 1995, Ser. No. 553,351

Claims priority, application Japan, Jul. 15, 1994, 94 164104

Int. Cl.⁶ H04B *7/212*

U.S. Cl. 370—337 **6 Claims**

1. A random access system for mobile communication comprising a base station and first and second mobile stations which access



a TDMA common access channel generated by said base station, wherein:

said base station has means for detecting "IDLE", "BUSY", and "RESERVED" states of each time slot of said common access channel, means for broadcasting detected state to a communication area of said base station, means for permitting communication with said first mobile station and setting time slot A to said "BUSY" state when said first mobile station accesses said time slot A which is in said "IDLE" state, and means for setting time slot B to said "RESERVED" state when said first mobile station requires said time slot B successively;

said first mobile station has means for using a time slot having an identical number with a number of a recognized time slot in a case that said first mobile station recognizes said time slot which is in said "BUSY" or "RESERVED" state for said first mobile station; and

said second mobile station has means for postponing signal transfer until said "IDLE" state is broadcasted in a case that said time slot is in said "BUSY" or "RESERVED" state for said first mobile station.

5,689,504
MOBILE RADIO COMMUNICATION SYSTEM AND CHANNEL CONTROL METHOD THEREFOR

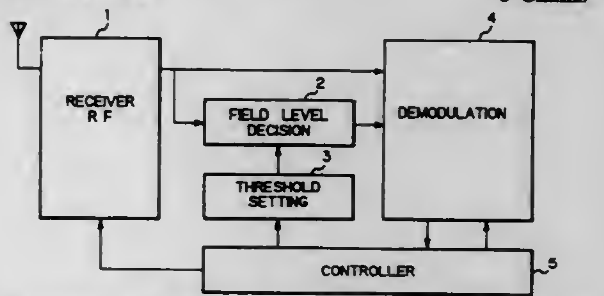
Tadao Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1995, Ser. No. 572,062

Claims priority, application Japan, Dec. 21, 1994, 6-318135

Int. Cl.⁶ H04J *3/06*

U.S. Cl. 370—350 **5 Claims**



4. A program for controlling synchronization of a mobile communication unit, comprising the steps of:

setting a first threshold value;

receiving a first control signal transmitted from a first base station and determining received electric field level of the first control signal;

if the electric field level of the first control signal exceeds the first threshold value, setting up synchronization to the first control signal and replacing the first threshold value with a second threshold value higher than the first threshold value;

receiving a second control signal transmitted from a second base station and determining received electric field level of the second control signal; and,

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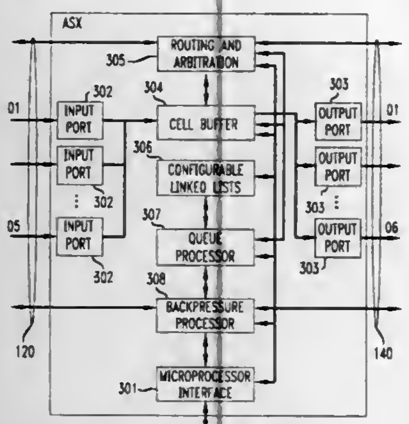
if the electric field level of the second control signal exceeds the second threshold value, setting up synchronization to the second control signal.

5,689,505
BUFFERING OF MULTICAST CELLS IN SWITCHING NETWORKS

Fabio Massimo Chiussi, Tinton Falls; Joseph George Kneuer, Fair Haven, and Vijay Pochampalli Kumar, Freebold, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 16, 1996, Ser. No. 584,932
Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—388 **20 Claims**



1. Apparatus for multicasting an ingress cell received at one of a plurality of input ports of a multistage switch network to one or more of a plurality of output ports of the network, each stage of the multistage switch network including one or more switching elements, the apparatus comprising at least one switching element of at least one stage of the multistage switch network including:

(a) means for receiving the ingress cell including a data payload and an output port bitmap segment identifying the one or more output ports of the multistage switch network to which the data payload is to be outputted,

(b) means for storing the data payload in an available cell buffer,

(c) a plurality of linked list output queues, at least one for each of the multistage switch network output ports for storing a cell buffer address entry,

(d) a reference counter, associated with each cell buffer, for storing a number equal to the number of associated one or more subsequent stage switching elements to which that ingress cell is to be outputted,

(e) means for interpreting the bitmap segment to identify multistage switch network output ports and any one or more subsequent stage switching elements to which the data payload is to be delivered and for making an entry into one or more linked list output queues associated with these subsequent stage switching elements, exactly one entry for each subsequent stage switching element to which that ingress cell should be outputted,

(f) means for transmitting, to each of the identified one or more subsequent stage switching elements or multistage switch network output ports, one copy of the data payload according to a sequence determined by the entries in the corresponding linked list output queue, and

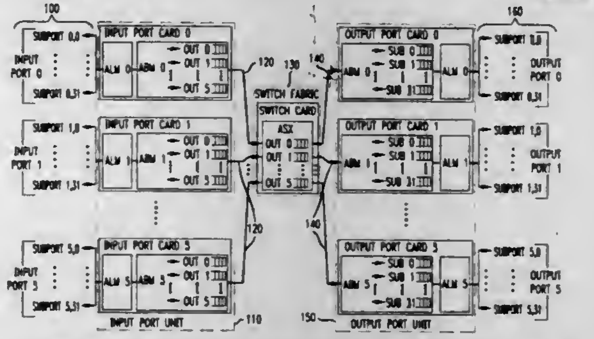
(g) means for deleting, at each of the linked list output queues, an entry therefrom when the payload is outputted to each identified one or more subsequent stage switching elements or multistage switch network output port and decrementing the reference counter by one, and for making available the cell buffer when the reference counter equals zero.

5,689,506
MULTICAST ROUTING IN MULTISTAGE NETWORKS

Fabio Massimo Chiussi, Tinton Falls; Joseph George Kneuer, Fari Haven, and Vijay Pochampalli Kumar, Freebold, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 16, 1996, Ser. No. 584,935
Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—388 **21 Claims**



1. Apparatus for multicasting an ingress cell received at one of a plurality of input ports connectable through a self-routing multistage network to one or more of a plurality of output ports, comprising:

means for receiving, at one of the input ports of a first stage of the network, an ingress cell including a data payload and information identifying output ports of said network to which the ingress cell is to be outputted;

means for determining a minimum number of next stage buffered switching elements of said network to which a copy of the ingress cell is to be outputted to enable the ingress cell to reach all of the identified output ports; and

means for routing each copy of the ingress cell to exactly one output port of the multistage network associated with said next stage switching element; the routing means optionally including

one or more memoryless switching elements, located between buffered switch elements of different stages of the multistage network, through which one or more ingress cells are concurrently routed using means for assuring a sequentially ordered delivery of ingress cells to the respective output port and any other one or more ports of the multistage network identified in the multicast connection.

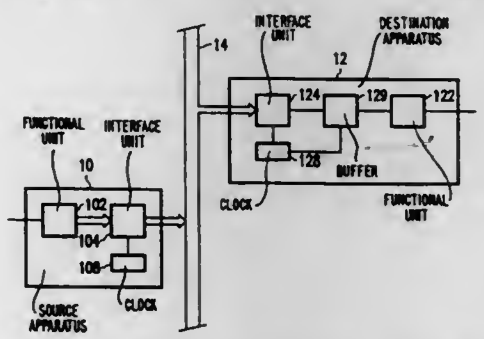
5,689,507
SIGNAL PROCESSING SYSTEM

Rudolf H.J. Bloks, and Marnix C. Vlot, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1995, Ser. No. 498,291
Claims priority, application European Pat. Off., Jul. 5, 1994, 94201945

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—389 **12 Claims**



1. A signal processing system comprising a source apparatus coupled to a destination apparatus, the source apparatus being

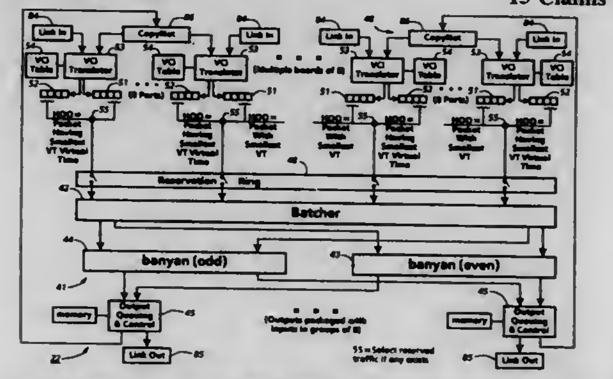
arranged for supplying a signal to the destination apparatus, the signal comprising video data and a time-stamp, the destination apparatus comprising a clock and means for detecting when a time-value of the clock corresponds to the time-stamp and for thereupon presenting the video data at an output, the signal further comprising synchronization data representing a time-value associated with an instant of delivery of the signal in the destination apparatus, the destination apparatus being arranged for adjusting the time-value of the clock according to the synchronization data, the system being characterized in that said system comprises a bus operable according to a time-slot allocation protocol, the source apparatus comprising a first interface unit for buffering the signal until an allocated time-slot is available on the bus, the synchronization data being set according to an instant of delivery of the signal to the first interface unit, the source apparatus supplying the signal to the destination apparatus via the bus, the destination apparatus comprising a buffer for buffering the signal prior to adjusting the time-value of the clock, the buffering in the buffer lasting until a predetermined interval, at least equal to a maximum wait-interval for the allocation of a time-slot on the bus, has elapsed after the instant of delivery of the signal to the first interface unit.

5,689,508
RESERVATION RING MECHANISM FOR PROVIDING FAIR QUEUED ACCESS IN A FAST PACKET SWITCH NETWORKS

Joseph B. Lyles, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1995, Ser. No. 576,099
Int. Cl.^{6} H04J *3/02;* **H04L** *12/56*

U.S. Cl. 370—391 **13 Claims**



1. In a finite bandwidth distributed multiplexing system which is configured to simultaneously route packets for a given class of service from up to k different inputs, where $k \geqq 1$, to a given output in response to service requests made by a potentially larger number of inputs on behalf of packets at said inputs; each of said inputs being assigned a predetermined share of said bandwidth for feeding packets to said output and having at least one storage queue for said packets pending service grants: an improved process for resolving scheduling conflicts among said packets, said process comprising the steps of

labeling each of the service requests made by said inputs upon their receipt (i) with an identifier which uniquely identifies the input making the request and (ii) with a virtual finishing time, said virtual finishing time being computed from a current virtual time by adding an offset that is weighted in accordance with the bandwidth share assigned to the input making the request;

entering the labeled service requests into a distributed queue;

sorting the labeled requests in said queue, each time a new request is entered into said queue, in accordance with their respective virtual finishing times to organize the labeled requests in ascending order of virtual finishing times; and

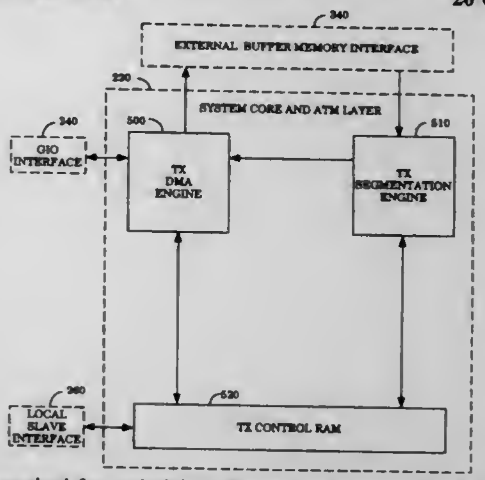
taking up to the first k labeled requests off said queue for service during each cycle of said multiplexing system.

5,689,509
APPARATUS AND METHOD FOR PACKETIZING AND SEGMENTING MPEG PACKETS

Andre J. Gaytan, Union City; Denny Gentry, Palo Alto, and Rasoul Oskouy, Fremont, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 499,226, Jul. 7, 1995, abandoned. This application Nov. 8, 1996, Ser. No. 748,554
Int. Cl.^{6} H04J *3/00;* **H04N** *7/08*

U.S. Cl. 370—396 **20 Claims**



1. A method for optimizing efficiency in transferring a block of data stored in a memory element, the method comprising the steps of:

accessing a plurality of overhead parameters from a data descriptor stored in the memory element, said data descriptor providing information about the block of data;

packetizing the block of data into a plurality of MPEG packets;

segmenting the plurality of MPEG packets to produce a plurality of cell packets, each of said plurality of cell packets contains in common at least one of said plurality of overhead parameters; and

loading a ring entry number identifying at least the data descriptor into an entry of a transmit completion ring of the memory element.

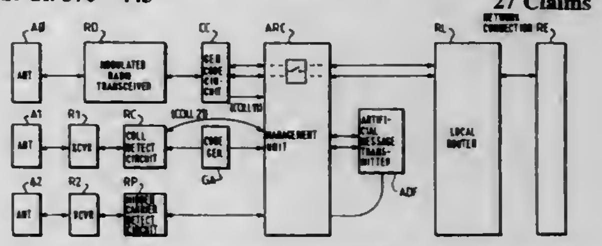
5,689,510
DATA TRANSMISSION INSTALLATION OF THE RADIO NETWORK TYPE, AND CORRESPONDING METHOD

Philippe Jacquet, Buc, and Paul Muhlethaler, Maisons Laffite, both of France, assignors to Inria Institut National de Recherche en Informatique et en Automatique, Le Chesnay Cedex, France

PCT No. PCT/FR93/00317, § 371 Date Sep. 26, 1994, § 102(e) Date Sep. 26, 1994, PCT Pub. No. WO93/20636, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 30, 1993, Ser. No. 307,579
Claims priority, application France, Apr. 2, 1992, 92 04032
Int. Cl.^{6} H04J *3/02*

U.S. Cl. 370—445 **27 Claims**



1. A data transmission installation, comprising at least two data processing terminals, each of the at least two data processing terminals including:

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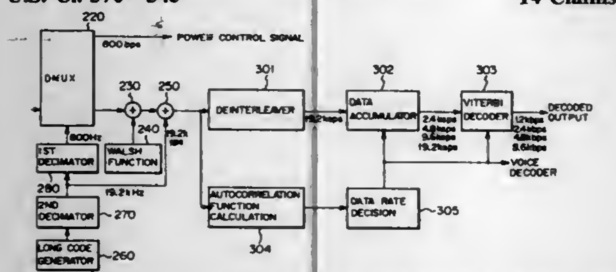
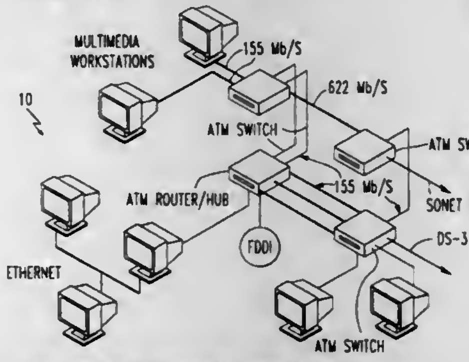
a network interface for transmitting messages on request, and collecting received messages;
a transmission/reception management device giving instructions confirming transmission or reception;
test means for defining a recognized collision; and
means for resolving collisions, following a recognized collision condition,
wherein each of the at least two data processing terminals includes a multi-directional radio transmission/reception device controlled in accordance with the confirming instructions for the transmission of messages to be exchanged,
and wherein in response at least to the start of an instruction confirming transmission, the radio transmission/reception device operates in rapidly alternating transmission/reception according to a pattern chosen in order to be peculiar to said each of the at least two data processing terminals,
and wherein said test means is configured to recognize a collision if a signal of a level greater than a first level threshold is received during a substantial part of at least one silence in the rapidly alternating transmission/reception.

5,689,511
DATA RECEIVER FOR RECEIVING CODE SIGNALS HAVING A VARIABLE DATA RATE
Yoshihito Shimazaki, and Kenichiro Hosoda, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 27, 1995, Ser. No. 579,325
Claims priority, application Japan, Jan. 19, 1995, 7-006133
Int. Cl.^{6} H04B *1/16;* H04J *3/22*
U.S. Cl. 370—545 **14 Claims**



1. A data receiver for receiving code data having a variable data rate and encoded with any one of a plurality of data rates and then repeated in accordance with the respective data rates to be provided with a same data rate thereby, and for restoring, frame by frame, the code data received to data having original data rates, said data receiver comprising:
data rate detecting means for sequentially receiving one frame of the code data having the same data rate at a time, and detecting the data rate of the one frame of the code data assigned before repetition of the code data;
data rate restoring means for restoring, based on the data rate detected by said data rate detecting means, the one frame of the code data to the data having the original data rate; and
data reproducing means for reproducing an original signal out of the code data restored by said data rate restoring means;
said data rate detecting means comprising:
calculating means for calculating autocorrelation functions of the one frame of the code data to thereby determine how many times the code data have been repeated; and
deciding means for determining the data rate of the one frame of the code data assigned before the repetition on the basis of a characteristic of the data rate in the autocorrelation functions;
said data rate restoring means and said data reproducing means each performing respective processing on the basis of the data rate determined by said deciding means.

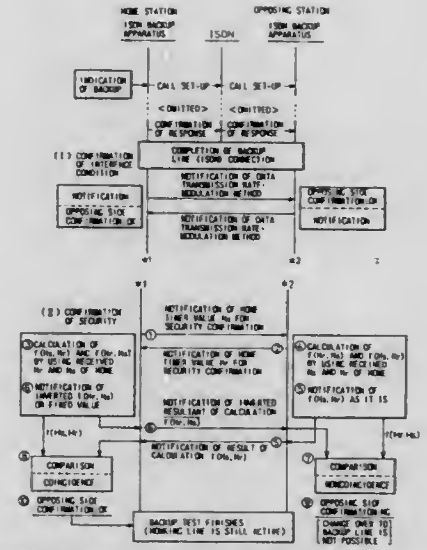
5,689,512
ATM CELL INTERFACE AND METHOD FOR DISPATCHING AN ATM CELL
Francois J. Bltz; Onat Menzilcioglu; Eric C. Cooper, and Robert D. Sansom, all of Pittsburgh, Pa., assignors to FORE Systems, Inc., Warrendale, Pa.
Continuation of Ser. No. 261,427, Jun. 17, 1994, Pat. No. 5,479,401, which is a continuation of Ser. No. 930,081, Aug. 14, 1992, Pat. No. 5,323,389. This application Dec. 21, 1995, Ser. No. 577,917
Int. Cl.^{6} H04L *12/56*
U.S. Cl. 370—395 **21 Claims**



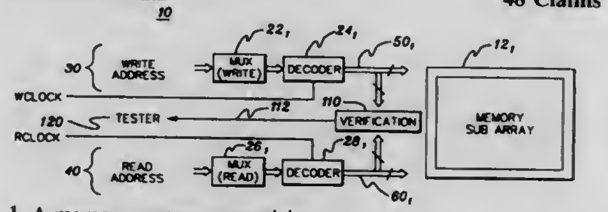
1. A communication network comprising:
an ATM network portion;
an ATM cell interface in communication with the ATM network portion;
a first general purpose computer connected to the ATM network portion and in communication with the ATM cell interface through the ATM network portion;
a second general purpose computer connected to the ATM network portion and in communication with the ATM cell interface through the ATM network portion, said first computer and second computer each execute instructions for applications other than communications between computers; and
an Ethernet connected to the ATM cell interface and in communication with the ATM network portion through the ATM cell interface.

5,689,513
DATA TRANSMISSION SYSTEM HAVING A BACKUP TESTING FACILITY
Ryoji Okita; Tobru Ogawa, and Michiko Kawada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 235,652, Apr. 29, 1994, abandoned. This application Mar. 29, 1996, Ser. No. 624,055
Claims priority, application Japan, Aug. 6, 1993, 5-195675
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 371—20.1 **22 Claims**

1. A data transmission system having a backup testing facility, the data transmission system comprising:
at least two transmission apparatuses, one is a home data transmission apparatus and the other is an opposing data transmission apparatus both connected by both a working line and a backup line which is switched from the working line when an actual fault occurs in the working line in a normal mode, so as to continue a data transmission through the backup line, wherein
said home data transmission apparatus is operative to start a backup line test in a test mode between the home data transmission apparatus and said opposing data transmission apparatus by transmitting a call to the opposing data transmission apparatus, via said backup line, and
said at least two data transmission apparatuses each comprise check data generating means, check data transmitting means and check data receiving means for generating, transmitting and receiving check data among each other so that the home data transmission apparatus confirms whether the backup line is normal or not without switching from the working line to the backup line idle in the test mode, the check data generating means is coupled to the check data transmitting means and the check data receiving means.


HOME STATION
OPPOSING STATION
ISDN
CALL SET-UP
CALL SET-UP
COMPARISON
COINCIDENCE
OPPOSING SIDE CONFIRMATION OK
NOTIFICATION OF RESULT OF CALCULATION
COMPARISON
NONCOINCIDENCE
OPPOSING SIDE CONFIRMATION NG
BACKUP TEST FINISHES (WORKING LINE IS STILL ACTIVE)
CHANGE OVER TO BACKUP LINE IS NOT POSSIBLE

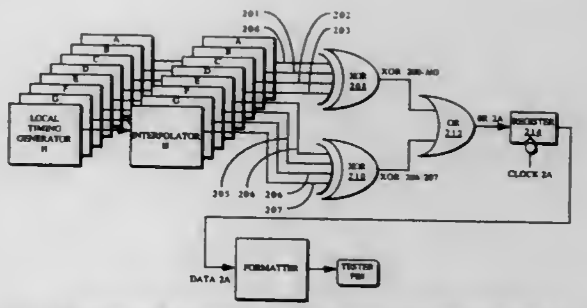
5,689,514
METHOD AND APPARATUS FOR TESTING THE ADDRESS SYSTEM OF A MEMORY SYSTEM
Toshibaru Saltoh, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 30, 1996, Ser. No. 724,573
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 371—21.2 **48 Claims**



1. A memory system, comprising:
an array of memory cells operable with a plurality of write word lines and a plurality of read word lines;
an address system coupled to the plurality of write word lines and the plurality of read word lines, the address system including:
  a write address unit for producing, from a write address, write signals on the plurality of write word lines, and
  a read address unit for producing, from a read address, read signals on the plurality of read word lines; and
a verification circuit coupled to receive the write signals and the read signals, such that upon application of the write and read addresses to the write address unit and the read address unit of the address system respectively, the write signals and the read signals produced thereby are processed by the verification circuit to verify proper operation of the address system.

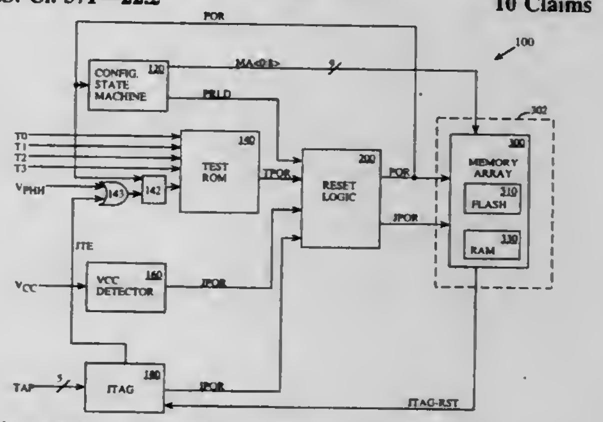
5,689,515
HIGH SPEED SERIAL DATA PIN FOR AUTOMATIC TEST EQUIPMENT
Michael C. Panis, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.
Filed Apr. 26, 1996, Ser. No. 638,026
Int. Cl.^{6} G01R *31/28*
U.S. Cl. 371—22.1 **13 Claims**

1. A method of operating a tester to increase the data rate of digital timing signals produced by the tester, comprising:
(a) generating a plurality of groups of digital timing signals, each group of digital timing signals being generated during a different one of a plurality of non-overlapping time intervals;



(b) combining each group of digital timing signals generated in step (a) to produce a plurality of serial data streams, wherein each group of digital timing signals is combined in accordance with the Boolean logical "exclusive-or" operation; and
(c) combining the plurality of serial data streams produced in step (b) to produce a new digital timing signal, wherein the serial data streams are combined in accordance with the Boolean logical "or" operation, whereby the data rate of the new digital timing signal is faster than the data rate of each digital timing signal generated in step (a).

5,689,516
RESET CIRCUIT FOR A PROGRAMMABLE LOGIC DEVICE
Ronald J. Mack, Gilroy; Derek R. Curd, San Jose; Sholeb Diba, Los Gatos; Napoleon W. Lee, Milpitas; Kameswara K. Rao, and Mihai G. Statovici, both of San Jose, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.
Filed Jun. 26, 1996, Ser. No. 670,916
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 371—22.2 **10 Claims**



1. An integrated circuit comprising:
a JTAG instruction port;
JTAG circuitry having a first input node connected to the instruction port and a second input node; and
programmable memory including a programmable JTAG-disable-bit storage location connected to the second input node of the JTAG circuitry.

5,689,517
APPARATUS FOR SCANNABLE D-FLIP-FLOP WHICH SCANS TEST DATA INDEPENDENT OF THE SYSTEM CLOCK
Kamalesh Ruparel, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Continuation of Ser. No. 234,859, Apr. 28, 1994, abandoned. This application Jul. 26, 1996, Ser. No. 686,506
Int. Cl.^{6} G01R *31/28*
U.S. Cl. 371—22.3 **12 Claims**

1. A scannable D-flip-flop circuit for processing data bits, said scannable D-flip-flop circuit comprising:

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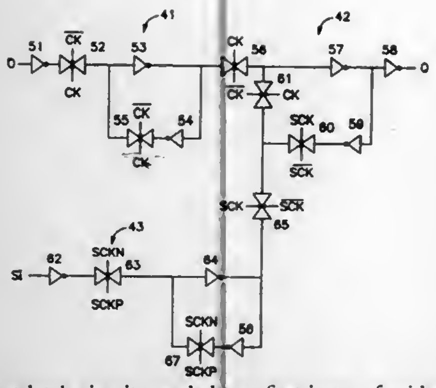


(a) a first latch circuit coupled to a first input of said scannable D-flip-flop, said first latch circuit receives a first data input signal and a first clock signal and stores said first data input signal in response to said first clock signal during a normal mode of operation, said first latch having an output;

(b) a second latcb circuit coupled to a second input of said scannable D-flip-flop, said second latch circuit receives a second data input signal and a second clock signal and stores said second data input signal in response to said second clock signal during a scan mode of operation, said second latch having an output;

(c) a third latch circuit having a data path and a feedback path wherein said data path is coupled to said output of said first latch circuit and said feedback path is coupled to said output of said second latch circuit, said third latch circuit receives said first data input signal and said first clock signal and stores said first data input signal in response to said first clock signal during said normal mode of operation, said third latch circuit receives said second data input signal and said second clock signal and stores said second data input signal in response to said second clock signal during said scan mode of operation, said third latch circuit is coupled to an output of said D-flip-flop.

5,689,518

METHOD AND AN APPARATUS TO MODIFY CRC IN INTERMEDIATE HIGH SPEED NETWORK NODES

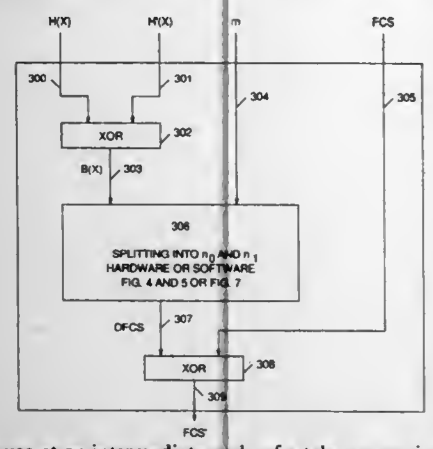
Claude Galand, Cagnes-Sur-Mer; Eric Saint-Georges, La Gaude, and Victor Spagnol, Cagnes-Sur-Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1995, Ser. No. 431,918

Claims priority, application European Pat. Off., May 6, 1994, 94480036

Int. Cl.^{6} H03M *13/00*

U.S. Cl. 371—37.1 **9 Claims**



1. For use at an intermediate node of a telecommunications data network at which input messages are received and may be modified before being forwarded as output messages to other nodes in the network, each message being contained in a frame having a header field, a data field and a CRC code field, a method of calculating a new CRC code for use in an output message, the value of said new CRC code being a function of the CRC code in the input message, modifications made in a modifiable part of the header field at the intermediate node, and the length of the data field, the distance in bits between the end of the modifiable part and the end of the message being defined as a variable m, said method comprising the steps of:

a. calculating the bit by bit difference of the input message and the message once modified in the intermediate network node, said difference being represented by a polynomial B(X), X being the symbolic variable of the polynomial representation and the polynomial coefficients belonging to the modulo 2 Galois's Field.

b. solving the equation $m+16=n_0+N\cdot n$ derive integer values for n_0 and n_1 where N is an integer power of the base 2;

c. calculating the difference between the CRC codes of the input and the modified messages using the three values n_0, n_1 and m as input; and

d. performing a modulo 2 addition of the said difference with the initial message code value to obtain the new message code value.

5,689,519

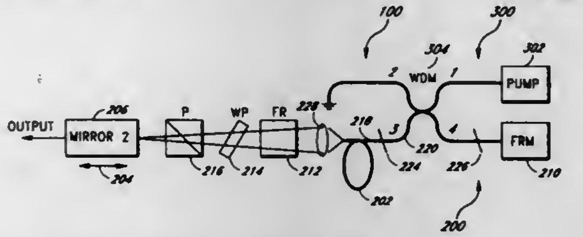
ENVIRONMENTALLY STABLE PASSIVELY MODELOCKED FIBER LASER PULSE SOURCE

Martin E. Fermann, and Donald J. Harter, both of Ann Arbor, Mich., assignors to IMRA America, Inc., and The Regents of the University of Michigan, both of Ann Arbor, Mich.

Filed Dec. 20, 1993, Ser. No. 169,707

Int. Cl.^{6} H01S *3/098*

U.S. Cl. 372—18 **6 Claims**



1. A passively modelocked laser comprising:

means for generating laser energy, said laser energy generating means having a cavity which includes:

a gain medium for amplifying energy in the cavity;

means for reflecting energy along an axis which passes through the gain medium;

means for compensating linear phase drifts of the gain medium;

means for outputting laser energy generated within said cavity;

a doped highly-birefringent fiber; and

low-birefringent fiber operably connected with said highly-birefringent fiber for transmitting laser energy along said axis of the cavity.

5,689,520

METHOD AND APPARATUS FOR VARIABLE WAVEFORM OUTPUT IN SURGICAL LASERS

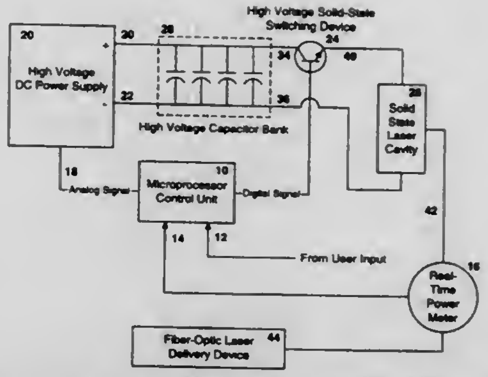
Anh N. Hoang, San Jose, Calif., assignor to Xintec Corporation, Oakland, Calif.

Filed Oct. 31, 1995, Ser. No. 550,631

Int. Cl.^{6} H01S *3/00*

U.S. Cl. 372—38 **14 Claims**

1. A variable waveform output laser system, the laser system having a laser cavity, the laser cavity containing a gain medium which produces a laser output upon stimulation, the laser output having a predetermined variable waveform, the waveform of the laser output being determined by a user's input to the laser system specifying the pulsewidth, frequency and/or amplitude of the laser output, the laser system comprising:



a high-voltage power supply, the power supply capable of inducing stimulation of the gain medium of the laser cavity, the power supply having a first terminal and a second terminal, the power supply being controlled by a control signal;

a high-voltage switching device, the switching device capable of rapidly and efficiently opening and closing a high-voltage circuit, the switching device disposed between the power supply and the laser system, the switching device having a high side and a low side, the high side of the switching device having an input and an output, the low side of the switching device having an input, the input of the low side being a control signal for the switching device, the input of the high side of the switching device being connected to the first terminal of the power supply, the output of the high side of the switching device being connected to the laser cavity for stimulation of the laser gain medium;

a real-time power meter, the meter connected to the laser system for measuring the laser output, the meter producing an output control signal proportional to the laser output pulsewidth, frequency and/or amplitude;

a microprocessor-based control unit, the control unit having a first input and a second input, the control unit producing a first control signal and a second control signal, the first input to the control unit being from a user interface, the second input to the control unit being the output control signal produced by the meter, the first control signal from the control unit for controlling the power supply, the second control signal from the control unit for controlling the switching device;

a high-voltage power storage element, the storage element disposed between the power supply and the switching device, the storage element receiving a charge from the power supply and delivering that charge through the switching device to the laser cavity such that the gain medium is stimulated to produce the predetermined variable waveform output of the laser system, whereby the user's input to the laser system will be processed by the control unit which in turn will send control signals to the power supply and the switching device, thus resulting in a predetermined variable waveform output of the laser system.

5,689,521

SEMICONDUCTOR LASER LIGHT SOURCE UNIT

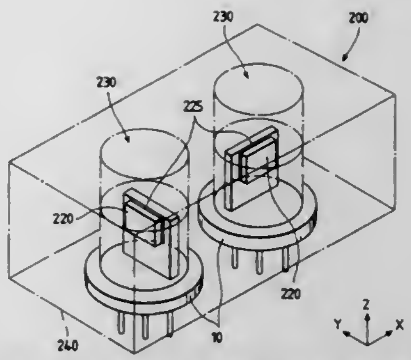
Naotaro Nakata, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Division of Ser. No. 22,549, Feb. 25, 1993, Pat. No. 5,499,262. This application Jun. 13, 1994, Ser. No. 258,706

Claims priority, application Japan, Mar. 18, 1992, 4-062065; Mar. 18, 1992, 4-062066; Mar. 25, 1992, 4-066538

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—50 **4 Claims**



1. A semiconductor laser light source unit for illuminating a remote light-receiving surface comprising a plurality of semiconductor lasers, each laser being contained in a separate package, the lasers being arranged adjacent to each other so as to emit light beams along the same axis toward the remote light-receiving surface and being oriented so that light emitting portions of respective pn junction planes are not parallel with each other and the light beams provide an illumination pattern on the light-receiving surface having improved angular uniformity, and wherein the semiconductor lasers emit respective laser beams carrying the same signal toward a single predetermined position at the remote light receiving surface.

5,689,522

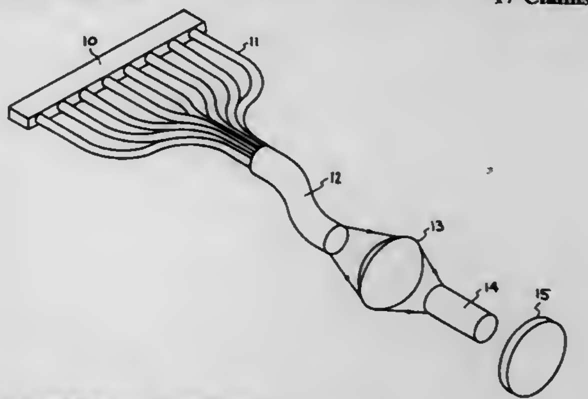
HIGH EFFICIENCY 2 MICROMETER LASER UTILIZING WING-PUMPED TM^{3+} AND A LASER DIODE ARRAY END-PUMPING ARCHITECTURE

Raymond J. Beach, Livermore, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Oct. 2, 1995, Ser. No. 537,371

Int. Cl.^{6} H01S *3/091;3/094*

U.S. Cl. 372—75 **17 Claims**



1. An apparatus, comprising:

a laser crystal doped with Tm^{3+} ions and having an end pump face coated to transmit light within a first range of about 755 nm to about 815 nm, said laser crystal comprising an output face, wherein said end pump face is coated to reflect light at about 2 micrometers; and

means for end pumping said laser crystal at a wavelength located on the wings of its main absorption feature, wherein said main absorption feature is located at approximately 785 nm, wherein said wings are located within a second range and a third range, wherein said second range is from about 755 nm to about 775 nm and wherein said third range is from about 790 nm to about 815 nm, wherein said Tm^{3+} ions produce laser light when said laser crystal doped with Tm^{3+} ions is end pumped at said wavelength located on said wings of said main absorption feature of said laser crystal, wherein said laser crystal is operable at high average power.

5,689,523

EXCITATION SYSTEM FOR MULTI-CHANNEL LASERS

Herb J. J. Seguin, 12639 - 52 Ave., Edmonton, Alberta, Canada, T6H 0P6

Continuation-in-part of Ser. No. 167,648, Dec. 14, 1993, abandoned. This application Jun. 12, 1995, Ser. No. 489,555

Int. Cl.^{6} H01S *3/097*

U.S. Cl. 372—82 **43 Claims**

1. A laser system comprising:

an optical cavity;

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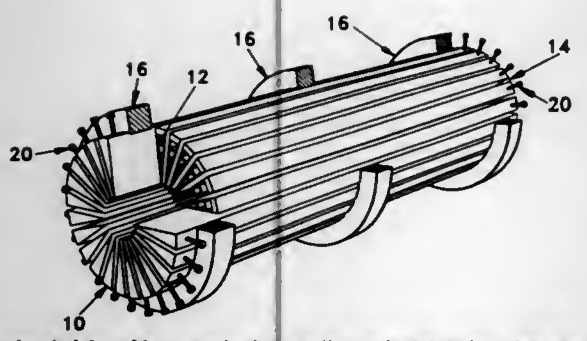


plural slabs of laser excitation media, each slab being elongated in a first direction and forming a slab gain channel, the plural slabs of laser excitation media forming an array of gain channels positioned within the optical cavity;

means attached to each slab of laser excitation media for cooling of the laser excitation media;

optical extraction means attached to each slab of laser excitation media for extraction of optical energy from the slabs of laser excitation media;

a source of laser excitation energy for exciting the laser excitation media; and

a resonant RF cavity circumvolving said array of gain channels;

means for pumping laser excitation energy from the source of excitation energy into the resonant RF cavity; and

a plurality of low impedance magnetic elements for matched coupling of laser excitation energy from the resonant RF cavity to each of the slabs of laser excitation media contained within the optical cavity, thereby providing multi-channel uniform power distribution.

5,689,524

PN CODE SYNCHRONIZING METHOD AND TRANSMITTER AND RECEIVER IN SPREAD SPECTRUM COMMUNICATION SYSTEMS

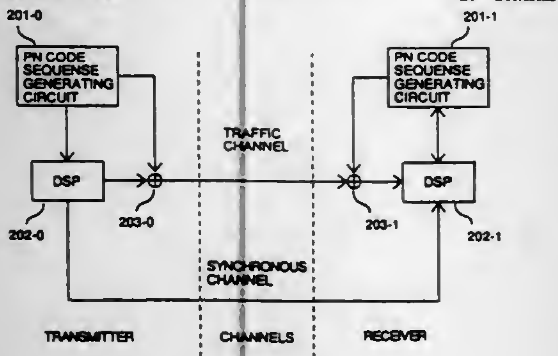
Tetsuya Takaki, and Kenji Ishida, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 22, 1994, Ser. No. 362,176

Claims priority, application Japan, Dec. 24, 1993, 5-326788

Int. Cl.^{6} H04L *27/30*

U.S. Cl. 375—200 **19 Claims**



8. A spread spectrum transmitter comprising:

a shift register for generating a PN code; and

a calculating means for calculating an internal digital value of the shift register after the elapse of time "M" using a matrix H^M, wherein the term "M" represents the time from when a receiver receives a synchronization channel to when the receiver receives a signal on the communication channel.

5,689,525

DIRECT-SEQUENCE SPREAD-SPECTRUM COMMUNICATION SYSTEM

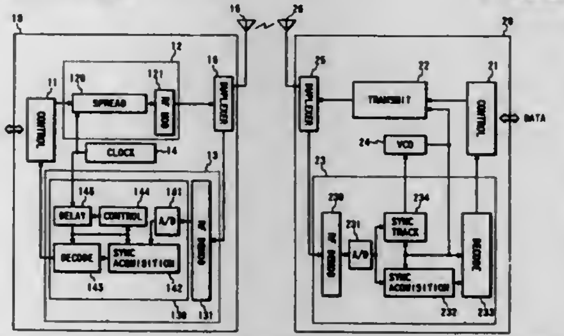
Minako Takeishi, Kawasaki; Ken Ikeda, Tokyo, and Kenichi Takahashi, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 4, 1995, Ser. No. 511,271

Claims priority, application Japan, Aug. 11, 1994, 6-189491

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 375—206 **8 Claims**



8. A direct-sequence spread-spectrum communication system comprising:

a base station; and

a terminal performing direct-sequence spread-spectrum communication with the base station by using code division multiple access;

the terminal including a receiving section, a transmitting section, and a controlling section, wherein the receiving section in the terminal includes a synchronization tracing circuit for reproducing a code clock signal on the basis of a signal received from the base station, wherein the transmitting section in the terminal transmits a signal on the basis of the reproduced code clock signal, and wherein the controlling section in the terminal controls the receiving section and the transmitting section in the terminal and performs signal processing;

the base station including a transmitting section, a receiving section, and a controlling section, wherein the transmitting section in the base station transmits a signal by using a self reference clock signal, wherein the receiving section in the base station includes receiving circuits corresponding to terminals respectively, wherein the receiving section in the base station includes signal processing circuits of a rake type for the receiving circuits respectively, wherein each of the signal processing circuits includes a delay circuit for delaying the self reference clock signal to maximize a correlation between a received signal and a reference code, and wherein the controlling section in the base station controls the receiving section and the transmitting section in the base station and performs signal processing,

wherein each of the signal processing circuits includes a delay circuit for delaying the self reference clock signal to maximize a correlation between a received signal and a reference code, wherein each of the signal processing circuits includes a memory storing information of a delay time related to the clock signal, wherein when a received power or a correlation temporarily drops, a clock signal maintained for the delay time stored in the memory is used by one or more of the signal processing circuits during a predetermined fixed time, wherein the stored delay time and a clock timing are not changed in cases where the received power or the correlation returns to an original level in a given time after dropping temporarily, and wherein a delay time corresponding to a maximum correlation is detected again in cases where the received power or the correlation does not return to an original level in a given time after dropping temporarily.

5,689,526

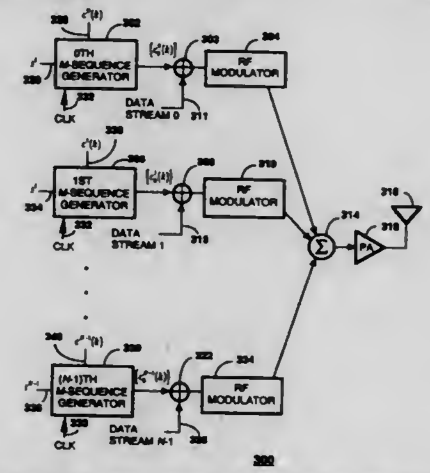
METHOD AND APPARATUS FOR SYNCHRONIZING A PLURALITY OF CODE DIVISION MULTIPLE ACCESS SIGNALS TO ENABLE ACQUISITION AND TRACKING BASED UPON A SINGLE PSEUDONOISE SPREADING CODE

Andrew M. Slonneger, Boynton Beach; Marco A. Mayor, Boca Raton, both of Fla., and Carl Myron Willis, Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 593,758, Jan. 29, 1996, abandoned. This application Feb. 26, 1996, Ser. No. 606,906

Int. Cl.^{6} H04B *1/707*

U.S. Cl. 375—206 **24 Claims**



1. A method for transmitting and receiving information in a spread spectrum signal in a data communication system, the method comprising at a transmitter the steps of:

initializing a plurality of pseudonoise (PN) sequence generators to a plurality of predetermined initial states;

thereafter generating a plurality of transmit PN sequences that are time-synchronized with one another by the plurality of PN sequence generators; and

transmitting the spread spectrum signal by utilizing the plurality of transmit PN sequences to encode the information; and

the method further comprising at a receiver the steps of:

acquiring and tracking a predetermined one of the plurality of transmit PN sequences;

predicting and tracking a selected one of the plurality of predetermined initial states;

adjusting a PN sequence generator to generate a selected PN sequence corresponding to one of the plurality of transmit PN sequences and time-synchronized with the predetermined one of the plurality of transmit PN sequences; and

despreading the corresponding one of the plurality of transmit PN sequences by utilizing the selected PN sequence to decode the information.

5,689,527

COMMUNICATIONS SYSTEM USING OPEN ARCHITECTURE BUS LINES

Steve Keith Hawkins, Plano, and Bruce Raymond Whitney, Terrell, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

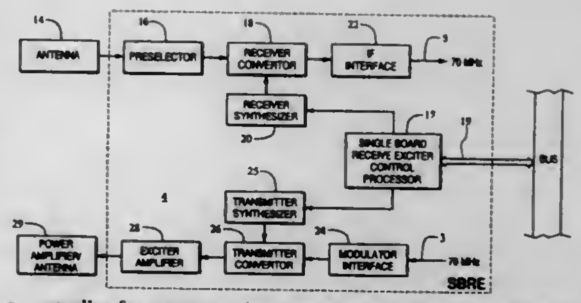
Division of Ser. No. 409,922, Mar. 23, 1995, which is a continuation of Ser. No. 84,622, Jul. 1, 1993, Pat. No. 5,504,777, which is a continuation-in-part of Ser. No. 959,258, Oct. 9, 1992, Pat. No. 5,384,805. This application Oct. 23, 1995, Ser. No. 547,121

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 375—222 **7 Claims**

1. A single board receiver exciter for transmitting and receiving signals, programmable to operate at a selected one of a variety of frequencies, comprising;

means for interfacing with a standard bus line to receive programming commands over the standard bus line;



a controller for programming operation of the receiver exciter in response to programming commands received over the standard bus lines;

a programmable receive-side preselector responsive to the controller for amplification and filtering a received signal to a desired bandwidth;

a programmable receiver synthesizer responsive to the controller for generating a receive mixing signal for mixing with the filtered received signal;

a receiver converter for mixing the received signal with the mixing signal to produce an intermediate frequency signal;

a programmable transmitter synthesizer responsive to the controller for generating a transmit mixing signal for mixing with a transmitted signal;

a programmable transmitter converter for mixing the transmitted signal with the transmit mixing signal to produce a transmit signal at a programmable output frequency; and

a programmable exciter amplifier responsive to the controller and to the transmit signal at the programmable output frequency for filtering and amplifying the transmitted signal to a desired frequency range.

5,689,528

DECISION FEEDBACK EQUALIZER WITH ADAPTIVE FILTER ARRAY OPERATING AS FEEDFORWARD FILTER OF THE EQUALIZER

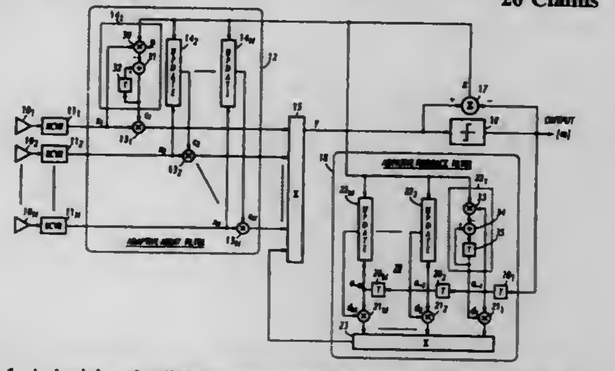
Ichiro Tsujimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 28, 1993, Ser. No. 174,428

Claims priority, application Japan, Dec. 28, 1992, 4-348995

Int. Cl.^{6} H04B *3/08;* **H03H** *7/30*

U.S. Cl. 375—233 **20 Claims**



1. A decision feedback equalizer for an array of antennas receiving a modulated carrier with a plurality of receiver means connected respectively to the antennas for recovering a plurality of symbol sequences from the carrier, said antennas being spaced at intervals equal to one-half of the wavelength of said carrier, the decision feedback equalizer comprising:

first filter means connected to the receiver means and respectively multiplying said symbol sequences with first weight coefficients;

combiner means combining the multiplied symbol sequences from said first filter means with second symbols applied thereto and producing therefrom a combined symbol sequence;

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decision means making a decision on the combined symbol sequence and producing therefrom a decision symbol sequence;

second filter means multiplying decision symbols successively supplied from said decision means respectively with second weight coefficients and applying the multiplied decision symbols as said second symbols to said combiner means;

error detector means detecting a difference between said decision symbol sequence and said combined symbol sequence and deriving therefrom a decision error;

first update means updating said first weight coefficients with correlations between said decision error and the symbol sequences from said receiver means so that a mean square of said decision error is reduced to a minimum value; and

second update means updating said second weight coefficients with correlations between said decision error and decision symbols successively supplied from the decision means so that the mean square of said decision error is reduced to the minimum value.

5,689,529

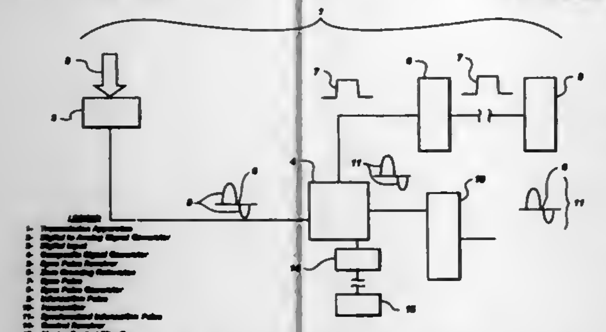
COMMUNICATIONS METHOD AND APPARATUS FOR DIGITAL INFORMATION

Neldon P. Johnson, American Fork, Utah, assignor to International Automated Systems, Inc., American Fork, Utah

Continuation-in-part of Ser. No. 533,618, Sep. 26, 1995, Pat. No. 5,640,422, which is a continuation-in-part of Ser. No. 285,030, Aug. 2, 1994, Pat. No. 5,517,528. This application Apr. 5, 1996, Ser. No. 628,280

Int. Cl.^{6} H04L *27/00*

U.S. Cl. 375—259 **197 Claims**



1. An apparatus for digital information transfer comprising:

a) means for allocating one or more source digital signals to unique, repetitive time slots;

b) means for generating an analog information wave for each said source digital signal, each said information wave being synthesized by combining a fundamental frequency wave of a pre-selected wave form and a pre-selected number of harmonics of the fundamental frequency wave, the amplitude and phase of the fundamental frequency wave and the amplitude and phase of each of the harmonics of the synthesized wave being a function of the magnitude of the corresponding source digital signal as measured during the allocated time slot for the signal;

c) means for transmitting each of the analog information waves within its allocated time slot;

d) means for receiving each of the analog information waves within its allocated time slot;

e) means for extracting the fundamental frequency wave and each of the harmonics of each analog information wave received during its allocated time slot; and

f) means for generating an output digital signal for each information wave received during its allocated time slot, said output digital signal having a digital magnitude which is a function of the amplitude and phase of the extracted fundamental frequency wave and the amplitude and phase of the extracted harmonics of the corresponding received information wave.

5,689,530

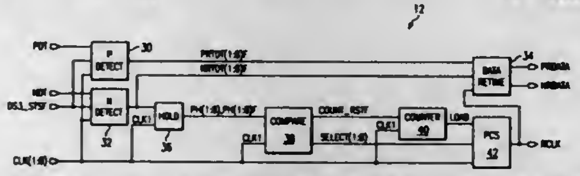
DATA RECOVERY CIRCUIT WITH LARGE RETIME MARGIN

Charles M. Honaker, Jr., Garland, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Continuation of Ser. No. 263,555, Jun. 22, 1994, abandoned. This application Aug. 28, 1995, Ser. No. 520,034

Int. Cl.^{6} H04L *25/34;25/49*

U.S. Cl. 375—286 **16 Claims**



1. Data recovery circuitry for generating a recovered data signal from an RZ data stream comprising:

circuitry for recovering a clock signal from said RZ data stream;

circuitry for translating said RZ data stream to an NRZ data stream prior to any retime operation on the RZ data stream, wherein said circuitry for translating comprises:

circuitry for generating a plurality of phased clocks;

circuitry for translating said RZ data stream to an NRZ data stream by sampling the RZ data stream responsive to said phased clocks to determine a first of said plurality of phased clocks to sample a predetermined logic level in said RZ data stream and for generating signals for respective of said phased clocks indicating whether the respective clock was the first to sample said predetermined logic level on its last active edge; and

circuitry for retiming the NRZ data stream with the recovered clock signal from said RZ data stream.

5,689,531

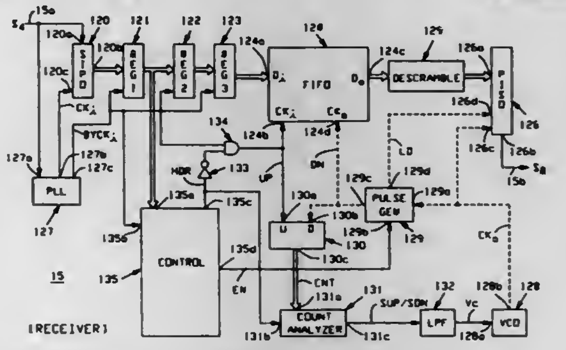
RECEIVER FOR A DIGITAL COMMUNICATION SYSTEM WHICH ELIMINATES CUMULATIVE JITTER

Charles Bert Hickman, Palmdale, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed May 31, 1996, Ser. No. 656,538

Int. Cl.^{6} H04L *27/06;* **H03D** *3/24*

U.S. Cl. 375—316 **16 Claims**



1. An electronic receiver which is comprised of:

an input terminal which receives a continuous series of bits at a receiver input bit rate which consists of data bits in spaced apart data blocks with respective headers that have a variable length and fill the space between said data blocks;

a digital logic circuit followed by a single input-single output memory which are coupled in series between said input terminal and an output port;

where said digital logic circuit generates control signals which cause said memory to store only selected bits from said data blocks but no bits from said headers; and,

a closed loop feedback control circuit, coupled to said memory, which selects a receiver output bit rate that is substantially constant and reads the stored bits from said memory onto said output port as a continuous bit stream at said substantially constant output bit rate such that the number of bits in said memory stays within a predetermined range regardless of said input bit rate.

5,689,532

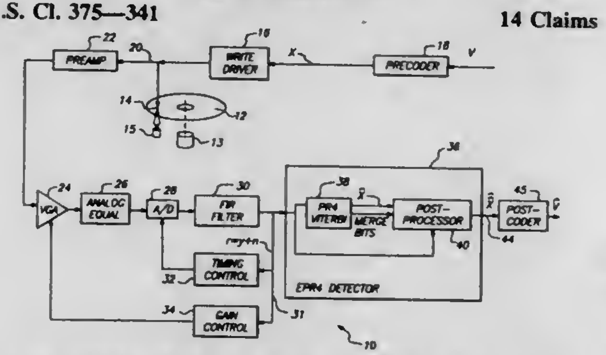
REDUCED COMPLEXITY EPR4 POST-PROCESSOR FOR SAMPLED DATA DETECTION

Kelly K. Fitzpatrick, Mountain View, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 497,520, Jun. 30, 1995, Pat. No. 5,521,945. This application May 24, 1996, Ser. No. 655,358

Int. Cl.^{6} H03D *1/00*

U.S. Cl. 375—341 **14 Claims**



1. An extended partial response class 4 (EPR4) detector within a partial response class 4 (PR4) equalized sampled data detection channel comprising:

a PR4 detector connected to receive samples from the PR4 equalized sampled data detection channel for producing an estimated sequence of binary information symbols corresponding to a determined path through a PR4 trellis and for producing a path information sequence relating to other paths that diverge or merge with the determined path,

an EPR4 post-processor connected to receive samples from the PR4 equalized sampled data detection channel, and connected to receive the estimated sequence and the path information sequence from the PR4 detector, the EPR4 post-processor for producing an estimated sequence of binary information symbols corresponding to a determined path through an EPR4 trellis that is selected by comparing alternative paths specified by the path information sequence and the determined path through the PR4 trellis.

5,689,533

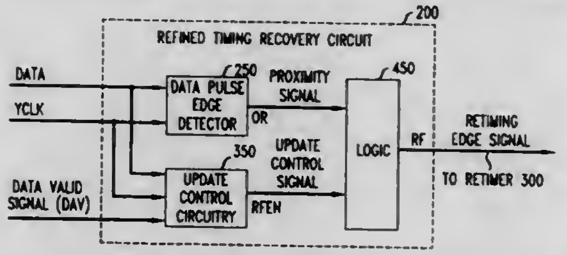
REFINED TIMING RECOVERY CIRCUIT

Gregory Thomas Brauns, Whitehall Township, Lehigh County, and Ramasubramaniam Ramachandran, King of Prussia, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 315,783, Sep. 30, 1994, Pat. No. 5,539,784. This application Jan. 11, 1996, Ser. No. 584,497

Int. Cl.^{6} H04L *7/02*

U.S. Cl. 375—360 **7 Claims**



1. A refined timing recovery circuit for retiming a recovered data signal derived from a received data pulse comprising:

a data pulse edge detector, said edge detector being adapted to be coupled to an oversampling clock having a series of clock pulses, each of the clock pulses having a rising edge and a falling edge;

said edge detector including:

a first two flip-flops, each with an output port, a data port being coupled to receive the received data pulse, and a clock port being coupled to receive the oversampling clock pulses;

a second two flip-flops, each with an output port, a data port coupled to the corresponding output port of the first two flip-flops, and a clock port being coupled to receive the oversampling clock pulses;

wherein each of the first two flip-flops is coupled to latch a received data pulse on different oversampling clock pulse edges; and

the second of two flip-flops is coupled to latch the output of the first two flip-flops on the same oversampling clock pulse edge.

5,689,534

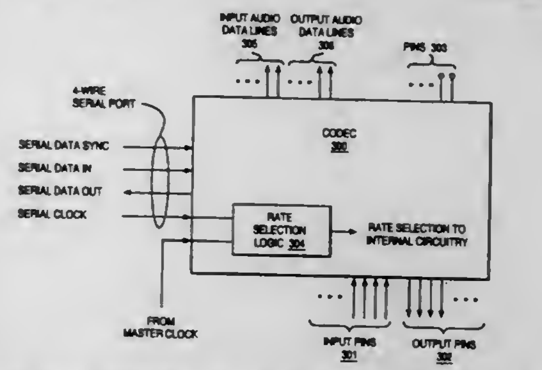
AUDIO FUNCTIONAL UNIT AND SYSTEM AND METHOD FOR CONFIGURING THE SAME

Eric C. Anderson, San Jose; David F. Wilson, Los Altos, and William V. Oxford, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Division of Ser. No. 881,842, May 12, 1992, abandoned. This application Oct. 18, 1993, Ser. No. 138,753

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—364 **31 Claims**



8. An audio functional unit in an audio system, wherein the audio system includes a master clock, said audio functional unit comprising:

a serial port clocked according to a serial clock from the audio system, wherein the serial clock is at a clock rate and is derived from the master clock;

an audio functional circuitry coupled to the serial port, wherein the audio functional circuitry is programmable, provides a plurality of functions and is operable at a plurality of sample rates; and

rate selection control logic coupled to the audio functional circuitry and coupled to receive the serial clock and the master clock, wherein the rate selection control logic senses a ratio between the serial clock and the master clock and reprograms the audio functional circuitry to operate at one of the plurality of sample rates in response to a change in the clock rate of the serial clock, such that the audio functional circuitry operates at another of the plurality of sample rates.

5,689,535

METHOD AND APPARATUS FOR PROCESSING MULTIPLE FACILITY DATALINKS

Robert W. Cantwell, Garland, and Steven D. Sensel, The Colony, both of Tex., assignors to DSC Communications Corporation, Plano, Tex.

Continuation of Ser. No. 934,922, Aug. 25, 1992, abandoned. This application Nov. 15, 1994, Ser. No. 341,291

Int. Cl.^{6} G06F *11/10*

U.S. Cl. 375—364 **18 Claims**

11. A method of receiving and processing a plurality of facility datalinks from a telecommunications network, each of the facility datalinks having a plurality of bits, comprising the steps of:

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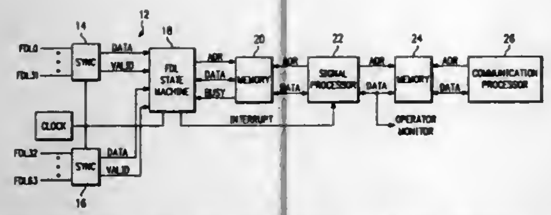


simultaneously receiving the plurality of facility datalinks from the telecommunications network;

synchronizing each bit of each of the plurality of facility datalinks;

multiplexing each bit of the plurality of facility datalinks onto a single data stream;

generating a valid signal for each bit;

processing the single data stream into specific memory formats in response to said valid signal; and

separately storing each of the specific memory formats of the plurality of facility datalinks.

5,689,536

CLOCK SUPPLY APPARATUS INDICATING AND TRANSMITTING PRECISENESS OF GENERATED CLOCK SIGNAL

Toshio Iyota, and Takeo Kato, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

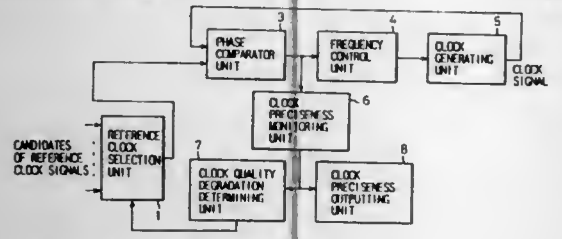
Continuation of Ser. No. 149,983, Nov. 10, 1993, abandoned.

This application Dec. 20, 1996, Ser. No. 770,911

Claims priority, application Japan, Nov. 10, 1992, 4-299888

Int. Cl.^{6} H04L *7/00*; H04J *3/06*

U.S. Cl. 375—376 **7 Claims**


3
4
5
PHASE COMPARATOR UNIT
FREQUENCY CONTROL UNIT
CLOCK GENERATING UNIT
CLOCK SIGNAL
CLOCK PRECISENESS MONITORING UNIT
6
CANDIDATES OF REFERENCE CLOCK SIGNALS
REFERENCE CLOCK SELECTION UNIT
1
7
CLOCK QUALITY DEGRADATION DETERMINING UNIT
8
CLOCK PRECISENESS OUTPUTTING UNIT

1. A clock supply apparatus comprising:

clock generating means for generating a clock signal having a frequency;

phase comparing means for inputting a reference clock signal, and for obtaining a phase difference between the reference clock signal and the clock signal generated by the clock generating means;

frequency control means for generating a control signal for controlling said frequency of the clock signal generated by the clock generating means, based on the phase difference;

a clock preciseness monitoring means, coupled to said phase comparing means, for monitoring preciseness of the clock signal, based on the phase difference;

a clock preciseness output means for outputting information indicating the preciseness of the clock signal, based on the phase difference; and

a command receiving means for receiving a command from outside said clock supply apparatus, said command requesting at least one of switching transmission lines, switching said reference clock signal, rewriting a program in a memory, rewriting control data in a memory, transmission of said information indicating preciseness of the clock signal, transmission of alarm information, transmission of log data, transmission of information on the switching of the transmission lines, and transmission of information on the switching of the reference clock signal.

5,689,537

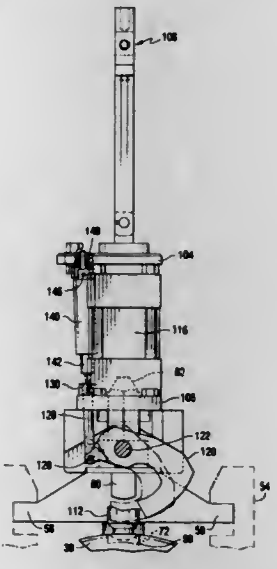
JET PUMP BEAM TENSIONER

Joseph James Hahn, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1996, Ser. No. 620,477

Int. Cl.^{6} C21C *19/00*

U.S. Cl. 376—260 **17 Claims**



17. A method of tensioning a hold down beam of a nuclear reactor jet pump inlet mixer, the hold down beam having a beam body, a pair of opposed beam tabs and a pair of opposed beam trunnions extending outwardly from the beam body, and a threaded beam bolt received within a correspondingly threaded channel extending through the beam body, the method comprising:

- (a) positioning the hold down beam on an upper surface of the inlet mixer with each beam tab under an inlet riser bracket of the jet pump;
- (b) positioning a tensioning apparatus over the hold down beam, the tensioning apparatus comprising
  - (i) a housing including a lower base plate and an upper base plate,
  - (ii) trunnion engaging means rotatably mounted on the lower base plate,
  - (iii) reciprocating means coupled to the upper support plate and lower base plate for engaging the inlet mixer adjacent to the beam trunnions, and
  - (iv) actuating means mounted between the upper support plate and lower base plate and extending through the lower base plate for selectively activating the trunnion engaging means;
- (c) rotating the trunnion engaging means into engagement with the trunnions;
- (d) extending the reciprocating means to engage the inlet mixer and force the beam tabs against the inlet riser brackets to thereby extend an opening between the hold down beam and the upper surface of the inlet mixer;
- (e) rotating the beam bolt to extend the bolt into contact with the upper surface of the inlet mixer; and
- (f) removing the tensioning apparatus from engagement with the hold down beam.

5,689,538

DEVICE AND METHOD FOR RECOVERING AND COOLING THE MOLTEN CORE OF A NUCLEAR REACTOR

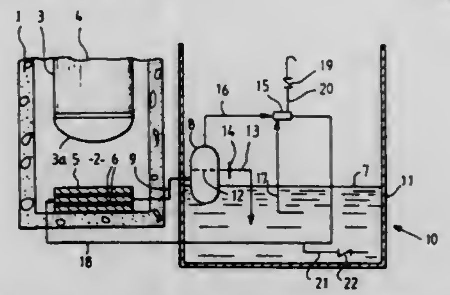
Nicolaas Bonhomme, Pontoise, France, assignor to Framatome, Courbevoie, France

Filed Sep. 6, 1996, Ser. No. 708,265

Claims priority, application France, Sep. 11, 1995, 95 10625

Int. Cl.^{6} G21C *9/016*

U.S. Cl. 376—280 **10 Claims**



1. A device for recovering and cooling the molten core of a nuclear reactor, including a molten core collector, comprising means for cooling the molten core by circulation of water and a circuit for feeding water to the cooling means of the collector and for removing a fluid formed from the cooling water that has circulated in the cooling means, said device including

- (a) a water storage tank;
- (b) a tank for collecting the fluid removed from the cooling means of the collector, comprising means for separating steam and water contained in the fluid and a conduit for removing the fluid into the storage tank; and
- (c) a steam ejector having a steam inlet connected to the collection tank, a water inlet connected to a pipe for sucking water from the storage tank and a water outlet connected by a feed pipe to the cooling means of the collector.

5,689,539

TIME INTERVAL MEASUREMENT SYSTEM AND A METHOD APPLIED THEREIN

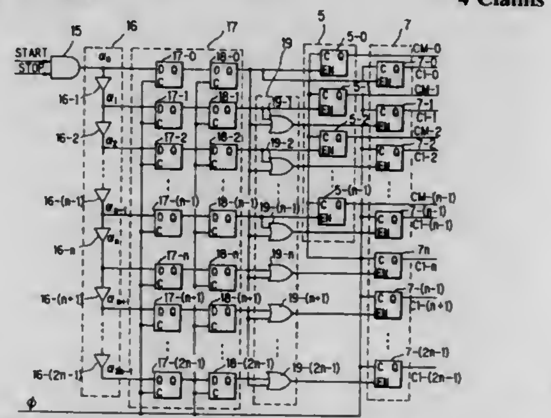
Hirokuni Murakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 31, 1996, Ser. No. 688,804

Claims priority, application Japan, Jul. 31, 1995, 7-194671

Int. Cl.^{6} G01B *7/00*

U.S. Cl. 377—20 **4 Claims**



1. A time interval measurement system comprising:

means for generating a measurement pulse having a pulse width of a time interval to be measured;

means for generating a series of delayed pulses, a first of said series of delayed pulses being said measurement pulse, each (k+1)-th of said series of delayed pulses having a same pulse width with said measurement pulse and being delayed by a unit delay time from k-th of said series of delayed pulses, and last of said series of delayed pulses being delayed from said measurement pulse more than two cycles of a system clock, k being a positive integer;

means for reforming each of said series of delayed pulses into a series of quantized pulses, each k-th of said series of quantized pulses being synchronized with said system clock and having a width of a pulse rising at a first rising edge of said system clock following a rising edge of k-th of said series of delayed pulses and falling at a first rising edge of said system clock following a falling edge of said k-th of said series of delayed pulses;

means for generating a series of discriminate number measurement pulses, each k-th of said series of discriminate number measurement pulses rising at a common time and falling at a falling edge of k-th of said series of delayed pulses;

a series of one-bit-counters, each k-th of said series of one-bit-counters counting a number of rising edges of said system clock during a period enabled with k-th of said series of discriminate number measurement pulses;

series of multi-bit counters having a bit width suficient for counting rising edges of said system clock during said time interval to be measured, each k-th of said series of multi-bit counters counting a number of rising edges of said system clock during a period enabled with k-th of a first half of said series of quantized pulses; and

control means for detecting a longest sequence of a same logic of outputs of said series of one-bit-counters and determining a discriminate number as a number of one-bit-counters outputting said longest sequence of a same logic, controlling addition means to accumulate and output a total number of outputs of a first sequence of said discriminate number of said series of multi-bit counters, and calculating said time interval to be measured by dividing said total number by said discriminate number and multiplying by a cycle time of said system clock.

5,689,540

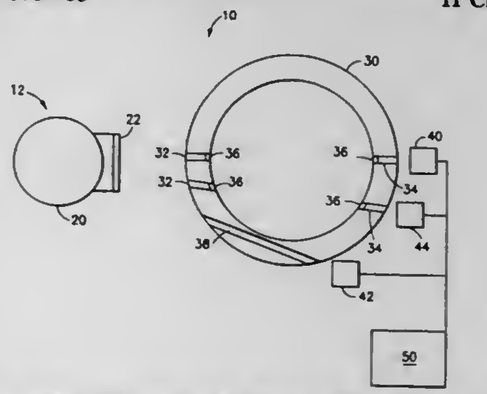
X-RAY WATER FRACTION METER

Kenneth E. Stephenson, Cambridge, England, and Arthur J. Becker, Ridgefield, Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Oct. 11, 1996, Ser. No. 730,547

Int. Cl.^{6} G01N *23/06*

U.S. Cl. 378—53 **11 Claims**



1. An apparatus for measuring water to liquid ratio in a multiphase flow, comprising:

means for providing a continuous bremsstrahlung photon spectrum;

a pipe located a distance from the photon spectrum means, the pipe containing a fluid mixture of oil, water, and gas;

a plurality of detectors for measuring photons passing from the photon spectrum means through the fluid; and,

means for monitoring an energy distribution of the photon spectrum means.

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5,689,541

X-RAY TUBE WHEREIN DAMAGE TO THE RADIATION EXIT WINDOW DUE TO BACK-SCATTERED ELECTRONS IS AVOIDED

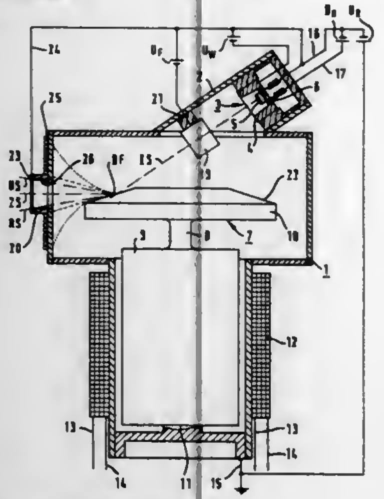
Peter Schardt, Roettenbach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 25, 1996, Ser. No. 736,957

Claims priority, application Germany, Nov. 14, 1995, 195 42 438.7

Int. Cl.^{6} H01J *35/16*

U.S. Cl. 378—140 **6 Claims**



1. An X-ray tube comprising:
a vacuum housing;
an anode and a cathode contained in said vacuum housing;
means for placing said cathode at a cathode potential;
an electrically conductive radiation exit window disposed in an electrically insulated manner from said vacuum housing;
means for placing said radiation exit window at said cathode potential; and
means for placing said vacuum housing at a potential which is positive in relation to said cathode potential.

5,689,542

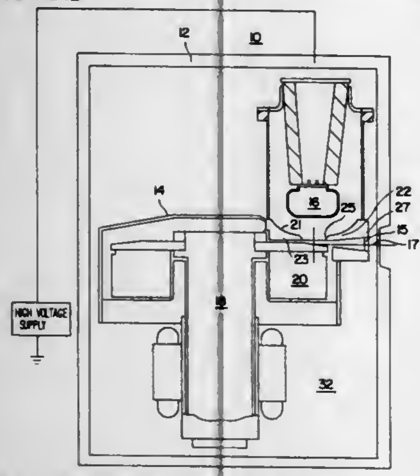
X-RAY GENERATING APPARATUS WITH A HEAT TRANSFER DEVICE

Gordon R. Lavering, Belmont, Calif., and Robert C. Treseder, Salt Lake City, Utah, assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 6, 1996, Ser. No. 660,617

Int. Cl.^{6} H01J *35/06*

U.S. Cl. 378—142 **35 Claims**



1. An X-ray generating apparatus comprising:
an evacuated envelope;
an anode assembly disposed within said evacuated envelope, said anode assembly having a target;
an electron source fixedly mounted within said evacuated envelope in proximity to said anode target for generating a beam of electrons onto a surface of said target for producing X-rays;
a shield structure placed between said anode assembly and electron source, said shield structure having:
  a body with an aperture for passing the electron beam, said body comprising a top surface facing said electron source, a bottom surface facing said anode target, an outer wall and an inner wall, said outer wall having higher linear dimension than said inner wall, and said inner wall defining said aperture;
  a heat transfer means for increasing a velocity of said cooling fluid passing therethrough, said heat transfer means being disposed within said body proximate to said inner wall and conductively attached thereto; and
  inflow and outflow chambers with a septum therebetween for circulating coolant within said inflow and outflow chambers, said inflow and outflow chambers being proximate to said anode target and electron source respectively, wherein, in operation, the heat is transferred to a cooling fluid passed through said chambers.

5,689,543

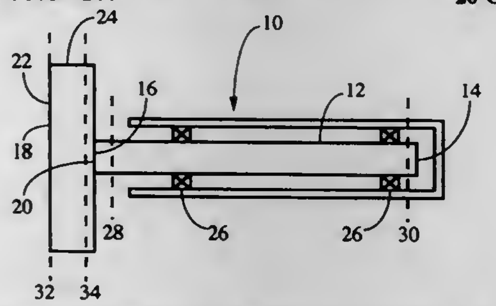
METHOD FOR BALANCING ROTATABLE ANODES FOR X-RAY TUBES

Brian J. Graves, Waukesba; Thomas G. Ebben, Sullivan, and Douglas J. Snyder, Brookfiled, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 18, 1996, Ser. No. 768,642

Int. Cl.^{6} H01J *35/10*

U.S. Cl. 378—144 **20 Claims**



1. A method for balancing a rotatable anode comprising the steps of:
a. dynamically balancing a rotor in a first set of correction planes at a first speed;
b. attaching a target to the rotor to provide the anode; and
c. dynamically balancing the anode in a second set of correction planes at a second speed.

5,689,544

X-RAY EXAMINATION APPARATUS COMPRISING A BEAM DIAPHRAGM

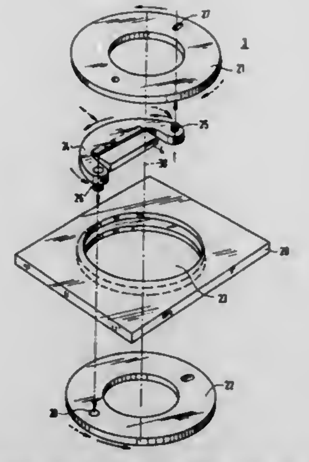
Fransiscus J. M. Van Den Besselaar, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1995, Ser. No. 558,064

Claims priority, application European Pat. Off., Nov. 21, 1994, 94203375

Int. Cl.^{6} A61B *6/06*

U.S. Cl. 378—150 **8 Claims**



1. An X-ray examination apparatus, comprising a beam diaphragm with a plurality of shutters and adjusting means coupled to the pair of shutters for varying a shutter aperture of the beam diaphragm comprising a plurality of control rings, said adjusting means being configured such that the plurality of shutters are mutually independently radially slidable and rotatable transversely of the central axis of the beam diaphragm and each of the shutters is adjusted by mutually independent rotation of a different associated two of said plurality of control rings, said mutually independent rotation of each different associated two of said plurality of control rings adjusting one and only one of said shutters.

5,689,545

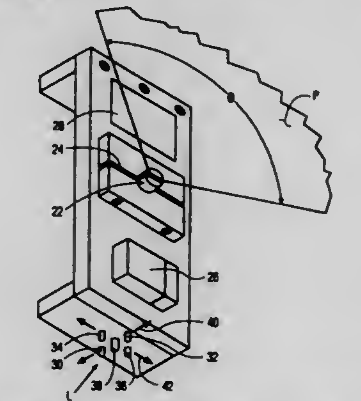
LASER LINE PROJECTING TOOL FOR LEVELING AND ALIGNMENT OF X-RAY EQUIPMENT, AND METHOD OF USE

Edwin Hopkins, Delafield, Wis., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1995, Ser. No. 573,167

Int. Cl.^{6} A61B *6/08*

U.S. Cl. 378—206 **8 Claims**



1. A portable battery powered tool for aligning equipment in an X-ray room, comprising:
mounting means carried by the tool for connecting the tool to an object;
a light source carried by the tool for projecting a line in a projection plane; and
electronic sensor and indicator means carried by the tool for indicating whether said projection plane deviates from horizontal in along each of two orthogonal axes;
wherein said mounting means comprises a plurality of channel engaging connectors carried by a surface of the tool for engaging channel in the ceiling of the X-ray room.

5,689,546

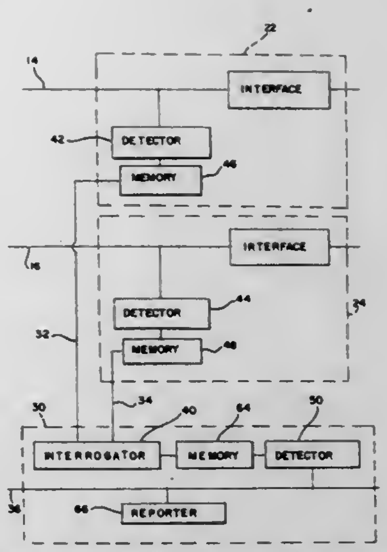
PERFORMANCE MONITORING SYSTEM FOR T1 TELEPHONE LINES

Laurence L. Sheets, St. Charles, and Michael T. Fitzgerald, Bolingbrook, both of Ill., assignors to Teltrend Inc., St. Charles, Ill.

Filed Jun. 6, 1995, Ser. No. 463,627

Int. Cl.^{6} H04M *1/24;3/08;3/22*

U.S. Cl. 379—34 **25 Claims**



20. A monitoring system for a digital transmission line network, said digital transmission line network including a plurality of transmission lines and a plurality of network interface units, each of said transmission lines being interconnected respectively to one of said network interface units and each of said transmission lines carrying payload, each of said network interface units having a detector for detecting a status of the payload transmitted along the transmission line interconnected to said network interface unit, and each of said network interface units having a memory for temporarily storing status information representative of said status, said monitoring system comprising, in combination:
a spare transmission line;
a common unit interconnected to said plurality of said network interface units and to said spare transmission line;
an interrogating circuit within said common unit for interrogating said network interface units and receiving said status information from said memories of said network interface units; and
a reporting circuit within said common unit for transmitting along said spare transmission line a report signal representative of said status information.

5,689,547

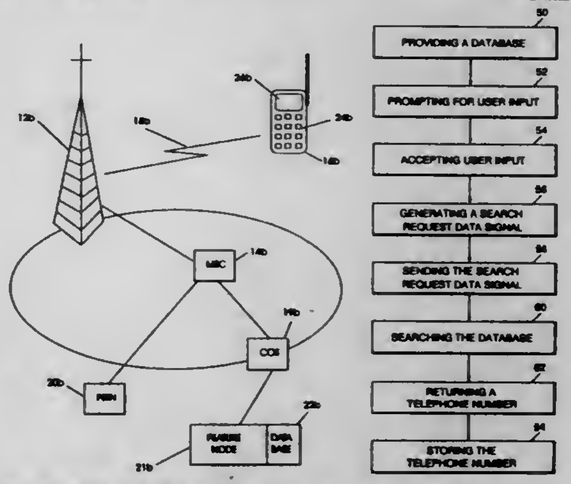
NETWORK DIRECTORY METHODS AND SYSTEMS FOR A CELLULAR RADIOTELEPHONE

Anders Lennart Mölne, Raleigh, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Nov. 2, 1995, Ser. No. 552,083

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 379—58 **15 Claims**



15. A cellular radiotelephone system comprising:
a network directory database comprising a plurality of telephone numbers;

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reception means for receiving a search request data signal from a cellular radiotelephone, said search request data signal including search criteria generated by said cellular radiotelephone in response to prompts for user input followed by user input of said search criteria;
search means for searching said network directory database for a match with said search criteria to identify a subset of said plurality of said of telephone numbers; and
transmission means for transmitting a return data signal including said subset of telephone numbers to said cellular radiotelephone;
wherein said reception means receives a plurality of search request data signals each of which includes an item of search criteria from said cellular radiotelephone which prompts for user input of a plurality of search criteria, which accepts user input of said plurality of said search criteria, which generates each of said separate search request data signals in response to said plurality of items of search criteria, and which sends each of said search request data signals separately.

5,689,548

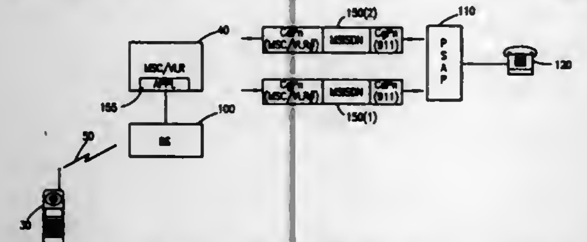
EMERGENCY CALL BACK USING MSC NUMBERS

Alain Guy Maupin, Richardson, and Vladimir Alperovich, Dallas, both of Tex., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Filed May 21, 1996, Ser. No. 651,982

Int. Cl.^{6} H04Q *7/00;9/00;* **H04M** *11/00;11/04*

U.S. Cl. 379—59 **23 Claims**



1. A method for establishing a call back from a wireline telecommunications terminal to a mobile station within a mobile telecommunications system, said mobile station assigned a mobile station identification number and associated with a home location register (HLR), wherein said mobile station is currently being served by a mobile switching center (MSC), said MSC assigned an dialable wireline directory number, and wherein said method comprising the steps of:
receiving a connection request signal with said dialable wireline directory number as a called party number by said MSC, said connection request signal further encapsulating said mobile station identification number and routed to said MSC without previously performing an interrogation of said home location register for said mobile station;
extracting said encapsulated mobile station identification number from said connection request signal; and
establishing a call back connection towards said mobile station with said extracted mobile station identification number as said called party number.

5,689,549

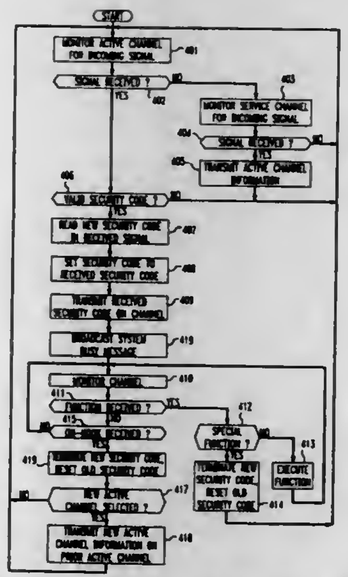
CORDLESS TELEPHONE BASE UNIT ARRANGED FOR OPERATING WITH MULTIPLE PORTABLE UNITS

Guido Bertocci, Freehold; William J. Nealon, Neptune City; Siegfried F. Rehwinkel, Middletown; Walter Tomkoski, Jamesburg, and Hon-Chi Yu, Aberdeen, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 1, 1994, Ser. No. 347,745

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 379—61 **30 Claims**



1. In a cordless telephone system employing a plurality of handset units and a base unit, an arrangement for establishing communications between the base unit and one of the plurality of handset units, the arrangement comprising:
means in both the base unit and each of the plurality of handset units for storing a common predetermined security code used in establishing each communication link between said base unit and one of the plurality of handset units over a communication channel;
means in each one of the plurality of handset units responsive to the establishing of a communication link with said base unit for generating a substitute security code uniquely different from said predetermined security code, said substitute security code being substituted for said predetermined security code for use in subsequent communications with said base unit over said communication channel; and
means for providing said substitute security code from one of the plurality of handset units to said base unit over an established communication link for use in said subsequent communications with said base unit during said established communication link, said base unit being unresponsive to communication attempts from other of the plurality of handset units unaccompanied by said substitute security code while communicating with a handset unit that provided said substitute security code.

5,689,550

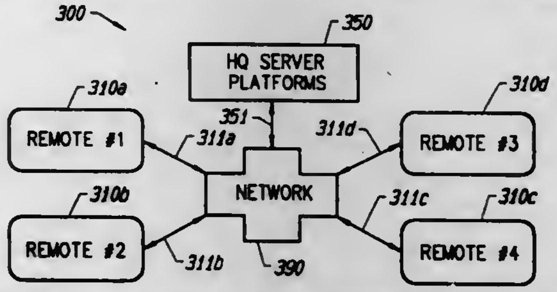
INTERFACE ENABLING VOICE MESSAGING SYSTEMS TO INTERACT WITH COMMUNICATIONS NETWORKS

Michael Garson, Cleveland, Ohio, and Bruce D. Stewart, Sebastian, Fla., assignors to Voice-Tel Enterprises, Inc., Cleveland, Ohio

Filed Aug. 8, 1994, Ser. No. 287,822

Int. Cl.^{6} H04M *1/65;* **H04J** *3/24;* **H04L** *12/66*

U.S. Cl. 379—89 **25 Claims**



25. A method for providing voice messaging services using a plurality of voice messaging systems interconnected via a communications network, each voice messaging system comprising a voice messaging processor and an interface, the method comprising the steps of:
generating a representation of a first voice message in a first voice messaging processor coupled to a telephone network, said first voice message being received from a subscriber of said telephone network;
transmitting said representation of said first voice message via a network to a first interface associated with said first voice messaging processor, said first interface for converting said representation of said first voice message to a converted representation of said first voice message for transmission over said communications network to a second voice messaging system, the second voice messaging system comprising a second interface and a second voice messaging processor;
receiving said converted representation of said first voice message at said second interface, said second interface reconverting said converted representation of said first voice message for processing by said second voice messaging processor; and
providing a management site coupled to the communications network for receiving an undeliverable voice message and determining a reason said undeliverable voice message could not be delivered.

5,689,551

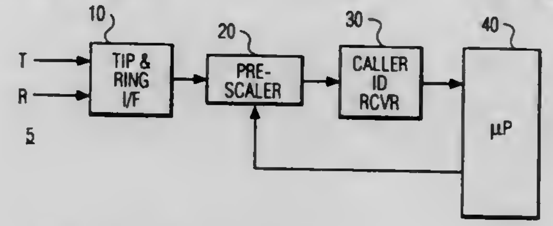
CALLER ID SYSTEM WITH PRESCALER

Clarence Charles Rudd, Oswego, N.Y., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Oct. 17, 1995, Ser. No. 544,085

Int. Cl.^{6} H04M *1/57*

U.S. Cl. 379—142 **17 Claims**



1. A caller ID system, comprising:
a caller ID receiver coupled to an input for receiving an input signal including a caller ID signal;
a processor coupled to the caller ID receiver for detecting an error in said caller ID signal; and
a prescaler, coupled between said input and the caller ID receiver, for scaling said input signal in response to said processor detecting said error in said caller ID signal.

5,689,552

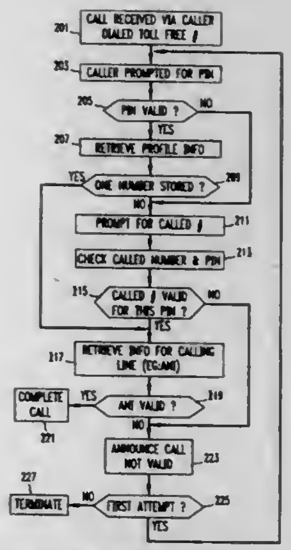
TELEPHONE CALLING WITH AUTOMATIC BILLING

Paul F. Gibilisco, Morris Township, N.J., assignor to AT&T Corp., Middletown, N.J.

Filed Aug. 31, 1993, Ser. No. 115,366

Int. Cl.^{6} H04M *17/00*

U.S. Cl. 379—145 **10 Claims**



6. A method of automatically communicating between a subscriber and a destination via a telecommunications network, said method comprising the steps of:
storing one or more destination telephone numbers and a billing account number for each of a plurality of subscribers;
responsive to a call made to a predetermined telephone number by a caller, authenticating the identity of said caller;
prompting said caller to provide an identifier uniquely associated with one of said stored destination telephone numbers, regardless of whether or not said caller is an authorized subscriber;
receiving from said caller, in response to said step of prompting, the identifier provided by said caller;
extending said call to the destination telephone number associated with the received identifier if said caller is an authorized subscriber;
announcing an error message to said caller and terminating the telephone call if said caller is not an authorized subscriber such that said caller can not determine whether said caller is unauthorized or the identifier provided by said caller is wrong.

5,689,553

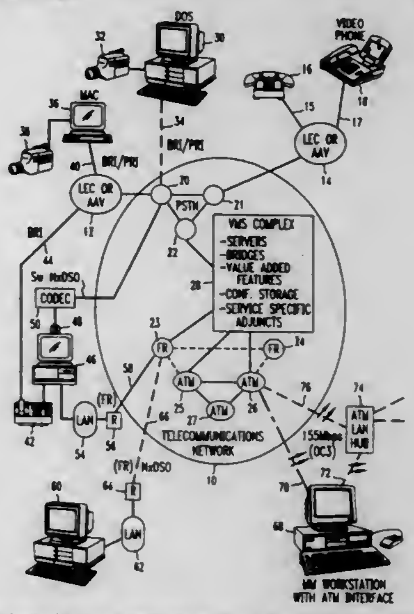
MULTIMEDIA TELECOMMUNICATIONS NETWORK AND SERVICE

Sudhir Raman Ahuja, Aberdeen; Murali Aravamudan, Berkley Heights; James Robert Ensor, Red Bank; Ashok K. Kuthyar, Holmdel; Ram S. Ramamurthy, Manalapan; Peter H. Stuntebeck, Little Silver, and Roy Philip Weber, Bridgewater, all of N.J., assignors to AT&T Corp., Middletown, N.J.

Filed Apr. 22, 1993, Ser. No. 51,724

Int. Cl.^{6} H04M *3/56*

U.S. Cl. 379—202 **35 Claims**



1. A multimedia telecommunications network comprising:
at least one node for connecting at least two subscribers;
audio, video and data bridges for connecting subscribers having different telecommunications capabilities; and
at least one virtual meeting services complex that is accessible to the subscribers, the virtual meeting services complex being

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associated with at least one of the at least one node for providing a multimedia telecommunications service for the subscribers, wherein the virtual meeting services complex includes a controllably persistent virtual meeting room for supporting multimedia telecommunications including any two of audio, video and data communications, the meeting room being controllably persistent in that the audio, video and data communications from an initial multimedia conference call are stored in a memory of the multimedia telecommunications network such that any two of the audio, video and data communications from the initial multimedia conference call are available to one or more subscribers at a time subsequent to when all subscribers are off the initial multimedia conference call.

5,689,554
INTERNETWORK COMMUNICATION SYSTEM FOR MANAGING SUBSCRIBER SWITCHES BETWEEN NETWORKS

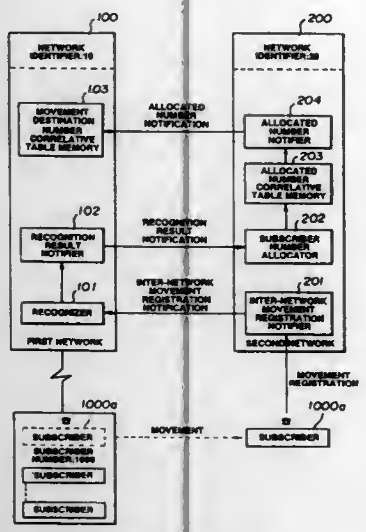
Shigeru Fukazawa, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 348,901, Nov. 25, 1994, abandoned, which is a continuation of Ser. No. 115,114, Sep. 2, 1993, abandoned. This application Nov. 12, 1996, Ser. No. 747,379

Claims priority, application Japan, Sep. 4, 1992, 4-237320

Int. Cl.^{6} H04M *7/00*

U.S. Cl. 379—219 **22 Claims**


100
NETWORK IDENTIFIER:10
103
MOVEMENT DESTINATION NUMBER CORRELATIVE TABLE MEMORY
102
RECOGNITION RESULT NOTIFIER
101
RECOGNIZER
FIRST NETWORK
ALLOCATED NUMBER NOTIFICATION
RECOGNITION RESULT NOTIFICATION
INTER-NETWORK MOVEMENT REGISTRATION NOTIFICATION
200
NETWORK IDENTIFIER:20
204
ALLOCATED NUMBER NOTIFIER
203
ALLOCATED NUMBER CORRELATIVE TABLE MEMORY
202
SUBSCRIBER NUMBER ALLOCATOR
201
INTER-NETWORK MOVEMENT REGISTRATION NOTIFIER
SECOND NETWORK
MOVEMENT REGISTRATION
1000a
SUBSCRIBER
SUBSCRIBER NUMBER:1000
SUBSCRIBER
SUBSCRIBER
MOVEMENT
1000a
SUBSCRIBER

1. A communication system comprising:

a first and second network, each having a plurality of subscriber terminals accommodated therein and having respectively different number plans;

each of the plurality of subscriber terminals accommodated in the first network, which issues a call to another network through the second network, the subscriber terminals including

registration means for notifying the second network of an identifier of the first network and a subscriber number of the subscriber terminal in the first network to register the identifier and the subscriber number over the second network; the second network including

subscriber number allocation means for allocating a subscriber number in the second network to the subscriber terminal in response to the registration by the registration means,

allocated number correlative table memory means for preparing and storing therein an allocated number correlative table showing a correlation between the subscriber number in the second network with the identifier of the first network and the subscriber number in the first network, and

allocated number notification means for notifying the first network of the subscriber number in the second network and an identifier of the second network; the first network including

subscriber number correlative table memory means for preparing and storing therein a subscriber number correlative table showing a correlation between the subscriber number in the first network, the subscriber number in the second network and the identifier of the second network in response to the notification from the allocated number notification means; and

wherein, when the subscriber terminal located in the second network issues a call, the second network transfers a call control to the first network according no the allocated number correlative table, while the first network performs the call control according to the subscriber number correlative table.

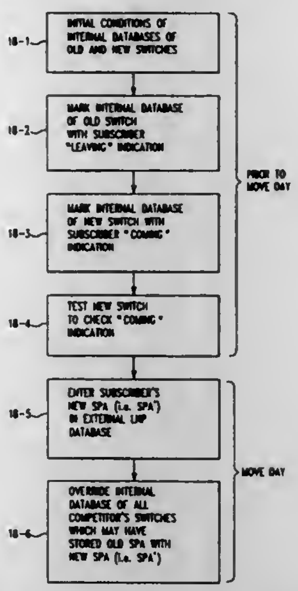
5,689,555
METHOD FOR TRANSFERRING A SUBSCRIBER TO A NEW LOCAL SERVICE PROVIDER

Edward Sonnenberg, Coral Springs, Fla., assignor to Siemens Stromberg-Carlson, Boca Raton, Fla.

Filed Jun. 30, 1995, Ser. No. 497,411

Int. Cl.^{6} H04M *3/00*

U.S. Cl. 379—220 **8 Claims**


18-1
INITIAL CONDITIONS OF INTERNAL DATABASES OF OLD AND NEW SWITCHES
18-2
MARK INTERNAL DATABASE OF OLD SWITCH WITH SUBSCRIBER "LEAVING" INDICATION
18-3
MARK INTERNAL DATABASE OF NEW SWITCH WITH SUBSCRIBER "COMING" INDICATION
18-4
TEST NEW SWITCH TO CHECK "COMING" INDICATION
PRIOR TO MOVE DAY
18-5
ENTER SUBSCRIBER'S NEW SPA (i.e. SPA') IN EXTERNAL LNP DATABASE
18-6
OVERRIDE INTERNAL DATABASE OF ALL COMPETITOR'S SWITCHES WHICH MAY HAVE STORED OLD SPA WITH NEW SPA (i.e. SPA')
MOVE DAY

3. A method for transferring a Subscriber of a current Local Service Provider to a future Local Service Provider within a common Numbering Plan Area (NPA) comprising the steps of:

providing a local number portability database adapted to store a relationship between each NXX-XXXX directory number assigned to Subscribers within the common Numbering Plan Area (NPA) and a call routing identifier, SPA, associated with the directory number, NXX-XXXX where:

SPA is a three digit designation code assigned to each one of the Local Service Providers within a common Numbering Plan Area (NPA), each one of the Local Service Providers being assigned a different Service Provider Area (SPA) code in the common Numbering Plan Area (NPA); and,

NXX is a three digit designation code representative of an exchange area within the common Numbering Plan Area (NPA);

marking an internal database of the current Local Service Provider's switch with a LEAVING indication;

marking an internal database of the future Local Service Provider's switch with a COMING indication; and

querying the local number portability database from either the current Local Service Provider's switch or the future Local Service Provider's switch when such LEAVING or COMING indication is marked to determine whether the local number portability database has been updated with the Subscriber's SPA' code.

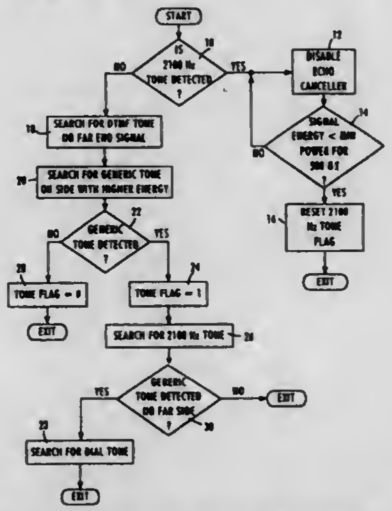
5,689,556
METHOD OF DETECTING NARROW-BAND SIGNALS IN AN ECHO CANCELLER

Prabhat K. Gupta, and Sanjay Gupta, both of Germantown, Md., assignors to Hughes Electronics, Los Angles, Calif.

Filed Sep. 15, 1995, Ser. No. 528,762

Int. Cl.^{6} H04B *3/23*

U.S. Cl. 379—410 **14 Claims**



1. A method of searching for narrow-band signals in signals at an echo canceller comprising the steps of:

searching for a generic tone in a near end and a far end signal over a predetermined period of time;

searching for a DTMF tone;

searching for a 2100 Hz tone;

searching for a dialtone if a generic tone is found; and

setting flags indicative of a need to suppress an echo.

5,689,557
REDIAL APPARATUS AND METHODS FOR PROCESSING SYMBOLS INPUT BY A USER BEFORE AND DURING A TELEPHONE CALL

Diego Kaplan, San Diego, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.

Filed Jan. 31, 1996, Ser. No. 593,304

Int. Cl.^{6} H04M *1/27*

U.S. Cl. 379—355 **20 Claims**

1. A method for processing commands and symbols input by a user to a mobile telephone, with said commands being input to control the operation of the telephone, and with said symbols being input for transmission by the mobile telephone to initiate a telephone call by identifying a telephone number to be connected to or for transmission by the mobile telephone during the telephone call, said mobile telephone having a new number buffer for storing selected symbols and a redial buffer for storing selected symbols, said method comprising the steps of:

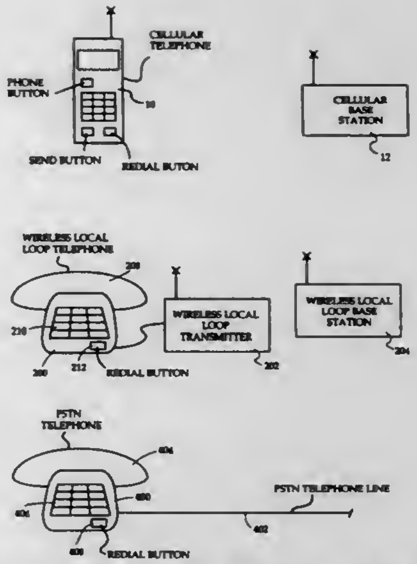
a) receiving either a redial command or a symbol input by the user;

b) if a redial command was received at step a), then transmitting the contents, if any, of the redial buffer to identify a telephone number to be connected to; and

c) if a symbol was received at step a), then

c.1) clearing the new number buffer,

c.2) storing the symbol received at step a) in the new number buffer,



c.3) receiving either a send command, a redial command or another symbol input by the user,

c.4) if a redial command was received at step c.3), then transmitting the contents, if any, of the redial buffer to identify a telephone number to be connected to,

c.5) if another symbol was received at step c.3), then storing the symbol received at step c.3) in the new number buffer and repeating step c.3), and

c.6) if a send command was received at step c.3),

c.6.a) storing the current contents of the new number buffer in the redial buffer,

c.6.b) transmitting the contents of the new number buffer to identify the telephone number to be connected to,

c.6.c) receiving another symbol input by the user, and

c.6.d) transmitting without storing the symbol received at step c.6.c) and repeating steps c.6.c) and c.6.d) until the telephone call is terminated.

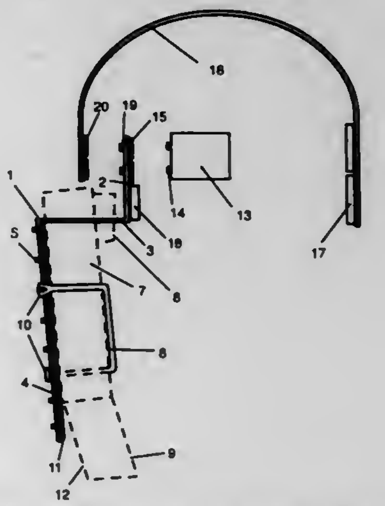
5,689,558
TELEPHONE HANDSET HOLDER

Alan G. Osgood, and Michael A. Osgood-Graver, both of 13012 SE. 164th St., Renton, Wash. 98058

Filed Mar. 25, 1996, Ser. No. 623,895

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—430 **7 Claims**



1. An apparatus for holding a handset of a corded telephone, a cordless telephone, a cellular telephone, a compact cellular tele-

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phone, or similar communication instrument by means of a rigid holder bracket and a restraining strap,

said rigid holder bracket has

(a) an upper section which is positioned against the user's head,

(b) a middle section which extends outward from the side of the user's head,

(c) a lower section which is parallel to the side of the user's head,

(d) studs on the side of the rigid holder bracket lower section opposite the user's head arranged in rows on the back of the rigid holder bracket lower section,

said restraining strap can be removeably attached to one said stud and extended around the handset and removeably attached to another said stud.

said rigid holder bracket positioned for use on either the left or right side of the user's head with the handset speaker and microphone towards the user's head and the backside of the handset towards the lower section of the rigid holder bracket, is secured to the rigid holder bracket by means of said restraining strap.

5,689,559

COPY PREVENTION METHOD AND APPARATUS OF A DIGITAL MAGNETIC RECORDING/REPRODUCING SYSTEM

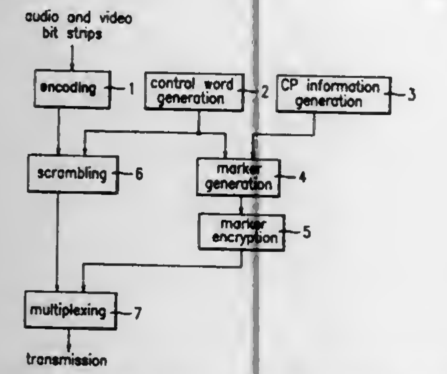
Tae Joon Park, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Dec. 1, 1995, Ser. No. 566,000

Claims priority, application Rep. of Korea, Dec. 8, 1994, 33336/1994

Int. Cl.^{6} H04N *7/16*

U.S. Cl. 380—3 **38 Claims**



1. A copy prevention method of a digital magnetic recording/reproducing system comprising:

an audio and video signal transmitting process of encrypting a marker formed by a control word for scrambling audio and video bit strips and copy prevention information for preventing an illegal copy by means of an encoding key, and multiplexing said marker with said audio and video bit strips scrambled by said control word, and

an audio and video signal receiving/recording process of detecting said marker from said transmitted bit strips, decrypting and analyzing the detected marker by means of an encoded key to determine whether copy is permitted or not, updating said detected marker to be recorded on a video tape, and generating said control word from said marker to perform a descrambling and supply the audio and video signals to be displayed on a monitor.

5,689,560

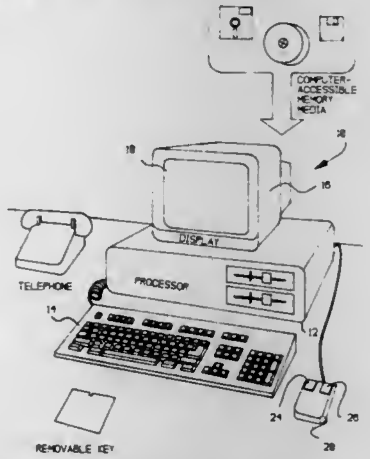
METHOD AND APPARATUS FOR ENABLING TRIAL PERIOD USE OF SOFTWARE PRODUCTS: METHOD AND APPARATUS FOR ALLOWING A TRY-AND-BUY USER INTERACTION

Thomas Edward Cooper, Louisville, and Robert Franklin Pryor, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1994, Ser. No. 235,035

Int. Cl.^{6} H04L *9/32;9/00*

U.S. Cl. 380—4 **18 Claims**



1. A method of distributing software objects from a producer to a potential user, comprising the method steps of:

providing a software object;

providing a computer-accessible memory media;

providing a file management program;

reversibly inhibiting a function of said software object;

recording said software object onto said computer-accessible memory media;

shipping said computer-accessible memory media from said producer to said potential user;

loading said file management program into a user-controlled data processing system and integrating an operation of said file management program into an operating system for said user-controlled data processing system;

reading said computer-accessible memory media with said user-controlled data processing system;

utilizing said file management program to restore said function of said software object with said user-controlled data processing system to allow access to said software object following completion of a remote authorization procedure.

5,689,561

COMPUTER-BASED TRADING CARD SYSTEM AND METHOD

Michael Pace, EMA Multimedia, Inc., 11911 San Vicente Blvd., Suite 225, Brentwood, Calif. 90049

Filed Oct. 6, 1995, Ser. No. 540,209

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—4 **29 Claims**

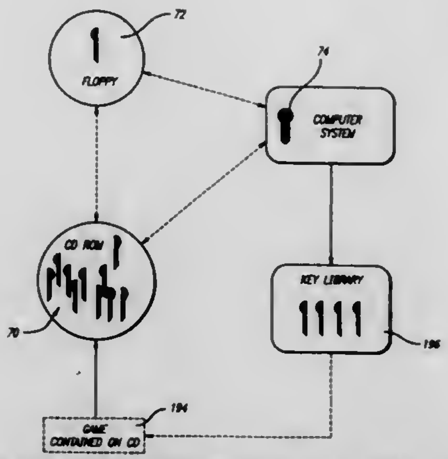
1. A computer-based collection system, comprising:

a computer system including a disk drive, a hard drive, a user input and a display system;

a program loaded into said computer system, said program including different locked first and second collection items;

a first disk having a first coded key, said first disk after being inserted into said disk drive being capable of unlocking, using said first coded key, said first collection item into said hard drive; and

a second disk having a second coded key, said second disk after being inserted into said disk drive being capable of unlocking, using said second coded key, said second collection item into said hard drive;



wherein said first coded key after unlocking said first collection piece is rendered inoperative and incapable of unlocking a corresponding first collection item in a similar program.

5,689,562

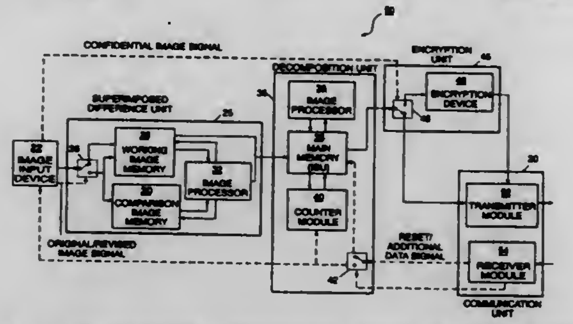
METHOD FOR TRANSMITTING SUPERIMPOSED IMAGE DATA IN A RADIO FREQUENCY COMMUNICATION SYSTEM

Amer Hassan, Cary, and David G. Matthews, Raleigh, both of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Filed Jul. 16, 1996, Ser. No. 682,044

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—9 **34 Claims**



34. A multiresolution transmission system for superimposed image data, comprising:

a) an image transmitting unit having memory for storing an original image and a subsequent revised image;

b) an image comparison means in the image transmitting unit for comparing the original image with the subsequent revised image and creating a difference image comprising the differences between the original image and the revised image;

c) an image transmitting unit having memory for storing a decomposed image in information blocks;

d) an image decomposition means for decomposing an image into a base image and one or more image details which are sequentially combined with the base image to create details images of increasingly higher resolution;

e) an image receiving unit including an image display;

f) communication means linking the image transmitting unit with the image receiving unit;

g) request means for sending image data requests from the image receiving unit to the image transmitting unit, with the image transmitting unit being responsive to the image data requests to send image data to the image receiving unit in discrete units beginning with the base image and progressing incrementally through the image details until the last image detail as reached;

h) an image processing means in the image receiving unit for combining the base image with the image details to create detail images of increasingly higher resolution with the addition of each image detail;

i) a reset means in the image receiving unit for terminating an image transmission sequence and notifying the image transmitting unit of a ready status for receiving another image; and

j) an image processing means in the image receiving unit for combining the difference image with original image to recreate the revised image.

5,689,563

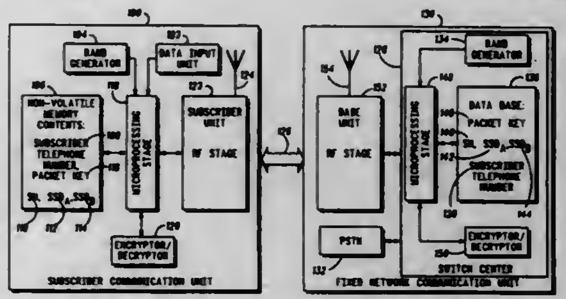
METHOD AND APPARATUS FOR EFFICIENT REAL-TIME AUTHENTICATION AND ENCRYPTION IN A COMMUNICATION SYSTEM

Daniel Peter Brown, Elmhurst; Louis David Finkelstein, Wheeling, and Jeffrey Charles Smolinske, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 84,664, Jun. 29, 1993, Pat. No. 5,455,863. This application Jun. 1, 1995, Ser. No. 457,212

Int. Cl.^{6} H04L *9/32;9/00*

U.S. Cl. 380—23 **15 Claims**



1. A subscriber unit which generates authentication messages for authenticating communications with a communication unit of a communication system, comprising:

(a) memory means for maintaining instant-specific information;

(b) processor means for generating an authentication message as a function of the instant-specific information; and

(c) transmitter means for transmitting the authentication message to the communication unit.

5,689,564

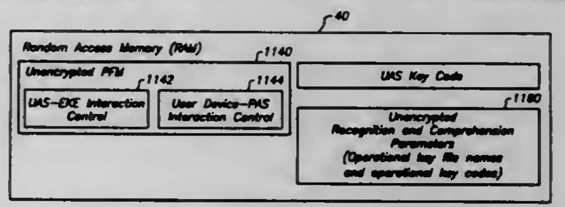
PERSONAL ACCESS MANAGEMENT SYSTEM

William Cedric Johnson, Los Angeles, and Donald L. Marx, Redondo Beach, both of Calif., assignors to ETA Technologies Corporation, Los Angeles, Calif.

Filed Feb. 13, 1995, Ser. No. 388,220

Int. Cl.^{6} H04L *9/32*

U.S. Cl. 380—25 **103 Claims**


40
Random Access Memory (RAM)
1140
Unencrypted PFM
1142
1144
UAS-EXE Interaction Control
User Device—PAS Interaction Control
UAS Key Code
1180
Unencrypted Recognition and Comprehension Parameters (Operational key file names and operational key codes)

1. In a sending device having a set of parameters stored therein including a device file name which uniquely identifies the sending device to a receiving device and a set of identification information, a method for exchanging information with the receiving device, comprising the steps of:

generating a message;

retrieving said device file name and said set of identification information;

deriving a first key code from said parameters;

encrypting said identification information and said message using said first key code as an encryption key to derive a set of encrypted identification information and an encrypted

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sending said device file name, said encrypted identification information, and said encrypted message to the receiving device, wherein said device file name is sent to the receiving device in unencrypted form.

5,689,565

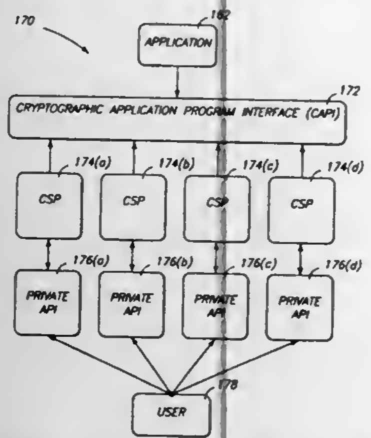
CRYPTOGRAPHY SYSTEM AND METHOD FOR PROVIDING CRYPTOGRAPHIC SERVICES FOR A COMPUTER APPLICATION

Terrence R. Spies, Redmond; Jeffrey F. Spelman, Duvall, and Daniel R. Simon, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 29, 1995, Ser. No. 496,801

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—25 **49 Claims**



1. A cryptography system to support an application requiring cryptographic functions, the cryptography system comprising:

a cryptographic application program interface (CAPI) to interface with the application and handle its requests for a cryptographic function;

at least one cryptography service provider (CSP) independent from, but dynamically accessible by, the CAPI;

the CSP providing the cryptographic function requested by the application, the CSP also managing and protecting at least one encryption key used in the cryptographic function to prevent exposure of the encryption key in a non-encrypted form to the CAPI and application; and

a private application program interface (PAPI) to interface the CSP with a user, the PAPI enabling the user to observe, confirm, or reject the requested cryptographic function.

5,689,566

NETWORK WITH SECURE COMMUNICATIONS SESSIONS

Minhtam C. Nguyen, 10018 Lexington Estates Blvd., Boca Raton, Fla. 33428

Filed Oct. 24, 1995, Ser. No. 547,346

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—25 **20 Claims**

1. A bi-directional security system for a network, comprising:

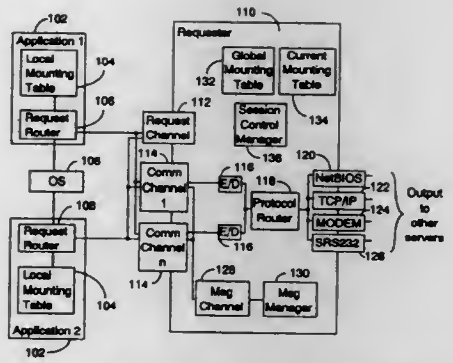
at least one client, the client further comprising:

client communication means to communicate with at least one server;

packet reception means to receive transmitted packet data from the server;

means to generate and transmit a first packet to the server, at least a portion of the first packet having a first packet header containing client identifying information;

means to encrypt at least a portion of the client identifying information in the first packet header prior to transmission;



means to decrypt at least a portion of the client authenticating information in a second packet header and to determine if the second packet is from the server, the client further having means to terminate the communication if the second packet is from an invalid server;

means to generate and transmit a third packet to the server, at least a portion the third packet having a third packet header containing session information; and

means to encrypt at least a portion of the session information in the third packet header prior to transmission; and

the server further comprising:

server communication means to communicate with the client;

packet reception means to receive transmitted packet data from the client;

means to decrypt at least a portion of the client identifying information in the first packet header and to determine if the first packet is from a valid client, the server further having means to terminate the communication if the first packet is from an invalid client;

means to generate and transmit a second packet to the client in response to the first packet, at least a portion the second packet having the second packet header containing client authenticating information;

means to encrypt at least a portion of the client authenticating information in the second packet header prior to transmission; and

means to decrypt at least a portion of the session information in the third packet header;

whereby, the client and the server each verify the validity of the other by transmitting encrypted identifying information to one another.

5,689,567

ELECTRONIC SIGNATURE METHOD AND APPARATUS

Hiroshi Miyauchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 364,042, Dec. 27, 1994, abandoned. This application Nov. 1, 1996, Ser. No. 742,446

Claims priority, application Japan, Dec. 27, 1993, 5-330558

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—25 **14 Claims**

1. An electronic signature method having an encryption step and a verification step, wherein said encryption step comprises the steps of:

(a) inputting a signature image of a signer, a signature object document to be signed, and secret information of the signer;

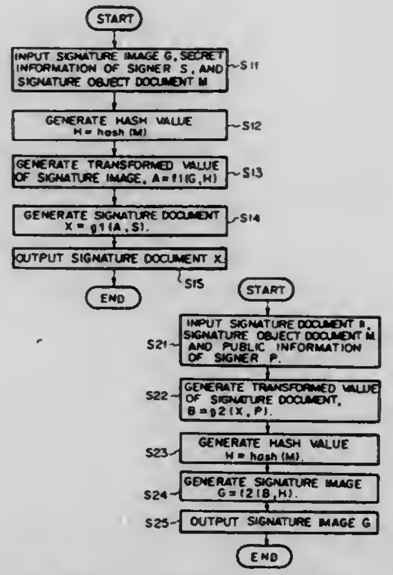
(b) hashing the signature object document to generate a hash value;

(c) encrypting the signature image with the hash value generated by said hashing step (b); and

(d) encrypting the encrypted signature image in accordance with the secret information to generate a signature document;

and wherein said verification step comprises the steps of:

(e) inputting the signature document, the signature object document, and public information of the signer;


START
INPUT SIGNATURE IMAGE G, SECRET INFORMATION OF SIGNER S, AND SIGNATURE OBJECT DOCUMENT M
S11
GENERATE HASH VALUE H = hash (M)
S12
GENERATE TRANSFORMED VALUE OF SIGNATURE IMAGE, A = f1(G,H)
S13
GENERATE SIGNATURE DOCUMENT X = g1(A,S)
S14
OUTPUT SIGNATURE DOCUMENT X
S15
END
START
INPUT SIGNATURE DOCUMENT X, SIGNATURE OBJECT DOCUMENT M AND PUBLIC INFORMATION OF SIGNER P
S21
GENERATE TRANSFORMED VALUE OF SIGNATURE DOCUMENT, B = g2(X,P)
S22
GENERATE HASH VALUE H = hash (M)
S23
GENERATE SIGNATURE IMAGE G = f2(B,H)
S24
OUTPUT SIGNATURE IMAGE G
S25
END

(f) decrypting the signature document to generate a decrypted signature document in accordance with the public information;

(g) hashing the signature object document to generate a hash value; and

(h) decrypting the decrypted signature document with the hash value generated by said hashing step (g) to generate a restored signature image.

5,689,568

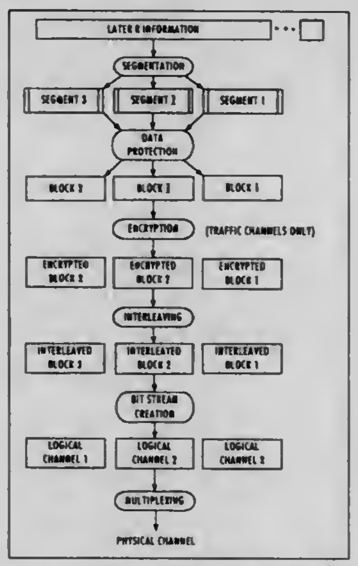
MEDIUM ACCESS CONTROL FOR A MOBILE SATELLITE SYSTEM

Enrique Laborde, Gaithersburg, Md., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Jun. 29, 1995, Ser. No. 496,327

Int. Cl.^{6} H04B *7/204*

U.S. Cl. 380—49 **14 Claims**



1. A method of transferring communication data across an air interface between a satellite and a ground terminal, comprising the steps of:

segmenting said communication data into uniform partitions;

protecting said communication data against corruption;

encrypting said communication data for confidentiality;

interleaving said communication data to randomize errors; and

multiplexing said communication data with control data into a number of superframes, each of which includes a plurality of frames having a multiplicity of time slots, wherein the control data is located within a particular one of the time slots of each frame and the communication data is located in a different one of the time slots of each frame.

5,689,569

METHOD AND DEVICE FOR THE UTILIZATION OF ELECTRICAL SIGNALS

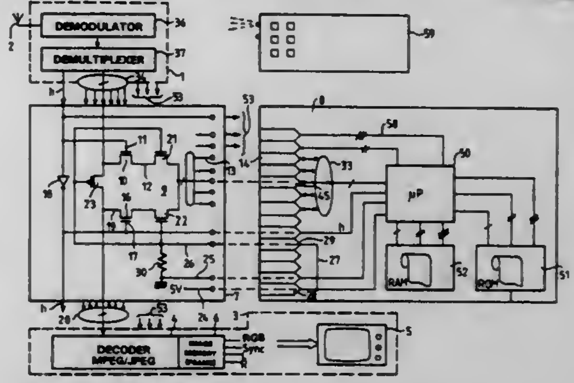
Patrice Peyret, Fuveau, France, assignor to Gemplus Card International, Gemenos, France

Continuation of Ser. No. 233,644, Apr. 26, 1994, Pat. No. 5,511,125. This application Oct. 23, 1995, Ser. No. 546,638

Claims priority, application France, Apr. 28, 1993, 93 05022

Int. Cl.^{6} H04L *9/00;* **H04N** *7/167*

U.S. Cl. 380—49 **15 Claims**



1. A device comprising:

a receiver, the receiver receiving a digital electrical signal;

a utilization device;

an auxiliary circuit;

a clock signal generator, the generator generating a clock signal having a plurality of clock cycles, each of the plurality of clock cycles having a first half-cycle and a second half-cycle; and

a communications interface, the communications interface being coupled to the receiver, to the utilization device, and to the auxiliary circuit, and the communications interface including a demultiplexer, the demultiplexer relaying the digital electrical signal from the receiver to the auxiliary circuit in real time and during the first half-cycle of each of the plurality of clock cycles, and the demultiplexer relaying a processed signal corresponding to the digital electrical signal from the auxiliary circuit to the utilization device in real time and during the second half-cycle of each of the plurality of clock cycles.

5,689,570

SOUND REPRODUCING ARRAY PROCESSOR SYSTEM

Stephen Francis Taylor, Pacific Palisades, Calif., assignor to Taylor Group of Companies, Inc., Santa Monica, Calif.

Division of Ser. No. 166,463, Dec. 14, 1993, Pat. No. 5,517,570. This application Feb. 27, 1996, Ser. No. 607,830

Int. Cl.^{6} H04S *5/02*

U.S. Cl. 381—18 **21 Claims**

1. A video game system, comprising:

(a) a sound bubble comprising a deformable two-dimensional sound reproducing surface configured as an enclosure, wherein the surface is comprised of a plurality of sound pixels, the sound pixels comprise addressable transducers for generating acoustical energy, and the sound pixels are arranged in an array having rows and columns so as to support propagation and movement of the acoustical energy along the rows and columns of the array; and

(b) a computer, coupled to the sound bubble, a monitor and a data storage means, for interacting with an operator under the control of a video game program, wherein the means for interacting comprises means for retrieving at least one audio

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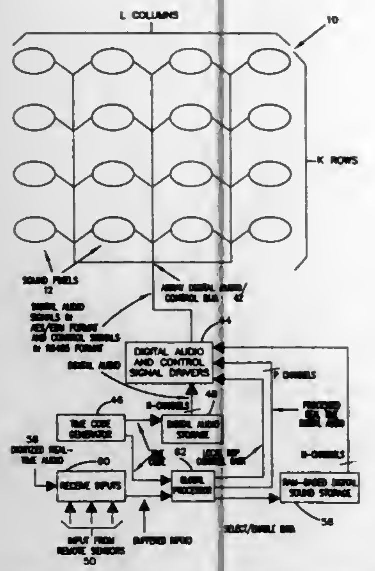


data stream from the data storage means for each of the sound pixels, means for transmitting each of the audio data streams to a specific sound pixel in the sound bubble, and means for modifying the audio data streams in response to the input from the operator, wherein the sound pixels are synchronized and interlinked by the audio data streams to reproduce a time line for the acoustical energy source radiating and moving through the rows and columns of the array.

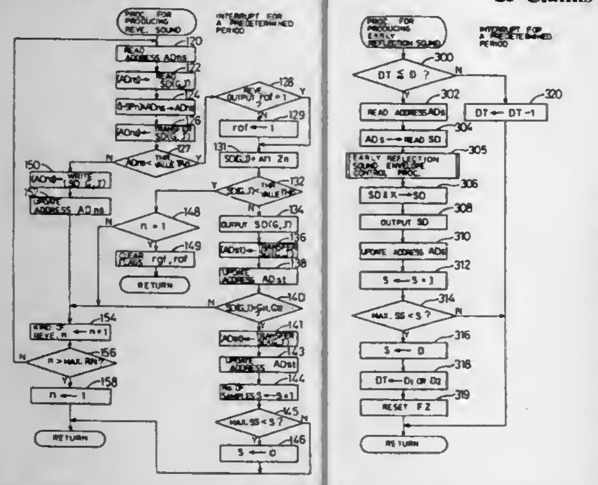
5,689,571
DEVICE FOR PRODUCING REVERBERATION SOUND
Mineo Kitamura, Hamamatsu, Japan, assignor to Kawai Musical Inst. Mfg. Co., Ltd., Hamamatsu, Japan

Filed Dec. 8, 1995, Ser. No. 569,605

Claims priority, application Japan, Dec. 8, 1994, 6-305249; Dec. 8, 1994, 6-305250

Int. Cl.^{6} H03G *3/00*

U.S. Cl. 381—63 **25 Claims**


PROC. FOR PRODUCING REVE. SOUND
INTERRUPT FOR A PREDETERMINED PERIOD
120
READ ADDRESS ADns
122
124
128
129
RETURN
158
146
PROC. FOR PRODUCING EARLY REFLECTION SOUND
INTERRUPT FOR A PREDETERMINED PERIOD
300
DT ≦ 0 ?
302
320
DT ← DT −1
READ ADDRESS ADs
318
DT ← D1 OR D2
319
RESET F Z
RETURN

1. A device for producing reverberation sound comprising:

at least one early reflection sound producing means for delaying externally provided sound data and controlling amplitude levels of the sound data to produce early reflection sounds;

at least one early reflection sound control means for controlling said at least one early reflection sound producing means such that early reflection sounds are produced for every one sound data;

at least one subsequent reverberation sound producing means for delaying the sound data and controlling amplitude level of the sound data to produce subsequent reverberation sounds, the delaying by said at least one subsequent reverberation sound producing means being different from the delaying by said at least one early reflection sound producing means, and control of the amplitude level by said at least one subsequent reverberation sound producing means being different from control of the amplitude level by said at least one early reflection sound producing means; and

at least one subsequent reverberation sound control means for controlling said at least one subsequent reverberation sound producing means such that plural subsequent reverberation sounds are produced for every one sound data,

said at least one subsequent reverberation sound producing means having at least one sound storage means for storing the sound data for each sample, the sound data being transferred within said at least one sound storage means in accordance with a predetermined delay speed coefficient.

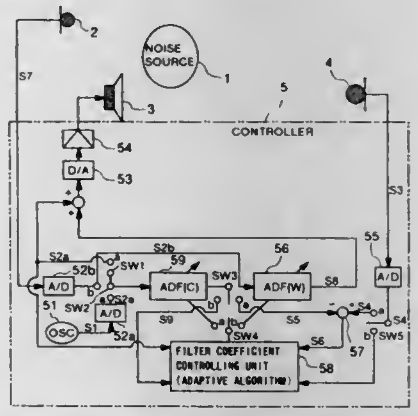
5,689,572
METHOD OF ACTIVELY CONTROLLING NOISE, AND APPARATUS THEREOF
Katsuo Ohki; Shinichi Shimode, both of Ibaraki-ken; Yukiji Iwase, Ushiku; Osamu Sekiguchi, Ryugasaki; Masanori Watanabe, Ibaraki-ken; Takahiro Daikoku, Ushiku; Tamotsu Tsukaguchi, Hiratsuka, and Shigeru Koizumi, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1994, Ser. No. 352,230

Claims priority, application Japan, Dec. 8, 1993, 5-308022; Dec. 17, 1993, 5-317563

Int. Cl.^{6} H03B *29/00*

U.S. Cl. 381—71.3 **44 Claims**



1. For use in an active noise-reduction controlling apparatus including a reference sensor for outputting a reference signal corresponding to information about a noise source; a noise-reduction error sensor for detecting a noise-reduction condition; an adding acoustic wave source for producing an acoustic wave having the same amplitude as that of an acoustic wave detected by said noise-reduction error sensor and having a phase opposite to that of said acoustic wave detected by said noise-reduction error sensor; a first adaptive digital filter for processing said reference signal to output a control signal for said adding acoustic wave source; a second adaptive digital filter for setting a predicted value of a transfer function between an input signal of said adding acoustic wave source and an output signal of said noise-reduction error sensor; and filter coefficient controlling means for optimizing a coefficient of said first adaptive digital filter based on said predicted value of the transfer function and the output signal of said noise-reduction error sensor, an active noise-reduction controlling method comprising the steps of:

(a) detecting an environmental change; and

(b) correcting said predicted value of the transfer function when the detected environmental change is greater than a predetermined value,

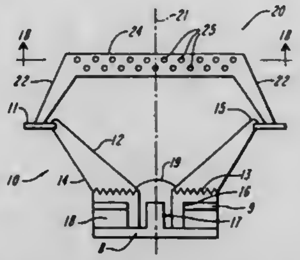
wherein step (a) includes obtaining a difference between coefficient values of said first adaptive digital filter which are detected during a noise-reduction operation.

5,689,573
FREQUENCY-DEPENDENT AMPLITUDE MODIFICATION DEVICES FOR ACOUSTIC SOURCES
P.K.G. Jones, Londonderry, N.H., assignor to Boston Acoustics, Inc., Lynnfield, Mass.

Filed Jan. 7, 1992, Ser. No. 817,524

Int. Cl.^{6} H04R *75/00*

U.S. Cl. 381—154 **19 Claims**



1. Apparatus for modifying the output response of an acoustic device by correcting for amplitude variations occurring in at least one narrow frequency band of the frequency response of the device, said apparatus comprising:

means for defining at least one elongated slot having an open edge, each slot corresponding to and being dimensioned so as to correct for said distortion, and each slot having a depth equal to approximately one-quarter of the wavelength of a frequency within said frequency band; and

means for supporting said at least one elongated slot such that the axis of each slot is disposed at an angle to the direction of propagation of acoustic signals so that the open edge of said slot intercepts the acoustic signals as they are generated by said device, said means for supporting including a bridge having side arms connected to a center slotted section at opposite ends thereof, wherein said center slotted section is formed with at least one slot so as to form said means for defining said at least one slot, and

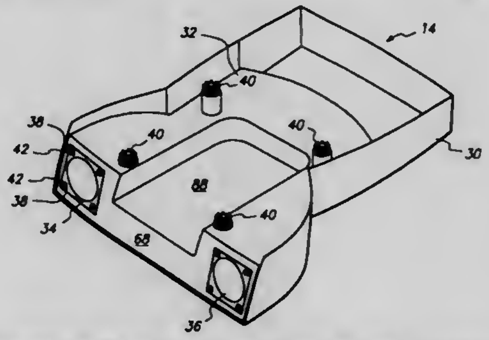
wherein said side arms are substantially equal in length and each is disposed at an oblique angle with respect to said center slotted section.

5,689,574
INTEGRAL SOUND MODULE FOR A MODULAR MONITOR
Douglas L. Heirich, Redwood City, and Roy Riccomini, Campbell, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 29, 1995, Ser. No. 412,704

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—158 **18 Claims**



1. An integrated audio and visual output system comprising:

a display device within a housing having a bottom;

an audio unit having a top and a front, the front defining an opening;

a first isolation means that absorbs vibrations, the first isolation means positioned between the top of the audio unit and the bottom of the housing, and connected to at least one adaptation in the top of the audio unit and to at least one adaptation in the bottom of the housing, for securing the audio unit to the housing while preventing vibration transfer into the display device; and

a speaker positioned in the opening of the audio unit, the speaker being mounted to the audio unit by a second isolation means that absorbs vibrations.

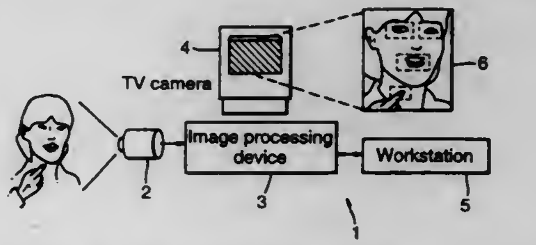
5,689,575
METHOD AND APPARATUS FOR PROCESSING IMAGES OF FACIAL EXPRESSIONS
Hiroshi Sako, County Dublin; Anthony Smith, Dublin, both of Ireland, and Mark Whitehouse, West Sussex, England, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 21, 1994, Ser. No. 346,164

Claims priority, application Ireland, Nov. 22, 1993, 93 0889

Int. Cl.^{6} G06K *9/00;9/46;9/54*

U.S. Cl. 382—118 **19 Claims**



1. An image processing apparatus comprising:

means for receiving a color facial image data stream in digital format;

a plurality of image data processing circuits interconnected for real time processing the image data in a pipelining manner to provide a real time output, the circuits comprising:

means for monitoring color values in the image data to identify image data pixels representing facial parts, and monitoring means comprising means for carrying out three-dimensional color histogram matching to monitor frequency of occurrence of pixel values in the image data and a backprojection means for comparing a generated histogram with a template histogram generated off-line, and

means for determining states of the facial parts by monitoring positional coordinates of the identified pixels, said means for determining further comprising a counter for determining the area of the facial part or parts; and

an output device outputting the determined facial part state data in real time.

5,689,576
SURFACE FEATURE MAPPING USING HIGH RESOLUTION C-SCAN ULTRASONOGRAPHY
John K. Schneider, Snyder, N.Y., and William E. Glenn, Ft. Lauderdale, Fla., assignors to Ultra-Scan Corporation, Amherst, N.Y.

Continuation of Ser. No. 3,800, Jan. 13, 1993, abandoned, which is a division of Ser. No. 610,429, Nov. 7, 1990, Pat. No. 5,224,174. This application Jul. 21, 1994, Ser. No. 278,393

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—124 **8 Claims**

1. A fingerprint imaging method comprising the steps of:

a. placing a live finger upon a scannable surface of a body of material having an acoustic impedance substantially matching that of the skin of the finger for imaging the same over the area of an image plane;

b. scanning the portion of the finger on said surface by focusing and directing an ultrasonic energy beam onto said surface and in a direction always substantially perpendicular to said image plane so as to provide a minimum spot size at the focal point

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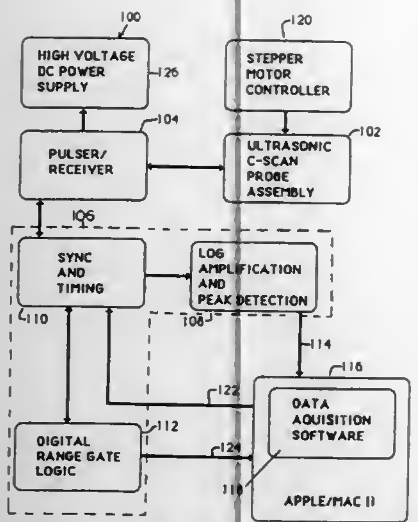


of said beam to provide maximum lateral resolution imaging in a plane substantially perpendicular to the direction of said beam;

c. receiving ultrasonic energy returned from said finger portion to capture an electronic image of the pattern of ridges and valleys of the fingerprint; and

d. said step of scanning including propagating the ultrasonic energy through a liquid medium providing relatively low attenuation at the frequency of the ultrasonic energy.

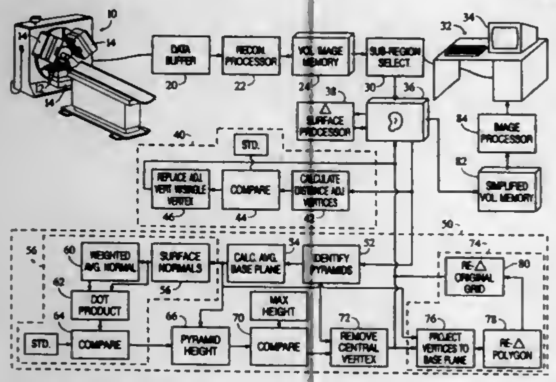
5,689,577
PROCEDURE FOR THE SIMPLIFICATION OF TRIANGULAR SURFACE MESHES FOR MORE EFFICIENT PROCESSING

Louis K. Arata, Mentor, Ohio, assignor to Picker International, Inc., Highland Heights, Ohio

Filed Oct. 14, 1994, Ser. No. 324,419

Int. Cl.^{6} G06T *17/20*

U.S. Cl. 382—128 **12 Claims**



1. In a medical diagnostic imaging apparatus which includes a patient examination apparatus for non-invasively examining an internal volumetric region of a patient and generating views of electronic data indicative thereof, a reconstruction processor for reconstructing the views into a volumetric image representation which is stored in an image memory, a triangular surface processor for replacing a surface of a selected volumetric region of the volumetric image representation in the image memory with a triangular mesh, an image processor for comparing (i) a viewing direction, (ii) an illumination direction and (iii) a surface normal of each viewable triangle of the triangular mesh to generate a corresponding image value, and an image display device for converting the image values into a corresponding human-readable image, the improvement comprising:

a vertex merging processor which collapses long, narrow triangles to lines such that long, narrow triangles of the triangular mesh that have a dimension smaller than a preselected minimum are collapsed into a straight line with their areas being split and merged into adjoining triangles; and

a vertex removal processor for removing a vertex shared by a plurality of triangles which are within a preselected tolerance of co-planar and retriangulating a polygon defined by the remaining peripheral vertices of the triangles with a smaller number of triangles, the vertex removal processor including:

a means for identifying a vertex common to a group of triangles which define a pyramid;

a means for determining an average plane of the vertices of the pyramid;

a means for comparing deviation among the surface normal of each viewable triangle of the pyramid for a preselected maximum deviation;

a means for determining a distance between the average plane and the common vertex to determine a height of the pyramid; and

a means for comparing the pyramid height with a preselected maximum pyramid height.

5,689,578
POLARIZED WAVE HOLDING OPTICAL FIBER, PRODUCTION METHOD THEREFOR, CONNECTION METHOD THEREFOR, OPTICAL AMPLIFIER, LASER OSCILLATOR AND POLARIZED WAVE HOLDING OPTICAL FIBER COUPLER

Ryozo Yamauchi; Kuniharu Himeno, both of Sakura; Minoru Sawada, Yachiyo; Fumio Suzuki, Sanbu-gun; Kazuhiko Aikawa, Sakura; Tetsuo Nozawa, Sakura, and Shigefumi Yamasaki, Sakura, all of Japan, assignors to Fujikura ltd., Tokyo, Japan

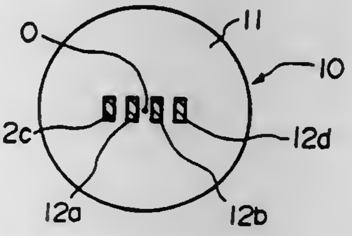
PCT No. PCT/JP94/00300, § 371 Date Oct. 25, 1994, § 102(e) Date Oct. 25, 1994, PCT Pub. No. WO94/17714, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 24, 1994, Ser. No. 318,848

Claims priority, application Japan, Feb. 25, 1993, 5-037102; Jun. 30, 1993, 5-162934; Jul. 1, 1993, 5-163583; Jul. 23, 1993, 5-183081; Jul. 23, 1993, 5-183082; Jul. 23, 1993, 5-183083

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—123 **18 Claims**



1. A polarization-maintaining optical fiber wherein a plurality of core portions each of which has a high refractive index are provided substantially longitudinally in parallel with a center axis of said optical fiber, and substantially in an array with the center axis in the cross section of said optical fiber, and wherein said core portions cooperate to propagate a single fundamental mode.

5,689,579
RULE-BASED CIRCUIT, METHOD AND SYSTEM FOR PERFORMING ITEM LEVEL RECONCILIATION

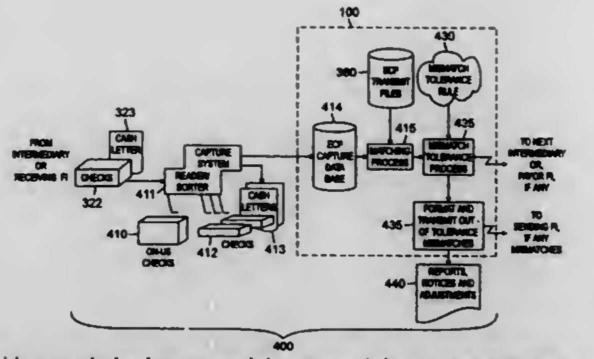
Stanley M. Josephson, Dallas, Tex., assignor to J.D. Carreker and Associates, Inc., Dallas, Tex.

Filed Jan. 17, 1996, Ser. No. 587,936

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—137 **30 Claims**

1. A reconciling circuit for use in electronic check processing for reconciling a first database with a second database, said first database containing first item data arranged in records and fields,


100
430
MISMATCH TOLERANCE RULE
380
ECP TRANSMIT FILES
414
ECP CAPTURE DATA BASE
415
MATCHING PROCESS
425
MISMATCH TOLERANCE PROCESS
323
CASH LETTER
FROM INTERMEDIARY OR RECEIVING FI
CHECKS
322
411
CAPTURE SYSTEM
READER SORTER
CASH LETTERS
410
ON-US CHECKS
412
CHECKS
413
TO NEXT INTERMEDIARY OR PAYOR FI, IF ANY
435
FORMAT AND TRANSMIT OUT OF TOLERANCE MISMATCHES
TO SENDING FI, IF ANY MISMATCHES
440
REPORTS, NOTICES AND ADJUSTMENTS
400

said second database containing second item data arranged in records and fields, said reconciling circuit comprising:

a matching circuit for comparing said records of said first database with said records of said second database, said matching circuit placing a designation on mismatching ones of said records of said first and second databases;

at least one field mismatch tolerance rule indicating, by field, an allowed extent of mismatch; and

a mismatch tolerance circuit for applying said at least one field mismatch tolerance rule to said fields of said mismatching ones, said mismatch tolerance circuit removing said designation when said fields of said mismatching ones fall within said mismatch tolerance rules.

5,689,580
PRINTED LETTER INSPECTING APPARATUS FOR SOLID OBJECTS

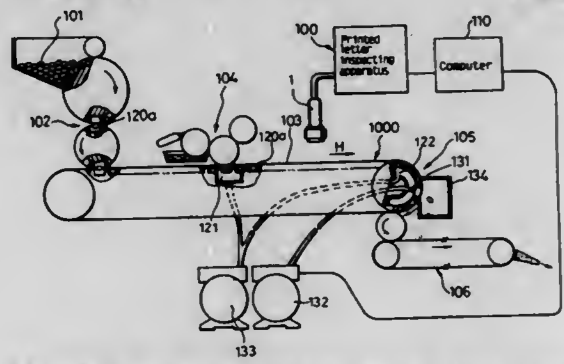
Taizo Yamamoto, Osaka; Hirokazu Konishi, Sakurai; Yoshihisa Kawaguchi, Kashihara, and Akira Nagao, Tenri, all of Japan, assignors to Japan Elanco Company Limited, Osaka, Japan

Continuation of Ser. No. 262,419, Jun. 20, 1994, abandoned. This application Nov. 12, 1996, Ser. No. 747,904

Claims priority, application Japan, Jun. 21, 1993, 5-149430

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—143 **4 Claims**



1. A printed letter inspecting apparatus for solid objects comprising:

surface scanning means disposed above a part of a carrier apparatus which horizontally carries solid objects placed on a plane, said surface scanning means scanning a surface of said solid objects in synchronism with a predetermined clock in one direction which is perpendicular to a carrying direction of said carrier apparatus at a sufficiently fast rate in comparison with speed of carrying of said carrier, said surface scanning means issuing an analog signal in synchronism with said predetermined clock,

analog/digital conversion means for converting said analog signal from said surface scanning means into a digital signal in synchronism with said predetermined clock,

at least one differential and coding means having a RAM for issuing an absolute value of a difference between one digital signal being obtained by an ongoing scanning operation of said surface scanning means, and another digital signal, which is stored in a memory, being obtained from said analog/digital conversion in synchronism with said predetermined clock, said differential and coding means comparing said absolute value of said difference with a first predetermined value and issuing a coded signal in synchronism with said predetermined clock when said absolute value of said difference is greater than said predetermined value, and

judging means each comprising an output circuit, a match number count circuit, an all-number count circuit and a total judging circuit;

said output circuit for judging a beginning position of said printed letters based on a counting number of said coded signal, and for issuing preliminarily stored coded signals of a letter pattern in synchronism with a next scanning of said surface scanning means when said counting number of said coded signal reaches a fourth predetermined value,

said match number count circuit for judging whether said printed letters are correctly printed to said solid objects by counting a match number between said coded signal from said differential and coding means and said preliminary stored coded signals from said output circuit, and for issuing an output signal in synchronism with said predetermined clock when said match number is greater than a fifth predetermined value,

said all-number count circuit for judging whether there is slippage of printed letters or ink stains on said solid objects by counting a number of said coded signal from said differential and coding means, and for issuing an output signal in synchronism with said predetermined clock when said number of said coded signal is smaller than a sixth predetermined value, and

said total judging circuit for judging whether said printed letters are defectively printed based on said output signals of said match number count circuit and said all-number count circuit, and for issuing an output signal,

the analog/digital conversion means, the differential and coding means and the judging means operating independent of a commonly linked processor.

5,689,581
METHODS OF INSPECTION

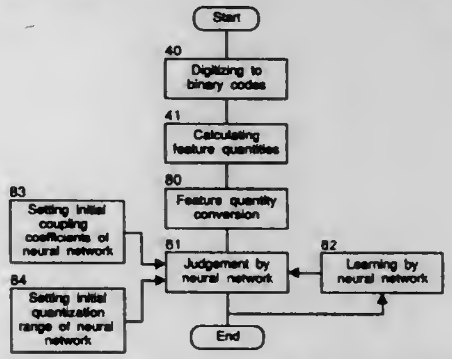
Masaya Nakao, Moriguchi; Susumu Maruno, Osaka, and Yasuharu Shimeki, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 27, 1995, Ser. No. 395,114

Claims priority, application Japan, Feb. 28, 1994, 6-029600

Int. Cl.^{6} G06K *9/62*

U.S. Cl. 382—156 **6 Claims**


Start
40
Digitizing to binary codes
41
Calculating feature quantities
80
Feature quantity conversion
83
Setting initial coupling coefficients of neural network
81
Judgement by neural network
82
Learning by neural network
84
Setting initial quantization range of neural network
End

1. An inspection method comprising steps of picking up an image of an object to be inspected by a visual sensor to output a video signal;

digitizing said video signal to obtain digital image data;

calculating feature quantities based on said digital image data;

inputting said feature quantities into a neural network comprising an input neuron, which is an adaptive propagation and

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vector quantization neuron, a plurality of intermediate neurons, each uniquely corresponding to one of quantization ranges present in said input neuron and a plurality of output neurons the number of which is equal to that of outputs to be needed;

quantizing said feature quantities based on predetermined quantization ranges in said input neuron,

calculating coupling coefficients between said input neuron and each of said plurality of intermediate neurons based on said feature quantities quantized in accordance with said predetermined quantization ranges to output a first output signal determined by said coupling coefficients to said plurality of intermediate neurons,

obtaining a second output signal in each intermediate neuron by multiplying said input first output signal with an intermediate coupling coefficient between said each intermediate neuron and one of said plurality of output neurons which has been determined by learning to output said second output signal to the corresponding output neuron,

converting said second output signals input from respective intermediate neurons into judging data using a function of said second output signals as variables in each of said plurality of output neurons; and

judging whether said object is nondefective or defective by comparing judging data output from said plurality of output neurons with each other wherein said intermediate coupling coefficients are set so that any object is judged to be defective before starting learning and are fitted so that if an object is nondefective then it is judged to be nondefective by performing learning with use of nondefective objects.

5,689,582

IMAGE PROCESSING APPARATUS HAVING IMAGE REGION DESIGNATING FUNCTION

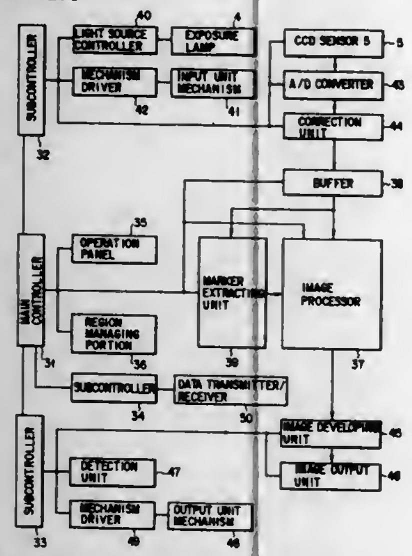
Naoya Murakami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1996, Ser. No. 593,947

Claims priority, application Japan, Feb. 3, 1995, 7-017184

Int. Cl.^{6} H04N *1/40;1/38;1/387;* **G06K** *9/34*

U.S. Cl. 382—176 **8 Claims**



1. An image processing apparatus comprising:

means for reading an original image as multi-value image data in units of a pixel;

means for converting the multi-value image data supplied from said reading means into data corresponding to a high density and an intermediate density;

means for preparing a predetermined number of adjacent pixels of data supplied from said converting means, the pixels of one unit including a target pixel;

first determining means for determining that the target pixel is an intermediate-density pixel positioned within an intermediate-density portion in the original image, when the target pixel has intermediate density and pixels adjacent to the target pixel do not have high density; and

second determining means for determining that the target pixel is an intermediate-density pixel positioned in an edge portion of the original image having high density, when the target pixel has intermediate density and the pixels adjacent to the target pixel have high density.

5,689,583

CHARACTER RECOGNITION APPARATUS USING A KEYWORD

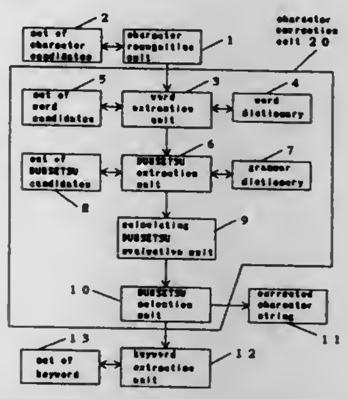
Hisao Niwa, Osaka; Kazuhiro Kayashima, Hirakata; Yasuharu Shimeki, Suita, and Hidetsugu Maekawa, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 295,351, Aug. 22, 1994, abandoned, which is a continuation of Ser. No. 9,013, Jan. 26, 1993, abandoned. This application May 23, 1996, Ser. No. 652,845

Claims priority, application Japan, Jan. 30, 1992, 4-014611; Jun. 18, 1992, 4-159842

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—181 **7 Claims**



1. A character recognition apparatus comprising:

a character recognition unit for scanning a document and outputting character candidates corresponding to the characters in a scanned line of characters of the document;

a correct character string selection unit for selecting a character string from character candidates output from said character recognition unit to provide a selected character string including plural word candidates, said string selection unit selecting a character string such that word candidates within the string are consistent with a vocabulary dictionary and a grammar dictionary; and

a keyword extraction unit for extracting keywords from a character string selected by said correct character selection unit based on occurrence of a certain word in the subject matter of the document scanned by said character recognition unit, wherein

said keyword extraction unit extracts a keyword according to both the frequency of appearance of the certain word in a character string selected by said selection unit and the frequency of appearance of the certain word in sentences within the document.

5,689,584

METHOD OF AND APPARATUS FOR PATTERN RECOGNITION AND METHOD OF CREATING PATTERN RECOGNITION DICTIONARY

Takao Kobayashi, Asaka, Japan, assignor to Bird Systems Research Institute, Inc., Tokyo, Japan

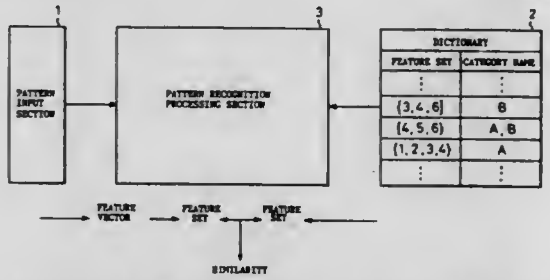
PCT No. PCT/JP94/02160, § 371 Date Aug. 8, 1995, § 102(e) Date Aug. 8, 1995, PCT Pub. No. WO95/17734, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 20, 1994, Ser. No. 500,995

Claims priority, appilcation Japan, Dec. 21, 1993, 5-344690

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—190 **9 Claims**



1. A method of pattern recognition, comprising the steps of:

(a) creating N subregions by dividing a region in which a pattern being an object of recognition is pictured into N blocks and numbering the N blocks so that each block has a corresponding subregion number;

(b) constructing a feature vector having N features as elements by calculating a feature for each of the N subregions in accordance with a prescribed criterion;

(c) constructing a total of (N−1) feature sets by retrieving the largest or smallest of the N elements of the feature vector to construct a first feature set consisting of one subregion number corresponding to the retrieved element, then retrieving the two largest or two smallest elements to construct a second feature set consisting of a combination of two subregion numbers corresponding to the two retrieved elements, and continuing such a retrieval and construction pattern until constructing the (N−1)th feature set consisting of a combination of (N−1) subregion numbers; and

(d) by reference to a dictionary in which feature sets obtained by performing the steps (a) to (c) on various kinds of model patterns are prerecorded along with category names of the model patterns, obtaining similarities between the feature sets of the input pattern and the feature sets stored in the dictionary in corresponding relationship to the category names, and determining a category name that provides the greatest similarity, as the category name of the input pattern;

wherein dividing the region in step (a) means dividing the region into N subregions of equal area size, and the feature calculated in step (b) is based on the sum of the values of dots in each individual subregion.

5,689,585

METHOD FOR ALIGNING A TEXT IMAGE TO A TRANSCRIPTION OF THE IMAGE

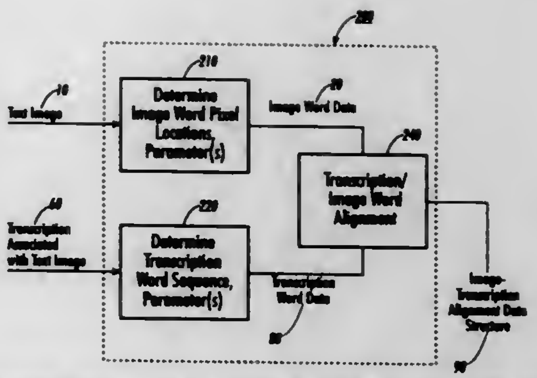
Dan S. Bloomberg; Leslie T. Niles, both of Palo Alto; Gary E. Kopec, Belmont, and Philip Andrew Chou, Menlo Park, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1995, Ser. No. 431,004

Int. Cl.^{6} G06K *9/72*

U.S. Cl. 382—229 **15 Claims**

1. A method of operating a machine to align image words in a text image to transcription words in a transcription associated with the text image; the machine including a processor and a memory device for storing data; the data stored in the memory device including instruction data the processor executes to operate the machine; the processor being connected to the memory device for accessing the data stored therein; the method comprising:


200
210
10
Text Image
Determine Image Word Pixel Locations, Parameter(s)
20
Image Word Data
240
Transcription/Image Word Alignment
60
Transcription Associated with Text Image
220
Determine Transcription Word Sequence, Parameter(s)
Transcription Word Data
80
Image-Transcription Alignment Data Structure
90

operating the processor to obtain an image definition data structure defining a text image including a plurality of glyphs representing characters in an image character set;

operating the processor to obtain a transcription data structure associated with the text image and including a plurality of transcription labels indicating character codes representing characters in the image character set;

operating the processor to produce an ordered image word sequence of image words occurring in the text image; each image word being an image region in the text image including at least one glyph;

operating the processor to produce an ordered transcription word sequence of transcription words occurring in the transcription data structure; each transcription word being a sequence of at least one transcription label indicating a character code in the image character set; and

operating the processor to perform an alignment operation to align image words in the ordered image word sequence with transcription words in the ordered transcription word sequence subject to a constraint of maintaining word order in each of the ordered transcription word sequence and the ordered image word sequence during alignment; the alignment operation producing an image-transcription alignment data structure indicating each image word in the ordered image word sequence paired with either no (a null) transcription word or with at most one transcription word in the ordered transcription word sequence.

5,689,586

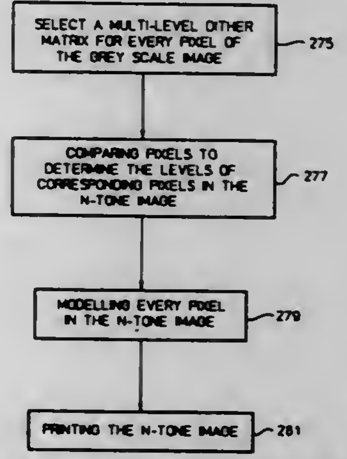
METHODS TO PRINT N-TONE IMAGES WITH MULTI-LEVELING TECHNIQUES

Qian Lin, Santa Clara, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 205,672, Mar. 2, 1994, abandoned. This application Jul. 13, 1995, Ser. No. 502,269

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—232 **16 Claims**


SELECT A MULTI-LEVEL DITHER MATRIX FOR EVERY PIXEL OF THE GREY SCALE IMAGE
275
COMPARING PIXELS TO DETERMINE THE LEVELS OF CORRESPONDING PIXELS IN THE N-TONE IMAGE
277
MODELLING EVERY PIXEL IN THE N-TONE IMAGE
279
PRINTING THE N-TONE IMAGE
281

1. A method of generating N-intensity-tone image from a grey scale image, both images having a plurality of pixels, each pixel in

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the grey scale image having a grey level that is within a maximum and a minimum levels, and each pixel in the N-intensity-tone image having a grey level that is one of N intensity levels with N bigger than two, the method comprising the steps of:

determining the intensity level of each pixel in the N-intensity-tone image based on the level of its corresponding pixel in the grey scale image and based on an original dither matrix, the number of grey levels between adjacent levels in the N intensity levels being not constant;

modeling the intensity level of every pixel in the N-intensity-tone image; and

printing the N-intensity-tone image with a printer by printing the intensity level of each pixel based on the modeling;

such that:

the printer prints the intensity level of each pixel by controlling a pulse with a pulse width; and

the pulse width of one intensity level is different from the pulse width of at least one other intensity level.

5,689,587

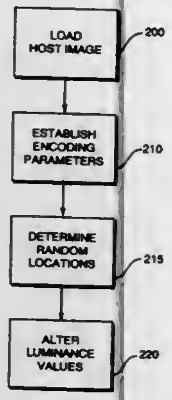
METHOD AND APPARATUS FOR DATA HIDING IN IMAGES

Walter Bender, Auburndale, Mass.; Norishige Morimoto, Tokyo, Japan, and Daniel Gruhl, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 9, 1996, Ser. No. 599,254

Int. Cl.^{6} G06K *9/36;* **G06F** *7/58;101/14*

U.S. Cl. 382—232 **85 Claims**



1. A method of embedding data in an image encoded as points, each point having a parameter value, the method comprising the steps of:

a. generating an ordered series of pseudo-random numbers;

b. assigning each pseudo-random number of the series to a first or a second group;

c, associating each pseudo-random number with a point;

d. designating each point associated with a pseudo-random number assigned to the first group to be a first point each point associated with a pseudo-random number assigned to the second group to be a second point; and

e. altering the image by

i. increasing the parameter value of each first point and of a first patch of points surrounding each first point and

ii. decreasing the parameter value of each second point and of a second patch of points surrounding each second point,

thereby embedding data in the image.

5,689,588

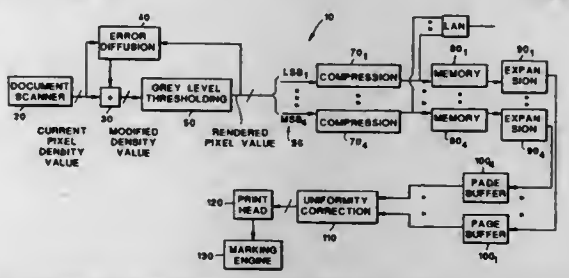
METHOD AND APPARATUS FOR INCREASING COMPRESSIBILITY OF MULTIBIT IMAGE DATA WITH THE LSB VALUE DETERMINED IN THE THRESHOLDING OPERATION BASED ON PIXEL POSITION

Gregory Rombola, Spencerport; Hwai-Tzuu Tai, and Thomas Joseph Wetzel, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1996, Ser. No. 582,319

Int. Cl.^{6} H04N *1/405;1/41;* **G06T** *5/00;9/00*

U.S. Cl. 382—237 **15 Claims**



1. A method of processing image data of pixels to be rendered for efficient storage in a memory or for efficient transmission over a communication pathway wherein a grey level value of a rendered pixel is represented by multiple bits including a most significant bit (MSB) and a least significant bit (LSB), said method comprising the steps of:

modifying the density values of successive pixels each in accordance with diffusion of errors in rendering of adjacent pixels to form for said pixels modified density values;

generating for each of said pixels a multibit digital signal that represents a rendered pixel value by subjecting the modified density value to a thresholding operation wherein the thresholding operation employs position of a pixel to determine the digital value of the LSB of the pixel; and

encoding the rendered pixel values to compress image data representing the rendered pixel values.

9. An apparatus for processing image data of pixels to be rendered for efficient storage in a memory or for efficient transmission over a communication pathway wherein a grey level value of a rendered pixel is represented by multiple bits including a most significant bit (MSB) and a least significant bit (LSB), said apparatus comprising:

means for modifying the density values of successive pixels each in accordance with diffusion of errors in rendering of adjacent pixels to form for said pixels modified density values;

rendering means for generating for each of said pixels a multibit digital signal that represents a rendered pixel value by subjecting the modified density value to a thresholding operation wherein the thresholding operation employs position of a pixel to determine the digital value of the LSB of the pixel; and

means for encoding the rendered pixel values to compress image data representing the rendered pixel values.

5,689,589

DATA COMPRESSION FOR PALETTIZED VIDEO IMAGES

Michael J. Gormish, Los Altos, and Martin P. Boliek, San Francisco, both of Calif., assignors to Ricoh Company Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

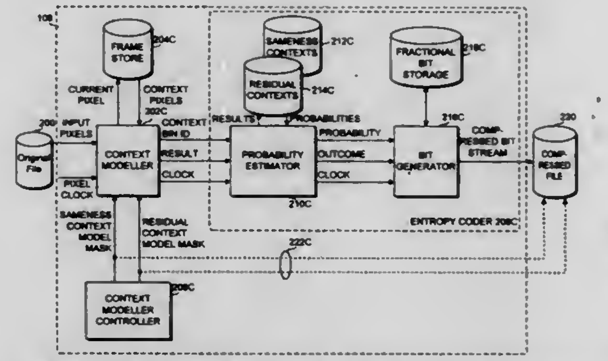
Filed Dec. 1, 1994, Ser. No. 347,789

Int. Cl.^{6} G06K *9/46;* **H04N** *1/40*

U.S. Cl. 382—239 **23 Claims**

1. A method of compressing an input symbol of a plurality of input symbols comprising the steps of:

comparing the input symbol to a sameness symbol, where the sameness symbol is a symbol relative to the input symbol according to a sameness relation, the step of comparing resulting in a sameness result;



determining a sameness context for the input symbol, where the sameness context is dependent on at least one context symbol, or portions thereof, relative to the input symbol according to a sameness context model;

outputting the sameness result and the sameness context to an entropy coder;

if the sameness result is negative, indicating a nonequivalence of the input symbol and the sameness symbol, performing the steps of:

determining a residual context for the input symbol, where the residual context is defined at least by context symbols, or portions thereof, relative to the input symbol according to a residual context model; and

outputting a representation of the input symbol as a residual result and the residual context to a coder; and

coding the sameness result, and the residual result if output, using the coder.

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BACKGROUND NOISE REMOVING APPARATUS AND METHOD APPLICABLE TO COLOR IMAGE PROCESSING APPARATUS

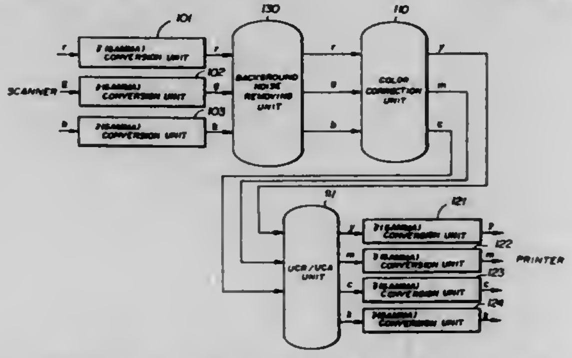
Hisao Shirasawa, and Kaoru Imao, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 52,918, Apr. 27, 1993, abandoned. This application May 19, 1995, Ser. No. 445,288

Claims priority, application Japan, Apr. 30, 1992, 4-110566; Oct. 28, 1992, 4-289787; Mar. 8, 1993, 5-045604

Int. Cl.^{6} G06K *9/40*

U.S. Cl. 382—254 **33 Claims**



101
130
110
r
γ (GAMMA) CONVERSION UNIT
102
SCANNER
g
γ (GAMMA) CONVERSION UNIT
103
b
γ (GAMMA) CONVERSION UNIT
BACKGROUND NOISE REMOVING UNIT
COLOR CORRECTION UNIT
y
m
c
91
121
UCR/UCA UNIT
γ (GAMMA) CONVERSION UNIT
122
PRINTER
123
124
k

1. A background noise removing apparatus for removing background noise from color image data represented as pixels, each pixel having a plurality of color components, and each color component having a respective density, the apparatus comprising a density converting means including:

means for determining whether or not the density of each color component of a pixel corresponds to a white or approximately white area in an input image, the determining means determining the density of each color component based on a single, collective piece of information concerning the densities of all the respective color components of the pixel; and

means for converting the density of each color component of said pixel to a lower density only when the determining means determines that the densities for all color components of said pixel correspond to a white or approximately white area in the input image.

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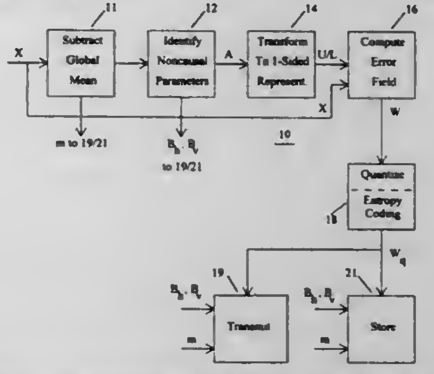
APPARATUS AND METHOD FOR NONCAUSAL, PREDICTIVE, DIGITAL IMAGE COMPRESSION

Nikhil Balram, Boca Raton, Fla., and José M. F. Moura, Pittsburgh, Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.

Filed Mar. 20, 1992, Ser. No. 854,200

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 382—276 **13 Claims**



1. A method of converting a noncausal, two dimensional signal representative of a digitized image into a statistically equivalent recursive model for use in processing the digital image, comprising the steps of:

(i) digitizing an image to produce a two dimensional signal;

(ii) filtering the two dimensional signal to arrive at data representative of an optimal set of parameters of the two dimensional signal by:

a. generating data representative of a potential matrix which represents the two dimensional signal for a given set of parameters;

b. filtering said potential matrix data to arrive at a statistically equivalent recursive model through a Cholesky factorization of said potential matrix data for said given set of parameters using a Riccati iteration filtering technique;

c. inputting white noise to said equivalent recursive model to generate k samples of the two dimensional signal;

d. obtaining an average value for $\chi_\tau^{(k)}$ where $\chi^{(k)}_\tau$ is data representative of a correlation of lag τ computed from sample k;

e. generating data representative of a gradient of a likelihood function by solving

$$\nabla L = [\nabla L_\tau : \tau \epsilon\ \eta_\rho] \text{ where}$$

$$\nabla L_\tau = \frac{E\{\chi_\tau\} - \chi_\tau}{\sigma^2} \quad \text{and}$$

$\hat{E}\{\chi_\tau\}$ is the average value of $[\chi_\tau i]$ said correlation data;

f. minimizing data representative of said likelihood function utilizing said data representative of said gradient of said likelihood function to arrive at a set of parameters;

g. comparing said arrived at set of parameters to a previously arrived at set of parameters to determine whether the difference therebetween is within a desired tolerance; and

h. repeating steps (a) through (g) until said data representative of said optimal set of parameters is determined;

(iii) generating data representative of a potential matrix which represents the two dimensional signal for said data representative of said optimal set of parameters;

(iv) filtering said potential matrix data to arrive at a statistically equivalent recursive model through said Cholesky factorization of said potential matrix data for said data representative of said optimal set of parameters using said Riccati iteration filtering technique; and

(v) processing the two dimensional signal using said recursive model.

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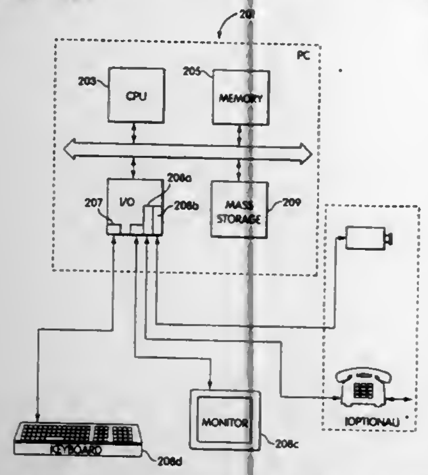
PARALLEL PROCESSING OF DIGITAL SIGNALS IN A SINGLE ARITHMETIC/LOGIC UNIT

Staffan Ericsson, Brookline; John Bruder, Arlington, both of Mass., and Bernd Girod, Spardorf, Germany, assignors to Vivo Software, Inc., Waltham, Mass.

Filed Dec. 22, 1993, Ser. No. 172,323

Int. Cl.^{6} G06K *9/54*

U.S. Cl. 382—304 **14 Claims**



1. A method of processing image signals in an arithmetic/logic unit having a register including a plurality of segments, each segment accommodating predetermined numbers of bits, and in which carry bits are propagated by operation in the arithmetic/logic unit from a lower order segment of the register to a higher order segment of the register, the method comprising the steps of:

- reciving a digital image signal formed of a sequence of digitial sample representative of numerical values, wherein the digital sample form sets in which at least one anticipated processing step is performed identically upon each digital sample in each set and wherein each set includes a digital sample represented by a number of bits corresponding to one of the plurality of segments;
- loading into contiguous adjacent segments of a single register, without unused bits therebetween, a set of first operands taken from a group including a first set of digital samples and a set of digital samples arranged to have correspondence with the segments of the single register, a second set of operands formed by a remainder of the group;
- performing an arithmetic/logic unit function that causes carry bits to be propagated, the function perform simulaneously between all the digital samples of the first set of operands and the second set of operands, forming a new set of digital samples in the register; and
- providing as a processed digital signal, a new sequence of the set of new digital samples.

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COMPACT FIBEROPTIC CIRCULATOR WITH LOW POLARIZATION MODE DISPERSION

J. J. Pan, and Yonglin Huang, both of Milpitas, Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

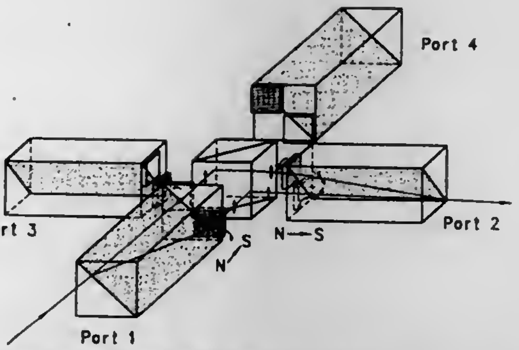
Continuation-in-part of Ser. No. 542,571, Oct. 13, 1995. This application Sep. 6, 1996, Ser. No. 701,909

Int. Cl.^{6} G02B *6/27*; G02F *1/29*

U.S. Cl. 385—11 **23 Claims**

1. An optical circulator comprising:

- at least first, second and third optical port assemblies, said optical port assemblies aligned in a linear array parallel to each other, each optical port assembly further comprising:
  - an end of an optical fiber;
  - a lens collimating light from said optical fiber end into a beam of collimated light and focussing a beam of collimated light to said optical fiber end in a reverse direction;



  - a birefringent crystal dimensioned and arranged with respect to said lens to split said collimated light beam from said lens into two parallel beams of light linearly polarized perpendicularly to each other, and to combine parallel beams of light linearly polarized perpendicularly to each other in said reverse direction into a beam of collimated light toward said lens; and
  - first and second Faraday rotators arranged with respect to said birefringent crystal to rotate said parallel beams from said birefringent crystal by equal and opposite angles so that said rotated beams are linearly polarized parallel to each other and to rotate parallel beams in said reverse direction by equal and opposite angles so that said rotated beams are linearly polarized perpendicularly to each other;
- at least one interface transmitting linearly polarized light directed at said interface in directions responsive to a polarization orientation of linearly polarized light; and
- a plurality of planar reflecting surfaces arranged with respect to said one interface and said optical port assemblies so that light from said first optical port assembly is directed to said second optical port assembly and light from said second optical port assembly is directed to said third optical port assembly.

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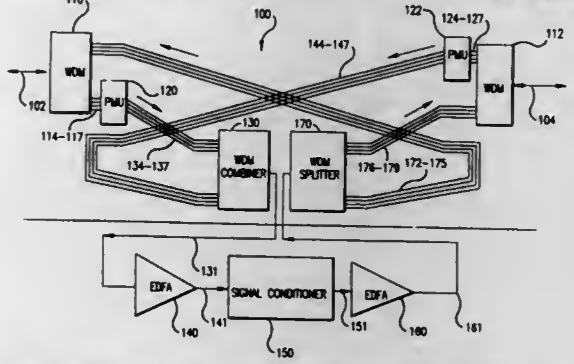
MULTIPLE WAVELENGTH BIDIRECTIONAL LIGHTWAVE AMPLIFIER

Xiaoping Charles Mao, Plano, Tex., assignor to MCI Communications Corp., Washington, D.C.

Continuation of Ser. No. 581,746, Dec. 29, 1995. This application Dec. 18, 1996, Ser. No. 769,201

Int. Cl.^{6} G02B *6/28*

U.S. Cl. 385—24 **20 Claims**



1. A multiple wavelength bidirectional lightwave amplifier, comprising:

- a first wavelength division multiplexer coupled to a first optical fiber;
- a second wavelength division multiplexer coupled to a second optical fiber;
- a first and second power management units coupled to said first and second wavelength division multiplexers, respectively;
- a wavelength combiner coupled to said first and second power management units;
- a first optical amplifier coupled to said wavelength combiner;

- a signal conditioner coupled to said first optical amplifier;
- a power equalizer coupled to said signal conditioner;
- a second optical amplifier coupled to said power equalizer;
- a wavelength splitter coupled to said second optical amplifier; and
- a third and fourth power management unit coupled to said wavelength splitter and to said first and second wavelength division multiplexers respectively.

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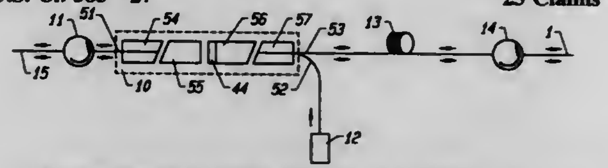
RARE EARTH-DOPED FIBER AMPLIFIER ASSEMBLIES FOR FIBEROPTIC NETWORKS

J. J. Pan, Milpitas, Calif., assignor to E-Tek Dynamics, Inc., San Jose, Calif.

Filed Jan. 17, 1996, Ser. No. 587,427

Int. Cl.^{6} G02B *6/26*; H01S *3/00;3/30*

U.S. Cl. 385—27 **23 Claims**



1. An optical fiber amplifier assembly comprising

- a first optical circulator having a first port receiving input signals and a second port, said first optical circulator transmitting input signals to said second port;
- a pumping laser generating light at a wavelength different from those of said input signals;
- a rare-earth doped fiber;
- a first coupler having a first fiber connected directly to said second port of said first optical circulator, a second fiber connected to said pumping laser and a third fiber connected to said rare-earth doped fiber, said coupler blocking said pumping laser light from said first fiber and reflecting said light to said third fiber, said coupler further transmitting said input signals from said first fiber to said third fiber;
- whereby said rare-earth doped fiber amplifies said input signals from energy of said pumping laser light.

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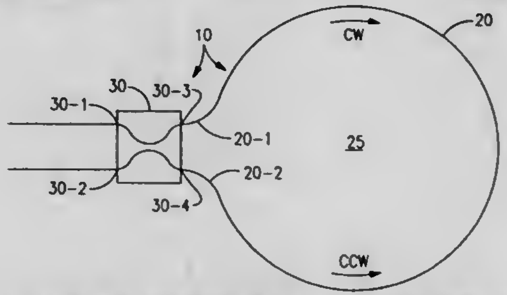
NONLINEAR OPTICAL LOOP MIRROR DEVICE PROVIDING PULSE WIDTH SWITCHING

Alan F. Evans, Beaver Dams, N.Y., assignor to Corning, Inc., Corning, N.Y.

Division of Ser. No. 577,135, Dec. 22, 1995, abandoned. This application Feb. 13, 1997, Ser. No. 799,345

Int. Cl.^{6} G02B *6/26;6/42*

U.S. Cl. 385—27 **27 Claims**



1. An optical fiber apparatus for reflecting optical pulses having a temporal width greater than a predetermined temporal width and transmitting optical pulses having a width less than said predetermined temporal width, comprising:

- a) an optical fiber including a first end having a relatively high dispersion value and a second end having a relatively low dispersion value, said fiber having a dispersion which decreases monotonically from said first end to said second end;
- b) an optical coupler having first and second I/O ports and first and second loop ports, said first and second loop ports being connected to the first and second ends of said fiber to form said fiber into a loop, said coupler serving as means for:
  - (i) dividing an input pulse entering one of said I/O ports into two component pulses which propagate in opposite directions around said loop, and
  - (ii) receiving component pulses returning to said coupler after propagating around said loop and dividing the energy of the received component pulses between said first and second I/O ports in accordance with the relative phases of the received component pulses;
- c). wherein the length of said loop, the dispersions at the ends of said loop and the rate of change of dispersion along said loop are so related to one another that:
  - (i) for input pulses having temporal widths greater than said predetermined temporal width, propagation around said loop causes the received component pulses to be generally in phase with one another, and
  - (ii) for input pulses having temporal widths less than said predetermined temporal width, propagation around said loop causes the received component pulses to be generally out of phase with one another.

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MULTIMODE INTERFERENCE COUPLERS AND METHOD THEREFOR

Pierre-André Besse, Renens, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

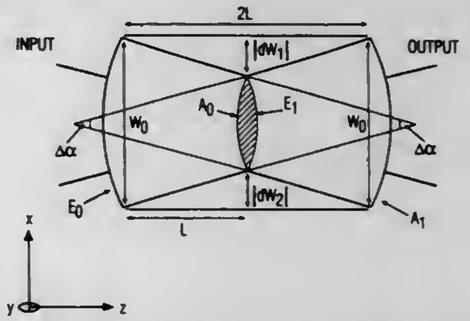
PCT No. PCT/CH94/00207, § 371 Date Aug. 4, 1995, § 102(e) Date Aug. 4, 1995, PCT Pub. No. WO95/12828, PCT Pub. Date May 11, 1995

PCT Filed Oct. 18, 1994, Ser. No. 464,731

Claims priority, application Switzerland, Nov. 4, 1993, 3310/93

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—39 **33 Claims**



24. An improved multimode interference (MMI) coupler having an input face and an output face, which MMI coupler comprises first and second MMI coupler sections proximate to one another in the direction of propagation, wherein said first and second MMI coupler sections define an unsplit multimode waveguide, the improvement characterized in that at least said first MMI coupler section constitutes a modified MMI coupler having a geometry which differs from that of a precursor MMI coupler, so that a resultant phase distribution which differs from that of the precursor MMI coupler occurs at an end face of said first section, said phase distribution producing a selected interference phenomenon at the output face, wherein the precursor MMI coupler is characterized as having a length L in the direction of propagation defined as

$$L=(M/N)*(3/A)*L_c$$

wherein

$$L_c=\pi/(\beta_0-\beta_1)\approx 4nW^2/3\lambda$$

and wherein

A is a real number,

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- β_0 and β_1 are respective propagation constants of first and second modes of the precursor MMI coupler,
- W is the width of the precursor MMI coupler,
- n is the index in the precursor MMI coupler,
- λ is the wavelength in vacuum,
- N is the number of images, and
- M is an integer, where N and M do not have a common sub-multiple.

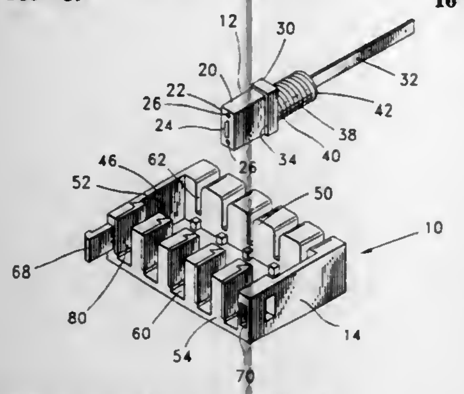
5,689,598
CONNECTOR BLOCK AND METHOD FOR SIMULTANEOUSLY MATING A PLURALITY OF OPTICAL FIBER CONNECTOR PAIRS

David L. Dean, Jr., Hickory, and James R. Merriken, Hudson, both of N.C., assignors to Slecor Corporation, Hickory, N.C.

Filed Jun. 11, 1996, Ser. No. 661,534

Int. Cl.^{6} G02B ***6/38***

U.S. Cl. 385—59 **16 Claims**



1. A connector block assembly, comprising:
(a) a plurality of connectors, each connector having a first end with an end face for mating against an end face of another connector and a second end where an optical fiber enters the connector, each connector having a longitudinal direction extending from the first end to the second end;
(b) a plurality of springs, each spring having a first end disposed against the second end of a respective one of the plurality of connectors, and a second end opposite thereto, the spring having a direction of compression parallel with the longitudinal direction of the connectors; and
(c) a block in which the plurality of connectors are removably mounted in parallel relation to each other with each end face of the plurality of connectors exposed and facing in the same direction and such that any individual connector can be removed from the block without disturbing the other connectors, the block defining a first shoulder surface against which each second end of the plurality of springs is abutted, the block configured to retain the plurality of connectors fixed relative to each other in a lateral direction while allowing linear movement of the plurality of connectors in the longitudinal direction against the plurality of springs and while allowing ready mounting and dismounting of connectors from the block.

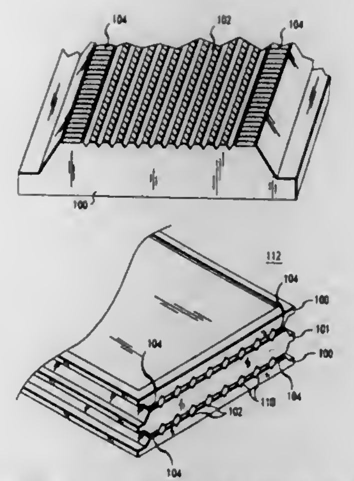
5,689,599
OPTICAL FIBER CONNECTOR WITH ENHANCED BONDING

Muhammed A. Shahid, Ewing Township, N.J., assignor to Lucent Technologies, Inc., Murray Hill, N.J.

Continuation of Ser. No. 290,272, Aug. 15, 1994, Pat. No. 5,519,798. This application Apr. 15, 1996, Ser. No. 632,255

Int. Cl.^{6} G02B ***6/36***

U.S. Cl. 385—83 **15 Claims**



5. A connector for supporting therebetween an array of optical devices that carry optical signals, said connector comprising:
first and second support members each having on a first surface thereof a parallel array of grooves and at least one side landing section, the side landing section being substantially planar and having a substantially irregular surface thereon;
the grooves of the first and second support members adapted to contain therebetween an array of optical fibers; and
the irregular surfaces of the side landing sections of the first and second support members juxtaposed to substantially overlap each other when the first and second support members are placed in mating relationship around the array of optical fibers, wherein each support member is made by:
making an array of V-grooves and side landings in monocrystalline material by photolithographic masking and etching, wherein the side landings are provided with a substantially irregular surface by:
(a) providing a mask layer having a window opening located substantially over each side landing so as to leave only the side landings exposed; and
(b) roughening the exposed side landing surfaces to obtain an irregular surface thereon;
depositing metal on the array of V-grooves and side landings;
removing the monocrystalline material; and
using the deposited metal as a mold portion for making the support member by molding.

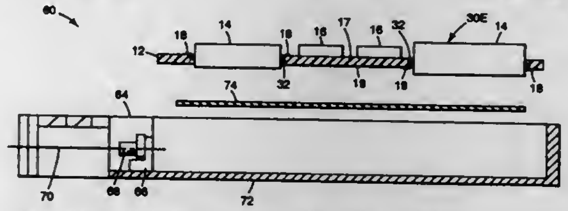
5,689,600
ELECTRONIC CIRCUIT STRUCTURE

Michael E. Griffin, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 376,017, Jan. 20, 1995, Pat. No. 5,631,807. This application Aug. 28, 1996, Ser. No. 704,208

Int. Cl.^{6} G02B ***6/36***

U.S. Cl. 385—88 **6 Claims**



1. An optoelectronic connector package comprising:
a housing;
a circuit substrate, mounted within said housing, said circuit substrate having a first major surface, a second major surface, and a plurality of side surfaces;
a plurality of conductive surfaces formed on at least one of said first major surface and said second major surface of said circuit substrate;
an aperture extending through said circuit substrate from said first major surface to said second major surface;

an electronic component suspended within said aperture, said electronic component including a plurality of conductive leads coupled to one or more of said conductive surfaces;
a connector structure, mounted within said housing, for receiving an optical fiber; and
an optoelectronic component, mounted within said housing and coupled to both said connector structure and said electronic component, for receiving an optical signal from said optical fiber, and for converting said optical signal to an electrical signal, said electronic component receiving said electrical signal from said optoelectronic component.

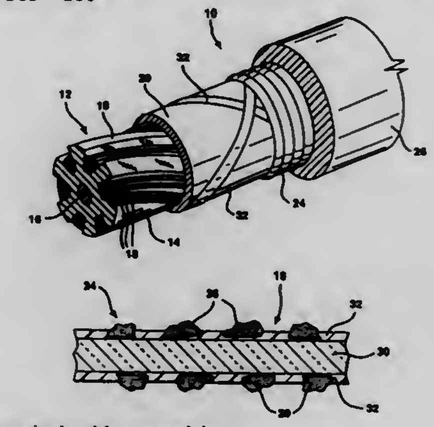
5,689,601
WATER BLOCKING OPTICAL CABLE REINFORCEMENT

Thomas P. Hager, Westerville; David L. Molnar, Newark, and Diane M. Hulett, Glenford, all of Ohio, assignors to Owens-Corning Fiberglas Technology Inc., Summit, Ill.

Filed Aug. 24, 1995, Ser. No. 519,038

Int. Cl.^{6} G02B ***6/44***

U.S. Cl. 385—100 **20 Claims**



1. An optical cable comprising:
an optical cable core;
optical fibers around the optical cable core; and
a glass fiber reinforcing material wrapped around the optical cable core and comprising glass fiber strands having thereon a first coating containing a binding agent and a second coating containing particles of a water blocking agent adhered to said glass fiber strands by said binding agent without said binding agent entirely coating said particles, wherein said binding agent contains a member selected from the group consisting of latex polymers, latex copolymers, and mixtures thereof.

5,689,602
CCD VIDEO SCOPE WITH ILLUMINATION TO THE OBJECT

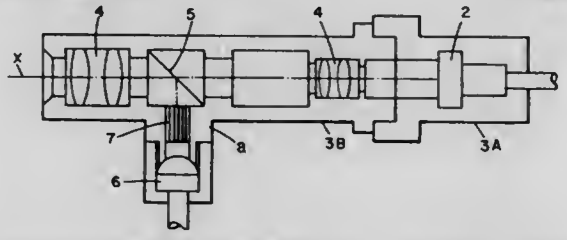
Junichi Arai, Urawa, Japan, assignor to Moritex Corporation, Japan

Filed Sep. 13, 1995, Ser. No. 527,419

Claims priority, application Japan, Oct. 20, 1994, 6-255348

Int. Cl.^{6} G02B ***6/06***

U.S. Cl. 385—119 **7 Claims**



1. A CCD video scope with illumination of an object, comprising:
an image capture optical system defining an optical axis;
a half mirror positioned on the optical axis;
a light source displaced from the optical axis and facing the half mirror;
a CCD element positioned on the optical axis for receiving an optical image of a subject facing the image capture optical system;
a bundle of optical fibers extending from the half mirror to the light source, the fibers having a diameter of 250μ or less and a length of 10 times or more the diameter of the optical fibers, the optical fibers having a maximum incident angle;
the light source having a light focusing lens with an exit angle equal to or less than the maximum incident angle of the optical fibers;
a camera head housing, the CCD element, image capture optical system, half mirror, light source and optical fibers being mounted in said camera head housing; and
the camera head housing comprising an image capture part and an optical head releasably mounted on said image capture part, the CCD element being mounted in the image capture part, and the image capture optical system, half mirror, light source and optical fibers being mounted in said optical head.

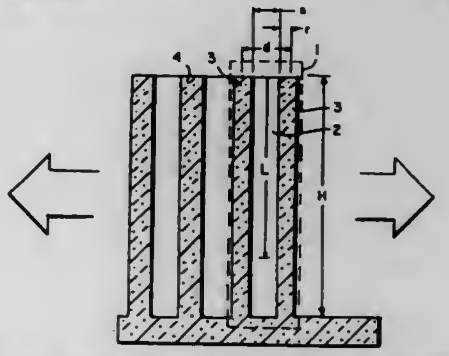
5,689,603
OPTICALLY INTERACTIVE NANOSTRUCTURE

Gerald C. Huth, 4701 Grand Ave., Ojai, Calif. 98028

Filed Jul. 7, 1993, Ser. No. 88,051

Int. Cl.^{6} G02B ***6/10***

U.S. Cl. 385—131 **17 Claims**



1. Optically interactive nanostructural element comprising: a semiconductor substrate including at least one radiation guide region extending into the substrate, the geometry of the substrate material surrounding the radiation guide region being selected such that it acts as a quantum confinement region for electrons in the substrate material and the radiation guide region acts as a classical waveguide for radiation, whereby the element absorbs or emits light of a wavelength corresponding to the selected geometry.

5,689,604
FIBER OPTIC OPERATIONS CENTER

Neal Anthony Janus, Parsippany; Frank Salvatore Leone, Berkeley Heights; William Joseph Parzygnat, Morris Township; Richard Joseph Pimpinella, Hampton, and Randy Alan Reagan, Morris Plains, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 9, 1996, Ser. No. 709,978

Int. Cl.^{6} G02B ***6/36***

U.S. Cl. 385—134 **20 Claims**

1. A fiber optic operations center comprising:
a frame defining a series of mounting holes;
an upper raceway, supported by the frame, having a radius adapted to protect fiber optic cables from excessive bending stress;
a duct wall, supported by the frame, adapted to restrain fiber optic cables;

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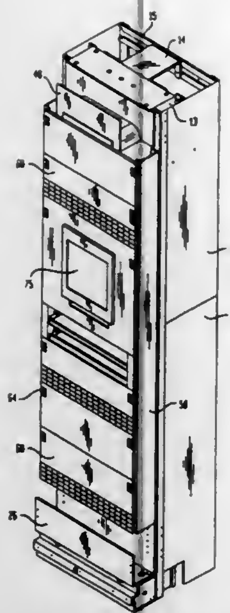


- a multiplicity of support shelves, having mounting brackets adapted to mate with mounting holes in the frame;
- an optical switch, mounted to the frame, adapted to receive a multiplicity of fiber optic cables and to select one or more of them thereby connecting them to one or more outputs;
- a remote test unit adapted to generate, transmit, receive, and analyze optical signals of at least one wavelength, having electronic inputs and outputs and optical inputs and outputs;
- a system controller, supported by a shelf, having a multiplicity of inputs and outputs, being connected to the optical switch to direct the selection of fiber optic cables, being connected to the remote test unit to direct the generation of an optical signal;
- input means, supported by a shelf, being connected to the system controller; and
- output means, supported by a shelf, being connected to the system controller.

5,689,605
SPLICE HOLDER ASSEMBLY FOR AN OPTICAL FIBER CABLE SPLICE CLOSURE

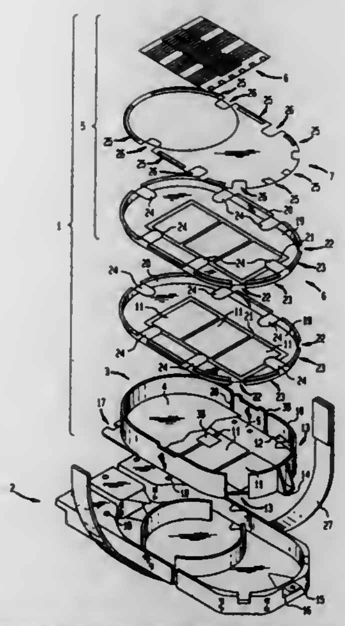
Gary Simpson Cobb, Norcross; Wesley Willing Jones, Lawrenceville, and Edward R. Moore, Atlanta, all of Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 9, 1995, Ser. No. 386,241

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—135 **30 Claims**

1. A splice holder assembly for holding at least one splice coupling optical fibers of a plurality of cables, the splice holder assembly adapted to fit inside of a cover of an optical fiber cable splice closure which receives and holds the plurality of cables, the splice holder assembly comprising:
- a splice tray having a bottom and sides defining an open-topped enclosure, the splice tray having at least one splice organizing module for holding splices coupling respective optical fibers, the splice organizing module mounted in contact with the bottom, and the splice tray having retainers extending from the inner surfaces of the sides of the splice tray at a level above the bottom;
- a card adapted to fit into the splice tray and to be held in position by the retainers, the card enclosing the splice organizing module when the card is inserted into the splice tray; and
- at least one splice cassette adapted to be fitted in the splice tray and supported by the card, the splice cassette including a bottom portion in which is mounted at least one additional splice organizing module for holding splices coupling respective optical fibers, and a cover adapted to fit over the bottom portion to enclose the splice cassette.



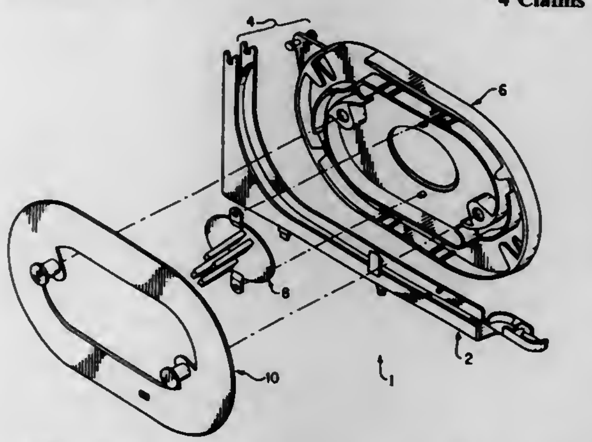
5,689,606
FIBER ROUTING AND RETENTION ASSEMBLY WITH MODULAR FIBER CONNECTOR SUPPORT

Tareq K. Hassan, Norcross, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Jun. 3, 1996, Ser. No. 657,417

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—135 **4 Claims**



1. A fiber routing and retention assembly for routing and mounting at least two fibers having a terminal end within an electronic enclosure, said assembly comprising:
- a fiber routing track, said fiber routing track including horizontal and vertical legs, each leg having a guide channel for guiding and retaining the fibers, said fiber routing track further including attachment structure for attaching said fiber routing track to the electronic enclosure;
- a fiber tray, said fiber tray retaining and routing the fibers therein, including the terminal ends of the fibers, said fiber tray having a raceway including inner and outer walls for routing the fibers therebetween; and
- pivot means coupled to said fiber routing track and said fiber tray for permitting the rotational movement of said fiber tray with respect to said track between a stowed position and an access position.

5,689,607
DEVICE FOR HOLDING AT LEAST ONE OPTICAL FIBER CABLE, AND A SPLICE BOX MAKING USE OF THE DEVICE

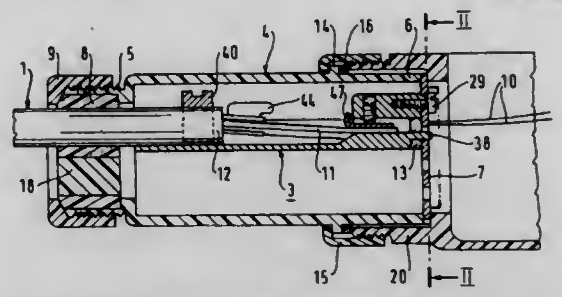
Alain Vincent, Juilly, and Michel Milanowski, Anserville, both of France, assignors to Alcatel Cable Interface, Vrigne Aux Bois, France

Filed Dec. 7, 1995, Ser. No. 568,586

Claims priority, application France, Dec. 8, 1994, 94 14774

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—136 **17 Claims**



1. A device for holding at least one optical fiber cable, the device including a fastening support for each cable, each fastening support including a substantially flat fastening face, is cable clamp for holding the corresponding jacketed cable stationary and for holding a stripped end of said cable thereon with its fibers disposed freely on a front end of said support, said device further including a cylindrical thimble inside which a plurality of identical fastening supports can be mounted for receiving a plurality of corresponding cables, the thimble having open front and rear ends and being organized so that its length is significantly greater than the length of said supports, at least one of said supports being mounted inside said thimble, and each corresponding cable being received therein through said rear end of said thimble after being secured on its support, a front end wedge fixed to the front end of each support inside said thimble and locked in an open front end of said thimble, and closure means for closing the rear end of their thimble, around each cable received in said thimble.

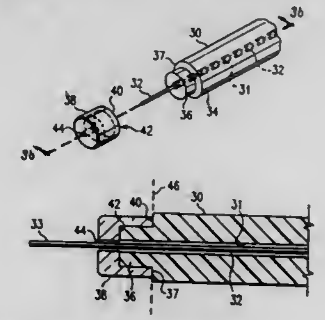
5,689,608
FIBER OPTIC ASSEMBLY

Andrew J. Moore; David L. Ma; Robert L. Bontz, and Harry B. Bonham, Jr., all of Plano, Tex., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Division of Ser. No. 254,438, Jun. 6, 1994, Pat. No. 5,509,952, which is a continuation of Ser. No. 980,246, Nov. 23, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 485,735

Int. Cl.^{6} G02B *6/00*

U.S. Cl. 385—139 **12 Claims**



10. A fiber optic assembly, comprising:
- a sleeve comprising a nonplanar end, said nonplanar end comprising a first material comprising nickel and iron and having a first coefficient of thermal expansion;
- a fiber extending through said sleeve, wherein said fiber has a tip extending outward from said nonplanar end of said sleeve;
- a sealing member adjacent said nonplanar end of said sleeve, wherein said sealing member comprises a second material comprising glass and having a second coefficient of thermal expansion;
- wherein said sealing member is bonded to said nonplanar sleeve end and to said fiber by the steps of:
  - heating said sealing member to a first temperature sufficient to cause said second material to flow adjacent said nonplanar end of said sleeve; and
  - cooling said sealing member to a second temperature less than said first temperature, wherein a compressive force is generated between said first and second materials due to the differences in said first and second coefficients of thermal expansion, said compressive force forming a seal between said first and second materials and a bond between said sealing member, said fiber, and said nonplanar sleeve end.

5,689,609
OPTICAL COUPLING CONFIGURATION

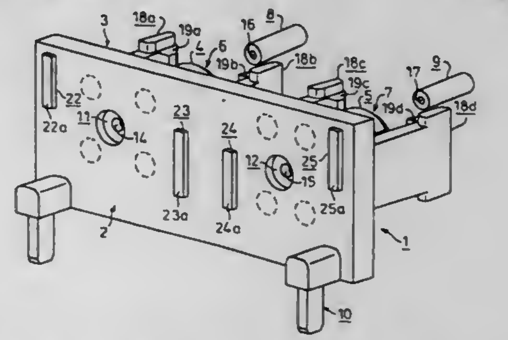
Vinko Tonejc, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 8, 1996, Ser. No. 694,103

Claims priority, application Germany, Aug. 8, 1995, 195 30 684.8

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—147 **5 Claims**



1. An optical coupling configuration, comprising:
- a flange with a front side and a back side;
- a metal part embedded in said flange, said metal part forming a stop and having at least one extension protruding from said flange;
- a receiving tube disposed on said front side, said receiving tube having an opening formed therein;
- said opening being adapted to receive a plug prong to be introduced in said opening up to said stop formed by said metal part; and
- an optical element disposed on said back side and aimed at said opening.

5,689,610
METHOD OF MAKING AN INDEX PRINT HAVING AN INDICATOR OF SUBSTANTIALLY WHERE AN IMAGE IS STORED ON A MOTION PICTURE IMAGE RECORDING MEDIUM

Joseph Anthony Manico, Rochester; David Lynn Patton, Webster; John Randall Fredlund; Peter Albert Frosig, both of Rochester, and Raymond Eugene Wess, Holley, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1994, Ser. No. 262,193

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 386—46 **6 Claims**

1. A method of making an index print having a plurality of imagettes representing images stored on a motion picture image recording medium, said plurality of imagettes being less in number than an entire number of images stored on the motion picture image recording medium, is characterized by steps of:

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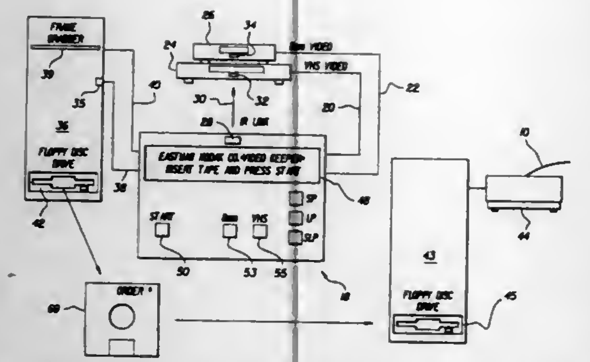


obtaining signals representing a plurality of images stored on said motion picture image recording medium, said obtaining signals including for each image steps of

(a) obtaining a signal representing an image stored on said motion picture image recording medium;

(b) analyzing said signal to determine if said image meets a predetermined minimum quality standard;

(c) allowing said signal to be used further if said image meets said predetermined minimum quality standard;

(d) moving said motion picture image recording medium a predetermined time or count to another image if said image does not meet said predetermined minimum quality standard;

(e) repeating steps (a) through (d) for a predetermined number of times for said another image until a quality image is located which meets said predetermined minimum quality standard;

determining where at least one of said plurality of images is located on said motion picture image recording medium;

using said signals to create a plurality of imagettes, corresponding to said plurality of images, on a recording sheet; and

using location information from the determining step to provide an indicator on said recording sheet adjacent at least one of said imagettes, corresponding to said at least one image, for indicating where said at least one image is stored on said motion picture image recording medium.

5,689,611

PANORAMA IMAGE PRODUCING METHOD AND APPARATUS

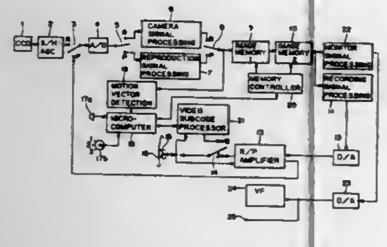
Masashi Ohta, Tokyo; Hiroshi Kobayashi, Chiba; Tsuneo Sekiya; Toshimichi Hamada, both of Tokyo; Kyoko Fukuda, and Koji Iijima, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

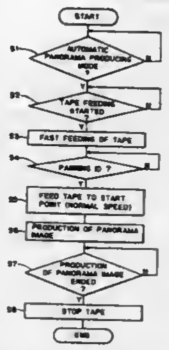
Continuation of Ser. No. 133,377, Oct. 8, 1993, Pat. No. 5,548,409. This application Jan. 5, 1996, Ser. No. 583,441

Claims priority, application Japan, Oct. 9, 1992, 4-297771; Oct. 9, 1992, 4-297772; Oct. 9, 1992, 4-297773; Oct. 9, 1992, 4-297774; Oct. 26, 1992, 4-309451

Int. Cl.⁶ H04N *5/76*

U.S. Cl. 386—46 **6 Claims**




START
AUTOMATIC PANORAMA PRODUCING MODE ?
TAPE FEEDING STARTED ?
FAST FEEDING OF TAPE
FEED TAPE TO START POINT (NORMAL SPEED)
PRODUCTION OF PANORAMA IMAGE
PRODUCTION OF PANORAMA IMAGE ENDED ?
STOP TAPE
END

1. An apparatus for recording a panorama image, comprising:

imaging means for imaging a subject to produce a plurality of image signals, each of said image signals representing a respective image;

motion vector detecting means for detecting motion vector information representing motion between at least two of said images; and

recording means for recording the motion vector information onto a recording medium together with the plurality of image signals produced by said imaging means, said plurality of images being recoverable upon reproduction of said plurality of image signals from said recording medium without using the recorded motion vector information, and the panorama image of said subject being producible from the recorded plurality of image signals using the recorded motion vector information.

5,689,612

IMAGE SIGNAL PROCESSING DEVICE

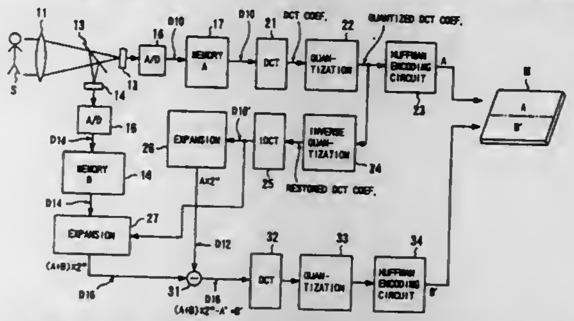
Nobuaki Abe, Sapporo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 275,355, Jul. 15, 1994. This application Aug. 30, 1996, Ser. No. 704,875

Claims priority, application Japan, Jul. 15, 1993, 5-197993; Jun. 20, 1994, 6-160554

Int. Cl.⁶ H04N *5/76*

U.S. Cl. 386—109 **14 Claims**



1. A device for processing an image signal, comprising:

first means for generating first image data, having a first resolution, based on an optical image;

means for applying an orthogonal transformation, a quantization, an inverse-quantization, and an inverse-orthogonal transformation to said first image data to obtain restored image data;

second means for generating second image data, based on said optical image, that is offset from said first image data by a predetermined amount on a spatial coordinate axis;

third means for generating third image data, based on said second image data and said restored image data, said third image data having a second resolution higher than said first resolution;

means for transforming said restored image data to an expanded image data having a number of pixels equal to a number of pixels of said third image data;

means for obtaining supplementary data representing a difference between said expanded image data and said third image data;

means for applying a data compression to said first image data and said supplementary data; and

means for recording said first image data and said supplementary data compressed by said data compression means to a recording medium.

5,689,613

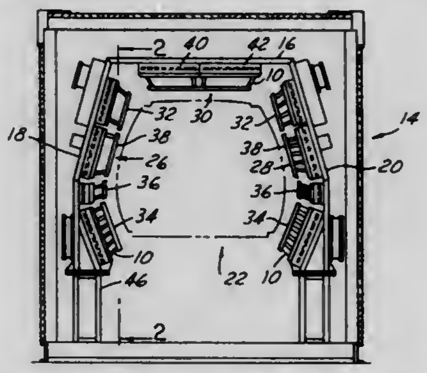
PLATINUM PLATED QUARTZ TUBES AND METHOD OF MAKING THE SAME

Thomas A. Cherry, Greensburg, Ind., assignor to DriQuik, Inc., Greensburg, Ind.

Continuation-in-part of Ser. No. 366,034, Dec. 29, 1994, abandoned. This application Mar. 26, 1996, Ser. No. 622,118

Int. Cl.⁶ A45D *20/40*

U.S. Cl. 392—407 **13 Claims**



1. A method for making a reflective infrared heating element comprising the steps of:

a) providing a tube of a material transparent to infrared radiation and capable of being heated to a temperature of at least 1400° F. without degradation;

b) providing a liquid mixture containing freely divided platinum in an organic vehicle which will evaporate at a temperature of at least 500° F.;

c) applying said liquid mixture to a portion of the circumference of said tube; and

d) heating the liquid mixture on the tube to a temperature in the range of about 500° F. to 700° F. for a period of about 30 to 60 minutes to at least partially evaporate and drive off the vehicle and thereafter to a temperature in the range of about 1100° F. to 1400° F. for a period of about three to six hours to adhere a dry film of a reflective coating of platinum onto said tube.

5,689,614

RAPID THERMAL HEATING APPARATUS AND CONTROL THEREFOR

Christian M. Gronet, and James F. Gibbons, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 131,830, Oct. 5, 1993, Pat. No. 5,487,127, which is a division of Ser. No. 882,656, May 13, 1992, Pat. No. 5,317,492, which is a division of Ser. No. 781,632, Oct. 24, 1991, Pat. No. 5,155,336, which is a continuation of Ser. No. 467,808, Jan. 19, 1990, abandoned. This application Jul. 31, 1995, Ser. No. 509,392

The portion of the term of this patent subsequent to Jan. 19, 2010, has been disclaimed.

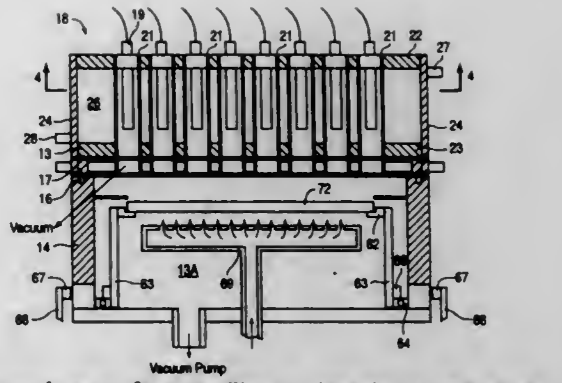
Int. Cl.⁶ H05B *3/40;* **C23C** *16/00;* **H01L** *21/00*

U.S. Cl. 392—416 **8 Claims**

1. A heat source for heating a semiconductor wafer during rapid thermal processing, comprising:

a plurality of sources of radiant energy, each radiant energy source including a surrounding light pipe and serving to radiate a predetermined defined area of said semiconductor wafer with a pattern of radiation intensity;

a mounting means for mounting said light pipes and said radiant energy sources next to each other so that a portion of the radiated defined area of one radiant energy source overlaps a portion of the radiated defined area of an adjacent radiant energy source; and



a control means for controlling the intensity of each of said radiant energy sources to control the radiation at different areas of said semiconductor wafer.

5,689,615

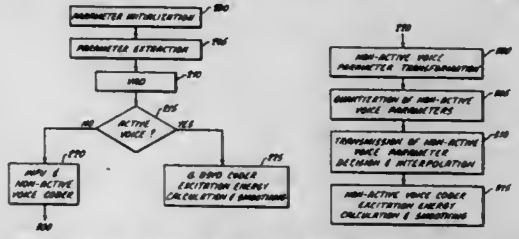
USAGE OF VOICE ACTIVITY DETECTION FOR EFFICIENT CODING OF SPEECH

Adil Benyassine, Costa Mesa, and Huan-Yu Su, San Clemente, both of Calif., assignors to Rockwell International Corporation, Newport Beach, Calif.

Filed Jan. 22, 1996, Ser. No. 589,132

Int. Cl.⁶ G10L *3/02*

U.S. Cl. 395—2.28 **9 Claims**


PARAMETER INITIALIZATION
PARAMETER EXTRACTION
VAD
ACTIVE VOICE ?
NO
YES
NON-ACTIVE VOICE CODER
G.729 CODER EXCITATION ENERGY CALCULATION & SMOOTHING
NON-ACTIVE VOICE PARAMETER TRANSFORMATION
QUANTIZATION OF NON-ACTIVE VOICE PARAMETERS
TRANSMISSION OF NON-ACTIVE VOICE PARAMETER DECISION & INTERPOLATION
NON-ACTIVE VOICE CODER EXCITATION ENERGY CALCULATION & SMOOTHING

1. In a speech communication system comprising: (a) a speech encoder for receiving and encoding an incoming speech signal to generate a bit stream for transmission to a speech decoder; (b) a communication channel for transmission; and (c) a speech decoder for receiving the bit stream from the speech encoder to decode the bit stream to generate a reconstructed speech signal, said incoming speech signal comprising periods of active voice and non-active voice, a method for efficient encoding of non-active voice, comprising the steps of:

a) extracting predetermined sets of parameters from said incoming speech signal for each frame, said parameters comprising spectral content and energy;

b) making a frame voicing decision of the incoming speech signal for each frame according to a first set of the predetermined sets of parameters;

c) if the frame voicing decision indicates active voice, the incoming speech signal being encoded by an active voice encoder to generate an active voice bit stream, continuously concatenating and transmitting the active voice bit stream over the channel;

d) if receiving said active voice bit stream by said speech decoder, invoking an active voice decoder to generate the reconstructed speech signal;

e) if the frame voicing decision indicates non-active voice, the incoming speech signal being encoded by a non-active voice encoder to generate a non-active voice bit stream, said non-active bit stream comprising at least one packet with each packet being 2-byte wide, each packet comprising a plurality of indices into a plurality of tables representative of non-active voice parameters;

f) if the frame voicing decision indicates non-active voice, transmitting the non-active voice bit stream only if a predetermined comparison criteria is met;

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g) if the frame voicing decision indicates non-active voice, invoking an non-active voice decoder to generate the reconstructed speech signal;

b) updating the non-active voice decoder when the non-active voice bit stream is received by the speech decoder, otherwise using a non-active voice information previously received.

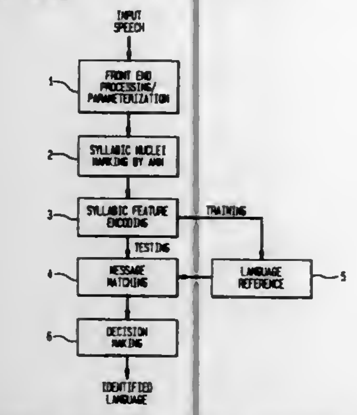
5,689,616
AUTOMATIC LANGUAGE IDENTIFICATION/VERIFICATION SYSTEM

Kung-Pu Li, LaJolla, Calif., assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 154,601, Nov. 19, 1993, abandoned. This application Jun. 28, 1996, Ser. No. 672,306

Int. Cl.^{6} G01L ***9/00***

U.S. Cl. 395—2.41 **29 Claims**



1. A Language Verification System comprising:

means for processing spoken text entered into the system whereby spoken text is converted into frames of speech, and wherein variations in input speech signals extrinsic to those introduced by a speaker's vocal tract are attenuated;

means for detecting and extracting phonetic speech features that are syllabic nuclei, from said frames of speech;

matching means for comparing said phonetic speech features with stored reference phonetic speech features and establishing a match score for said comparison proportional to degree of similarity between said phonetic speech features and said stored reference phonetic speech features; and,

decision means for identifying said input speech as corresponding to one of a plurality of languages, whereby said language identification for said input speech is established on the basis of a comparison of said match score with at least one predetermined threshold score associated with at least one of said plurality of languages, said decision means encompasses a scoring methodology wherein multiple matched speakers within sand across a multiplicity of languages are identified as to a language spoken based on a score selected from the group consisting of a minimum score, an average score and a combination minimum-average score.

5,689,617
SPEECH RECOGNITION SYSTEM WHICH RETURNS RECOGNITION RESULTS AS A RECONSTRUCTED LANGUAGE MODEL WITH ATTACHED DATA VALUES

Matthew G. Pallakoff, Mountain View; Kurt W. Rodarmer, Sunnyvale, and Arthur Arlo Reeves, Santa Cruz, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

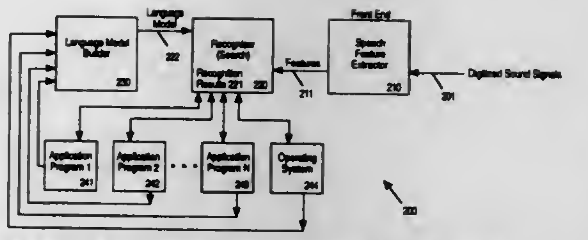
Filed Mar. 14, 1995, Ser. No. 404,472

Int. Cl.^{6} G10L ***9/00***

U.S. Cl. 395—2.64 **9 Claims**

1. A method of speech recognition for a speech recognition system operating on a computer system, comprising the steps of:

the speech recognition system generating a language model with embedded structure and attached data values;



the speech recognition system receiving a sound signal;

the speech recognition system processing the sound signal to extract speech features;

the speech recognition system comparing and matching the speech features to the language model for generating a recognition result having the embedded structure and attached data values of the language model for those portions of the language model matched to the speech features.

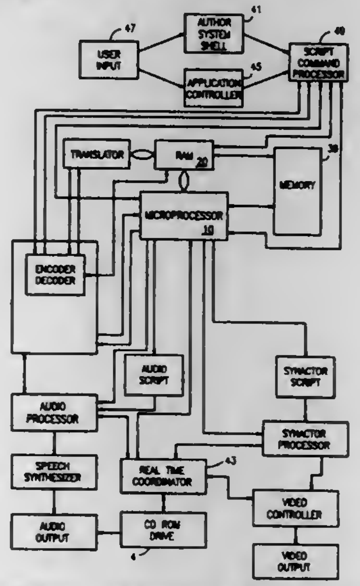
5,689,618
ADVANCED TOOLS FOR SPEECH SYNCHRONIZED ANIMATION

Elon Gasper, Bellevue, and Richard Wesley, Seattle, both of Wash., assignors to Bright Star Technology, Inc., Bellevue, Wash.

Division of Ser. No. 65,704, May 20, 1993, abandoned, which is a continuation of Ser. No. 657,714, Feb. 19, 1991, abandoned. This application May 31, 1995, Ser. No. 457,023

Int. Cl.^{6} G10L ***3/00***

U.S. Cl. 395—2.85 **6 Claims**



1. For a programmed computer having a memory and a real-time random access animation and vivification engine driver, an apparatus for providing a voice sound for a synactor for sound-animation synchronization, the apparatus comprising:

a voice synthesizer coupled to the computer for producing synthesizer phonemes, the voice synthesizer including:

first means for receiving speech samples derived from input audio data and for providing a sample speech signal representing the speech samples;

first segmentation means coupled to the first means for extracting from the sample speech signal the speech samples in accordance with a predetermined speech segmentation plan, the first segmentation means for providing constituent speech segments;

second means for receiving speech text and for providing a speech text signal representing the speech text;

second segmentation means coupled to the second means for segmenting the speech text signal to provide constituent text segments in accordance with the predetermined speech segmentation plan;

encoding means for encoding the constituent speech segments to provide encoded constituent speech segments; and

combining means for combining the encoded constituent speech segments to provide a speech signal representative of animated speech corresponding to the speech text where each of the constituent speech segments corresponds to at least one of the constituent text segments;

means for creating a voice reconciliation phoneme table, the voice reconciliation phoneme table including the synthesizer phonemes;

means for providing a synactor model phoneme table, the synactor model phoneme table including synactor phonemes for the voice sound of the synactor;

means for determining which of the synthesizer phonemes are unrecognized as compared to the synactor model phoneme table;

means for finding substitute phonemes from the synactor model phoneme table for the unrecognized phonemes in the voice reconciliation phoneme table;

means for creating a generic phoneme table, the generic phoneme table including recognized synthesizer phonemes from the voice reconciliation phoneme table and the substitute phonemes; and

means for using the generic phoneme table, the voice reconciliation phoneme table and the synactor model phoneme table to provide a runtime reconciled phocode table for using the voice synthesizer to provide voice sound for the synactor without modifying the synactor model phoneme table.

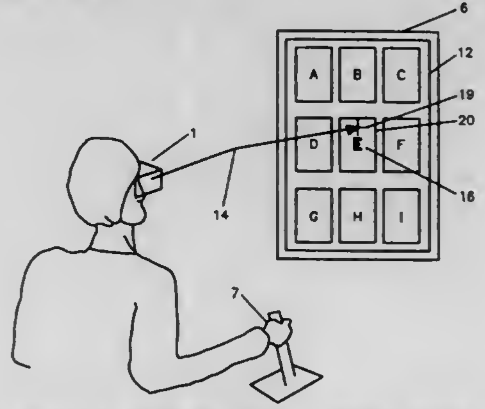
5,689,619
EYETRACKER CONTROL OF HEADS-UP DISPLAYS

Christopher C. Smyth, Fallston, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1996, Ser. No. 695,847

Int. Cl.^{6} G06F ***15/00;17/20***

U.S. Cl. 395—10 **6 Claims**



1. A method for automated adaptive display interface which automates the presentation of gaze aiding cues in response to periods of high cognitive loading of a person performing tasks, comprising the steps of:

maintenance of a record of said person's short term eye movements by a computer to produce a short term eye movement history;

automatic analysis by said computer of said short term eye movement history for determining erratic eye movement patterns about a display element when said short term eye movements fall both into and beyond a predetermined space surrounding said display, element for a certain period of time;

recognition by said computer of said erratic eye movement patterns as representative of periods of high cognitive loading; and

instruction by said computer to a video display for the presentation of a gaze cue marker on said video display near said display element and display capture windows on said video display surrounding said display elements during said periods of high cognitive loading.

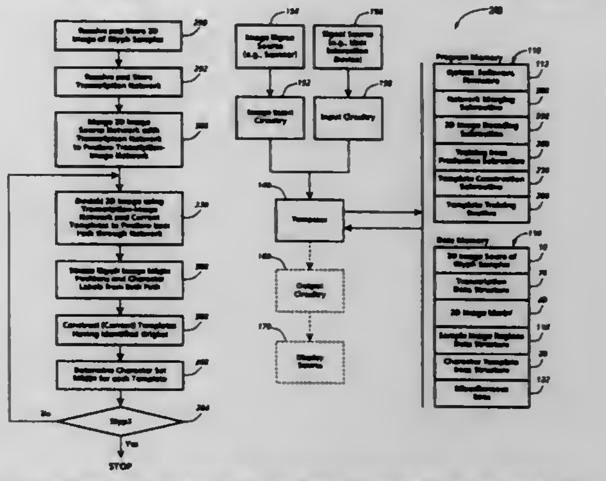
5,689,620
AUTOMATIC TRAINING OF CHARACTER TEMPLATES USING A TRANSCRIPTION AND A TWO-DIMENSIONAL IMAGE SOURCE MODEL

Gary E. Kopec, Belmont; Philip Andrew Chou, Menlo Park, and Leslie T. Niles, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1995, Ser. No. 431,223

Int. Cl.^{6} G06T ***1/40;*** **G06K** ***9/00***

U.S. Cl. 395—20 **32 Claims**



1. A method of operating a machine to train a set of character templates for use in a recognition system; the machine including a processor and a memory device for storing data; the data stored in the memory device including instruction data which the processor executes to operate the machine; the processor being connected to the memory device for accessing and executing the instruction data stored therein; the method comprising:

operating the processor to receive a two-dimensional (2D) image source of glyph samples having a vertical dimension size larger than a single line; each glyph sample being an image instance of a respective one of a plurality of characters in a character set; the set of character templates being trained representing respective ones of the plurality of characters in the character set;

operating the processor to receive a transcription network in the form of a finite state network data structure indicating a transcription associated with the 2D image source of glyph samples; the transcription including an ordered arrangement of transcription labels; the transcription network indicating the ordered arrangement of the transcription labels in the transcription as at least one transcription path through the transcription network;

operating the processor to access a two-dimensional (2D) image source network in the form of a stochastic finite state network data structure, stored in the memory device of the machine; the 2D image source network modeling as a grammar a spatial image structure of a set of 2D images, each including a plurality of glyphs; a first one of the set of 2D images being modeled as at least one path through the 2D image source network that indicates an ideal image consistent with the spatial image structure of the first image; the at least one path indicating path data items associated therewith and accessible by the processor; the path data items indicating image positions and glyph labels paired therewith of respective ones of the plurality of glyphs included in the first image; the 2D image source of glyph samples being one of the images included in the set of 2D images modeled by the 2D image source network;

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operating the processor to merge the 2D image source network with the transcription network to produce a transcription-image network; the transcription-image network being a modified form of the 2D image source network wherein, when the transcription is associated with the first image, the transcription-image network models the first image as at least one complete transcription-image path through the transcription-image network that indicates an ideal image consistent with the spatial image structure of the first image and that further indicates the path data items, the transcription-image path further indicating a sequence of message strings consistent with the ordered arrangement of the transcription labels indicated by the at least one transcription path through the transcription network;

operating the processor to perform a decoding operation on the 2D image source of glyph samples using the transcription-image network to produce at least one complete transcription-image path indicating an ideal image consistent with the spatial image structure of the 2D image source of glyph samples;

operating the processor to produce training samples using the path data items associated with the at least one complete transcription-image path; each training sample including a 2D image position in the 2D image source of glyph samples indicating an image position therein and a glyph label paired therewith; and

operating the processor to produce the set of character templates using the training samples.

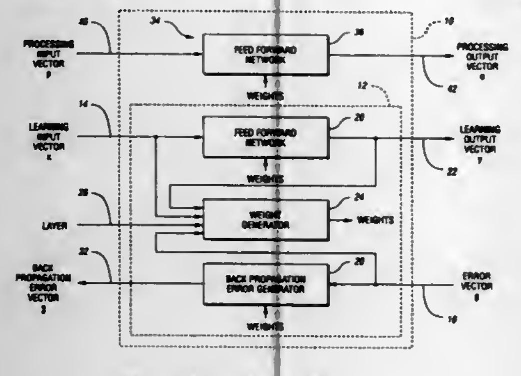
5,689,621
MODULAR FEEDFORWARD NEURAL NETWORK ARCHITECTURE WITH LEARNING

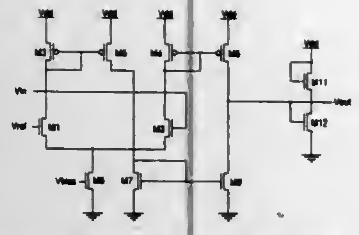
Fathi M. A. Salam, Okemos, and Hwa-Joon Oh, East Lansing, both of Mich., assignors to Michigan State University, East Lansing, Mich.

Filed Apr. 28, 1995, Ser. No. 430,542

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—24 **11 Claims**





1. A neural network integrated circuit comprising:

a learning circuit which receives a first learning vector signal and a second learning vector signal and generates a plurality of weight signals based thereupon; and

a first feedforward network which receives the weight signals and an input vector signal and forms an output vector signal based thereupon;

wherein the learning circuit includes a second feedforward network which forms a learning output vector signal based upon the first learning vector signal and the weight signals, and wherein the learning circuit and the first feedforward network have an analog circuit implementation.

5,689,622
METHOD FOR ADJUSTING NETWORK PARAMETERS IN A MULTI-LAYER PERCEPTRON DEVICE PROVIDED WITH MEANS FOR EXECUTING THE METHOD

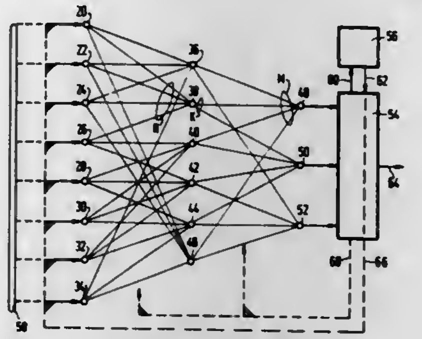
Junichi Higashino, Tokyo, Japan, and Eric H. J. Persoon, Eindhoven, Netherlands, assignors to N.V. Philips Gloeilampenfabrieken, Eindhoven, Netherlands, and Hitachi Ltd., Tokyo, Japan

Continuation of Ser. No. 141,439, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 570,472, Aug. 21, 1990, abandoned. This application Feb. 21, 1995, Ser. No. 391,324

Claims priority, application European Pat. Off., Aug. 23, 1989, 89202133

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—23 **10 Claims**



1. A multilayer perceptron device, comprising:

input means for receiving an input vector;

a plurality of processing layers of processing elements including at least one hidden layer of processing elements;

forward propagation comparison means for comparing a processed input vector to an associated target vector and generating a feedback control signal for updating a respective network parameter using back propagation under control of a learning rate, wherein said learning rate is $eta_i = eta_o \times M/KN$, wherein eta_o is an overall learning rate for a layer in question, wherein eta_i is a learning rate for updating the respective network parameter, wherein N is the number of inputs to the processing element fed by the updatable parameter value in question, K is the number of outputs from that processing element, and M is the number of inputs to the processing elements of the next layer.

5,689,623
SPREAD SPECTRUM DIGITAL SCREENING

Adam I. Pinard, Amherst, N.H., assignor to Optronics International Corporation, Chelmsford, Mass.

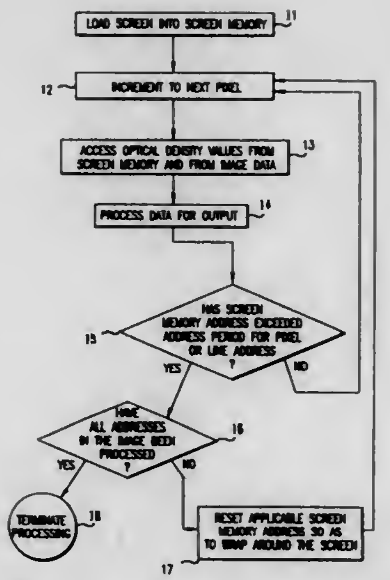
Filed Mar. 27, 1995, Ser. No. 410,785

Int. Cl.^{6} G06K *15/00;* **H04N** *1/40*

U.S. Cl. 395—106 **19 Claims**

1. A digital screening mask comprising:

a computer readable memory for storing data, wherein stored in the memory is a two dimensional array of optical density threshold values, each value being in a range between a minimum value and a maximum value, wherein a frequency domain plot of said array of threshold values is characterized by a function in magnitude independent of angle within a band of frequencies between a minimum frequency and a maximum frequency, the minimum frequency normally being imperceptible to humans and the maximum frequency being a frequency within the ability of a printing press to print.


LOAD SCREEN INTO SCREEN MEMORY
11
12
INCREMENT TO NEXT PIXEL
ACCESS OPTICAL DENSITY VALUES FROM SCREEN MEMORY AND FROM IMAGE DATA
13
PROCESS DATA FOR OUTPUT
14
15
HAS SCREEN MEMORY ADDRESS EXCEEDED ADDRESS PERIOD FOR PIXEL OR LINE ADDRESS ?
YES
NO
HAVE ALL ADDRESSES IN THE IMAGE BEEN PROCESSED ?
16
YES
NO
TERMINATE PROCESSING
18
RESET APPLICABLE SCREEN MEMORY ADDRESS SO AS TO WRAP AROUND THE SCREEN
17

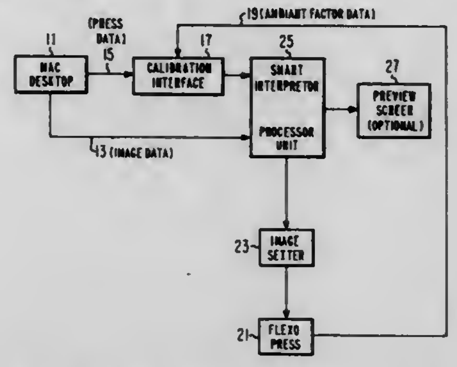
5,689,624
STOCHASTIC BASED INCREASED TONAL RANGE FLEXOGRAPHIC SCREENING PROCESS AND APPARATUS

John M. Allegrezza, 1503 Potters Pl., Holland, Pa. 18966

Filed Mar. 3, 1995, Ser. No. 398,159

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—112 **20 Claims**



1. A process for frequency modulated screening of desktop publisher image data values for flexo-press printer apparatus which has input gain compensation affected by ambient factors data, comprising the steps of:

obtaining equipment factors as a function of the ambient factors data for the particular flexo-press printer apparatus being operated, and obtaining the image data values and flexo-press data received from a desktop publisher and the ambient factors data received from the flexo-press printer apparatus, said obtaining equipment factors step including calibrating said flexo-press data as a function of said ambient factors data;

generating an interpreter language having a number of words numbering x times the number of possible said image data values provided by said desktop publisher, said interpreter language generation being modified as a function of said calibrated flexo-press data;

interpreting the image data values based upon the calibrated flexo-press data and said interpreter language generated; and

outputting said interpreted image data values to said flexo-press printer apparatus.

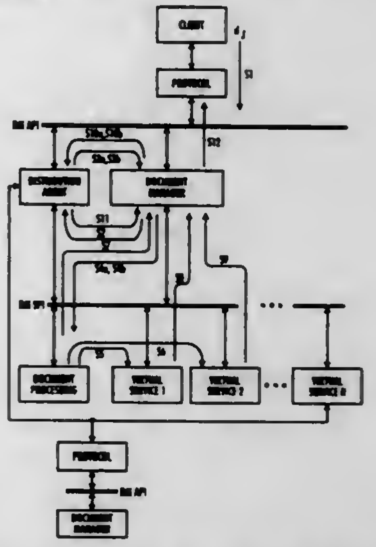
5,689,625
DOCUMENT SERVER FOR PROCESSING A DISTRIBUTION JOB IN A DOCUMENT PROCESSING SYSTEM

Paul R. Austin, Webster; Wendell L. Kibler, Ontario; Christopher Kulbida, Fairport; Steven E. Haehn, Rochester, and Keith G. Bunker, Hilton, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1995, Ser. No. 563,808

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—114 **4 Claims**



1. A document server, including a client, for processing a distribution job in a document processing system, the document server being disposed on a network serving a plurality of network users, the distribution job including an image data set as well as a first job ticket and a second job ticket, the first and second job tickets including first and second sets of attributes, selected ones of the attributes of the first and second attribute sets being corresponded with client programmed values with each client programmed value describing a manner in which first and second copies of the image data set are to be stored in or processed by the document processing system, wherein at least one attribute in each of the first and second attribute sets is not provided with a client programmed value, the document processing system including a first virtual service for storing or processing a first copy of the image data set in accordance with the first attribute set and a second virtual service for storing or processing a second copy of the image data set in accordance with the second attribute set, comprising:

a document manager, communicating with the first and second virtual services, for coordinating the storing or processing of the first and second job copies in the first and second virtual services;

a distribution agent, communicating with said document manager, for receiving the first and second job tickets of the distribution job as a single package, said distribution agent transmitting a copy of the first job ticket of the single package to said document manager so that said document manager facilitates routing of both the first copy of the image data set and the copy of the first job ticket to the first virtual service, and said distribution agent transmitting a copy of the second job ticket of the single package to said document manager so that said document manager facilitates routing of both the second copy of the image data set and the copy of the second job ticket to the second virtual service;

a database, communicating with said distribution agent, for storing a plurality of user profiles with each user profile including a network attribute set for each of the network users, each attribute in each network user attribute set having

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a corresponding value indicating one of the network user's preferences with respect to a manner in which a set of image data is to be stored or processed by the document processing system; and

prior to transmitting the first and second job tickets copies from said distribution agent to said document manager, said distribution agent automatically designating, by reference to the database, a value to be provided for those attributes lacking a client programmed value.

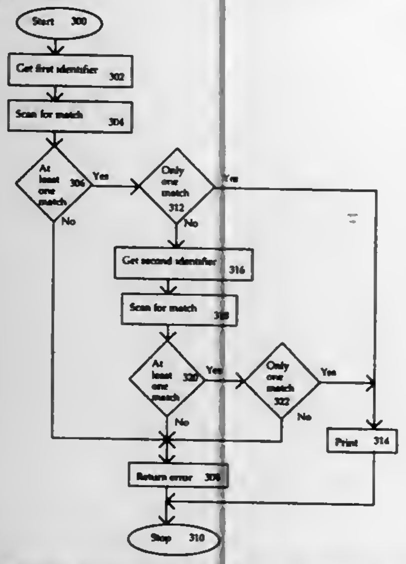
5,689,626
SYSTEM AND METHOD FOR LINKING A FILE TO A DOCUMENT AND SELECTING THE FILE

Michael T. Conley, Newark, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 17, 1995, Ser. No. 423,135

Int. Cl.⁶ G06K *15/00*

U.S. Cl. 395—117 **24 Claims**



1. A method for associating a file to a document and selecting the file when the document is printed so that the contents of the file are used when the document is printed, the method comprising the steps of:

providing a means for selecting a file containing data to be used when the document is printed;

storing a file identifier in a print record associated with the document after the file is selected, wherein the file identifier is comprised of a first identifier and a second identifier;

retrieving the first identifier from the print record when the document is to be printed;

selecting the file by searching all files for at least one match using the first identifier when the document is to be printed;

if only one match occurs when searching all files using the first identifier, using the contents of the matching file when printing the document;

if more than one match occurs when searching all flies using the first identifier, retrieving the second identifier from the print record;

searching all files for only one match using the first identifier and the second identifier;

if only one match occurs when searching all files using the first identifier and the second identifier, using the contents of the matching file when printing the document; and

if more than one match occurs when searching all files using the first identifier and the second identifier, returning an error message because the selected file can not be found.

5,689,627
POLYGON DRAWING AND FILLING APPARATUS WHICH INITIALLY SORTS THREE DIMENSIONAL POLYGONS BY PLANAR CHARACTERISTICS

Ikumi Arai, and Masafumi Baba, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 5, 1995, Ser. No. 498,129

Claims priority, application Japan, Nov. 29, 1994, 6-295051

Int. Cl.⁶ G06T *15/00*

U.S. Cl. 395—123 **4 Claims**

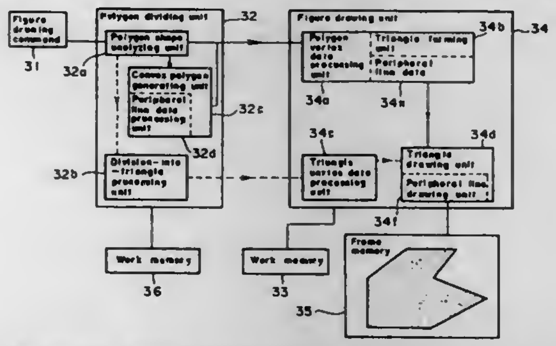


Figure drawing command
31
Polygon dividing unit
32
Polygon shape analyzing unit
32a
Convex polygon generating unit
Peripheral line data processing unit
32c
32d
Division-into-triangle processing unit
32b
Figure drawing unit
34
34b
Polygon vertex data processing unit
Triangle forming unit
Peripheral line data
34a
34e
34c
34d
Triangle vertex data processing unit
Triangle drawing unit
Peripheral line drawing unit
34f
Work memory
36
Work memory
33
Frame memory
35

1. A polygon drawing apparatus for admitting a figure drawing command including command type data and vertex data defining a polygon to be drawn and for outputting raster data about said polygon, said polygon drawing apparatus comprising:

polygon shape analyzing means for judging, based on said command type data of said figure drawing command, whether said polygon constituted by said vertex data of said figure drawing command is a plane figure or a non-planar figure;

division-into-triangle processing means for dividing said polygon into a plurality of triangles when said polygon shape analyzing means judges that said polygon is a non-planar figure and for generating vertex data about each of the divided triangles;

triangle vertex data processing means for performing vertex data processing on each of said divided triangles constituted by said vertex data generated by said division-into-triangle processing means;

polygon vertex data processing means for performing the vertex data processing on said polygon when said polygon shape analyzing means judges that said polygon is a plane figure;

triangle forming means for dividing into a plurality of triangles the polygon constituted by the vertex data processed by said polygon vertex data processing means and for generating vertex data about each of the divided triangles; and

triangle drawing means for successively transforming into raster data each of the triangles constituted by one of two kinds of vertex data, one kind of vertex data having been processed by said triangle vertex data processing means, the other kind of vertex data having been generated by said triangle forming means.

5,689,628
COUPLING A DISPLAY OBJECT TO A VIEWPOINT IN A NAVIGABLE WORKSPACE

George G. Robertson, Foster City, Calif., assignor to Xerox Corporation, Stamford, Conn.

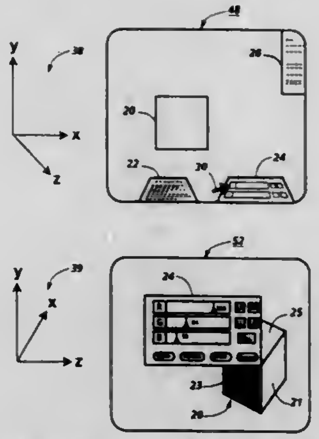
Filed Apr. 14, 1994, Ser. No. 227,763

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—127 **21 Claims**

1. A method of operating a system including a display, a user input device for producing signals indicating actions of a system user, memory for storing data, and a processor connected for receiving signals and for presenting images on the display; the method comprising:

presenting a first image on the display that is perceptible as viewed from a first viewpoint in a navigable workspace; the first workspace including a first display object;



receiving a first signal from the user input device indicating selection by the system user of the first display object as a selected display object;

coupling the selected display object to the first viewpoint in the navigable workspace in response to the first signal;

receiving a sequence of next viewpoint signals from the user input device requesting viewpoint motion in the navigable workspace; each next viewpoint signal indicating a next viewpoint in the navigable workspace that is displaced in the workspace from the next viewpoint of a preceding next viewpoint signal in the sequence of signals; and

presenting on the display, in response to each next viewpoint signal, a respective next image including the selected display object; the respective next image being perceptible as viewed from the next viewpoint in the navigable workspace; the selected display object being perceptible as a moved continuation of the selected display object in a preceding respective next image; when the selected display object is coupled to the first viewpoint, the selected display object being presented in each respective next image so that the selected display object is perceptible as viewed from the first viewpoint in the navigable workspace.

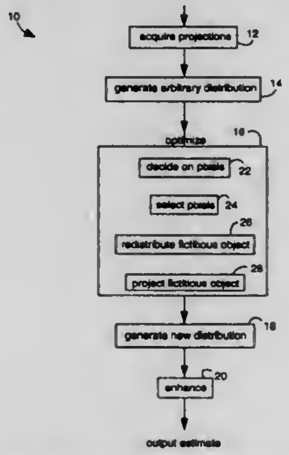
5,689,629
ITERATIVE OPTIMIZING QUANTIZATION METHOD FOR RECONSTRUCTING THREE-DIMENSIONAL IMAGES FROM A LIMITED NUMBER OF VIEWS

Heung-Rae Lee, Dublin, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Dec. 12, 1995, Ser. No. 571,330

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—127 **4 Claims**


10
acquire projections
12
generate arbitrary distribution
14
optimize
16
decide on pixels
22
select pixels
24
redistribute fictitious object
26
project fictitious object
28
generate new distribution
18
enhance
20
output estimate

1. A method of reconstructing a three-dimensional image in a volume from a finite number of two-dimensional projections at various limits of said volume, the method comprising the steps of:

collecting a plurality of two-dimensional projections of a three-dimensional object-of-interest in a volume from various points of observation outside said volume;

defining said three-dimensional object-of-interest as a group of elements;

selecting any one of said plurality of two-dimensional projections to serve as a reference projection;

arbitrarily defining a fictitious three-dimensional strawman in said volume that is constrained by said reference two-dimensional projection;

modifying said three-dimensional strawman one at a time to conform to each of said other two-dimensional projections;

optimizing by continued iterations through the step of modifying and comparing until further optimization of said three-dimensional strawman is limited by a residual sum of background noise; and

outputting a representation of said optimized strawman as an estimate of the three-dimensional character of said object-of-interest in said volume.

5,689,630
INFORMATION REPRODUCING APPARATUS

Shigeyuki Taniwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

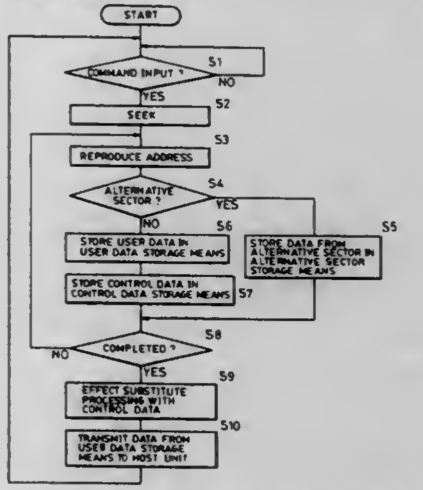
Continuation of Ser. No. 499,768, Mar. 27, 1990, abandoned.

This application Oct. 22, 1993, Ser. No. 139,779

Claims priority, application Japan, Mar. 28, 1989, 1-075416

Int. Cl.⁶ G06F *12/12*

U.S. Cl. 395—182.06 **9 Claims**


START
COMMAND INPUT ?
S1
NO
YES
S2
SEEK
S3
REPRODUCE ADDRESS
ALTERNATIVE SECTOR ?
S4
YES
NO
S6
STORE USER DATA IN USER DATA STORAGE MEANS
S5
STORE DATA FROM ALTERNATIVE SECTOR IN ALTERNATIVE SECTOR STORAGE MEANS
STORE CONTROL DATA IN CONTROL DATA STORAGE MEANS
S7
COMPLETED ?
S8
NO
YES
S9
EFFECT SUBSTITUTE PROCESSING WITH CONTROL DATA
S10
TRANSMIT DATA FROM USER DATA STORAGE MEANS TO HOST UNIT

1. An information reproducing apparatus for reading out information recorded on a recording medium having a plurality of information tracks and for transferring read-out information to a host computer, each of said information tracks having a plurality of recording blocks and at least one alternative recording block and for outputting the read information to a host computer, the information recorded in the recording blocks and the alternative recording block, each of the blocks comprising address data indicating a position of each block, user data recorded by a user as desired and control data for controlling the user data, said apparatus comprising:

read means for reading out the information recorded on the recording medium;

storage means for temporarily storing the information read out by said read means, said storage means having a first storage area for storing the user data read out from the recording blocks, a second storage area for storing the user data read out from the alternative recording block and a third storage area for storing the control data; and

input means for inputting a command for reproducing desired information recorded on the recording medium,

wherein said read means reads out sequentially the information from the recording blocks and the alternative recording block, regardless of existence or non-existence of any defect in the recording blocks, in response to input of the command by said input means, the user data read out from the recording blocks are stored in the first storage area of said storage means, the user data read out from the alternative recording block are stored in the second storage area of said storage means, the control data read out from the recording blocks and the

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alternative recording block are stored in the third storage area of said storage means, the user data stored in the first and the second storage areas are reconstituted in accordance with the control data stored in the third storage area after one unit of information to be transferred at a time to the host computer has been stored in said storage means, and the reconstituted user data are transferred to the host computer.

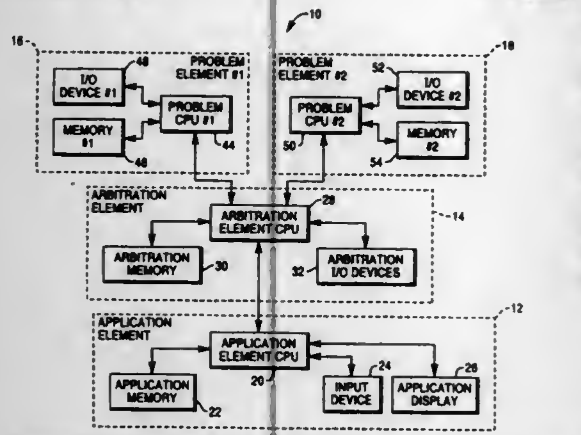
5,689,631
PARALLEL PROCESSING COMPUTER AND METHOD OF SOLVING A PROBLEM USING SIMULTANEOUSLY EXECUTED DIFFERENT AND COMPETING PROCEDURES

Stephen V. Chenoweth, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 82,705, Jun. 28, 1993, abandoned. This application Jul. 17, 1995, Ser. No. 502,942

Int. Cl.^{6} G06F *13/00;15/16*

U.S. Cl. 395—182.09 **15 Claims**



1. A method for utilizing the assets of a parallel processing computer to solve a predetermined problem comprising the steps of:

formulating the problem by an application program;
creating different, competing, and previously undefined procedures from a pre-existing rule for solving the problem;
substantially simultaneously starting execution of the procedures;
starting a timer at the start of execution;
if more than one different solution was generated by the procedures after a predetermined time period, returning a best one of the solutions based upon the rule for solving the problem to the application program; and
if a solution was not generated by any of the procedures after the predetermined time period, terminating execution of all procedures.

5,689,632
COMPUTING UNIT HAVING A PLURALITY OF REDUNDANT COMPUTERS

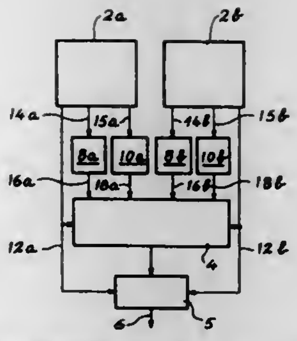
Richard Galy, Charenton, and Alain Giraud, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, France

Continuation of Ser. No. 490,349, Jun. 14, 1995, abandoned. This application Oct. 24, 1996, Ser. No. 736,295

Claims priority, application France, Jun. 14, 1994, 94 07251

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.09 **7 Claims**



7. A computing unit having two redundant computers for independently performing identical computing tasks and for each supplying computing data to a comparator, and a multiplexer controlled by the comparator so as to transmit to an output the computing data of at least one of the computers when the comparator detects an agreement of the computing data from each computer, wherein the computing unit also has means for controlling and for checking the satisfactory operation of each computer, the multiplexer for supplying to an output the computing data of a computer, whose satisfactory operation is verified by the control and checking means when the comparator detects a difference in the computing results coming respectively from each computer and also wherein each computer has a plurality of microcontrollers operating in turn such that each of said microcontrollers is periodically activated and deactivated, and only one of said microcontrollers is activated during any given time period, and also wherein said means for checking satisfactory operation includes for each computer a life-tester system for establishing whether the computer is in an operating state and a consistency tester system for analyzing the computing data of a given test processing performed by each computer and each microcontroller also includes a monitoring system for monitoring operation of said microcontrollers and for disconnecting power supply of any microcontroller when failure of operation is detected.

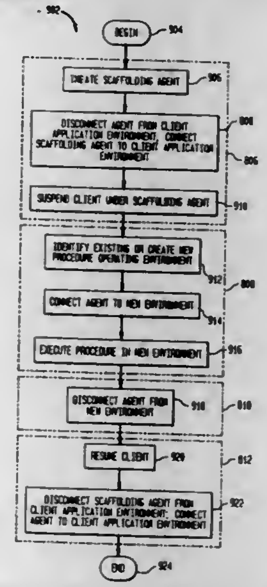
5,689,633
COMPUTER PROGRAM PRODUCT AND PROGRAM STORAGE DEVICE FOR INCLUDING STORED PROCEDURE USER DEFINED FUNCTION OR TRIGGER PROCESSING WITHIN A UNIT OF WORK

Curt L. Cotner; Robert J. Heaps, both of Gilroy; Wendy L. Koontz; Benjamin R. Little, both of San Jose, and Thomas J. Toomire, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 311,035, Sep. 23, 1994, Pat. No. 5,553,234. This application Jun. 7, 1995, Ser. No. 484,311

Int. Cl.^{6} G06F *13/00;13/06*

U.S. Cl. 395—182.14 **15 Claims**


902
BEGIN
904
CREATE SCAFFOLDING AGENT
906
DISCONNECT AGENT FROM CLIENT APPLICATION ENVIRONMENT, CONNECT SCAFFOLDING AGENT TO CLIENT APPLICATION ENVIRONMENT
908
SUSPEND CLIENT UNDER SCAFFOLDING AGENT
910
IDENTIFY EXISTING OR CREATE NEW PROCEDURE OPERATING ENVIRONMENT
912
CONNECT AGENT TO NEW ENVIRONMENT
914
EXECUTE PROCEDURE IN NEW ENVIRONMENT
916
DISCONNECT AGENT FROM NEW ENVIRONMENT
918
RESUME CLIENT
920
DISCONNECT SCAFFOLDING AGENT FROM CLIENT APPLICATION ENVIRONMENT; CONNECT AGENT TO CLIENT APPLICATION ENVIRONMENT
922
END
924

1. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for incorporating an external predefined

procedure into an existing unit of work, said existing unit of work being part of a client application process, said method steps comprising:

(a) creating, in a database environment, a "logical representation" of said client application process, that is connected to said client application process;
(b) disconnecting said "logical representation" from said client application process;
(c) connecting said "logical representation" to a procedure operating environment to execute external programs;
(d) executing said external predefined procedure in said procedure operating environment;
(e) disconnecting said "logical representation" from said procedure operating environment; and
(f). reconnecting said "logical representation" to said client application process, to incorporate the external predefined procedure into the existing unit of work.

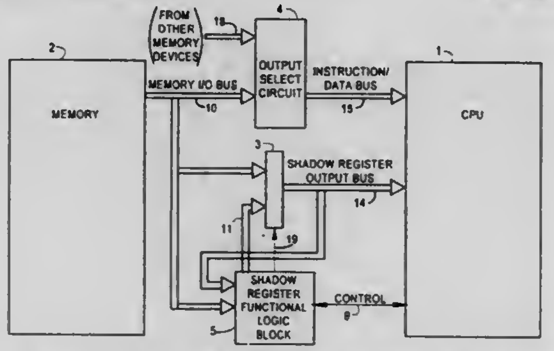
5,689,634
THREE PURPOSE SHADOW REGISTER ATTACHED TO THE OUTPUT OF STORAGE DEVICES

John G. McBride, Fort Collins, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Sep. 23, 1996, Ser. No. 717,646

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 395—183.15 **16 Claims**



1. A multi-purpose shadow register apparatus in a computer system, said computer system having a central processing unit, a memory, a memory output select circuit, and a memory output bus which provides memory output data from the memory to the memory output select circuit, said multi-purpose shadow register apparatus comprising:

a shadow register in parallel with the memory output select circuit and connected to receive memory output data from the memory output bus, said shadow register being responsive to an output enable signal to provide shadow register output data on a shadow register output bus; and
a shadow register functional logic block comprising a plurality of functional blocks which utilize the shadow register in a mutually time-exclusive manner.

5,689,635
MICROPROCESSOR MEMORY TEST CIRCUIT AND METHOD

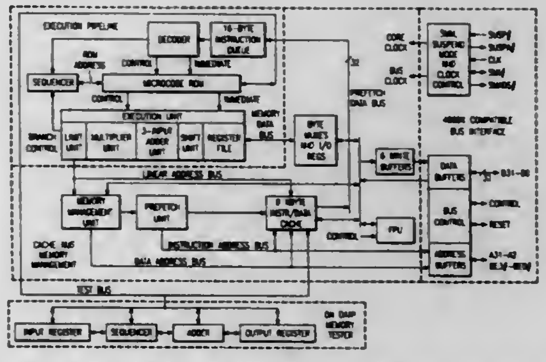
Gianluca Petrosino, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 27, 1995, Ser. No. 579,564

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.18 **20 Claims**

7. A microprocessor for use in an electronic system comprising:
volatile memory having an address bus and a data bus;
a test bus in addition to the address bus and data bus of said volatile memory;
an on-chip memory test circuit coupled to said test bus; and



means for disabling the electronic system other than the microprocessor until said volatile memory had been tested.

5,689,636
TRACER SYSTEM FOR ERROR ANALYSIS IN RUNNING REAL-TIME SYSTEMS

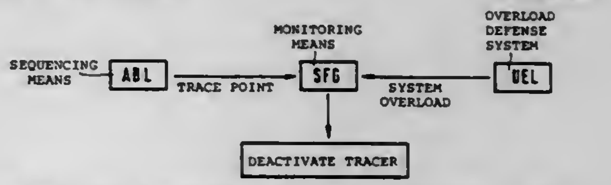
Ulrich Kleber, Munich, and Hans-Joerg Keller, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 28, 1994, Ser. No. 313,883

Claims priority, application Germany, Sep. 28, 1993, 43 32 993.4

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.21 **16 Claims**



9. In a tracer system for error analysis of programs, said programs running in a real-time system, the improvement comprising:

a monitor for determining dynamic load on the real-time system caused by the tracer system and for deactivating the tracer system when the dynamic load upwardly exceeds at least one specific threshold:
the monitor having an interface to a system component of the real-time system via which it receives information about an existing overload level in case of overload, and the monitor deactivating the tracer system when a specific overload level has been reached: and
the monitor interface to the system component of the real-time system being to an overload defense system.

5,689,637
CONSOLE SIMULATOR, MULTI-CONSOLE MANAGEMENT SYSTEM AND CONSOLE MANAGEMENT DISTRIBUTION SYSTEM

R. Brent Johnson, 10816 E. Newton St., Tulsa, Okla. 74116, and Darrell B. Burson, P.O. Box 580068, Tulsa, Okla. 74158

Division of Ser. No. 367,950, Jan. 3, 1995. Pat. No. 5,592,657, which is a continuation of Ser. No. 47,754, Apr. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 877,886, May 1, 1992, abandoned. This application Jul. 5, 1996, Ser. No. 675,784

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—183.22 **7 Claims**

1. A method of monitoring a plurality of computer systems having central processing units, which method comprises:

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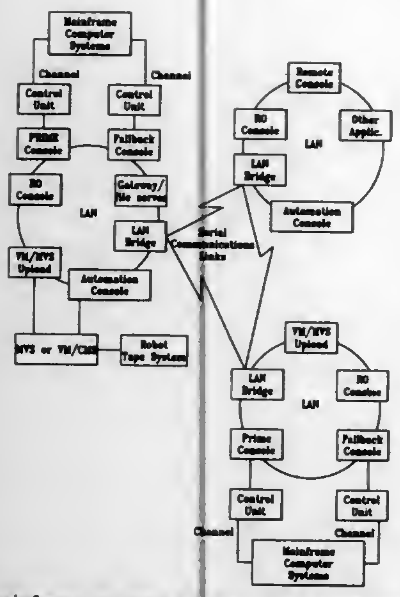


storing mainframe operator messages from a mainframe operating system in a memory in communication with a central processing unit;

inputting operator data and messages into said memory through interface means;

transferring said mainframe operator messages, in a multitasking environment, between said central processing unit of the monitoring system and said central processing units of said monitored computer system;

scanning, recognizing and intercepting said mainframe operator messages destined for a human operator;

performing at least one step that would normally have to be performed by said human operator; and

displaying said operator input data and messages and mainframe operator messages on a display in communication with said central processing unit of said monitoring system.

5,689,638

METHOD FOR PROVIDING ACCESS TO INDEPENDENT NETWORK RESOURCES BY ESTABLISHING CONNECTION USING AN APPLICATION PROGRAMMING INTERFACE FUNCTION CALL WITHOUT PROMPTING THE USER FOR AUTHENTICATION DATA

Vladimir Sadovsky, Kirkland, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Dec. 13, 1994, Ser. No. 355,401

Int. Cl.^{6} G06F *13/00*

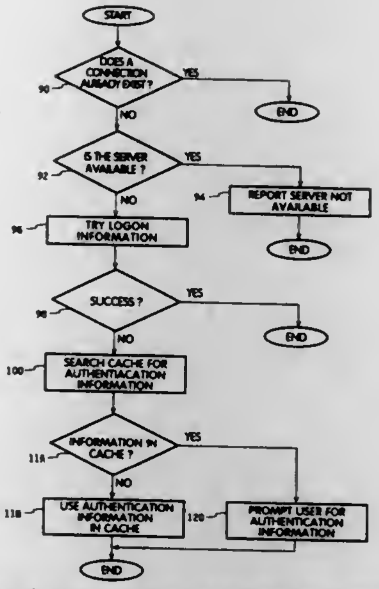
U.S. Cl. 395—188.01 **13 Claims**

1. In a programmed computer having a plurality of network providers for accessing remote network resources, where each of the network providers is associated with a distinct type of network software and each of the network providers manages connections between the computer and a computer network, a method for accessing independent network resources in a computer network, the method comprising:

storing logon data for a user when the user logs on to a local computer system in the computer network;

storing authentication data in an authentication data cache shared among the network providers when the network providers access an independent network resource;

in response to a request from an application program to enumerate network resources available at an independent network resource in a first network, checking whether a connection has been established to the independent network resource in the first network;


START
DOES A CONNECTION ALREADY EXIST?
90
YES
END
NO
IS THE SERVER AVAILABLE?
92
YES
94
REPORT SERVER NOT AVAILABLE
END
NO
96
TRY LOGON INFORMATION
SUCCESS?
98
YES
END
NO
100
SEARCH CACHE FOR AUTHENTICATION INFORMATION
INFORMATION IN CACHE?
116
YES
NO
118
USE AUTHENTICATION INFORMATION IN CACHE
120
PROMPT USER FOR AUTHENTICATION INFORMATION
END

if the connection has not been established, executing a connection API function in response to a connection API function call from the application to establish the connection without prompting the user for authentication data including:

a) routing the the connection API function call to a network provider that manages connections with a network having the independent network resource;

b) using the network provider to authenticate access to the independent network resource without requesting authentication data from the user by searching for authentication data corresponding to the independent network resource in the authentication data cache and authenticating access to the independent network resource using the corresponding authentication data in the shared authentication data cache;

c) enumerating the network resources available at the independent network resource on the first network using the connection established with the independent network resource;

in response to a request from the application program to enumerate network resources available at an independent network resource at a second network, checking whether a connection has been established to the independent network resource in the second network; and

if the connection has not been established, executing the connection API function in response to a connection API function call from the application to establish the connection without prompting the user for authentication data including steps a–c

wherein the first and second networks run on different types of network software.

5,689,639

METHOD AND APPARATUS FOR UPDATING AND TRANSMITTING LINE-ORIENTED DATA SETS

Siegfried Schwarz, Boeblingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1995, Ser. No. 450,054

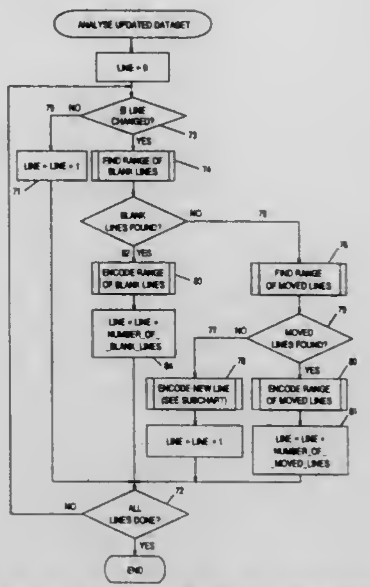
Claims priority, application European Pat. Off., Oct. 29, 1994, 94117136.5

Int. Cl.^{6} G06F *3/00;5/00;7/00;* **H03M** *7/00*

U.S. Cl. 395—200.01 **20 Claims**

16. A method for determining changes in line-oriented data sets of characters or pixel graphics in a data processing unit with respect to timely occurring changes of said data set, said method comprising the steps of:

providing, in said data processing unit, two data structures which keep the states of the data sets at different time intervals and which are filed with the data sets;


ANALYSE UPDATED DATASET
LINE = 0
IS LINE CHANGED?
73
NO
YES
LINE = LINE + 1
71
FIND RANGE OF BLANK LINES
74
BLANK LINES FOUND?
NO
76
YES
ENCODE RANGE OF BLANK LINES
FIND RANGE OF MOVED LINES
LINE = LINE + NUMBER_OF_BLANK_LINES
MOVED LINES FOUND?
NO
YES
ENCODE NEW LINE (SEE SUBCHART)
ENCODE RANGE OF MOVED LINES
LINE = LINE + 1
LINE = LINE + NUMBER_OF_MOVED_LINES
NO
ALL LINES DONE?
72
YES
END

comparing the data sets provided in said data structures in order to locate changed and unchanged lines;

in case of changed lines, determining for the data sets of the later time internal whether said changed lines are blank lines, and if not, determining whether said changed lines are moved lines with respect to at least another line contained elsewhere in the data set of the previous time interval; and

generating updated information with respect to said changed and unchanged lines.

5,689,640

METHOD AND SYSTEM FOR DOWNLOADING DATA TO NETWORK NODES

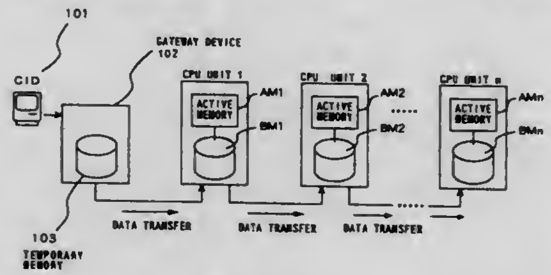
Yasuyo Okanoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 15, 1995, Ser. No. 490,551

Claims priority, application Japan, Jun. 15, 1994, 6-156808

Int. Cl.^{6} G06F *13/38;12/02*

U.S. Cl. 395—200.01 **30 Claims**



1. A system comprising:

a first device comprising a first memory for storing a first data file;

a second device comprising a second memory for storing the first data file received from the first device; and

a network which is connected to the second device and receives the first data file from the second device,

the network comprising a plurality of nodes in a predetermined configuration,

each the node comprising:

a plurality of memories each having a capacity which is not smaller than an amount of the first data file, one of the plurality of memories storing a second data file; and

control means for controlling the plurality of memories such that another of the plurality of memories stores the first data file received from the second device.

5,689,641

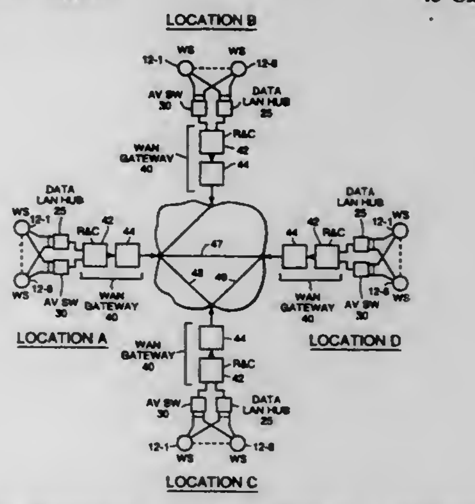
MULTIMEDIA COLLABORATION SYSTEM ARRANGEMENT FOR ROUTING COMPRESSED AV SIGNAL THROUGH A PARTICIPANT SITE WITHOUT DECOMPRESSING THE AV SIGNAL

Lester F. Ludwig, Foster City; J. Chris Lauwers, Menlo Park; Keith A. Lantz, Los Altos; Gerald J. Burnett, Atherton, all of Calif., and Emmett R. Burns, Incline Village, Nev., assignors to Vicor, Inc., Palo Alto, Calif.

Filed Oct. 1, 1993, Ser. No. 131,523

Int. Cl.^{6} H04N *7/15;* **H04L** *12/00*

U.S. Cl. 395—200.02 **43 Claims**



1. A teleconferencing system for conducting a teleconference among a plurality of participants comprising:

(a) first, second and third locations;

(b) at least one workstation at each of the first, second and third locations, each workstation including audio and video capture and reproduction capabilities arranged to capture and reproduce participant video images and spoken audio;

(c) a codec associated with each of the first, second and third locations;

(d) an AV path linking the three locations;

(e) a network switch associated with at least one of the first and second locations and designed to route codec compressed AV signals representing captured participant video images and spoken audio along the AV path;

(f) a switch in communication with the third location to route compressed AV signals, destined for the second location, from the first location to the second location without the compressed AV signals being decompressed or reproduced at said third location; and

(g) a Local Area Network switch functionally positioned between the workstation at and the codec associated with one of the first and second locations to route signals to the workstation at that location,

wherein the location at which the Local Area Network switch is positioned is a multi-participant location having a plurality of workstations, and

wherein the Local Area Network switch is arranged to receive signals from the codec at that location and route the received signals to a destination workstation of the workstation plurality.

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5,689,642
RECIPIENT PRIORITIZED COMMUNICATION CHANNEL PROFILES

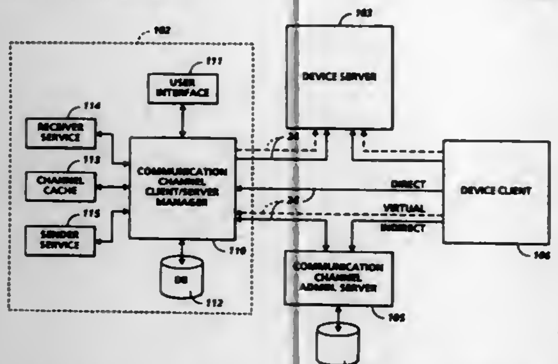
Larry E. Harkins, Rochester; Ken Hayward, North Brockport; Thomas J. Herceg, Pittsford; Jonathan D. Levine, Rochester, and David M. Parsons, Victor, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 130,828, Oct. 4, 1993, Pat. No. 5,513,126. This application Nov. 22, 1995, Ser. No. 562,325

Claims priority, application Japan, Jul. 14, 1995, 7717158

Int. Cl.^{6} H04L *12/28*

U.S. Cl. 395—200.04 **22 Claims**



1. In a network having a plurality of devices interconnected over a network channel having a plurality of connecting paths, the method of transmitting predetermined data from a given source to a designated recipient on the network comprising the steps of:

identifying the recipient to receive the data,

accessing the recipients profile for receiving said data, said profile designating recipients' priority of receiving data including designating a least one device on the network,

responsive to recipients profile for receiving said data, determining a set of connecting paths to transmit the predetermined data from the given source to the recipient, and

conveying the predetermined data from the given source to the device on the network designated by the recipient.

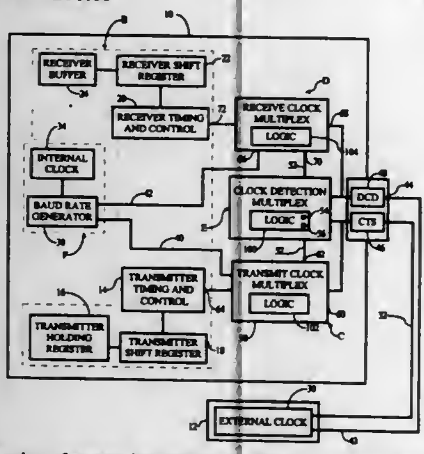
5,689,643
COMMUNICATION DEVICE FOR TRANSMITTING ASYNCHRONOUS FORMATTED DATA SYNCHRONOUSLY

Thomas B. O'Hanlan, 100 Edgemont Ave., Liberty, S.C. 29657

Filed Dec. 9, 1994, Ser. No. 353,496

Int. Cl.^{6} G06F *13/12;13/42*

U.S. Cl. 395—200.05 **10 Claims**



1. A device for an isochronous data communication system communicating asynchronously formatted data between a first data terminal having an internal clocking means for asynchronous communicating and a remote communication unit having an external clocking means for synchronous communication, said device comprising:

a clock multiplex circuit for receiving an internal clock signal generated by said first clocking means and for receiving an external clock signal transmitted from said second clocking means, said clock multiplex circuit transmitting a data timing signal for timing said communication of data between said first data terminal and said remote communication unit;

a logic means operatively connected with said clock multiplex circuit for determining said data timing signal, said data timing signal corresponding with said external clock signal if said external clock signal is transmitted from said remote communication unit to said clock multiplex circuit, and said data timing signal corresponding with said internal clock signal if no external clock signal is transmitted from said remote communication unit; and

a communication control device operatively connected with said clock multiplex circuit for controlling said communciation of asynchronously formatted data between said first data terminal and said remote communication unit, said communication control device receiving said data timing signal transmitted from said clock multiplex circuit;

whereby communication of asynchronous formatted data between said first data terminal and remote communication unit are controlled by a clock signal transmitted by said remote communication unit if present.

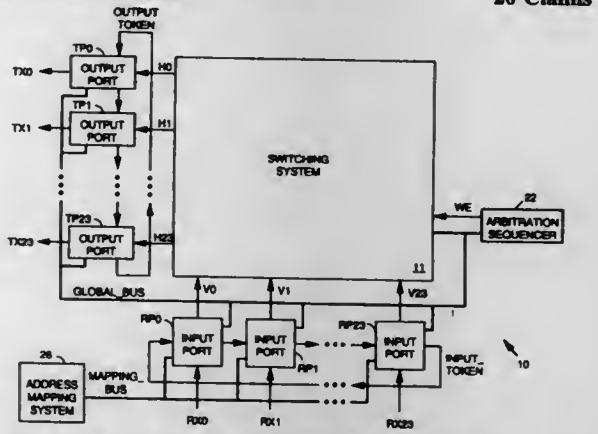
5,689,644
NETWORK SWITCH WITH ARBITRATION SYTEM

Ger-Chih Chou; Kent Blair Dahlgren, both of San Jose, and Wen-Jai Hsieh, Palo Alto, all of Calif., assignors to I-Cube, Inc., Campbell, Calif.

Filed Mar. 25, 1996, Ser. No. 621,422

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.06 **20 Claims**



1. A network switch for routing data packets between a plurality of network stations, comprising:

a plurality of input ports interconnected to form an input token passing ring, each input port including means for passing the input token to a succeeding input port of the ring after receiving an input token from a preceding input port of the ring, and each input port including means for receiving and forwarding data packets from corresponding network station;

a plurality of output ports interconnected to form an output token passing ring, each output port including means for passing an output token from a succeeding output port of the ring after receiving the output token from a preceding output port of the ring, and each output port including means for receiving and forwarding data packets to a corresponding network station;

a switching system connected to said input and output ports for receiving packets forwarded by said input ports and selectively routing them to said output ports in accordance with input routing data; and

a global bus interconnecting said input ports, said output ports and said switching system;

wherein when one of said output ports receives the output token and is idle (not currently receiving a packet), it signals the input ports via said global bus to begin passing the input token, and wherein when a token receiving input port has received a packet to be forwarded to the token receiving output port, the token receiving input port sends routing data to said switching system via said global bus.

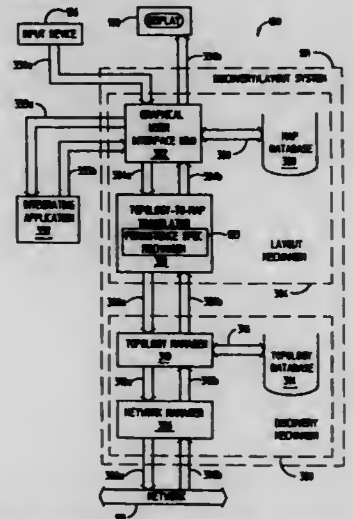
5,689,645
PERSISTENCE SPECIFICATION SYSTEM AND METHOD FOR PRODUCING PERSISTENT AND TRANSIENT SUBMAPS IN A MANAGEMENT STATION FOR A DATA COMMUNICATION NETWORK

Robert Dwight Schettler; William Girard McCollom, and David M. Haimson, all of Fort Collins, Colo., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Dec. 1, 1994, Ser. No. 348,024

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.1 **13 Claims**



6. A persistence specification system for enhancing intercommunication between an integrating application and a graphical user interface so that more information concerning a network is provided to a user, while memory requirements and processing time are minimized, comprising:

a topology database for storing a plurality of submaps of map data for a graphical user interface, said submaps for driving a display;

a translator configured to convert said topology data from said topology database to map data for said map database, said translator configured to generate submaps from said map data for said graphical user interface for driving said display;

a persistence specification mechanism associated with said translator, said persistence specification mechanism configured to evaluate objects within said map data and configured to specify each object as persistent and, alternatively, as transient, based upon said object evaluation an persistence input pertaining to said objects, said persistence mechanism configured to evaluate each said submap and configured to specify a submap as persistent and, alternatively, as transient, based upon said submap evaluation, said submap being specified as persistent when said submap comprise a persistent object, said submap being specified as transient when said submap comprises no persistent object; and

said translator configured to generate and continuously maintain said persistent submaps within said map database, said translator configured to generate and temporarily maintain said transient submaps upon receiving a user prompt for a temporary time period corresponding with said user prompt;

said integrating application in communication with said persistence specification mechanism for generating said persistence input:

said persistence specification mechanism being configured to advise said integrating application of said persistent objects; and

said integrating application being configured to provide supplemental display information to said graphical user interface based upon said persistent objects.

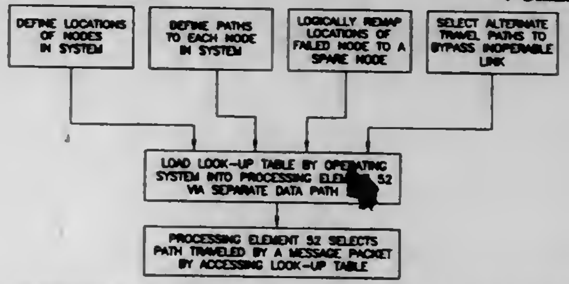
5,689,646
CONFIGURING OF NETWORKED SYSTEM TO PERMIT REPLACEMENT OF FAILED MODES AND SELECTION OF ALTERNATE PATHS

Gregory Michael Thorson, Altoona, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Division of Ser. No. 983,979, Nov. 30, 1992, Pat. No. 5,553,198. This application Oct. 10, 1995, Ser. No. 541,803

Int. Cl.^{6} H04J *3/26*

U.S. Cl. 395—200.15 **4 Claims**


DEFINE LOCATIONS OF NODES IN SYSTEM
DEFINE PATHS TO EACH NODE IN SYSTEM
LOGICALLY REMAP LOCATIONS OF FAILED NODE TO A SPARE NODE
SELECT ALTERNATE TRAVEL PATHS TO BYPASS INOPERABLE LINK
LOAD LOOK-UP TABLE BY OPERATING SYSTEM INTO PROCESSING ELEMENT 52 VIA SEPARATE DATA PATH
PROCESSING ELEMENT 52 SELECTS PATH TRAVELED BY A MESSAGE PACKET BY ACCESSING LOOK-UP TABLE

1. A method of configuring a networked system having a plurality of configured nodes connected by links in an n-dimensional topology having n dimensions, including a first and a second dimension, wherein two or more nodes are connected in 2n directions to other nodes in the system, the 2n directions including first and second directions in each of the n dimensions, the method comprising:

defining a location in the networked system for each of the plurality of configured nodes;

defining a path to each configured node from all other configured nodes, wherein the path is used for routing packets of information from a source node to a destination node;

loading entries into a look-up table in each of the configured nodes, wherein the entries correspond to the defined locations of the configured nodes and defined paths to each configured node from all other configured nodes, wherein each entry defines a direction order for routing from the source node to the destination node according to a priority in each of the 2n directions, wherein the first direction of the first dimension, the second direction of the first dimension, the first direction of the second dimension, and the second direction of the second dimension all have different defined priorities for packet routing;

replacing a failed configured node by logically remapping the defined locations of said failed configured node to a spare node not included in the configured nodes and by loading the logically remapped defined locations into each look-up table; and

selecting alternate travel paths to a configured node by redefining the direction order for routing packets in at least two of the 2n directions to allow a packet of information to be routed around an inoperable link in the n-dimensional topology and loading the alternate travel paths into corresponding look-up tables.

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5,689,647
PARALLEL COMPUTING SYSTEM WITH PROCESSING ELEMENT NUMBER SETTING MODE AND SHORTEST ROUTE DETERMINATION WITH MATRIX SIZE INFORMATION

Hiroki Miura, Osaka-fu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-fu, Japan

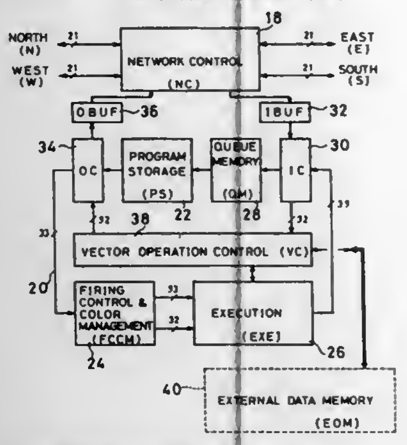
Continuation of Ser. No. 370,459, Jan. 9, 1995, abandoned, which is a continuation of Ser. No. 67,268, May 24, 1993, abandoned, which is a continuation of Ser. No. 492,680, Mar. 13, 1990, abandoned. This application Nov. 1, 1995, Ser. No. 551,694

Claims priority, application Japan, Mar. 14, 1989, 1-63091; Mar. 14, 1989, 1-63092; Jun. 15, 1989, 1-153276; Jun. 15, 1989, 1-153277; Oct. 13, 1989, 1-266624; Oct. 13, 1989, 1-266625; Oct. 13, 1989, 1-266626

Int. Cl.^{6} G06F *15/173*

U.S. Cl. 395—200.15 **44 Claims**

PROCESSING ELEMENT (PE)



1. A parallel computer system comprising:

a plurality of processing elements, each of said processing elements including
  a network control unit having a plurality of individual communication ports,
  a data processing unit, and
  a mode flag capable of being selectively set for operating the processing element in a first number setting mode or a second normal operation mode,

each said network control unit receiving data sets that each contain a processing element identifying number and performing a transfer control of the received data sets;

a plurality of individual communication lines for coupling the plurality of individual communication ports of said network control units of said plurality of processing elements into a network;

sending means for sequentially sending the data sets onto said network, said sending means sending each data set with a different processing element identifying number while any of said processing elements are in said first number setting mode;

holding means in each of said plurality of processing elements for holding a respective processing element identifying number corresponding to each said processing element as received in a data set from said sending unit; and

number setting means in each of said plurality of processing elements for setting said processing element identifying number, wherein

each of the network control units, (i) while its respective processing element is in said first number setting mode, transfers each received data set to its own processing element irrespective of the processing element identifying number contained in the received data set arriving at any one of said plurality of communication ports of a said processing element, (ii) while said own processing element is in said second normal mode transfers the received data set to said own processing element only when the processing element identifying number contained in the data set is equal to the processing element identifying number held by said own processing element, and (iii) while a said processing element is in said second normal mode and at a time when the processing element identifying number contained in the received data set is not equal to the respective processing element identifying number held by its own processing element, transfers the data set to a selected one of said plurality of communication ports of the processing element, and

means in each of said processing elements for setting the mode flag in said normal operation mode when said processing element identifying number is held by said holding means.

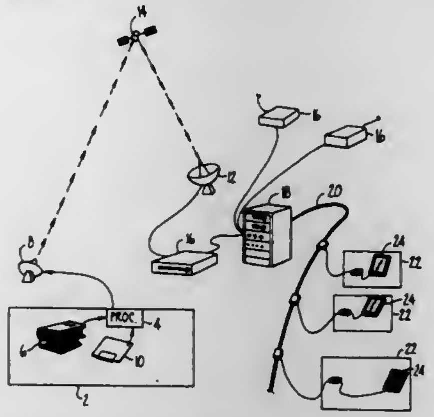
5,689,648
METHOD AND APPARATUS FOR PUBLICATION OF INFORMATION

Stephen H. Diaz, Palo Alto, and Scott Summit, Portola Valley, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 31, 1992, Ser. No. 830,165

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—226 **17 Claims**



1. A publication system comprising:

a) means at a publisher's facility for producing a periodical publication in digital form;

b) means for transmitting said periodical publication in digital form to a cable television service provider;

c) a memory and display system at a subscriber location for receiving and storing said publication from said cable television service provider over a cable system and including a display for visually displaying said periodical;

wherein said memory and display system comprises:
  i. a base unit which is coupled to said cable system to receive and process information including said publication, and
  ii. a portable memory/display unit which
    iia. includes a display and a memory,
    iib. is removably mounted and electrically coupled to said base unit,
    iic. comprises central processing means for inputting data and displaying data on said display,
    iid. is capable of storing and formatting an entire publication transferred from said base unit for presentation on said display, and
    iie. is capable of displaying an entire publication to a user while removed from said base unit.

5,689,649
SYSTEM FOR OPERATION OF A COMBINATION MORTGAGE, EQUITY LOAD AND SAVINGS PLAN

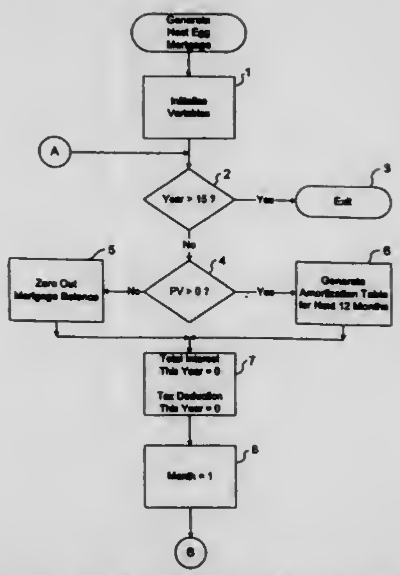
Robert Altman, 195 Hackensack Ave.; John W. Cleary, 113 Parkway, both of Harrington Park, N.J. 07640, and Morris Markowitz, 249-15 Cullman Ave., Little Neck, N.Y. 11362

Filed Mar. 1, 1991, Ser. No. 662,970

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 395—236 **13 Claims**

1. A method, implemented on a computer for implementing a nest egg mortgage plan which comprises: determining an amount of mortgage for which an applicant would qualify and a predetermined term of repayment of principal therefor based on conventional lending practices; creating an accelerated payment schedule for such mortgage so that the principal is repaid within a shorter time than the predetermined term of the mortgage; applying the difference between the accelerated payments and nonaccelerated payments as a source of equity; providing an equity loan against the source of equity; applying the loan to generate an investment vehicle; and automatically computing the amounts for each of the previously recited steps using a computer, whereby amounts placed in the investment vehicle increase over the term of the mortgage while the equity loan and mortgage principal are repaid to by the end of the term of the mortgage, and wherein said applying step further comprises automatically creating an investment vehicle and automatically transferring amounts borrowed from said loan into said investment vehicle.


Generate Nest Egg Mortgage
1
Initialize Variables
A
2
Year > 15 ?
Yes
3
Exit
No
5
Zero Out Mortgage Balance
No
4
PV > 0 ?
Yes
6
Generate Amortization Table for Next 12 Months
7
Total Interest This Year = 0
Tax Deduction This Year = 0
8
Month = 1
B

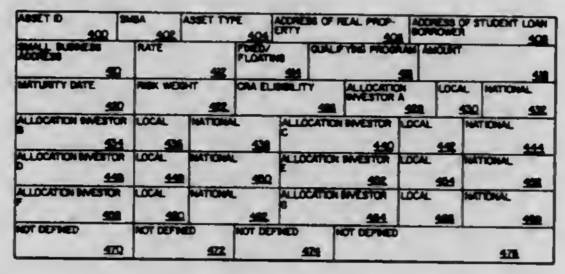
5,689,650
COMMUNITY REINVESTMENT ACT NETWORK

Glenn B. McClelland, 5 Sylvan La., Old Greenwich, Conn. 06870; Richard D. Levinson, 28 Furnace Woods Rd., Cortlandt Manor, N.Y. 10566, and Judith S. Sloan, 26 Leslie Pl., New Rochelle, N.Y. 10804

Filed Feb. 23, 1995, Ser. No. 393,423

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 395—236 **58 Claims**



52. A financial and CRA interest transaction network apparatus based on a managed pool of assets and a computer processor comprising:

a client service administrator establishing an investor account through the modification of a computer record, said client service administrator providing a command interface to command said transaction network to increase or decrease an investor's financial holding in the network and to specify an investor's desired geographic area from which to acquire CRA interest;

a data storage device operationally connected to said client service administrator, said data storage device for maintaining computer records of said investor account;

a CRA interest accountant operably connected to said data storage device, said CRA interest accountant operatively connected to said client service administrator, said CRA interest accountant determining the CRA interest of assets represented by computer records, said CRA interest accountant allocating said CRA interests to said investor account by modifying computer records of said investor account;

a transfer agent linked to said data storage device and said client service administrator, said transfer agent conducting transactions by book entry by modifying computer records to denote said transactions, said transfer agent buying and selling assets for said pool of assets;

a financial accountant linked to said transfer agent, said financial accountant operating in parallel with said CRA interest accountant, said financial accountant determining said pool of assets' share price and said financial accountant providing means for distributing a financial return from said pool of assets to said investor account;

an investment advisor linked to said transfer agent, said financial accountant and said CRA accountant, said investment advisor providing means for determining appropriate assets to buy or sell to maintain said pool of assets within a predetermined range of financial risk while maintaining a CRA interest balance to substantially fulfill the CRA interest demand from said investor account; and

a custodian linked to said transfer agent, said custodian providing means for receiving assets purchased by said transfer agent and acknowledging receipt thereof.

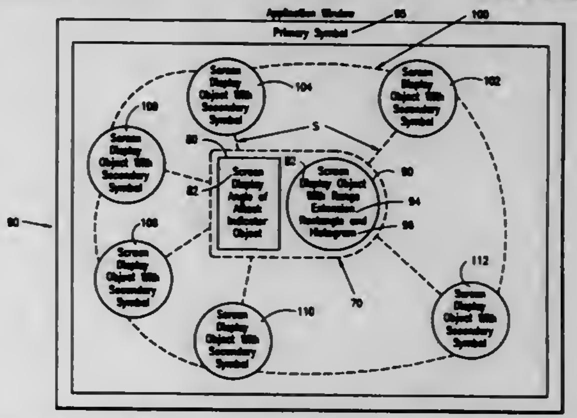
5,689,651
SYSTEM FOR PROCESSING AND DISPLAYING FINANCIAL INFORMATION

Fane Lozman, 601 E. 32nd St., #805, Chicago, Ill. 60616

Filed Oct. 13, 1994, Ser. No. 322,422

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 395—237 **20 Claims**


Application Window
Primary Symbol
85
100
Screen Display Object With Secondary Symbol
104
102
106
108
110
112
5
80
82
Screen Display Angle of Attack Indicator Object
Screen Display Object With Range Extension Rectangle and Histogram
90
94
96
70
60

1. A device for processing and displaying financial market data corresponding to user selected primary and secondary symbols, comprising:

a) a programmable computer including a display;

b) a communication device connected to said computer for receiving financial market data from an external data source; and

c) said programmable computer including software for selecting the primary and secondary symbols from the financial market data and displaying the data corresponding to the primary symbol on a central portion of said display and displaying the data corresponding to the secondary symbols on a peripheral portion of said display in a hub-and-spoke configuration and periodically updating the data corresponding to the selected primary and secondary symbols.

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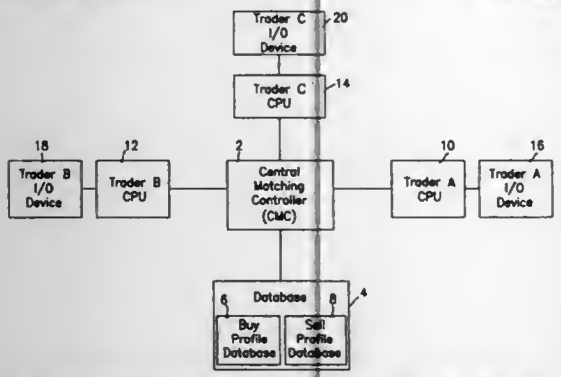
5,689,652
CROSSING NETWORK UTILIZING OPTIMAL MUTUAL SATISFACTION DENSITY PROFILE

William A. Luplen, Hesperus, and John Terrell Rickard, Durango, both of Colo., assignors to Optimark Technologies, Inc., Durango, Colo.

Filed Apr. 27, 1995, Ser. No. 430,212

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—237 **19 Claims**



1. A crossing network that matches orders for a plurality of instruments based upon a satisfaction and size profile, the crossing network comprising:

a plurality of trader terminals for entering an order for an instrument in the form of a satisfaction density profile that represents a degree of satisfaction to trade the instrument at a plurality of (price, quantity) combinations, each satisfaction density profile representing either a buy order or a sell order for the instrument; and

a matching controller computer coupled to each one of the plurality of trader terminals over a communications network and receiving as input each satisfaction density profile entered at each one of the plurality of trading terminals, the matching controller computer comprising

means for pairing each satisfaction density profile representing a buy order with each satisfaction density profile representing a sell order,

means for calculating for each satisfaction density profile pair a mutual satisfaction function, each mutual satisfaction function including a plurality of (price, quantity) combinations representing a degree of mutual satisfaction for trading said quantity at said price,

means for ranking according to the degree of mutual satisfaction every (price, quantity) combination of every mutual satisfaction function, and

means for matching, in accordance with the ranking, buy orders with sell orders.

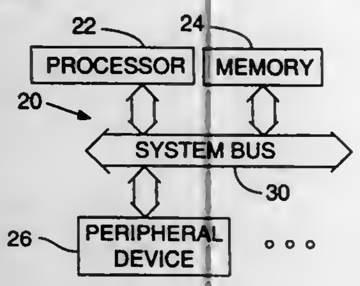
5,689,653
VECTOR MEMORY OPERATIONS

Alan H. Karp, Palo Alto; Frederic C. Amerson, Santa Clara; Dennis Brzezinski, Sunnyvale; Rajiv Gupta, Los Altos, all of Calif., and William S. Worley, Jr., Breckenridge, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 6, 1995, Ser. No. 384,308

Int. Cl.^{6} G06F *9/00;13/00*

U.S. Cl. 395—250 **20 Claims**



1. A computer system comprising:

a memory hierarchy including a cache memory and a main memory;

a register file comprising a plurality of registers;

a vector buffer for storing a load vector comprising a plurality of data elements obtained from the memory hierarchy and for storing a store vector comprising a plurality data elements for transfer to the memory hierarchy;

a vector prefetch unit in communication with the memory hierarchy, the register file, and the vector buffer and operative to transfer the data elements of the load vector and the data elements of the store vector between the memory hierarchy and the vector buffer, and between the vector buffer and the register file; and

an instruction unit in communication with the memory hierarchy and the vector prefetch unit, the instruction unit being operative to read the coded instructions from the memory hierarchy,

the instruction unit being operative, in response to a vector request instruction specifying the data elements of the load vector and the data elements of the store vector, to cause the vector prefetch unit to transfer the data elements of the load and store vectors between the memory hierarchy and to the vector buffer, and

the instruction unit being operative, in response to a vector element operation instruction, to cause the vector prefetch unit to transfer a next one of the data elements of the load vector in the vector buffer from the vector buffer to the register file and to transfer a data element contained in the register file from the register file to the vector buffer to provide a next one of the data elements of the store vector while transferring the next one of the data elements from the vector buffer to the register file.

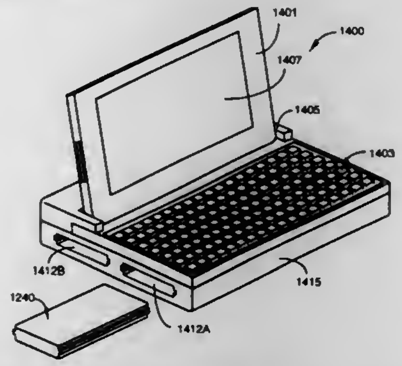
5,689,654
DIGITAL ASSISTANT SYSTEM INCLUDING A HOST COMPUTER WITH A DOCKING BAY FOR THE DIGITAL ASSISTANT WHEREIN A HEAT SINK IS MOVED INTO CONTACT WITH A DOCKED DIGITAL ASSISTANT FOR COOLING THE DIGITAL ASSISTANT

Dan Kikinis, Saratoga; Pascal Dornier, Sunnyvale, and William J. Seiler, Scotts Valley, all of Calif., assignors to Elonex F.P. Holdings, Ltd., London, England

Continuation-in-part of Ser. No. 144,231, Oct. 28, 1993, and a continuation-in-part of Ser. No. 159,078, Nov. 29, 1993, Pat. No. 5,539,616, which is a continuation-in-part of Ser. No. 97,946, Feb. 26, 1993, Pat. No. 5,278,730, which is a continuation of Ser. No. 905,480, Jun. 29, 1992, abandoned, and a continuation-in-part of Ser. No. 152,431, Nov. 12, 1993, Pat. No. 5,473,506. This application Nov. 7, 1994, Ser. No. 335,487

Int. Cl.^{6} G06F *3/00;13/00*

U.S. Cl. 395—281 **12 Claims**



1. A digital assistant system, comprising:

a digital assistant having a CPU, a memory connected to the CPU by a bus, a power supply, a display, input apparatus, and a host interface comprising a host interface bus coupled to the CPU and to an interface connector;

a host computer having a host CPU, a docking bay adapted for receiving and docking the digital assistant, a host bus coupled to the CPU and to a host interface connector in the docking bay compatible with the interface connector of the digital assistant, and control routines for managing communication with the docked digital assistant; and

at least one heat sink structure in the docking bay with translation apparatus for moving the heat sink structure into contact with the docked digital assistant during a portion of time the digital assistant is docked.

5,689,655
APPARATUS FOR CONNECTING AND DISCONNECTING DRIVES UNDER ACTIVE STATE

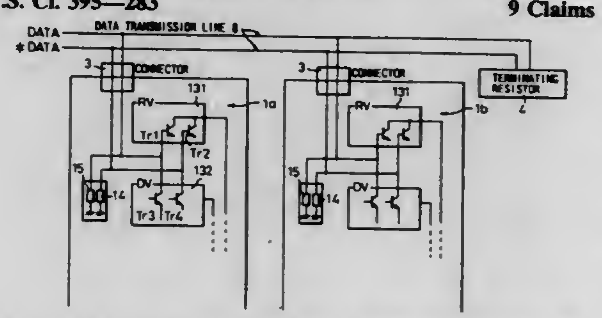
Hiroyuki Tanaka, and Masahide Kanegae, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 341,759, Nov. 18, 1994, abandoned. This application Dec. 27, 1996, Ser. No. 777,398

Claims priority, application Japan, Apr. 18, 1994, 6-078950

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—283 **9 Claims**



1. An apparatus for connecting and disconnecting drives to and from a data transmission line under an active state, comprising:

a plurality of drives removably connected in parallel to said data transmission line;

data communication terminals provided for each of said drives, so as to be connected to said data transmission line and disconnected from said data transmission line;

a transmitter provided for each of said drives and connected to said data communication terminals via a transmission transistor;

an activation transistor for controlling the activation state of said transmission transistor; and

means for deactivating said transmission transistor to fix the levels at said data communication terminals when said data communication terminals are open;

said means for deactivating comprising resistors connected between said data communication terminals and a ground, the resistance of each of said resistors being determined not to disturb an impedance of said data transmission line when said data communication terminals are closed, a potential between said resistors maintaining said activation transistor in an on state when said communication terminals are closed, said resistors including a pull down resistor for changing said potential to turn off said activation transistor and deactivate said transistor pair to thereby fix the levels when said data communication terminals are open.

5,689,656
DYNAMIC HIERARCHICAL ARBITRATION OF COMPUTER RESOURCE ACCESS REQUESTS

Eric A. Baden, Saratoga, and Brian A. Childers, Santa Clara, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

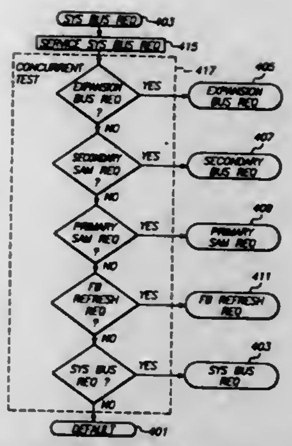
Continuation of Ser. No. 434,182, May 3, 1995, abandoned. This application Jan. 10, 1997, Ser. No. 767,118

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—296 **20 Claims**

1. A method of prioritizing computer resource access requests, comprising the steps of:

providing a number, n, of priority schemes in correspondence with a like number, n, of potentially requesting entities,



wherein n is an integer greater than one, wherein each priority scheme designates relative priority of the potentially requesting entities with respect to one another, and whereby for each priority scheme there exists one corresponding potentially requesting entity, and a number, n−1, of noncorresponding potentially requesting entities;

selecting one of the priority schemes as a current priority scheme;

determining a set of currently requesting entities from the number of potentially requesting entities;

using the current priority scheme to select a highest priority requesting entity from the set of currently requesting entities and designating the selected highest priority requesting entity as the next requesting entity to be serviced; and

newly selecting one of the priority schemes as the current priority scheme for use in selecting a subsequent highest priority requesting entity, wherein the newly selected priority scheme corresponds to the highest priority requesting entity,

wherein at least one of the priority schemes designates a first priority for the corresponding potentially requesting entity, and a second priority for one of the noncorresponding potentially requesting entities, the first priority being higher than the second priority.

5,689,657
APPARATUS AND METHODS FOR BUS ARBITRATION IN A MULTIMASTER SYSTEM

Hans-Jurgen Desor, Denzlingen, and Soenke Mehrgardt, March-Neuershausen, both of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Germany

Continuation-in-part of Ser. No. 166,141, Dec. 14, 1993, abandoned, which is a continuation of Ser. No. 853,673, Mar. 19, 1992, abandoned. This application Jan. 18, 1996, Ser. No. 599,444

Claims priority, application European Pat. Off., Mar. 30, 1991, 91105138

Int. Cl.^{6} G06F *13/36*

U.S. Cl. 395—299 **19 Claims**

1. A bus arbitration apparatus for use in a video system comprising:

a data bus;

an identification bus, said identification bus including a plurality of logic lines;

a plurality of video sources, each of said video sources corresponding to a plurality of pixel signals representative of observer-visible pixels, each of said video sources having means for selecting a particular pixel signal from said plurality of pixel signals for transmission to said data bus, coupled to said data bus and each having a predetermined priority for accessing said data bus, said predetermined priority of each of said video sources determined in accordance with an identification word associated with each of said video sources and wherein each said identification word includes a plurality of bits;

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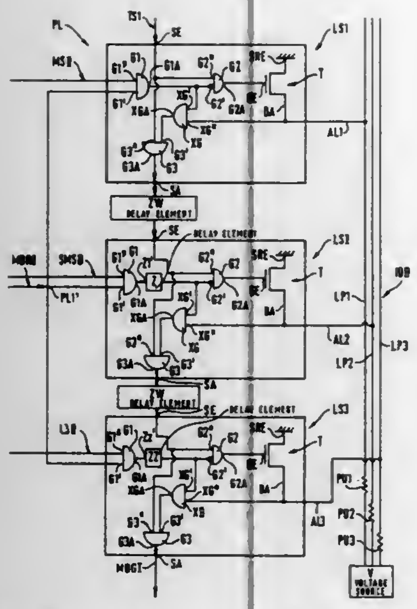


means for forming a logic level on said identification bus by logically combining equally significant bits of each of said identification words;

means for performing a plurality of overlapping bus grant cycles, wherein each of said plurality of bus grant cycles determines priority among said plurality of said video sources by successively comparing, during a system dock time period, said equally significant bits of each of said identification words with said logic level on each of said logic lines on said identification bus, to eliminate each of said plurality of video sources having an associated identification word containing a bit that does not correspond to said logic level, wherein each of said successive comparisons occurs during each successive system clock time period, wherein each of said bus grant cycles includes multiple system clock time periods; and

means for granting access to said data bus to one of said plurality of video sources that is not eliminated during each of said bus grant cycles.

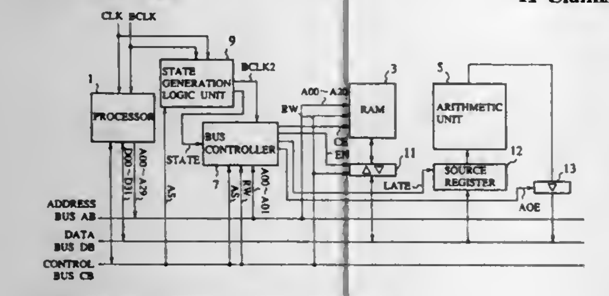
5,689,658

DATA PROCESSING SYSTEM

Miho Koga, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 401,616, Mar. 9, 1995, abandoned.
This application Oct. 2, 1996, Ser. No. 724,815
Claims priority, application Japan, Mar. 9, 1994, 6-038145
Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—304 **11 Claims**



1. A data processing system comprising:

processor means;

a first device;

a second device;

an address bus and a data bus through which the processor, the first device, and the second device are connected;

state means for checking a front half and a rear half of a bus cycle of the processor means, and generating a control signal indicating the front half and the rear half of the bus cycle; and

control means for receiving the control signal from the state means and address data through the address bus, and based on the received address data for outputting a signal indicative of the first device to transmit data and indicative of the second device to receive the data transmitted from the first device during the front half of the bus cycle, and for outputting a signal indicative of the second device to transmit data to the processor during the rear half of the bus cycle.

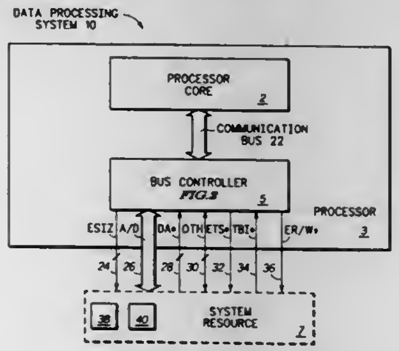
5,689,659

METHOD AND APPARATUS FOR BURSTING OPERAND TRANSFERS DURING DYNAMIC BUS SIZING

Donald L. Tietjen; Frank C. Galloway; Juan Guillermo Revilla; Nancy G. Woodbridge; David M. Menard, and Ronny L. Arnold, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 30, 1995, Ser. No. 550,043
Int. Cl.^{6} G06F *13/28;13/00*

U.S. Cl. 395—307 **19 Claims**



A/D —ADDRESS AND DATA
DA• —DATA ACKNOWLEDGE
ESIZ —(EXTERNAL) REQUEST DATA LENGTH VALUE
ISIZ —(INTERNAL) REQUESTED DATA LENGTH VALUE
TBI• —TRANSFER BURST INHIBIT
TS• —TRANSFER START
OTH —OTHER CONTROLS

1. A method for performing a plurality of burst accesses across a communication bus in a data processing system, the method comprising the steps of:

initiating a first one of the plurality of burst accesses;

providing a first requested data length to a bus controller;

providing a first resource port size to the bus controller;

in response to receipt of the first requested data length and the first resource port size, determining a first bus size and determining a first number of bursts;

dynamically sizing the communication bus to the first bus size;

providing the first requested data length external to a first resource port;

transferring the first number of bursts across the communication bus;

initiating a second one of the plurality of burst accesses;

providing a second requested data length to the bus controller;

providing a second resource port size to the bus controller;

in response to receipt of the second requested data length and the second resource port size, determining a second bus size and determining a second number of bursts;

dynamically sizing the communication bus to the second bus size;

providing the second requested data length external to a second resource port; and

transferring the second number of bursts across the communication bus;

wherein the first bus size and the second bus size are different sizes for a first combination of requested data length and port size values; and

wherein the first bus size and the second bus size are a same size for a second combination of requested data length and port size values.

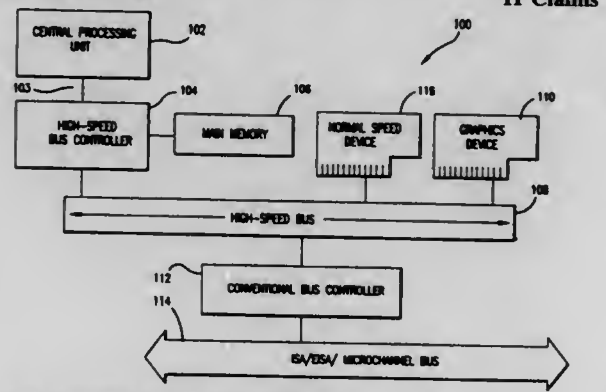
5,689,660

ENHANCED PERIPHERAL COMPONENT INTERCONNECT BUS PROTOCOL

Leith L. Johnson, and Richard Carlson, both of Fort Collins, Colo., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Continuation of Ser. No. 396,395, Feb. 28, 1995, abandoned.
This application Sep. 11, 1996, Ser. No. 712,225
Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—309 **11 Claims**



1. A computer apparatus comprising:

a peripheral component interconnect (PCI) bus having a multiplexed address/data bus, a multiplexed control/byte enable bus, an interface control bus, and a clock line carrying a clock signal having first and second edges for each clock cycle, wherein the bus normally transfers data on only one edge of the clock signal in each clock cycle;

a master device coupled to the bus, said master device complying with a PCI bus specification;

a normal target device coupled to the bus, the normal target device capable of transferring data on only one edge of the clock signal, said normal target device complying with the PCI bus specification;

a high speed target device coupled to the bus, the high speed target device capable of transferring data on both edges of the clock signal, wherein the high speed target device complies with the PCI bus specification so as to allow the data transfer between the normal target device and the master device on only one edge of the clock signal;

address means located in the master device for placing an address on the multiplexed address/data bus to identify an addressed target device, the addressed target device being one of the normal and high speed target devices during a first address phase;

means located in said master device for driving first and second byte enable codes onto command/byte enable lines of the PCI bus during the first address phase, the first and second byte enable codes indicating a request to transfer data on both edges of the clock signal;

means located in the normal target device for responding to the second byte enable code by asserting a disconnect instruction on the interface control bus;

means located in said master device for determining if the addressed target device has asserted the disconnect instruction;

first means located in the master device for driving and accepting data; and

second means responsive to both the first and second byte enable codes for driving and accepting data located in the high speed target device, the first and second means for driving and accepting data operable to transfer a first data word on the multiplexed address/data bus during the first clock edge of a selected clock cycle and transfer a second data word on the multiplexed address/data bus during the second clock edge of the selected clock cycle.

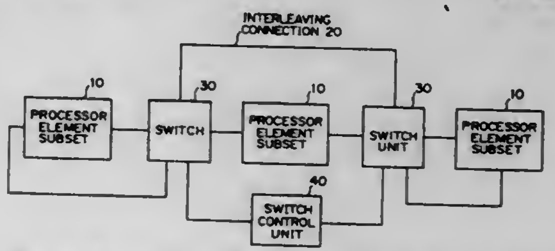
5,689,661

RECONFIGURABLE TORUS NETWORK HAVING SWITCHES BETWEEN ALL ADJACENT PROCESSOR ELEMENTS FOR STATICALLY OR DYNAMICALLY SPLITTING THE NETWORK INTO A PLURALITY OF SUBSYSTEMS

Kenichi Hayashi, Kawasaki, Japan, and Isaac Liu Chuang, Prospect, Ky., assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 210,457, Mar. 21, 1994, abandoned.
This application Jul. 18, 1996, Ser. No. 683,140
Claims priority, application Japan, Mar. 31, 1993, 5-074409
Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—311 **26 Claims**



1. A reconfigurable torus network system for use in a parallel computer comprising:

first, second and third adjacent processor element subsets, each comprising at least one processor element, and each having respective input and output terminals;

a first switch connected to the input and output terminals of said first processor element subset and connected to the output terminal of said second processor element subset;

a second switch connected to the input and output terminals of said third processor element subset, connected to the input terminal of said second processor element subset, and connected to the first switch; and

interleave connection means for setting said first and second switches to electrically connect the output terminal of said first processor element subset to the input terminal of said third processor element subset such that data from said first processor element subset is directly transferred to said third processor element subset and for setting said second switch to electrically connect the output terminal of said third processor element subset to the input terminal of said second processor element subset to thereby transfer data from said first processor element subset to said second processor element subset through said third processor element subset.

5,689,662

SHELL EXTENSIONS FOR AN OPERATING SYSTEM

Satoshi Nakajima, Bellevue; George H. Pitt, III; Joseph D. Belfiore, both of Redmond, and Christopher J. Guzak, Kirkland, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 355,410, Dec. 13, 1994. This application Jun. 7, 1995, Ser. No. 476,903
Int. Cl.^{6} G06F *15/00;7/00*

U.S. Cl. 395—326 **13 Claims**

1. In a data processing system having a video display and an operating system with a name space mechanism for providing a name space of objects, including file system objects and a name space viewer for viewing objects in the name space on the video display, a method comprising the steps of:

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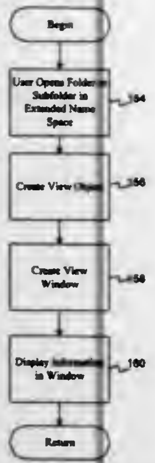

Begin
User Opens Folder or Subfolder in Extended Name Space
154
Create View Object
156
Create View Window
158
Display Information in Window
160
Return

providing a name space extension by an application program for adding non-file system objects to the name space;

using the name space extension to add non-file system objects to the name space; and

using the name space viewer to view at least one of the non-file system objects that are added by the name space extension;

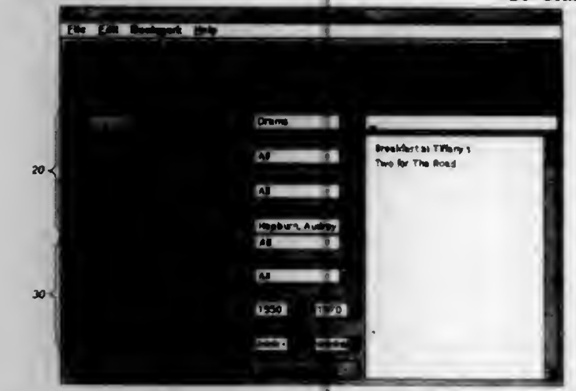
wherein the data processing system further comprises a registry that is used by the operating system and wherein said method further comprises the step of registering the name space extension in the registry.

5,689,663
REMOTE CONTROLLER USER INTERFACE AND METHODS RELATING THERETO

John C. Williams, Mercer Island, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 898,212, Jun. 19, 1992, abandoned.
This application Jun. 6, 1995, Ser. No. 472,052
Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—327 **18 Claims**



1. A computer system comprising:

a display device operatively connected to a computer;

means for displaying on at least a portion of the display device a graphic depiction of a remote control transmission device, which resembles an analogous physical remoate controller, having a display window area and a button bank area with a plurality of buttons, the display window area displaying contents comprising textual, pictorial, or graphical information, wherein the plurality of buttons in response to selection selectably control the contents displayed in the display window area; and

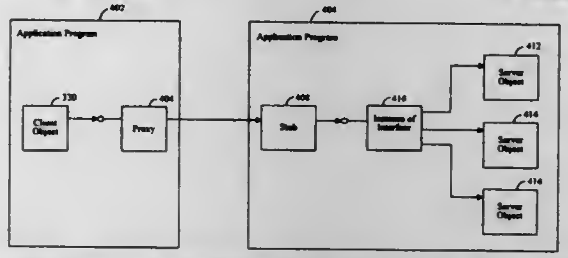
means for selecting a button within the button bank area to control the contents displayed in the display window area of the graphic depiction of the remote control transmission device.

5,689,664
INTERFACE SHARING BETWEEN OBJECTS

Raman Narayanan, Bellevue, and Cory Alan Reina, Kirkland, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 14, 1995, Ser. No. 423,643
Int. Cl.⁶ G06F *3/100*

U.S. Cl. 395—340 **25 Claims**



1. In a computer system having a source screen object having data, a plurality of destination screen objects for receiving the data from the source screen object, and an interface with function members for transferring the data, a method for sharing an instance of the interface between the destination screen objects, comprising the steps of:

under the control of the computer system,

creating the instance of the interface;

for each of the destination screen objects,

registering the instance of the interface with the computer system;

receiving a request to transfer the data from the source screen object to a selected one of the destination screen objects in response to user input;

retrieving the instance of the interface registered for the selected destination screen object; and

transferring the data from the source screen object to the selected destination screen object utilizing the function members of the retrieved instance of the interface, wherein each of the function members determines which of the destination screen objects is the selected destination screen object.

5,689,665
APPARATUS AND METHOD FOR DISPLAYING WINDOWS

Kinichi Mitsui, Asaka, Japan, and Shahram Javey, Toronto, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 031,383, Dec. 17, 1992, abandoned.
This application Jun. 7, 1995, Ser. No. 483,907
Claims priority, application Japan, Feb. 28, 1992, 4-043276
Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—342 **20 Claims**

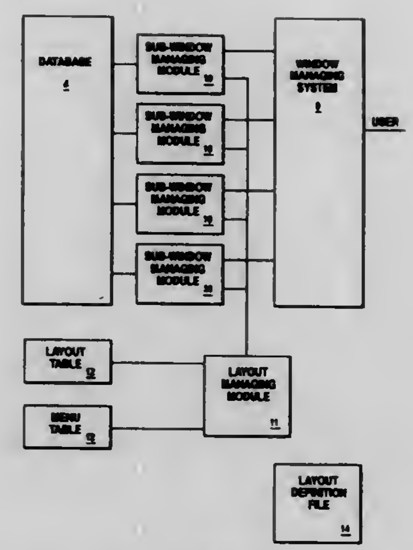
1. A window displaying apparatus comprising:

means for displaying a first application specified graphical user interface for an application program including a plurality of windows on a display screen;

means for storing information specifying the graphical user interface, the information including a window type for each of the windows, each window type displaying information in a different form;

means for displaying in each of the windows, a corresponding portion of the graphical user interface as specified in the storing means;

means responsive to user input for changing the application specified graphical user interface to a user specified graphical user interface during runtime of the application program including means for changing the window type of at least one window from an application specified window type to a user specified window type; and



INTERNAL CONFIGURATION OF BROWSER

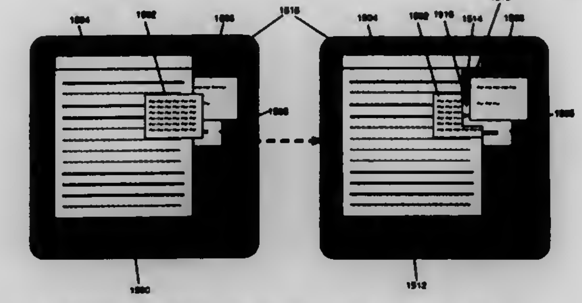
means for displaying the user specified graphical user interface including the at least one window according to the changed window type.

5,689,666
METHOD FOR HANDLING OBSCURED ITEMS ON COMPUTER DISPLAYS

David T. Berquist, St. Paul; Peter M. Eisenberg; Mitchell B. Grunes, both of Minneapolis; Martin A. Kenner, Burnsville; Janelle J. Kozak, St. Paul; John M. Kruse, Minneapolis; Cindy L. Munson, Woodbury, and Althea M. Robins, St. Paul, all of Minn., assignors to 3M, St. Paul, Minn.

Continuation of Ser. No. 240,229, May 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 188,219, Jan. 27, 1994, abandoned. This application Jul. 12, 1996, Ser. No. 679,191
Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—345 **131 Claims**



1. A method of displaying items in layers, the method comprising the steps, performed in a data processing system of:

executing first program code to display a plurality of items so that each of the items is displayed as a different layer with respect to each of the other items and so that at least portions of items in lower layers are obscured by items in upper layers, wherein one of the items is a note; and,

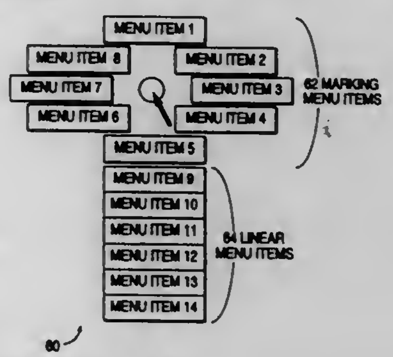
executing second program code to select the note so that those items, which are displayed in layers above the selected note and which would otherwise obscure a portion of the selected note, are cut out in order to expose the otherwise obscured portion of the selected note and so that an otherwise obscured portion of an item which is layered below the selected note is revealed.

5,689,667
METHODS AND SYSTEM OF CONTROLLING MENUS WITH RADIAL AND LINEAR PORTIONS

Gordon P. Kurtenbach, Toronto, Canada, assignor to Silicon Graphics, Inc., Mountain View, Calif.

Filed Jun. 6, 1995, Ser. No. 469,913
Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—352 **4 Claims**



1. A display process, comprising:

displaying a menu comprising a radial marking menu portion and a linear location menu portion;

determining whether a stroke by a pointing device has an end point in a linear location selection region indicating selection of a linear location menu item corresponding to the linear selection location region; and

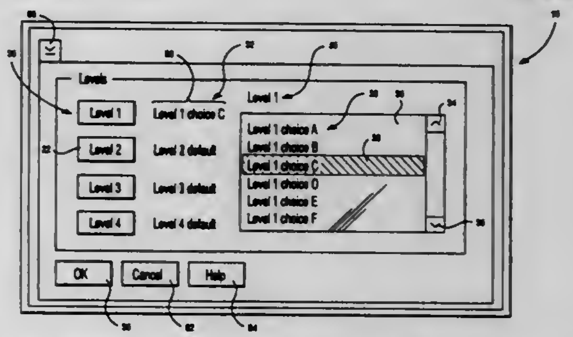
determining a corresponding pattern selection region when a stroke direction is not in the linear location selection region and indicating selection of a radial marking menu item associated with a pattern selection region.

5,689,668
DYNAMIC HIERARCHICAL SELECTION MENU

Phillip Beaudet, Pickering, Canada; Matthew Black; Jonathan Edwards, both of Lexington, Ky.; Julian Jones, Toronto, Canada; Eduardus Antonius Theodorus Merks, and Roger Spall, both of North York, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 233,160, Apr. 25, 1994, Pat. No. 5,559,945. This application Sep. 23, 1996, Ser. No. 717,949
Claims priority, application Canada, May 4, 1993, 2095452
Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—353 **13 Claims**



1. A computer program product for hierarchical menu selections for use in a computer system having a display screen, comprising:

a computer usable medium having computer readable program code embodied in said medium for providing a zoned menu control window including a first zone displaying indicators representing a plurality of selection levels in a menu hierarchy, and a second zone having contents comprising a displayed list of selection options for one of said selection levels;

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- computer readable program code means embodied in said medium for entering an option selected from said displayed list of selection options;
- computer readable program code means embodied in said medium for refreshing said contents of said second zone by replacing said displayed list of selection options with a second list of selection options for a different selection level in response to entry of an option selected from said displayed list of selection options; and
- computer readable program code registration means embodied in said medium for implementing a computer task on selection of options for all selection levels in said menu hierarchy.

5,689,669

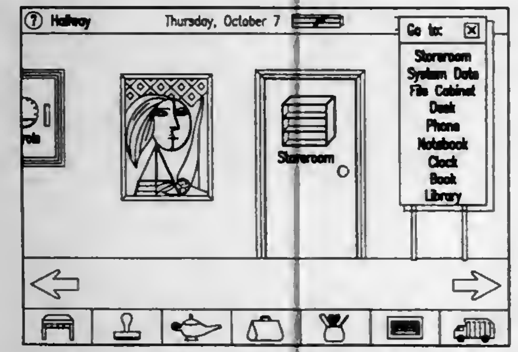
GRAPHICAL USER INTERFACE FOR NAVIGATING BETWEEN LEVELS DISPLAYING HALLWAY AND ROOM METAPHORS

Kevin M. Lynch, San Francisco; Andrew J. Hertzfeld, Palo Alto, and William D. Atkinson, Portola Valley, all of Calif., assignors to General Magic, Mountain View, Calif.

Filed Apr. 29, 1994, Ser. No. 235,603

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 395—355 **32 Claims**



1. A method for navigating within a graphical user interface of a computer system having a central processing unit coupled to a display device, the method comprising the steps of:

- providing a first navigation level, the first navigation level including a plurality of first level objects having a respective plurality of functions;
- displaying on the display device, when the first navigation level is accessed, a first level object using a functional metaphor representing the function of the object;
- providing a second navigation level, the second navigation level including a second level object;
- displaying on the display device, when the second level is accessed, the second level object using a physical metaphor of a room, the room including physical metaphors for the plurality of first level objects, the room providing a superview for the plurality of first level objects;
- accessing a first level object from the second navigation level by actuating the physical metaphor of the first level object;
- accessing the second navigation level from the first navigation level by stepping back from the first navigation level;
- providing a third navigation level, the third navigation level including a third level object;
- displaying on the display device, when the third navigation level is accessed, the third level object using a physical metaphor of a hallway of a building, the physical metaphor of the hallway including a metaphor for an entrance, the entrance representing a room of the second navigation level;
- accessing the room of the second navigation level from the third navigation level by actuating the entrance; and
- accessing the third navigation level from the second navigation level by stepping back from the second navigation level.

5,689,670

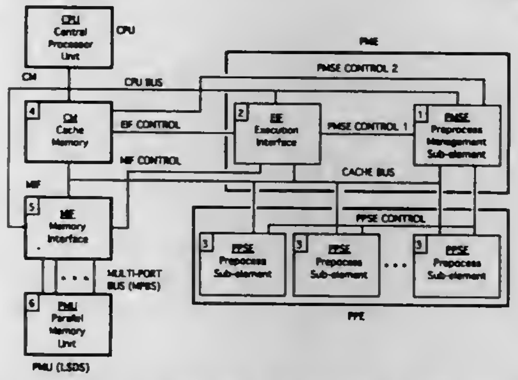
DATA TRANSFERRING SYSTEM WITH MULTIPLE PORT BUS CONNECTING THE LOW SPEED DATA STORAGE UNIT AND THE HIGH SPEED DATA STORAGE UNIT AND THE METHOD FOR TRANSFERRING DATA

Fong Luk, 2926 Lambeth Ct., San Jose, Calif. 95132

Continuation of Ser. No. 745,051, Oct. 7, 1991, abandoned, which is a continuation of Ser. No. 324,723, Mar. 17, 1989, abandoned. This application Oct. 7, 1996, Ser. No. 671,106

Int. Cl.⁶ G06F *9/38;13/00*

U.S. Cl. 395—383 **3 Claims**



1. A method for transferring data between a high speed data processing system (DPS) and a low speed data storage (LSDS) unit, said system including a central processing unit (CPU), a prefetch processing unit (PPU) including a preprocess management sub-element (PPME) and a plurality of preprocess sub-elements (PPSEs), and a high speed data storage (HSDS) unit wherein said CPU, said PPU, and said HSDS are interconnected with a CPU address bus and a CPU data bus, and said LSDS and HSDS are interconnected with a multiple port bus (MPBS), wherein said MPBS having a data path wider than said CPU data bus to allow more data transferred in parallel between said HSDS and said LSDS at a lower speed than between a data transfer between said CPU and said HSDS, said method comprising the steps of:

- (a) scanning signals from said CPU for determining whether an operation of said CPU is a data output operation, a data input operation or an instruction fetch operation;
- (b) when an data output operation of said CPU is detected, holding up said output operation if said HSDS is full and receiving said signals from said CPU including data and an associated address, storing said signals in said HSDS if said HSDS is not full and transferring, concurrently with said step of receiving and storing said signals in HSDS, said signals stored in said HSDS to said LSDS through said multiple port bus;
- (c) when a data input or an instruction fetch operation of said CPU is detected, checking said HSDS for determining whether said HSDS containing required data or instructions for said data input or instruction fetch operation of said CPU and (i) if said HSDS contains said required data or instructions, transferring said required data or instructions from said HSDS to said CPU; (ii) if said HSDS does not contain said required data or instructions, holding up said data input or instruction operation until said required data or instructions are retrieved from said LSDS; (iii) retrieving said required data or instructions from said LSDS; and (iv) prefetching additional prefetched data or instructions in adjacent locations of said required data or instructions from said LSDS for transferring said required data or instructions together with said additional prefetched data or instructions to said HSDS through said multiple port bus, wherein said step of prefetching additional prefetched data or instructions further includes the steps of:
  - (iv-a) monitoring said CPU bus initially with said PMSE for capturing an address location of an instruction being fetched by said CPU from said LSDS and assigning I number of PPSE, wherein I being a predetermined integer number, to fetch and decode said instruction being fetched by said CPU and (I-1) instructions immediately following said instruction in consecutive order via said MPBS when said address location for said instruction is captured by said PMSE, then storing said I number in said PMSE for indicating said I number of PPSEs being assigned;
  - (iv-b) if one of said I number of PPSEs decodes a branch instruction for said CPU to execute multiple program paths includes an unbranched instruction and a plurality of branched instructions each with a branch location in said LSDS, applying said PPSE for fetching said an unbranched instruction and said branched instructions from said branch location in said LSDS and continuing said decoding and fetching operation for said unbranched instruction and assigning a new PPSE for each of said branched instruction for performing said decoding and fetching operations; and
  - (iv-c) applying said PMSE for monitoring said CPU bus for detecting an actual CPU branch operation and for capturing an actual CPU branched or unbranched program path for releasing said PPSEs being assigned for one of said branch instructions which are not taken by said actual CPU branched or unbranched program path.

5,689,671

SYSTEM FOR REDUCING QUANTITY OF DATA TRANSMITTED TO A USER UNIT BY TRANSMITTING ONLY AN IDENTIFIER WHICH POINTS TO PRE-STORED INFORMATION IN THE USER UNIT

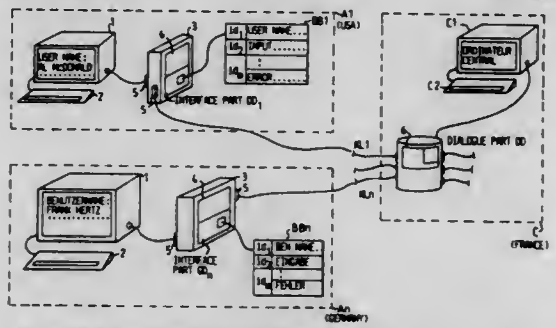
Fredrik Strömberg, Bromma, Sweden, assignor to ICL Systems AB, Kista, Sweden

Continuation of Ser. No. 244,394, May 19, 1994, abandoned. This application Dec. 13, 1996, Ser. No. 764,229

Claims priority, application Sweden, Nov. 27, 1991, 9103513

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—385 **11 Claims**



1. A method for obtaining simplified dialogue between a central computer unit and at least one user unit of a plurality of user units in a computer system arrangement, wherein the user units each include a display means and a memory means and can be connected to the central computer unit, wherein the user units are of different types, and wherein the central computer unit includes a central memory means in which there is stored a software part, referred to as a dialogue part, intended for data processing requested by a said user unit, wherein information relating to text and/or pictures, depending on the user unit type and depending on a chosen type of information display, for presentation on the respective display means is prestored in the memory means of each user unit; wherein the prestored information is different for the different user unit types, wherein the information transmitted in a dialogue session from the central computer unit to a said user unit includes an identifier which corresponds to a particular message to be transmitted and which identifier is the same for all user units to which that particular message is to be sent irrespective of their type and the chosen type of information display, wherein the identifier points out, in the said user unit's memory means, a respective presentation object which corresponds to the message, and wherein the respective presentation object presents the message on the said user unit's display means in the respective manner for the said user unit, characterised in that a first local call including the identifier is made in the central computer unit, the purpose of said call being to cause the message to be presented on a display means;

- in that the first local call is converted to a non-local call in the central computer unit;
- in that the non-local call is converted to a second local call by a said user unit;
- in that a picture interpreter in the said user unit identifies a corresponding presentation object in the said user unit's memory means by means of the identifier included in the second local call;
- in that the presentation object may include a pre-defined program operation which presents the message either as a picture which consists solely of text or as a picture which includes both text and graphics, or as a message which includes a graphic picture and sound illustration, in accordance with the type of user unit concerned;
- in that the picture is presented on a display means belonging to the said user unit;
- in that a user of the said user unit gives one or more reply data;
- in that reply data is transmitted from the said user unit to the central computer unit, which receives this data;
- and in that the central computer converts reply data to a format which can be interpreted as a reply to the first local call.

5,689,672

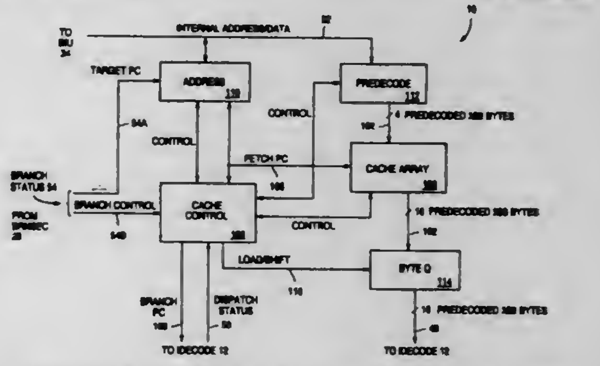
PRE-DECODED INSTRUCTION CACHE AND METHOD THEREFOR PARTICULARLY SUITABLE FOR VARIABLE BYTE-LENGTH INSTRUCTIONS

David B. Witt, and Michael D. Goddard, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 29, 1993, Ser. No. 145,905

Int. Cl.⁶ G06F *9/30;9/38;12/00*

U.S. Cl. 395—329 **38 Claims**



1. An instruction cache for a processor of the type having a variable byte-length instruction format, comprising:

- an array for storing a plurality of instruction blocks, each of the instruction blocks comprising a plurality of instruction bytes and at least one corresponding predecode bit for each of the instruction bytes;
- first means for prefetching a plurality of instruction bytes from an instruction source;
- second means for predecoding each of the prefetched instruction bytes to determine the at least one corresponding predecode bit for each prefetched instruction byte, the at least one predecode bit including a field for indicating instruction boundaries among the plurality of prefetched instruction bytes;
- third means for storing the plurality of prefetched instruction bytes and corresponding at least one predecode bit for each prefetched instruction byte into an instruction block within the array; and
- fourth means for delivering a requested stream of instruction bytes and corresponding at least one predecode bit from an instruction block within the array to an instruction decoder of the processor;
- wherein the variable byte-length instruction format is the X86 instruction set format, and wherein the at least one predecode

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bit corresponding to each of the instruction bytes includes a group of predecode bits collectively set to:

- a first value to indicate that the corresponding instruction byte, as prefetched and predecoded, is a prefix byte;
- a second value to indicate that the corresponding instruction byte, as prefetched and predecoded, is an opcode byte;
- a third value to indicate that the corresponding instruction byte, as prefetched and predecoded, is a MODR/M byte;
- a fourth value to indicate that the corresponding instruction byte, as prefetched and predecoded, is an S-I-B byte; and
- a fifth value to indicate that the corresponding instruction byte, as prefetched and predecoded, is a DISP/IMM byte.

5,689,673

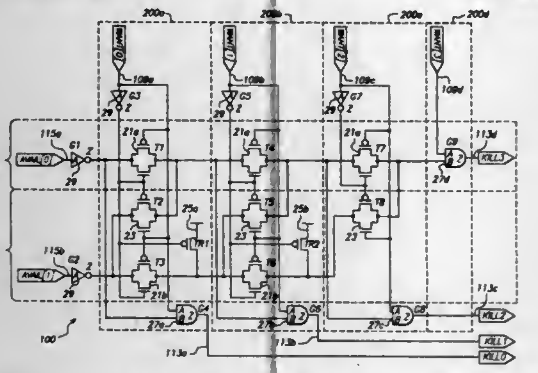
APPARATUS AND METHOD FOR CONTROLLING INSTRUCTION FLOW BY USING A MATRIX OF TRANSMISSION GATES IN SUPER-SCALER MICROPROCESSOR AND SELECTIVELY DELAYING MICROPROCESSOR INSTRUCTION EXECUTION BASED ON RESOURCE AVAILABILITY

Takeshi Kitahara, Santa Clara, Calif., assignor to Hal Computer Systems, Inc., Campbell, Calif.

Filed Feb. 14, 1995, Ser. No. 388,602

Int. Cl.^{6} G06F *13/14;9/22;9/30*

U.S. Cl. 395—391 **9 Claims**



1. An apparatus including an instruction flow control circuit, comprising:

- a primary signal path including a plurality of propagating gates, each propagating gate receiving complementary inputs from one of a plurality of resource request signals, each propagating gate propagating a resource availability signal in the primary signal path where the resource request signal input into the propagating gate does not request a resource;
- at least one secondary signal path including a plurality of propagating gates, each propagating gate receiving complementary inputs from one of the plurality of resource request signals, each propagating gate propagating a resource availability signal in the secondary signal path where the resource request signal input into the propagating gate does not request a resource;
- a shifting gate coupled between selected pairs of propagating gates in selected pairs of signal paths, each shifting gate receiving complementary inputs from the same resource request signal providing inputs to the pair of propagating gates, and shifting the resource availability signal in one of the signal paths to the other signal path where the resource request signal requests a resource;
- a transistor coupled after each propagating gate in each secondary signal path, and receiving an input from the same resource request signal providing inputs to the propagating gate in the secondary signal path, the transistor changing a logic level in the secondary signal path coupled thereto where the resource request signal requests a resource; and
- a plurality of comparing gates, each comparing gate coupled to the primary signal path to receive a resource availability signal, and further coupled to receive a selected one of the resource request signals, for comparing the signals and producing in response thereto a suppression signal.

5,689,674

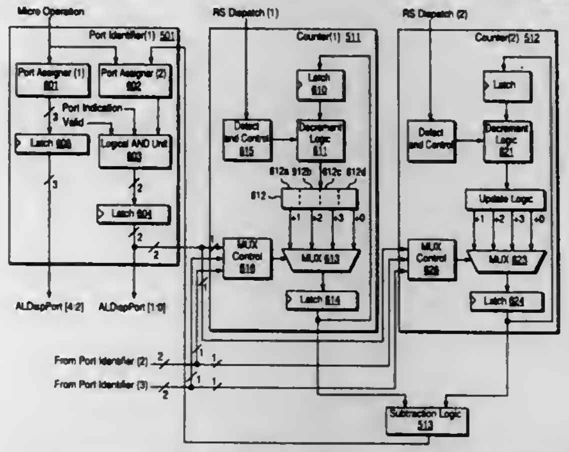
METHOD AND APPARATUS FOR BINDING INSTRUCTIONS TO DISPATCH PORTS OF A RESERVATION STATION

James S. Griffith, Aloha; Shantanu R. Gupta, Beaverton, and Glenn J. Hinton, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 31, 1995, Ser. No. 550,745

Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—393 **22 Claims**



1. An apparatus for identifying a first dispatch port of a reservation station from which an instruction is to be dispatched, wherein the instruction could be dispatched from a plurality of dispatch ports of the reservation station, the apparatus comprising:

- a counter mechanism to maintain a first count of instructions which are pending dispatch from the first dispatch port of the plurality of dispatch ports; and
- a port identifier, coupled to the counter mechanism, to identify the first dispatch port based on the first count of instructions.

5,689,675

RANKING-BASED ADDRESS ASSIGNMENT IN A MODULAR SYSTEM

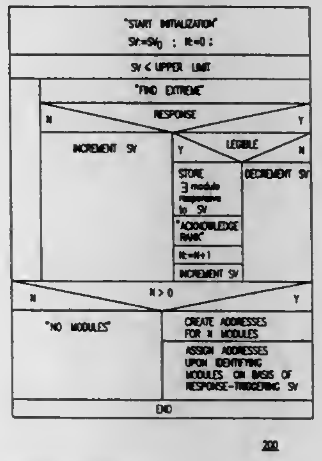
Arnold W. Buij, and Marcel Beij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1994, Ser. No. 346,945

Claims priority, application European Pat. Off., Nov. 29, 1993, 93203330

Int. Cl.^{6} G06F *12/06;* **H04Q** *1/00*

U.S. Cl. 395—405 **5 Claims**



1. A control system comprising:

- a plurality of modules, each particular module including identification means for representing a particular number to enable identification of the particular module;
- control means being operative to control assignment of respective addresses to respective modules of the plurality of modules for access to the plurality of modules and being operative to carry out an assignment of the respective addresses to respective modules of the plurality of modules on the basis of the particular numbers, said control means being operative to perform the steps of:
- a) determining a plurality of mutually exclusive number ranges, each respective one containing a respective single number of the particular numbers, the determining including:
  - i) stimulating each respective module of the modules to respond if its respective particular number lies in a specific range of numbers without the respective module transmitting its particular number; and
  - ii) altering the specific range if none or more than one of the modules responds; and
- b) specifying the respective addresses on the basis of the specific ranges found and carrying out the assignment.

5,689,676

SEQUENTIAL EEPROM WRITING APPARATUS WHICH SEQUENTIALLY AND REPETITIVELY REPLACES A HEAD POSITION POINTER WITH A LAST POSITION POINTER

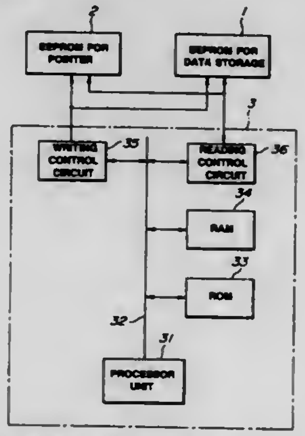
Harumi Hirose, Tokyo; Toshizumi Ando, Kanagawa; Yoshiki Takekawa, Tokyo; Toshiaki Isogawa, and Shingo Nakata, both of Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 803,670, Dec. 3, 1991, abandoned, which is a continuation of Ser. No. 342,084, Apr. 24, 1989, abandoned. This application Nov. 18, 1996, Ser. No. 746,878

Claims priority, application Japan, Apr. 28, 1988, 63-106298; May 20, 1988, 63-123636; May 16, 1988, 63-118984

Int. Cl.^{6} G06F *12/02*

U.S. Cl. 395—430 **1 Claim**



1. An apparatus for storing data in memory device having a finite total number of writings comprising:

- a data memory having a plurality of data areas for storing data;
- a pointer memory for storing pointer information corresponding to said plurality of data areas, said pointer information identifying a beginning data area and wherein said pointer information is sequentially ordered from a head position pointer to a last position pointer; and
- a control means for identifying a start in said pointer memory by said head position pointer and writing and changing the contents of said pointer memory sequentially and repetitively by replacing said head position pointer with a last position pointer.

5,689,677

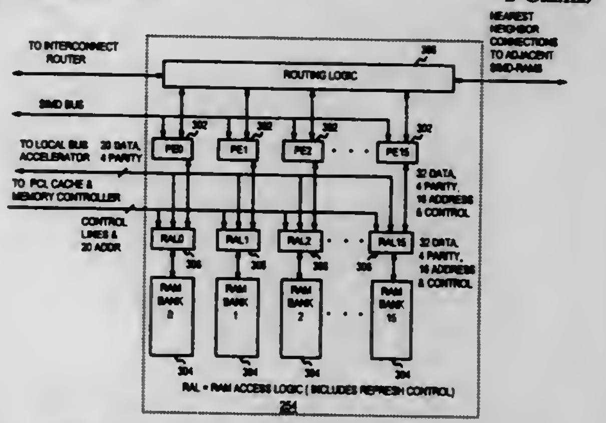
CIRCUIT FOR ENHANCING PERFORMANCE OF A COMPUTER FOR PERSONAL USE

David C. MacMillan, 3931 Jefferson Ave., Redwood City, Calif. 94062

Filed Jun. 5, 1995, Ser. No. 464,307

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—433 **2 Claims**



1. A circuit comprising:

- a first logic circuit means capable of issuing instructions;
- a second logic circuit means responding to the instructions; and
- a dynamic memory means, the first logic circuit means capable of causing a refresh of the dynamic memory means by inserting a new refresh instruction into a sequence of instructions.

5,689,678

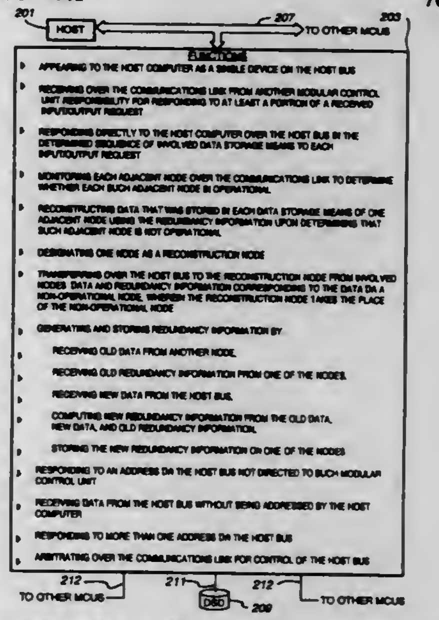
DISTRIBUTED STORAGE ARRAY SYSTEM HAVING A PLURALITY OF MODULAR CONTROL UNITS

David C. Stallmo; William A. Brant, and Randy Hall, all of Boulder, Colo., assignors to EMC Corporation, Hopkinton, Mass.

Continuation of Ser. No. 29,794, Mar. 11, 1993. This application Mar. 31, 1995, Ser. No. 415,157

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—441 **76 Claims**


201
HOST
207
TO OTHER MCUS
203
FUNCTIONS
APPEARING TO THE HOST COMPUTER AS A SINGLE DEVICE ON THE HOST BUS
RECEIVING OVER THE COMMUNICATIONS LINK FROM ANOTHER MODULAR CONTROL UNIT RESPONSIBILITY FOR RESPONDING TO AT LEAST A PORTION OF A RECEIVED INPUT/OUTPUT REQUEST
RESPONDING DIRECTLY TO THE HOST COMPUTER OVER THE HOST BUS IN THE
212
211
212
TO OTHER MCUS
DISC
209
TO OTHER MCUS

1. A distributed storage array system configured to be coupled to a host computer having a host bus, the system including:

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(a) a plurality of data storage means for storing and retrieving data in a selected sequence;

(b) a communications link;

(c) a plurality of modular control units, each configured to communicate with the host computer directly over said host bus, and be capable of appearing to the host computer as a single device on said host bus, each modular control unit being coupled to at least one corresponding data storage means and to each other modular control unit by said communications link, wherein each modular control unit includes:

(1) means for receiving input/output requests from the host computer directly over said host bus, for determining a sequence of data storage means involved in responding to a pending one of the received input/output requests, and for transferring, over said communications link, responsibility for responding to the pending one of the received input/output requests to the modular control units corresponding to the sequence of involved data storage means;

(2) means (a) for receiving from another modular control unit, over said communications link, responsibility for responding to at least a portion of a received input/output request, and (b) for responding directly to the host computer over said host bus in the determined sequence of involved data storage means to each input/output request.

5,689,679

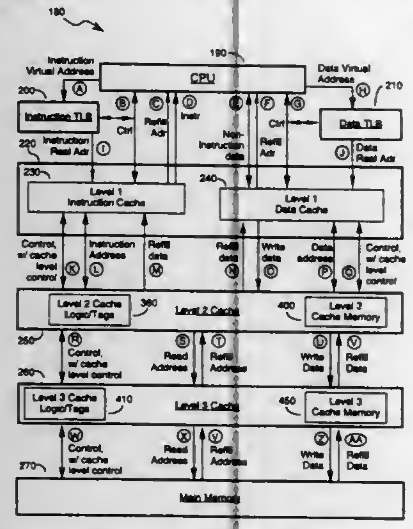
MEMORY SYSTEM AND METHOD FOR SELECTIVE MULTI-LEVEL CACHING USING A CACHE LEVEL CODE

Norman Paul Jouppi, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 55,232, Apr. 28, 1993, abandoned. This application Mar. 5, 1996, Ser. No. 610,901

Int. Cl.⁶ G06F *12/08;13/00*

U.S. Cl. 395—449 **26 Claims**



1. A memory system for coupling to a central processor, which issues a data request having a specified address to be accessed, the memory system comprising;

a main memory;

cache levels coupled between the main memory and the central processor in a multilevel hierarchy, each of the cache levels having a cache memory;

means, coupled to the processor, for identifying a cache level code associated with the data request, the cache level code indicating a hierarchical level in the multilevel hierarchy; and means for determining from the cache level code whether or not data associated with the specified address can be written to the cache memory at each of the cache levels.

5,689,680

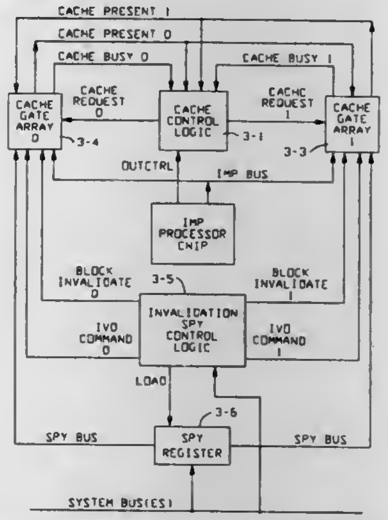
CACHE MEMORY SYSTEM AND METHOD FOR ACCESSING A COINCIDENT CACHE WITH A BIT-SLICED ARCHITECTURE

Bruce E. Whittaker, Mission Viejo; David M. Kalish, Laguno Niguel, and Saul Barajas, Mission Viejo, all of Calif., assignors to Unisys Corp., Blue Bell, Pa.

Filed Jul. 15, 1993, Ser. No. 92,408

Int. Cl.⁶ G06F *12/02;12/08;13/00*

U.S. Cl. 395—454 **3 Claims**



3. A computer system with cache memory coupled to a system bus mean and adapted to provide coincident, simultaneous operations, said cache memory comprising a pair of like, separate, bit-sliced cache modules, each including a first and second IN-register means for storing spy address value from system bus write operation, and invalidation queue means fed, in multiplex fashion, by the outputs of said IN-register means and, in turn, feeding its output to a TAG RAM structure; each said TAG RAM structure being arranged and adapted to handle only on-half of the address values presented, and also arranged to enable processor operations and invalidation operations to be "overlapped", and to even operate simultaneously; the system comprises:

invalidation spy control logic means for monitoring said system bus of commands that potentially modify data stored in said cache modules;

cache gate array means for handling even and odd addresses;

cache control logic means utilized for distinguishing between said even and odd addresses, and directing cache requests to said cache gate array means;

said cache modules being input by first system bus means coupled via associated first spy register means, to both said first IN-registers means, and also input by second system bus mean, coupled, via associated second spy register means, to both said second IN-register means;

wherein said first spy register means and said second spy register means are for storing the potential invalidation address that is being loaded from said invalidation spy control logic means;

wherein said TAG RAM arrays and invalidation queue means comprise a pair of identical ASIC arrays.

5,689,681

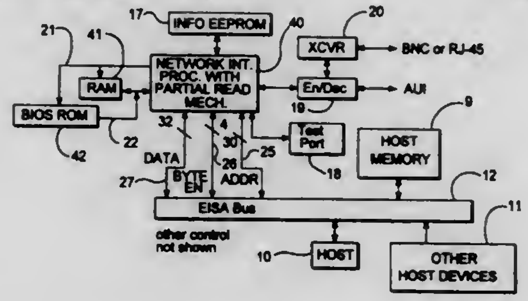
SYSTEM FOR READING DYNAMICALLY CHANGING DATA SUPPORTING PARTIAL READS OF STORAGE LOCATIONS

Brian Petersen, Los Altos, Calif., assignor to 3Com Corporation, Santa Clara, Calif.

Division of Ser. No. 383,663, Feb. 2, 1995, which is a continuation of Ser. No. 018,694, Feb. 17, 1993, abandoned. This application May 24, 1995, Ser. No. 449,492

Int. Cl.⁶ G06F *12/00;13/36;13/42*

U.S. Cl. 395—481 **5 Claims**



1. For a host data processing system, a peripheral device comprising:

a memory including a plurality of storage locations having addresses, at least one of the plurality of storage locations including a plurality of sections;

means, coupled with the memory, for supplying data to the plurality of storage locations independent of the host data processing system;

a host interface for reading the data in the plurality of storage locations, the host interface including:

a read store, coupled to the memory and responsive to an address of one of the plurality of storage locations and an update signal, for storing data from the plurality of sections of the addressed storage location;

addressing means for supplying addresses indicating selected storage locations and section enable signals indicating selected ones of the plurality of sections of addressed storage locations;

means, coupled with the read store and the addressing means, for providing access to data in the read store to the host data processing, the provided data being from the selected ones of plurality of sections indicated by the section enable signals; and

means for generating the update signal in response to the addresses and section enable signals so that the read store is not changed between sequential reads by the host data processing system to different sections of the same storage location, wherein the sequential reads being sequential in time and including a first read and a second read, the second read occurring after the first read and occurring without an intervening read existing between the first read and the second read;

wherein the means for generating an update signal includes:

means, responsive to the addresses, for detecting a sequence of at least two sequential reads by the host data processing system to the same storage location; and

means, responsive to sequential reads by the host data processing system and section enable signals, for controlling the update signal so that the read store is not updated when the second read accesses a different section of the storage location than the first read, and the read store is updated when the second read accesses the same storage location as is accessed by the first read.

5,689,682

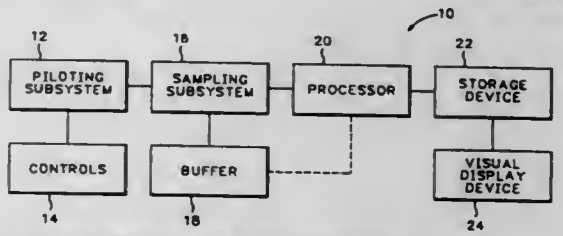
COMPUTERIZED FLIGHT SIMULATION CONTROL SAMPLING AND PRODUCTION SYSTEM AND METHOD

Mark E. Peasley; Hugh Diedrichs; Cyrus R. Kanga, and Edwin W. Wise, all of Eugene, Oreg., assignors to Dynamix, Inc., Eugene, Oreg.

Filed Mar. 7, 1995, Ser. No. 399,841

Int. Cl.⁶ G06F *17/17;* **G09B** *9/12*

U.S. Cl. 395—500 **20 Claims**



1. A graphical production system comprising:

a piloting subsystem configured to control computer simulated transient characteristics of a computer generated object in response to user operable controls that affect the transient characteristics of the object, where the piloting subsystem is configured to generate and display to a user a first video sequence depicting the transient characteristics of the object, whereby a user can pilot the object using such controls while viewing the first video sequence;

a sampling subsystem operatively connected to the piloting subsystem for periodically sampling numerous times the transient characteristics of the object during piloting by the user to produce a sampled data set of numerous transient characteristic samples, where the transient characteristics include at least the position of the object; and

a processor operatively connected to the sampling subsystem for rendering at least one video frame corresponding to the transient characteristics of the object for each of a plurality of the numerous transient characteristic samples, the processor further being configured to store the rendered video frames to thereby create a second video sequence in the form of an animation sequence of numerous video frames depicting the computer simulated transient characteristics of the object.

5,689,683

HARDWARE SIMULATOR CAPABLE OF DEALING WITH A DESCRIPTION OF A FUNCTIONAL LEVEL

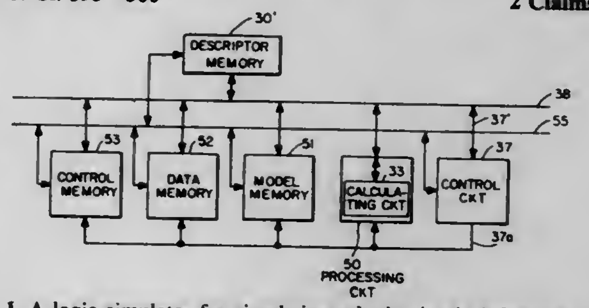
Shigeru Takasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 74,725, Jun. 10, 1993, Pat. No. 5,572,708, which is a continuation of Ser. No. 486,705, Feb. 28, 1990, abandoned. This application May 1, 1995, Ser. No. 432,260

Claims priority, application Japan, Feb. 28, 1989, 1-48225; May 24, 1989, 1-131079; Jun. 30, 1989, 1-166926; Dec. 7, 1989, 1-318102

Int. Cl.⁶ G06F *17/50*

U.S. Cl. 395—500 **2 Claims**



1. A logic simulator for simulating a logic circuit defined by a plurality of sentences, each sentence comprising at least one operator and at least two variables which are operated on according to said at least one operator, said logic simulator comprising:

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a model memory for memorizing a plurality of operators which are for carrying out operations specified by said sentences;

a variable memory for memorizing a plurality of initial values of the variables specified by said sentences;

sentence calculating means connected to said model memory and said variable memory for carrying out calculation on one of said plurality of sentences one at a time and outputting a result of said calculation based on at least one of said operators and at least two of said initial values of said variables for each calculation of said plurality of sentences, said at least one of said operators and said at least two of said initial values of said variables being specified by said one of the sentences;

a data memory connected to said sentence calculating means for memorizing said results of said calculations for said plurality of sentences; and

substituting means connected to said sentence calculating means and said data memory for substituting said result of calculation for a previous result that was previously calculated according to said one of the sentences.

5,689,684

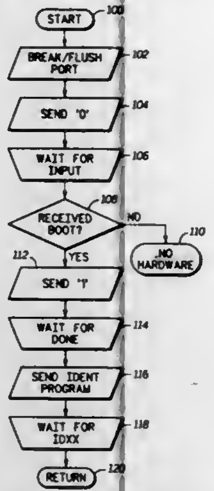
METHOD AND APPARATUS FOR AUTOMATICALLY RECONFIGURING A HOST DEBUGGER BASED ON A TARGET MCU IDENTITY

Deepak Mulchandani, and Rand Gray, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 7, 1995, Ser. No. 485,331

Int. Cl.^{6} G06F *9/455;15/177*

U.S. Cl. 395—500 **16 Claims**



1. A method for automatically reconfiguring a Host Debugger to correspond to a Target MCU, said method comprising:

a) querying the Target MCU to send a station type identification;

b) receiving the station type identification from the Target MCU;

c) utilizing the station type identification received from the Target MCU to identify a set of corresponding files; and

d) reconfiguring the Host Debugger based on the contents of one or more files in the set of corresponding files, wherein step (d) comprises:

(1) loading Symbol Tables into the Host Debugger corresponding to one or more programs loaded into the Target MCU, and

(2) dynamically determining an object file format for each of the one or more object files containing the Symbol Tables, wherein:

the object file format for each of the one or more object files is dynamically determined by looking for specified patterns in the headers of the object files.

5,689,685

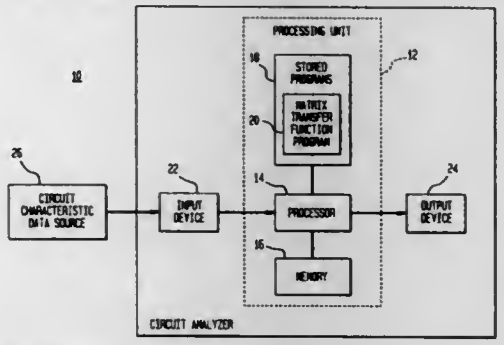
APPARATUS AND METHOD FOR ANALYZING CIRCUITS USING REDUCED-ORDER MODELING OF LARGE LINEAR SUBSCIRCUITS

Peter Feldmann, Short Hills, and Roland Wilhelm Freund, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 269,230, Jun. 30, 1994, Pat. No. 5,537,329. This application Jun. 9, 1995, Ser. No. 489,270

Int. Cl.^{6} G06G *7/19*

U.S. Cl. 395—500 **22 Claims**



1. An apparatus comprising:

a processing unit having:

a memory for storing circuit characteristic data representing a circuit;

a program for generating matrix transfer function data relating to a matrix transfer function associated with the circuit characteristic data;

a processor for executing the program; and

means for generating the frequency response signal in response to the matrix transfer function data.

5,689,686

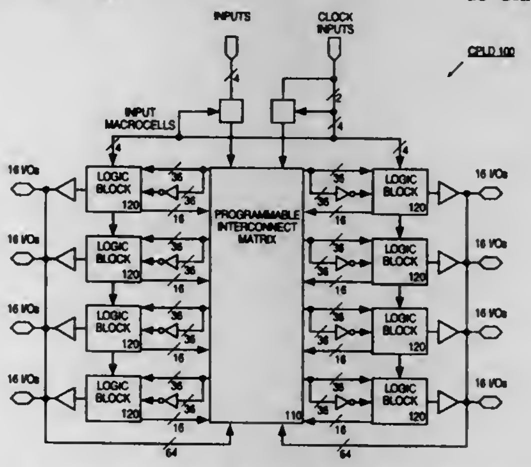
METHODS FOR MAXIMIZING ROUTABILITY IN A PROGRAMMABLE INTERCONNECT MATRIX HAVING LESS THAN FULL CONNECTABILITY

Hagop A. Nazarian, San Jose; Stephen M. Douglass; W. Alfred Graf, both of Saratoga; S. Babar Raza, Sunnyvale; Sundar Rajan, Mountain View; Shiva Sorooshlan Borzin, Fremont, and Darren Neuman, San Jose, all of Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Continuation of Ser. No. 282,911, Jul. 29, 1994, abandoned. This application Mar. 21, 1997, Ser. No. 822,769

Int. Cl.^{6} H04Q *3/04*

U.S. Cl. 395—500 **13 Claims**



1. A process for routing a blocked input signal from an input conductor of a programmable interconnect matrix to one of a plurality of output conductors of the programmable interconnect matrix, the process comprising the steps of:

a) selecting a multiplexor coupled to receive the blocked input signal, wherein the multiplexor is captured by a capturing input signal;

b) replacing the capturing input signal with the blocked input signal such that the blocked input signal is routed through the multiplexor to an output conductor;

c) determining that the capturing input signal cannot be routed through an available multiplexor;

d) [ending if the available multiplexor is coupled to receive the capturing input signal such that capturing input signal is routed through the available multiplexor;

e)] replacing the blocked input signal with the capturing input signal such that the capturing input signal is routed through the multiplexor to the output conductor.

5,689,687

ELECTRONIC DEVICE

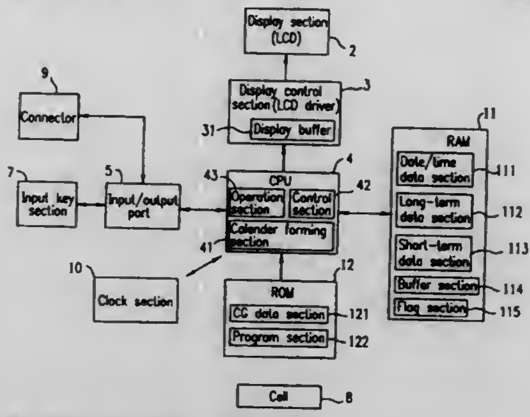
Yoko Nishioka, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1996, Ser. No. 637,384

Claims priority, application Japan, Apr. 25, 1995, 7-101138

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—514 **7 Claims**



1. An electronic device, comprising:

short-term data storing means for storing short-term data which represents a short-term scheduled event and includes graphic symbol data representing a graphic symbol and also for storing a first flag having one of a first state and a second state, the first flag corresponding to the short-term data;

long-term item data storing means for storing long-term data which represents a long-term scheduled event and includes long-term item data representing a long-term item of the long-term scheduled event and also for storing a second flag having one of the first state and the second state, the second flag corresponding to the long-term data;

display means for displaying the graphic symbol and the long-term item;

flag storing means for storing a third flag having one of the first state and the second state; and

control means for, when the third flag is in the first state, controlling the display means to display the graphic symbol of the short-term scheduled event represented by the short-term data which corresponds to the first flag in the first state and for, when the third flag is in the second state, controlling the display means to display the long-term item of the long-term scheduled event represented by the long-term data which corresponds to the second flag in the first state.

5,689,688

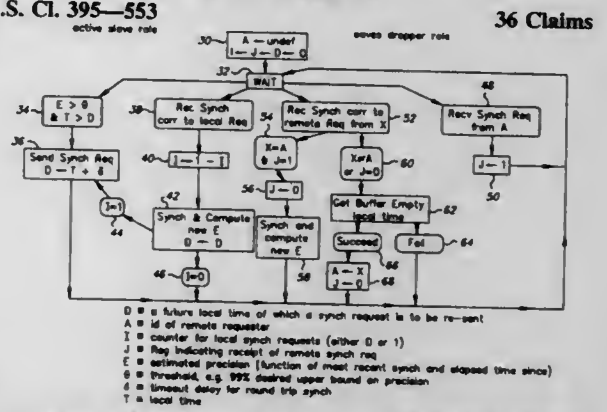
PROBABILISTIC ANONYMOUS CLOCK SYNCHRONIZATION METHOD AND APPARATUS FOR SYNCHRONIZING A LOCAL TIME SCALE WITH A REFERENCE TIME SCALE

Hovey Raymond Strong, and Edward Leo Wimmers, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1993, Ser. No. 153,332

Int. Cl.^{6} G06F *1/14*

U.S. Cl. 395—553 **36 Claims**


active slave role
eaves dropper role
30
A ← undef
I ← J ← D ← 0
32
WAIT
34
E > θ & T > D
36
Send Synch Req
38
Rec Synch corr to local Req
40
54
Rec Synch corr to remote Req from X
52
48
Recv Synch Req from A
X=A & J=1
X≠A or J=0
60
J ← 1
50
42
I=1
44
Synch & Compute new E
D ← D
56
J ← 0
Synch and compute new E
58
Get Buffer Empty local time
62
Succeed
66
Fail
64
A ← X
J ← 0
68
46
I=0
D = a future local time of which a synch request is to be re-sent
A = id of remote requester
I = counter for local synch requests (either 0 or 1)
J = flag indicating receipt of remote synch req
E = estimated precision (function of most recent synch and elapsed time since)
θ = threshold, e.g. 99% desired upper bound on precision
Δ = timeout delay for round trip synch
T = local time

1. For use with a communication network including a plurality of nodes which maintain respective local time scales and a reference time source which maintains a reference time scale, a method for synchronizing a local time scale of one of the nodes with the reference time scale comprising the steps of:

synchronizing based on a first procedure responsive to a first event, the first procedure including synchronizing according to a protocol in which the node is known to the reference time source; and

synchronizing based on a second procedure responsive to a second event the second procedure including synchronizing according to a protocol in which the node is anonymous to the reference time source.

5,689,689

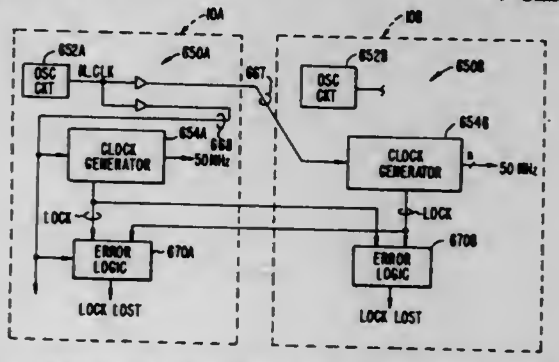
CLOCK CIRCUITS FOR SYNCHRONIZED PROCESSOR SYSTEMS HAVING CLOCK GENERATOR CIRCUIT WITH A VOLTAGE CONTROL OSCILLATOR PRODUCING A CLOCK SIGNAL SYNCHRONOUS WITH A MASTER CLOCK SIGNAL

Steven C. Meyers, Round Rock; John Michael Brown; William F. Bruckert, both of Austin, and James Stephens Klecka, Lexington, all of Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation-in-part of Ser. No. 992,944, Dec. 17, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,748

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—553 **9 Claims**



1. Apparatus for providing clock signals synchronized to a master clock signal for at least a pair of synchronous processing elements, comprising:

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each of the pair of processing elements including:
a master oscillator circuit to produce a clock signal,
a clock generator circuit coupled to receive the master clock signal to produce the synchronized clock signals therefrom for such one of the pair of processing elements, the clock generator circuit having a voltage controlled oscillator circuit responsive to a phase voltage to produce a first clock signal that is synchronous with the master clock signal, a counter circuit coupled to receive the first clock signal to produce a number of divisions of the first clock signal that includes the synchronized clock signals and a replica of the master clock signal, and a phase compare means coupled to receive the master clock signal and the replica of the master clock signal to produce the phase voltage; and
means for coupling the master oscillator circuit of a one of the pair of processing elements to provide the clock signal as the master clock signal to the clock generator of each of the pair of processing elements.

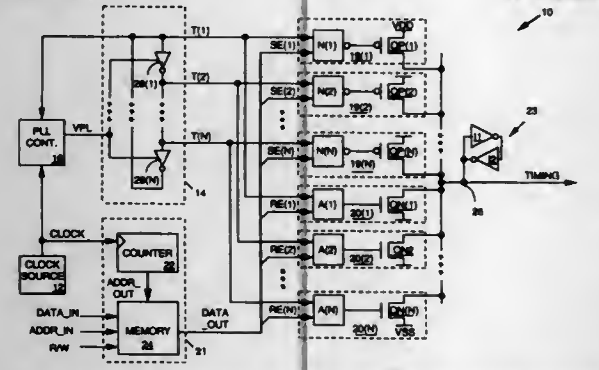
5,689,690
TIMING SIGNAL GENERATOR

Gary J. Lesmeister, Hayward, Calif., and Daniel J. Bedell, Portland, Oreg., assignors to Credence Systems Corporation, Fremont, Calif.

Continuation-in-part of Ser. No. 534,015, Sep. 25, 1995. This application Dec. 18, 1995, Ser. No. 574,333

Int. Cl.⁶ G06F *1/04*

U.S. Cl. 395—555 **20 Claims**



1. An apparatus for generating a timing signal at an output node comprising:
means for generating a clock signal;
means for receiving the clock signal and producing N periodic reference signals distributed in phase and frequency locked to the clock signal where N is greater than 1;
a first source of high logic level voltage;
a second source of low logic level voltage;
means for generating a set of N set signals and a set of N reset signals;
a set of N set circuits, each receiving a separate one of said N set signals, each receiving a separate one of said N reference signals, and each coupling said output node to said first source in response to a pulse of its received reference signal when its received set signal is asserted; and
a set of N reset circuits, each receiving a separate one of said N reset signals, each receiving a separate one of said N reference signals, and each coupling said output node to said second source in response to a pulse of its received reference signal when its received reset signal is asserted.

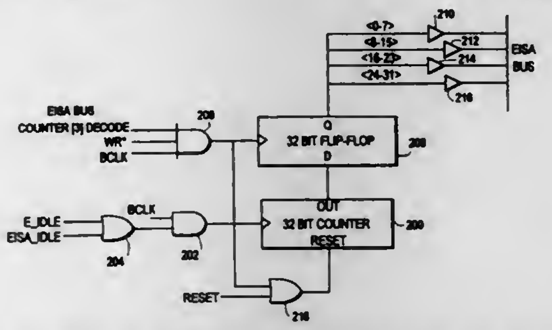
5,689,691
COMPUTER BUS UTILIZATION DETERMINATION APPARATUS

James M. Mann, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 119,705, Sep. 10, 1993, abandoned. This application Nov. 8, 1995, Ser. No. 555,255

Int. Cl.⁶ G06F *13/14*

U.S. Cl. 395—557 **8 Claims**



1. A system for determining utilization of a bus on which a plurality of different cycles may be run, the cycles having a length which is a multiple of a synchronizing clock, and which may be controlled by a number of sources, comprising:
means for determining if the bus is idle;
means for counting the number of synchronizing clock periods wherein the bus is determined to be idle;
means for periodically reading said means for counting and obtaining a counter value;
means for determining the time between said periodic reading of said means for counting; and
means for determining a bus utilization value utilizing a ratio of said counter value times the synchronizing clock period to said time between periodic reading.

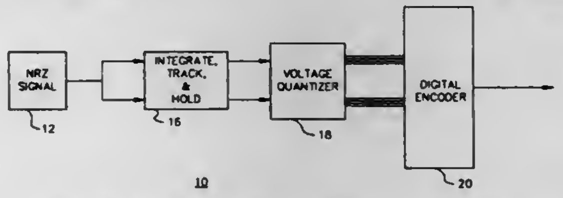
5,689,692
METHOD AND APPARATUS FOR DECODING AN ENCODED NRZ SIGNAL

Iain Ross MacTaggart, Eden Prarie, and David E. Tetzlaff, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 23, 1992, Ser. No. 996,224

Int. Cl.⁶ G06F *1/12;1/14;* H04L *25/49;* G11B *20/10*

U.S. Cl. 395—558 **18 Claims**



7. A decoder for an encoded non-return to zero (NRZ) signal comprising:
first signal output means which detects a first transition in the NRZ signal and outputs a first signal which changes in magnitude at a predetermined rate;
second signal output means which detects a second transition in the NRZ signal and outputs a second signal that changes in magnitude at a predetermined rate;
first means for measuring the magnitude of the first signal at the second transition and converting the magnitude of the first signal to a number of consecutive first bits; and
second means for measuring the magnitude of the second signal at the first transition and converting the magnitude of the second signal to a number of consecutive second bits.

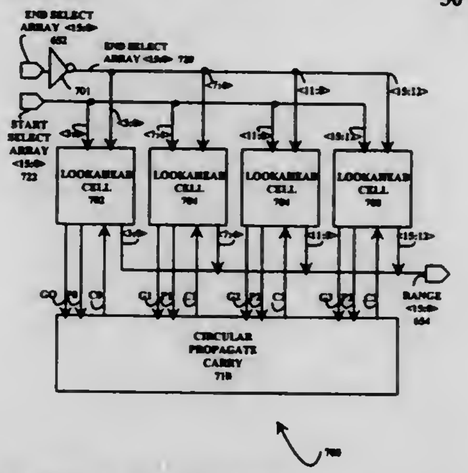
5,689,693
RANGE FINDING CIRCUIT FOR SELECTING A CONSECUTIVE SEQUENCE OF REORDER BUFFER ENTRIES USING CIRCULAR CARRY LOOKAHEAD

Scott A. White, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 26, 1994, Ser. No. 233,568

Int. Cl.⁶ G06F *9/302*

U.S. Cl. 395—565 **30 Claims**


END SELECT ARRAY <15:0>
END SELECT ARRAY <15:0> 720
701
START SELECT ARRAY <15:0>
LOOKAHEAD CELL
RANGE <15:0>
CIRCULAR PROPAGATE CARRY 710
700

1. A range-finding circuit comprising:
a plurality of cells arranged in a ordered array,
each cell being input coupled to a carry, to an ordered portion of bits of a first multiple-bit pointer and to an ordered portion of bits of a second multiple-bit pointer and
each cell being output coupled to a generate, to a propagate and to an ordered portion of bits of a multiple-bit range which corresponds to the ordered portions of first and second pointers,
the carry, generate and propagate being respective elements of a plurality of ordered carries, generates and propagates, and
the pointers designating a range in which range bits between the pointers are assigned a first logic level and range bits outside the pointers are assigned a second opposite logic level; and
a propagating circuit coupled to the plurality of cells to receive the ordered generates and propagates and to furnish the ordered carries as a function thereof.

5,689,694
DATA PROCESSING APPARATUS PROVIDING BUS ATTRIBUTE INFORMATION FOR SYSTEM DEBUGGING

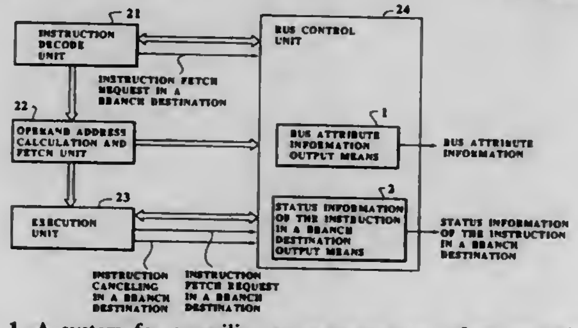
Masami Funyu, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1993, Ser. No. 10,016

Claims priority, application Japan, Jan. 28, 1992, 4-013012

Int. Cl.⁶ G06F *9/40;11/30*

U.S. Cl. 395—581 **8 Claims**


21
INSTRUCTION DECODE UNIT
24
BUS CONTROL UNIT
INSTRUCTION FETCH REQUEST IN A BRANCH DESTINATION
22
OPERAND ADDRESS CALCULATION AND FETCH UNIT
1
BUS ATTRIBUTE INFORMATION OUTPUT MEANS
BUS ATTRIBUTE INFORMATION
23
EXECUTION UNIT
3
STATUS INFORMATION OF THE INSTRUCTION IN A BRANCH DESTINATION OUTPUT MEANS
STATUS INFORMATION OF THE INSTRUCTION IN A BRANCH DESTINATION
INSTRUCTION CANCELLING IN A BRANCH DESTINATION
INSTRUCTION FETCH REQUEST IN A BRANCH DESTINATION

1. A system for compiling an accurate trace of an execution sequence to facilitate debugging, comprising:
a first unit requesting an instruction fetch for executing an instruction decode, branch prediction, and precedence branch of a branch instruction;
a second unit for calculating operand addresses requesting an operand fetch;
a third unit for executing instructions and requesting an operand store;
a trace memory for storing a trace of the instructions fetched by said first unit; and
a bus control unit connected to said first, second and third units for conducting bus cycles according to an instruction fetch request signal from said first unit, an operand fetch request signal from said second unit, and an operand store request signal from said third unit,
wherein said bus control unit outputs a bus attribute signal indicating that an instruction at a destination of a conditional branch instruction has been fetched prior to execution of the conditional branch instruction, and outputs a debug information signal indicating that the conditional branch instruction did not satisfy its branch conditions upon execution of said conditional branch instruction by said third unit, and
wherein the trace stored in said trace memory is corrected in accordance with the bus attribute signal and the debug information signal.

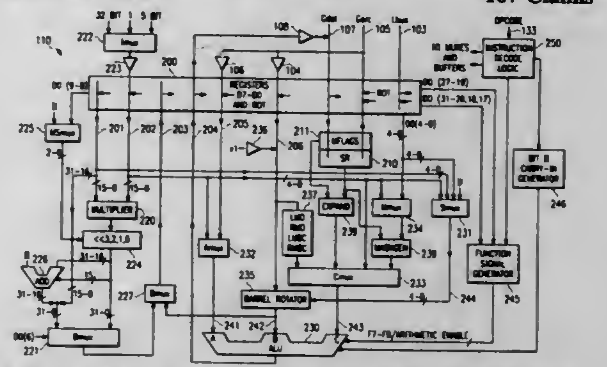
5,689,695
CONDITIONAL PROCESSOR OPERATION BASED UPON RESULT OF TWO CONSECUTIVE PRIOR PROCESSOR OPERATIONS

Christopher J. Read, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 158,741, Nov. 30, 1993. This application Jun. 7, 1995, Ser. No. 482,697

Int. Cl.⁶ G06F *9/30*

U.S. Cl. 395—581 **167 Claims**



1. The method of conditional data processing operation implemented in three consecutive instructions consisting of the steps of:
(1) storing at least one instance of a set of three consecutive instructions forming an AND conditional sequence;
(2) in response to a first instruction of an instance of said set of three consecutive instructions forming an AND conditional sequence
performing a first arithmetic/logical operation forming a first result, and
setting a first condition in either a first state or a second state dependent upon said first result of said first arithmetic/logical operation;
(3) in response to a second instruction of said instance of said set of three consecutive instructions forming an AND conditional sequence
performing a second arithmetic/logical operation forming a second result if said first condition is in said first state and not performing said second arithmetic/logical operation if said first condition is in said second state, and
setting said first condition in either said first state or said second state dependent upon said second result of said second arithmetic/logical operation if said second arithmetic/logical operation was performed; and

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(4) in response to a third instruction of said instance of said set of three consecutive instructions forming an AND conditional sequence

performing a third operation conditional upon said first condition being in said first state, whereby said third operation is performed only if both said first result of said first arithmetic/logical operation and said second result of said second arithmetic/logical operation set said first condition in said first state.

5,689,696

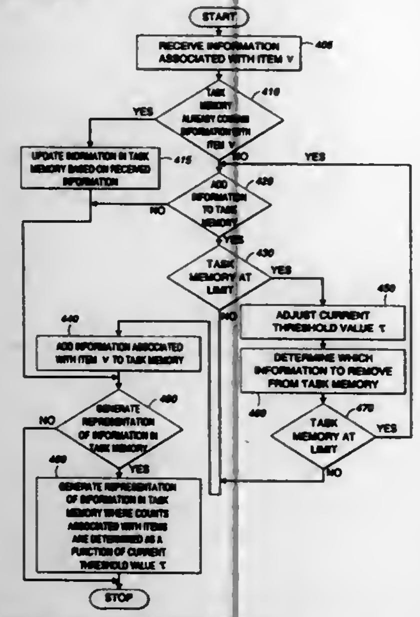
METHOD FOR MAINTAINING INFORMATION IN A DATABASE USED TO GENERATE HIGH BIASED HISTOGRAMS USING A PROBABILITY FUNCTION, COUNTER AND THRESHOLD VALUES

Phillip B. Gibbons, Westfield, N.J.; Yossi Matias, Potomac, Md., and Andrew Witkowski, Forster City, Calif., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 28, 1995, Ser. No. 579,753

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—601 **9 Claims**


START
RECEIVE INFORMATION ASSOCIATED WITH ITEM V
405
410
YES
NO
415
UPDATE INFORMATION IN TASK MEMORY BASED ON RECEIVED INFORMATION
ADD INFORMATION TO TASK MEMORY
420
YES
NO
TASK MEMORY AT LIMIT
430
YES
NO
ADJUST CURRENT THRESHOLD VALUE τ
450
DETERMINE WHICH INFORMATION TO REMOVE FROM TASK MEMORY
460
TASK MEMORY AT LIMIT
470
YES
NO
440
ADD INFORMATION ASSOCIATED WITH ITEM V TO TASK MEMORY
GENERATE REPRESENTATION OF INFORMATION IN TASK MEMORY
480
NO
YES
490
GENERATE REPRESENTATION OF INFORMATION IN TASK MEMORY WHERE COUNTS ASSOCIATED WITH ITEMS ARE DETERMINED AS A FUNCTION OF CURRENT THRESHOLD VALUE τ
STOP

1. A method comprising the steps of:

receiving information associated with an item for entry into a database, and

if said database comprises other information associated with said item, then updating said other information based on the received information, and if said database does not comprise other information associated with said item, then adding said information to said database based upon a probability that is a function of a threshold value.

5,689,697

SYSTEM AND METHOD FOR ASYNCHRONOUS DATABASE COMMAND PROCESSING

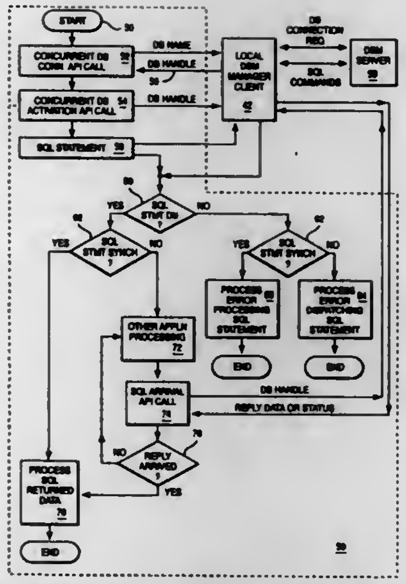
William Mitchell Edwards, Pflugerville; Domingo Segundo Hidalgo, and Leigh Allen Williamson, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 266,052, Jun. 27, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,703

Int. Cl.^{6} G06F *17/30;7/00*

U.S. Cl. 395—603 **8 Claims**

1. A computer implemented method for processing query statements by a database management system, the method comprising the steps of:



accepting a connection request from an application program for connecting said application program to said database management system;

establishing an interprocess connection in response to said connection request, the connection having a unique connection identifier;

testing to determine whether an asynchronous or synchronous connection was requested;

activating the connection for either synchronous or asynchronous processing, based on the results of the testing step;

accepting a query statement for processing on the activated connection; and when the connection has been activated for asynchronous processing,

responding to periodic polling by the application program to the database management system using the unique connection identifier to indicate whether the dispatched query statement has completed processing;

returning reply data in response to the periodic polling if the dispatched query statement has completed processing; and

returning an incomplete processing indicator otherwise.

5,689,698

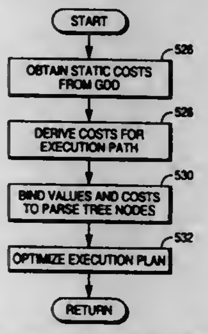
METHOD AND APPARATUS FOR MANAGING SHARED DATA USING A DATA SURROGATE AND OBTAINING COST PARAMETERS FROM A DATA DICTIONARY BY EVALUATING A PARSE TREE OBJECT

William Phillip Jones, Weldon; Arthur F. Kaufmann, Los Angeles; Colin Luck, El Segundo, and Jukka I. Saukkonen, San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 20, 1995, Ser. No. 546,283

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—604 **15 Claims**


START
526
OBTAIN STATIC COSTS FROM GDD
528
DERIVE COSTS FOR EXECUTION PATH
530
BIND VALUES AND COSTS TO PARSE TREE NODES
532
OPTIMIZE EXECUTION PLAN
RETURN

1. A method of providing access to object data stored in an object server in response to a database query, comprising the steps of:

receiving the database query comprising a relational operation from a client, said relational operation comprising at least one object surrogate identifying object data stored in an object server;

transforming the database query into relational database commands;

transmitting the relational database commands to a relational database management system;

receiving a response table from the relational database management system;

compiling an answer set from the response table, the answer set comprising an object locator identifying the object data stored in the object server and responsive to the database query;

transmitting the answer set to the client;

wherein the transforming step comprises the steps of

parsing the database command into a parse tree of object structures comprising relational database commands and object server commands, said parse tree comprising parse tree nodes;

obtaining cost parameters for the parse tree object structures from a global data dictionary;

binding the cost parameters to the parse tree nodes;

iterating over the parse tree object structures to evaluate parse tree options according to the cost parameters and a selection criteria; and

selecting the parse tree option based upon the cost parameters and selected criteria.

5,689,699

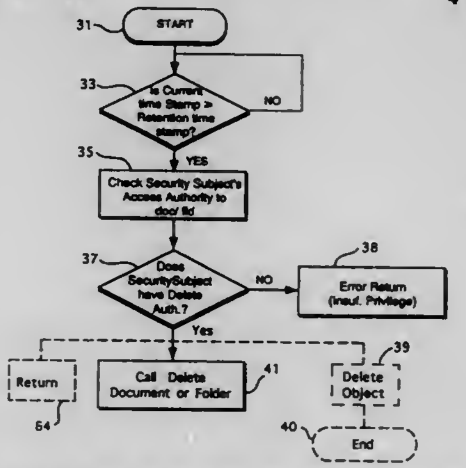
DYNAMIC VERIFICATION OF AUTHORIZATION IN RETENTION MANAGEMENT SCHEMES FOR DATA PROCESSING SYSTEMS

William E. Howell, N. Richland Hills; Hari N. Reddy, Grapevine, and Diana S. Wang, Trophy Club, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1992, Ser. No. 996,421

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—609 **4 Claims**


31
START
33
Is Current time Stamp > Retention time stamp?
NO
35
YES
Check Security Subject's Access Authority to doc/ fld
37
Does SecuritySubject have Delete Auth.?
NO
38
Error Return (Insuf. Privilege)
Yes
Return
64
Call Delete Document or Folder
41
39
Delete Object
40
End

1. A method of deleting an object in a data processing system, said object being provided with an expiration time by a security subject, comprising the steps of:

a) determining when said expiration time has occurred;

b) when said expiration time has occurred, determining if said security subject has authority to delete said object; and

c) deleting said object if said security subject has authority to delete, otherwise maintaining said object on said data processing system.

5,689,700

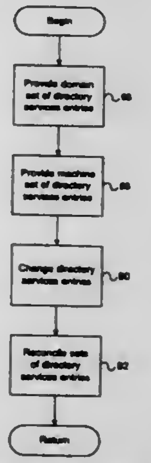
UNIFICATION OF DIRECTORY SERVICE WITH FILE SYSTEM SERVICES

Arnold Miller; Yuval Neeman, both of Bellevue; Aaron M. Contorer, Kirkland; Pradyumna K. Misra, Issaquah; Michael R. C. Seaman, Kirkland, and Darryl E. Rubin, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 29, 1993, Ser. No. 175,063

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—610 **20 Claims**


Begin
Provide domain set of directory services entries
Provide machine set of directory services entries
Change directory services entries
90
Reconcile sets of directory services entries
92
Return

1. In a distributed system having components including at least one storage device and at least one computer system, a distributed file system for storing files in file system structures and a distributed name space of names of the file system structures in which each distinct name may refer to only one file system structure, a method comprising the steps of:

storing files in the storage device in the file system structures;

storing directory entries in the storage device in the file system structures that store the files such that the directory entries have names in the distributed name space, at least some of said directory entries holding information regarding how to locate the file system structures in the distributed system; and

accessing a first of the file system structures in the storage device that stores at least one directory entry to locate a second of the file system structures using the information stored in the first file system structure.

5,689,701

SYSTEM AND METHOD FOR PROVIDING COMPATIBILITY BETWEEN DISTRIBUTED FILE SYSTEM NAMESPACES AND OPERATING SYSTEM PATHNAME SYNTAX

Michael Bradford Ault, Austin; Ernst Robert Plassmann, Pflugerville; Bruce Arland Rich, Round Rock, and Michael David Wilkes, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 355,873, Dec. 14, 1994, abandoned. This application Dec. 14, 1995, Ser. No. 572,582

Int. Cl.^{6} G06F *17/30;9/45*

U.S. Cl. 395—610 **2 Claims**

1. A method implemented on a computer system including a computer executing a first operating system, for referencing, with a computer executing a second operating system, objects in a distributed file system (DFS) having an incompatible namespace, said second operating system having at least one drive and drive designator associated therewith and said DFS including a DFS client installable file system (IFS) client driver, comprising:

generating a first request including a DFS pathname prefix with said second operating system to associate said drive designator with said client driver;

servicing said first request by validating existence of said prefix;

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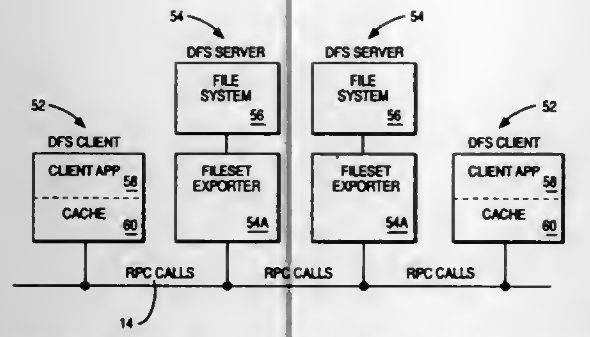


generating a second request having a file specification for said second operating system including said drive designator in a pathname;

servicing said second request with said client drive by determining if said second request carries said pathname containing a letter for said drive designator;

editing said file specification with said DFS in response to said servicing said second request by replacing said drive designator in said pathname with said prefix;

generating, in response to said editing, a single universal distributed file system namespace accessible by said first and second operating system and having a syntax native to said second operating system; and

performing said referencing with said single universal distributed file system namespace, said referencing being of said objects in said DFS on said computer executing said first operating system.

5,689,702

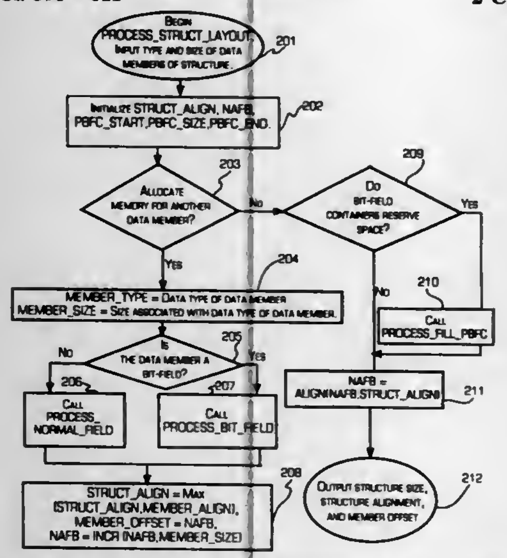
FLEXIBLE DATA STRUCTURE LAYOUT FOR DATA STRUCTURE INCLUDING BIT-FIELD DATA MEMBERS

Gopi Kumar Bulusu, Sunnyvale, Calif., assignor to Microtec Research, Inc., Santa Clara, Calif.

Filed Jun. 7, 1995, Ser. No. 480,619

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—611 **2 Claims**


BEGIN PROCESS_STRUCT_LAYOUT, INPUT TYPE AND SIZE OF DATA MEMBERS OF STRUCTURE.
201
INITIALIZE STRUCT_ALIGN, NAFB, PBFC_START, PBFC_SIZE, PBFC_END.
202
203
ALLOCATE MEMORY FOR ANOTHER DATA MEMBER?
NO
YES
209
DO BIT-FIELD CONTAINERS RESERVE SPACE?
YES
NO
204
MEMBER_TYPE = DATA TYPE OF DATA MEMBER
MEMBER_SIZE = SIZE ASSOCIATED WITH DATA TYPE OF DATA MEMBER
210
CALL PROCESS_FILL_PBFC
205
IS THE DATA MEMBER A BIT-FIELD?
NO
YES
206
207
CALL PROCESS_NORMAL_FIELD
CALL PROCESS_BIT_FIELD
NAFB = ALIGN(NAFB, STRUCT_ALIGN)
211
208
STRUCT_ALIGN = MAX (STRUCT_ALIGN, MEMBER_ALIGN), MEMBER_OFFSET = NAFB, NAFB = INCR (NAFB, MEMBER_SIZE)
OUTPUT STRUCTURE SIZE, STRUCTURE ALIGNMENT, AND MEMBER OFFSET
212

1. A method for laying out data members of a data structure, the data members including bit-field data members, the method comprising the steps of:

accepting as input i) an identifier of each data member, ii) a data type for each data member, and iii) a data type size for each data member;

accepting as input the value of a parameter specified by a user, the parameter indicating, if the structure is an unpacked structure, an increment that defines where a new allocation unit for a bit-field data member will start relative to the allocation unit for the previous data member, the increment being equal to the bit-field alignment requirement;

sequentially determining a member offset for each of the data members, wherein:

the determination of the member offset of each data member is dependent upon whether the data member is a bit-field data member or not; and

the determination of one or more of the member offsets is dependent upon the value of the parameter; and

determining a size of the data structure.

5,689,703

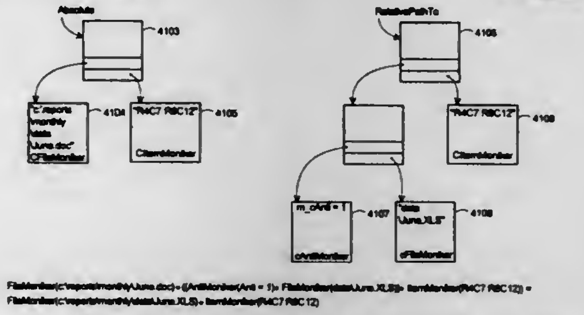
METHOD AND SYSTEM FOR REFERRING TO AND BINDING TO OBJECTS USING IDENTIFIER OBJECTS

Robert G. Atkinson, Woodinville; Antony S. Williams, Mercer Island, and Edward K. Jung, Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 88,724, Jul. 6, 1993, Pat. No. 5,581,760, which is a continuation-in-part of Ser. No. 909,983, Jul. 6, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 467,065

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—614 **4 Claims**



1. A method in a computer system for determining a relative path from a first identifier object to a second identifier object, the first identifier object having naming information that references first source data and having a class identifier that identifies code, having a relative path function member that, when executed, determines the relative path from the first identifier object to a requested identifier object, the second identifier object having naming information that references second source data, the method comprising the steps of:

invoking the relative path function member of the first identifier object with an indicator to the naming information of the second identifier object; and

under control of the relative path function member, returning an indicator to an identifier object wherein the returned identifier object when composed with the first identifier object yields a reference to an identifier object that is equal to the second identifier object.

5,689,704

RECORDING MEDIUM, RECORDING/PLAYBACK DEVICE WHICH USES COMMANDS IN CHARACTER STRING FORM FOR AUDIO SYSTEM CONTROL

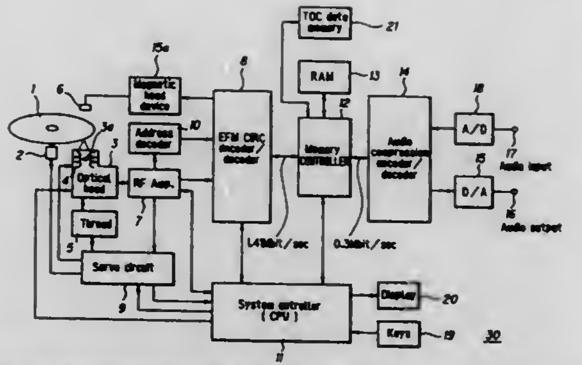
Tadao Yoshida, and Katsuya Hori, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 206,535, Mar. 4, 1994, abandoned. This application May 18, 1995, Ser. No. 444,045

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—615 **3 Claims**

1. A recording/reproduction device for use with a recording medium on which management information for managing recording/playback operations is recorded together with one or a plurality of units of audio information, the recording medium being further provided with a character recording region for management information, in which character information can be recorded,



wherein predetermined character string information is recorded as commands in this character recording region, the recording/reproduction device comprising:

command read-in means, for reading in character string information recorded as commands on the recording medium from the recording medium;

control means, for, according to the character string information read in by the command read-in means, controlling the execution of those indicated operations; and

input/output means, controlled by the control means, required for executing the operations specified by the read-in character string information.

5,689,705

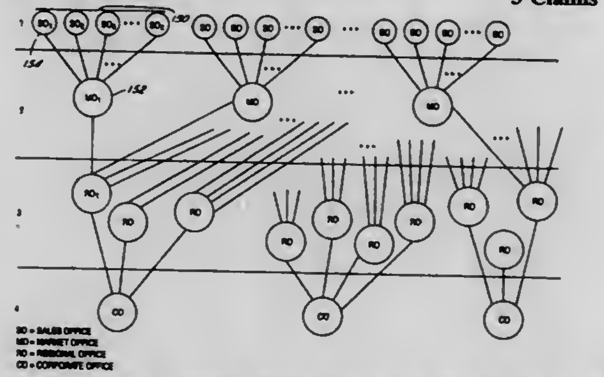
SYSTEM FOR FACILITATING HOME CONSTRUCTION AND SALES

Timothy A. Fino, Farmington, and Stephan E. Hall, Birmingham, both of Mich., assignors to Pulte Home Corporation, Bloomfield Hills, Mich.

Filed Feb. 13, 1995, Ser. No. 387,541

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—617 **3 Claims**



1. A method of communicating between first and second geographically remote data bases, comprising the steps of:

(A) receiving information relating to the construction and sale of homes into said first data base,

(B) separating said information into a plurality of first data base records,

(C) determining which of said plurality of first data base records have been altered from a previous state,

(D) sending said altered records sent from said first data base with a respectively associated record of said first data base to said second data base,

(E) matching each altered data base record sent from said first data base with a respectively associated record of said second data base, and

(F) amending each matched record of said second data base to reflect the information present in the respectively associated altered record sent from said first data base.

5,689,706

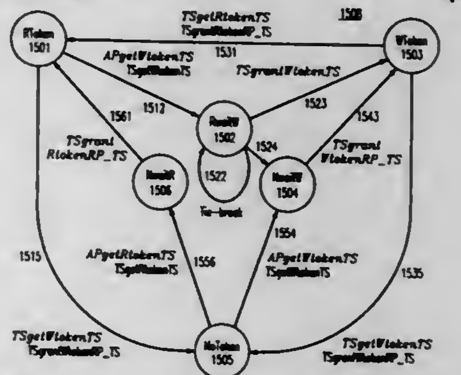
DISTRIBUTED SYSTEMS WITH REPLICATED FILES

Chung-Hwa Herman Rao, Edison, and Andrea H. Skarra, Chatham, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 282,683, Jul. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 80,037, Jun. 18, 1993, Pat. No. 5,572,709. This application Oct. 10, 1996, Ser. No. 728,580

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—617 **4 Claims**



1. A method for synchronizing a file altering operation which a process executing on a first component of a distributed data processing system performs on replicated file that has one copy on a mass storage drive of the first component and another copy on a mass storage drive of another component of the distributed data processing system with each of the replicated copies being peers, the method comprising the steps of:

in the process, determining whether a write token required to perform the file altering operation is in the first component;

in the process, if the write token is in the first component, waiting until the write token is available and thereupon performing the file altering operation; and otherwise requesting that a token server in the first component request the write token from the other component of the distributed data processing system;

in the process, when the write token arrives from the other component, performing the file altering operation when the write token is available and sending a notification message of the file altering operation to the other component by a channel which delivers messages in the order in which the channel receives them; and

in the token server, responding to a request for the write token from the other component only after completion of the file altering operation using the same channel as was used to send the notification message.

5,689,707

METHOD AND APPARATUS FOR DETECTING MEMORY LEAKS USING EXPIRATION EVENTS AND DEPENDENT POINTERS TO INDICATE WHEN A MEMORY ALLOCATION SHOULD BE DE-ALLOCATED

Jeffrey M. Donnelly, Holmdel, N.J., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 4, 1995, Ser. No. 566,768

Int. Cl.^{6} G06F *12/00;11/00*

U.S. Cl. 395—622 **17 Claims**

1. A method for detecting memory leaks in a program executing on a computer system using memory management functions, said memory management functions operative to query and maintain a memory allocation table for storing information regarding currently allocated blocks of computer memory in said computer system including corresponding requesting file information and de-allocation information, said method comprising the steps of:

allocating a block of computer memory for a function in said program requesting said block of computer memory, said function being a basic programming unit of said program;

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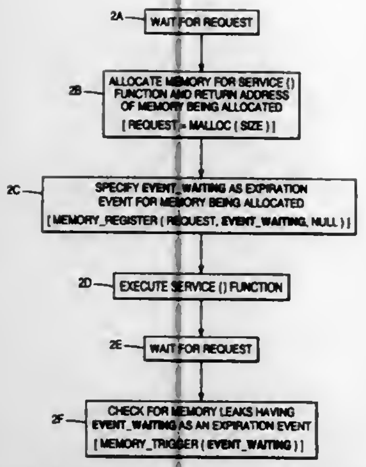

2A
WAIT FOR REQUEST
2B
ALLOCATE MEMORY FOR SERVICE () FUNCTION AND RETURN ADDRESS OF MEMORY BEING ALLOCATED [REQUEST = MALLOC (SIZE)]
2C
SPECIFY EVENT_WAITING AS EXPIRATION EVENT FOR MEMORY BEING ALLOCATED [MEMORY_REGISTER (REQUEST, EVENT_WAITING, NULL)]
2D
EXECUTE SERVICE () FUNCTION
2E
WAIT FOR REQUEST
2F
CHECK FOR MEMORY LEAKS HAVING EVENT_WAITING AS AN EXPIRATION EVENT [MEMORY_TRIGGER (EVENT_WAITING)]

specifying said de-allocation information for said block of computer memory being allocated, said de-allocation information indicative of when said currently allocated blocks of computer memory should be de-allocated, wherein the step of specifying said de-allocation information for said block of computer memory being allocated includes specifying an expiration event for said block of computer memory being allocated, said expiration event being an occurrence indicative of when said block of computer memory should be de-allocated, and assigning a unique numerical values as said expiration event in said memory allocation table, said unique numerical value indicative of a type of said expiration event, said type of expiration event includes an expiration event where an expiration should never occur;

storing said requesting file information and de-allocation information corresponding to said function requesting said block of computer memory in said memory allocation table using said memory management functions,

querying said memory allocation table using said memory management functions for said currently allocated blocks of computer memory having de-allocation events thereby indicating corresponding said currently allocated blocks of computer memory should have been de-allocated.

5,689,708

CLIENT/SERVER COMPUTER SYSTEMS HAVING CONTROL OF CLIENT-BASED APPLICATION PROGRAMS, AND APPLICATION-PROGRAM CONTROL MEANS THEREFOR

Barbara Ann Regnier, Mazeppa, and David Nicholas Youngers, Rochester, both of Minn., assignors to ShowCase Corporation, Rochester, Minn.

Filed Mar. 31, 1995, Ser. No. 414,729

Int. Cl.^{6} G06F *9/46*

U.S. Cl. 395—682 **9 Claims**

1. A method of managing a set of shared system resources in a computer network having at least one server coupled to a plurality of clients each containing a plurality of application programs executable by a plurality of users at said clients, said programs having interfaces for allowing said users to choose dynamically among said shared system resources, said method comprising:

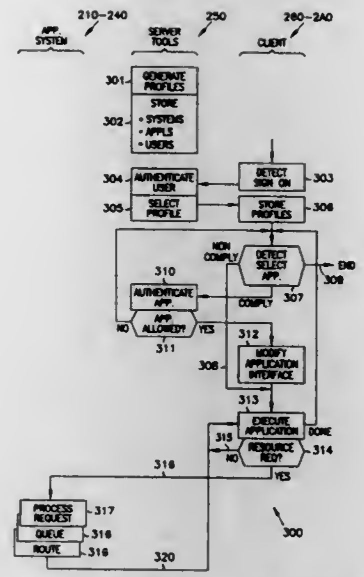
generating in said server a plurality of profiles specifying the allowability of individual ones of said shared system resources within particular ones of said application programs for certain ones of said users;

identifying one of said users at one of said client computers;

in response to said identification, selecting certain information from said profiles corresponding to said individual shared system resources for said particular application programs for said one identified user;

detecting at said one client computer a request for a particular one of said application programs by said one user;

dynamically modifying at least one of said user interfaces for said particular one application program in response to said certain profile information corresponding to said identified one user for said particular one application program so as to make available to said one user only those of said shared system resources specified by said profile information for said particular one application program for said identified one user.



5,689,709

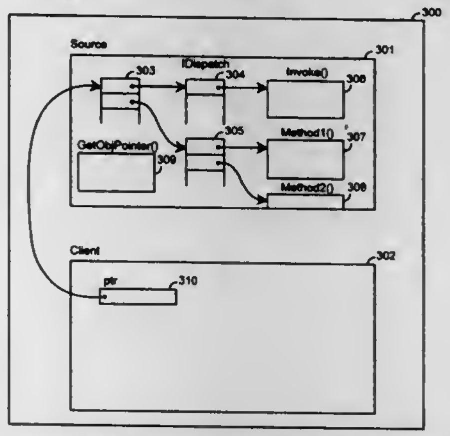
METHOD AND SYSTEM FOR INVOKING METHODS OF AN OBJECT

Tom Corbett, Eugene, Oreg.; Peter H. Golde, Bellevue, Wash.; Mark S. Igra, and Bradford H. Lovering, both of Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 975,832, Nov. 13, 1992, Pat. No. 5,515,536. This application Feb. 1, 1996, Ser. No. 595,527

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—683 **12 Claims**



1. A method in a computer system for accessing one of a plurality of properties of an object, each property having a name, said object having a name, said method comprising the computer-implemented steps of:

designating one of said properties as an unnamed property that is the property of said properties accessed when said object is identified without identifying the name of a property;

receiving input containing an identifier of the name of said object, wherein the input does not contain an identifier of the name of said property;

parsing said received input, wherein it is detected that the identifier of the name of said property is not contained within the input; and

in response to detecting that the identifier of the name of said property is not contained in the input, accessing the unnamed property of said object and not other properties of said properties.

5,689,710

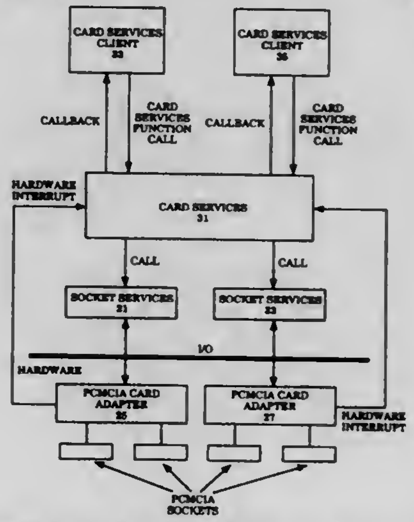
PROTECTED MODE C BINDING FOR PCMCIA CARD SERVICES INTERFACE

James C. Stanley, Portland; David A. Sandage, Forest Grove; Stewart W. Hunt, Portland, and Arland D. Kunz, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 40,214, Apr. 1, 1993, abandoned. This application Jul. 11, 1995, Ser. No. 500,529

Int. Cl.^{6} G06F *9/30;9/00*

U.S. Cl. 395—701 **18 Claims**



1. A method for implementing PCMCIA Card Services for at least one application program running on a computer system executing a Windows operating system, said method comprising the steps of:

loading a Card Services driver into said computer system, said Card Services driver being software interrupt based;

providing a translation Card Services dynamic link library, said translation Card Services dynamic link library comprising a library of translation C functions corresponding to a library of defined Card Services functions;

calling a translation C function in said translation Card Services dynamic link library from said application program to perform a corresponding Card Services function, said application program passing at least one function parameter to said translation C function;

placing said function parameter passed to said translation C function into a register for a Card Services software interrupt call into said Card Services driver; and

calling said Card Services driver from said translation C function in said translation Card Services dynamic link library using a software interrupt call, said Card Services driver performing said Card Services functionality.

5,689,711

METHOD AND APPARATUS FOR REPRESENTING DATA DEPENDENCIES IN SOFTWARE MODELING SYSTEMS

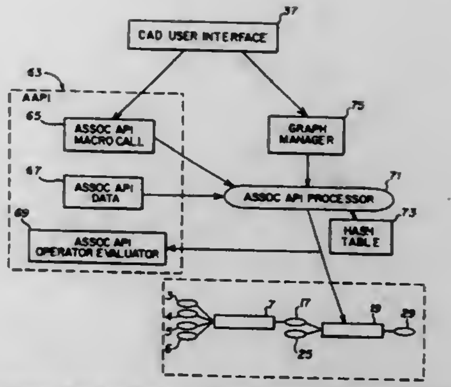
Theodore Bardasz, 49 Parkerville Rd., Chelmsford, Mass. 01824, and Stefano Malnati, 148 Main St., Unit B533, N. Andover, Mass. 01845

Filed Apr. 21, 1995, Ser. No. 426,594

Int. Cl.^{6} G06F *9/44;17/50*

U.S. Cl. 395—701 **30 Claims**

1. A method for providing parametric capabilities to a software modeling system having a plurality of functions and a user interface that responds to receipt of each one of a plurality of commands by calling a corresponding one of the plurality of functions, the plurality of functions being executed during a modeling session to create a model, the method including steps of:



A. providing a wrapper around each of the plurality of functions in the software system to create a corresponding plurality of associative functions, each of the associative functions including a call to its corresponding function and further including a capability of creating and adding graph entities to a dependency representation of the model when its corresponding function is executed during the modeling session; and

B. modifying the user interface so that in response to each received command, the associative function that corresponds to the function corresponding to the received command is called.

5,689,712

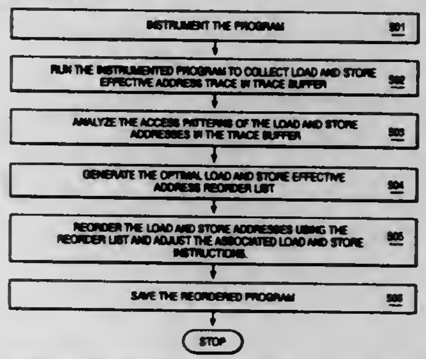
PROFILE-BASED OPTIMIZING POSTPROCESSORS FOR DATA REFERENCES

Randall Ray Heisch, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1994, Ser. No. 280,910

Int. Cl.^{6} G06F *9/44;9/45*

U.S. Cl. 395—704 **12 Claims**


INSTRUMENT THE PROGRAM
501
RUN THE INSTRUMENTED PROGRAM TO COLLECT LOAD AND STORE EFFECTIVE ADDRESS TRACE IN TRACE BUFFER
502
ANALYZE THE ACCESS PATTERNS OF THE LOAD AND STORE ADDRESSES IN THE TRACE BUFFER
503
GENERATE THE OPTIMAL LOAD AND STORE EFFECTIVE ADDRESS REORDER LIST
504
REORDER THE LOAD AND STORE ADDRESSES USING THE REORDER LIST AND ADJUST THE ASSOCIATED LOAD AND STORE INSTRUCTIONS.
505
SAVE THE REORDERED PROGRAM
506
STOP

1. A computer implemented process for directing a computer system having at least a processor, memory, and user controls, to optimize a program at the object code level, said program having memory references, comprising the steps of:

instrumenting each of said memory references to create an instrumented program by:

setting a pointer to an address;

scanning said program to detect one of said memory references;

replacing said memory reference with a branch to said pointer;

generating instrumentation code at said pointer;

generating said memory reference; and

repeating said above steps until all of said memory references have been instrumented;

executing said instrumented program to capture effective address trace data for each of said memory references;

analyzing access patterns of said effective address trace data;

in response to said analyzing step, reordering said memory references to create an optimized program.

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5,689,713

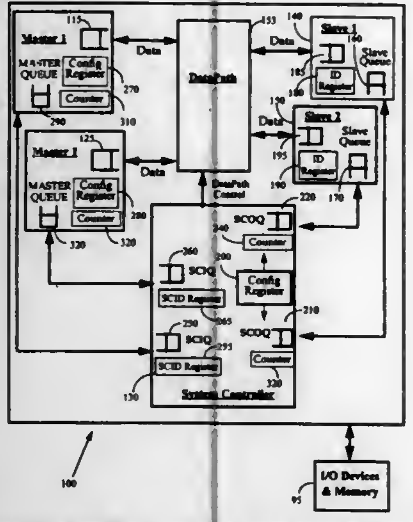
METHOD AND APPARATUS FOR INTERRUPT COMMUNICATION IN A PACKET-SWITCHED COMPUTER SYSTEM

Kevin B. Normoyle, San Jose; Zahir Ebrahim, Mountain View; Satyanarayana Nishtala, Cupertino; William C. Van Loo, Palo Alto; Sun-Den Chen, San Jose, and Charles E. Narad, Santa Clara, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 414,875, Mar. 31, 1995. This application Apr. 20, 1995, Ser. No. 425,537

Int. Cl.^{6} G06F *13/14;13/24*

U.S. Cl. 395—736 **20 Claims**



1. A method for handling interrupt requests from a first device to at least one of a second device and a third device via a system controller coupled to each of at least the first, second and third devices, said second and third devices being interruptible devices, each said device and the system controller including a processor and a memory storing instructions for execution by the respective processors, the second device being coupled to a first interrupt input queue and the third device being coupled to a second interrupt input queue, each said interrupt queue configured for accepting at least one interrupt request, the system controller being configured to store queue size information relating to respective sizes of said first and second input queues, the method including the steps of:

(1) generating in the first device a first interrupt request with said second device as a destination device for said first interrupt request;
(2) receiving said first interrupt request at the system controller;
(3) based at least in part on said queue size information, determining in the system controller whether the first interrupt input queue is full, and if not, then:
  (3A) passing said first interrupt request to the second device; but if so, then:
  (3B) sending the first device a signal indicating non-acknowledgment of said first interrupt request.

5,689,714

METHOD AND APPARATUS FOR PROVIDING LOW POWER CONTROL OF PERIPHERAL DEVICES USING THE REGISTER FILE OF A MICROPROCESSOR

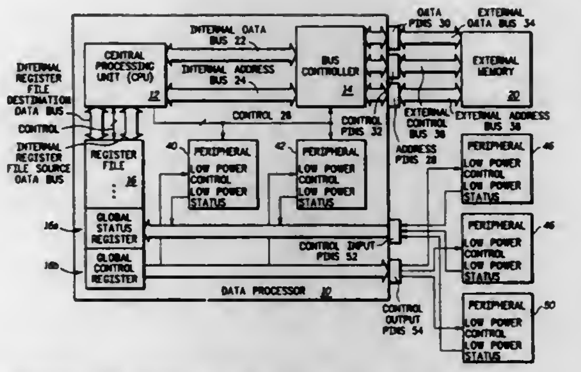
William C. Moyer, Dripping Springs, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1995, Ser. No. 520,121

Int. Cl.^{6} G06F *1/32;13/00*

U.S. Cl. 395—750 **20 Claims**

8. A data processing system comprising:
a central processing unit (CPU) located on an integrated circuit;
a data bus coupled from the CPU to external terminals of the integrated circuit for communicating with peripherals external to the CPU;



a plurality of registers located on the integrated circuit;
an internal bus coupling the CPU to the plurality of registers so that read and write operations can be performed directly to the plurality of registers via the internal bus without using the data bus, the internal bus being located totally within the integrated circuit;
a plurality of input terminals of the integrated circuit coupled to a status register wherein the status register is one register within the plurality of registers, the status register being capable of being read by the CPU;
a plurality of output terminals of the integrated circuit coupled to a control register wherein the control register is one register within the plurality of register, the control register being capable of being written with low power control information by the CPU,
wherein a first CPU instruction is used to access the data bus and a second CPU instruction different from the first CPU instruction is used to access the control register and the status register; and
a plurality of peripheral devices having output terminals coupled to the plurality of input terminals of the integrated circuit and having input terminals coupled to the plurality of output terminals of the integrated circuit, the control register and status register using the plurality of input terminals and plurality of output terminals of the integrated circuit to control a low power mode of the plurality of peripheral devices.

5,689,715

LOW POWER RING DETECT FOR COMPUTER SYSTEM WAKE-UP

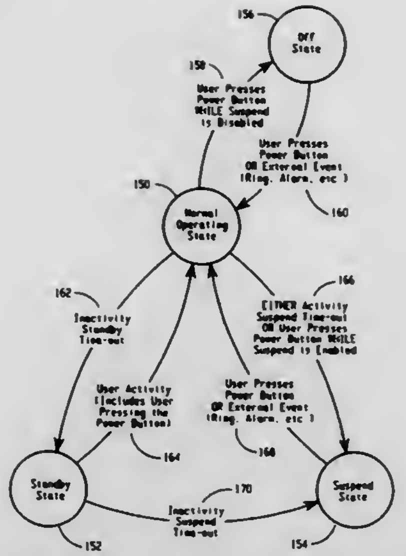
Dwayne Thomas Crump; Steven Taylor Pancoast, and Paul Harrison Benson, IV, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 302,157, Sep. 7, 1994, abandoned. This application Oct. 17, 1996, Ser. No. 733,214

Int. Cl.^{6} G06F *13/10*

U.S. Cl. 395—750 **11 Claims**

1. A computer system comprising:
(a) a CPU;
(b) a power management processor in circuit communication with said CPU;
(c) a modem in circuit communication with said power management processor via a ring signal line and in circuit communication with said CPU, for being placed in circuit communication with a telephone line, and characterized by generating a ring signal on said ring signal line responsive to a telephone ring signal being present on said telephone line;
(d) a power supply in circuit communication with said CPU and said power management processor comprising circuitry for selectively providing system power to said CPU responsive to said power management processor, characterized by having a first power supply state and a second power supply state, and further characterized by having circuitry for providing auxiliary power to said power management processor;


156
Off State
158
User Presses Power Button WHILE Suspend is Disabled
User Presses Power Button OR External Event (Ring, Alarm, etc)
160
150
Normal Operating State
162
Inactivity Standby Time-out
166
EITHER Activity Suspend Time-out OR User Presses Power Button WHILE Suspend is Enabled
User Activity (Includes User Pressing the Power Button)
164
User Presses Power Button OR External Event (Ring, Alarm, etc)
168
Standby State
170
Inactivity Suspend Time-out
Suspend State
152
154

wherein said first power supply state is characterized by said power supply providing system power to said CPU and providing auxiliary power to said power management processor; and
wherein said second power supply state is characterized by said power supply not providing system power to said CPU and said power supply providing auxiliary power to said power management processor;
(1) wherein said power management processor is further characterized by causing said power supply to transition from said first power supply state to said second power supply state responsive to at least one of a first predetermined plurality of conditions;
(2) wherein said power management processor is further characterized by causing said power supply to transition from said second power supply state to said first power supply state responsive to at least one of a second predetermined plurality of conditions;
(3) wherein one of said second predetermined plurality of conditions comprises a ring signal being communicated from said modem to said power management processor; and
(4) wherein said power management processor is further characterized by analyzing the frequency of the ring signal generated by said modem and wherein one of said second predetermined plurality of conditions comprises a ring signal having a frequency in a predetermined range being communicated from said modem to said power management processor.

5,689,716

AUTOMATIC METHOD OF GENERATING THEMATIC SUMMARIES

Francine R. Chen, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

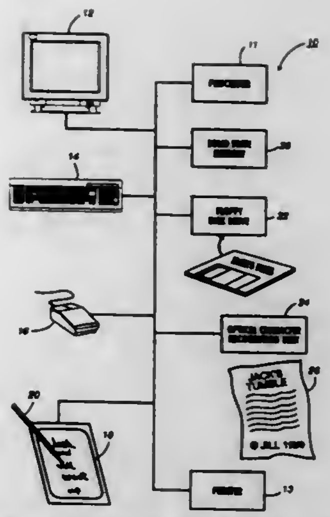
Filed Apr. 14, 1995, Ser. No. 422,573

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—761 **10 Claims**

1. A processor implemented method of generating a thematic summary of a document presented in machine readable form to the processor, the document including a first multiplicity of sentences and a second multiplicity of terms, the processor implementing the method by executing instructions stored in electronic form in a memory device coupled to the processor, the processor implemented method comprising the steps of:

a) determining a value of a first number of thematic terms based upon a value of a second number representing a length of the thematic summary, the first number being less than the second number;



b) selecting the first number of thematic terms from the second multiplicity of terms;
c) scoring each sentence of the first multiplicity of sentences based upon occurrence of thematic terms in each sentence; and
d) selecting the second number of thematic sentences from the first multiplicity of sentences based upon the score of each sentence.

5,689,717

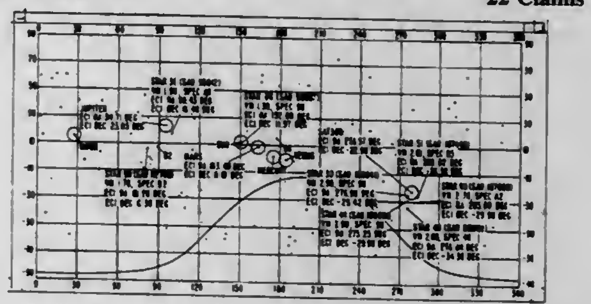
METHOD AND APPARATUS FOR THE PLACEMENT OF ANNOTATIONS ON A DISPLAY WITHOUT OVERLAP

Mark D. Pritt, Walkersville, Md., assignor to Lockheed Martin Corporation, Bethesda, Md.

Continuation of Ser. No. 162,415, Dec. 3, 1993, abandoned. This application Feb. 7, 1996, Ser. No. 598,094

Int. Cl.^{6} G06T *13/00*

U.S. Cl. 395—773 **22 Claims**



1. In a computer system having a plurality of dynamic objects displayed on a display, and having a list of variably-sized annotations currently displayed on the display where each annotation is associated with a display object, the real time method of determining where to position a dynamic object and its associated annotation on the display when displaying an additional annotation associated with a display object the position of which on the display is changing in real time without deleting or moving any previously displayed annotations comprising:

a) selecting a unique display position for the additional annotation based upon a specified, variable distance between the display position and the display object and a specified, variable angle formed by the intersection of a line extending horizontally from the display object and a line extending from the display position to the display object;
b) testing whether the selected display position for the additional annotation overlaps any annotation presently displayed by incrementing the angle by a pre-specified angle increment until all possible angles in a 360 degree range have been tested then incrementing the distance by a distance increment and re-incrementing the angle; if there is no overlap then

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adding the additional annotation to the list of annotations and displaying the additional annotation at the selected display position, or, if more than one non-overlapping position exists, choosing the display position farthest from the currently displayed annotations; if there is overlap returning to and repeating the selecting step to determine a new display position for testing until a non overlapping display position is found or all positions have been tested in which case the display position having the least overlap is selected and displayed; and

c) providing animated, real time display repositioning responses to dynamic changes in the positions of displayed objects on the display resulting from incoming, constantly changing data by deleting those objects and their associated annotations, displaying those objects in their new positions on the display and treating the deleted annotations as additional annotations for purposes of finding new positions for their display by returning to the selecting step.

5,689,718

SYSTEM AND METHOD FOR PROCESSING DOCUMENT INFORMATION USING PASSWORD PROTECTED ICONS THAT REPRESENT DOCUMENT CONTENT

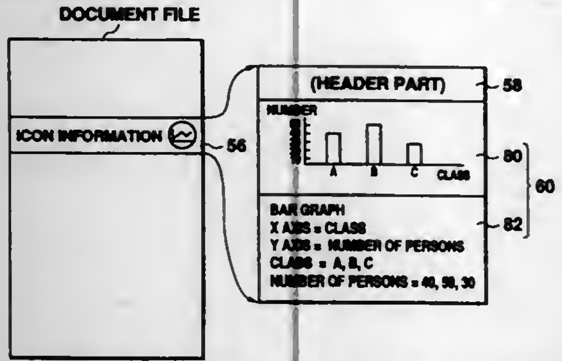
Hiroshi Sakurai; Nobuyuki Ikeda, and Akehiro Watabe, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 154,164, Nov. 17, 1993, abandoned. This application Jan. 30, 1996, Ser. No. 594,373

Claims priority, application Japan, Dec. 1, 1992, 4-321782

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 395—779 **14 Claims**



1. A system for processing information of a document, comprising:

(b) means for displaying said document on a screen;
(c) means for editing said document;
(d) means for selecting a partial area of said document, said partial area containing at least a portion of one of text and graphics of a page or pages of the document;
(e) means for associating said partial area with a corresponding icon symbolizing said partial area;
(f) display control means for displaying the corresponding icon on the screen instead of the at least a portion of one of text and graphics contained within said partial area;
(g) activation control means for restoring information within said partial area on the screen when said icon is activated;
(h) means for protecting the partial area of the document by associating the icon corresponding to the partial area with a password to provide a secret icon;

said activation control means activating said secret icon when a password specified for said secret icon coincides with the password;

wherein the means for editing includes means for copying the at least a portion of one of text and graphics within the partial area from a first position within the document to a second position within the document by copying the icon from the first position to the second position;

wherein said display control means displays the icon in one of an area icon display mode and a position icon display mode, such that in said area icon display mode all information within said partial area on the screen is removed while said partial area on the screen is maintained and an area icon is displayed at any position within said partial area, and such that in said position icon display mode all of said partial area is removed from the screen together with the information contained therein and a position icon is displayed at a position in the document where said partial area was previously present, said area icon display mode maintaining an original layout of the document, and said position icon display mode changing the original layout of the document.

5,689,719

PARALLEL COMPUTER SYSTEM INCLUDING PROCESSING ELEMENTS

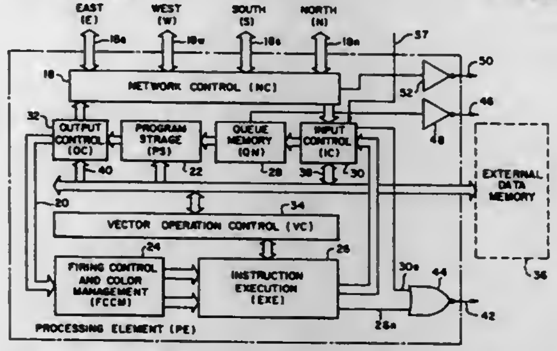
Hiroki Miura, Takatsuki, and Yasuhito Koumura, Nara, both of Japan, assignors to Sanyo Electric O., Ltd., Moriguchi, Japan

Filed Jun. 29, 1992, Ser. No. 907,926

Claims priority, application Japan, Jun. 28, 1991, 3-158790; Jul. 2, 1991, 3-161781; Oct. 31, 1991, 3-286078

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 39—800 **25 Claims**



1. A parallel computer system which receives a mode setting signal indicating a first state or a second state, comprising:

a plurality of processing elements, each having at least four communication ports, east, west, south and north, said plurality of processing elements being arranged in a matrix of rows in the east-west direction and columns in the south-north direction to form a processing element array;

a plurality of bidirectional row communication lines by which each of said plurality of processing elements can transmit and receive data in the east-west direction by using the east and west communication ports;

a plurality of bidirectional column communication lines by which each of said plurality of processing elements can transmit and receive data in the south-north direction by using the north and south communication ports; and

communication control means associated with each of said processing elements for allowing bidirectional transmission of data using one of said plurality of bidirectional row communication lines and one of said plurality of bidirectional column communication lines in response to said mode setting signal indicating said first state and allowing unidirectional transmission of data using one of said plurality of bidirectional row communication lines and one of said plurality of bidirectional column communication lines in response to said mode setting signal indicating said second state;

wherein each of the processing elements is individually identified by a processing element identifying number which contains a row number and a column number, and said data includes at least a destination processing element number for identifying a processing element by which said data is to be received,

each of said processing elements includes deciding means for deciding whether the destination processing element number included in arriving data and the identifying number of the processing element match,

said communication control means including first control means for sending said arriving data as an output from one of said four communication ports using one of said row communication lines and one of said column communication lines in accordance with said mode setting signal indicating said first state and for sending said arriving data as an output either from one of two communication ports in said east-west direction using one of said row communication lines or from one of two communication ports in said south-north direction using one of said column communication lines in accordance with said mode setting signal indicating said second state when the destination processing element number and the processing element identifying number do not match, and

wherein said communication control means includes second control means for sending transmission data as an output from one of said four communication ports of a processing element using one of said row communication lines and one of said column communication lines in response to said mode setting signal indicating said first state and in accordance with the destination processing element number within said transmission data and the processing element number of the processing element comprising said communication control means when said transmission data to be transmitted is generated in the processing element, and for sending transmission data as an output either from one of two communication ports of a processing element using one of said row communication lines in said east-west direction or from one of two communication ports of a processing element using one of said column communication lines in said south-north direction in accordance with said mode setting signal indicating said second state.

5,689,720

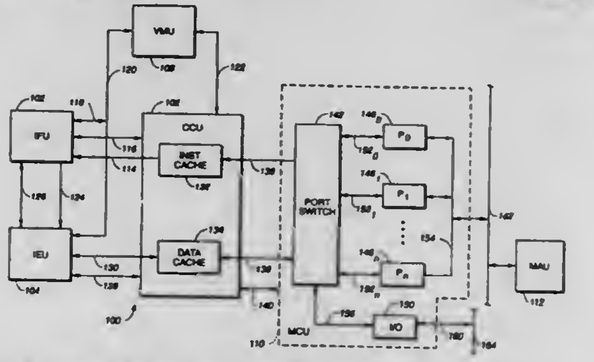
HIGH-PERFORMANCE SUPERSCALAR-BASED COMPUTER SYSTEM WITH OUT-OF-ORDER INSTRUCTION EXECUTION

Le Trong Nguyen, Monte Sereno; Derek J. Lentz, Los Gatos; Yoshiyuki Miyayama, Santa Clara; Sanjiv Garg, Freemont; Yasuaki Hagiwara, Santa Clara; Johannes Wang, Redwood City; Te-Li Lau, Palo Alto; Sze-Shun Wang, San Diego, and Quang H. Trang, San Jose, all of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 817,810, Jan. 8, 1992, Pat. No. 5,539,911, which is a continuation of Ser. No. 727,006, Jul. 8, 1991, abandoned. This application Feb. 15, 1996, Ser. No. 602,021

Int. Cl.^{6} G06F *9/30;9/38;9/22*

U.S. Cl. 395—800 **11 Claims**



1. A superscalar microprocessor, comprising:

means for storing data in a plurality of registers identifiable by register references, said plurality of registers including a predetermined register and a temporary register, wherein said temporary register is configured for storing out-of-order execution results;

means for fetching a predetermined sequence of instructions to be executed, wherein an instruction of said predetermined sequence of instructions includes a register reference; and

executing means, coupled to said fetching means, for executing said instructions out of said predetermined sequence, said executing means including means, coupled to said storing means, for selecting said temporary register where the execution of said instruction provides said register reference to select said predetermined register for the storage of data.

5,689,721

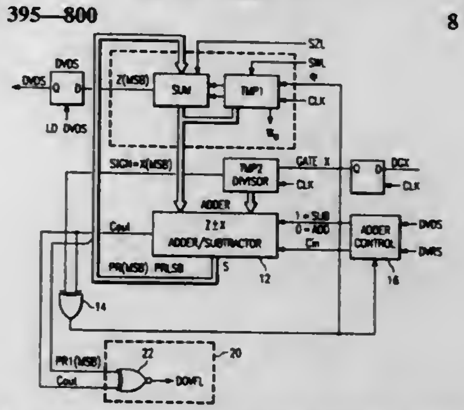
DETECTING OVERFLOW CONDITIONS FOR NEGATIVE QUOTIENTS IN NONRESTORING TWO'S COMPLEMENT DIVISION

Robert D. Maher, III, Carrollton, Tex., assignor to Cyrix Corporation, Richardson, Tex.

Continuation of Ser. No. 492,966, Jun. 20, 1995, abandoned, which is a continuation of Ser. No. 64,507, May 18, 1993, abandoned. This application Apr. 2, 1996, Ser. No. 626,574

Int. Cl.^{6} G06F *7/52*

U.S. Cl. 395—800 **8 Claims**



1. In a system with iterative divide circuitry for performing nonrestoring division using two's complement 2n bit signed dividends and two's complement n bit signed divisors, overflow detection circuitry for detecting overflow conditions specifically in cases that yield two's complement negative quotients, comprising:

iterative divide circuitry that receives a signed dividend and a signed divisor of opposite signs, when a resulting quotient is negative; and

first and second overflow detection circuitry coupled to the iterative divide circuitry;

in a first iterative step, the iterative divide circuitry shifts out a sign bit of the signed dividend, and then adds the signed divisor, properly aligned, to obtain a first partial remainder, and a carry out bit which is designated Cout;

the first overflow detection circuitry providing in response to the first partial remainder and Cout a first overflow signal if the magnitude of the first partial remainder causes an overflow condition to occur for any n-bit divisor;

if the first overflow detection circuitry does not provide the first overflow signal, the iterative divide circuitry is operable (i) to perform a sequence of iterative divide steps using successive partial remainders and the signed divisor to obtain a sequence of quotient digits and successive partial remainders, and then (ii) to provide an adjusted signed quotient;

the second overflow detection circuitry being responsive to the adjusted signed quotient to provide a second overflow signal if the adjusted signed quotient cannot be stored in two's complement format in an n bit register;

whereby the first and second overflow signals identify all cases of overflow.

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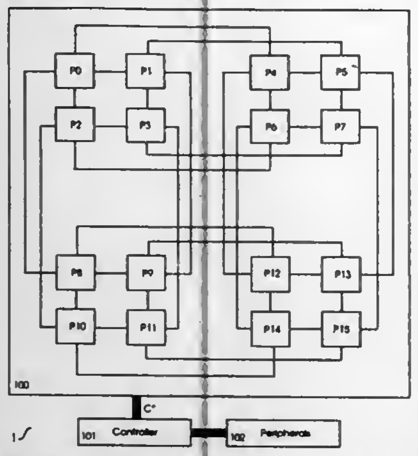
5,689,722
MULTIPIPELINE MULTIPROCESSOR SYSTEM

Paul Noble Swarztrauber, Boulder, Colo., assignor to University Corporation for Atmospheric Research, Boulder, Colo.
Continuation of Ser. No. 7,766, Jan. 22, 1993, abandoned.
This application Apr. 24, 1996, Ser. No. 639,315
Int. Cl.^{6} G06F *15/80;15/16*
U.S. Cl. 395—800 **30 Claims**

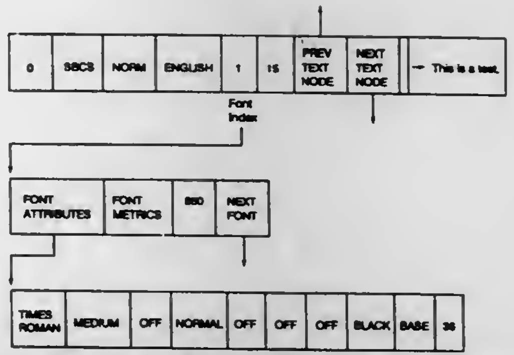


1. A multipipeline multiprocessor comprising a hypercube-like processor interconnection network capable of transmitting on all wires simultaneously, that interconnects P processors via bidirectional communication paths, each of said P processors having d inputs and d outputs, where d is equal to a positive integer no greater than $\log_2 P$, each of said processors comprises:
computing means;
memory means connected to said d outputs for transmitting data on selected ones of said d outputs;
network means, including a local switch, for connecting selected ones of said d inputs to said memory means to collate communications between said processor interconnection network and said memory means;
means for storing a plurality of connection maps, each of which maps from a defined computation task to a predefined interconnection of said d inputs and said d outputs; and
wherein said computing means is responsive to a receipt of a computation task, for retrieving a one of said connection maps, corresponding to said received computation task, from said storing means to activate said network means and said memory means to interconnect said d inputs and said d outputs, respectively, as defined by said transmitted connection map.

5,689,723
METHOD FOR ALLOWING SINGLE-BYTE CHARACTER SET AND DOUBLE-BYTE CHARACTER SET FONTS IN A DOUBLE-BYTE CHARACTER SET CODE PAGE

Chan S. Lim, Potomac; Gregg A. Salsi, Germantown, both of Md., and Isao Nozaki, Yamato, Japan, assignors to International Business Machines Corp, Armonk, N.Y.
Filed Feb. 3, 1993, Ser. No. 13,271
Int. Cl.^{6} G09G *1/00*
U.S. Cl. 395—805 **3 Claims**

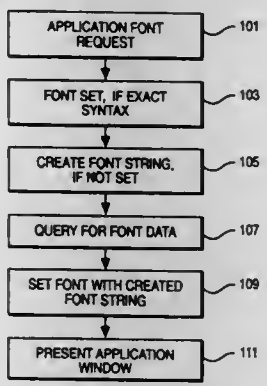
1. A method for editing a structured document which presents SINGLE-BYTE CHARACTER SET SBCS and DOUBLE-BYTE CHARACTER SET DBCS character types having named fonts and attributes using a DBCS code page, comprising the steps of:
inputting a first alphanumeric character as an input character;
determining said input character's font name and attributes and whether said input character's type is SBCS or DBCS;



determining whether the current document position text node type is SBCS or DBCS;
inserting said input character into the current document position's text node if said input character type is determined to match said current document position's text node type, and said input character's font name and attributes match an existing entry in said current document position's text node font table;
creating a new text node type matching that of said input character and inserting said input character therein if said input character's type does not match said current document position's text node type, or if said current document position's text node font table contains no match to said input character's font name and attributes; and
displaying said input character at a next document position.

5,689,724
GENERIC FONT SPECIFICATION LEADING TO SPECIFIC FONT SELECTION

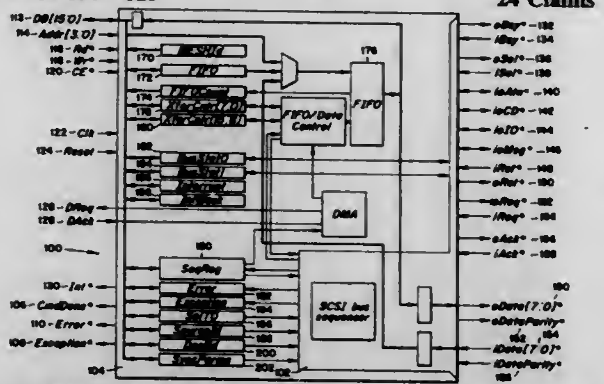
Scott Anthony Morgan; Troy Gary Reish, and Craig Ardner Swearingen, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 175,337, Dec. 23, 1993, abandoned.
This application Oct. 11, 1995, Ser. No. 540,761
Int. Cl.^{6} G06F *17/00*
U.S. Cl. 395—805 **20 Claims**


APPLICATION FONT REQUEST
101
FONT SET, IF EXACT SYNTAX
103
CREATE FONT STRING, IF NOT SET
105
QUERY FOR FONT DATA
107
SET FONT WITH CREATED FONT STRING
109
PRESENT APPLICATION WINDOW
111

1. A method for changing a font request to a font request in an operating system specific syntax, comprising the steps of:
receiving a font request from an application run by an operating system, the application and operating system resident in a computer memory, the application font request being in one of a plurality of possible syntaxes;
determining that the application font request is in a syntax different than an operating system specific syntax expected by the operating system; and
translating the application font request to an application font request in the operating system specific syntax.

5,689,725
SYSTEM FOR GENERATING STATUS SIGNALS OF SECOND BUS ON FIRST BUS BY COMPARING ACTUAL PHASE OF THE SECOND BUS WITH EXPECTED PHASE OF SECOND BUS

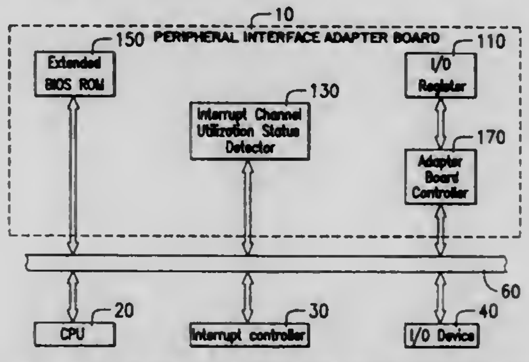
Michael K. Eneboe, San Jose; Kevin M. Christiansen, Saratoga, and Bruce E. Eckstein, Cupertino, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed May 2, 1995, Ser. No. 432,818
Int. Cl.^{6} G06F *15/02*
U.S. Cl. 395—825 **24 Claims**



11. Method for accelerating operation of a first controller which transfers information between a first device and a second device, said first controller communicating with said first device via a first bus, and communicating with said second device via a second bus, said method comprising the steps of:
executing a transaction for transferring information from said first device to said second device;
monitoring an actual phase of said second bus;
comparing said actual phase of said second bus with an expected phase of said second bus; and
generating status signals on said first bus in response to said step of comparing.

5,689,726
COMPUTER SYSTEM INTERFACE ADAPTER CAPABLE OF AUTOMATIC SELF-CONFIGURATION AND SELF-DIAGNOSIS BEFORE OPERATING SYSTEM INITIATION

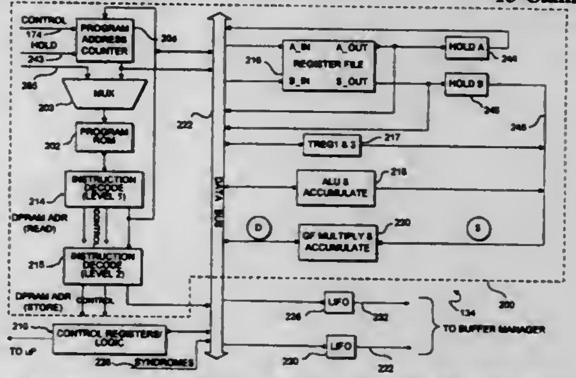
Shu-Chu Lin, Hsinchu Hsien, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan
Filed May 3, 1995, Ser. No. 433,724
Int. Cl.^{6} G06F *13/00*
U.S. Cl. 395—830 **18 Claims**



1. An interface adapter for installation onto a system expansion bus of a computer system, said interface adapter being accessible by a central processing unit (CPU) of said computer system via said system expansion bus for implementing a self-configuration procedure for incorporation of said interface adapter into said computer system before said computer system initiates an operating system, said interface adapter comprising:
memory means coupled to said system expansion bus for storing a control program portion, said control program portion including an automatic self-configuration program module accessible by said CPU via said system expansion bus for implementing said self-configuration procedure before said computer systems initiates the operating system;
input/output register means coupled to said system expansion bus for setting up an input/output address range and interrupt channel assignments under control of said CPU via said system expansion bus when said CPU is executing said automatic self-configuration procedure, said register means comparing on said adapter board input/output address ranges of the interface adapter with input/output address ranges of any other interface adapters resident on said expansion bus to determine the existence of address range conflicts, and upon determination of an address range conflict, assigning an alternative input/output address range to said adapter board; and
detection means coupled to said system expansion bus for detecting utilization status of interrupt channels available in said computer system when said CPU is executing said automatic self-configuration procedure, said detection means comparing on said adapter board an interrupt channel of the adapter with an interrupt channel of any other interface adapters resident on said expansion bus to determine the existence of an interrupt channel conflict and upon determination of said interrupt channel conflict assigning an alternative interrupt channel to said adapter board.

5,689,727
DISK DRIVE WITH PIPELINED EMBEDDED ECC/EDC CONTROLLER WHICH PROVIDES PARALLEL OPERAND FETCHING AND INSTRUCTION EXECUTION

Carl Bonke, Rancho Santa Margarita; Trinh Bui, Mountain View; Stanley Chang, Irvine; Joanne Wu, Diamond Bar, and Phong Tran, Irvine, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.
Continuation-in-part of Ser. No. 302,639, Sep. 8, 1994. This application May 8, 1995, Ser. No. 436,520
Int. Cl.^{6} G06F *9/30;11/00*
U.S. Cl. 395—840 **15 Claims**



1. A disk drive, adapted for storing user data provided from a host, comprising:
a storage disk having a plurality of data tracks on a disk surface;
means for reading and writing data to and from the data tracks on the data storage disk;
a microprocessor for controlling disk drive operations under program control; and
a host interface and disk controller, coupled to receive host commands and user data from, and provide retrieved and corrected user data to, the host, the host interface and disk controller comprising:
check symbol/syndrome generator means for generating error correction code syndromes during read operations and for providing error correction code syndromes corresponding to detected errors; and

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an error corrector for correcting errors in said user data read from the data storage disks, said error corrector employing the error correction code syndromes, said error corrector including:

finite field processor means for calculating over a finite field;

means for storing an error correction control program including selected instructions executable by said finite field processor means;

first decoding means for receiving error correction control program instructions from said means for storing and decoding said instructions; and

second decoding means for receiving error correction control program instructions from said first decoding means and further decoding said instructions,

wherein said first decoding means receives and decodes a second instruction in parallel with said second decoding means further decoding a first instruction.

5,689,728
CONTROLLER OF PATHS FOR DATA TRANSFER IN SYSTEM HAVING EXTERNAL MEMORY DEVICE

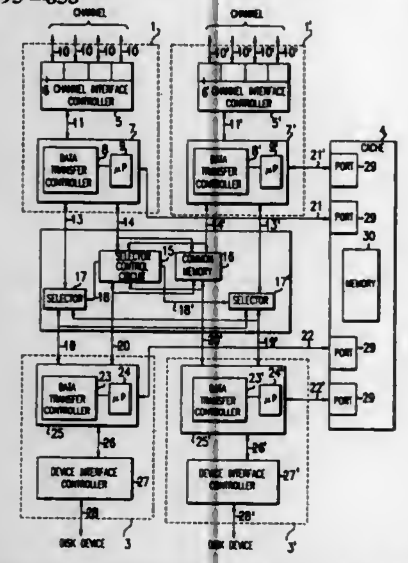
Shuji Sugimoto; Norio Hamada; Yoshiro Shiroyanagi, and Hisaharu Takeuchi, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,766

Claims priority, application Japan, Aug. 30, 1988, 63-213566

Int. Cl.^{6} G06F *13/38*

U.S. Cl. 395—858 **5 Claims**



1. A data transfer controller between a high order apparatus and a low order device, comprising:

(a) a cache memory, said cache memory being able to temporarily store data transferred between the high order apparatus and the low order device;

(b) a plurality of first paths, each of said first paths being able to transfer data between the high order apparatus and said cache memory, each of said first paths including a first adaptor;

(c) a plurality of second paths, each of said second paths being able to transfer data between said cache memory and the low order device, each of said second paths including a second adaptor; and

(d) means for selecting one of said first paths, available for data transfer, and one of said second paths, available for data transfer, and constructing a third path, said third path transferring data through said first and second adapters of said selected paths.

5,689,729
STORAGE SUBSYSTEM HAVING PLURALITY OF ACCESS PATHS PERMITTING INDEPENDENT ACCESS TO CACHE MEMORY FROM HOST AND INDEPENDENT ACCESS TO THE CACHE FROM ROTATING STORAGE DEVICE

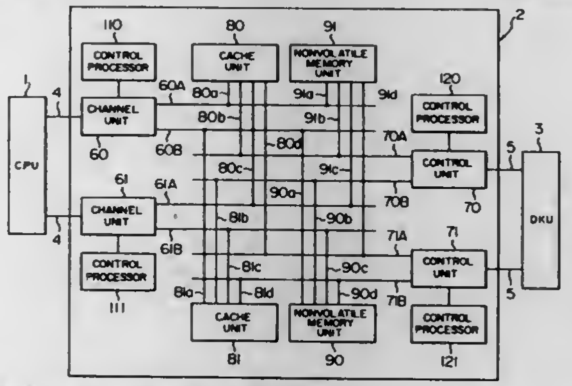
Yasuo Inoue, Odawara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 984,763, Dec. 3, 1992, Pat. No. 5,459,856. This application Jul. 13, 1995, Ser. No. 502,045

Claims priority, application Japan, Dec. 6, 1991, 3-322965

Int. Cl.^{6} G06F *15/02*

U.S. Cl. 395—872 **12 Claims**



9. A storage subsystem comprising:

a rotating storage device storing data from a host and sending data to the host in response to a request from the host; and

a memory controller including:

- a cache memory storing the data transferred between the host and the rotating storage device,
- a plurality of channel units controlling data transfer to and from the host,
- a plurality of control units controlling data transfer to and from the rotating storage device, and
- a plurality of access paths permitting independent access to the cache memory from the host and independent access to the cache memory from the rotating storage device, the plurality of access paths including a plurality of common data buses, each common data bus being coupled to each channel unit, the cache memory and each control unit, the access paths controlling data transfer between the host and the rotating storage device,
- each of said plurality of channel units having a plurality of access lines which are each connected to each of said plurality of common data buses,
- each of said plurality of control units having a plurality of access lines which are each connected to each of said plurality of common data buses, and
- said cache memory having a plurality of access lines which are each connected to each of said plurality of common data buses.

5,689,730
NETWORK INTERFACE APPARATUS ADAPTABLE TO MULTIFUNCTION PERIPHERAL APPARATUS

Naoki Wakasugi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 6, 1995, Ser. No. 554,573

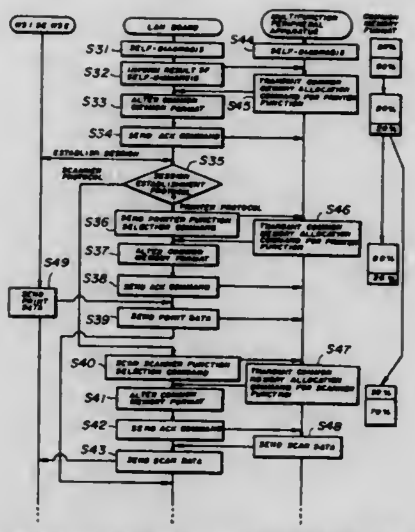
Claims priority, application Japan, Nov. 15, 1994, 6-280772; Oct. 17, 1995, 7-268572

Int. Cl.^{6} G06F *12/00;13/00*

U.S. Cl. 395—876 **8 Claims**

1. A network interface apparatus, comprising:

communication means for performing data communication between a multifunction peripheral apparatus and another apparatus via a network, said multifunction peripheral apparatus performing a predetermined plurality of functions;



common storage means for temporarily storing data when said data is being communicated between said multifunction peripheral apparatus and said other apparatus via said network; and

alteration means for altering a data-storage-area allocation of said common storage means so as to make said allocation appropriate for a particular function being selected out of said predetermined plurality of functions of said multifunction peripheral apparatus.

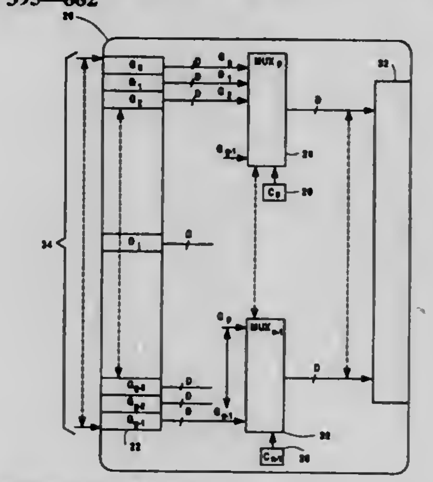
5,689,731
PROGRAMMABLE SERIALIZER USING MULTIPLEXER AND PROGRAMMABLE ADDRESS COUNTER FOR PROVIDING FLEXIBLITY IN SCANNING SEQUENCES AND WIDTH OF DATA

Roderick Michael P. West, Colchester; Hiroyuki Ando, Essex Junction; Stephen B. Barrett; Peter Casavant, both of Williston; Edward K. Evans; Daniel Liguori, both of Essex Junction, and David Litten, Jericho, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 475,545

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—882 **5 Claims**



1. A serializer, comprising:

a multi-bit data input port adapted for receiving input data;

a multi-bit data output port for outputting selected data;

at least one multiplexer having a multiplexer output connected to said output port,

an address input, and a plurality of data input channels having addresses, each of the plurality of data input channels being connected to a corresponding bit of said input port, at least one data input channel being coupled to the multiplexer output when the corresponding address of the at least one data input channel is applied to the address input; and

at least one programmable address counter corresponding to said at least one multiplexer for generating a sequence of multiplexer data input addresses for input into said multiplexer address input, said counter including a storage device for storing an initial address value and an address increment value, said initial address value representing the multiplexer data channel that is to be initially coupled to the multiplexer output, said address increment value representing the increment that must be added to a current multiplexer data channel address so as to produce a next multiplexer data channel address, said storage device of said at least one programmable address counter storing a count value representing the number of multiplexer addresses that must be generated by said at least one programmable counter prior to said counter restarting the sequence at said initial address value.

5,689,732
APPARATUS FOR RECORDING AND REPRODUCING DATA HAVING A SINGLE RECORDING AND REPRODUCING UNIT AND A PLURALITY OF DETACHABLE INTERFACES FOR CONNECTING TO DIFFERENT TYPES OF COMPUTER PORTS

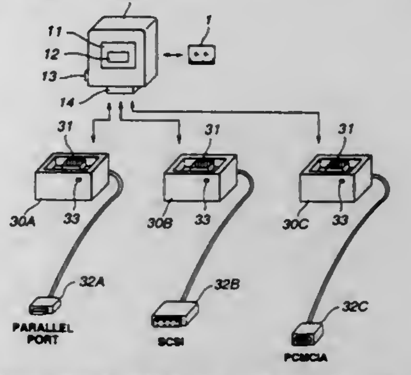
Tsuyoshi Kondo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 14, 1995, Ser. No. 490,146

Claims priority, application Japan, Jun. 21, 1994, 6-160745; Jul. 28, 1994, 6-177049

Int. Cl.^{6} G06F *3/06;5/00*

U.S. Cl. 395—884 **14 Claims**



1. A recording and/or reproducing system comprising:

recording and/or reproducing means for recording and/or reproducing digital data on or from a tape-shaped recording medium loaded therein, and for generating and receiving recording/reproducing control signals; and

interfacing means comprising:

- a first input/output (I/O) means for exchanging digital data and control signals with an external information equipment, wherein said digital data and control signals are formatted in one of the following interface standards: a computer parallel port interface standard, a small computer system interface (SCSI) standard, or a Personal Computer Memory Card International Association (PCMCIA) interface standard,
- a second I/O means for exchanging digital data and said recording/reproducing control signals with said recording and/or reproducing means, wherein said digital data and said recording/reproducing control signals are formatted in a recording and/or reproducing interface standard,

wherein said interfacing means converts the digital data and said recording/reproducing control signals supplied by said recording and/or reproducing means through said second I/O means into the one of the following interface standards: the computer parallel port interface standard, the SCSI standard, or the PCMCIA interface standard and said interfacing means routes the converted digital data and control signals through said first I/O means to said external information equipment, and

wherein said interfacing means also converts the digital data and control signals supplied from said external information equipment through said first I/O means into the recording

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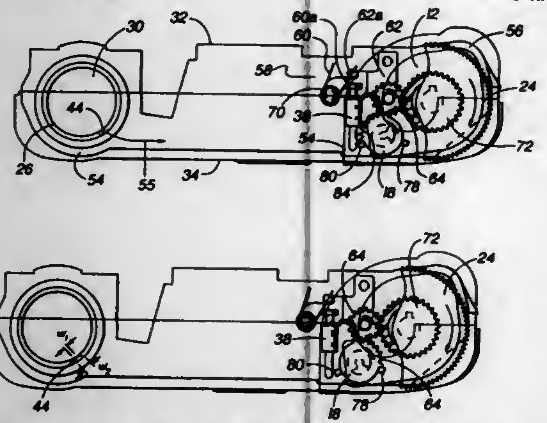
and/or reproducing interface standard and said interface means routes the converted digital data and recording/reproducing control signals through said second I/O means to said recording and/or reproducing means, thereby controlling said recording and/or reproducing means.

5,689,733
FILM LOADING METHOD FOR A SINGLE USE APS CAMERA

Arthur Zawodny, Tsing Yi Island; Bill Yung Wai Lam, Nam Tin; Eli Shoer, Wanchai, and Franco Yik Kai Chung, Hong Kong, all of Hong Kong, assignors to Concord Camera Corp., Avenel, N.J.

Filed Sep. 13, 1996, Ser. No. 713,780
Int. Cl.^{6} G03B *17/02*
U.S. Cl. 396—6 **9 Claims**



1. In a camera of the type that employs a film cassette having a light lock door that is movable between open and closed positions, the camera having a main body, a back cover securely attached thereto, a film cassette compartment on one end, a rotatable spool with a film receiving slot on the other end, a film path extending between the film cassette compartment and the spool, a film cassette loading port for loading the film cassette into the film cassette compartment, rotatable advancing means for advancing film between the film cassette and the spool, a method comprising the steps of:

i) loading the film cassette into the film cassette compartment via the film loading port with the light lock door closed, the advancing means engaging a light lock door actuator inside the film cassette;
ii) rotating the advancing means in a first direction to open the light lock door;
iii) preventing further rotation of the advancing means from operating the light lock door actuator;
iv) continuing to rotate the advancing means in the first direction to drive film out of the cassette, across the film path and into the film receiving slot;
v) winding film from the cassette onto the spool;

whereby the camera is pre-loaded with the back cover, in place the camera being adapted to take exposures, one frame at a time, by rotating the advancing means in a second direction opposite to the first direction to withdraw film back into the cassette.

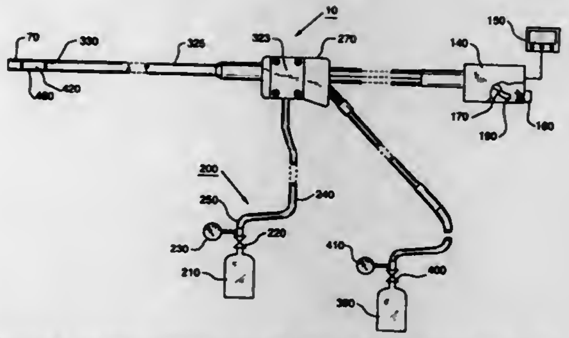
5,689,734
PRESSURIZED CAMERA SYSTEM

James A. Bauer, Hampton; George F. Dailey, Plum Borough, and Edward J. Hyp, Irwin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1996, Ser. No. 703,319
Int. Cl.^{6} G03B *17/08;17/00*
U.S. Cl. 396—28 **3 Claims**

1. A pressurized camera system for viewing an object, comprising:

a housing having an interior and a view port;



imaging means disposed in the interior of said housing and in optical communication with the view port for viewing the object through the view port and for generating an image of the object;

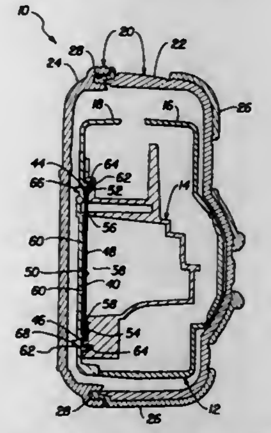
pressurizing means in communication with the interior of said housing for pressurizing the interior of said housing above ambient pressure to prevent contamination from entering the interior of said housing; said pressurizing means including:

(a) first pressurized fluid supply means for supplying a first pressurized fluid into the interior of said housing;
(b) a first conduit having a first end and a second end, the first end of said first conduit connected to said first pressurized fluid supply means for conducting the first pressurized fluid through said first conduit;
(c) a positioning tube having a first end and a second end, the first end of said positioning tube attached to said housing for positioning said housing near the object; and
(d) connector means attached to said second end of said positioning tube and removably interconnected with said second end of said first conduit for connecting and disconnecting said first pressurized fluid supply means and said positioning tube.

5,689,735
WATER-RESISTANT CAMERA

Randy E. Horning, LeRoy, and John H. Alligood, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 10, 1997, Ser. No. 781,765
Int. Cl.^{6} G03B *17/08*
U.S. Cl. 396—29 **7 Claims**



1. A water-resistant camera comprising a main body part and a rear cover part having a film clearance space between them to permit movement of successive sections of a filmstrip across a backframe opening in said main body part, and a water-resistant casing part spaced opposite said rear cover part, is characterized in that:

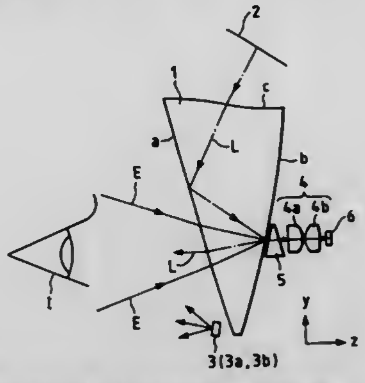
said rear cover part has respective support means located on a particular side of the rear cover part that faces said water-resistant casing part and are aligned with discrete raised portions of said main body part bordering said film clearance

space, for cooperating with said raised portions to prevent the water-resistant casing part from pushing the rear cover part substantially into the film clearance space when water pressure tends to press the water-resistant casing part inwardly toward the rear cover part.

5,689,736
IMAGE OBSERVATION APPARATUS

Atsushi Okuyama, Tokorozawa, and Shoichi Yamazaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1996, Ser. No. 606,851
Claims priority, application Japan, Feb. 28, 1995, 7-066992
Int. Cl.^{6} G03B *13/02;* **A61B** *31/14*
U.S. Cl. 396—51 **18 Claims**



1. An image observation apparatus comprising:

an optical system having a plurality of reflecting surfaces and a positive refracting power to guide light from an image to an observer; and

a visual axis detection system comprising a light source for illuminating an anterior ocular segment of the observer to detect a visual axis of the observer, light-receiving means for receiving an image of the anterior ocular segment which is formed by light reflected by the anterior ocular segment and having passed through a tilted curved surface constituting said optical system, and correcting means for correcting an aberration of the image of the anterior ocular segment which occurs when the image passes through the tilted curved surface constituting said optical system, said correcting means comprising a tilted curved surface.

5,689,737
SHAKE DETECTION DEVICE, SHAKE RECORDING DEVICE AND ACCOMPANYING EQUIPMENT

Tetsuro Kanbara, Sakai, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

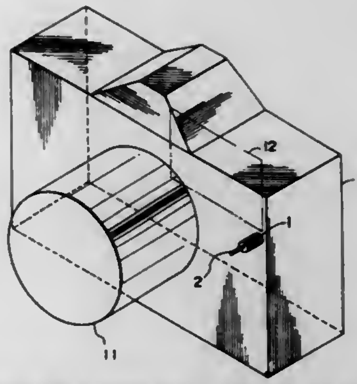
Filed Feb. 21, 1996, Ser. No. 604,729
Claims priority, application Japan, Feb. 24, 1995, 7-036610
Int. Cl.^{6} G03B *17/24;* **G01D** *9/42*
U.S. Cl. 396—52 **27 Claims**

1. An apparatus having a shake recording device, said apparatus comprising:

a data recorder for recording data;

a light source which emits a light to a photosensitive medium so as to record on the medium a locus of shake of the apparatus; and

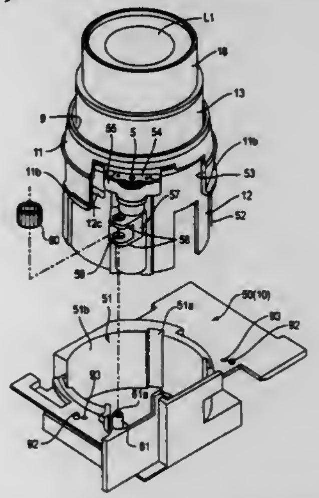
a controller which controls said light source to alter, over time in a predetermined pattern, a color of the light being emitted by said light source during a recording of data by said data recorder so that the thus recorded locus of shake represents an error in the data recorded by said data recorder due to shaking of the apparatus.



5,689,738
CAMERA HAVING BACK FOCUS ADJUSTING APPARATUS

Seiji Uziie; Kazuyoshi Azegami, and Hiroshi Nomura, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 166,078, Dec. 14, 1993, abandoned.
This application Sep. 5, 1995, Ser. No. 523,805
Claims priority, application Japan, Dec. 14, 1992, 4-085644 U; Jan. 14, 1993, 5-000787 U
Int. Cl.^{6} G03B *1/18*
U.S. Cl. 396—79 **32 Claims**



7. A camera having an apparatus for adjusting a back focus, comprising:

a rotationally stationary barrel to be secured to a camera body, said rotationally stationary barrel including movable lens groups comprising a photographing lens and including a threaded portion;

restricting means for preventing rotational movement of said rotationally stationary barrel and for permitting axial movement of said rotationally stationary barrel; and

an adjusting ring provided in said camera body and including a threaded portion directly threadedly engaging with said threaded portion of said rotationally stationary barrel,

direct engagement of said threaded portion of said rotationally stationary barrel and said threaded portion of said adjusting ring comprising means for adjusting a position of said rotationally stationary barrel in an optical axial direction in accordance with rotation of said adjusting ring.

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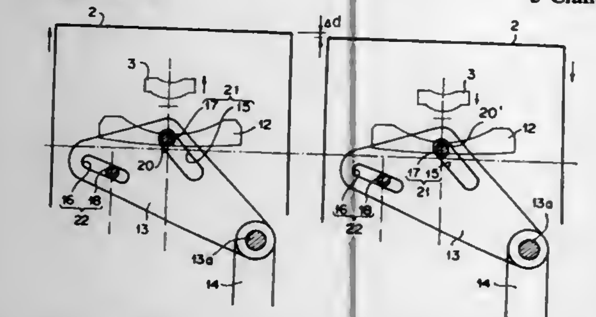
5,689,739
LENS DRIVE MECHANISM FOR PHOTOGRAPHIC CAMERA WITH ZOOM LENS

Toshio Yoshida, and Akio Omiya, both of Saitama-ken, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Jan. 9, 1997, Ser. No. 780,779
Claims priority, application Japan, Jan. 10, 1996, 8-002182
Int. Cl.^{6} G03B *5/00*
U.S. Cl. 396—83 **5 Claims**



1. In a photographic camera provided with a zoom lens comprising a front lens group which is moved back and forth in the direction of an optical axis held by a movable lens barrel and a rear lens group which is disposed behind the front lens group and is moved backed and forth in the direction of the optical axis maintaining a predetermined optical position relative to the front lens group in response to movement of the front lens group,

a lens drive mechanism comprising

a cam lever which is supported on the camera body for rotation about a rotational axis perpendicular to the optical axis,

a first engagement mechanism provided on the cam lever for said movable lens barrel, and

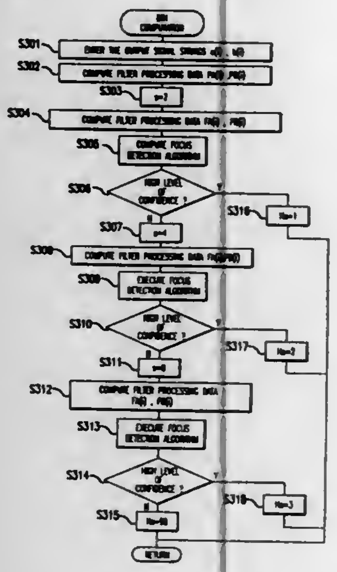
a second engagement mechanism provided on the cam lever for said rear lens group,

one of said first and second engagement mechanisms being adapted to engage with a predetermined play for permitting focusing of the zoom lens.

5,689,740
FOCUS DETECTION DEVICE

Shigeyuki Uchiyama, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 30, 1995, Ser. No. 497,464
Claims priority, application Japan, Sep. 5, 1994, 6-211393
Int. Cl.^{6} G03B *3/10;13/34*
U.S. Cl. 396—101 **16 Claims**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COMPUTE FILTER PROCESSING DATA
COMPUTE FOCUS DETECTION ALGORITHM
HIGH LEVEL OF CONFIDENCE ?
EXECUTE FOCUS DETECTION ALGORITHM
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RETURN

1. A focus detection device having a phototaking lens, comprising:

a plurality of focus detection areas within an image field of an object;

a plurality of photo-electric conversion devices, each of said photo-electric devices corresponding to each of said focus detection areas;

a focus detection optical system guiding light rays from said object to said photo-electric conversion devices, wherein each of said photo-electric devices outputs electrical signals corresponding to the light intensity distribution of said focus detection areas;

a filter processing device that utilizes a plurality of filter algorithm processes for extracting a plurality of frequency components, said filter processing device generating filter processing data corresponding to said frequency components for each of the electrical signals, the filter processing device outputting a plurality of filter processing data that corresponds to said focus detection areas;

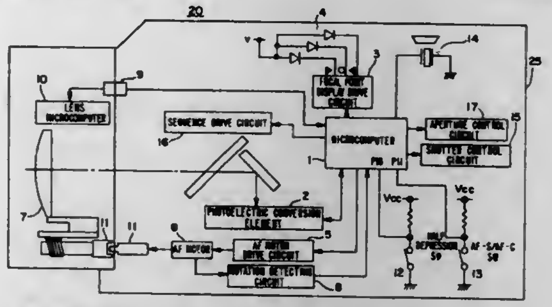
a focus detection algorithm device that calculates focus adjustment condition signals for each of said filter processing data, the focus adjustment condition signals representing focus adjustment conditions of said phototaking lens at each of said focus detection areas; and

a final focus determination device that determines a final focus adjustment condition signal based on focus adjustment condition signals calculated by the focus detection algorithm device using filter processing data that corresponds to the highest frequency component among the plurality of filter processing data.

5,689,741
AUTOMATIC FOCUS CAMERA HAVING AN AUDIO DEVICE TO INDICATE AN IN-FOCUS STATE OF A LENS AND A METHOD THEREOF

Toshiaki Hozumi, and Shozo Yamano, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 30, 1995, Ser. No. 497,156
Claims priority, application Japan, Sep. 6, 1994, 6-212443
Int. Cl.^{6} G03B *13/36*
U.S. Cl. 396—130 **12 Claims**



1. An automatic focus camera having a lens, comprising:

a focal point apparatus to detect a focal point status of the lens and, in response, driving the lens to an in-focus position;

a start focus detection device to start the operation of said focal point apparatus;

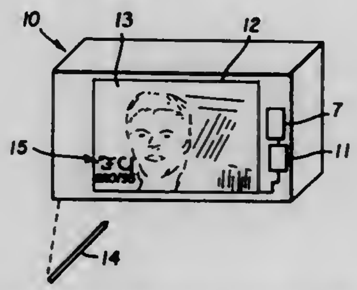
an audio device to generate a sound in response to the lens being in-focus; and

a control device to repeatedly control said focal point apparatus, in a continuous mode, to drive the lens to the in-focus position even after said focal point apparatus has detected an in-focus state and a subsequent defocus state of the lens, said control device causing said audio device to generate the sound in the continuous mode only an initial time the lens is in the in-focus state during the period between the start and end of the focal point detection by said focal point apparatus.

5,689,742
FULL FRAME ANNOTATION SYSTEM FOR CAMERA

Frederick Rockwell Chamberlain, IV, Vista, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1996, Ser. No. 729,460
Int. Cl.^{6} G06B *17/24;* **H04N** *5/222*
U.S. Cl. 396—313 **6 Claims**



1. A camera having an annotation system comprising:

an optical imaging system for exposing photosensitive media to a scene;

a digital imaging system for producing a digital image of said scene;

a display for displaying said digital image;

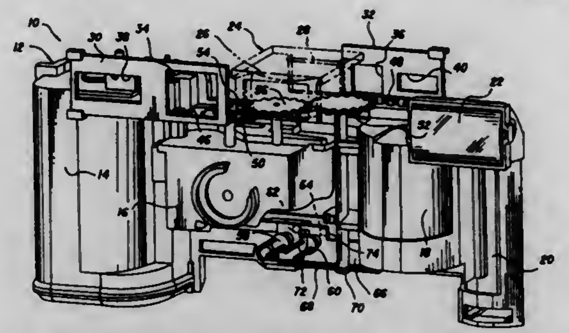
a touch sensitive user input layer overlaying said display for inputting annotation data; and

a data recorder for recording said annotation data on said photosensitive media.

5,689,743
DIFFERENTIAL VIEWFINDER MASKS

Randy Eugene Horning, and Ralph Merwin Lyon, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1996, Ser. No. 659,555
Int. Cl.^{6} G03B *17/24;17/02;13/02*
U.S. Cl. 396—316 **6 Claims**



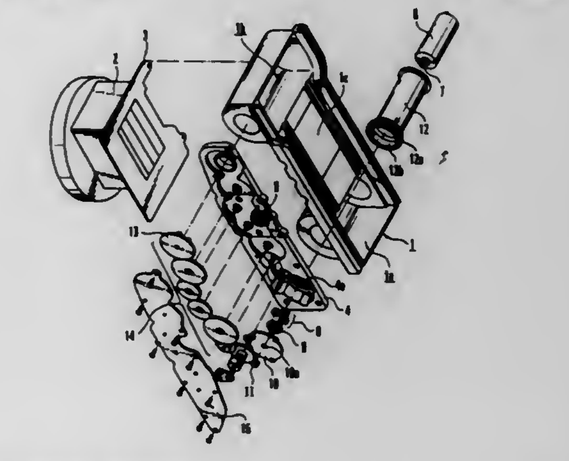
1. A camera comprising viewfinder means for defining a field of view provided with a given aspect ratio for viewing a subject to be photographed, and a pair of front and rear masks insertable in the field of view to position respective larger and smaller openings of said front and rear masks in the field of view to change the aspect ratio of the field of view from the given aspect ratio to a selected aspect ratio also for viewing the subject, is characterized further in that:

differential gear means connects said front and rear masks for moving the front mask a greater extent than the rear mask is moved to position the larger and smaller openings in the field of view.

5,689,744
CAMERA

Shoji Kaihara, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 290,459, Aug. 15, 1994, abandoned. This application Jan. 31, 1997, Ser. No. 791,540
Claims priority, application Japan, Sep. 1, 1993, 5-217558
Int. Cl.^{6} G03B *17/42*
U.S. Cl. 396—411 **19 Claims**



1. A camera comprising:

a) an actuator arranged as a drive source for a camera operating mechanism;

b) a transmission mechanism arranged to transmit a driving force of said actuator to said camera operating mechanism; and

c) a base member arranged to support at least a part of said transmission mechanism, said base member having a stationary toothed portion formed directly on said base member and arranged to mesh with a gear which is connected to said part of said transmission mechanism.

5,689,745
APPARATUS AND METHOD FOR LOADING AND UNLOADING A CAMERA WITH A DISCRETE FILM STRIP

Dennis Roland Zander, Penfield; William Andrew Bergstresser, Prattsburgh; Bradley S. Bush, Hilton; Eric Peschan Hochreiter, Bergen; Jeffrey Charles Robertson, and Paul Teremy, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1995, Ser. No. 569,634
Int. Cl.^{6} G03B *1/00;17/00;17/26;29/00*
U.S. Cl. 396—429 **54 Claims**

1. Apparatus for loading a photographic camera of a type including an external housing having a movable closure giving access to a film guide track within the camera, the guide track extending between an unexposed film chamber and an exposed film chamber, said apparatus comprising:

a frame;

a nest supported on said frame for receiving a camera;

a source for unexposed photographic film positioned on said frame separate from said nest;

film loading track extending between said source and said nest for guiding film from said source, past said closure and into said film guide track within said camera; and

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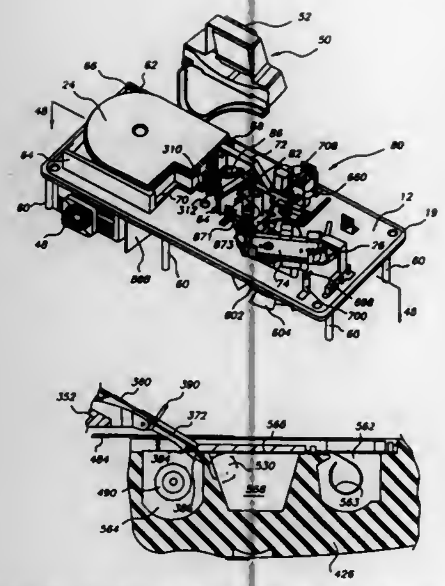


means for driving film from said source, along said loading track and into said camera.

5,689,746

AMOUNT-OF-LIGHT ADJUSTING DEVICE

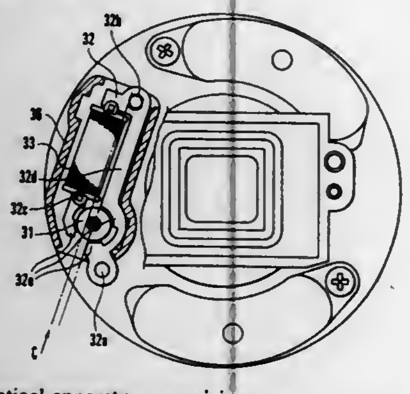
Hiroshi Akada; Tatsuo Chigira; Hironori Takano, all of Kanagawa-ken, and Masahiko Tsuzuki, Saitama-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1994, Ser. No. 287,875

Claims priority, application Japan, Aug. 13, 1993, 5-201372; Feb. 24, 1994, 6-026690; Feb. 24, 1994, 6-026691; Feb. 28, 1994, 6-030428

Int. Cl.^{6} G03B *9/02*

U.S. Cl. 396—508 **27 Claims**



1. An optical apparatus comprising:

a) a light-blocking member arranged to move to vary a light-blocking area;

b) drive means for driving said light-blocking member, said drive means including a stator and a rotor, said stator formed by a first stator arm having a first rotor opposed portion and a second stator arm having a second rotor opposed portion, said rotor made eccentric with respect to a central position of said first stator arm and said second stator arm, said first and second rotor opposed portions having portions having different air gaps relative to said rotor; and

c) an optical system,

at least said stator and said rotor of said drive means being disposed rearward of said light-blocking member in the direction of an optical axis of said optical system.

5,689,747

DEVICE FOR INTERFACING BETWEEN A FILM DEVELOPING DEVICE AND SILVER RECOVERY UNIT

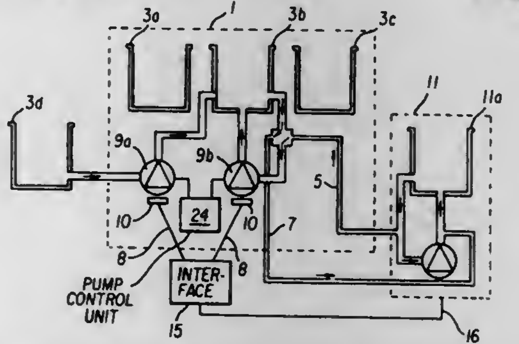
Andreas Jeutter, Steinheim, and Gerhard Ueffinger, Weinstadt-Grossheppach, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1996, Ser. No. 616,405

Claims priority, application Germany, Mar. 17, 1995, 195 09 757.2

Int. Cl.^{6} G03D *3/02*

U.S. Cl. 396—578 **8 Claims**



1. A device for interfacing between a film developing device and a silver recovery unit for checking the operating condition of said film developing device, said film developing device having at least one electric motor-driven pump, a plurality of liquid lines and a pump/machine control unit, and at least one sensor for detection of the operating condition of said film developing device is installed outside the at least one pump of said film developing device such that said sensor is fastened directly to a housing wall of said motor-driven pump.

5,689,748

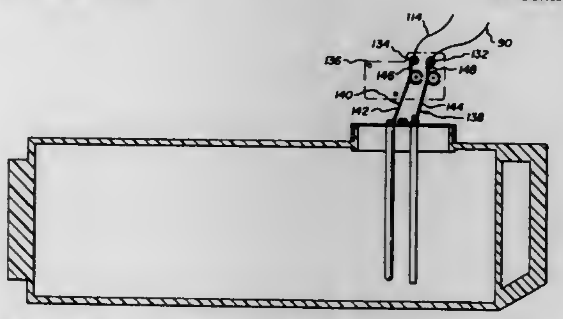
PHOTOGRAPHIC PROCESS WITH IMPROVED REPLENISHMENT MONITORING SYSTEM

Raymond Eugene Wess, Holley; Ralph Leonard Piccinino, Jr., Rush, and John Howard Rosenburgh, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1996, Ser. No. 655,106

Int. Cl.^{6} G03D *3/02*

U.S. Cl. 396—578 **16 Claims**



1. A processor for processing a photosensitive material, comprising:

at least one processing section;

a recirculation system for circulating processing solution through said at least one processing section, said recirculation system including at least one conduit for recirculating processing solution;

a replenishment system for delivering replenishment solution contained within a container to said recirculation system, said replenishment system including a single means secured to said container for withdrawing replenishment solution from said container and for monitoring the level of the replenishment in said container.

5,689,749

APPARATUS FOR DEVELOPING A RESIST-COATED SUBSTRATE

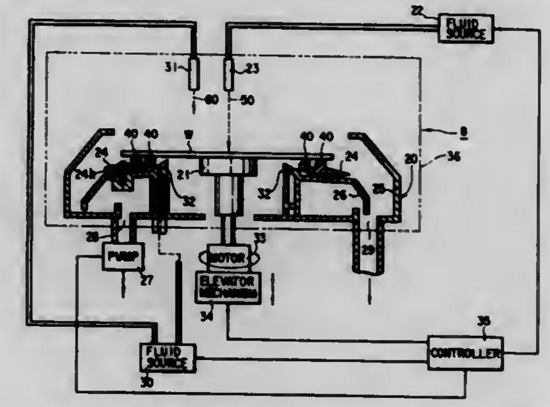
Hideya Tanaka; Norimitsu Morioka, and Kosuke Yoshihara, all of Kumamoto, Japan, assignors to Tokyo Electron Limited, Tokyo, and Tokyo Electron Kyushu Limited, Tosu, both of Japan

Filed Aug. 31, 1995, Ser. No. 521,845

Claims priority, application Japan, Aug. 31, 1994, 6-230627

Int. Cl.^{6} G03D *3/02*

U.S. Cl. 396—611 **13 Claims**



1. A developing apparatus for developing a photoresist-coated on substrate, comprising:

a spin chuck having a mount smaller in size than the substrate and adapted to be spin-driven with the photoresist-coated substrate surface held upward;

a cup surrounding the substrate on the mount of the spin chuck;

a developing solution nozzle for applying a developing solution on the photoresist-coated substrate held on the mount;

a first washing solution nozzle for applying a washing solution to the photoresist-coated surface of the substrate held on the mount;

a second washing solution nozzle for applying the washing solution to a rear surface of the substrate on the mount;

a liquid seal ring mounted substantially coaxial with the spin chuck and having a diameter greater than the mount and smaller than the substrate; and

a liquid film forming section provided on an upper end of the liquid seal ring and located near and opposite a periphery of a rear surface of the substrate on the mount to provide a clearance relative to the periphery of the rear surface of the substrate, wherein

the liquid film forming section includes

a first wall portion situated substantially orthogonal to the rear surface of the substrate and in an outwardly facing relation, and

a second wall portion gently inclined relative to the rear surface of the substrate and situated in an inwardly facing relation,

the liquid film forming section creates an annular continuous washing solution film at the clearance,

the first wall portion prevents the developing solution from intruding more inward than the clearance, and

the second wall portion promotes a discharge of the developing solution from the clearance.

5,689,750

APPARATUS FOR THE WET PROCESSING OF PHOTOGRAPHIC SHEET MATERIAL

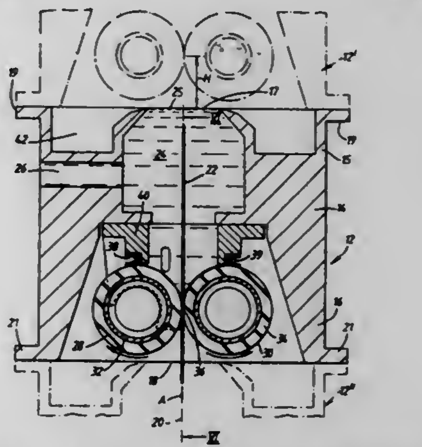
Bartholomeus Verlinden, Tongeren; Marc De Niel, Borgerhout, and Bart Verhoest, Wilrijk, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 7, 1996, Ser. No. 643,795

Claims priority, application European Pat. Off., May 20, 1995, 95201328

Int. Cl.^{6} G03D *3/08*

U.S. Cl. 396—614 **14 Claims**



1. An apparatus for the wet processing of photographic sheet material having a thickness of 0.05 mm to 0.5 mm comprising at least one treatment vessel (12, 12', 12") having upper and lower openings (17, 18), one of said openings (17) constituting a sheet material inlet and the other of said openings (18) constituting a sheet material outlet, said inlet and outlet defining there-between a substantially vertical sheet material path (20) through said vessel, said vessel including a sealing arrangement at said lower opening comprising a rotatable roller (28) biased towards a reaction surface (30) to define a roller nip (36) there-between through which the sheet material path extends and a stationary sealing member (38, 39) bearing against said roller in sealing contact along its length to retain treatment liquid (24) in said vessel (12), said roller (28) comprising a core (32) carrying a covering (34) of elastomeric material, the ratio (ϕ/L) of the maximum diameter (ϕ) of the roller to the length (L) thereof being at least 0.012.

5,689,751

AUTOMATIC PROCESSOR FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

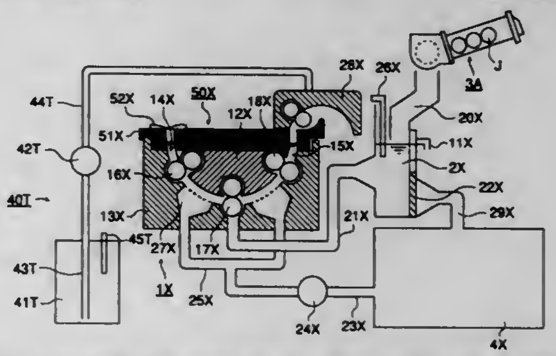
Yutaka Ueda, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Nov. 30, 1995, Ser. No. 565,339

Claims priority, application Japan, Dec. 6, 1994, 6-302275

Int. Cl.^{6} G03D *3/02*

U.S. Cl. 396—626 **20 Claims**



1. An automatic processor for processing a silver halide photographic light-sensitive material with a processing solution, the processor comprising:

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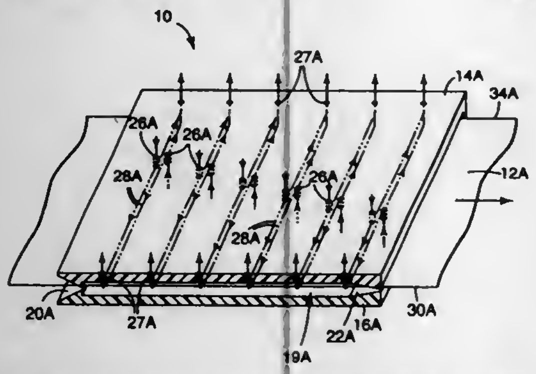
- a processing tank containing the processing solution for processing the material;
- a circulating path for circulating the processing solution, the circulating path connecting the processing tank; and
- a supplying means for supplying a solid composition to the processing tank or the path, wherein the following expression is satisfied:

$$V_w \leqq Vf$$

where V_w represents an amount (liter) of the processing solution in the processing tank and Vf represents an amount (liter) of the processing solution in the path.

5,689,752
PROCESSING APPARATUS, METHOD, AND SYSTEM FOR PHOTOSENSITIVE MATERIALS

Renato Bolognese, Savona, Italy, and Basavaraj R. Desai, Knoxville, Tenn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 23, 1996, Ser. No. 590,159
Int. Cl.⁶ G03D *3/02*
U.S. Cl. 396—626 **23 Claims**

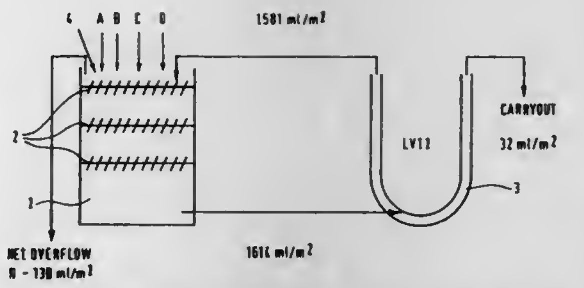


1. An apparatus adapted for use in the processing of a photosensitive material traveling in a material direction, the photosensitive material having a material width including a first width portion and a second width portion, the first and second width portions being smaller than the material width, the apparatus comprising:

- a housing having a processing chamber for containing processing fluid, the housing also having at least one material port for allowing the photosensitive material to pass through the processing chamber; and
- means operatively coupled to the housing for directing at least one first stream of processing fluid across the first width portion and for directing at least one second stream of processing fluid across the second width portion of the photosensitive material, the at least one first stream and the at least one second stream not moving substantially cocurrently with nor countercurrently to the material direction, the directing means being configured such that the first width portion and the second width portion together substantially equal the material width.

5,689,753
METHOD OF PHOTOGRAPHIC PROCESSING WITH SOLUTION REPLENISHMENT

Peter Jeffery Twist, Missenden, England, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 20, 1996, Ser. No. 667,200
Claims priority, application United Kingdom, Jun. 22, 1995, 9512700
Int. Cl.⁶ G03D *3/02*
U.S. Cl. 396—626 **9 Claims**

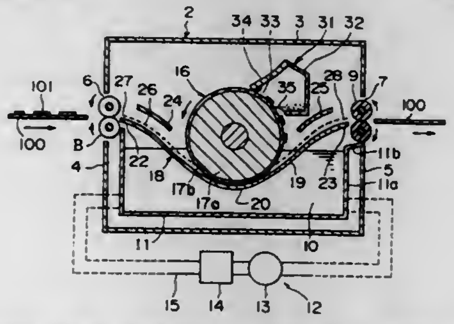


1. A method of redox amplification processing of a photographic color material in which the image-forming step takes place in a developer-amplifier solution containing both a photographic color developing agent and an oxidant contained in a processing tank of comparatively small volume (the processing tank),

- in which a developer-amplifier replenisher solution which is stable over an idle period of 48 hours, is provided from a tank of comparatively large volume (the reservoir) holding sufficient for replenishment over a predetermined extended period of time at a rate which is greater than 160 ml/m² of material processed,
- the overflow from the processing tank is returned to the reservoir where additions are made in a predetermined manner from water and/or one or more of four solutions comprising color developing agent concentrate, oxidant concentrate, buffer concentrate and anti-oxidant concentrate.

5,689,754
REGENERATING APPARATUS FOR RECORDING MEDIUM

Masazumi Yoshida, Amagasaki; Junji Machida, and Kaoru Furusawa, both of Toyonaka, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed Oct. 26, 1994, Ser. No. 329,480
Claims priority, application Japan, Oct. 28, 1993, 5-270339; Oct. 28, 1993, 5-270350
Int. Cl.⁶ G03G *21/00*
U.S. Cl. 399—1 **19 Claims**

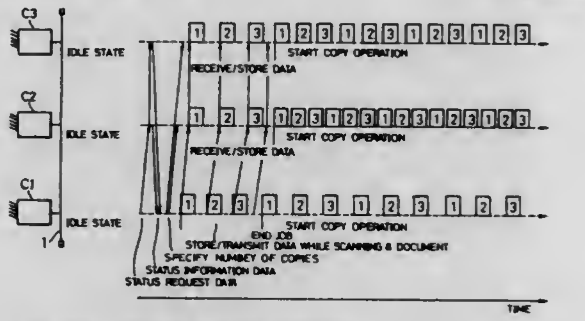


1. A regenerating apparatus for removing a printing material from a recording medium so as to reuse the recording medium, comprising:

- (a) a container for accommodating a liquid for swelling the printing material;
- (b) a guide member for guiding the recording medium, part of which is arranged in the liquid;
- (c) a rotatable transporting roller for transporting the recording medium along the guide member, so that the printing material on the recording medium is immersed in the liquid;
- (d) a rotatable transferring roller disposed near the guide member so as to be in contact at a circumferential surface thereof with the recording medium and receive the printing material swollen by the liquid from the recording medium; and
- (e) a scraper which contacts the surface of the transferring roller to remove the printing material therefrom;
- (f) wherein the surface of the transferring roller is formed with at least one of the materials selected from polyolefin resin, polyester resin, nitrogen containing resin, sulfur containing resin, fluororesin, silicon resin, polyacetal resin, epoxy resin, polyether ether ketone resin, and phenol resin; and
- (g) wherein the transferring roller is so arranged as to contact the recording medium removed from the liquid.

5,689,755
DISTRIBUTED INTERCONNECTED IMAGE FORMING SYSTEM

Hiroyuki Ataka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 18, 1995, Ser. No. 423,980
Claims priority, application Japan, Apr. 21, 1994, 6-083103; Dec. 28, 1994, 6-328441
Int. Cl.⁶ G03G *15/00*
U.S. Cl. 399—8 **15 Claims**

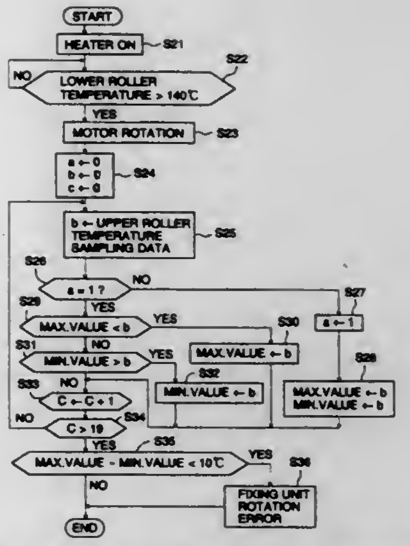


1. An image forming system comprising:

- plural image forming apparatuses provided with image reading means for reading an image from a document to be converted into image data and image forming means for forming an image based on the image data; and
- a communication line for connecting said plural image forming apparatuses,
- each of said plural image forming apparatuses comprising:
  - data transmission means for transmitting image data to another image forming apparatus using said communication line;
  - data receiving means for receiving the image data transmitted by said data transmission means;
  - distribution number set means for setting a distribution number of sets to be produced in each image forming apparatus when performing image forming operation of plural sets;
  - distribution number transmission means for transmitting the distribution number of sets to each image forming apparatus set by said distribution number set means to another image forming apparatus using said communication line;
  - distribution number receiving means for receiving the distribution number of sets transmitted by said distribution number transmission means wherein each of said plural image forming apparatuses further comprises processing capacity detecting means for detecting a processing capacity for an image forming operation of each image forming apparatus,
  - said distribution number set means sets the distribution number of sets to each image forming apparatus according to the processing capacity of each image forming apparatus detected by said processing capacity detecting means and said distribution number set means sets the distribution number in proportion to a process speed of image forming operation of each image forming apparatus so that all the image forming apparatuses complete respective image forming operations substantially at the same time.

5,689,756
ROTATION ABNORMALITY DETECTING DEVICE FOR USE IN IMAGE FORMING APPARATUS

Kenji Taki; Takao Kurohata; Yasuhiko Yamaguchi; Chiharu Kobayashi, and Kiyoshi Kimura, all of Hachioji, Japan, assignors to Konica Corporation, Japan
Filed Jul. 20, 1995, Ser. No. 504,483
Claims priority, application Japan, Jul. 25, 1994, 6-172551
Int. Cl.⁶ G03G *15/20*
U.S. Cl. 399—33 **16 Claims**

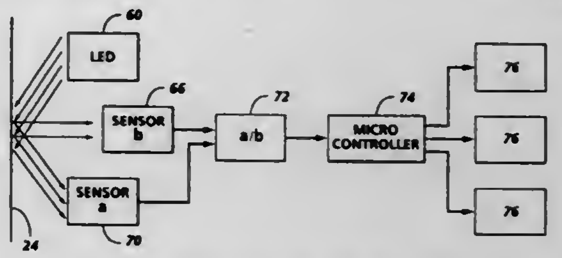


1. An image forming apparatus comprising:

- (a) a unit provided detachably attachable to said apparatus for forming an image;
- (b) a driving source provided inside said apparatus and outside said unit;
- (c) transmission for transmitting a driving force from said driving source;
- (d) a rotary member inside said unit, said rotary member being rotated by the driving force from said driving source transmitted through said transmission;
- (e) a detector adapted to detect a characteristic value indicating an image forming condition of said unit, said detector outputting a signal indicative of said value;
- (f) a control for controlling said image forming condition on the basis of said signal from said detector so that said characteristic value is maintained constant; and
- (g) a judging device for recognizing a rotation abnormality of said rotary member based only on said signal from said detector.

5,689,757
METHOD AND APPARATUS FOR DETECTING SUBSTRATE ROUGHNESS AND CONTROLLING PRINT QUALITY

John L. Ferrante, Williamson; Leela Ganguly, Webster; J. Stephen Kittelberger, Rochester; Kathryn A. Wallace, Canandaigua, and Joseph R. Weber, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 276,573, Jul. 18, 1994, abandoned.
This application Jul. 28, 1995, Ser. No. 509,017
Int. Cl.⁶ G03G *21/00*
U.S. Cl. 399—45 **2 Claims**



1. An electrophotographic marking machine, comprising:

- a photoreceptor;
- a corona generating device for charging said photoreceptor;
- a first light source for inducing a latent image on said charged photoreceptor;
- a developer for developing said latent image by depositing a marking material at a toner concentration on said photoreceptor, wherein said developer receives a control signal that controls the toner concentration;

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- a fuser for fusing said deposited marking material onto a substrate;
- a sheet feeder having a substrate holder, said sheet feeder for moving the substrate from said substrate holder through said fuser;
- a second light source for illuminating the substrate;
- a first light sensing device for sensing specularly reflected light from the substrate and for generating a first signal in response thereto;
- a second light sensing device for sensing diffusely reflected light from the substrate and for generating a second signal in response thereto;
- control circuitry operatively connected to said first and second light sensing devices for generating a ratio value of said first and second signals; and
- an operation controller operatively connected to said control circuitry, said operation controller for receiving said ratio value from said control circuitry and for producing said control signal from said ratio value.

5,689,758
IMAGE-TRANSFER AND SHEET-SEPARATION APPARATUS

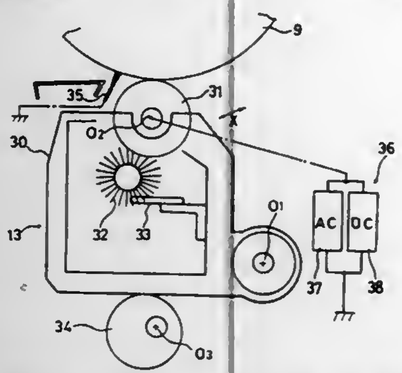
Ryuji Wataki, Nara-ken, and Shigeo Fujita, Moriguchi, both of Japan, assignors to Mita Industrial Co., Ltd., Japan

Continuation of Ser. No. 267,938, Jul. 6, 1994, abandoned, which is a continuation of Ser. No. 958,733, Oct. 9, 1992, Pat. No. 5,408,300. This application Nov. 17, 1995, Ser. No. 560,508

Claims priority, application Japan, Oct. 18, 1991, 3-271064

Int. Cl.⁶ G03G *15/00*

U.S. Cl. 399—45 **48 Claims**



1. An apparatus for transferring onto a sheet an image retained on an image receiver and toner-developed from a positive latent image, and for subsequently separating the sheet from the image receiver, comprising:

- a transfer roller pressing on the image receiver for applying a bias voltage to the sheet, the bias voltage being within the range of 500 V to 2000 V and being composed of an AC voltage within the range of 1000 V to 1500 V superimposed on a DC voltage, such that
  - the DC voltage charges the sheet with a charge having a polarity opposite to a charge carried by the toner that causes the toner-developed image to adhere to the image receiver, the DC voltage opposite polarity charge inducing transfer of the toner-developed image from the image receiver onto the sheet, and
  - the AC voltage electrically discharges the sheet from the transfer roller;
- a bias voltage supply unit connected to the transfer roller; and
- a charge-stripping brush for removing remnant electric charge from the sheet after the sheet is discharged by the AC voltage, the charge-stripping brush being provided in a position forward of the transfer roller along a transport direction of the sheet during the image transferring, such that an edge of the brush contacts a surface of the sheet opposite to that containing the transferred toner-developed image.

5,689,759
COPYING APPARATUS AND SHEET SIZE DETECTING DEVICE ADAPTED FOR USE THEREIN

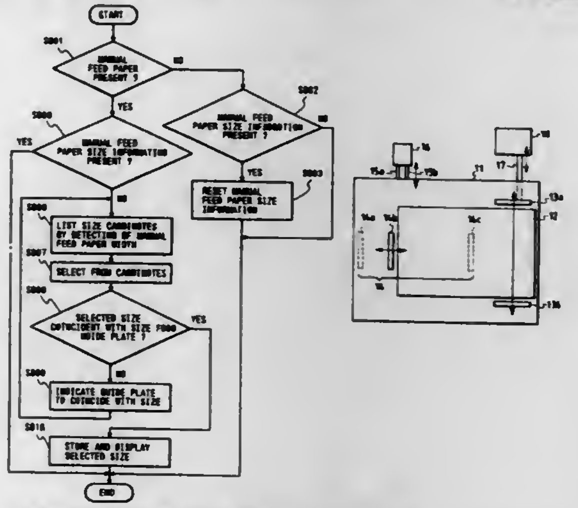
Keizo Isemura, Kokubunji; Hideki Adachi, Kawasaki; Tokuharu Kaneko, Yokohama, and Satoru Kutsuwada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 111,563, Aug. 24, 1993, abandoned. This application Mar. 25, 1996, Ser. No. 622,183

Claims priority, application Japan, Aug. 25, 1992, 4-248669; Oct. 2, 1992, 4-289638; Nov. 10, 1992, 4-323830

Int. Cl.⁶ G03G *00/00*

U.S. Cl. 399—45 **24 Claims**


START
MANUAL FEED PAPER PRESENT ?
YES
NO
MANUAL FEED PAPER SIZE INFORMATION PRESENT ?
SELECT FROM CANDIDATES
INDICATE GUIDE PLATE TO COINCIDE WITH SIZE
STORE AND DISPLAY SELECTED SIZE
END

1. A sheet size detecting device comprising:

- sheet width setting means for setting width of a recording sheet;
- sheet width detecting means for releasing a first electrical signal corresponding to a set value of said sheet width setting means;
- sheet length setting means for setting the length of said recording sheet;
- sheet length detecting means for releasing a second electrical signal corresponding to a set value of said sheet length setting means;
- sheet size detecting means for detecting the size of said sheet, based on said first and second electrical signals;
- wherein said first electrical signal released by said sheet width detecting means is a continuous electrical signal designating said sheet width, and said second electrical signal released by said sheet length detecting means is an electrical signal designating regular-sized sheets contained in one of plural divided sheet length regions; and
- setting means for setting, in case said sheet size detecting means detects plural regular sheet sizes based on said first and second electrical signals, an order of priority of detection to said regular sheet sizes.

5,689,760
IMAGE FORMING APPARATUS HAVING A FIXING SPEED AND A MOVEMENT SPEED OF THE RECORDING MEDIUM VARIABLY SYNCHRONIZED IN ACCORDANCE WITH A TYPE OF RECORDING MEDIUM

Akio Suzuki, Tokyo, and Masanori Muramatsu, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 363,896, Dec. 27, 1994, abandoned. This application Jul. 23, 1996, Ser. No. 681,497

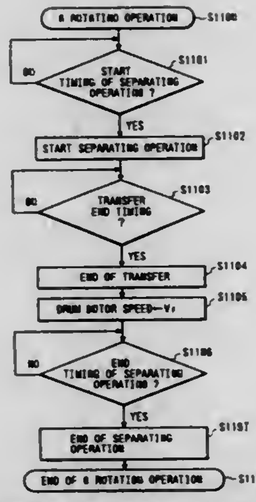
Claims priority, application Japan, Dec. 27, 1993, 5-330230

Int. Cl.⁶ G03G *15/14;15/20*

U.S. Cl. 399—45 **30 Claims**

1. An image forming apparatus comprising:

- recording material holding means for holding a recording material to record image information;


θ ROTATING OPERATION
S1100
START TIMING OF SEPARATING OPERATION ?
S1101
NO
YES
START SEPARATING OPERATION
S1102
TRANSFER END TIMING ?
S1103
END OF TRANSFER
S1104
DRUM MOTOR SPEED→V1
S1105
END TIMING OF SEPARATING OPERATION ?
S1106
END OF SEPARATING OPERATION
S1107
END OF θ ROTATING OPERATION
S1108

- means for switching and setting a plurality of fixing speeds; and
- separating means for separating said recording material from said recording material holding means at a speed corresponding to said fixing speed set,
- wherein a separation timing of the separating means, at the time of separating the recording material from said recording material holding means, is controlled in accordance with a paper size of said recording material.

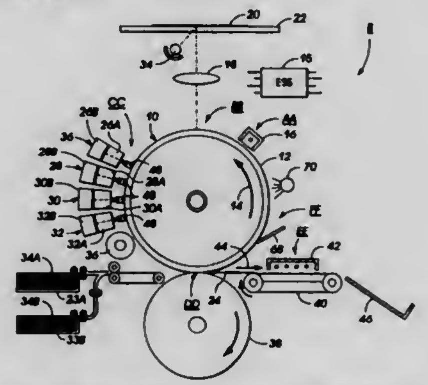
5,689,761
LIQUID IMMERSION DEVELOPMENT MACHINE HAVING A DEVELOPMENT SYSTEM ADAPTED TO COMPENSATE FOR COPY PAPER ROUGHNESS

Gary A. Denton, Lexington, Ky., and Henry R. Till, East Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1996, Ser. No. 720,285

Int. Cl.⁶ G03G *15/00;15/10*

U.S. Cl. 399—45 **7 Claims**



6. In a liquid immersion development (LID) reproduction machine developing and transferring toner images onto copy sheets of paper, a development unit for developing latent images so as to produce toner images compensating for differences in a surface roughness of different types of copy sheets receiving the toner images, the development unit comprising:

- (a) a first developer material supply source containing a selectable first developer material, having a first color and a first level of pigmentation, for developing a latent image to be transferred onto a first type of copy sheet having a first type of image receiving surface;
- (b) a second developer material supply source containing a selectable second developer material, having said first color and a second level of pigmentation different from said first level of pigmentation, for developing a latent image to be transferred onto a second type of copy sheet having a second and different type image receiving surface, thereby varying the level of pigmentation of developer material of said first color to produce high quality toner images compensating for differences between types of image receiving surfaces of copy sheets; and
- (c) control means connected to said development system for selecting either said first developer material supply source or said second developer material supply source, for supplying said first developer material or said second developer material responsively to a type of copy sheet selected to receive the latent image being developed.

5,689,762
IMAGE FORMING APPARATUS EQUIPPED WITH IMAGE QUALITY AND ADJUSTING DEVICE

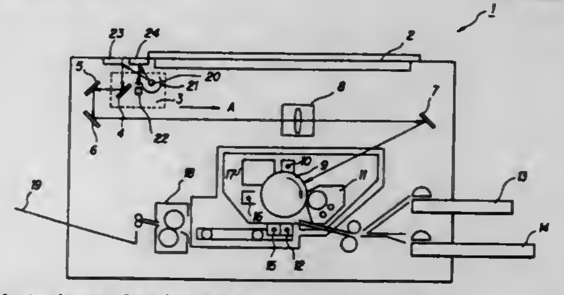
Kazuya Hamaguchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1996, Ser. No. 587,539

Claims priority, application Japan, Feb. 13, 1995, 7-024013

Int. Cl.⁶ G03G *15/043*

U.S. Cl. 399—51 **4 Claims**



1. An image forming apparatus comprising:

- a plurality of density samples having different levels of density;
- an exposure light source for exposing an original and said density samples to light;
- a reflected-light amount detecting means for detecting amounts of light reflected from said density samples, each of which is exposed to a respective predetermined exposure amount of light;
- a control-characteristic calculating means for calculating a control characteristic for determining an exposure light amount corresponding to a reflected-light amount, based on the amounts of light reflected from said density samples; and
- an exposure light amount controlling means for controlling the amount of light emitted from said exposure light source to the original, based on the control characteristic.

5,689,763
CAPACITIVE BASED SENSING SYSTEM FOR USE IN A PRINTING SYSTEM

Darrel R. Rathbun, Ontario; John J. Ricciardelli, Poughkeepsie, and Gerald A. Domoto, Briarcliff Manor, all of N.Y., assignors to Xerox Corporation, Stamford

Filed Sep. 16, 1996, Ser. No. 715,268

Int. Cl.⁶ G03G *15/06*

U.S. Cl. 399—53 **19 Claims**

1. In a print development system for a printing system in which a print is developed with developer material and development of the print varies as a function of both a first parameter and a second parameter, wherein the development system includes a capacitance, a sensing system for measuring a first value varying as a function of the first parameter and a second value varying as a function of the second parameter, comprising:

- a sensing subsystem for measuring an output by reference to the capacitance; and
- a signal development subsystem, responsive to said sensing system, for developing, from the output, both a first signal and a second signal with the first signal corresponding to the first

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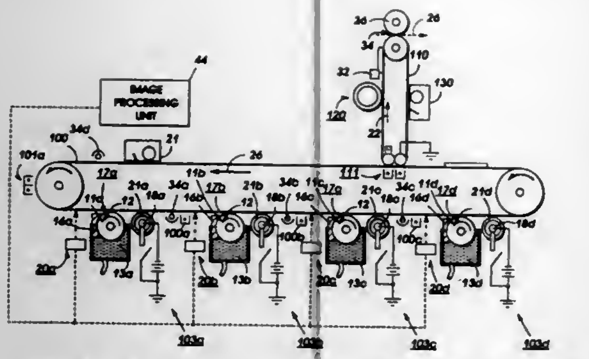


value and the second signal corresponding to the second value.

5,689,764

IMAGE FORMING APPARATUS AND DEVICE FOR DRIVING A CONTACT TYPE CHARGING MEMBER

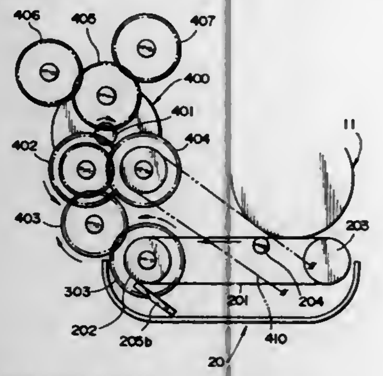
Yutaka Fukuchi, Yokohama, and Hidenobu Endoh, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,280

Claims priority, application Japan, May 24, 1995, 7-124719; May 25, 1995, 7-126406; Nov. 22, 1995, 7-304135

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—75 **10 Claims**



1. An image forming apparatus comprising:
an image carrier for forming an image thereon;
a first motor for causing said image carrier to rotate;
contact type charging means for charging said image carrier in contact therewith;
a driven gear for causing said charging means to rotate;
a drive gear for causing said driven gear to rotate in direct or indirect mesh therewith; and
a second motor independent of said first motor and for driving said charging means.

5,689,765

IMAGE FORMING APPARATUS WHICH INPUTS INFORMATION FROM A USER DURING AN IMAGE FORMING OPERATION

Michiaki Nishinozono, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

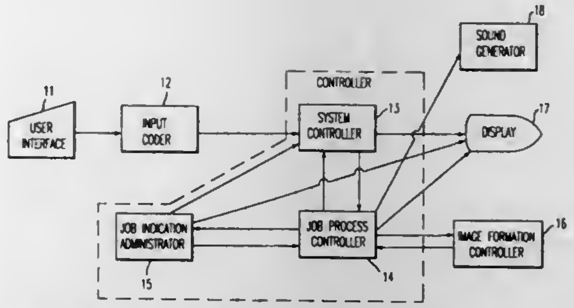
Filed Oct. 5, 1995, Ser. No. 540,240

Claims priority, application Japan, Oct. 5, 1994, 6-266212

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—81 **12 Claims**

1. An image forming apparatus, comprising:
a user interface which inputs information from a user including information regarding a certain time when to stop generating images and outputs information to the user;
an automatic document feeder;
an optical scanner which receives pages from the automatic document feeder;



an image generator which prints an image using image information received from the optical scanner; and
a controller, connected to the user interface, automatic document feeder, optical scanner, and image generator which receives, when the image forming apparatus is generating images input information from the user interface and changes parameters used to control the image forming apparatus,
wherein the controller changes parameters of a currently executing job;
wherein the controller changes parameters of a job which is to execute in the future; and
wherein the controller stops the generation of images when the certain time to stop the generation of images has occurred.

5,689,766

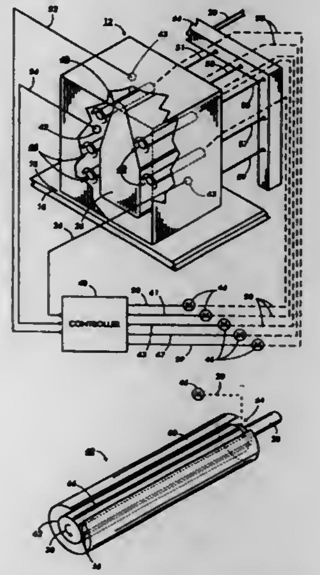
APPARATUS FOR CONTROLLING AIR FLOW IN A PRINTING MACHINE

Thomas C. Hollar, Penfield, and Karl B. Ayash, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1995, Ser. No. 548,220

Int. Cl.^{6} G03G *21/00;21/20*

U.S. Cl. 399—92 **16 Claims**



1. An apparatus for maintaining an ambient condition about a marking module, including:
a substantially air impervious enclosure defining a chamber having the marking module mounted therein;
an air source, coupled to said enclosure, for supplying air to the chamber;
means for sensing the air flow in the chamber of said enclosure to control the air flowing from said air source to the chamber; and
an air dispersion device, coupled to said air source and said sensing means, for controlling the air flow to the chamber of said enclosure, said dispersion device includes a plurality of diffusers, and a plurality of valves coupled to said plurality of diffusers, said valves being responsive to said sensing means for controlling air flow.

5,689,767

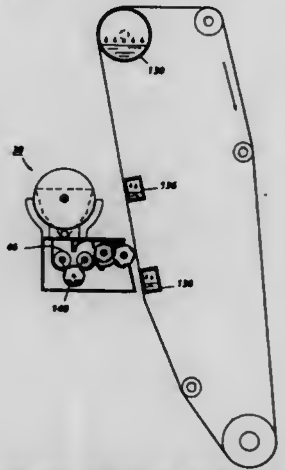
ISOTHERMALIZING MEMBER FOR A PRINTING MACHINE

Gerald A. Domoto, Briarcliff Manor; Elias Panides, Hartsdale; Karl B. Ayash, Webster; Thomas C. Hollar, Penfield, and Michael J. Martin, Hamlin, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1995, Ser. No. 551,088

Int. Cl.^{6} G03G *21/20*

U.S. Cl. 399—94 **10 Claims**



1. A printing machine having an apparatus for equalizing the temperature of a body in contact with the apparatus, comprising:
a sealed chamber, wherein said sealed chamber further comprises a sealed cylindrical member supported for rotation about a longitudinal axis thereof; and
a fluid contained within said sealed chamber, said fluid being in a two phase condition and the printing machine having a photoreceptive web member for forming images thereon, wherein said photoreceptive web member is supported for movement by said sealed cylindrical member.

5,689,768

ELECTROPHOTOGRAPHING APPARATUS FOR COLLECTING TONER FROM A PHOTOSENSITIVE MEMBER AND CONVEYING IT TO DEVELOPING MEANS

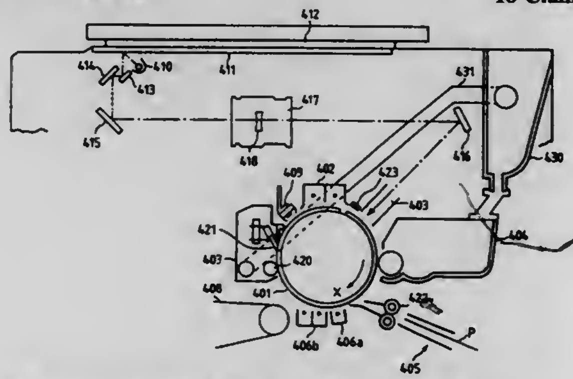
Toshiyuki Ehara, Yokohama; Koji Yamazaki, Nara, and Tetsuya Karaki, Kyoto, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1995, Ser. No. 568,268

Claims priority, application Japan, Dec. 7, 1994, 6-303644

Int. Cl.^{6} G03G *5/08;15/00;21/00*

U.S. Cl. 399—96 **18 Claims**



14. An electrophotographing apparatus comprising:
a photosensitive member capable of bearing toner thereon, in which the absolute value of the temperature dependency of the receptive potential of said photosensitive member at a temperature of 25° to 45° C. is 0.5 (%/deg) or less;
latent image forming means for forming a latent image on said photosensitive member;
developing means for developing the latent image with toner as a toner image;
transfer means for transferring the toner image formed on said photosensitive member onto a transfer material at a transfer position;
collection means for collecting the toner from a surface of said photosensitive member after said surface passes through said transfer position;
toner convey means for conveying the toner collected by said collection means to said developing means; and
a heat source disposed in the proximity of the surface of said photosensitive member and adapted to heat said photosensitive member with a temperature gradient of 1 to 100 (deg/sec).

5,689,769

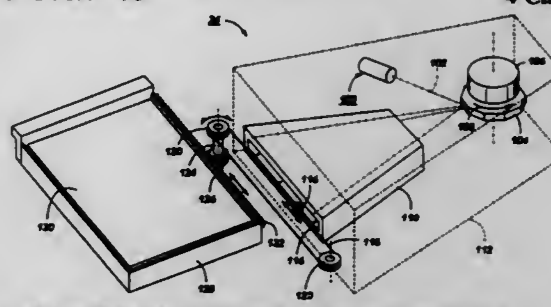
SEMI-AUTOMATIC EXIT WINDOW CLEANER

James J. Appel, Rochester; Edward A. Powers, Penfield, and Kenneth R. Ossman, Macedan, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1996, Ser. No. 669,121

Int. Cl.^{6} G03G *15/04*

U.S. Cl. 399—98 **4 Claims**



1. A semi-automatic exit window cleaner comprised of:
an exit window;
a wiper for contacting said exit window;
a movable mechanical coupling operatively connected to said wiper; and
a drive mechanism attached to said mechanical coupling, said drive mechanism for moving said mechanical coupling when an operator moves an operator accessed element, wherein said moving of said mechanical coupling causes said wiper to swipe across said exit window;
wherein said operator accessed element is a substrate holding drawer.

5,689,770

IMAGE FORMING APPARATUS WHICH MAINTAINS A TEMPERATURE OF A CHARGE ROLLER

Junji Kurokawa, Yokohama; Kazuo Nojima, Chiba; Masako Chiba, Urawa, and Toshio Nakahara, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 210,446, Mar. 21, 1994, which is a division of Ser. No. 983,966, Dec. 1, 1992. This application Jul. 25, 1995, Ser. No. 506,814

Claims priority, application Japan, Dec. 2, 1991, 3-343985; Apr. 10, 1992, 4-091070; Oct. 31, 1992, 4-316489

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 399—100 **15 Claims**

1. In a charging device for an image forming apparatus, a cleaning member is held in contact with a charge roller having an

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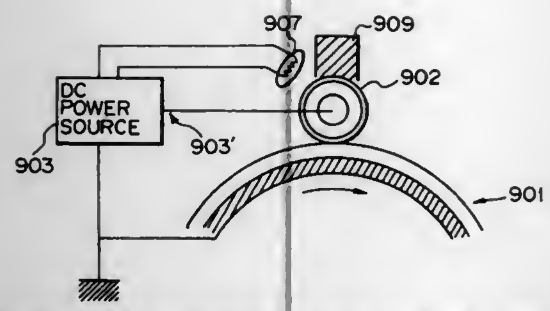


elastic layer formed of epichlorohydrin rubber, said charge roller being rotated before actual image formation.

5,689,771
COLOR IMAGE FORMING APPARATUS HAVING BIAS CONTROLLER FOR CLEANING TRANSFER ROLLER

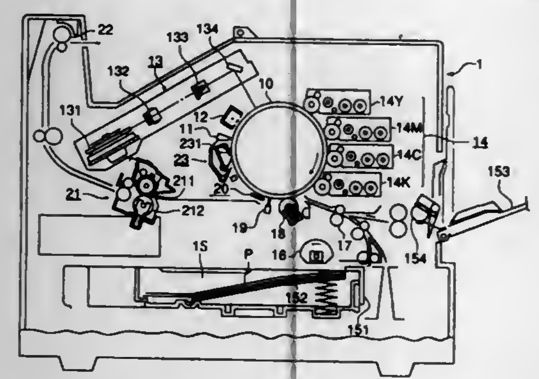
Kazuhiko Sato, and Shigeki Takenouchi, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 23, 1996, Ser. No. 606,365

Claims priority, application Japan, Mar. 2, 1995, 7-066657; Mar. 14, 1995, 7-054287

Int. Cl.^{6} G03G *15/16*

U.S. Cl. 399—101 **12 Claims**



1. An apparatus for forming a multi-color image composed of at least two component colors on a sheet material, comprising:

an electrically chargeable photoconductor on which a toner image is formed, the photoconductor having a transfer section at which the toner image is transferred from the photoconductor to the sheet material, wherein the photoconductor is rotatable and has a radius of curvature larger than 40 mm at the transfer section;

image forming means comprising means for charging the photoconductor, means for imagewise exposing the charged photoconductor so as to form a latent image, means for developing the latent image so as to form a color toner image, the image forming means forming at least two component color toner images one after another on the photoconductor so that a latter color toner image is superimposed on a charged former color toner image on the charged photoconductor, wherein the toner images on the photoconductor have an electric polarity;

means for transferring the toner images onto the sheet material, the transferring means comprising

a transferring roller whose surface is made of an elastic foamed material in which an average cell diameter is 1 μm to 300 μm, the transferring roller coming in contact with the sheet material and pressing the sheet material onto the photoconductor at the transfer section during a transferring operation so that the toner images are transferred at a time as the multi-color image onto the sheet material, and

an electric bias member for applying an electric bias onto the transferring roller, wherein

during the transferring operation, the electric bias member applies onto the transferring roller an opposite electric bias of a constant current having the opposite electric polarity to that of the toner image, and

during a cleaning operation in which the transferring roller is brought in contact with the photoconductor at the transfer section so as to shift toner adhered on the transferring roller to the photoconductor, the electric bias member applies onto the transferring roller alternately an identical electric bias of a constant voltage having the identical electric polarity with that of the toner image and an opposite electric bias of a constant current having the opposite electric polarity to that of the toner image, six times or more.

5,689,772
FRAME, DEVELOPING APPARATUS, PROCESS CARTRIDGE AND ELECTRO-PHOTOGRAPHIC IMAGE FORMING APPARATUS HAVING A TONER FRAME AND A DEVELOPING FRAME COUPLED THERETO

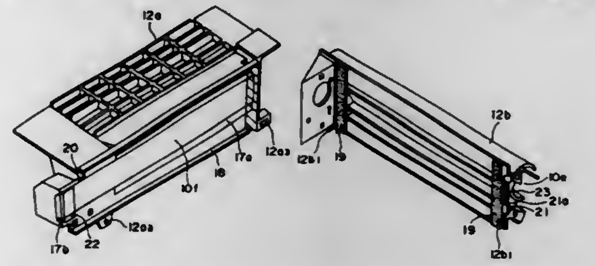
Yasuo Fujiwara, Urawa, and Satoshi Kurihara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 502,290

Claims priority, application Japan, Jul. 15, 1994, 6-163567

Int. Cl.^{6} G03G *15/00;15/08*

U.S. Cl. 399—106 **47 Claims**



1. A frame for a developing device for a process cartridge detachably mountable to a main assembly of an image forming apparatus, said frame comprising:

a developing frame having a mounting portion for mounting a developing roller for developing a latent image formed on an electrophotographic photosensitive member, said developing frame having a projection on a side opposed from a side provided with said mounting portion, said projection being disposed longitudinally outside an elastic seal provided adjacent one longitudinal end of said developing frame to prevent leakage of toner;

a toner frame having a toner container portion for containing toner usable for a developing operation of the developing roller, said toner frame having a toner supply opening for supplying toner to the developing roller and a recess adjacent a longitudinal end of said toner supply opening; and

a toner seal provided with said toner frame for openably sealing said toner supply opening,

wherein said projection and said recess are engageable with each other to couple said developing frame and said toner frame, and wherein said toner seal is removed with a removal direction thereof being limited by said projection engaged with said recess.

5,689,773
EXCHANGEABLE TONER CARTRIDGE FOR AN IMAGE FORMING APPARATUS

Yong Ung Ha, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

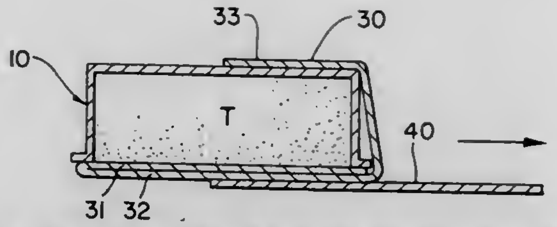
Filed Mar. 11, 1996, Ser. No. 612,824

Claims priority, application Rep. of Korea, Mar. 9, 1995, 95-4021

Int. Cl.^{6} G03G *15/08*

U.S. Cl. 399—106 **6 Claims**

1. An exchangeable toner cartridge installed on a developing unit having a flange upwardly extended from a lower edge of each side thereof, said toner cartridge comprising discrete first and second sealing means, said first sealing means removably attached to the bottom of said toner cartridge for selectively closing off a toner supplying opening formed at the bottom; and second sealing means removably disposed on said first sealing means for preventing leakage or spread of toner due to poor attachment or excess movement during removal of said first sealing means.



5,689,774
PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS USING SUCH A PROCESS CARTRIDGE

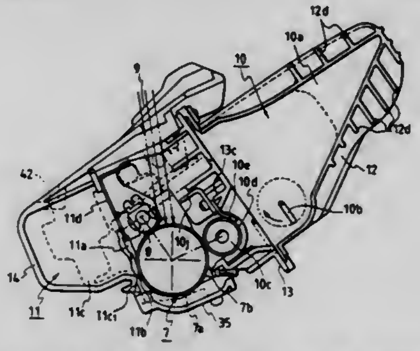
Kazuo Shishido, Yokohama; Shinichi Sasaki, Fujisawa; Isao Ikemoto, Kawasaki; Masahiko Yashiro, Yokohama; Toshiyuki Karakama, Tokyo, and Atsushi Numagami, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 306,518, Sep. 15, 1994, Pat. No. 5,543,898, which is a continuation of Ser. No. 70,703, Jun. 2, 1993, abandoned. This application Jun. 27, 1996, Ser. No. 671,352

Claims priority, application Japan, Sep. 4, 1992, 4-260613; Oct. 15, 1992, 4-301587

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—111 **27 Claims**



1. An electrophotographic process cartridge adapted to be removably inserted, in a direction transverse to an axial direction of a photosensitive drum of said process cartridge, into an image forming apparatus having a driving gear and an arrangement that guides said process cartridge to an operative position in the image forming apparatus and supports said process cartridge in the operative position, said process cartridge comprising:

a rotatable photosensitive drum;

a driven gear disposed coaxially with said photosensitive drum so as to cooperate with the driving gear of the image forming apparatus when said process cartridge is mounted in the image forming apparatus;

a charging roller disposed adjacent said photosensitive drum;

a developing roller disposed adjacent said photosensitive drum;

a cleaning blade disposed adjacent said photosensitive drum;

a casing having a front frame, relative to the insertion direction of said process cartridge, formed from a resin material, said photosensitive drum and said cleaning blade being disposed in said front frame and said front frame containing a waste toner reservoir that includes front frame reinforcing internal ribs; a middle frame, formed from the resin material that said front frame is formed, in which said developing roller is disposed; a rear frame, formed from the resin material that said front frame and said middle frame are formed, which includes a developer reservoir and a grip portion that is grippable by an operator when inserting said process cartridge into and removing said process cartridge from the image forming apparatus; a light passing opening through which latent image forming light is passed to said photosensitive drum; and an image transfer opening through which developed images are transferred from said photosensitive drum to a transfer material; and

outwardly protruding guide members disposed on said casing at opposite sides of said front frame so as to cooperate with the arrangement of the image forming apparatus when said process cartridge is mounted in the image forming apparatus.

5,689,775
TRANSFER DEVICE CONFIGURATION IN AN IMAGE-REPRODUCING STATION

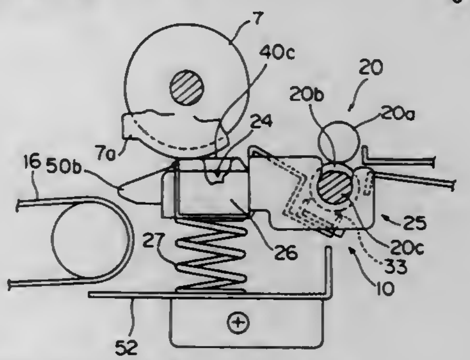
Takeshi Marumoto, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 3, 1996, Ser. No. 582,316

Claims priority, application Japan, Jan. 10, 1995, 7-002134

Int. Cl.^{6} G03G *15/16*

U.S. Cl. 399—121 **6 Claims**



1. An image reproducing device comprising:

a frame;

an image forming element supported within said frame;

a sheet supply device supported in said frame for transporting sheets to the image forming element;

a transfer device disposed approximately between said sheet supply device and said image forming element, said transfer device comprising:

a shield frame supported within the image reproducing device;

a housing formed with a pair of insulating blocks and a connector extending between said insulating blocks, said connector and said insulating blocks formed integrally as a single element, said housing supported within a portion of said shield frame;

a discharge wire extending between said insulating blocks and supported thereby, said discharge wire positioned proximate the image forming element, and a portion of said shield frame shaped to at least partially surround said discharge wire; and

a charge removing member fitted to said connector.

5,689,776
CONTACT CHARGING SYSTEM FOR UNIFORMLY CHARGING A CHARGE RETENTIVE SURFACE

Andrew B. Radcliffe, Rochester, and Dale R. Mashtare, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1995, Ser. No. 538,927

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 399—174 **6 Claims**

1. A printing apparatus adapted to print page image information onto copy sheets from a photoconductive surface and including a

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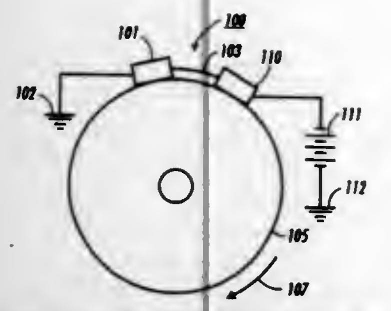
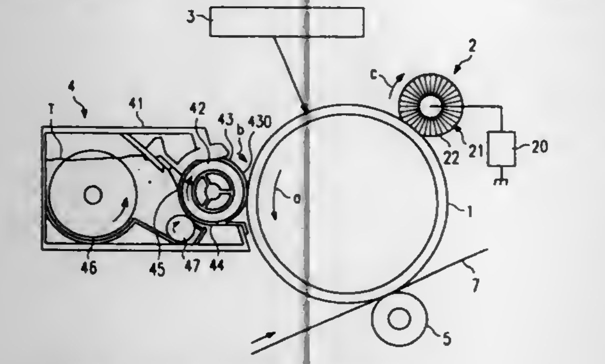


contact charging system for uniformly charging the photoconductive surface by tailoring electric fields, comprising:
a biasing source;
a pair of shoes with one of the shoes being grounded and the other being biased to a desired DC potential by said biasing source; and
a resistive film in contact with said pair of shoes and wherein said film or shoes are adapted to be placed in contact with the photoconductive surface.

5,689,777
IMAGE FORMING APPARATUS HAVING CONTACT CHARGER

Masashi Yamamoto, Settsu; Hitoshi Saito, Mie-Ken, and Koji Uno, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed Nov. 9, 1995, Ser. No. 555,779
Claims priority, application Japan, Nov. 9, 1994, 6-274639
Int. Cl.^{6} G03G *15/02*
U.S. Cl. 399—174 **7 Claims**



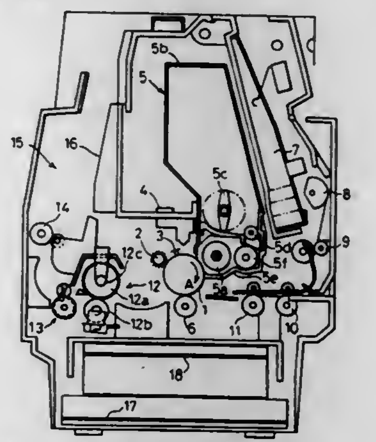
1. An image forming apparatus comprising:
a photosensitive member;
a contact charging unit having a charging rotary brush in contact with a surface of the photosensitive member;
exposure means for exposing the surface of the photosensitive member to an image over an area thereof, charged by the charging unit, to form an electrostatic latent image;
a developing unit for developing the latent image into a visible image and collecting residual developer remaining on the surface of the photosensitive member after the visual image is transferred to a transfer material; and
a power source unit for applying to the charging unit an oscillating voltage fulfilling the requirement of:

$$\Delta t<L/Vpc \text{ or } \Delta t>3\times L/Vpc$$

wherein said oscillating voltage has a plurality of peaks and a central voltage value, wherein Δt is a time taken for the oscillating voltage to vary between ±300 V above and below the central voltage value between the peaks of the oscillating voltage, L is a printing pitch, and Vpc is a speed of movement of the surface of the photosensitive member.

5,689,778
IMAGE FORMING APPARATUS

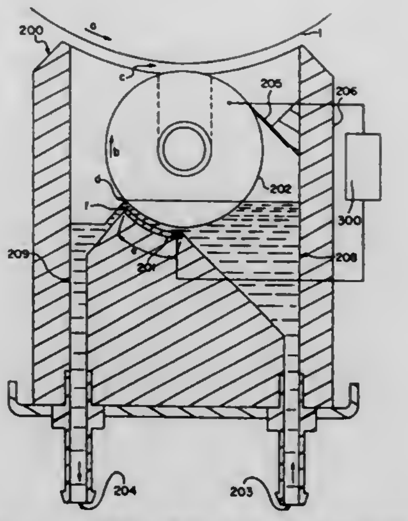
Takashi Hayakawa, Soraku-gun, and Katsumi Adachi, Ikoma-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 13, 1995, Ser. No. 557,974
Claims priority, application Japan, Dec. 28, 1994, 6-328767
Int. Cl.^{6} G03G *15/02*
U.S. Cl. 399—174 **29 Claims**



1. An image forming apparatus comprising:
an image carrier for holding a developer image on a surface thereof;
charging means for charging the surface of said image carrier;
exposing means for forming an electrostatic latent image by exposing the charged surface of said image carrier;
developing and cleaning means for collecting residual developer remaining on the surface of said image carrier after a transfer operation, and applying developer to the electrostatic latent image so as to form a developer image;
transferring means for transferring the developer image to a transfer material; and
developer scattering means, provided separately from said charging means, for scattering the residual developer before the surface of said image carrier moves to an exposure position from a charging position.

5,689,779
LIQUID DEVELOPER AND DEVELOPING METHOD AND DEVELOPING APPARATUS USING SAME

Hidetoshi Miyamoto, Takatsuki; Toshimitsu Fujiwara, Kobe, and Shuji Iino, Muko, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed May 8, 1996, Ser. No. 646,568
Claims priority, application Japan, May 8, 1995, 7-109728
Int. Cl.^{6} G03G *15/10;9/08*
U.S. Cl. 399—237 **16 Claims**



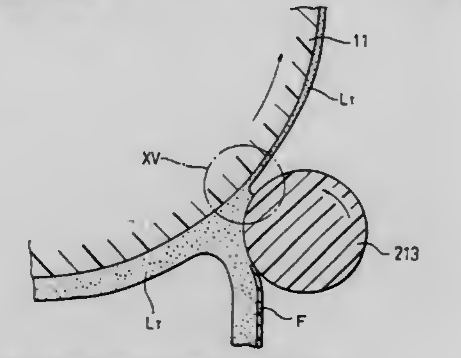
1. A liquid developer for developing an electrostatic latent image comprising a carrier fluid and electrically charged toner particles dispersed therein, wherein said liquid developer satisfies the following relationship:

$$25.0\geqq V_0/\Delta V_{10}\geqq 1.5$$

wherein V_0 denotes surface potential of a toner particle layer electrically deposited on a conductive substrate by applying bias voltage between said substrate and an electrode confronting said substrate, and ΔV_{10} denotes change of the surface potential decaying for 10 seconds after shutting off the bias voltage.

5,689,780
ELECTROPHOTOGRAPHIC COLOR PRINTING APPARATUS USING SUCCESSIVELY ENGAGEABLE DEVELOPING UNITS

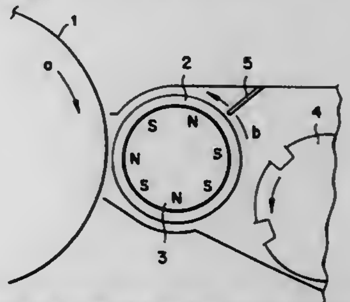
Yoshihiro Tamura, Tokyo; Hidetoshi Hara, and Jun Inagaki, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Division of Ser. No. 307,772, Sep. 26, 1994, abandoned. This application May 31, 1996, Ser. No. 656,805
Claims priority, application Japan, Jan. 27, 1993, 5-11949
Int. Cl.^{6} G03G *15/10*
U.S. Cl. 399—249 **11 Claims**



1. An electrophotographic printer comprising:
a photosensitive drum;
exposure means for forming an electrostatic latent image based on print information;
developing means for developing said electrostatic latent image on said photosensitive drum into a toner image by means of a wet toner;
a first squeeze roller for squeezing surplus wet toner adhering to said photosensitive drum, said first squeeze roller being set so that a contact angle at which a liquid carrier of said wet toner is in contact with a surface of said first squeeze roller is smaller than a contact angle at which said liquid carrier is in contact with a surface of said photosensitive drum;
transfer means for transferring said toner image onto a recording medium, which the toner image is to be transferred to and fixed on; and
fixing means for fixing said toner image transferred on said recording medium onto said recording medium.

5,689,781
CARRIER FOR ELECTROSTATIC LATENT IMAGE DEVELOPING

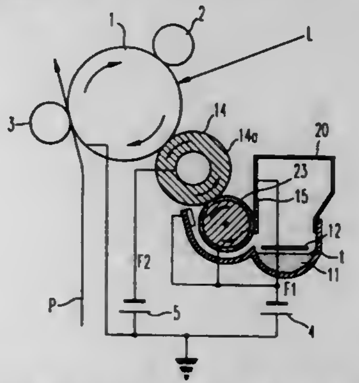
Hiroshi Shibano, Takarazuka; Tomoharu Nishikawa, Osaka; Koichi Takenaka, Itami, and Hideaki Yasunaga, Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed Aug. 31, 1995, Ser. No. 522,104
Claims priority, application Japan, Sep. 7, 1994, 6-213501
Int. Cl.^{6} G03G *15/08*
U.S. Cl. 399—252 **21 Claims**



1. A method for forming a magnetic brush comprising:
forming an electrostatic latent image;
rotating a sleeve which is adjacent to the image;
arranging a fixed magnet adjacent to the sleeve; and
applying a developer including a toner and a carrier onto said sleeve, said carrier having a saturation magnetization of about 50 to about 80 emu/g, a residual magnetization of about 3 to about 10 emu/g, and a coercive force of about 20 to about 50 oersted, said carrier comprising a binder resin and magnetic powder dispersed in the binder resin.

5,689,782
DEVELOPING APPARATUS FOR ELECTRONIC PHOTOGRAPHIC RECORDING EQUIPMENT, HAVING TWO DEVELOPER TRANSFER ROLLERS

Eisaku Murakami, Hiratsuka; Kazuhiro Yuasa, Zama; Shuichi Endoh, Isehara; Iwao Matsumae, Musashino; Yoshiaki Tanaka, Kawasaki; Hiroshi Hosokawa, Yokohama; Mugizirob Uno, Isehara; Hiroshi Saitoh, Ayase; Eizi Takenaka, Isehara; Toshihiro Sugiyama, Atsugi; Tetsuo Yamanaka, Tokyo-to, and Satoru Komatsubara, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 7, 1995, Ser. No. 485,772
Claims priority, application Japan, Jun. 8, 1994, 6-126458
Int. Cl.^{6} G06G *15/08*
U.S. Cl. 399—281 **10 Claims**



1. A developing apparatus comprising first developer transfer means for attracting and transferring a developer, developer control means for thinning the developer on said first developer transfer means and charging said developer by friction, second developer transfer means for attracting the developer, which is friction-charged by said developer control means on said first developer

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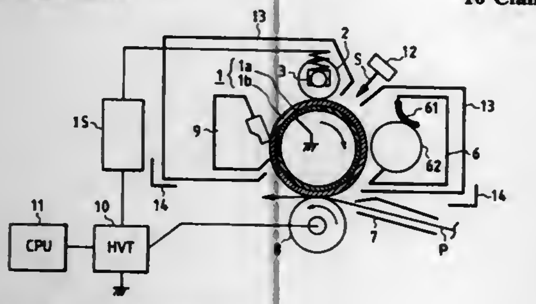
transfer means, at a contact position with the first developer transfer means, transferring the developer onto a photoreceptor for electronic photography at a developing position and developing a static latent image, and a bias power supply for applying a bias voltage at least to the first developer transfer means and the second developer transfer means and generating a static power which makes the developer on the first developer transfer means attracted at said contact position by the second developer transfer means, said first developer transfer means being provided with an insulation layer, wherein a volume resistance value at a position near a surface layer of said second developer transfer means is larger than a volume resistance value of said insulation layer.

5,689,783

ELASTIC BLADE AND DEVELOPING DEVICE USING THE SAME

Hiroshi Sasame, Yokohama; Toru Ishigaki, Ibaraki-ken; Noriyuki Yanai, Yokohama; Tetsuya Kobayashi, Kawasaki; Naoki Enomoto; Yoshiro Saito, both of Yokohama, and Arihiro Yamamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1996, Ser. No. 651,894
Claims priority, application Japan, Jun. 2, 1995, 7-136820
Int. Cl.^{6} G03G *15/08*
U.S. Cl. 399—284 **10 Claims**



1. An elastic blade comprising:
a rubber layer; and
a surface resin layer provided on the rubber layer;
wherein said surface resin layer satisfies the following condition:

$$3 \leqq E \times t \leqq 30,$$

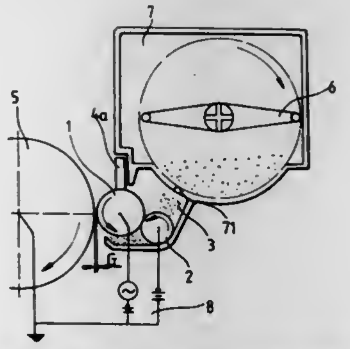
where
E: elastic modulus of the surface resin layer (kg/cm^2);
t: thickness of the surface resin layer (cm).

5,689,784

NON-CONTACTING, NON-MAGNETIC, MONO-COMPONENT DEVELOPING APPARATUS

Kyu-chul Shin, and Kyung-hwan Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 15, 1994, Ser. No. 357,609
Claims priority, application Rep. of Korea, Jun. 30, 1994, 94-15692
Int. Cl.^{6} G03G *15/08*
U.S. Cl. 399—285 **2 Claims**



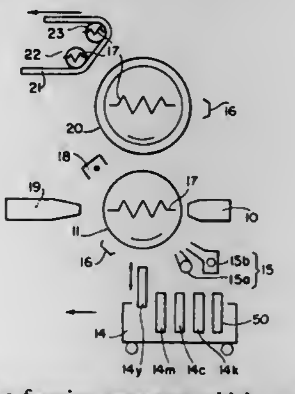
1. A non-contacting, non-magnetic, mono-component developing apparatus comprising:
a developing roller made entirely of a polyurethane rubber having a semi-conductivity and a same surface roughness as that of a toner particle;
a toner supplying roller made of a polyurethane foam for supplying the toner particles and for charging the toner particles on said supplying roller by a frictional nipping action with said developing roller;
doctor means for forming a uniformly thin toner layer on the surface of said developing roller while contacting said developing roller;
a photosensitive drum which is maintained at a developing gap between said drum and said developing roller so that developing of an image on said drum is performed without contact with said developing roller;
an electric power source for applying a predetermined bias voltage across said developing roller, said toner supplying roller and said photosensitive drum, wherein said bias voltage is a combination of a direct current and an alternating current, with said developing roller and said drum having said alternating current applied thereto and said toner supplying roller having a direct current applied thereto, whereby image density is increased as said gap is decreased, wherein said gap is no more than five times a mean diameter of said particles.

5,689,785

COLOR IMAGE FORMING METHOD AND APPARATUS USED THEREFOR

Eiichi Kato, and Sadao Osawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 219,453, Mar. 29, 1994, Pat. No. 5,582,941. This application May 9, 1996, Ser. No. 647,217
Claims priority, application Japan, Mar. 30, 1993, 5-093833
Int. Cl.^{6} G03G *15/01;15/00*
U.S. Cl. 399—302 **6 Claims**



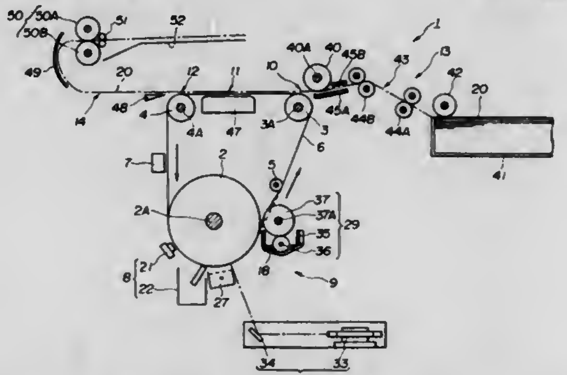
1. A color image forming apparatus which comprises a means for forming a mono-color or multi-color toner image on an electrophotographic photoreceptor by an electrophotographic process; a means for forming a releasable transfer layer on said photoreceptor having said toner image formed thereon; a means for transferring said toner image together with said transfer layer onto a primary receptor; and a means for transferring said toner image together with said transfer layer from said primary receptor onto a receiving material.

5,689,786

IMAGE FORMING APPARATUS HAVING ENDLESS BELT PHOTOSENSITIVE MEMBER IN WHICH THE SOLIDIFIED DEVELOPER BECOMES MOLTEN

Hiroshi Tokunaga, Tokyo; Hideki Matsuzaka, and Akira Shirakura, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP94/02271, § 371 Date Sep. 27, 1995, § 102(e) Date Sep. 27, 1995, PCT Pub. No. WO95/18402, PCT Pub. Date Jul. 6, 1995
PCT Filed Dec. 27, 1994, Ser. No. 507,235
Claims priority, application Japan, Dec. 28, 1993, 5-338624
Int. Cl.^{6} G03G *15/16*
U.S. Cl. 399—307 **19 Claims**



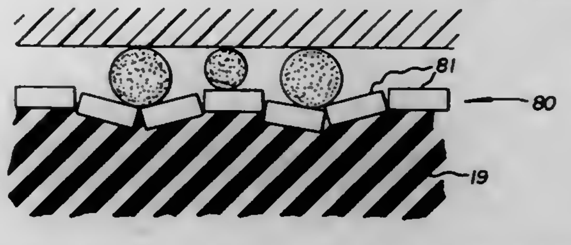
1. An image forming apparatus comprising:
a solidified developer which is solid at an ordinary temperature, is molten by implementing a heating processing thereto, and is re-solidified by implementing a cooling processing thereto and including printing particles dispersed in a dispersion medium of the solidified developer;
an endless belt-shaped photosensitive member;
a traveling guide section composed of a drive roller of a first diameter and a pair of guide rollers of a second, smaller diameter disposed in such a manner that their respective outer circumferential surfaces mutually constitute the same plane with respect to a horizontal direction, the traveling guide section being adapted to allow the endless belt-shaped photosensitive member to be laid across the respective rollers for undergoing endless traveling;
an image preparation process section comprised of electrification means for electrifying an entire surface of the endless belt-shaped photosensitive member, exposure means for allowing the surface of the endless belt-shaped photosensitive member electrified on the basis of a picture signal to be exposed to light to form an electrostatic latent image, and development means for delivering the solidified developer in a molten state to the surface of the endless belt-shaped photosensitive member to form a developer image corresponding to the electrostatic latent image, the electrification means, the exposure means, and the development means being disposed in order along a traveling direction of the endless belt-shaped photosensitive member at the outer circumferential portion of the drive roller of the traveling guide section;
a recording sheet supply section for delivering a recording sheet;
a recording sheet delivered from the recording sheet supply section and caused to be closely in contact with the surface of the endless belt-shaped photosensitive member on which a developer image is formed;
heating means for heating one of the endless belt-shaped photosensitive member or the recording sheet so that a temperature thereof is more than the melting point of the dispersion medium of the solidified developer to cause the developer image formed on the surface of the endless belt-shaped photosensitive member to be in a molten state;
cooling means disposed at a front end portion where the endless belt-shaped photosensitive member is traveled in a horizontal direction and adapted for cooling the endless belt-shaped photosensitive member with which the recording sheet is closely in contact and the recording sheet so that the solidified developer in a molten state for forming the developer image is re-solidified on the surface of the recording sheet and is transferred thereto while the surface of the belt-shaped photosensitive member and the recording sheet are horizontally disposed; and
peeling means for peeling from the endless belt-shaped photosensitive member the recording sheet to which the developer image is transferred from the endless belt-shaped photosensitive member.

5,689,787

TRANSFER MEMBER HAVING SECTIONED SURFACE COATING TO ENHANCE MICRO-COMPLIANCE

Thomas N. Tombs, Brockport; Donald S. Rimai, Webster; David J. Quesnel, Pittsford, and William B. Vreeland, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1996, Ser. No. 648,846
Int. Cl.^{6} G03G *15/16;* **B32B** *3/00*
U.S. Cl. 399—308 **21 Claims**



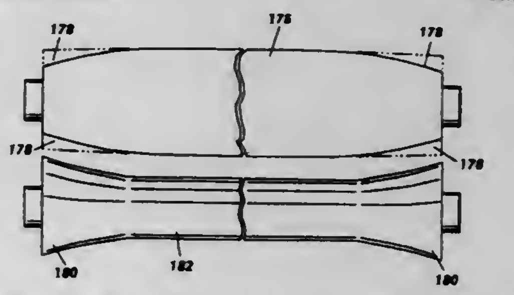
1. An intermediate transfer member for transferring a toner image from a primary image member in an electrophotographic apparatus to a receiving sheet, comprising:
a substrate;
a compliant blanket attached to a surface of said substrate; and
an overcoat, bonded to said complaint blanket, sectioned into small segments wherein said segments are less than about 1 mm at a longest dimension.

5,689,788

HEAT AND PRESSURE ROLL FUSER WITH SUBSTANTIALLY UNIFORM VELOCITY

Rabin Moser, Victor, N.Y., assignor to Xerox Corporation, Stamford

Filed Mar. 22, 1996, Ser. No. 620,640
Int. Cl.^{6} G03G *15/20*
U.S. Cl. 399—328 **4 Claims**



1. Fuser apparatus for fixing toner images to various substrates, said apparatus comprising:
a pair of roller members each comprising an outer deformable elastomeric layer;
one of said roller members having a nonuniform diameter such that its center has a larger diameter than its ends;
another of said roller members having flared ends;
said ends of said one of said roller members having a dimension that produces a substantially uniform nip profile and a uniform nip velocity when moved in pressure engagement with

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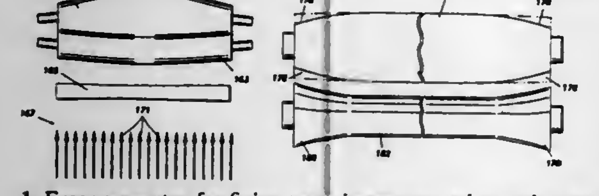
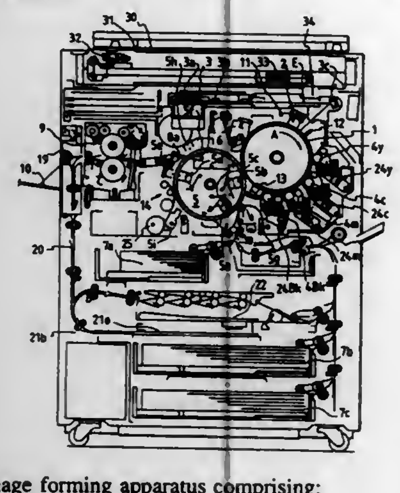
said another of said roller members, said ends of said one of said roller members including a thickness equivalent to an amount of flare on said another of said roller members.

5,689,789
UNIFORM NIP VELOCITY ROLL FUSER
Rabin Moser, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 22, 1996, Ser. No. 621,302
Int. Cl.^{6} G03G *15/20*
U.S. Cl. 399—331 **3 Claims**



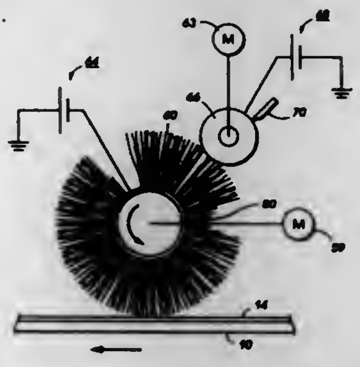
1. Fuser apparatus for fixing toner images to various substrates, said apparatus comprising:
- a heated fuser roll having an outer deformable elastomeric layer and a nonuniform diameter such that it has a larger diameter at its center than at its ends;
- a pressure roll having an outer deformable elastomeric layer having a thickness that is equal to or less than the thickness of the deformable elastomeric layer of said fuser roll and having a uniform diameter;
- said ends of said fuser roll having a dimension that produces a substantially uniform nip profile and a uniform nip velocity when moved in pressure engagement with said pressure roll.

5,689,790
IMAGE FORMING APPARATUS WITH SPACE PARTICLE LAYER FORMED ON TRANSFER DRUM
Takahiro Kubo, Tokyo; Yoshihiro Murasawa, Yokohama; Takashi Hasegawa, Ageo, and Satoshi Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 258,422, Jun. 10, 1994, abandoned.
This application May 15, 1996, Ser. No. 655,287
Claims priority, application Japan, Jun. 15, 1993, 5-168590; Jun. 15, 1993, 5-168591
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 399—343 **26 Claims**



1. An image forming apparatus comprising:
- an image bearing member; and
- a recording material bearing member for bearing a recording material to convey it to a transfer station where an image is transferred from said image bearing member onto the recording material, said recording material bearing member being capable of bearing a plurality of recording materials simultaneously at different positions thereon;
- wherein said apparatus is operable in a mode in which respective images are successively transferred onto first and second surfaces of each recording material, and, in said mode, when images are formed on the second surfaces of the plurality of recording materials, during a time period in which an area of said recording material bearing member with which the first surface of the recording material was previously contacted is passing through at least said transfer station without bearing the recording material, spacer particles are provided between said image bearing member and said area on said recording material bearing member to prevent transfer of oil to said image bearing member from said area on said recording material bearing member.

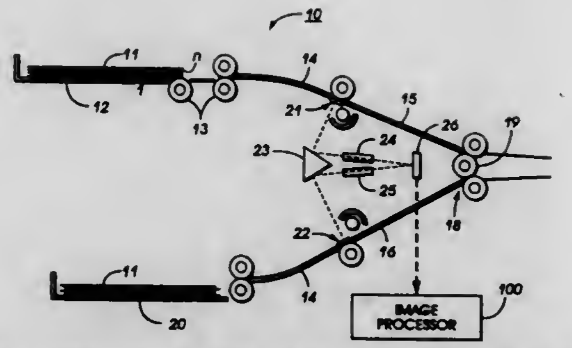
5,689,791
ELECTRICALLY CONDUCTIVE FIBERS
Joseph A. Swift, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 1, 1996, Ser. No. 673,531
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 399—353 **28 Claims**



1. A miniature cleaning brush, wherein said brush has a small diameter and comprises fine diameter electroconductive fibers comprising a filamentary polymer substrate with finely divided electrically conductive filler particles suffused through the filamentary polymer substrate and which filler particles are present within the filamentary polymer substrate as a uniformly dispersed phase adhered to the polymer substrate in an annular region located at the periphery of the fiber and extending inwardly along the diameter thereof, wherein said electrically conductive particles are present in an amount sufficient to render the electrical resistance of the fibers to be from about 1×10^3 ohms/cm to about 1×10^{12} ohm/cm, and wherein said miniature brush has a fiber fill density of from about 60,000 to about 350,000 fibers per square inch.

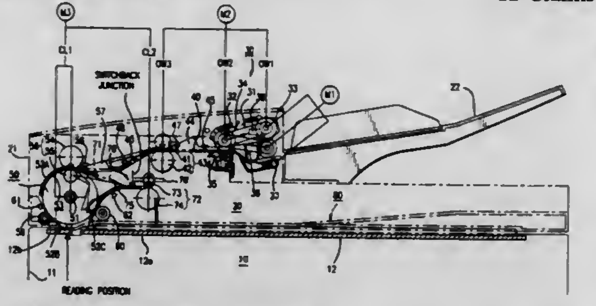
5,689,792
SIMPLIFIED AND HIGHER PRODUCTIVITY DUPLEX DOCUMENT SCANNING SYSTEMS
Thomas Acquaviva, Penfield; James D. Rees, Pittsford, and John A. Durbin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 1, 1995, Ser. No. 566,271
Int. Cl.^{6} G03G *15/00*
U.S. Cl. 399—365 **19 Claims**

1. An imaging system for imaging with higher productivity both of first and second opposing sides of duplex document sheets sequentially fed from a stack thereof in an input tray, comprising:
- a generally "V" shaped document feeding path with first and second arms meeting at a base position,
- a document sheet feeding input path system for sequentially feeding document sheets from said input tray into and through said first arm to said base position,



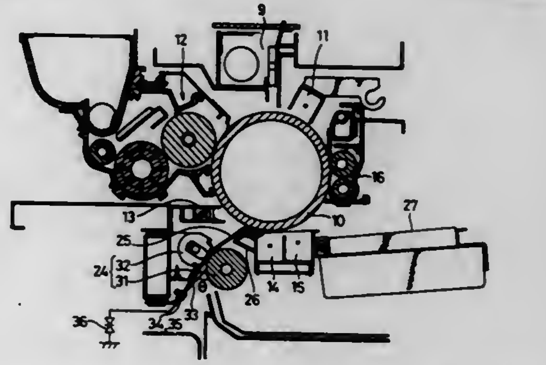
- a document sheet reversing system at said base position for reversing the direction of movement of document sheets received from said first arm and feeding said document sheets into said second arm without inversion,
- a document sheet feeding output path system for feeding document sheets through said second arm from said base position,
- a document sheet output tray for receiving document sheets fed through said second arm from said base position,
- a first imaging station in said first arm for imaging said first sides of said document sheets,
- and a second imaging station in said second arm for imaging said second sides of said document sheets,
- and an optics system for said first and second imaging stations which is positioned in between said first and second arms and inside of said generally "V" shaped document feeding path so that said document sheets feed through said second arm without interfering with said imaging of said first sides in said first imaging station.

5,689,793
AUTOMATIC DOCUMENT FEEDER WITH A COMPACT DOCUMENT REVERSING DEVICE
Atsumi Kobayashi; Hidenobu Sugano; Masaki Ohmori, and Tetsuya Aiyama, all of Yamanashi, Japan, assignors to Nisca Corporation, Yamanashi, Japan
Filed Nov. 2, 1995, Ser. No. 552,084
Claims priority, application Japan, Nov. 8, 1994, 6-298816
Int. Cl.^{6} G03G *15/00*
U.S. Cl. 399—374 **12 Claims**



1. A document feeder comprising;
- a platen for reading and scanning an original document with an image transferred at a predetermined speed;
- a feeding stacker for storing the original document with the image and feeding the original document to said platen;
- an ejection stacker for storing the original document transferred from said platen after the image is read;
- a feeding roller having an original document transfer inlet connected to said feeding stacker, a transfer outlet connected to said ejection stacker, and a transfer path extending from the transfer inlet to the transfer outlet through said platen along a periphery of said feeding roller so that a part of the feeding roller adjoins a reading position of the platen;
- driving means connected to said feeding roller to rotate said feeding roller;
- a first pinch roller disposed on an upstream side and a second pinch roller disposed on a downstream side in a transferring direction of a reading position of the platen, said first and second pinch rollers being engaged with said feeding roller;
- a reversing path disposed between said second pinch roller and the original document transfer inlet, said reversing path including a pair of reversible rollers for reversing the original document from the platen to exchange leading and rear edges of the original document in the transferring direction and leading the original document toward the transfer inlet of said feeding roller; and
- paper ejecting rollers disposed between said second pinch roller and said ejection stacker, said paper ejecting rollers transferring the original document from said platen to said ejection stacker.

5,689,794
PAPER TRANSPORT MECHANISM FOR USE IN AN IMAGE FORMING APPARATUS
Akihiro Kondo, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka-fu, Japan
Filed Feb. 28, 1996, Ser. No. 607,410
Claims priority, application Japan, Mar. 3, 1995, 7-044434
Int. Cl.^{6} G03G *15/00*
U.S. Cl. 399—388 **11 Claims**



1. A paper transport mechanism for use in an image forming apparatus in which a toner image formed on a surface of a photosensitive member is transferred by an image transfer voltage generated by an image transfer unit onto paper which has been fed from a paper storage up to the photosensitive member through a paper path, the paper transport mechanism comprising:
- a first roller having a width not smaller than a maximum width of the paper stored in the paper storage;
- a group of second rollers aligned along the first roller for gripping the paper therebetween and transporting it toward the photosensitive member, each of the second rollers having a small width;
- a non-undulation guide member provided immediately upstream of the first and second rollers for pressing the paper passing through the paper path against the first roller, the non-undulation guide member having a width not smaller than the maximum width of the paper;
- said non-undulation guide member being formed with an electrically conductive material and being electrically connected to a grounding terminal provided on a main body of the image forming apparatus; and
- a voltage-dependent resistor whose resistance drops when a voltage applied thereto exceeds a predetermined voltage level connected between the non-undulation guide member and grounding terminal, and wherein the predetermined voltage level is higher than a voltage across the voltage-dependent resistor when the image transfer voltage is applied by way of the paper.

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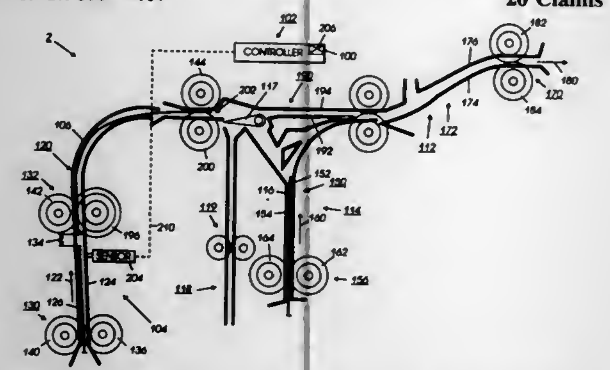
5,689,795
SHEET TRANSFER APPARATUS WITH ADAPTIVE SPEED-UP DELAY

Jane F. Mastrandrea, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 24, 1996, Ser. No. 719,269

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—407 **20 Claims**



1. A printing apparatus, including a processing section for transferring a developed image onto a copy sheet and a finishing section for receiving plural copy sheets to generate a print set, comprising:

a first sheet feeding apparatus associated with the processing section for feeding the sheets through the processing station at a first translational speed;

a second sheet feeding apparatus associated with the finishing section for feeding the sheets to the finishing section at a second translational speed;

a sheet transfer apparatus for transferring the sheets from said first sheet feeding apparatus to said second sheet feeding apparatus, for changing the speed of the sheets from the first translational speed to the second translational speed and for positioning adjacent sheets in the second feeding apparatus in a spaced apart relationship therebetween defining a space between adjacent sheets; and

a controller operably connected to the sheet transfer apparatus for controlling the feeding of sheets through the sheet transfer apparatus to permit the space to be selectively determined.

5,689,796
METHOD OF MANUFACTURING MOLDED COPPER-CHROMIUM FAMILY METAL ALLOY ARTICLE

Takao Kasai, Tokyo; Naoto Ogasawara, Saitama; Naoyoshi Akiyoshi, and Takeo Hamada, both of Osaka, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, and Toho Kinzoku Co., Ltd., Osaka, both of Japan

Filed Jul. 18, 1996, Ser. No. 687,003

Claims priority, application Japan, Jul. 18, 1995, 7-181206

Int. Cl.^{6} B22F *3/12*

U.S. Cl. 419—32 **8 Claims**

1. A method of manufacturing a molded copper-chromium family metal based alloy article which comprises injection-molding a mixture consisting essentially of copper powder, a chromium family metal powder, an iron family metal powder, phosphorous and a thermoplastic organic binder consisting essentially of a polymer binder and a low molecular binder in a ratio by volume of 5:1 to 1:1, dewaxing a molded body formed by the injection-molding by heating in a reducing atmosphere, and then sintering the dewaxed molded body at 1,100 to 1,450° C. in a reducing atmosphere.

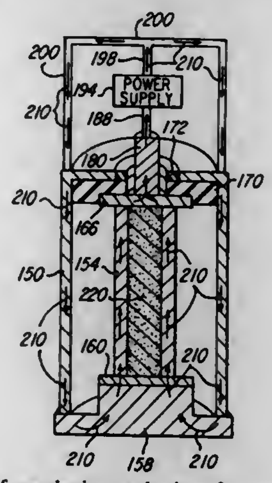
5,689,797
STRUCTURE AND METHOD FOR COMPACTION OF POWDER-LIKE MATERIALS

Bhanumathi Cheliuri, Dublin; John P. Barber, Kettering, and Duane Charles Newman, London, all of Ohio, assignors to IAP Research, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 834,148, Feb. 10, 1992, Pat. No. 5,405,574. This application Apr. 6, 1995, Ser. No. 418,593

Int. Cl.^{6} B22F *1/02;* C21D *1/04*

U.S. Cl. 419—38 **10 Claims**



1. A method of producing a body of compacted particulate material, comprising the steps of:

providing a quantity of particulate material, providing a container, said container being reusable, positioning the particulate material within the retainer, providing an electrically conductive drive member, positioning the electrically conductive drive member adjacent the particulate material in a non-electrical contacting manner, applying electrical energy to the electrically conductive drive member and creating a magnetic field to induce a current in said retainer to cause magnetic compaction pressure to be applied to the particulate material to compress the particulate material to provide a body of compacted particulate material; and

providing a retainer comprising a movable electrically conductive pressure member, positioning the movable electrically conductive pressure member adjacent the particulate material and the electrically conductive drive member, whereby as electrical energy is applied to the electrically conductive drive member to create a magnetic field which moves the movable electrically conductive pressure member toward the particulate material and magnetic compaction pressure is applied to the particulate material by movement of the electrically conductive pressure member.

5,689,798
METHOD AND APPARATUS FOR REMOVING UNDESIRABLE CHEMICAL SUBSTANCES FROM GASES, EXHAUST GASES, VAPORS, AND BRINES

Franz Dietrich Oeste, Münzenberg, Germany, assignor to Olga Dietrich, Arnheim, Netherlands, and Robert Aalbers, Münster, Germany

Division of Ser. No. 237,960, May 3, 1994, Pat. No. 5,480,524, which is a continuation-in-part of Ser. No. 991,794, Dec. 17, 1992, abandoned. This application Sep. 27, 1995, Ser. No. 534,535

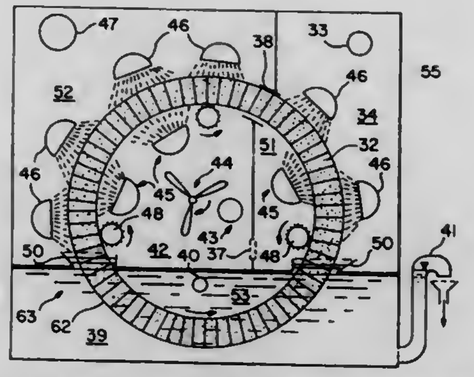
Claims priority, application Germany, Dec. 21, 1991, 41 42 520.0; Dec. 2, 1992, 42 41 451.2

Int. Cl.^{6} B01J *19/12*

U.S. Cl. 422—186.3 **12 Claims**

1. An apparatus for purifying fluid substances by photocatalytic reaction occurring on a catalyst surface, said apparatus comprising:

a closed housing formed of a corrosion-resistant material and having inlet and outlet nozzles for a purifiable substance;



a catalyst carrier supported in said housing and having a large surface area, the carrier being highly resistant to chemical corrosion and shortwave light and having a mechanical stability needed for mobile mechanical parts;

a first catalyst, applied to said catalyst carrier and consisting of a least one of oxide, mioxide or a combination thereof with semiconductor behaviors, mixed, loaded or both, with at least one metal of the platinum series of the VIII group of the periodic table of chemical elements;

a second catalyst, applied to said catalyst carrier, consisting of at least one element of the lanthanides, actinides and the IIIb group of the periodic table of chemical elements;

a frame for supporting said catalyst carrier in said housing;

at least one source of shortwave light of wavelengths from 250 to 400 nm, as a photon source;

at least one washing zone provided in said housing for said catalyst carrier and including a cavity for receiving a catalyst carrier washing liquid and provided with inlet and outlet nozzles for the washing liquid; and

means for moving said catalyst carrier through said at least one washing zone.

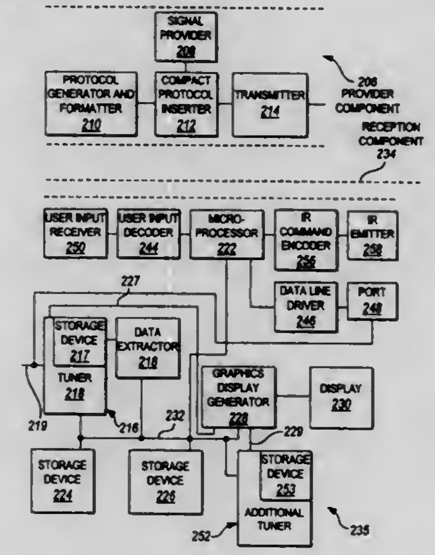
5,689,799
METHOD AND APPARATUS FOR ROUTING CONFIDENTIAL INFORMATION

Brian P. Dougherty, and Eric E. Del Sesto, both of Alameda, Calif., assignors to Wink Communications, Inc., Alameda, Calif.

Filed Apr. 26, 1995, Ser. No. 429,109

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 455—2 **20 Claims**



1. An system for routing confidential user information to a vendor comprising:

a provider component for broadcasting an application identifier to at least one reception component;

a reception component for storing at least one user identifier, receiving and storing the application identifier, assembling user response information, and transmitting to a response collector the application identifier received and the user response information assembled; and

a response collector component for storing the application identifier and vendor routing information, associating the application identifier with the vendor routing information, receiving the application identifier and user response information from the reception component, and transmitting the user response information to the vendor associated with the application identifier received.

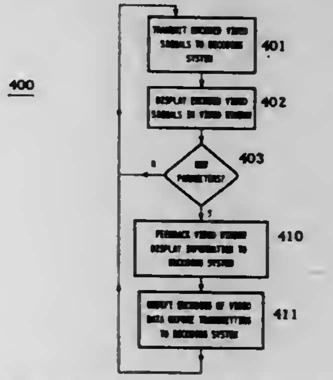
5,689,800
VIDEO FEEDBACK FOR REDUCING DATA RATE OR INCREASING QUALITY IN A VIDEO PROCESSING SYSTEM

Terry Downs, Forest Grove, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 23, 1995, Ser. No. 494,013

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 455—5.1 **18 Claims**



1. A method for processing video signals in a source computer, the method comprising the steps of:

(a) transmitting video data to a destination computer; wherein:
  the destination computer displays the video data;
  the destination computer reduces one or more of the following video data display parameters: window size, resolution, and color range; and
  the destination computer notifies the source computer of the reduction of the one or more video data display parameters; and

(b) adjusting the transmission of video data transmitted to the destination computer in accordance with the reduction of the one or more video data display parameters.

5,689,801
POWER MONITORING SYSTEM FOR A SINGLE SITE, SPLIT LOCATION TRUNKED RADIO COMMUNICATION SYSTEM

John S. Frichtel, Lynchburg; Robert O. Canada, III, Bedford, and Kennard N. Gwin, Lynchburg, all of Va., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Nov. 14, 1994, Ser. No. 340,346

Int. Cl.^{6} H04B *7/155*

U.S. Cl. 455—9 **13 Claims**

11. In a split location, single site RF trunked communications system including first and second split site locations each having plural base station transceivers connected to first and second site controllers located at the first and second locations, respectively, a method comprising the steps of:

detecting at each location, which of the first and second site controllers is controlling operation of the split location, single site RF trunked communications system, and

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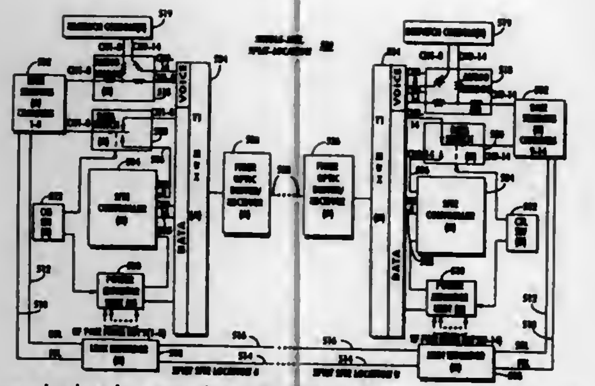


monitoring the transmitted RF power of base station transceivers at both the first and second split site locations using only one of the first and second site controllers.

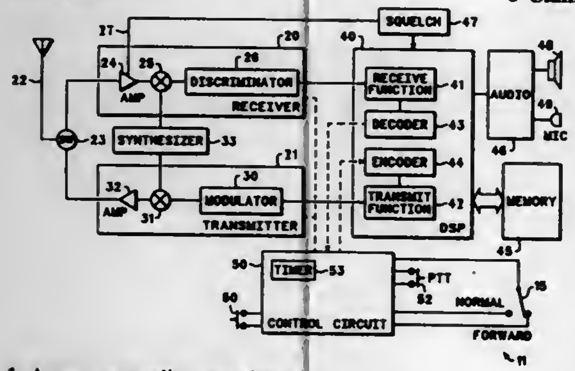
5,689,802
TWO-WAY RADIO WITH TRANSMIT MODE AND REPEAT MODE

Ariel Luzzatto, Holon, Israel, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 24, 1995, Ser. No. 410,257

Int. Cl.^{6} H04B *07/15*

U.S. Cl. 455—11.1 **3 Claims**



1. A two-way radio comprising:

a receiver for receiving a radio signal including a voice message;

a storage element coupled to the receiver for storing the voice message received;

a voice input device for inputting voice messages;

a user-actuable selection input for receiving a user input to change between a transmit mode and a repeat mode;

a transmitter selectively coupled to the storage element and the voice input device for selectively transmitting input voice messages when in the transmit mode and retransmitting the stored voice message when in the repeat mode;

a detection circuit for detecting the radio signal;

a control circuit coupled to the receiver, the transmitter and the detection circuit and operable in the repeat mode for activating the transmitter to retransmit the voice message when the detection circuit detects that the radio signal ends.

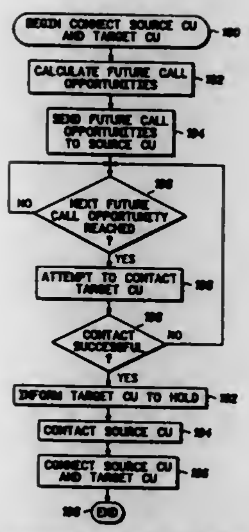
5,689,803
DIAL-BACK CALL COMPLETION METHOD AND APPARATUS IN A RADIO-COMMUNICATION SYSTEM

Daniel Richard Tayloe, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 25, 1995, Ser. No. 519,220

Int. Cl.^{6} H04B *7/185; 7/26;* **H04Q** *7/38*

U.S. Cl. 455—12.1 **16 Claims**


BEGIN CONNECT SOURCE CU AND TARGET CU
CALCULATE FUTURE CALL OPPORTUNITIES
SEND FUTURE CALL OPPORTUNITIES TO SOURCE CU
NEXT FUTURE CALL OPPORTUNITY REACHED ?
NO
YES
ATTEMPT TO CONTACT TARGET CU
CONTACT SUCCESSFUL ?
NO
YES
INFORM TARGET CU TO HOLD
CONTACT SOURCE CU
CONNECT SOURCE CU AND TARGET CU
END

1. A method for establishing a communication path in a communication system having multiple communication units, at least one communication antenna that predictably changes a position with respect to a target communication unit, and at least one control facility, the method comprising the steps of:

a) determining whether a target link is successfully established when a source communication unit makes a first call attempt to establish the communication path with the target communication unit, the communication path requiring establishment of the target link between the target communication unit and one of the at least one communication antenna;

b) where the target link is not successfully established, calculating a future call opportunity when the target communication unit will have a better opportunity to support the target link because a predicted future position of one of the at least one communication antenna will have moved within an optimal call initiation area with respect to the target communication unit;

c) attempting to contact the target communication unit during the future call opportunity;

d) where attempting to contact the target communication unit is successful, requesting that the target communication unit hold while the source communication unit is contacted;

e) contacting the source communication unit; and

f) connecting the source communication unit and the target communication unit.

5,689,804
MEDIUM-FREQUENCY RADIO TRANSMISSION SYSTEM

Tadao Sugita; Tatehiko Toyosawa; Kazumi Shoji; Shinichi Watanabe, all of Tokyo; Atsumi Fujiwara, and Masaaki Kitanda, both of Hiroshima, all of Japan, assignors to NHK Integrated Technology Inc., and Nippon Hoso Kyokai, both of Tokyo, Japan

Continuation of Ser. No. 207,209, Mar. 8, 1994, Pat. No. 5,537,637. This application Jan. 16, 1996, Ser. No. 586,973

Claims priority, application Japan, Sep. 21, 1993, 5-234892; Dec. 6, 1993, 5-305537

Int. Cl.^{6} H04B *7/14*

U.S. Cl. 455—14 **1 Claim**

1. A medium-frequency radio transmission system comprising:

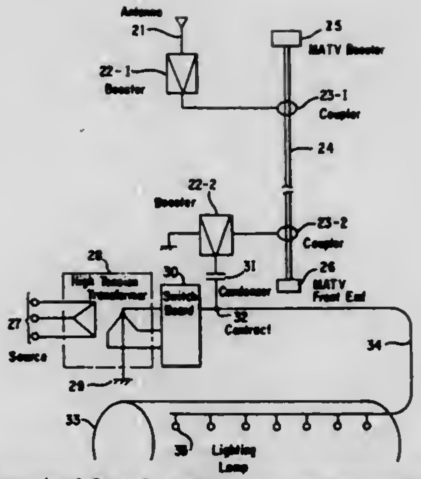
a receiving antenna for receiving an amplitude-modulated medium-frequency radio wave at an existing building rooftop;

a booster connected to said antenna and comprising a phase shifter, a level regulator, and an impedance matching device for preventing oscillation;

a first coupler connected to said booster for coupling the received medium-frequency radio wave to an existing distributing cable or distributing conductive piping, said distributing cable or distributing conductive piping being for transmitting the radio wave to a predetermined floor;

a first pair of couplers composed of a second coupler and a third coupler and combined with a first interconnection line at the predetermined floor for linking said distributing cable or said distributing conductive piping to a first loop-like line; and

a second pair of couplers composed of a fourth coupler and a fifth coupler and combined with a second interconnection line at another floor for linking the received medium-frequency radio wave with a second loop-like line, wherein said first and second loop-like lines are closed-loop conductors, said loop-like lines receiving and reradiating the medium-frequency radio wave, thereby enabling listening to an amplitude-modulated medium-frequency radio wave in an objective area of the predetermined floor, wherein said couplers comprise a ferrite core surrounding a primary line and a secondary line, wherein the amplitude-modulated medium-frequency radio wave is transmitted to the predetermined floor via an existing distributing cable or distributing conductive piping with said booster and said couplers including said interconnection lines.



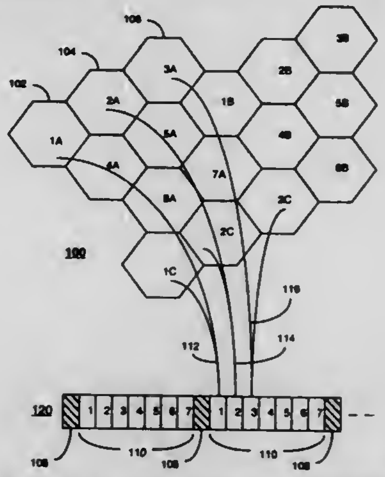
5,689,805
COMMUNICATION SYSTEM AND METHOD PROVIDING MINIMUM MESSAGE TRANSMISSION DELAY

Douglas I. Ayerst, Delray Beach; William Joseph Kuznicki, Coral Springs, and Robert John Schwendeman, Pompano Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 10, 1995, Ser. No. 541,842

Int. Cl.^{6} H04Q *7/26*

U.S. Cl. 455—33.1 **21 Claims**



1. A method for providing minimum transmission delay for delivery of a message in a communication system which comprises a plurality of transmission cells which include one or more cell receivers and a cell transmitter and which define geographical transmission areas, the method comprising the steps of:

transmitting, during a first scheduled time interval, from the cell transmitter located within the plurality of transmission cells, an address identifying a communication transceiver for which a message is intended and a color code signal identifying the cell transmitter;

receiving, during a second scheduled time interval, by at least one of said one or more cell receivers located within the plurality of transmission cells, an acknowledgment signal generated by the communication transceiver for which a message is intended, the acknowledgment signal including the color code signal identifying the cell transmitter transmitting the address;

transmitting, from the cell transmitter identified by the color code signal, during a third time interval including a predetermined sequence of scheduled message transmission frames, the address identifying the communication transceiver for which a message is intended and the message during a selected one of the predetermined sequence of scheduled message transmission frames designated by the color code signal; and

receiving, by the communication transceiver, during the selected one of the predetermined sequence of scheduled message transmission frames, the address identifying the communication transceiver for which the message is intended and the message transmitted by the cell transmitter identified.

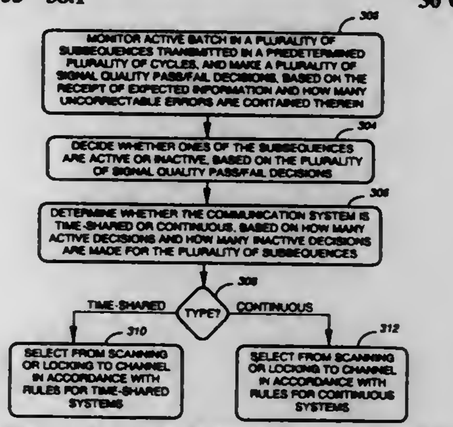
5,689,806
COMMUNICATION RECEIVER FOR SELECTING BETWEEN SCANNING AND LOCKING TO A CHANNEL AND METHOD THEREFOR

Paul Marko, Pembroke Pines, Fla.; Motty Shor, Holon; Mark Rindsberg, Jerusalem, both of Israel, and Craig Wadin, Sunrise, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1995, Ser. No. 578,399

Int. Cl.^{6} H04B *1/06;* **H04J** *3/00*

U.S. Cl. 455—38.1 **30 Claims**


MONITOR ACTIVE BATCH IN A PLURALITY OF SUBSEQUENCES TRANSMITTED IN A PREDETERMINED PLURALITY OF CYCLES, AND MAKE A PLURALITY OF SIGNAL QUALITY PASS/FAIL DECISIONS, BASED ON THE RECEIPT OF EXPECTED INFORMATION AND HOW MANY UNCORRECTABLE ERRORS ARE CONTAINED THEREIN
304
DECIDE WHETHER ONES OF THE SUBSEQUENCES ARE ACTIVE OR INACTIVE, BASED ON THE PLURALITY OF SIGNAL QUALITY PASS/FAIL DECISIONS
DETERMINE WHETHER THE COMMUNICATION SYSTEM IS TIME-SHARED OR CONTINUOUS, BASED ON HOW MANY ACTIVE DECISIONS AND HOW MANY INACTIVE DECISIONS ARE MADE FOR THE PLURALITY OF SUBSEQUENCES
TIME-SHARED
TYPE?
CONTINUOUS
310
312
SELECT FROM SCANNING OR LOCKING TO CHANNEL IN ACCORDANCE WITH RULES FOR TIME-SHARED SYSTEMS
SELECT FROM SCANNING OR LOCKING TO CHANNEL IN ACCORDANCE WITH RULES FOR CONTINUOUS SYSTEMS

1. A method in a channel scanning communication receiver operating in a communication system that periodically transmits information in a plurality of cycles, a cycle comprising a plurality of subsequences, the method for determining whether to operate in a scanning mode or in a locked mode, the method comprising the steps of:

making a plurality of signal quality pass/fail decisions for the plurality of subsequences transmitted in a predetermined plurality of cycles, a decision made for a transmission of a subsequence;

making a plurality of subsequence active/inactive decisions for ones of the plurality of subsequences transmitted in the predetermined plurality of cycles, based upon the plurality of signal quality pass/fail decisions made for the plurality of subsequences;

determining whether the communication system is time-shared, based upon how many active decisions and how many inactive decisions are made for the ones of the plurality of subsequences; and

selecting from operation in the scanning mode and operation in the locked mode in accordance with predetermined rules for time-shared systems, in response to the determining step finding that the communication system is time-shared.

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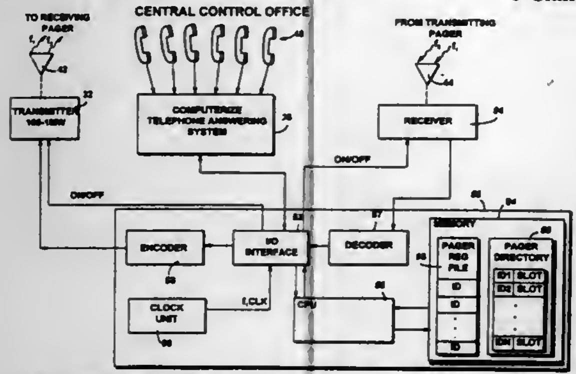
5,689,807
PAGING METHOD AND APPARATUS

Gabriel K. Wong, and Po S. Tsui, both of Honolulu, Hi., assignors to Digicomm, Ltd., Hong Kong, Hong Kong

Division of Ser. No. 264,973, Jun. 24, 1994, Pat. No. 5,542,115.
This application Feb. 29, 1996, Ser. No. 609,976
Int. Cl.^{6} H04B *7/208*

U.S. Cl. 455—38.1 **6 Claims**



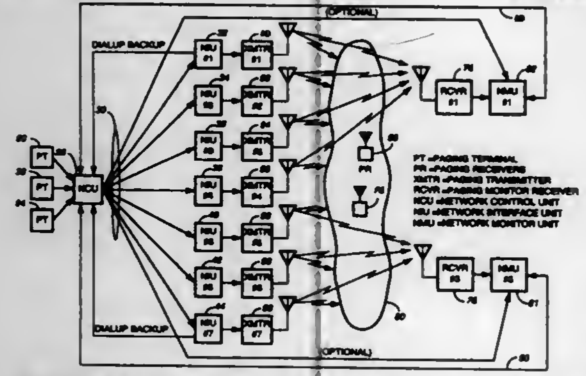
1. A control station which communicates with a two-way paging unit, the control station comprising:
- a clock unit which generates at least a first clocking signal;
- a first receiver which receives a station switch request signal from the paging unit, the station switch request signal including a frame of information comprising a plurality of time divided slots related to the first clocking signal, one of the plurality of time slots as selected by the paging unit bearing information serving to at least temporarily associate with the paging unit with the selected time slot;
- a processor which prepares a paging unit transmit authorization signal, the paging unit transmit authorization signal including a frame of information comprising a same plurality of time divided slots as the station switch request signal and information in a same selected one of the time slots as in the station switch request signal;
- a transmitter for transmitting the paging unit transmit authorization signal.

5,689,808
MULTIPLE CHANNEL AUTOMATIC SIMULCAST CONTROL SYSTEM

Joel E. Sandahl; Scott A. McFarland, and John F. Nagel, all of Quincy, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 775,623, Oct. 10, 1991, abandoned.
This application Mar. 10, 1994, Ser. No. 641,367
Int. Cl.^{6} H04B *7/00*

U.S. Cl. 455—51.2 **26 Claims**



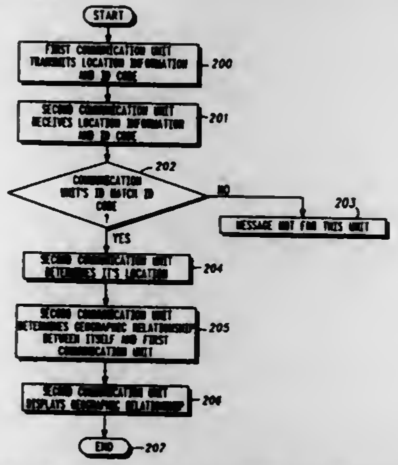
21. An apparatus for effecting simulcast broadcasting of data, comprising:
- a source of information;
- a network control unit, having a high-stability timebase, coupled to the source of information to produce a signal containing data and digital identifying information, the signal clocked from the high-stability timebase; and
- a plurality of transmitters, each coupled to the network control unit to receive the signal, and each having a modulation-generating timebase,
- each modulation-generating timebase phase locked to the high-stability timebase by way of synchronization information included in the signal, and
- each modulation-generating timebase adjusted by a corresponding correction value provided by the network control unit, thereby providing a highly accurate coincident modulation of the plurality of transmitters during a radio broadcast containing the signal.

5,689,809
METHOD FOR DETERMINING GEOGRAPHIC RELATIONSHIPS BETWEEN COMMUNICATION UNITS

Gary W. Grube, Palatine; Marc C. Naddell, Schaumburg, and Mark L. Shaughnessy, Algonquin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 209,023, Mar. 10, 1994, abandoned.
This application Dec. 5, 1995, Ser. No. 567,440
Int. Cl.^{6} H04Q *7/32*

U.S. Cl. 455—54.1 **12 Claims**


START
FIRST COMMUNICATION UNIT TRANSMITS LOCATION INFORMATION AND ID CODE
200
SECOND COMMUNICATION UNIT RECEIVES LOCATION INFORMATION AND ID CODE
201
202
COMMUNICATION UNIT'S ID MATCH ID CODE
NO
203
MESSAGE NOT FOR THIS UNIT
YES
SECOND COMMUNICATION UNIT DETERMINES IT'S LOCATION
204
SECOND COMMUNICATION UNIT DETERMINES GEOGRAPHIC RELATIONSHIP BETWEEN ITSELF AND FIRST COMMUNICATION UNIT
205
SECOND COMMUNICATION UNIT DISPLAYS GEOGRAPHIC RELATIONSHIP
206
END
207

1. A method for determining a geographic relationship between communication units, the method comprising the steps of:
- transmitting, by a first communication unit, a speech message together with first location information of the first communication unit to a second communication unit;
- receiving, by the second communication unit, the speech message together with the first location information;
- determining, by the second communication unit, second location information of the second communication unit;
- determining, by the second communication unit, a geographic relationship between the first communication unit and the second communication unit based on the first location information and the second location information; and
- displaying, by the second communication unit, the geographic relationship and the speech message audibly to a user of the second communication unit by generating a multi-dimensional audible message, wherein the multi-dimensional audible message produces an acoustic perception of at least a directional component of the geographic relationship.

5,689,810
METHOD OF FACILITATING TALLGROUP CALLS IN A PEER COMMUNICATION NETWORK

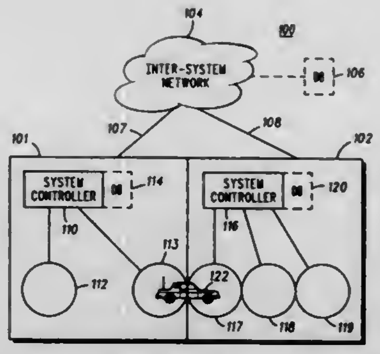
Mark Shaughnessy, Algonquin; Daniel McDonald, Cary, and Michael Sasuta, Mundelein, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 330,411, Oct. 28, 1994, abandoned.
This application Apr. 22, 1996, Ser. No. 635,530
Int. Cl.^{6} H04B *7/26*

U.S. Cl. 455—54.2 **14 Claims**

11. In a communications network that includes a plurality of peer-to-peer communication system networks, wherein each communication system network includes a system controller, a method of facilitating a talkgroup call throughout the communications network, the method comprising the steps of:
- at a first communication unit of a plurality of communication units that are members of at least a first talkgroup, sending a request for a call involving members of the first talkgroup to a first system controller at a first communication system network;

at the first system controller,
- receiving the request from the first communication unit;
- identifying a second communication system network containing members of the first talkgroup; and
- selectively sending a talkgroup call command to the second communication system network, thereby facilitating the talkgroup call throughout the communications network.

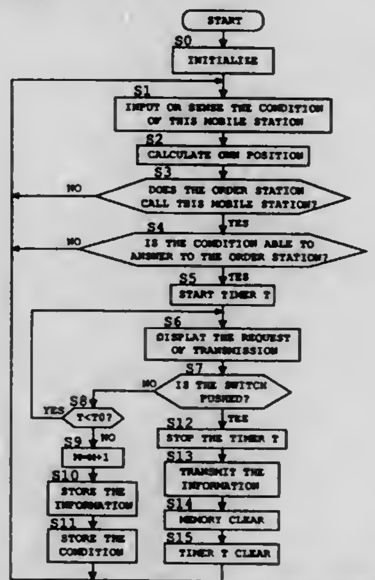


5,689,811
COMMUNICATION SYSTEM FOR COMMUNICATING INFORMATION ASCERTAINING WHY REPLY INFORMATION WAS NOT TRANSMITTED

Rikuo Hatano, Toyota, and Toshimitsu Oka, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 763,706, Sep. 23, 1991, abandoned.
This application Dec. 19, 1996, Ser. No. 769,871
Claims priority, application Japan, Sep. 22, 1990, 2-252840
Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—54.2 **8 Claims**



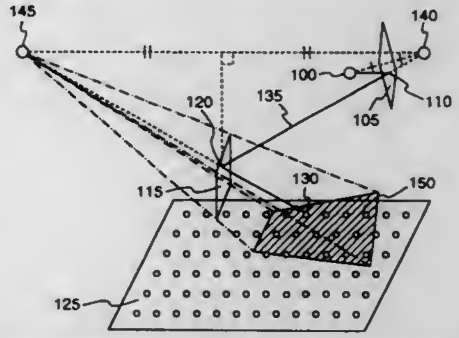
1. An information communication system comprising:
- an order station including a transmission device for transmitting a command signal; and
- a mobile station comprising a receiver for receiving the command signal transmitted by said order station, said mobile station further comprising means for transmitting reply information to said order station in response to receiving the transmitted command signal, a memory, a controller for storing to said memory information representing that said reply information has not been transmitted to said order station despite said mobile station receiving the transmitted command signal, and for storing to said memory information representing a position of said mobile station at which the transmitted command signal was received, wherein said controller stores the position information of said mobile station to said memory only when the reply information is not transmitted despite said mobile station receiving the transmitted command signal, and means for transmitting the information stored in said memory to said order station, wherein the position information stored in said memory is used to ascertain why reply information was not transmitted by said mobile station to said order station.

5,689,812
RADIO PROPAGATION SIMULATION METHOD

Satoshi Takahashi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1995, Ser. No. 493,319
Claims priority, application Japan, Jun. 21, 1994, 6-138522
Int. Cl.^{6} H04B *17/02*

U.S. Cl. 455—67.6 **12 Claims**



1. A radio propagation simulation method of obtaining received power of electric waves emitted from a transmitting point at a point in a three-dimensional space including electric wave reflection objects at a plurality of evaluation points on a plane in the space, comprising:
- a first step of obtaining at each of the plural evaluation points received power of electric waves received directly from the transmitting point or electric waves having penetrated through reflection objects; and
- a second step of deciding for each of the reflection objects a particular area at which reflection waves arrive, obtaining for each of the evaluation points contained in the particular area received power of reflection waves or reflection waves having penetrated through reflection objects, and adding the received power to that obtained in the first step.

5,689,813
RADIO APPARATUS CAPABLE OF DETECTING FIELD INTENSITY

Kenji Seki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 23, 1995, Ser. No. 447,346
Claims priority, application Japan, May 24, 1994, 6-109284
Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—67.7 **8 Claims**

6. A method of displaying a positional relation between a first radio apparatus and a second radio apparatus, said method comprising the steps of:
- transmitting a signal from said second radio apparatus to said first radio apparatus;

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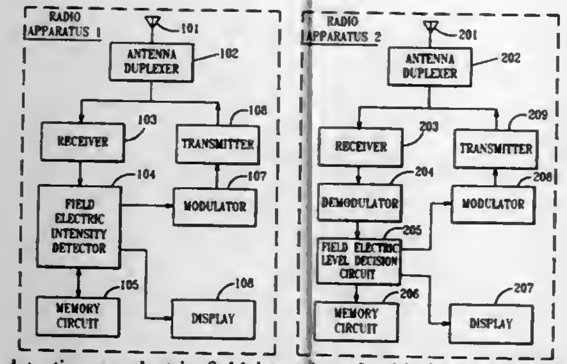


detecting an electric field intensity of said signal at said first radio apparatus to thereby output a field intensity detection signal;

calculating at said first radio apparatus a mean value of said field intensity detection signal at a predetermined interval to thereby output a latest field intensity level signal;

comparing at said first radio apparatus said latest field intensity level signal with a plurality of predetermined field intensity level signals to thereby output a decision signal representative of a result of comparison;

displaying, based on said decision signal, a positional relation between said first and second radio apparatuses at said first radio apparatus;

transmitting said field intensity detection signal from said first radio apparatus to said second radio apparatus;

calculating at said second radio apparatus a mean value of said field intensity detection signal at a predetermined interval to thereby output said latest field intensity level signal;

comparing at said second radio apparatus said latest field intensity level signal with said plurality of field intensity level signals stored in said second radio apparatus to thereby output a decision signal representative of a result of comparison; and

displaying a positional relation between said first and second radio apparatuses at said second radio apparatus.

5,689,814
RADIO COMMUNICATION APPARATUS WITH EXPANDED DYNAMIC RANGE

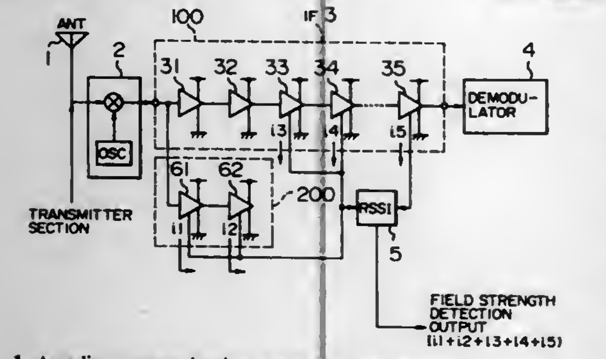
Hiroshi Hagisawa, Gunma-ken; Kazuo Watanabe, Takasaki; Kyoichi Takahashi, Fujioka; Kenji Takahashi, Takasaki; Michio Waki, Gunma-ken, and Tadashi Matsuoka, Takasaki, all of Japan, assignors to Hitachi, Ltd., and Hitachi Microcomputer System, Ltd., both of Tokyo, Japan

Filed Aug. 17, 1994, Ser. No. 291,870

Claims priority, application Japan, Aug. 20, 1993, 5-206365; Nov. 10, 1993, 5-281202

Int. Cl.⁶ H04B *1/16*

U.S. Cl. 455—69 **17 Claims**



1. A radio communication apparatus comprising:

a first signal path including at least one first amplifier for amplifying a signal, at least one second amplifier for amplifying an output of said at least one first amplifier, and at least one first detector for detecting said amplified signal;

a second signal path connected to an input portion of said first signal path including at least one third amplifier for amplifying said signal, and at least one second detector for detecting said amplified signal output from said at least one third amplifier;

a signal strength detector circuit connected to said first and second signal paths for adding said detected signal of said first detector and said detected signal of said second detector;

wherein said at least one first amplifier includes a pair of transistors having emitters and collectors, respectively; collector resistors connected to the collectors of said respective transistors; and a current source directly connected to said emitters, said at least one first amplifier performing differential operation;

said at least one second amplifier includes a pair of transistors having collectors and emitters, respectively; collector resistors connected to the collectors of said respective transistors; emitter resistors connected to the emitters of said respective transistors; and a current source connected to said emitter resistors, said at least one second amplifier performing differential operation; and

said at least one third amplifier includes a pair of transistors having collectors and emitters, respectively; collector resistors connected to the collectors of said respective transistors; emitter resistors connected to the emitters of said respective transistors; and a current source connected to the emitter resistors, said at least one third amplifier performing differential operation.

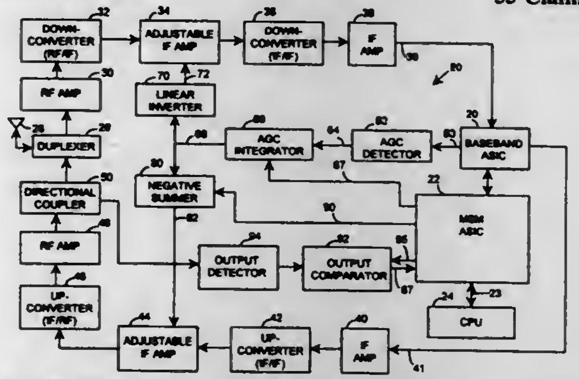
5,689,815
SATURATION PREVENTION SYSTEM FOR RADIO TELEPHONE WITH OPEN AND CLOSED LOOP POWER CONTROL SYSTEMS

Ryo Yamazaki, Arlington Heights, Ill.; Anthony B. Waldroup, Suwanee, Ga., and He Feng Wang, Saitama, Japan, assignors to Oki Telecom, Inc., Suwanee, Ga.

Filed May 4, 1995, Ser. No. 434,650

Int. Cl.⁶ H04B *1/00;7/00*

U.S. Cl. 455—69 **55 Claims**



51. An output power system for a radio telephone operable with a base station, said output power system comprising:

an adjustable transmitter amplifier;

an adjustable gain controller coupled to said adjustable transmitter amplifier including an open loop portion and a closed loop portion;

an output power detector coupled to said adjustable transmitter amplifier;

an output power trigger level comparator coupled to said output power detector; and

a closed loop portion reducer coupled to said output power trigger level comparator and said closed loop portion of said adjustable gain controller wherein said closed loop portion reducer prevents closed loop power control saturation.

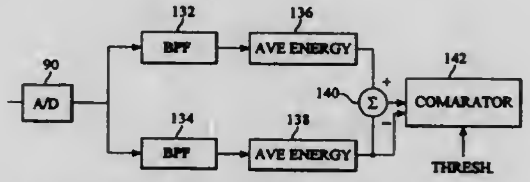
5,689,816
METHOD AND APPARATUS FOR DIFFERENTIATING A WIRELESS ANALOG SIGNAL FROM A WIRELESS DIGITALLY ENCODED SIGNAL

Tony Sluman Lee, Alameda, and Jong-keung Cheng, Danville, both of Calif., assignors to Atmel Corporation, San Jose, Calif.

Filed Nov. 2, 1995, Ser. No. 556,748

Int. Cl.⁶ H04B *1/40;* **H04L** *25/00;27/00*

U.S. Cl. 455—74 **19 Claims**



1. A method of determining a characteristic of a wireless signal transmitted in one of a plurality of channels, wherein said characteristic of said wireless signal is either a digitally encoded signal or an analog signal, said method comprising:

receiving said wireless signal to produce an RF received signal;

converting said received RF signal into a baseband signal;

digitizing said baseband signal to produce a digitized signal;

filtering said digitized signal by a first filter means to produce a first filtered signal;

filtering said digitized signal by a second filter means to produce a second filtered signal;

generating a first energy signal based upon said first filtered signal;

generating a second energy signal based upon said second filtered signal;

comparing said first energy signal to said second energy signal; and

determining the characteristic of said wireless signal based upon said comparison.

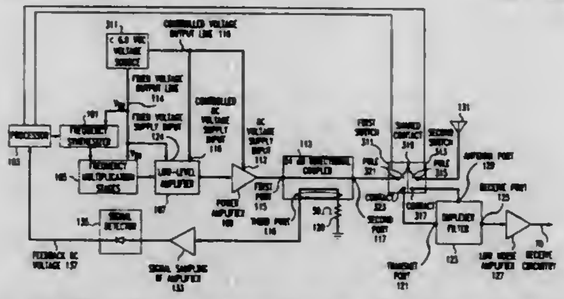
5,689,817
RF DUPLEXER BYPASSING TECHNIQUES FOR TRANSCEIVERS

Wilson Fok, Holmdel, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 26, 1996, Ser. No. 592,823

Int. Cl.⁶ H04B *1/44*

U.S. Cl. 455—79 **10 Claims**



1. An RF switching apparatus for use with a transceiver that includes an RF power amplifier, an antenna, receiver circuitry, a duplexer filter, and a DC voltage source;

the duplexer filter having a first port adapted for connection to the receiver circuitry, a second port adapted for connection to the RF power amplifier, and a third port adapted for connection to the antenna;

WHEREIN THE RF SWITCHING APPARATUS IS CHARACTERIZED BY:

(a) a first switch for coupling the RF power amplifier to any one of a second switch and the second port of the duplexer filter, and

(b) said second switch for coupling the antenna to any one of the first switch and the third port of the duplexer filter.

5,689,818
MOBILE TERMINAL DEVICE FOR TELECOMMUNICATIONS, INCLUDING A SWITCH CIRCUIT

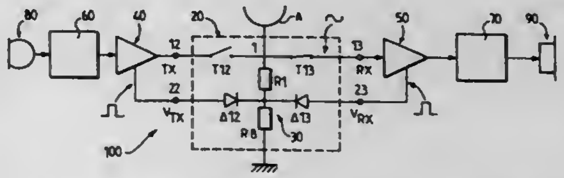
Nathalie Caglio, Limeil-Brevannes, and Didier Meignant, Emerainville, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1995, Ser. No. 576,540

Claims priority, application France, Dec. 29, 1994, 94 15873

Int. Cl.⁶ H04B *1/44*

U.S. Cl. 455—83 **7 Claims**



1. A mobile terminal device for telecommunications comprising:

a transceiving aerial;

a section for data transmission, including a transmitting amplifier which has a first, time-division multiplexed pulsed bias voltage and further which applies a first AC signal to an input terminal;

a section for data reception, including a receiving amplifier which has a second, time-division multiplexed pulsed bias voltage and further which receives a second AC signal from an output terminal;

a switch circuit including a first and a second field effect transistor arranged as switching transistors connected in series between the input terminal and the output terminal, wherein the switching transistors have a common terminal connected to the aerial; and

a logic OR circuit formed by a first and a second diode which have a common terminal, wherein said OR circuit is connected to ground via a resistor, wherein the diodes receive the first and the second multiplexed bias voltage respectively, so that at the terminals of the diodes are obtained a first and a second multiplexed pulsed voltage difference applied between control electrodes of the first and second switching transistors and the common terminal of the diodes connected to the aerial via bias resistors, to render the first switching transistor conductive and, at the same time, cut off the second switching transistor.

5,689,819
TRANSMITTER-RECEIVER

Shuji Nishimura, and Kenji Itoh, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 22, 1995, Ser. No. 562,066

Claims priority, application Japan, Jun. 5, 1995, 7-137998

Int. Cl.⁶ H04B *1/40*

U.S. Cl. 455—86 **7 Claims**

1. A transmitter-receiver comprising:

a transmitting local oscillator for generating a transmitting oscillation signal having a transmitting local oscillating frequency based on a reference signal;

a transmitting circuit for providing an output by converting frequency of a transmitted signal input thereto in accordance with said transmitting oscillation signal;

a receiving local oscillator for generating a receiving oscillation signal having a receiving local oscillating frequency based on said reference signal;

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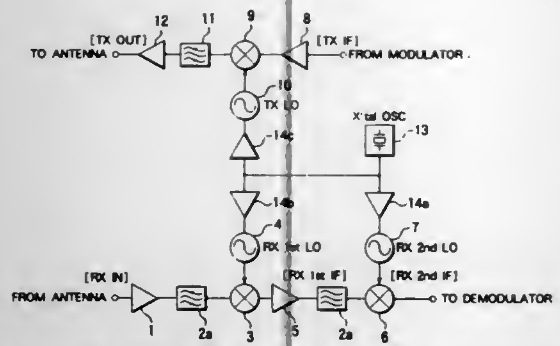


a receiving circuit for providing an output by converting a frequency of a received signal input thereto in accordance with said receiving oscillation signal;

a reference signal oscillator provided as a common reference signal source for supplying said reference signal to said transmitting local oscillator and to said receiving local oscillator;

wherein a frequency arrangement of said transmitting local oscillating frequency, frequency of signals existing within said transmitting circuit, said receiving local oscillating frequency and frequency of signals existing within said receiving circuit being set such that the frequencies of the signals existing within the transmitter-receiver avoid overlapping one another;

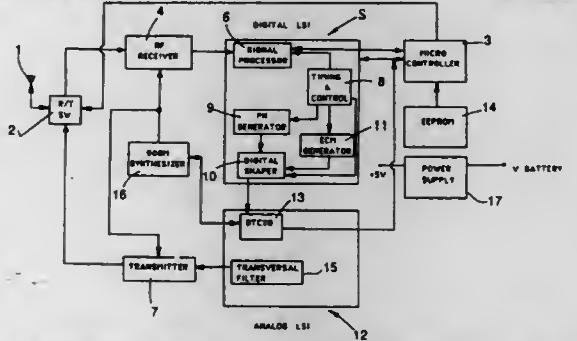
wherein said transmitting circuit comprises: a transmitting intermediate amplifier for amplifying a transmitted signal input as having a transmitting intermediate frequency; a transmitting mixer for providing an output by mixing an output from the transmitting intermediate amplifier and an output of said transmitting local oscillator to effect a frequency conversion thereof from the transmitting intermediate frequency to a predetermined transmitting frequency; a transmitting band-pass filter for removing unnecessary wave components from the output of the transmitting mixer; and a transmitting power amplifier for amplifying an output of the transmitting band-pass filter and delivering it to an antenna;

wherein said receiving local oscillator comprises: a receiving first local oscillator for generating a receiving oscillation signal having a receiving first local oscillating frequency based on said reference signal; and a receiving second local oscillator for generating a receiving oscillation signal having a receiving second local oscillating frequency based on said reference signal; and wherein said receiving circuit comprises: a low-noise amplifier for amplifying a received wave input from an antenna; a receiving first band-pass filter for removing unnecessary wave components from an output of the low-noise amplifier; a receiving first mixer for mixing an output of the receiving first band-pass filter and the output of said receiving first local oscillator to provide an output by converting the receiving frequency into a receiving first intermediate frequency; a receiving first intermediate amplifier for amplifying the output of the receiving first mixer; a receiving second band-pass filter for removing unnecessary wave components from an output of the receiving first intermediate amplifier; and a receiving second mixer means for mixing an output of the receiving second band-pass filter and an output of said receiving second local oscillator to provide an output by converting the receiving first intermediate frequency into a receiving second intermediate frequency; further comprising damping means for damping a leakage signal provided between said transmitting local oscillator and said receiving first and second local oscillators, wherein buffer means are provided as said damping means respectively between said reference signal oscillator and said transmitting local oscillator, between said reference signal oscillator and said receiving first local oscillator, and between said reference signal oscillator and said receiving second local oscillator.

5,689,820
VEHICLE LOCATION UNIT

Shemon Nahear, Giveat Zeev, and Chaim Caspi, Rehovot, both of Israel, assignors to Tadiran Ltd., Holon, Israel

Continuation of Ser. No. 63,235, May 18, 1993, abandoned.
This application Nov. 5, 1996, Ser. No. 743,923
Claims priority, application Israel, May 29, 1992, 102051
Int. Cl.^{6} H04B *1/40*
U.S. Cl. 455—86 **8 Claims**



1. A Vehicle Location Unit (VLU) device having means for transmitting a signal, means for receiving a signal, a microcontroller for controlling a transmitting/receiving path, and conventional circuit elements comprising memory means, power supply means, the device comprising:

a digital Large Scale Integration (LSI) including:
  - timing and control means for providing a timing and control signal to each transmission/reception phase of operation of the VLU;
  - a signal processor being connected to the receiving means and the timing and control means, the signal processor receiving a signal from the receiving means;
  - a PN generator being connected to the timing and control means, the PN generator generating a required bit pattern to a digital shaper; and
  - said digital shaper having a first input which is connected to the timing and control means and a second input based on said required bit pattern, which is connected to the PN generator, the digital shaper outputting a shaping control signal to an analog LSI; and

said analog LSI including:
  - a Digital Temperature Compensated Crystal Oscillator (DTCXO) for sensing a temperature and translating the sensed temperature into digital data which are read by the microcontroller; and
  - a transversal filter converting said shaping control signal into an analog-shaped data, the transversal filter having an output which is connected to the transmitting means.

5,689,821
DEVICE FOR CONTROLLING EXTENSION AND RETRACTION OF AN ANTENNA

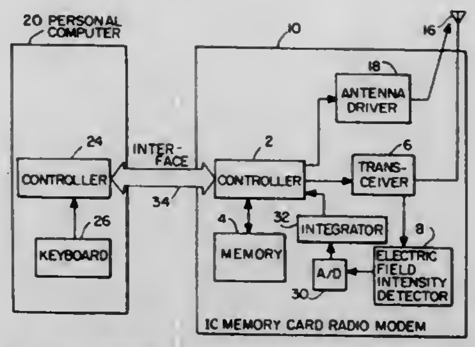
Mamoru Shimazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,309
Claims priority, application Japan, Dec. 28, 1993, 5-337683
Int. Cl.^{6} H04B *1/38;* H01Q *1/24*
U.S. Cl. 455—89 **26 Claims**

1. A communication device, which includes a body having a keyboard and a transceiver having an antenna, for operating extension and retraction of said antenna, comprising:

detecting means for detecting electric field intensity of a received signal when said transceiver is inserted into said body; and

control means for controlling said extension and retraction of said antenna in response to said electric field intensity,

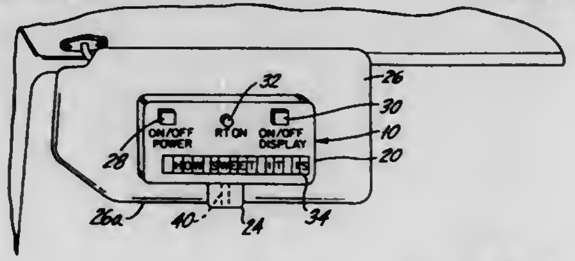


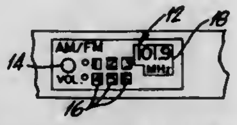
wherein said antenna is retracted when said transceiver is inserted into said body and said control means controls an antenna condition from the retracted antenna condition.

5,689,822
WIRELESS COUPLED ADAPTER FOR DECODING INFORMATION FROM A BROADCAST SIGNAL TO WHICH A RADIO IS TUNED

Leo Zucker, 2591 Dunning Dr., Yorktown Heights, N.Y. 10598

Filed Feb. 17, 1995, Ser. No. 390,685
Int. Cl.^{6} H04B *1/38*
U.S. Cl. 455—89 **20 Claims**





1. A method of decoding information transmitted in a broadcast carrier signal; comprising:

tuning a broadcast receiver to a selected broadcast carrier signal of a certain carrier frequency, the selected broadcast carrier signal having encoded information, the broadcast receiver radiating a local signal having a property capable of identifying said carrier frequency;

placing coupling/antenna means in the vicinity of the broadcast receiver for responding to said local radiated signal and to said selected broadcast carrier signal;

producing, from an output of the coupling/antenna means, a tuning signal corresponding to the local radiated signal;

selecting, according to said tuning signal, the broadcast carrier signal to which the broadcast receiver is tuned from an output of the coupling/antenna means; and

decoding information encoded in the selected broadcast carrier signal and producing a corresponding decoded information signal.

5,689,823
RADIO HAVING AN OPTION BOARD INTERFACE AND AN OPTION BOARD FOR USE THEREWITH

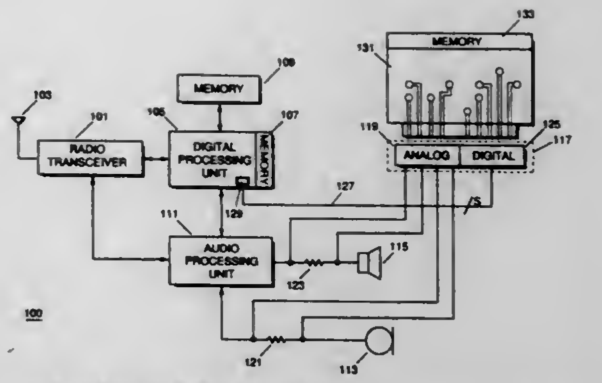
Joseph E. Phillips, Huntley, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 21, 1995, Ser. No. 391,907
Int. Cl.^{6} H04B *1/38*
U.S. Cl. 459—89 **15 Claims**

1. A radio, comprising:

A) a radio transceiver;

B) a digital processing unit having:



non-volatile programmable memory;

a serial bus interface which is operably coupled to the radio transceiver;

a memory having an operating protocol stored therein, wherein the operating protocol provides for:
  - at least a first address that uniquely corresponds to at least a part of the radio transceiver; and
  - at least a second address that uniquely corresponds to an option board;

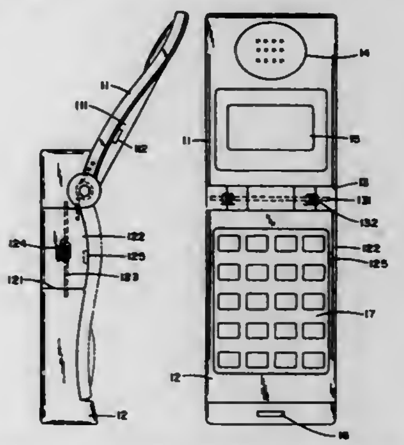
C) an audio processing unit operably coupled to the radio transceiver and to the digital processing unit;

D) an option board interface constructed and arranged to interface with the option board, the option board interface having:
  - an analog interface operably coupled to the audio processing unit; and
  - a digital interface operably coupled to the serial bus interface.

5,689,824
FOLDING PORTABLE WIRELESS APPARATUS CAPABLE OF AUTOMATICALLY OPENING UPPER AND LOWER CASES

Michio Nagai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 14, 1995, Ser. No. 502,810
Claims priority, application Japan, Jul. 15, 1994, 6-186420
Int. Cl.^{6} H04B *1/38*
U.S. Cl. 455—89 **1 Claim**



1. A folding portable wireless apparatus in which an upper case and a lower case are connected by a hinge to enable opening and/or closing said both cases, comprising:

opening impetus giving means for giving an impetus to said upper case and said lower case in an opening direction; and

locking means provided to the both side faces of said upper case and said lower case,

said locking means including open levers which are provided on the both side faces of either said upper case or said lower case and can be manually operated; engaging portions which are

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provided on the both side faces of the other case and interlock with said open levers to lock said both cases; and locking impetus giving means for giving an impetus to said open levers in such a direction that the locked state established between said open levers and said engaging portions is maintained,

wherein said open levers are so provided to the both side faces of one case as to be capable of oscillation about a shaft; a hook or a locking groove is formed to one end of each of said open levers; and said engaging portions are provided on the both side faces of the other case and constituted by locking grooves or hooks with which said hooks or said locking grooves engage; and

wherein said open levers can oscillate in a direction of the thickness of one case; one end of each of said open levers protrudes from the front face of the case; a hook or a locking groove is formed on the inner face of said one end; and said locking impetus giving means inwardly gives an impetus to said one end.

5,689,825

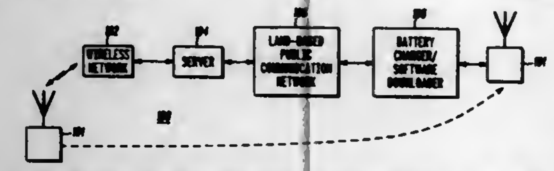
METHOD AND APPARATUS FOR DOWNLOADING UPDATED SOFTWARE TO PORTABLE WIRELESS COMMUNICATION UNITS

Ziva Averbuch, and Rod Averbuch, both of Buffalo Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1995, Ser. No. 508,658

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 455—89 **15 Claims**


WIRELESS NETWORK
SERVER
LAND-BASED PUBLIC COMMUNICATION NETWORK
BATTERY CHARGER/ SOFTWARE DOWNLOADER

1. A method for an integrated battery charger and software downloader to receive updated software from a server, the method comprising steps of:

coupling a portable wireless communication unit to the integrated battery charger and software downloader;

detecting, in the portable wireless communication unit, a flag that indicates availability of the updated software; and

receiving a priority indication from the portable wireless communication unit;

sending to the server, download session parameters to initialize a download session;

receiving, from the server, blocks of the updated software;

storing the blocks of the updated software to produce stored blocks;

updating the download session parameters when the download session has conclude.

5,689,826

Patent Not Issued For This Number

DESIGNS

GRANTED November 18, 1997

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DESIGNS

NOVEMBER 18, 1997

386,285
CANDY CONFIGURATION

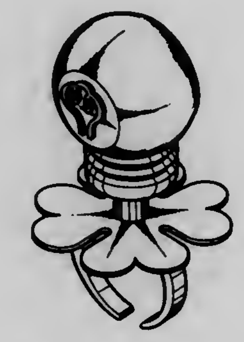
Sung Ae Ahn, 1-303, Jangmi 3rd Apartment, Sincheon-dong, Songpa-ku, Seoul, Rep. of Korea

Filed Sep. 24, 1996, Ser. No. 60,209

Claims priority, application Rep. of Korea, Mar. 25, 1996, 96-5240

Term of patent 14 years
LOC (6) Cl. 01 - *01*

U.S. Cl. D1—127



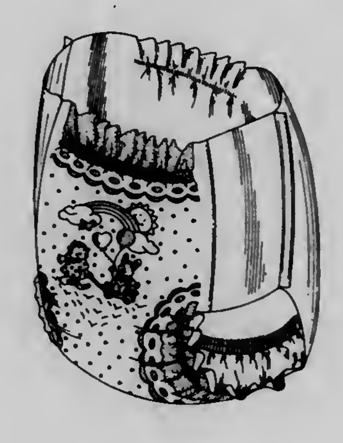
386,286
TRAINING PANT

Leonard Michael Kaczmarzyk, Hortonville; Marci Elizabeth Kuske, Appleton; Thomas Michael Lager, Neenah; Robert Lee Popp, Hortonville, and Richard Thomas Wehrle, New London, all of Wis., assignors to Kimberly Clark Worldwide, Inc., Neenah, Wis.

Filed Apr. 23, 1996, Ser. No. 53,522

Term of patent 14 years
LOC (6) Cl. 02 - *01*

U.S. Cl. D2—712



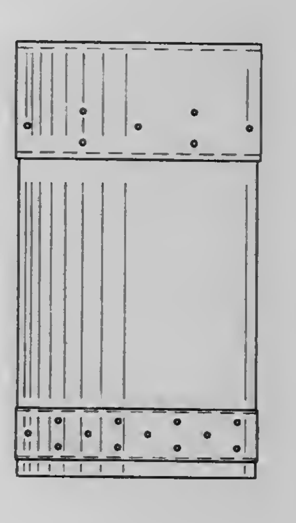
386,287
LEGGING

Nettie H. Graves, 4735 Crossbend Rd., McLeansville, N.C. 27301

Division of Ser. No. 26,342, Jul. 25, 1994, Pat. No. Des. 371,452. This application Apr. 11, 1996, Ser. No. 52,545

Term of patent 14 years
LOC (6) Cl. 02 - *04*

U.S. Cl. D2—901



386,288
SHOE SOLE

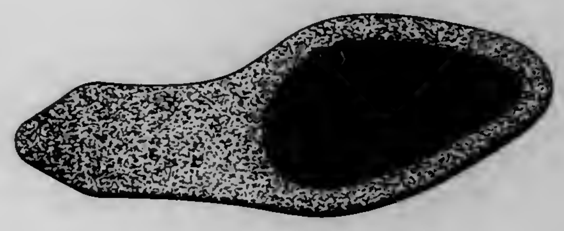
Jean-Paul Merceron, Monthodon, France, assignor to Article Chaussant Europeen (ARCHE), Chateau-Renault, France

Filed Aug. 24, 1995, Ser. No. 43,251

Claims priority, application France, Feb. 24, 1995, 951.175

Term of patent 14 years
LOC (6) Cl. 02 - *04*

U.S. Cl. D2—953



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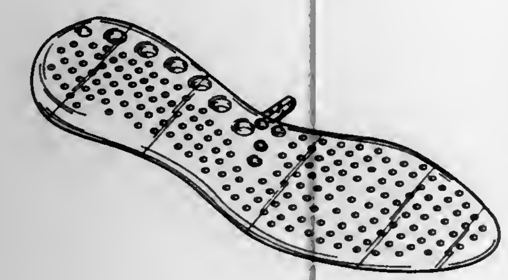
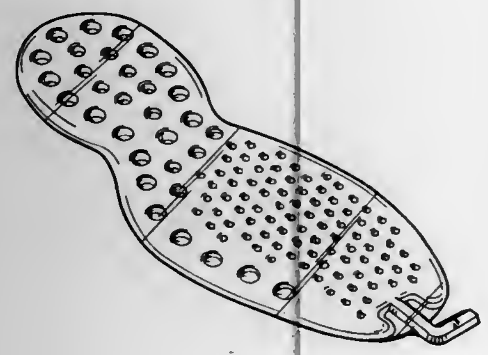
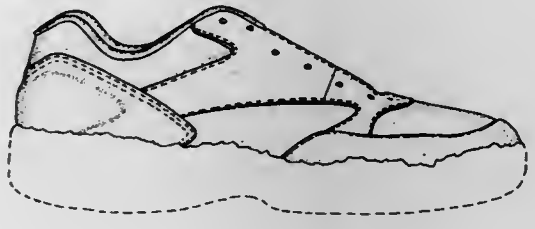
386,289
BLADDER FOR A SHOE SOLE
Joel L. Passke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,490
The portion of the term of this patent subsequent to Dec. 31, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—961



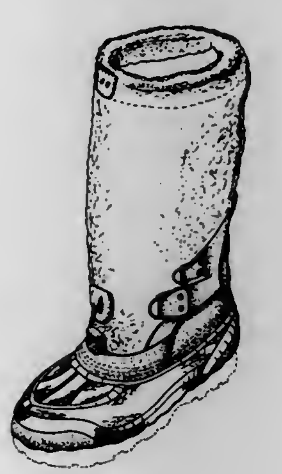
386,290
BLADDER FOR A SHOE SOLE
Joel L. Passke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,534
The portion of the term of this patent subsequent to Jan. 7, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—961



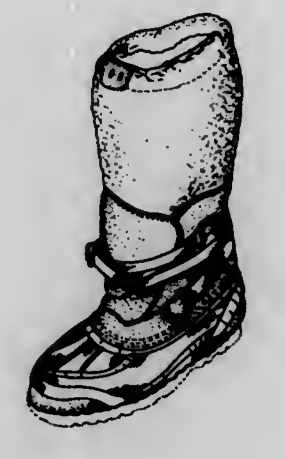
386,291
SHOE UPPER
Joseph A. Napurano, Jr., Newton, Mass., assignor to Reebox International Ltd., Stoughton, Mass.
Filed Oct. 29, 1996, Ser. No. 61,703
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969



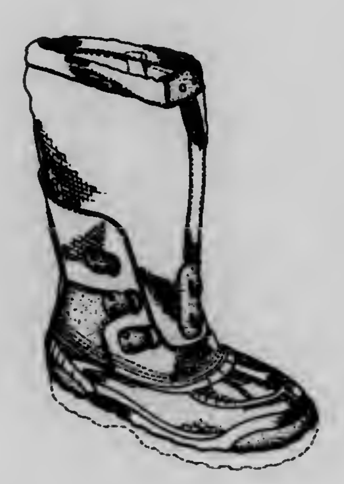
386,292
SHOE UPPER
Mike Brooks, Nelsonville; Edgar H. Simpson; Theodore A. Kastner, both of Lancaster, and Diana A. Wurfbain, Athens, all of Ohio, assignors to Rocky Shoes and Boots, Inc., Nelsonville, Ohio
Filed Jun. 4, 1996, Ser. No. 55,440
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—970



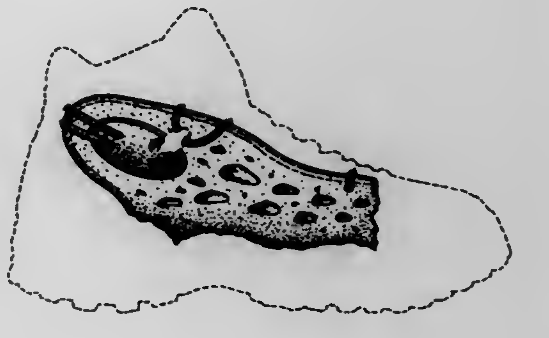
386,293
SHOE UPPER
Mike Brooks, Nelsonville; Edgar H. Simpson; Theodore A. Kastner, both of Lancaster, and Diana A. Wurfbain, Athens, all of Ohio, assignors to Rocky Shoes and Boots, Inc., Nelsonville, Ohio
Filed Jun. 4, 1996, Ser. No. 55,441
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—970



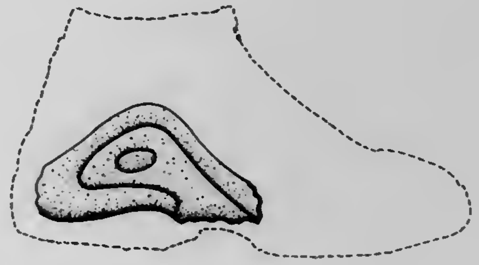
386,294
SHOE UPPER
Mike Brooks, Nelsonville; Edgar H. Simpson; Theodore A. Kastner, both of Lancaster, and Diana A. Wurfbain, Athens, all of Ohio, assignors to Rocky Shoes and Boots, Inc., Nelsonville, Ohio
Filed Jun. 4, 1996, Ser. No. 55,442
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—970



386,295
SIDE ELEMENT OF A SHOE UPPER
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 8, 1996, Ser. No. 60,808
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



386,296
PORTION OF A SHOE
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 4, 1997, Ser. No. 66,118
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



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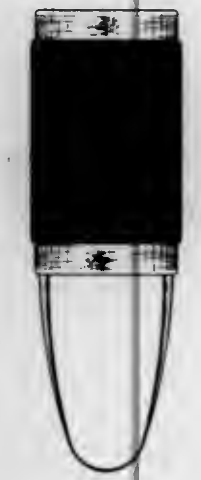
386,297

STIRRUP BOOT SOCK

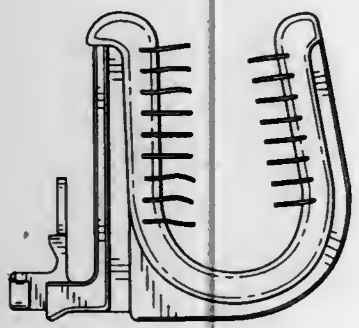
Monica Minnick, and Albert Minnick, both of 527 Stony Way, Norristown, Pa. 19403
Filed Jul. 5, 1996, Ser. No. 56,685
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—980



386,298

COMBINED CELLULAR PHONE AND BINOCULAR CLIP

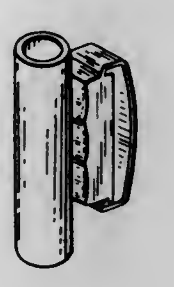
Dennis H. Hancock, Mountain Green, Utah, assignor to All-Rite Products, Inc., Mountain Green, Utah
Filed May 14, 1996, Ser. No. 54,407
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—218



386,299

EXPANDABLE POLICE BATON HOLDER

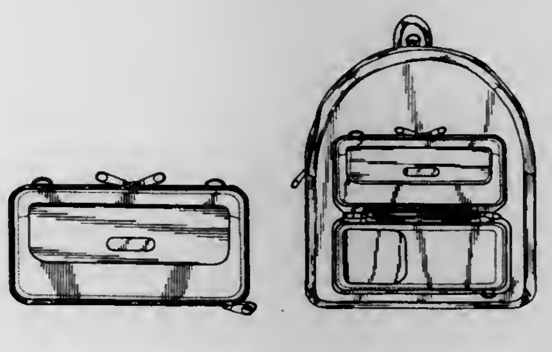
Paul D. Starrett, Jaffrey, N.H., assignor to Monadnock Lifetime Products, Inc., Fitzwilliam, N.H.
Filed Apr. 24, 1996, Ser. No. 53,536
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—229



386,300

CLUTCH SIZED BAG EXPANDABLE TO BACKPACK

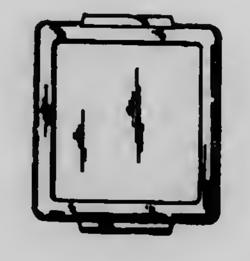
David Kopel, Agoura Hills, Calif., assignor to Koltov, Inc., Westlake Village, Calif.
Continuation-in-part of Ser. No. 34,095, Jan. 27, 1995. This application Aug. 23, 1995, Ser. No. 43,034
The portion of the term of this patent subsequent to Sep. 23, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—233



386,301

IDENTIFICATION CASE

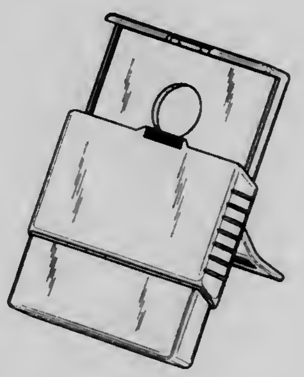
Stephen H. Wolff, 35 W. 35th St., New York, N.Y. 10001
Filed Jan. 18, 1996, Ser. No. 49,119
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—247



386,302

BUSINESS CARD CASE

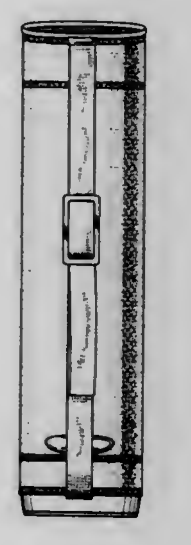
Curtis Taylor, 10 N. Main St., Chagrin Falls, Ohio 44022
Filed Oct. 16, 1996, Ser. No. 61,137
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—247



386,303

GOLF BAG WITH GOLF CLUB PARTITIONS

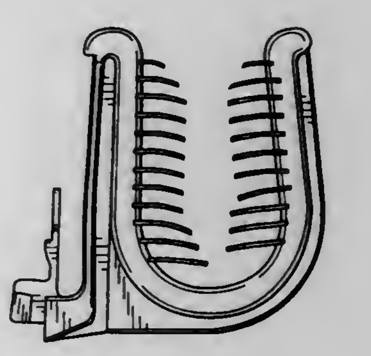
Jessie Li-Kuo Wang, 531 - 12th Ave., San Francisco, Calif. 94118
Filed Aug. 17, 1995, Ser. No. 42,800
The portion of the term of this patent subsequent to Aug. 26, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—255



386,304

COMBINED GUN AND BOW HOLDER

Dennis H. Hancock, Mountain Green, Utah, assignor to All-Rite Products, Inc., Mountain Green, Utah
Filed May 14, 1996, Ser. No. 54,400
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—262



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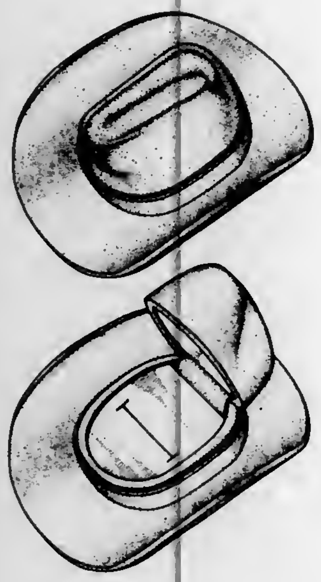
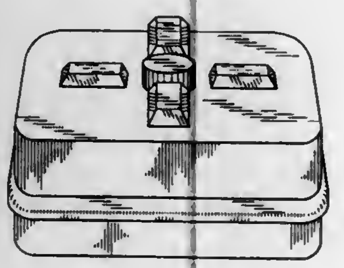
386,305
COWBOY HAT JEWELRY BOX

Anson W. Lau, 352 Alahmar Terr., San Gabriel, Calif. 91775
Filed Jun. 21, 1996, Ser. No. 56,093
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—271



386,306
STACKABLE TWO-PIECE CONTAINER FOR A TORQUE CONVERTER

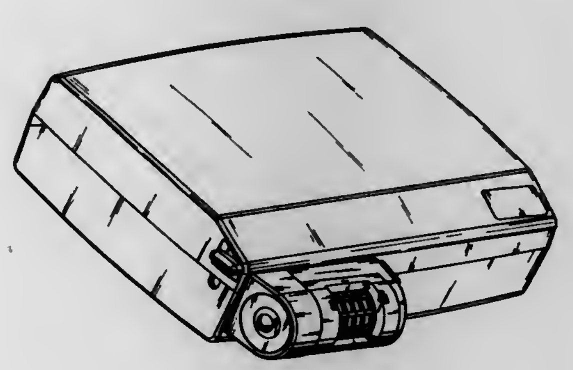
Wade Zimmerman, P.O. Box 3504, Thousand Oaks, Calif. 91359
Filed Apr. 4, 1996, Ser. No. 52,593
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—273



386,307
PORTABLE SECURITY CASE

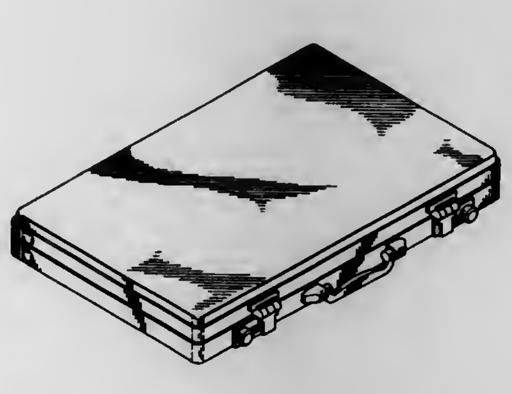
Robert L. Naas, Skaneateles, and Mark A. Ferguson, Jamesville, both of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.

Division of Ser. No. 35,857, Mar. 8, 1995, Pat. No. Des. 376,691. This application Jun. 13, 1996, Ser. No. 55,841
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—294



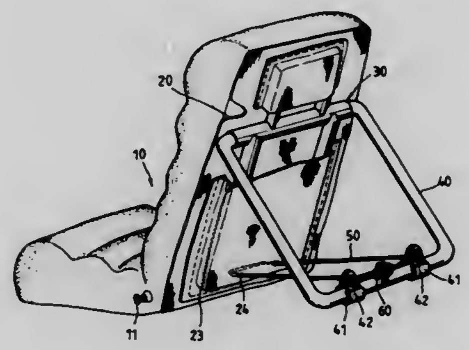
386,308
BUSINESS CARD BOX

Tsang-Ming Chen, 4-1, Lane Tung An, Trh Lin Town, Changhua, Taiwan
Filed Jun. 24, 1996, Ser. No. 56,130
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—294



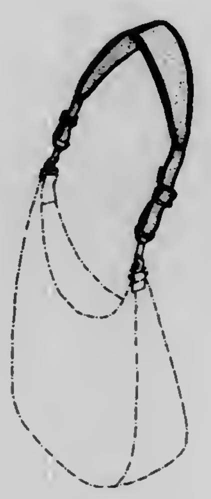
386,309
SEAT FRAME FOR SUITCASE

Hung-Hsin Hsieh, 15F, No. 83, Sec. 1, Chung-Hsiao East Rd., Taipei, Taiwan
Filed Jun. 29, 1995, Ser. No. 40,863
Term of patent 14 years
LOC (6) Cl. 03 - *99*
U.S. Cl. D3—318



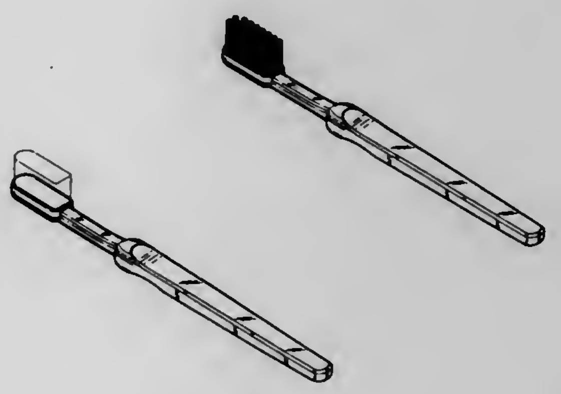
386,310
SHOULDER CARRYING STRAP

Nathaniel L. Smith, Holliston, Mass., assignor to Nepsco, Inc., Hollister, Mass.
Filed Oct. 8, 1996, Ser. No. 60,817
Term of patent 14 years
LOC (6) Cl. 03 - *99*
U.S. Cl. D3—327



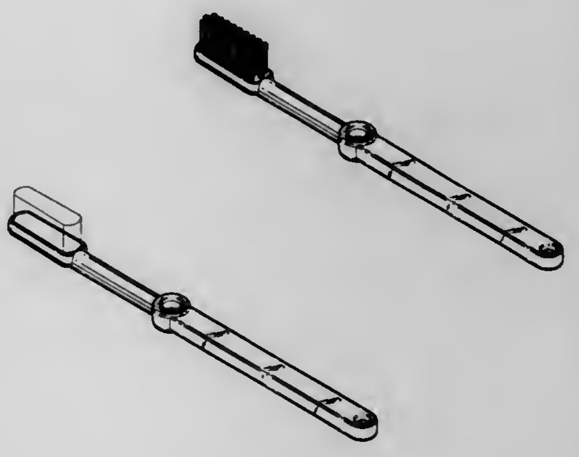
386,311
TOOTHBRUSH

Robert Moskovich, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Apr. 4, 1996, Ser. No. 52,001
The portion of the term of this patent subsequent to Nov. 11, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104



386,312
TOOTHBRUSH

Robert Moskovich, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Apr. 4, 1996, Ser. No. 52,002
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104



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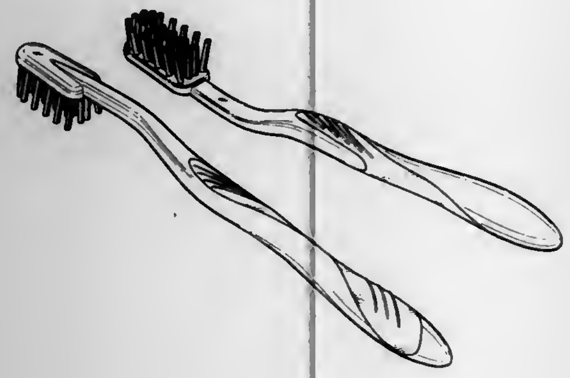
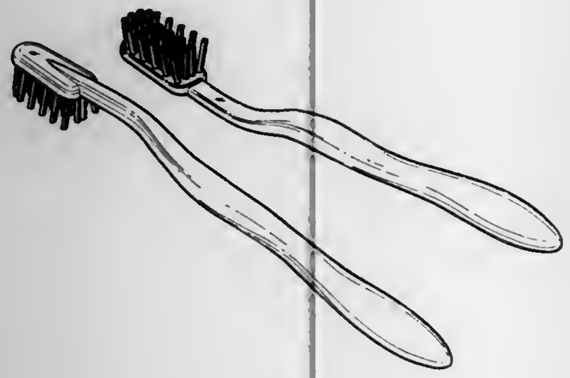
386,313
TOOTHBRUSH

Robert Moskovich, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Sep. 5, 1996, Ser. No. 59,722
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104



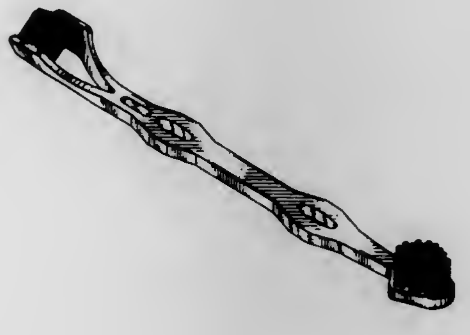
386,314
TOOTHBRUSH

Robert Moskovich, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Sep. 5, 1996, Ser. No. 59,728
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104



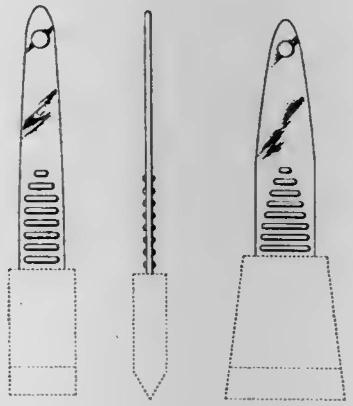
386,315
MULTIPLE HEAD TOOTH BRUSH

Jean-Louis Vrignaud, Scottsdale, Ariz., assignor to Devmark, Ltd., Luxembourg, Luxembourg
Filed Jun. 25, 1996, Ser. No. 56,174
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—106



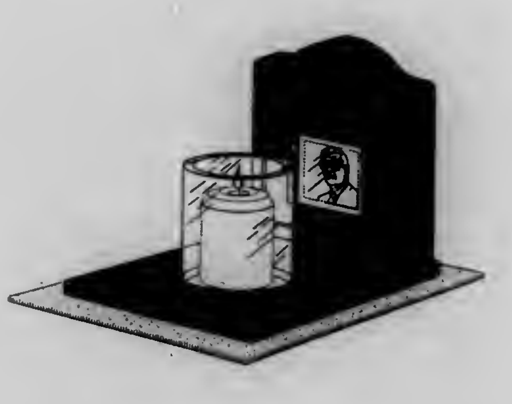
386,316
BRUSH HANDLE

Roger Fischer, Lancaster; Peter F. Lynch, and Robert L. Naas, both of Skaneateles, all of N.Y., assignors to Shur-Line, Inc., Lancaster, N.Y.
Filed Jan. 30, 1996, Ser. No. 49,742
Term of patent 14 years
LOC (6) Cl. 04 - *04*
U.S. Cl. D4—138



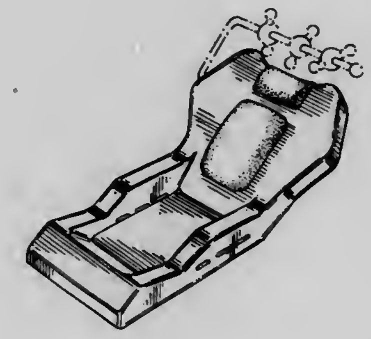
386,317
NOVELTY MUSICAL PICTURE FRAME

John D. Costa, 571 Macintosh Rd., Ormond Beach, Fla. 32174-3250
Filed Dec. 21, 1995, Ser. No. 48,122
Term of patent 14 years
LOC (6) Cl. 06 - *07*
U.S. Cl. D6—300



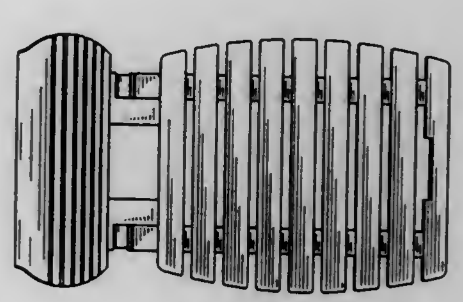
386,318
PORTABLE INFANT'S HAIR WASHING SEAT

Rene M. Smith, 4009 "B" Clark St., New Windsor, N.Y. 12553
Filed Apr. 10, 1996, Ser. No. 53,282
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—333



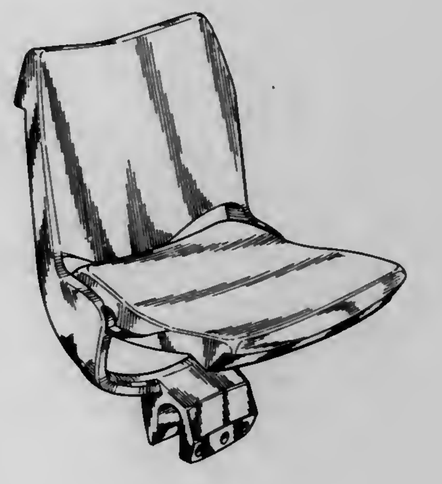
386,319
FOLDABLE SEAT

Eran Meyer, Haifa, Israel, assignor to Dar Plast Ltd. Israeli Company, Kiryat Motzkin, Israel
Filed Aug. 15, 1995, Ser. No. 42,627
Claims priority, application Israel, Feb. 15, 1995, 24004
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—368



386,320
STADIUM SEAT

Sheldon King, Milsons Point, Australia, assignor to Sebel Furniture Limited, Bankstown, Australia
Filed Dec. 22, 1995, Ser. No. 48,798
Claims priority, application Australia, Jun. 23, 1995, 1947/95
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—368



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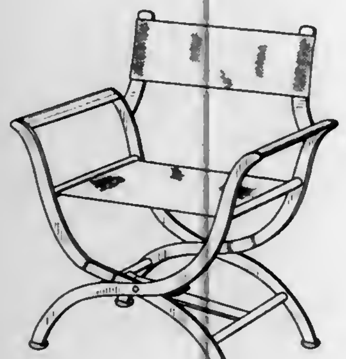
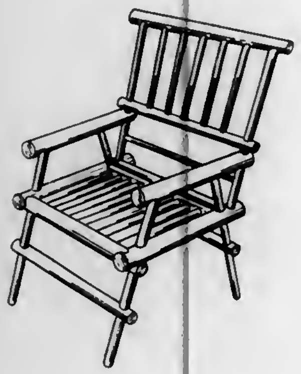
386,321
OUTDOOR ARM CHAIR

William M. Vanderminden, Middle Granville, N.Y., assignor to Telescope Casual Furniture Co., Granville, N.Y.
Filed Jul. 9, 1996, Ser. No. 56,786
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—368



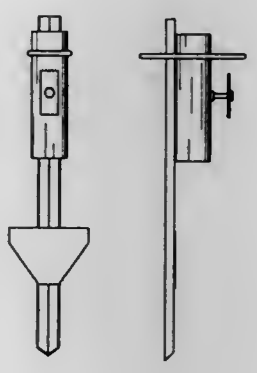
386,322
ASSEMBLED CHAIR

Lawson Maury, 4790 Kingsgate Pl., Memphis, Tenn. 38117
Filed Aug. 20, 1996, Ser. No. 58,681
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—370



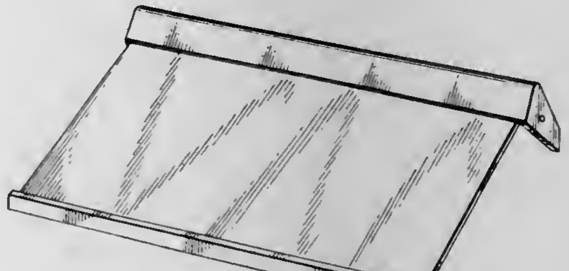
386,323
GROUND INSERTED UMBRELLA SUPPORT

J. C. Davis, 509 Hanson St., Arvin, Calif. 93203
Filed May 6, 1996, Ser. No. 54,021
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—417



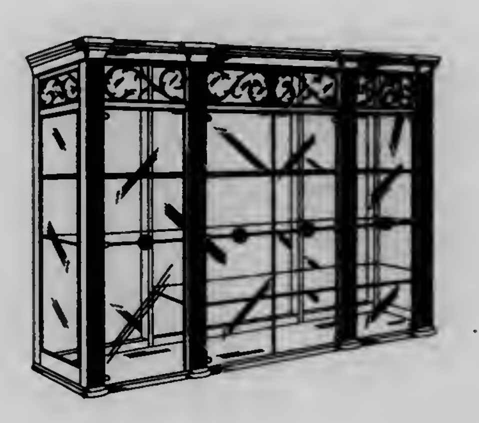
386,324
BINGO SHEET HOLDER

Gunther Degen, 821 Five Point Rd., Virginia Beach, Va. 23454
Filed Sep. 13, 1995, Ser. No. 43,823
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—420



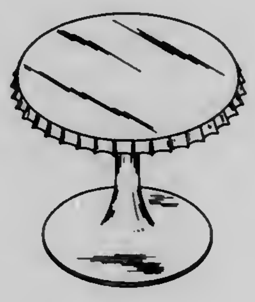
386,325
HUTCH

Timothy M. O'Hare, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.
Filed Aug. 20, 1996, Ser. No. 58,685
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—436



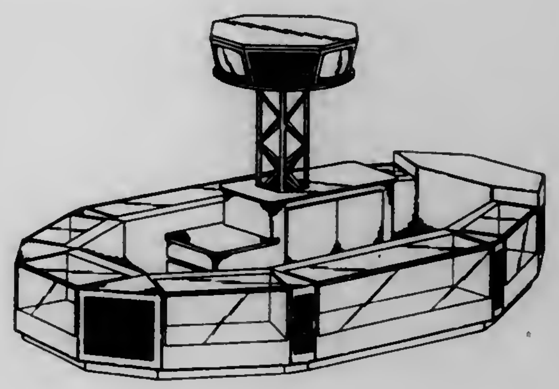
386,326
BOTTLE CAP TABLE

Eric John Kreuzer, 10802 W. Hillsborough Ave., #1612, Tampa, Fla. 33615
Filed Nov. 14, 1996, Ser. No. 62,431
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—451



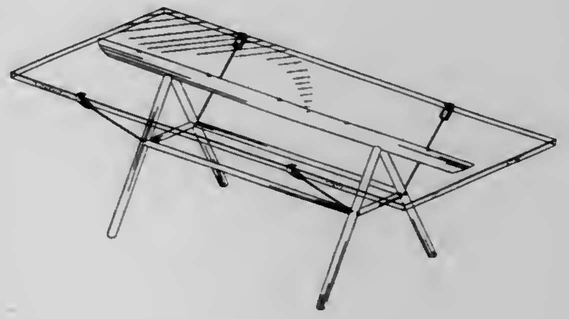
386,327
DISPLAY KIOSK

Dean Rotchin, Palm Beach, Fla., assignor to ASOTV Partners Limited, Palm Beach, Fla.
Filed Jun. 19, 1996, Ser. No. 55,987
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D6—470



386,328
TABLE

Glendon Robert Good, 2000 Second St., Berkeley, Calif. 94710
Filed Dec. 18, 1995, Ser. No. 48,024
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—480



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386,329
ADJUSTABLE NOVELTY STAND WITH INTERCHANGEABLE POSTS

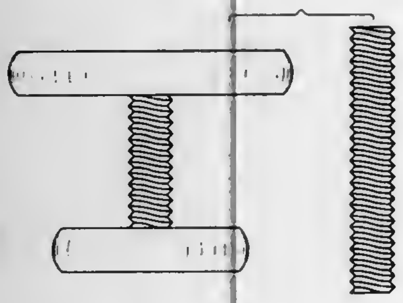
James J. Keclik, 257 Green Mountain Dr., Bolingbrook, Ill. 60440

Filed Jul. 17, 1996, Ser. No. 57,151

Term of patent 14 years

LOC (6) Cl. 06 - *03*

U.S. Cl. D6—486



386,330
TABLE LEG

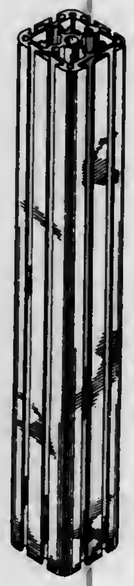
Robert Russell, Kentwood, Mich., assignor to Hon Industries Inc., Muscatine, Iowa

Filed Jun. 7, 1996, Ser. No. 55,577

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—495



386,331
TABLE LEGS

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex SARL, Oyonnax, France

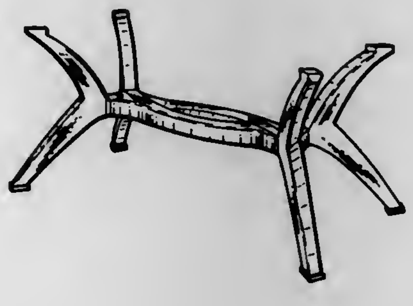
Filed Jul. 24, 1996, Ser. No. 57,399

Claims priority, application WIPO, Jan. 26, 1996, DMA/003209

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—495



386,332
TABLE LEGS

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France

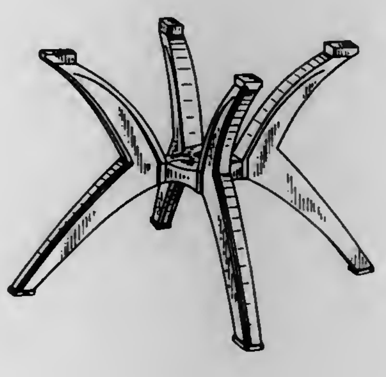
Filed Jul. 24, 1996, Ser. No. 57,398

Claims priority, application Hague Agreement, Jan. 26, 1996, DMA/003209

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—498



386,333
SEAT FOR MODULAR SEATING SYSTEM

Brian J. Kane, San Francisco, Calif., assignor to Landscape Forms, Inc., Kalamazoo, Mich.

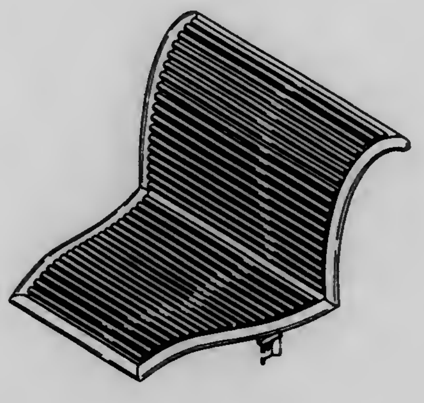
Filed Mar. 1, 1996, Ser. No. 51,296

The portion of the term of this patent subsequent to Oct. 28, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—500



386,334
TOP PORTION OF A SPRING CORE

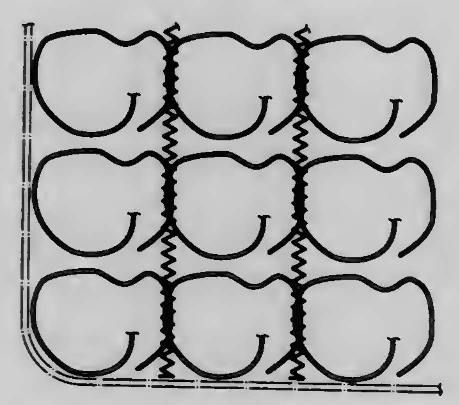
Thomas J. Wells, Carthage, Mo., assignor to L&P Property Management Company, Chicago, Ill.

Filed Mar. 15, 1996, Ser. No. 51,699

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—504



386,335
DRAWER DIVIDER UNIT

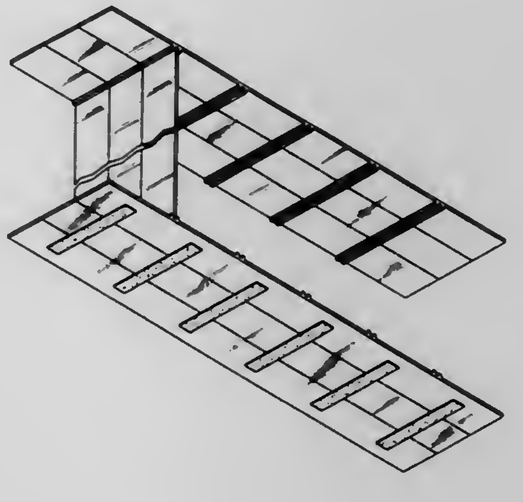
Robert L. LaFreniere, 388 N. Sicily Pl., Chandler, Ariz. 85226

Filed Sep. 11, 1996, Ser. No. 59,431

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—510



386,336
STORAGE DRAWER

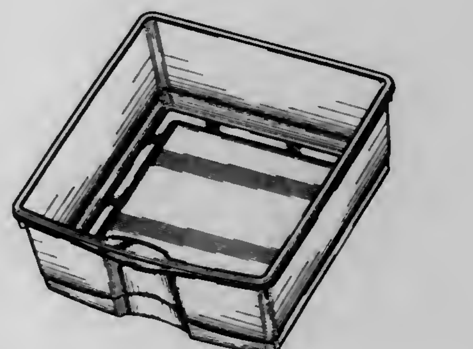
Patrick Douglas, Medina, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Nov. 4, 1996, Ser. No. 62,422

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—510



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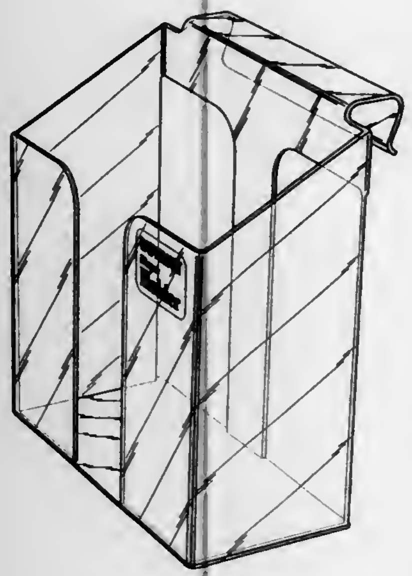
DIAPER HOLDER

Diane M. Zissu, 174 Hardscrabble Rd., Bernardsville, N.J. 07924

Filed May 24, 1996, Ser. No. 54,893
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D6—513



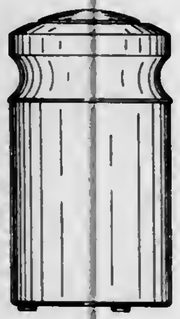
386,338

CUP DISPENSER

Frederick Hadtke, New Providence, and Jonathan E. Rush, Phillipsburg, both of N.J., assignors to James River Corporation of Virginia, Richmond, Va.

Filed Mar. 1, 1996, Ser. No. 50,985
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D6—516



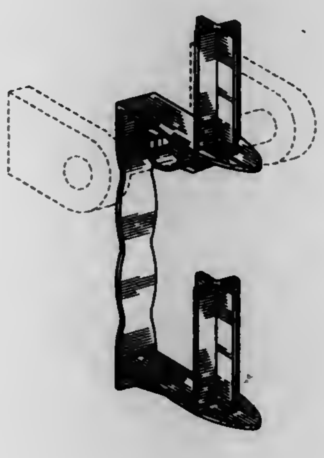
386,339

TOILET TISSUE HOLDER

David L. Schneider, 261 Pfrimmers Chaple Rd., SE., Corydon, Ind. 47112

Filed Jul. 23, 1996, Ser. No. 57,321
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D6—520



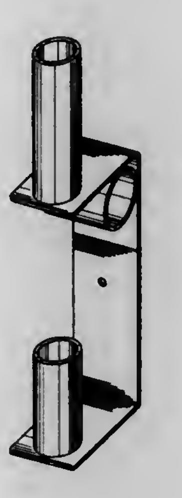
386,340

TOILET TISSUE HOLDER

David L. Schneider, 261 Pfrimmers Chaple Rd., SE., Corydon, Ind. 47112

Filed Jul. 24, 1996, Ser. No. 57,406
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D6—520



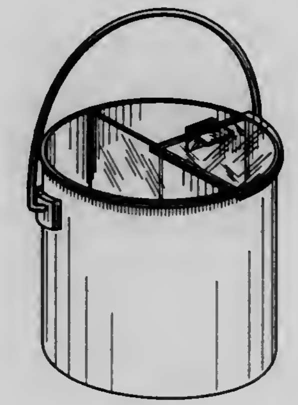
386,341

SHOWER BUCKET

Keith Walker, 17304 Walden Ave., Cleveland, Ohio 44128

Filed Dec. 12, 1995, Ser. No. 47,742
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D6—525



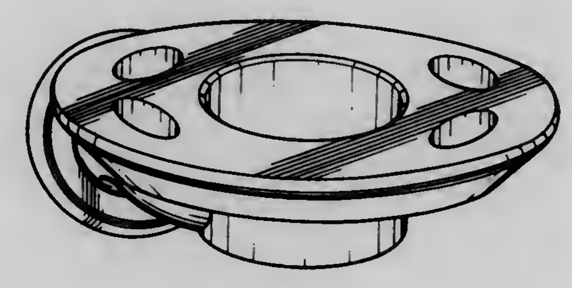
386,342

TOOTHBRUSH-TUMBLER HOLDER

Glenn David Moore, Newfoundland, N.J., assignor to Melard Manufacturing Corp., Passaic, N.J.

Filed May 24, 1996, Ser. No. 54,925
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D6—531



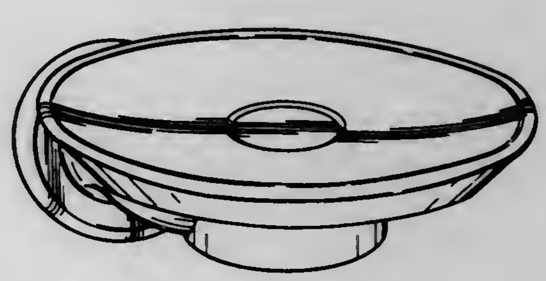
386,343

SOAP DISH

Glenn David Moore, Newfoundland, N.J., assignor to Melard Manufacturing Corp., Passaic, N.J.

Filed May 24, 1996, Ser. No. 54,884
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D6—532



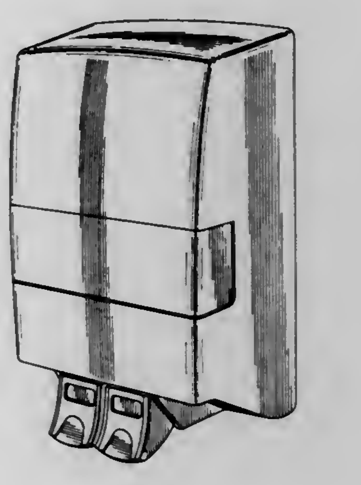
386,344

LIQUID SOAP DISPENSER

Allen E. Brandenburg, Austin, and John E. Maldonado, San Antonio, both of Tex., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Nov. 1, 1995, Ser. No. 45,869
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D6—544



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MULTIPLE SPOUT DISPENSER

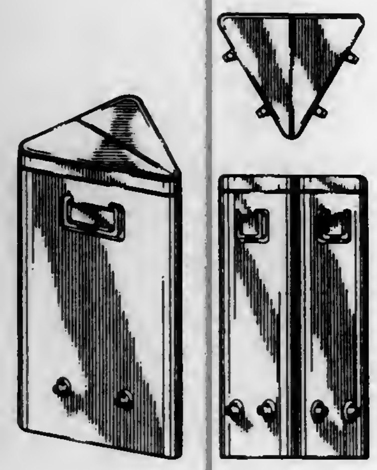
Patricia Juarez, 7777 N. Foothill Dr. South, Paradise Valley, Ariz. 85253

Filed Sep. 9, 1996, Ser. No. 59,348

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—544



386,346

MIRRORED MEDICINE CABINET

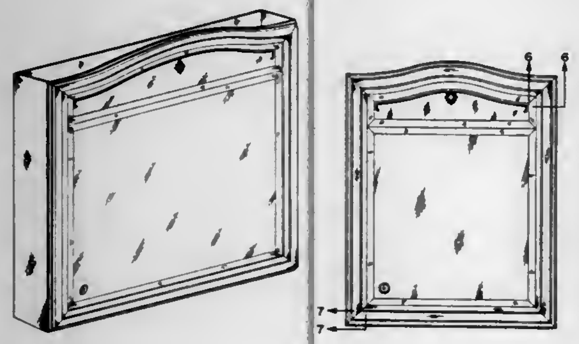
James J. Palka, 22351 W. Thornridge Dr., Kildeer, Ill. 60047

Filed Sep. 21, 1995, Ser. No. 44,238

Term of patent 14 years

LOC (6) Cl. 08 - *08*

U.S. Cl. D6—559



386,347

WALL-MOUNTED CONTAINER FOR THE PROTECTION AND STORAGE OF SAFETY GLASSES OR GOGGLES

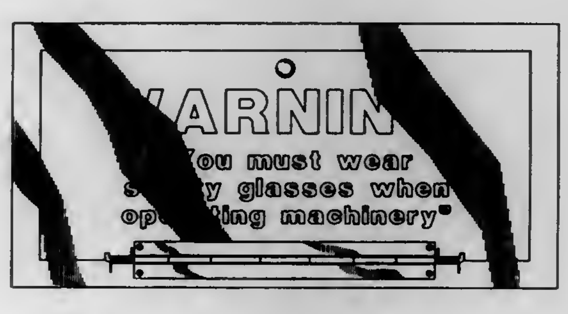
Conrad Rios, 6811 Walker Ave., Bell, Calif. 90201

Filed Jul. 1, 1996, Ser. No. 56,516

Term of patent 14 years

LOC (6) Cl. 08 - *08*

U.S. Cl. D6—559



386,348

CUSHION

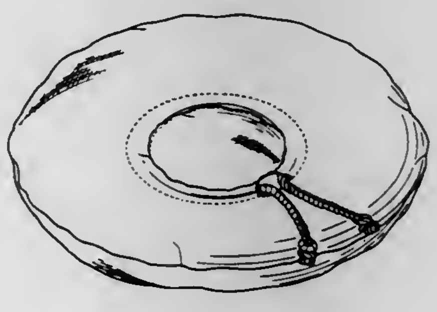
Edward Weidman, 404 4th Ave., East Northport, N.Y. 11731, and Nancy Hassell, 1 Sutton Pl., Huntington, N.Y. 11743

Filed Sep. 17, 1996, Ser. No. 59,892

Term of patent 14 years

LOC (6) Cl. 06 - *09*

U.S. Cl. D6—601



386,349

TOASTER COVER CONSISTING OF LID AND ELASTICIZED SKIRT

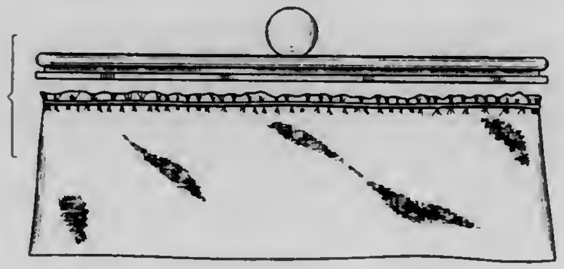
Lynne S. Wysocky, 12372 Concord Ct., Chino, Calif. 91710, and Cindy L. Foreman, 12373 Concord Ct., Chino, Calif. 91710-2147

Filed Jul. 11, 1996, Ser. No. 56,909

Term of patent 14 years

LOC (6) Cl. 06 - *13*

U.S. Cl. D6—610



386,350

AUTOMATED BEVERAGE DISPENSER

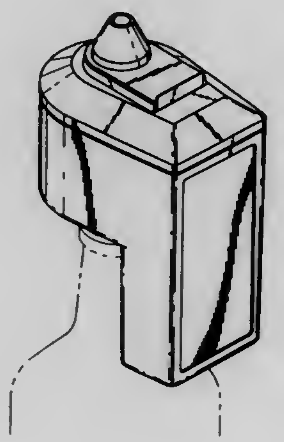
Mike Mogadam, 646 Lambeth Ct., Sunnyvale, Calif. 94087

Filed May 30, 1996, Ser. No. 55,055

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—312



386,351

JUG WITH WATER FILTER

Carsten Joergensen, Kriens, Switzerland, assignor to PI-Design AG, Triengen, Switzerland

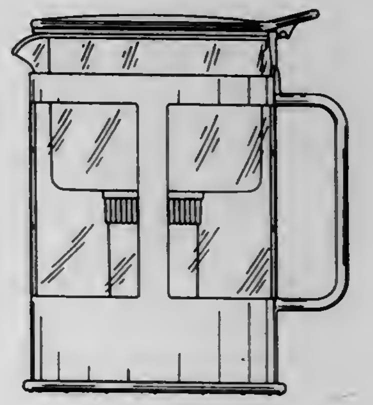
Filed May 23, 1996, Ser. No. 54,836

Claims priority, application Denmark, Feb. 13, 1996, 159/96

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—319



386,352

CLASSIC TOASTER

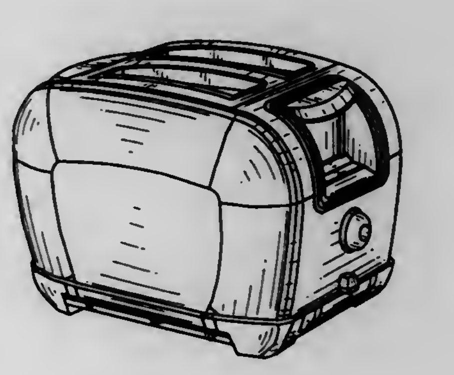
Jonathan Mandell, Hattiesburg, Miss.; Paulette Abraham, Chicago, Ill., and Shawn Hoss, Hattiesburg, Miss., assignors to Sunbeam Products, Inc., Delray Beach, Fla.

Filed Jan. 12, 1996, Ser. No. 49,071

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—330



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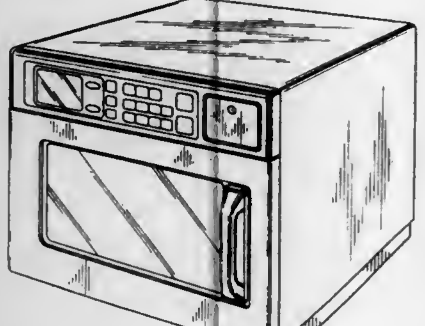
386,353
MICROWAVE OVEN

Munenori Fujimoto, and Akio Mikami, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1996, Ser. No. 59,224
Term of patent 14 years
LOC (6) Cl. 07 - *02*

U.S. Cl. D7—351



386,354
COOKWARE

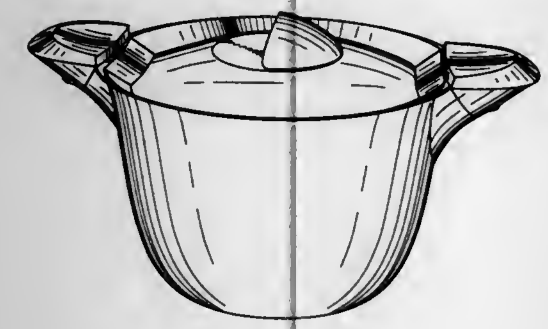
Jan A. N. Hoekstra, Rotterdam, Netherlands, assignor to Verkoopmaatschappij Van Kempen & Begeer B.V., Zoetermeer, Netherlands

Filed May 20, 1996, Ser. No. 54,709

Claims priority, application Benelux TM/Des. Off., Nov. 21, 1995, 71325-00

Term of patent 14 years
LOC (6) Cl. 07 - *02*

U.S. Cl. D7—360

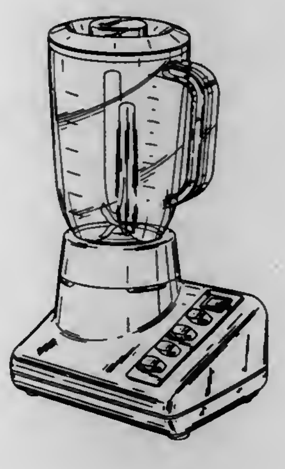


386,355
COMBINATION BLENDER JAR AND BASE

Carl B. Davidson, Mocksville, N.C.; Benjamin A. Governale, Phoenix, Md., and Ricky A. Place, Hanover, Pa., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 35,067, Feb. 17, 1995, abandoned.
This application Jan. 3, 1996, Ser. No. 50,540
Term of patent 14 years
LOC (6) Cl. 31 - *00*

U.S. Cl. D7—378



386,356

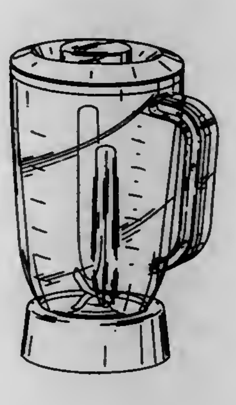
Patent Not Issued For This Number

386,357
BLENDER JAR

Carl B. Davidson, Mocksville, N.C., assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 35,066, Feb. 17, 1995, abandoned.
This application Jan. 3, 1996, Ser. No. 50,539
Term of patent 14 years
LOC (6) Cl. 31 - *00*

U.S. Cl. D7—413

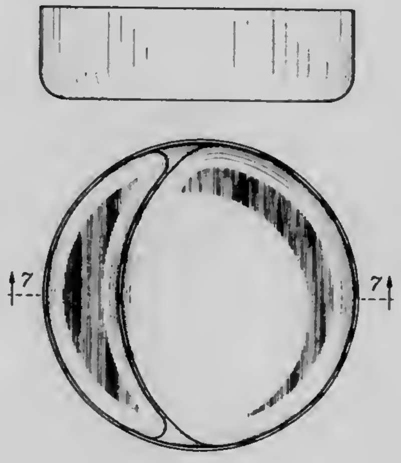


386,358
PARTITIONED BOWL

Robert Pfeilsticker, 1815 Fite Ter., Langhorne, Pa. 19047

Filed Nov. 18, 1996, Ser. No. 62,543
Term of patent 14 years
LOC (6) Cl. 07 - *01*

U.S. Cl. D7—555



386,359

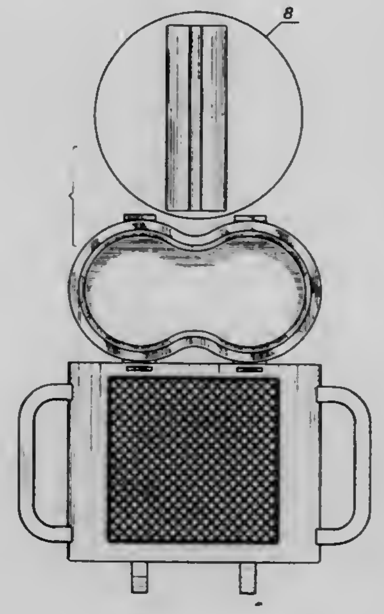
Patent Not Issued For This Number

386,360
COOLER KEEPER FOR TWO LITER BOTTLES

Gordon J. Krug, Sr., 259 M Golf Course Rd., Portage, Pa. 15946

Filed Apr. 23, 1996, Ser. No. 53,076
Term of patent 14 years
LOC (6) Cl. 72 - *01*

U.S. Cl. D7—605

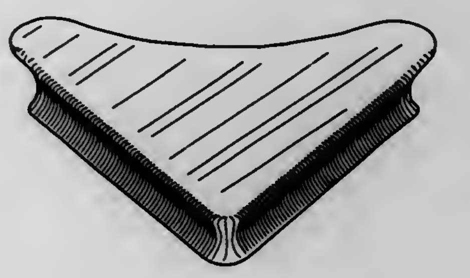


386,361
EATING AID

Megan J. Morrow, and Dennis Morrow, both of P.O. Box 123, Wilmington, Vt. 05363

Filed May 15, 1996, Ser. No. 55,738
Term of patent 14 years
LOC (6) Cl. 07 - *03*

U.S. Cl. D7—642

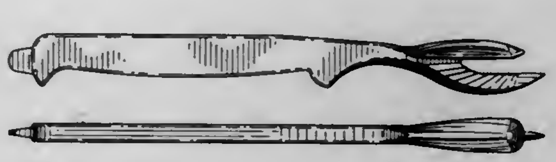


386,362
SHELLFISH OPENING AND MEAT REMOVAL UTENSIL

Anthony LaSalle, and Betty LaSalle, both of Overland Park, Kans., assignors to Lasalle Product Development, Inc., Overland Park, Kans.

Filed Aug. 16, 1996, Ser. No. 59,122
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D7—693



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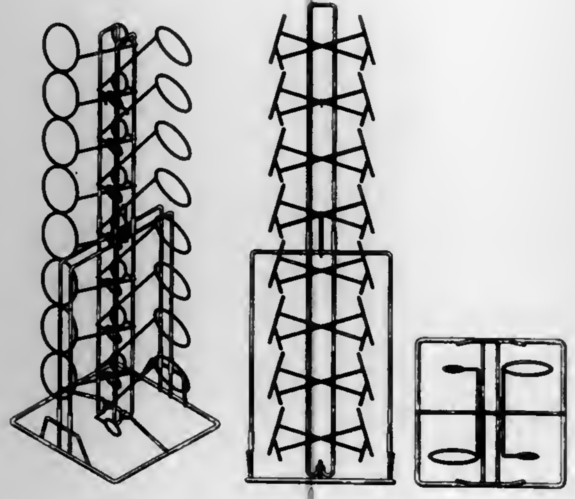
386,363
WINE BOTTLE RACK

Shahriar Dardashti, c/o Atlantic Representations, Inc., Post Office Box 2399, Santa Fe Springs, Calif. 90670

Continuation of Ser. No. 51,233, Mar. 6, 1996, abandoned.
This application Sep. 9, 1996, Ser. No. 59,737
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D7—704

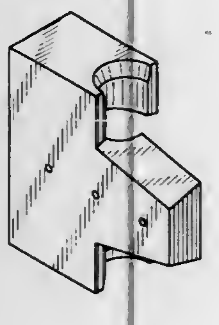


386,364
LANDSCAPE TIMBER CONNECTING SYSTEM MEMBER

Peter Rimback, Oakwood, and James Vidmar, Willoughby, both of Ohio, assignors to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed May 31, 1996, Ser. No. 55,192
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1

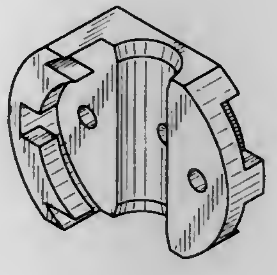


386,365
LANDSCAPE TIMBER CONNECTING SYSTEM MEMBER

Peter Rimback, Village of Oakwood, and James F. Vidmar, Willoughby, both of Ohio, assignors to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed May 31, 1996, Ser. No. 55,196
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1

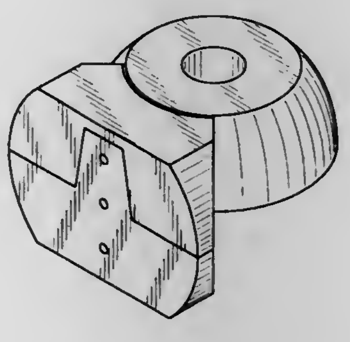


386,366
LANDSCAPE TIMBER CONNECTING SYSTEM MEMBER

Peter Rimback, Village of Oakwood, and James Vidmar, Willoughby, both of Ohio, assignors to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed May 31, 1996, Ser. No. 55,206
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1

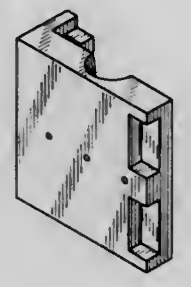


386,367
LANDSCAPE TIMBER CONNECTING SYSTEM MEMBER

Peter Rimback, Village of Oakwood, and James Vidmar, Willoughby, both of Ohio, assignors to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed May 31, 1996, Ser. No. 55,306
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1

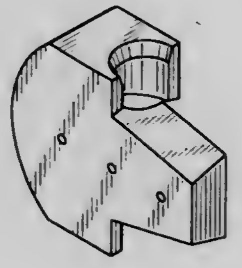


386,368
LANDSCAPE TIMBER CONNECTING SYSTEM MEMBER

Peter Rimback, Village of Oakwood, and James Vidmar, Willoughby, both of Ohio, assignors to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed May 31, 1996, Ser. No. 55,309
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1

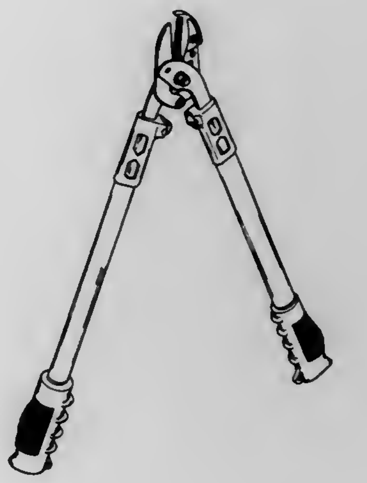


386,369
SHEARS

Ching-Shui Lin, 58, Ma Yuan West St., Taichung, Taiwan

Filed Sep. 27, 1995, Ser. No. 49,573
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—5

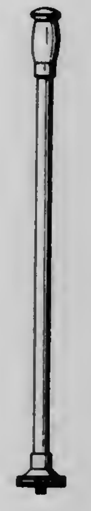


386,370
GARDEN WEEDER

Andrew Nicholas Oxley, and Charles Michael Oxley, both of Oxfordshire, Great Britain, assignors to PZ Products Limited, Oxfordshire, Great Britain

Filed Mar. 19, 1996, Ser. No. 52,546
Claims priority, application United Kingdom, Sep. 19, 1995, 2050493
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D8—8



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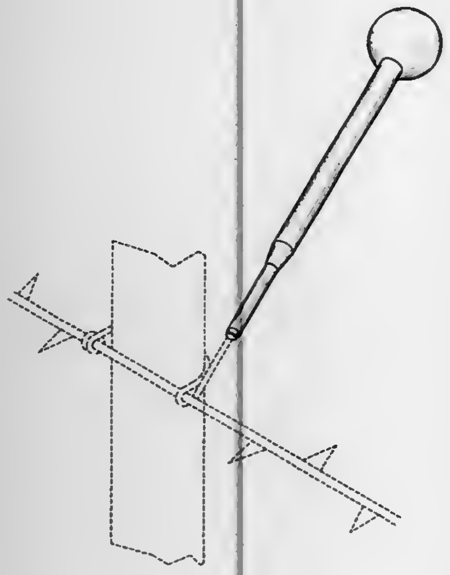
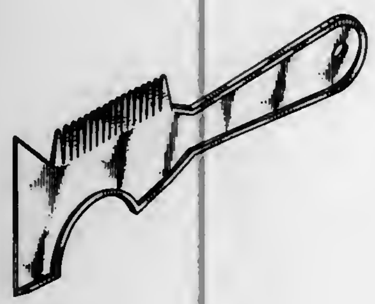
386,371
T-POST CLIP INSTALLER

Glen L. Gloyna, Rte. 5, Box 2260, Nacadoches, Tex. 75961
Filed May 8, 1996, Ser. No. 53,503
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—14



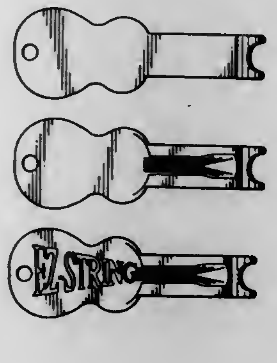
386,372
TOOL

Sherman L. Weiss, 11360 Sherman Way, Sun Valley, Calif. 91352
Filed Jun. 13, 1996, Ser. No. 55,782
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—14



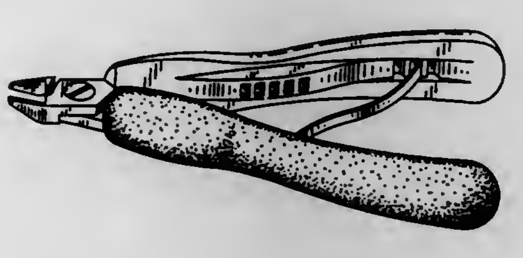
386,373
GUITAR BRIDGE PIN PULLER

Michael J. Weinmuller, 1564 Willowbrook La., Simi Valley, Calif. 93065
Filed Jun. 27, 1996, Ser. No. 56,341
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—16



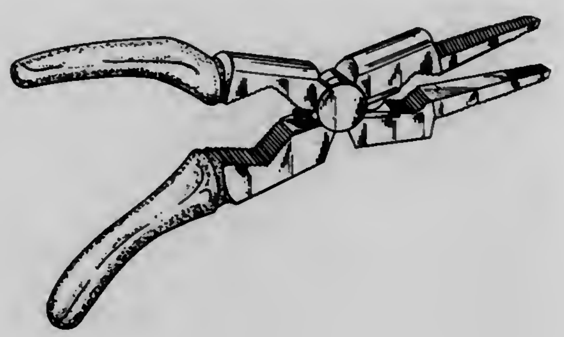
386,374
PLIERS

Conny Jansson, Enkoping; Hans Himberg; Hakan Bergqvist, both of Bromma, and Olle Bobjer, Spanga, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden
Filed Aug. 14, 1996, Ser. No. 58,408
Claims priority, application Sweden, Nov. 11, 1993, 93-2538; Nov. 11, 1993, 93-2539; Nov. 11, 1993, 93-2540; Nov. 11, 1993, 93-2541; Nov. 11, 1993, 93-2542; Nov. 11, 1993, 93-2543
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—52



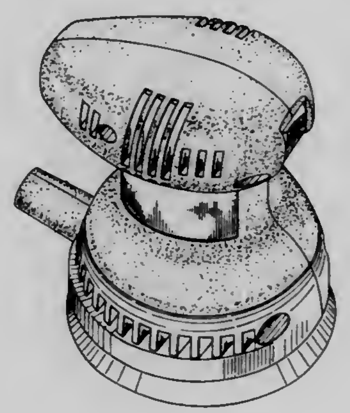
386,375
WELDER'S PLIERS

Joseph W. Harris, Cincinnati, Ohio, assignor to J.W. Harris Co., Inc., Cincinnati, Ohio
Filed Nov. 13, 1996, Ser. No. 62,360
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—52



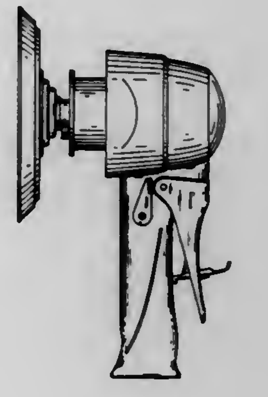
386,376
SANDER

Tetsuhisa Kaneko, and Kouji Takeuchi, both of Anjo, Japan, assignors to Makita Corporation, Anjo, Japan
Filed Aug. 13, 1996, Ser. No. 58,614
Claims priority, application Japan, Feb. 23, 1996, 8-4742
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—62



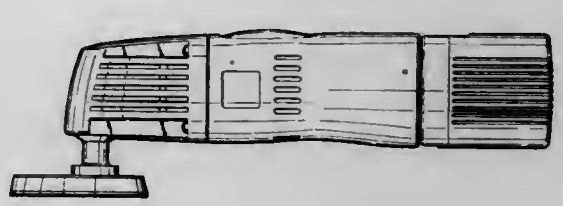
386,377
SANDER

Eric Sung, Ta-Li, Taiwan, assignor to K.K.U. Limited, Japan
Filed Sep. 11, 1995, Ser. No. 43,730
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—62



386,378
TRIANGLE GRINDER

Heinrich Henssler, and Martin Schultheiss, both of Schwäbisch Gmünd, Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Germany
Filed Aug. 27, 1996, Ser. No. 58,888
Claims priority, application Germany, Mar. 1, 1996, M96019468
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—62



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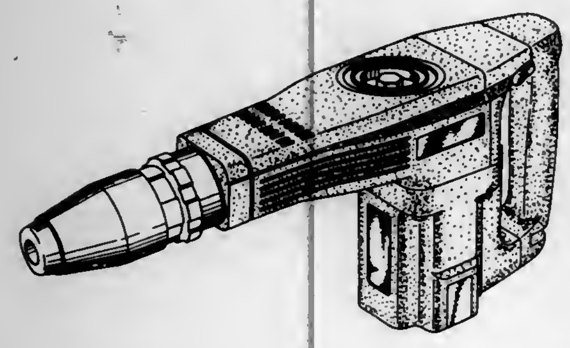
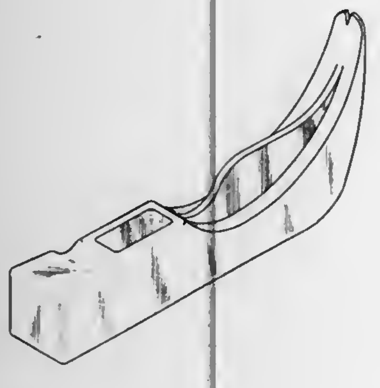
386,379
PORTABLE ELECTRIC HAMMER

Yoshihiro Kasuya, Anjo, Japan, assignor to Makita Corporation, Anjo, Japan
Filed Aug. 14, 1996, Ser. No. 58,622
Claims priority, application Japan, Feb. 20, 1996, 8-4456
Term of patent 14 years
LOC (6) Cl. 8 - *01*
U.S. Cl. D8—69



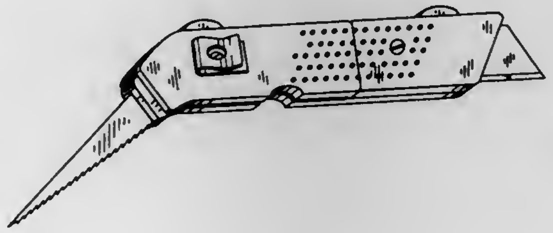
386,380
HAMMER HEAD

Daniel Villarreal, 1288 W. 11th St. #211, Tracy, Calif. 95376
Filed Jun. 13, 1996, Ser. No. 55,787
Term of patent 14 years
LOC (6) Cl. 08 - *02*
U.S. Cl. D8—78



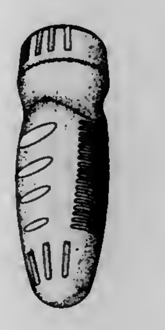
386,381
SHEETROCK UTILITY KNIFE

Joseph D. Black, 256 Melvin Ave., and Harold C. McNamara, 22 Parish Ave., both of Staten Island, N.Y. 10314
Filed Feb. 26, 1996, Ser. No. 50,720
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—99



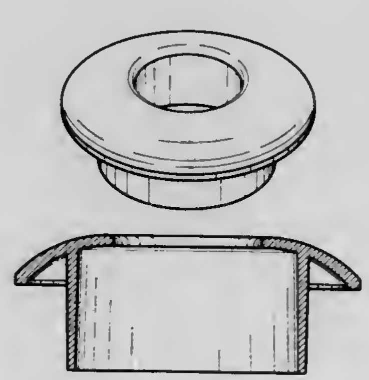
386,382
TOOL HANDLE

Hsuan-Sen Shiao, 2F, No. 15-1, Lane 369, Min-Chuan Rd., Pei Dist., Taichung City, Taiwan
Filed Sep. 16, 1996, Ser. No. 59,801
Term of patent 14 years
LOC (6) Cl. 08 - *04*
U.S. Cl. D8—107



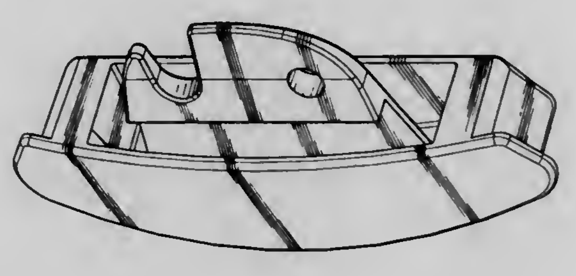
386,383
HANDLE

David C. Lougeé, Dallas, Tex., assignor to Oceanic Systems, Inc., Dallas, Tex.
Filed Oct. 29, 1996, Ser. No. 61,723
Term of patent 14 years
LOC (6) Cl. 08 - *06*
U.S. Cl. D8—313



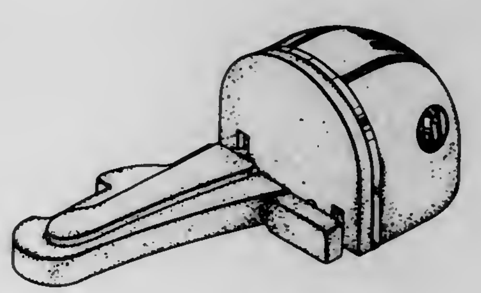
386,384
LOCK FOR STORAGE CONTAINER

Kevin Rausch, Wooster, and Matthew Williams, North Canton, both of Ohio, assignors to Rubbermaid Specialty Products Inc., Wooster, Ohio
Filed Jun. 5, 1996, Ser. No. 55,395
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—330



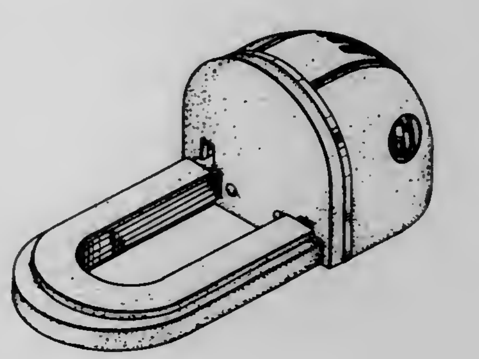
386,385
LOCK FOR A GEAR SHIFT LEVER

Yun-Tung Hsu, Taipei, Taiwan, assignor to Ching-Tsai Wang, Taichung, Taiwan
Filed Mar. 18, 1996, Ser. No. 51,779
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—331



386,386
LOCK FOR A GEAR SHIFT LEVER

Yun-Tung Hsu, Taipei, Taiwan, assignor to Ching-Tsai Wang, Taichung, Taiwan
Filed Mar. 18, 1996, Ser. No. 51,774
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—333



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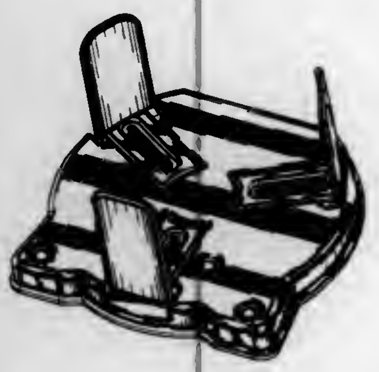
BRACKET

Kevin Rausch, Wooster, Ohio, assignor to Rubbermaid Specialty Products Inc., Wooster, Ohio
Filed Jun. 4, 1996, Ser. No. 55,361
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—349

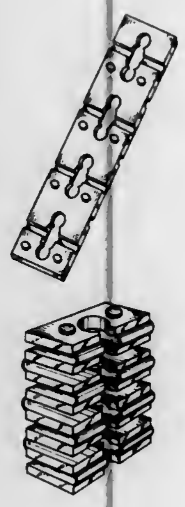


386,388

FOLDABLE SPACER

Mark Antonucci, 2520-A Fifth St., Santa Monica, Calif. 90405
Filed Mar. 20, 1995, Ser. No. 36,389
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—354

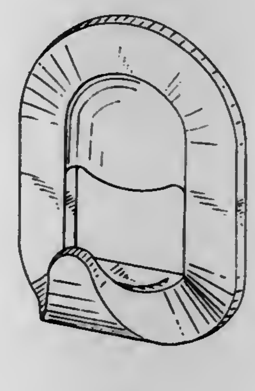


386,389

HOOK

James A. Hofman, Warrenville, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Dec. 22, 1995, Ser. No. 48,851
The portion of the term of this patent subsequent to Jan. 28, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—367

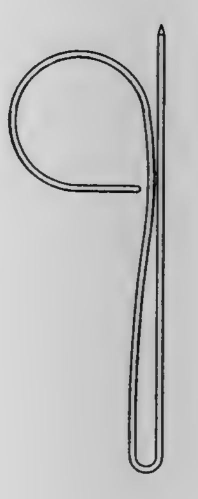


386,390

HOOK

Linda A. Ebarb, 4783 Citrus Dr., New Orleans, La. 70127
Filed Apr. 29, 1996, Ser. No. 53,661
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—370

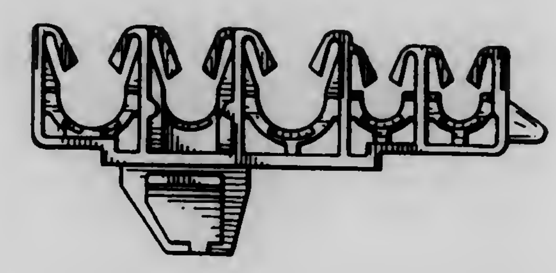


386,391

ROD HOLDER

Atsushi Ogawa, Utsunomiya, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed May 21, 1996, Ser. No. 54,754
Claims priority, application Japan, Jan. 26, 1996, 8-1510
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—380

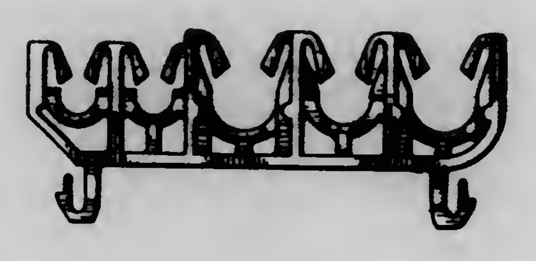


386,392

ROD HOLDER

Atsushi Ogawa, Utsunomiya, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed May 21, 1996, Ser. No. 54,755
Claims priority, application Japan, Jan. 26, 1996, 8-1511
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D8—380

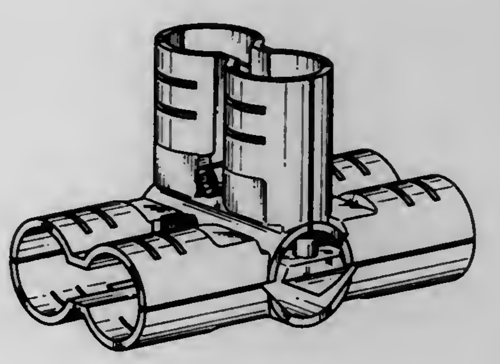


386,393

JOINT

Masayuki Ookubo, and Yasuyuki Otani, both of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co., Ltd., Japan
Filed Jan. 11, 1996, Ser. No. 48,685
Term of patent 14 years
LOC (6) Cl. 08 - *08*

U.S. Cl. D8—382

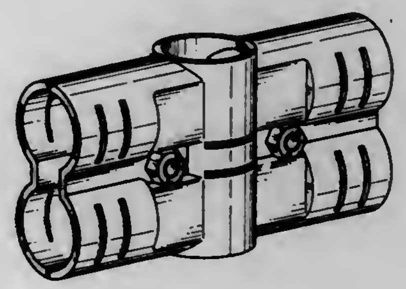


386,394

JOINT

Masayuki Ookubo, and Yasuyuki Otani, both of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co., Ltd., Japan
Filed Jan. 11, 1996, Ser. No. 48,686
Term of patent 14 years
LOC (6) Cl. 08 - *08*

U.S. Cl. D8—382



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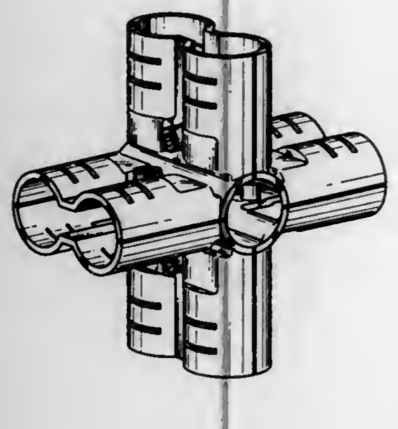
386,395
JOINT
Masayuki Ookubo, and Yasuyuki Otani, both of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co., Ltd., Japan

Filed Jan. 11, 1996, Ser. No. 48,687
Term of patent 14 years
LOC (6) Cl. 08 - *08*

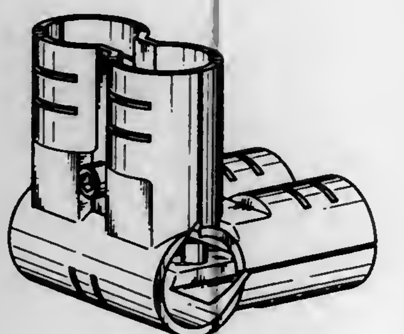
U.S. Cl. D8—382



386,396
JOINT
Masayuki Ookubo, and Yasuyuki Otani, both of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co., Ltd., Japan

Filed Jan. 11, 1996, Ser. No. 48,689
Term of patent 14 years
LOC (6) Cl. 08 - *08*

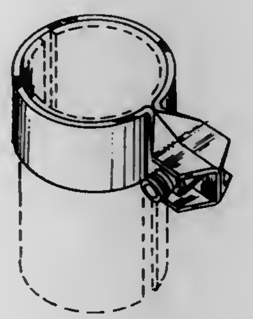
U.S. Cl. D8—382



386,397
CONNECTION SLEEVE FOR BRUSH HANDLES AND WIPER HANDLES
Stephan G. Adriaenssens, Meulebeke, Belgium, assignor to N.V. Moerman, Meulebeke, Belgium

Filed Oct. 19, 1995, Ser. No. 45,437
Term of patent 14 years
LOC (6) Cl. 08 - *08*

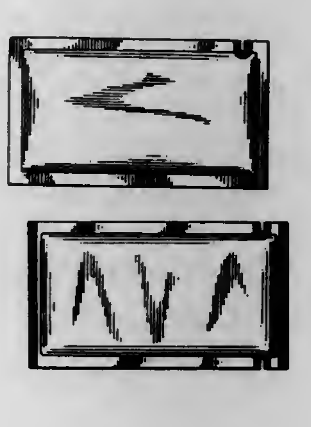
U.S. Cl. D8—396



386,398
DISPENSER POUCH
Steven D. Davis, Yuciappa, Calif., assignor to Winpak Lane, Inc., San Bernardino, Calif.

Filed Aug. 1, 1994, Ser. No. 26,551
Term of patent 14 years
LOC (6) Cl. 09 - *05*

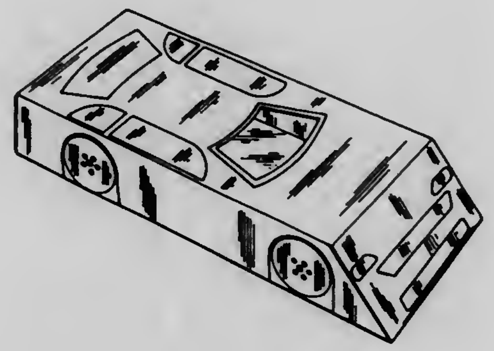
U.S. Cl. D9—305



386,399
PACKAGE FOR SLIPPER SOCK
Pamela Dianne Stokely, Hudson; Sarah T. Whittington, Concord, and Robert Haynes Russell, Hickory, all of N.C., assignors to Holiday Hosiery, Inc., Hudson, N.C.

Filed Oct. 6, 1995, Ser. No. 45,037
Term of patent 14 years
LOC (6) Cl. 09 - *03*

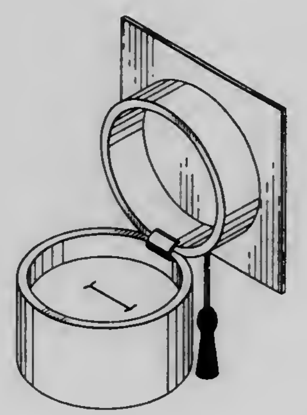
U.S. Cl. D9—308



386,400
HAT JEWELRY BOX WITH TASSEL
Anson W. Lau, 352 Alahmar Ter., San Gabriel, Calif. 91775

Filed Mar. 19, 1996, Ser. No. 52,008
Term of patent 14 years
LOC (6) Cl. 09 - *03*

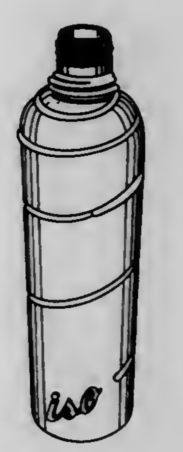
U.S. Cl. D9—320



386,401
BOTTLE WITH HELICAL GROOVE FORMATION
Jeannette Prestia, Melrose Park; Laura S. Elliott, Chicago; Lawrence Laske, Highland Park, and Caroline Marchionna, Naperville, all of Ill., assignors to Zotos International, Inc., Darien, Conn.

Filed Mar. 18, 1996, Ser. No. 51,793
Term of patent 14 years
LOC (6) Cl. 09 - *01*

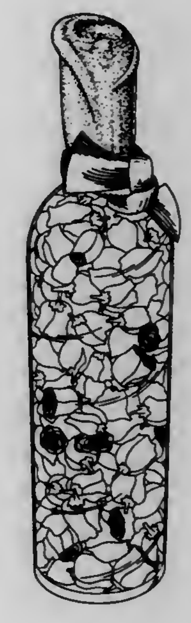
U.S. Cl. D9—332



386,402
BOTTLE WITH CONTENTS
Susan P. Sahatjian, Fresno, Calif., assignor to Morgan & Company, Inc., Fresco, Calif.

Filed May 24, 1996, Ser. No. 54,934
Term of patent 14 years
LOC (6) Cl. 09 - *01*

U.S. Cl. D9—337



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COMBINED CONTAINER AND APPLICATOR DEVICE FOR OILS, LOTIONS AND LIKE COSMETIC FLUIDS

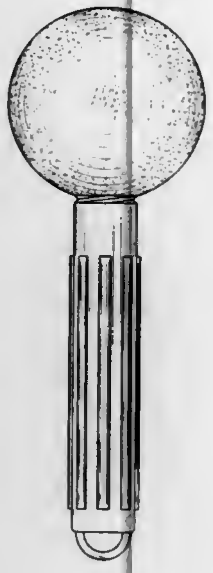
Novia McGregor, 98-15 Horace Harding Expressway #6H, Rego Park, N.Y. 11368

Filed Oct. 15, 1996, Ser. No. 61,036

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—338



386,404

BATTERY OPERATED HAND-HELD DISPENSER

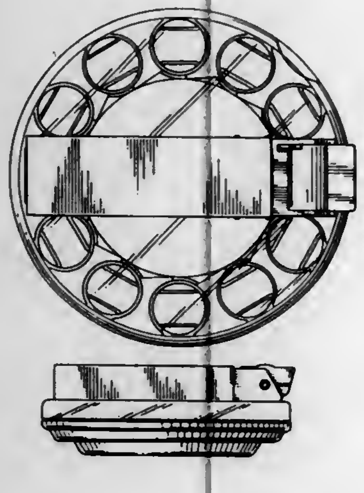
Karl D. Kirk, III; Paul Mulhauser, both of New York, and Diego Fontayne, Montebello, all of N.Y., assignors to Cap Toys, Inc., Bedford Heights, Ohio

Filed Feb. 28, 1996, Ser. No. 50,852

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—339



386,405

MOTOR VEHICLE TUNE-UP KIT CONTAINER

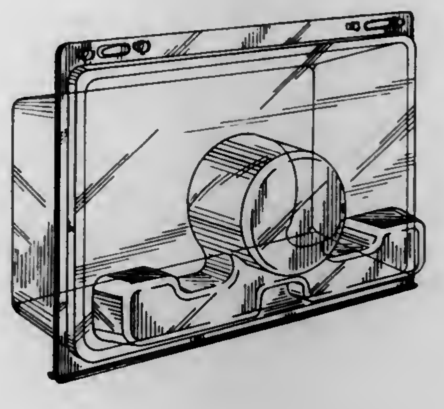
I. Robert Bernstein, Deerfield; Joseph W. Gaske, Brookfield, and Daniel J. Flynn, DesPlaines, all of Ill., assignors to Triple-A Specialty Co., Chicago, Ill.

Filed Dec. 4, 1996, Ser. No. 63,581

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—415



386,406

PACKAGE FOR COMPACT DISK

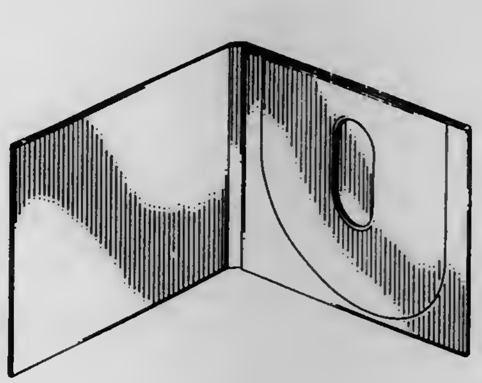
Richard F. House, St. Charles, Ill., assignor to Jefferson Smurfit Corporation, Clayton, Mo.

Filed Apr. 29, 1996, Ser. No. 53,664

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—433



386,407

DIAMOND-SHAPED PROTRUSION PATTERN ON A CONTAINER SURFACE

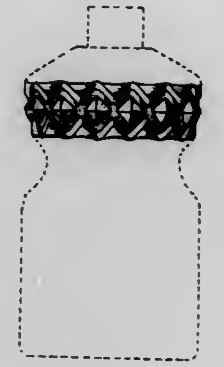
Louis Yager Gutting; James L. Bono, both of Cincinnati, and John E. Skidmore, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 9,340, Jun. 8, 1993, abandoned. This application Dec. 19, 1994, Ser. No. 32,463

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—434



386,408

BEVERAGE BOTTLE CARRIER

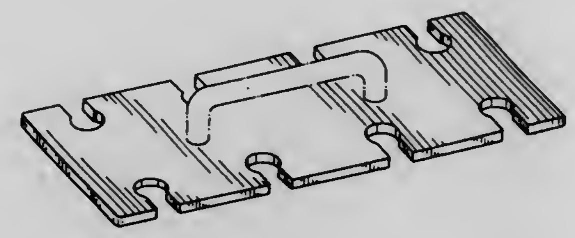
Kenneth D. Wasielewski, 26 Gold St., Buffalo, N.Y. 14206, and David J. Wasielewski, 627 23rd St., Apt. 3, Niagara Falls, N.Y. 14301

Filed Jul. 14, 1995, Ser. No. 41,440

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—434



386,409

GROCERY BAGS HANDLE

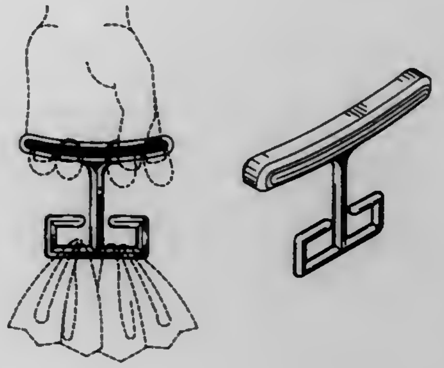
Luis A. Santini, Calle 1 #49 Hermanas Davala, Bayamon, Puerto Rico, 00959

Continuation-in-part of Ser. No. 35,751, Mar. 6, 1995, Pat. No. Des. 379,432. This application Sep. 24, 1996, Ser. No. 65,700

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—434



386,410

CAP FOR CONTAINER

Veit Mahlmann, Hamburg, Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Germany

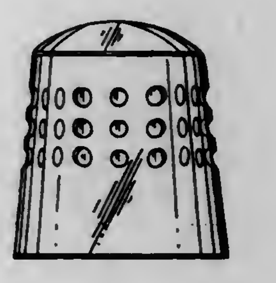
Filed Apr. 19, 1996, Ser. No. 53,379

Claims priority, application Germany, Oct. 30, 1995, M 95 08 577.7

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—445



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JEWELRY HANGER AND ORGANIZER

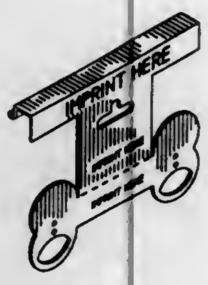
Dorothy VanFleet, 50 Berkeley St. E. 181, Satellite Beach, Fla. 32937

Filed Mar. 8, 1996, Ser. No. 51,863

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—457



386,412

BODY FOR A BOTTLE

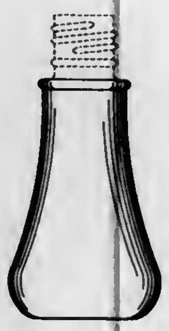
Carl Aug. Heinz, Tettau-Ofr, Germany, assignor to Carl Aug. Heinz Glashüttenwerke GmbH & Co. KG, Tettau-Ofr, Germany

Division of Ser. No. 11,148, Jul. 28, 1993, Pat. No. Des. 369,553. This application Jan. 5, 1996, Ser. No. 48,600

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—500



386,413

COMBINED BOTTLE, DISPENSING CLOSURE AND TRAVEL CAP

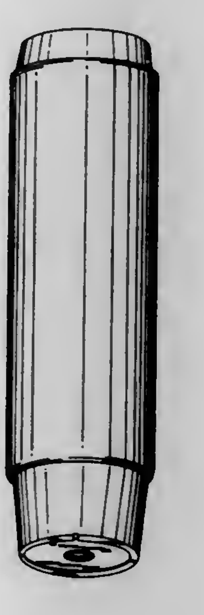
Timothy E. Fitten, Chaska, Minn.; Dieter F. Lay, Oconomowoc, Wis., and Thomas M. Bender, Reading, Pa., assignors to Redmond Products, Inc., Chanhassen, Minn.

Filed May 3, 1995, Ser. No. 38,307

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—503



386,414

BOTTLE FOR A NUTRITIONAL PRODUCT

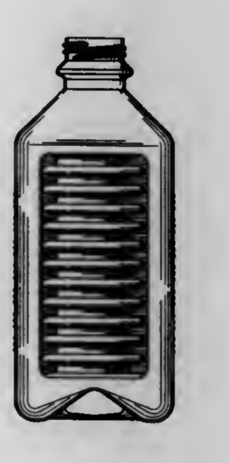
Patrick Edward McCallister, Columbus, and Joseph Michael Lippian, Worthington, both of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 26,130, Jul. 20, 1994, Pat. No. Des. 372,091. This application Dec. 21, 1995, Ser. No. 48,160

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—520



386,415

BOTTLE FOR A NUTRITIONAL PRODUCT

Patrick Edward McCallister, Columbus, and Joseph Michael Lippian, Worthington, both of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

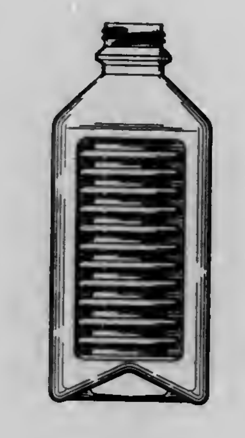
Continuation-in-part of Ser. No. 26,130, Jul. 20, 1994, Pat. No. Des. 372,091. This application Dec. 21, 1995, Ser. No. 48,175

The portion of the term of this patent subsequent to Sep. 9, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—520



386,416

BOTTLE BODY

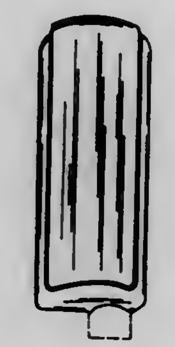
Randolf C. Kotoucek, St. Louis; Suzanne L. Fenton, St. Charles, both of Mo., and Eric Hatch, Troy, Mich., assignors to Kranson Industries, St. Louis, Mo.

Filed Oct. 10, 1995, Ser. No. 45,099

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—521



386,417

BOTTLE BODY

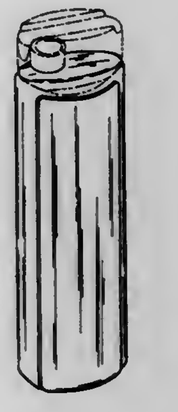
Randolf C. Kotoucek, St. Louis; Suzanne L. Fenton, St. Charles, both of Mo., and Eric Hatch, Troy, Mich., assignors to Kranson Industries, St. Louis, Mo.

Filed Oct. 10, 1995, Ser. No. 45,097

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—523



386,418

SIDEWALLS FOR A BOTTLE

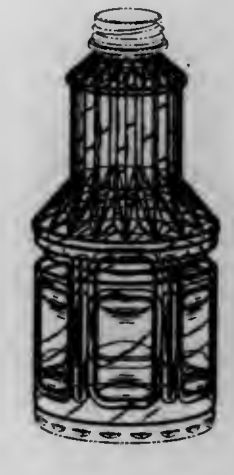
Richard Edstrom, New York, N.Y., and James W. Smith, Houston, Tex., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 20, 1996, Ser. No. 50,488

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—538



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LCD ALARM CLOCK

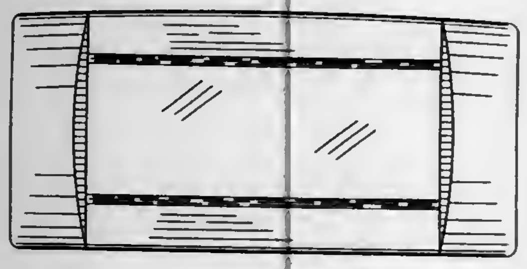
Shu Kwan Wong, New Territories, Hong Kong, assignor to Herald Electronics Limited, New Territories, Hong Kong

Filed Aug. 20, 1996, Ser. No. 58,660

Term of patent 14 years

LOC (6) Cl. 10 - *01*

U.S. Cl. D10—1



386,420

BEZEL AND CASING FOR A WATCH

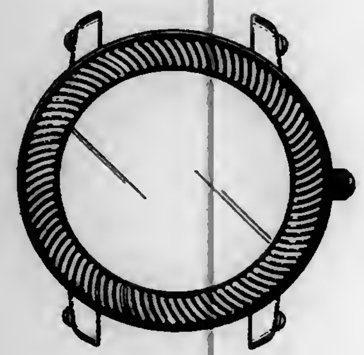
M. Amelia Kennedy, Woodbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 1, 1996, Ser. No. 56,457

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,421

BEZEL AND CASING FOR A WATCH

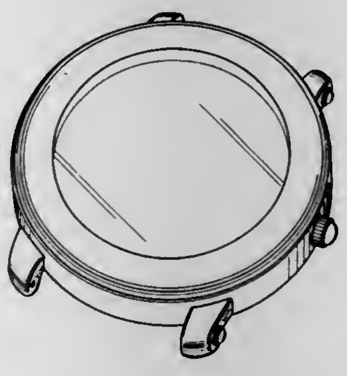
M. Amelia Kennedy, Woodbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 1, 1996, Ser. No. 56,465

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,422

CASING FOR A WATCH

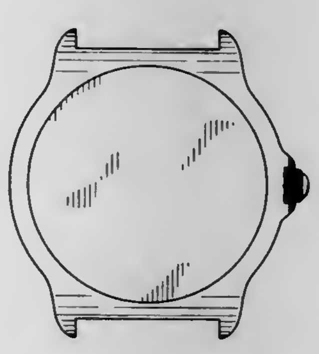
Daniel Lai Kong Sang, Shatin, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 3, 1996, Ser. No. 56,596

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,423

CASING FOR A WATCH

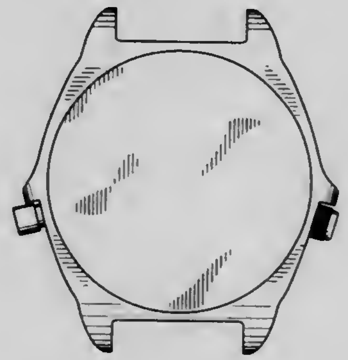
Daniel Lai Kong Sang, Shatin, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 3, 1996, Ser. No. 56,598

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,424

BEZEL AND CASING FOR A WATCH

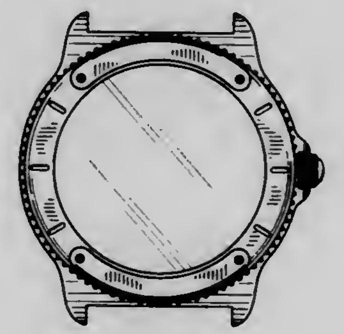
Daniel Lai Kong Sang, New Territories, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 3, 1996, Ser. No. 56,603

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,425

BEZEL AND CASING FOR A WATCH

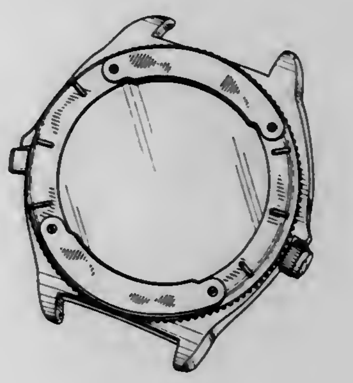
Daniel Lai Kong Sang, Shatin, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 3, 1996, Ser. No. 56,604

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,426

TIME MEMORIAL LOCKET

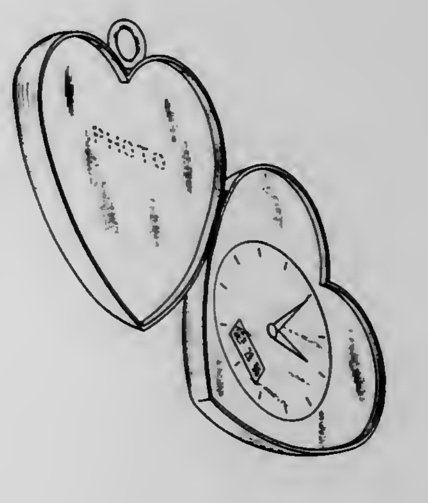
Lisa G. Gemmell, 2463 Marble Springs Rd., Barnhart, Mo. 63012

Filed Jul. 11, 1996, Ser. No. 56,899

Term of patent 14 years

LOC (6) Cl. 10 - *03*

U.S. Cl. D10—31



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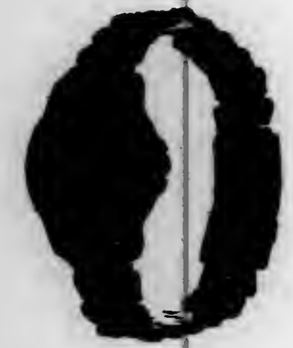
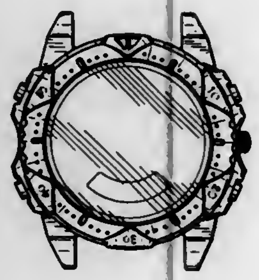
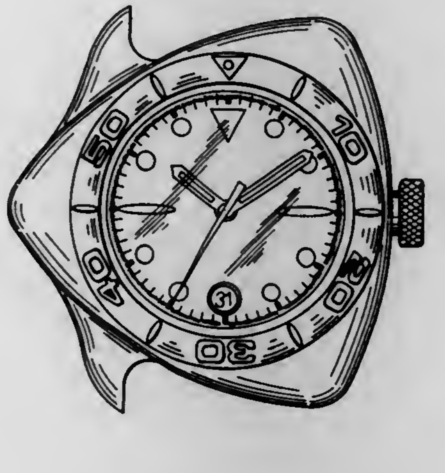
386,427
WRISTWATCH
Eddy Burgener, Le Landeron, Switzerland, assignor to Roventa-Henex SA, Bienne, Switzerland
Filed Oct. 16, 1996, Ser. No. 61,080
Claims priority, application Switzerland, Apr. 16, 1996, DMA/003292
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—32



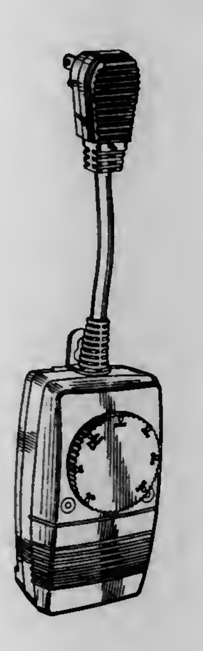
386,428
ANALOG DIGITAL COMBINATION WATCH
Nimfa Barz Toribio, Mandaue, Philippines, assignor to Timex Corp., Middlebury, Conn.
Filed Jul. 2, 1996, Ser. No. 56,543
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—38



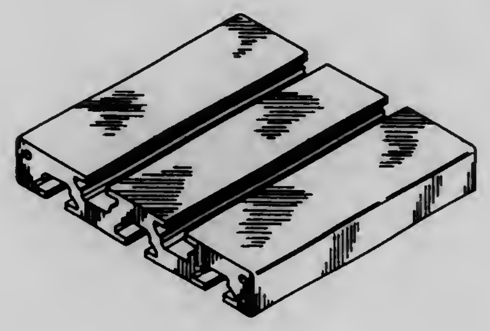
386,429
WRIST WATCH
Robert Alfred Brodmann, New York, N.Y., assignor to Design Knowledge International Labs, Inc., New York, N.Y.
Filed Feb. 27, 1997, Ser. No. 67,377
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—39



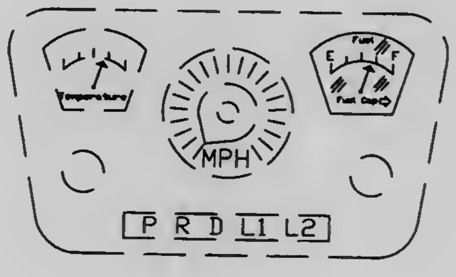
386,430
OUTDOOR PHOTO-CONTROL TIMER
John A. Czerlanis, Wonder Lake, Ill., and Robert D. Giese, Kenosha, Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.
Filed Jul. 31, 1996, Ser. No. 57,740
Term of patent 14 years
LOC (6) Cl. 10 - *03*
U.S. Cl. D10—40



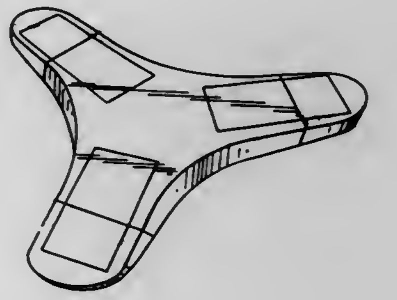
386,431
FRAME FOR PRESSURIZED FLUID-OPERATING DEVICES
Shigekazu Nagai, and Koji Sugano, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1995, Ser. No. 37,756
Claims priority, application Japan, Oct. 19, 1994, 6-31723
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—94



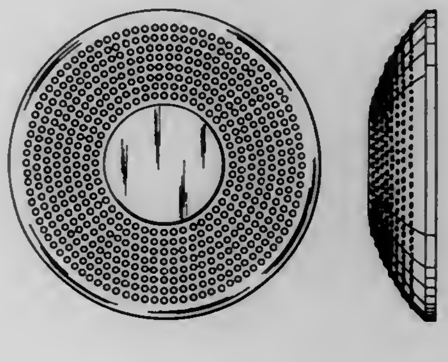
386,432
AUTOMOBILE GAS CAP LOCATION INDICATOR
Mike Degan, 1680 S. Hwy. 121, Lewisville, Tex. 75067
Filed Jan. 30, 1996, Ser. No. 49,747
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—102



386,433
BUOY WITH SOLAR CELLS
Alan Cibuzar, Brainerd, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Nov. 12, 1996, Ser. No. 62,295
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—107



386,434
REFLECTIVE PAVEMENT MARKER
Hector Sandino, 168 Monroe St., Irvine, Calif. 92620
Filed Feb. 18, 1997, Ser. No. 66,742
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—113



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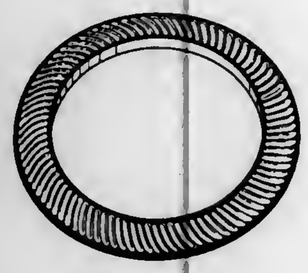
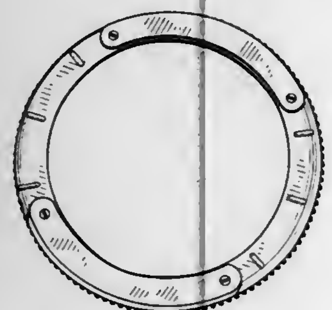
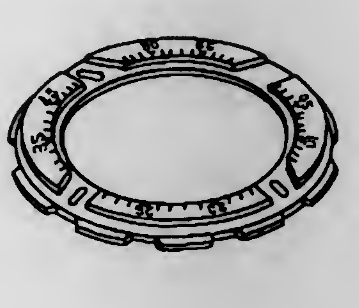
386,435
BEZEL RING FOR A WATCH
M. Amelia Kennedy, Woodbury, Conn., assignor to Timex Corporation, Middlebury, Conn.
Filed Jul. 1, 1996, Ser. No. 56,458
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—128



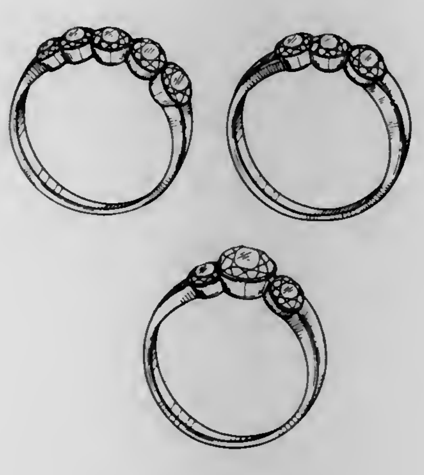
386,436
BEZEL RING FOR A WATCH
Daniel Lai Kong Sang, Shatin, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.
Filed Jul. 3, 1996, Ser. No. 56,599
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—128



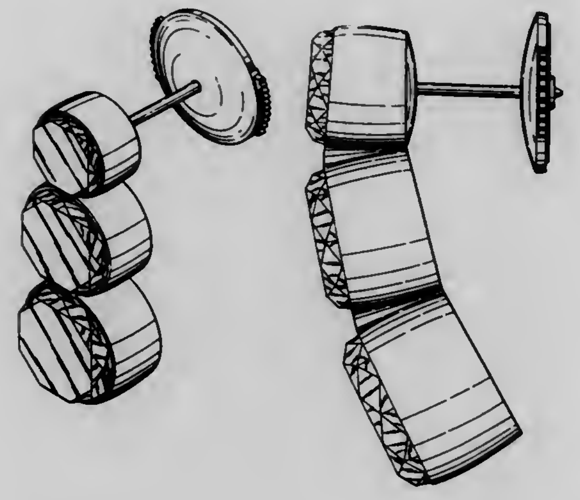
386,437
WATCH BEZEL
Daniel Lai Kong Sang, Ma On Shan, Hong Kong, assignor to Timex Corporation, Middleburg, Conn.
Filed Jul. 31, 1996, Ser. No. 57,782
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—128



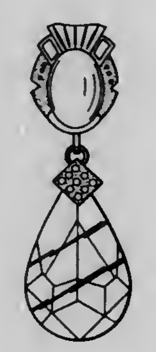
386,438
FINGER RING
Israel Itzkowitz, N. Hollywood, Calif., assignor to Ambar Diamonds Inc., Los Angeles, Calif.
Filed Aug. 19, 1996, Ser. No. 58,569
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—34



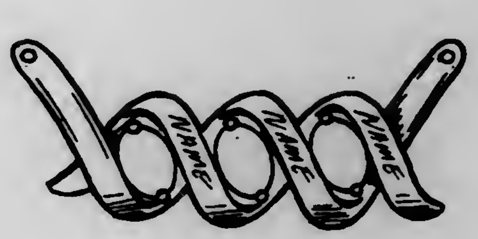
386,439
EARRING
Israel Itzkowitz, N. Hollywood, Calif., assignor to Ambar Diamonds Inc., Los Angeles, Calif.
Filed May 20, 1996, Ser. No. 56,222
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—41



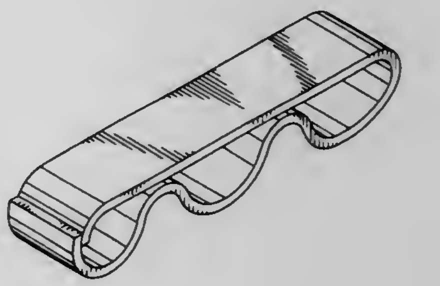
386,440
JEWELRY PIN
Dianna Napper, 2683 Timberglen Dr., Wexford, Pa. 15090
Filed Jan. 24, 1996, Ser. No. 49,362
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—43



386,441
THREE STONE DIAGONAL RIBBON NECKLACE PENDANT
Jerry Morrison, Austin, Tex., assignor to CJC Holdings, Inc., Austin, Tex.
Filed Jul. 23, 1996, Ser. No. 57,363
The portion of the term of this patent subsequent to Oct. 14, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—79



386,442
JEWELRY CHAIN SEPARATOR
Laura Anusavice, 165 Shady Hill Dr., East Greenwich, R.I. 02818
Filed Mar. 14, 1996, Ser. No. 51,596
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—87



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386,443
JEWELRY SETTING

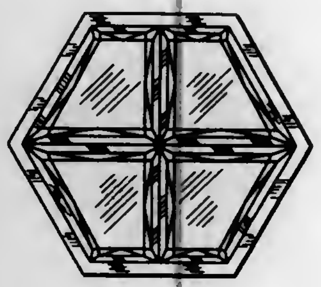
Israel Itzkowitz, N. Hollywood, Calif., assignor to Ambar Diamonds, Inc., Los Angeles, Calif.

Filed May 31, 1996, Ser. No. 55,188

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—91



386,444
EAR ORNAMENT

Richard W. Udko, Beverly Hills, Calif., assignor to Unigem International, Beverly Hills, Calif.

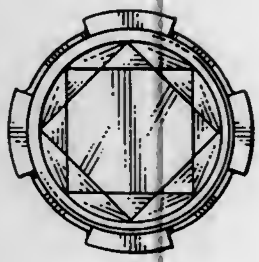
Filed Mar. 19, 1996, Ser. No. 51,812

The portion of the term of this patent subsequent to May 6, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—92



386,445
STRAIGHT WIRE FRAME ICICLE DISPLAY

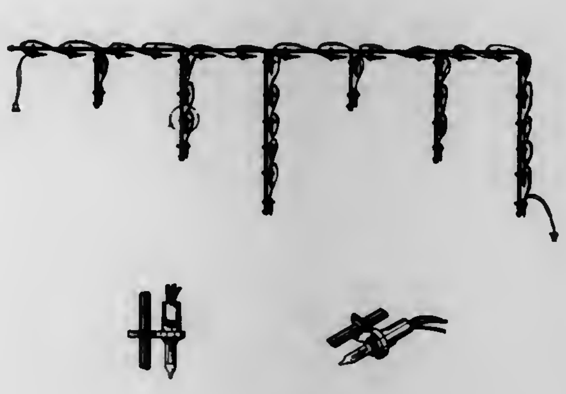
Renee Odierna, Mansfield, Ohio, assignor to J. Kinderman & Sons, Inc., Philadelphia, Pa.

Filed Jun. 25, 1996, Ser. No. 57,735

Term of patent 14 years

LOC (6) Cl. 11 - *05*

U.S. Cl. D11—121



386,446
RACING SOUVENIR

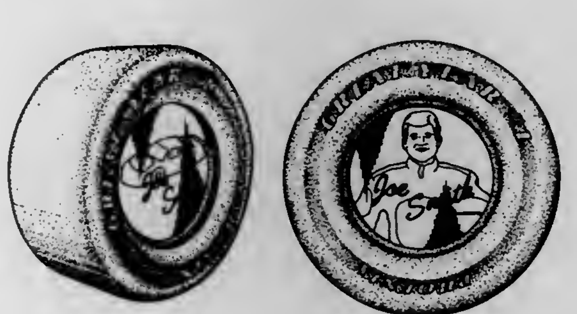
Michael Favish, San Diego, Calif., assignor to Fotoball USA, Inc., San Diego, Calif.

Filed Dec. 13, 1995, Ser. No. 47,824

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—131



386,447
HANGING MOBILE

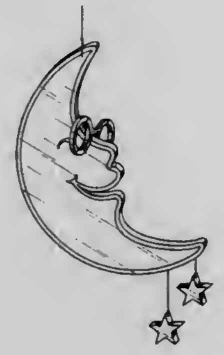
Moshe Yehoshoua, P.O. Box 460584, San Francisco, Calif. 94146-0584, assignor to Moshe Yehoshoua, San Francisco, Calif.

Filed May 19, 1995, Ser. No. 39,054

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—141



386,448
NOVELTY GALLOWS

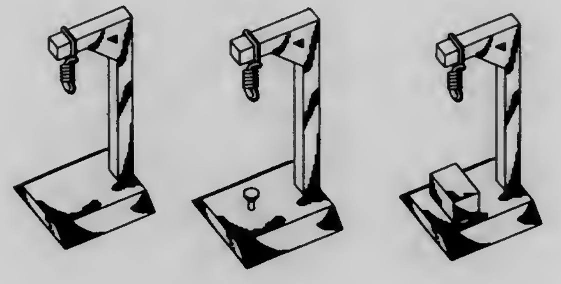
Patrick Vidal, 2618 Arrowhead Dr., Rapid City, S. Dak. 57702

Filed Jan. 4, 1996, Ser. No. 48,636

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—157



386,449
SLED

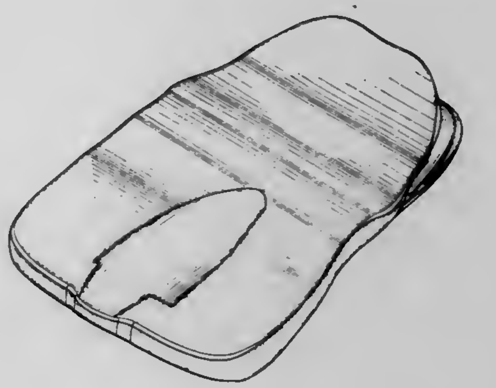
Timm J. Fenton, New Canaan, Conn., and Sergio Photiadis, Athens, Greece, assignors to Rubbermaid Specialty Products Inc., Wooster, Ohio

Continuation of Ser. No. 44,205, Sep. 20, 1995. This application Mar. 7, 1996, Ser. No. 51,257

Term of patent 14 years

LOC (6) Cl. 12 - *14*

U.S. Cl. D12—11



386,450
REFUSE BIN GRABBER

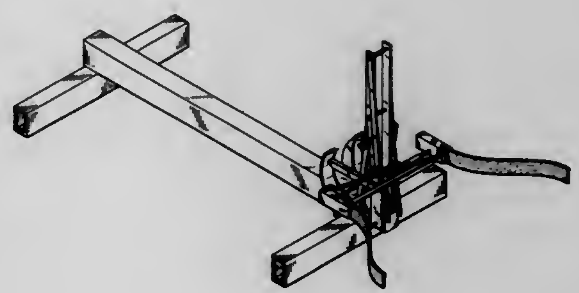
Ahmed Saad Benmiloud, Alameda, Calif., assignor to Paint Productions, Inc., Hayward, Calif.

Filed Feb. 7, 1996, Ser. No. 50,029

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—15



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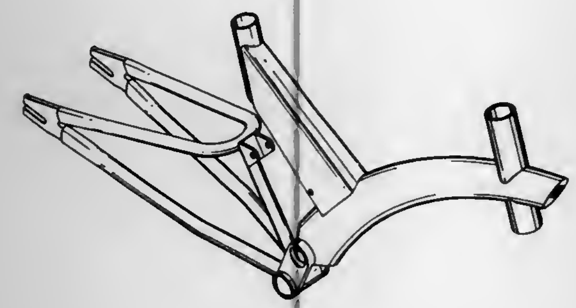
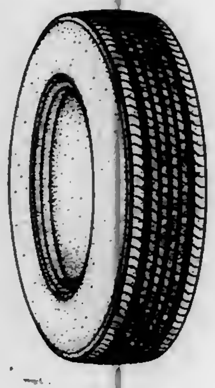
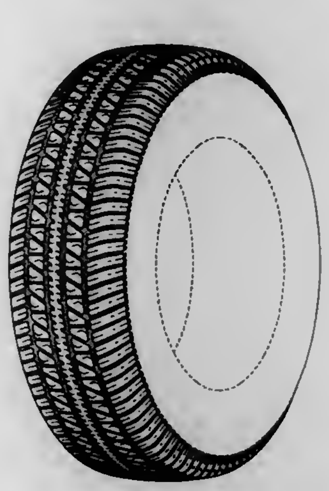
386,451
BICYCLE FRAME
Ping-Hsu Liao, Taichung City, Taiwan, assignor to Giant Manufacturing Co., Ltd., Taichung Hsien, Taiwan
Filed Nov. 15, 1996, Ser. No. 63,303
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—111



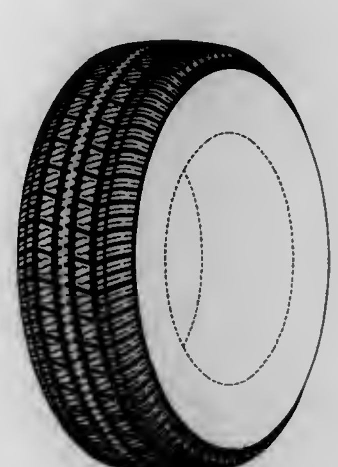
386,452
AUTOMOBILE TIRE
Tetsuhito Tsukagoshi, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 25, 1996, Ser. No. 56,186
Claims priority, application Japan, Dec. 25, 1995, 7-38933
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—141



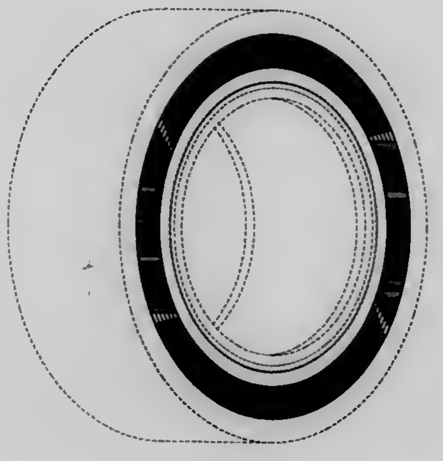
386,453
TIRE TREAD
James G. Guspodin, Akron, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Feb. 2, 1996, Ser. No. 49,873
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—146



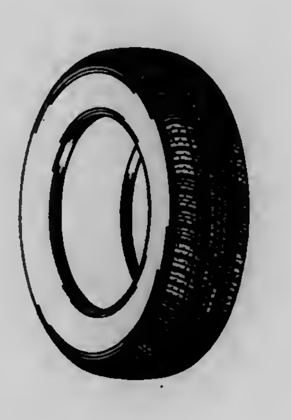
386,454
TIRE TREAD
James G. Guspodin, Akron, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Feb. 2, 1996, Ser. No. 49,902
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



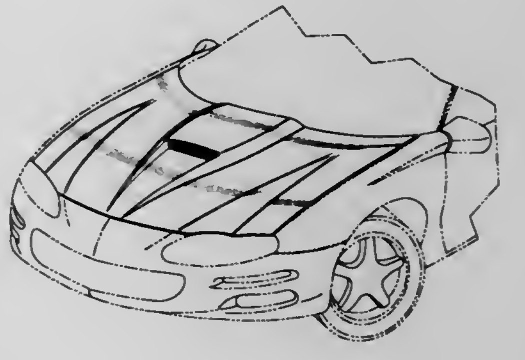
386,455
DECORATIVE BAND FOR A TIRE SIDEWALL
Michel Clementz, Arlon, Belgium; Gilbert Feller, Burden, and Raymond Merx, Junglinster, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 27, 1995, Ser. No. 41,957
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—152



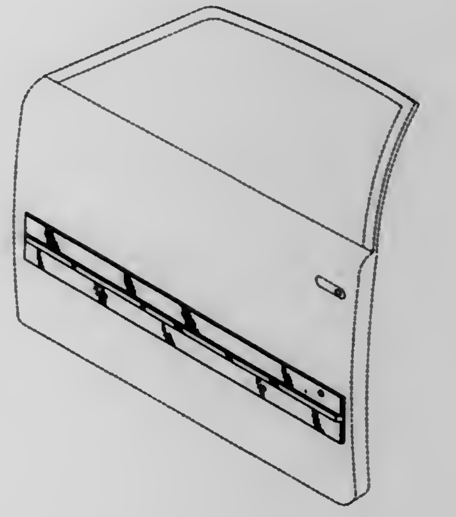
386,456
AUTOMOBILE TIRE
Naoki Yukawa, Takarazuka, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Apr. 10, 1996, Ser. No. 52,869
Claims priority, application Japan, Oct. 11, 1995, 7-30463
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



386,457
AUTOMOBILE HOOD
Randolph James Wittine, Sterling Heights, Mich., assignor to SLP Engineering, Inc., Troy, Mich.
Filed Nov. 1, 1996, Ser. No. 61,867
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—173



386,458
VEHICLE DOOR PANEL
John J. Smith, 550 E. Myrtle Ave., Glendora, Calif. 91741
Filed Aug. 8, 1996, Ser. No. 58,140
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—190



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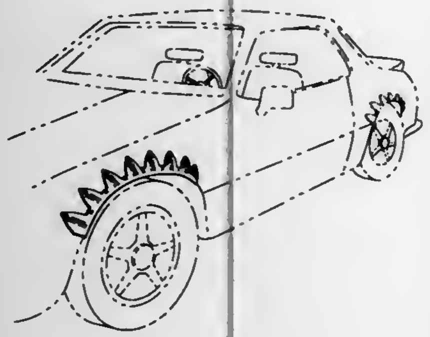
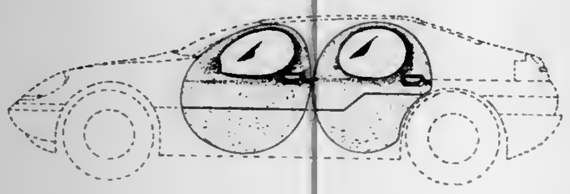
386,459
DECORATIVE FENDER MOLDING

Theodore Madison, 540 W. 55th St. #6L, New York, N.Y. 10019
Filed Dec. 17, 1996, Ser. No. 63,835
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—190



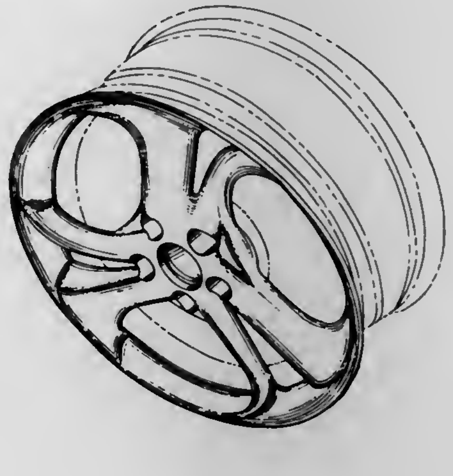
386,460
EXTERIOR SURFACE DESIGN OF A PAIR OF AUTOMOBILE DOORS

Saheed Oluwasegun Fawehinmi, 6302 Hardwood Dr., Lanham, Md. 20706
Filed Jul. 8, 1996, Ser. No. 56,757
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—196



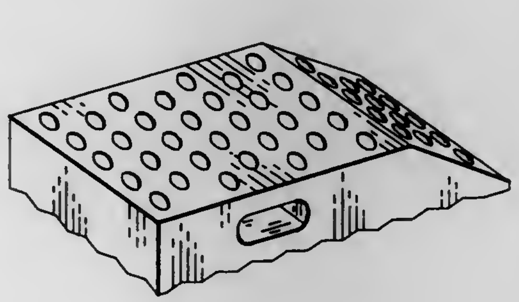
386,461
VEHICLE-WHEEL FRONT FACE

Mark D. Neeper, Denver, Colo., assignor to Mobile Hi-Tech Wheels, Torrance, Calif.
Filed Apr. 24, 1996, Ser. No. 53,616
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—209



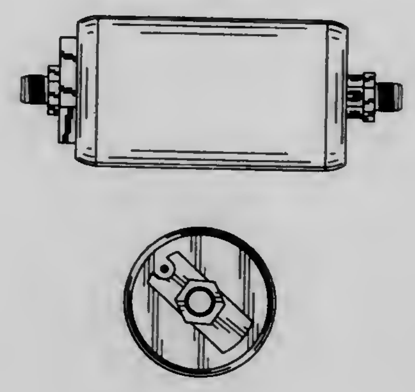
386,462
RAMP

Michael Erin McCune, and Naomi Dorene McCune, both of 120 S. School St., Lodi, Calif. 95240
Filed Jul. 18, 1996, Ser. No. 57,180
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—217



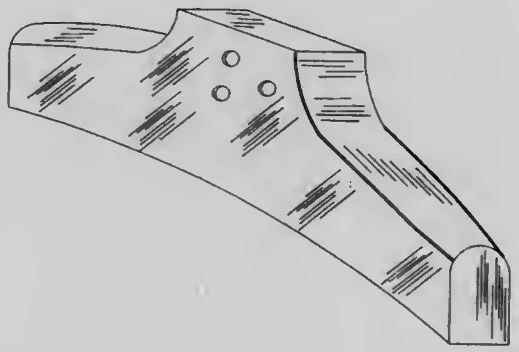
386,463
FUEL FILTER WITH POP-OUT INDICATOR

James H. Garrard, Kirkwood, and Steve R. Pinkston, House Springs, both of Mo., assignors to Essex Industries, Inc., St. Louis, Mo.
Filed Jun. 14, 1994, Ser. No. 24,416
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—218



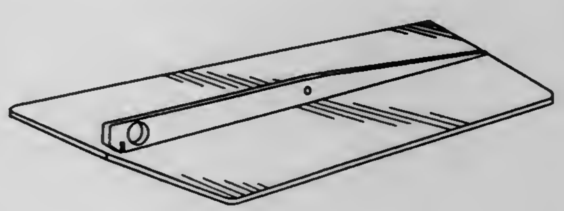
386,464
HEATING WINDSHIELD WIPER SHROUD

David L. Simmons, P.O. Box 4112, Sevierville, Tenn. 37864-4112
Filed Oct. 10, 1995, Ser. No. 46,592
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—220



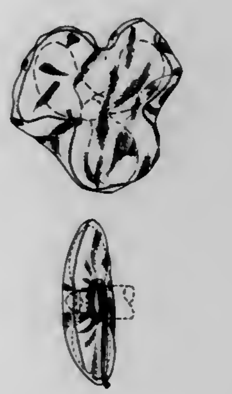
386,465
PLANING FLOATS FOR POWER BOAT

Helmuth Bachmann, 339 Greenlake Dr., Sunnyvale, Calif. 94089
Filed May 9, 1995, Ser. No. 38,665
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—317



386,466
PROP COVER

Bradford L. Hanson, 1144 S. Monroe St., Denver, Colo. 80210
Division of Ser. No. 25,508, Jul. 5, 1994, Pat. No. Des. 369,310. This application Apr. 29, 1996, Ser. No. 53,772
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—401



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386,467

VISOR CASSETTE HOLDER

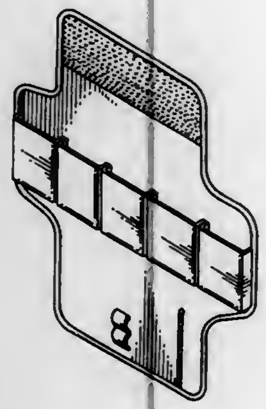
Roger J. Alves, Simi Valley, and Roy Nimpoeno, Monterey Park, both of Calif., assignors to Scosche Industries, Inc., Moorpark, Calif.

Filed Feb. 26, 1996, Ser. No. 50,731

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—417



386,468

MOTORCYCLE LUGGAGE CARRIER

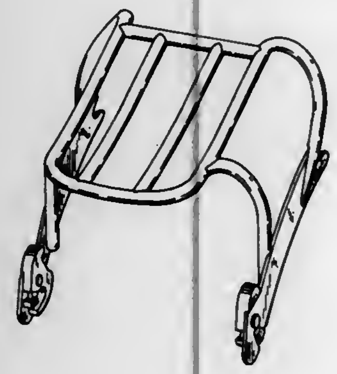
Donald M. Gogan, Brookfield, and Geoffrey T. Williams, Mequon, both of Wis., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.

Filed May 1, 1996, Ser. No. 53,917

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—407



386,469

REAR WHEEL UNIT FOR MOTORCYCLE TO TRICYCLE CONVERSION

John Lehman, Box 2193, Westlock, Alberta, Canada, T0G 2L0, and Larry David Strilchuk, 4 Fieldstone Place, Spruce Grove, Alberta, Canada, T7X 2Z4

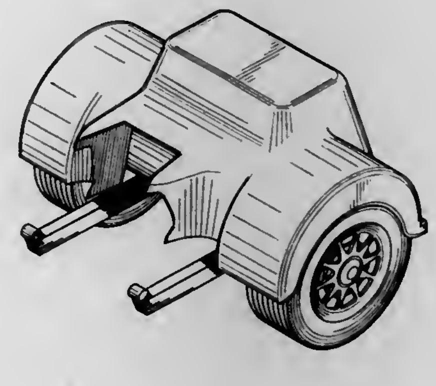
Filed Aug. 17, 1994, Ser. No. 27,412

Claims priority, application Canada, Feb. 18, 1994, 1994-0372

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—110



386,470

TIRE TREAD

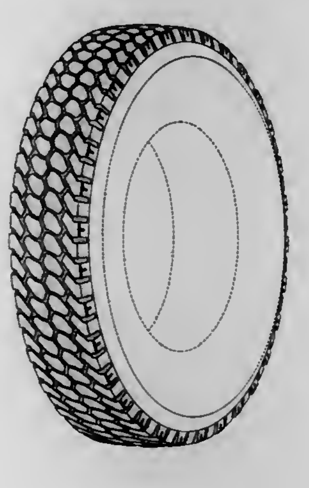
Daniel Scheuren, Bastogne, and Michel Pierre Charles Robert, Fauvillers, both of Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 23, 1996, Ser. No. 53,455

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,471

TIRE TREAD

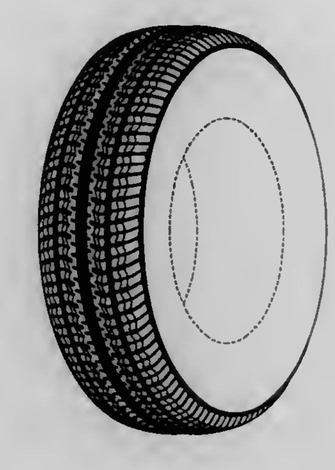
John Steven Attinello, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 31, 1996, Ser. No. 55,227

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,472

MIRROR

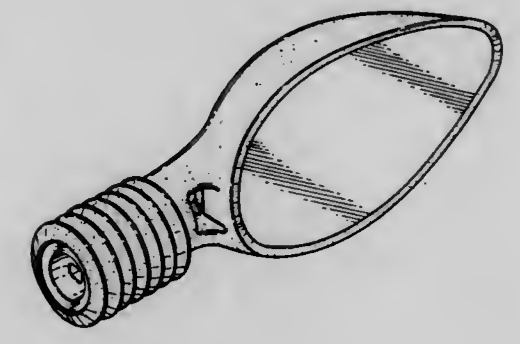
Kenneth D. Eisenbraun, Birmingham, and Richard G. Leveille, Fort Gratiot, both of Mich., assignors to CIPA USA, Inc., Port Huron, Mich.

Filed Feb. 26, 1996, Ser. No. 50,749

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—187



386,473

NETWORK ADAPTOR

Trent L. England, Costa Mesa; Walter D. Kuver, Laguna Hills, both of Calif.; Teddy R. Bryant, Greeneville, Tenn., and Shawn G. Hanna, Cupertino, Calif., assignors to Canon Information Systems, Inc., Costa Mesa, Calif.

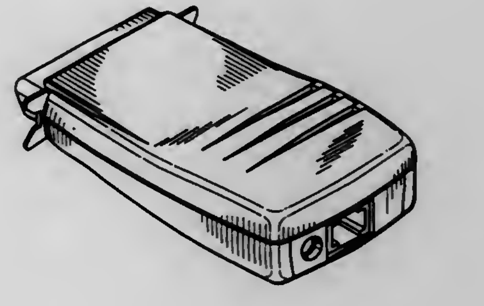
Filed Jun. 9, 1995, Ser. No. 40,100

The portion of the term of this patent subsequent to Dec. 31, 2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—147



386,474

THREE BARREL ELECTRICAL CONTACT CARTRIDGE BOX

Dave Kopser, P.O. Box 146, Golden, Colo. 80402-0146

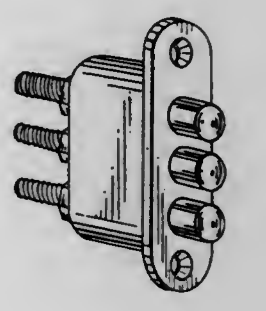
Continuation-in-part of Ser. No. 37,575, Apr. 17, 1995, which is a continuation-in-part of Ser. No. 227,558, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 876,774, May 1, 1992, abandoned. This application Mar. 11, 1996, Ser. No. 51,407

The portion of the term of this patent subsequent to Sep. 24, 2013, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—164



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386,475
READ/WRITE DEVICE FOR IC BUILT-IN CARDS

Kenzo Hiramatsu, Musashino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

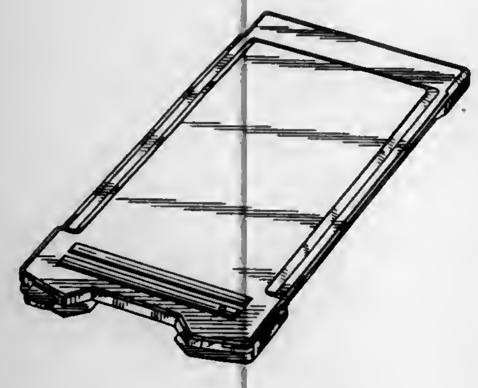
Filed Sep. 7, 1995, Ser. No. 43,605

Claims priority, application Japan, Mar. 9, 1995, 7-6418

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—182



386,476
ICON FOR A DISPLAY SCREEN

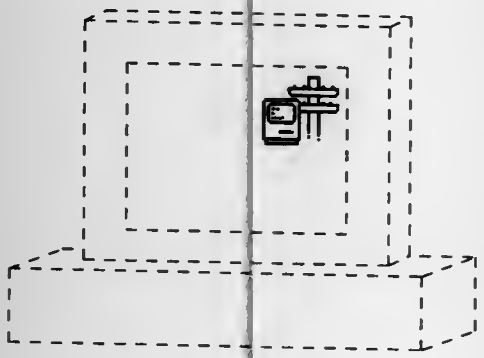
Deanna M. Thomas, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 27, 1992, Ser. No. 936,961

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.5



386,477
ICON FOR A DISPLAY SCREEN

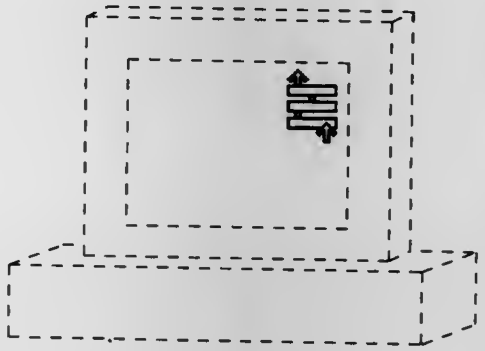
Deanna M. Thomas, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 9, 1992, Ser. No. 942,682

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.3



386,478
COMPUTER COVER

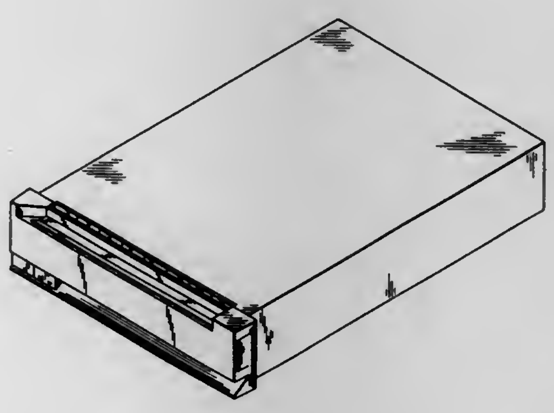
Pedro Marcos Alfonso, Austin, Tex., and Michael Horton Sharp, Johnstone, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1996, Ser. No. 60,673

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100



386,479
CARD READER

Dieter Lassmann, Lormes, and Alexandre Manthe, Aix En Provence, both of France, assignors to Gemplus Card International, Gemenos, France

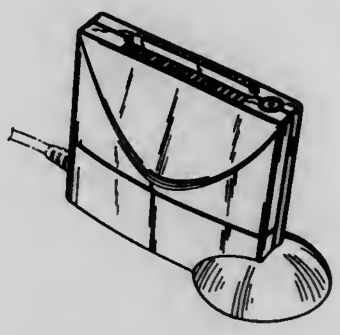
Filed Jul. 9, 1996, Ser. No. 56,796

Claims priority, application France, Jan. 9, 1996, 0960109

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—105



386,480
NOTEBOOK COMPUTER

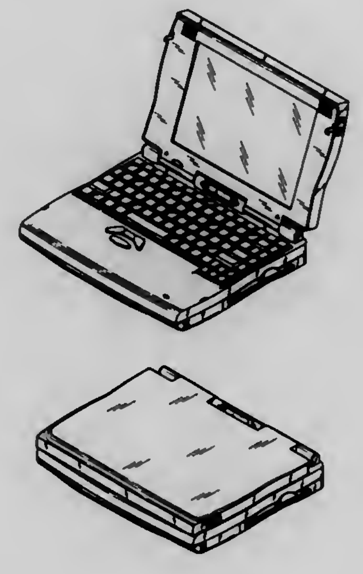
John J. Daly, Irvine; Max Yoshimoto, San Francisco; Jeffrey Salazar, Belmont, all of Calif., and Chia-Chun Lee, Taipei, Taiwan, assignors to AST Research, Inc., Irvine, Calif.

Filed Apr. 2, 1996, Ser. No. 52,325

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—106



386,481
OPERATION AND STORING CONTROL UNIT OF ELECTRONIC COMPUTERS

Masaaki Iino, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan

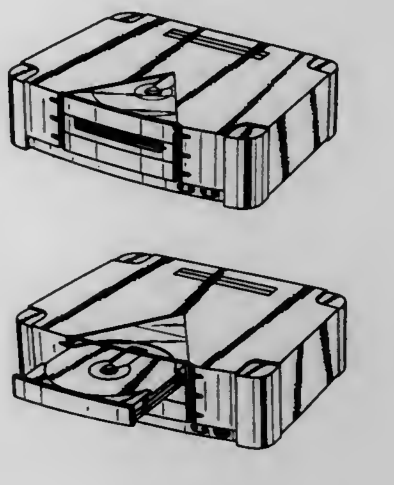
Filed Jul. 15, 1996, Ser. No. 57,037

Claims priority, application Japan, Mar. 14, 1996, 8-6788

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—107



386,482
OPTICAL DISC DRIVE

Masafumi Ito; Shigeru Hasegawa; Haruki Takita, and Katsuhiro Takashima, all of Musashino, Japan, assignors to Teac Corporation, Japan

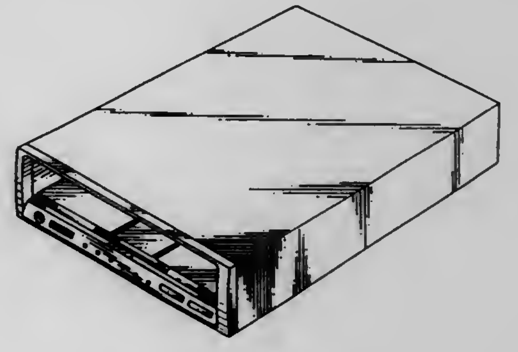
Filed Jan. 26, 1996, Ser. No. 49,545

Claims priority, application Japan, Jul. 28, 1995, 7-22338

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—109



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386,483

COMPUTER MOUSE

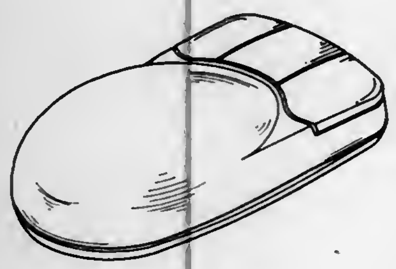
Fu Chin Cheng, Hsin Tien, Taiwan, assignor to Sysgration Ltd., Taipei Haiwn, Taiwan

Filed Jul. 25, 1996, Ser. No. 57,436

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114



386,484

COMPUTER MOUSE

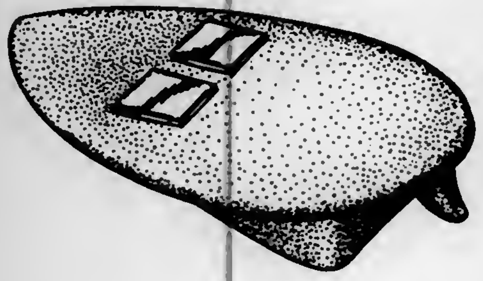
Kurt A. Jensen, Tucson, Ariz., and Gregory J. Hol, Redondo Beach, Calif., assignors to Bullshark Enterprises, Inc., Tucson, Ariz.

Filed Aug. 20, 1996, Ser. No. 58,686

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114



386,485

ICON FOR A DISPLAY SCREEN

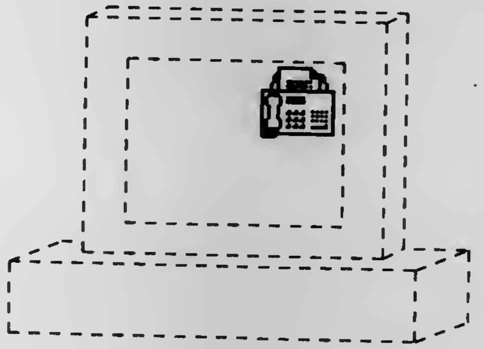
Deanna M. Thomas, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 27, 1992, Ser. No. 937,819

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.5



386,486

ICON FOR A COMPUTER DISPLAY

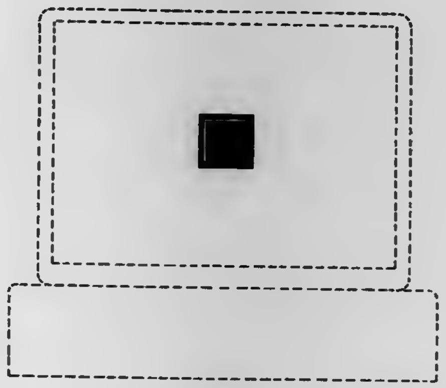
Susan Rafuse, Maynard, and John Meade, Marblehead, both of Mass., assignors to Boston Technology, Inc., Wakefield, Mass.

Filed Jan. 6, 1995, Ser. No. 33,210

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.5



386,487

ICON FOR A DISPLAY SCREEN

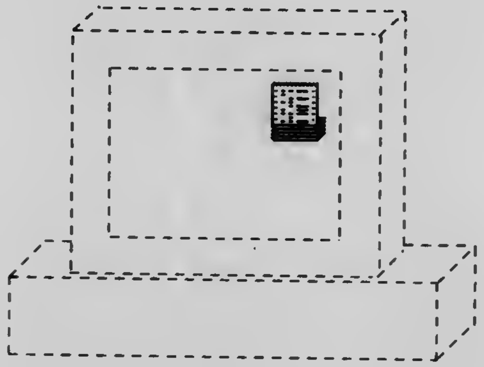
Deanna M. Thomas, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 27, 1992, Ser. No. 938,634

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.8



386,488

DATA ENTRY KEYBOARD

Masaaki Kageyama; Hideki Ito; Yoshirou Koutaka; Takahiro Murakami; Katsuyuki Katayama, all of Fukushima-ken, and Hiromi Chiba, Kanagawa-ken, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

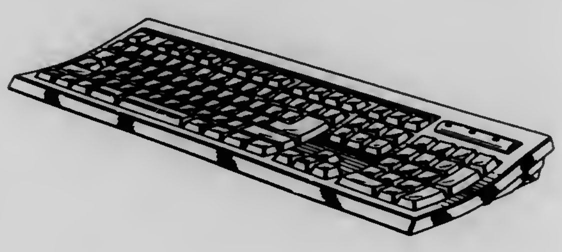
Filed Feb. 6, 1996, Ser. No. 49,992

Claims priority, application Japan, Aug. 9, 1995, 7-23501

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—115



386,489

OPTICAL SCANNER

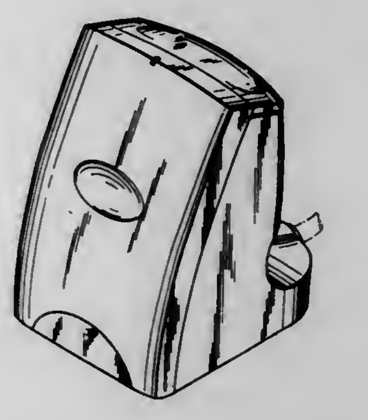
Ron Goldman, Westbury, N.Y., and Peter Wyatt, Portland, Oreg., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Filed Jul. 24, 1995, Ser. No. 41,726

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—116



386,490

FACSIMILE MACHINE

Hidetoshi Fujimoto, Nara-ken, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

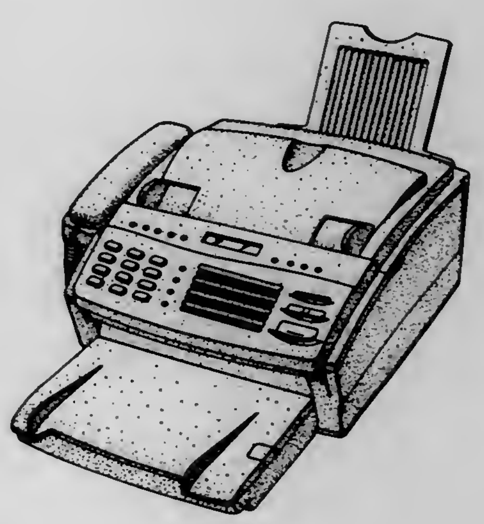
Filed Aug. 23, 1996, Ser. No. 58,808

Claims priority, application Japan, Feb. 23, 1996, 8-4778

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D14—118



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386,491
MAGNET OPTICAL DISC RECORDER

Satoshi Masamitsu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

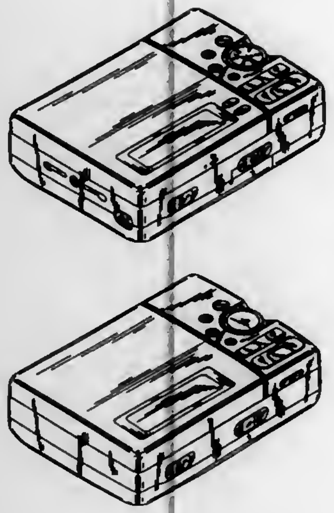
Filed Nov. 17, 1995, Ser. No. 46,511

Claims priority, application Japan, May 18, 1995, 7-13627

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—136



386,492
PORTABLE RADIOTELEPHONE

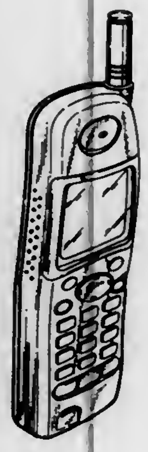
Katsuhiro Yamaguchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1996, Ser. No. 60,043

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—138



386,493
TELEPHONE

Laura Ann Mahan, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

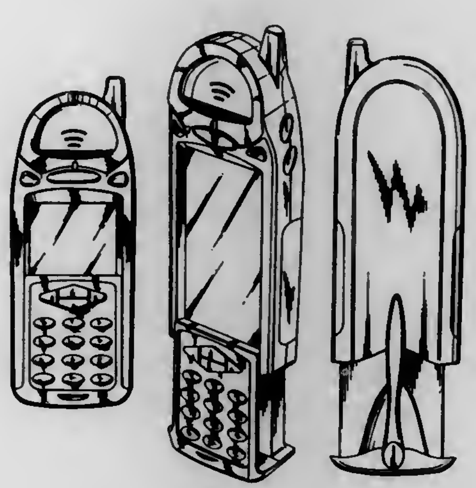
Filed Nov. 21, 1996, Ser. No. 61,305

Claims priority, application Canada, Oct. 10, 1996, 1996-2336

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—138



386,494
FACEPLATE FOR A PORTABLE TELEPHONE

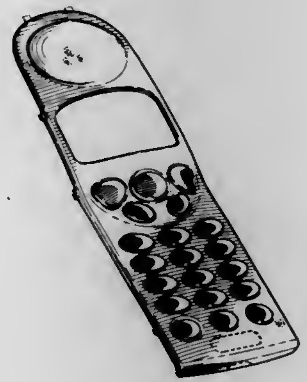
Daryl R. Harris, Evanston, and Daniel L. Williams, Vernon Hills, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 45,343, Oct. 17, 1995. This application Nov. 6, 1996, Ser. No. 62,061

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—138



386,495
CORDLESS TELEPHONE REMOTE PACK AND BASE UNIT

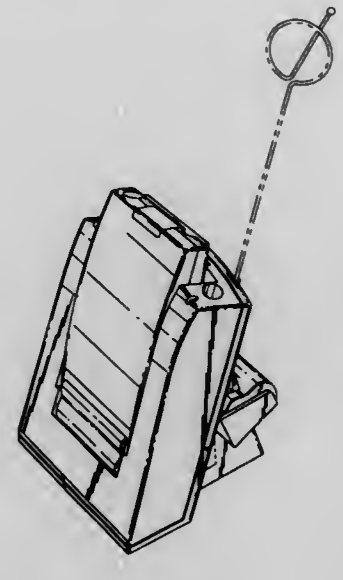
Giscla Schmoll, San Francisco, Calif., assignor to Hello Direct, Inc., San Jose, Calif.

Filed Jun. 14, 1996, Ser. No. 55,883

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—149



386,496
TELEPHONE STAND

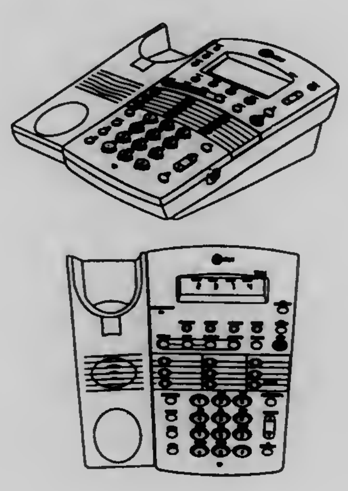
Jochen Philipp Backs, San Francisco, Calif.; Stephen Edward Bennett, Succasunna, N.J.; Mark Biasotti, San Jose, Calif.; Mark B. Larew, Indianapolis, Ind.; John Matthew Law, Carmel, Ind.; Everett Wayne Mathis, Greenwood, Ind.; Raymond Motluck, Noblesville, Ind.; Michael John Nuttall, Portola Valley, Calif., and John Henry Schaffeld, New Vernon, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 32,906

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—151



386,497
SELECTIVE CALL TRANSCEIVER

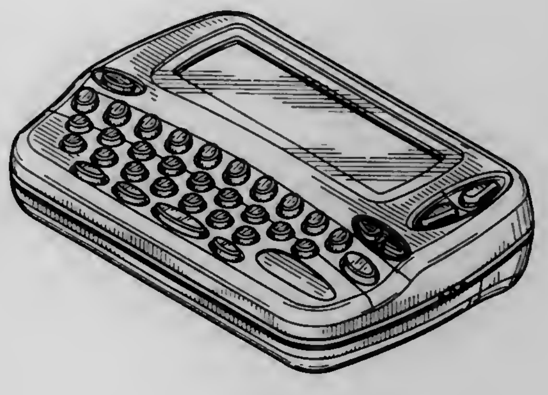
Mark Andrew Huslig, Haltom City; Bruce Wade Ross, Fort Worth, and Gregory Lane Henderson, Watauga, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 19, 1996, Ser. No. 62,995

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—191



386,498
ELECTROACOUSTIC TRANSDUCER

Kazushige Tajima, and Yoshio Imahori, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka, Japan

Filed Jun. 13, 1996, Ser. No. 55,790

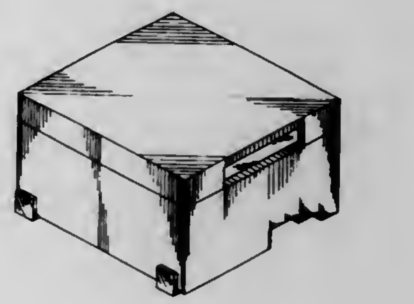
Claims priority, application Japan, Dec. 13, 1995, 7-37615

The portion of the term of this patent subsequent to Jan. 14, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—222



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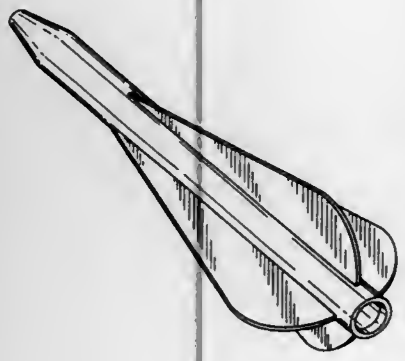
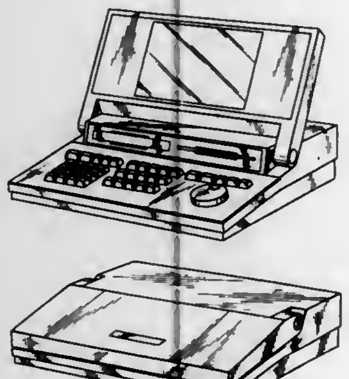
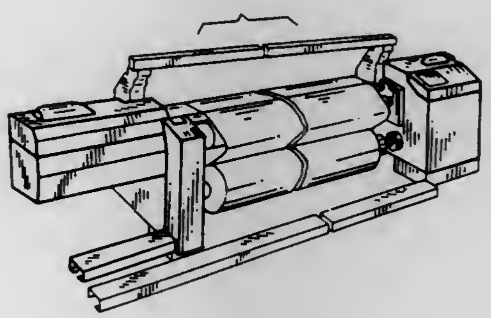
386,499
HYDROPHONE HOUSING
Alexander G. Langer, Cudjoe Key, Fla., assignor to Langer Electronics Corp., Cudjoe Key, Fla.
Filed Sep. 26, 1995, Ser. No. 44,776
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—228



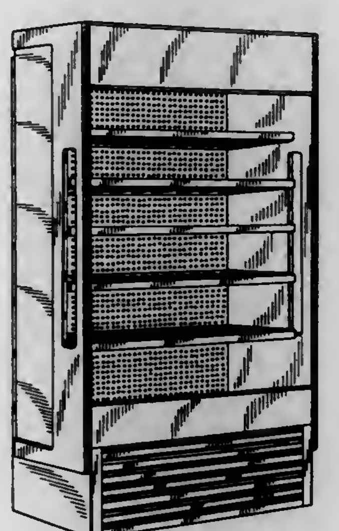
386,500
VIDEO EDITOR WITH LIQUID CRYSTAL MONITOR
Hiroyuki Matsumoto; Takashi Hiraoka, both of Osaka; Sadayoshi Azuma, Kyoto, and Akio Ohno, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 22, 1996, Ser. No. 50,521
Claims priority, application Japan, Aug. 22, 1995, 7-24490
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—239



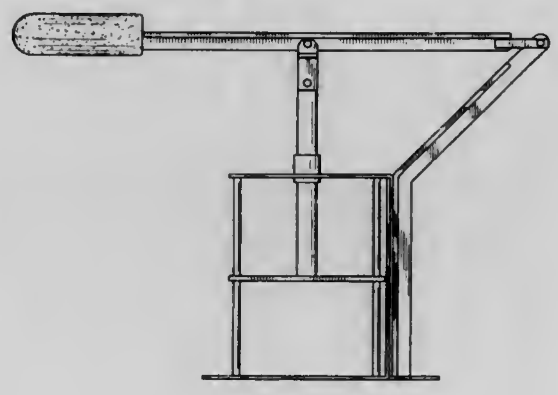
386,501
WEAVING MACHINE
Henry Shaw, Woesten-Vleteren, Belgium, assignor to Picanol N.V., Naamloze Vennootschap, Belgium
Filed Nov. 28, 1995, Ser. No. 47,173
Claims priority, application Benelux TM/Des. Off., Jun. 22, 1995, 5802-00
Term of patent 14 years
LOC (6) Cl. 15 - *06*
U.S. Cl. D15—66



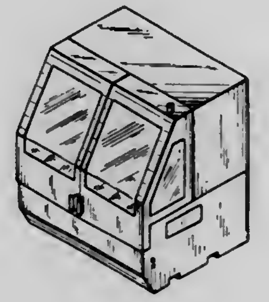
386,502
REFRIGERATED DISPLAY CASE
Andrew B. Sholl, Cranbury, N.J., assignor to Henschel-Steinau, Inc., Englewood, N.J.
Filed Jul. 31, 1996, Ser. No. 57,754
Term of patent 14 years
LOC (6) Cl. 15 - *07*
U.S. Cl. D15—79



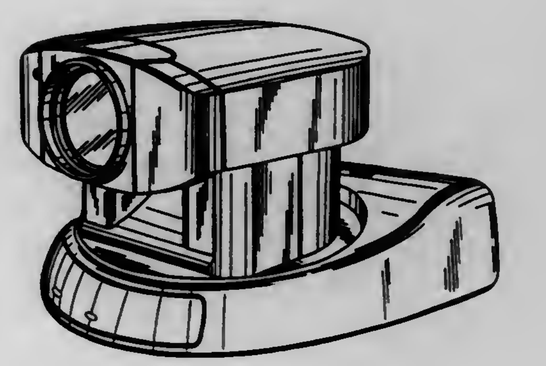
386,503
POP CAN CRUSHER
Paul T. Emerson, P.O. Box 8, Troutdale, Va. 24378
Filed Aug. 9, 1996, Ser. No. 58,652
Term of patent 14 years
LOC (6) Cl. 15 - *09*
U.S. Cl. D15—123



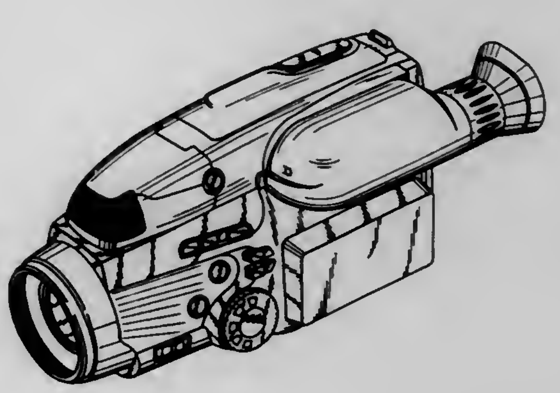
386,504
AUTOMATIC REEL GRINDER ENCLOSURE
James H. Dieck, River Falls, Wis., assignor to Foley-Belsaw Company, Minneapolis, Minn.
Continuation of Ser. No. 38,087, Apr. 28, 1995, abandoned. This application Oct. 2, 1995, Ser. No. 44,821
Term of patent 14 years
LOC (6) Cl. 15 - *09*
U.S. Cl. D15—124



386,505
VIDEO CAMERA FOR TV CONFERENCE SYSTEM AND SECURITY USE
Koichi Maeyama, Tokyo, Japan, assignor to Sony Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1996, Ser. No. 50,949
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



386,506
CAMCORDER
Byung-O Choi, and Seung-myun Choi, both of Kyung Ki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed May 20, 1996, Ser. No. 54,710
Claims priority, application Rep. of Korea, Nov. 24, 1995, 1995-22698
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



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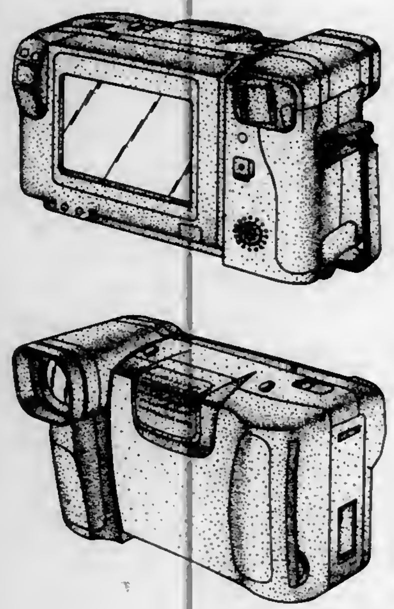
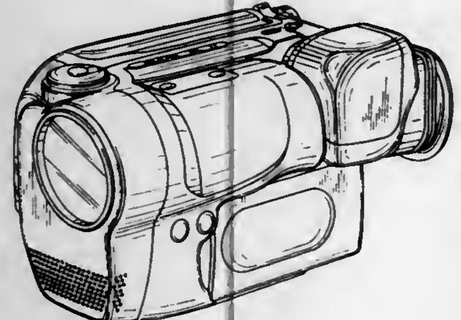
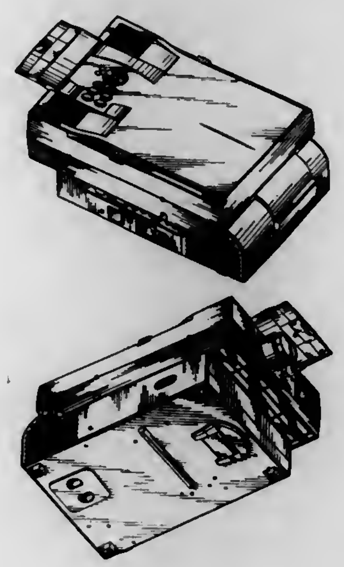
386,507
COMBINED MONITOR VIDEO TAPE RECORDER AND VIDEO CAMERA
Hiroshi Ohi, and Taro Nomura, both of Tochigi-ken , Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 7, 1996, Ser. No. 59,120
Claims priority, application Japan, Nov. 7, 1995, 7-33678
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



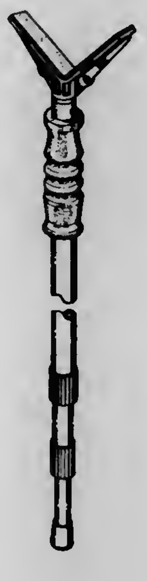
386,508
VIDEO CAMERA WITH VIDEO TAPE RECORDER
Masahito Ohwada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1996, Ser. No. 59,362
Claims priority, application Japan, Mar. 21, 1996, 8-7720
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



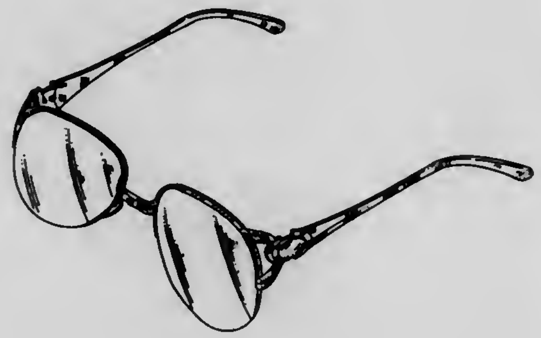
386,509
INTEGRATED LIQUID CRYSTAL DISPLAY PROJECTOR
Kenneth W. Baar, Escondido; Paul R. Corsaro, Encinitas; Lonnie C. Pogue, San Diego; Brian Macowski, Cardiff By The Sea, and David Kwock Bun Lee, Glendale, all of Calif., assignors to Proxima Corporation, San Diego, Calif.
Filed Jun. 7, 1996, Ser. No. 55,608
Term of patent 14 years
LOC (6) Cl. 16 - *02*
U.S. Cl. D16—225



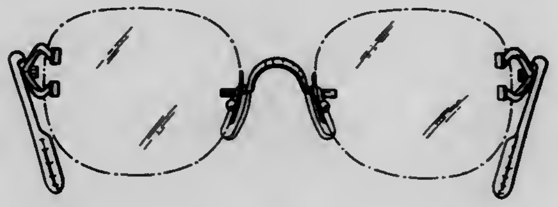
386,510
TELESCOPING MONOPOD GUN AND CAMERA SUPPORT
Thomas K. M. Peterson, 124 Stoney Point Rd., Courtland, Minn. 56021
Filed Mar. 11, 1996, Ser. No. 51,440
Term of patent 14 years
LOC (6) Cl. 16 - *05*
U.S. Cl. D16—244



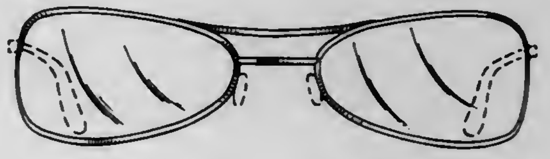
386,511
EYE GLASSES
Kenei Takekoshi, 251, Aza-Gibo, Tomigusuku-Son, Shimajiri-Gun, Okinawa, Japan
Filed Dec. 4, 1995, Ser. No. 47,416
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—315



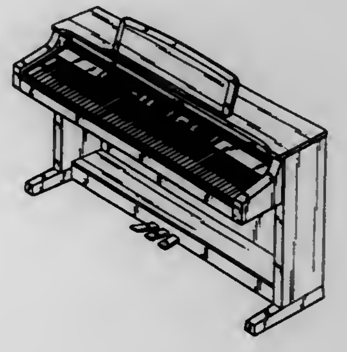
386,512
SPECTACLE FRAME
Alain-Dominique Perrin, Rueil Malmaison, and Jacques Diltoer, Villeneuve la Garenne, both of France, assignors to Cartier International B.V., Amsterdam, Netherlands
Filed Dec. 30, 1993, Ser. No. 17,191
Claims priority, application France, Jul. 2, 1993, 93 3505
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—316



386,513
EYEWEAR FRONT
Simon M. Conway, Lima, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Continuation of Ser. No. 46,673, Oct. 20, 1995. This application Aug. 8, 1996, Ser. No. 58,119
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—326



386,514
ELECTRONIC PIANO
Tsutomu Nakada, and Daisuke Saito, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan
Filed Apr. 15, 1996, Ser. No. 53,152
Claims priority, application Japan, Oct. 17, 1995, 7-31116
Term of patent 14 years
LOC (6) Cl. 17 - *01*
U.S. Cl. D17—7



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386,515
PRINTER

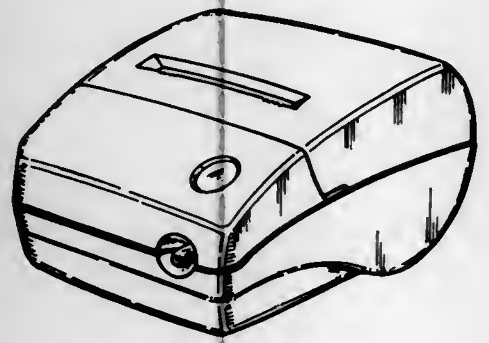
David J. Sommerville; David K. Oram, and Andrew B. Chalmers, all of Edinburgh, Scotland, assignors to Able Systems Limited, Cheshire, England

Filed Feb. 5, 1996, Ser. No. 49,948

Term of patent 14 years

LOC (6) Cl. 18 - *01*

U.S. Cl. D18—4



386,516
ICON FOR A DISPLAY SCREEN

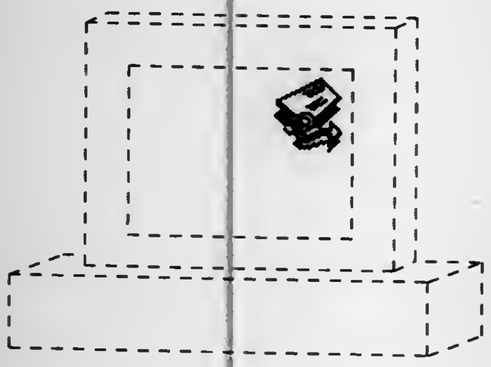
Deanna M. Thomas, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 9, 1992, Ser. No. 942,683

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.5



386,517
PHOTOCOPIER

Masaki Takahashi, and Hiroaki Sasaki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

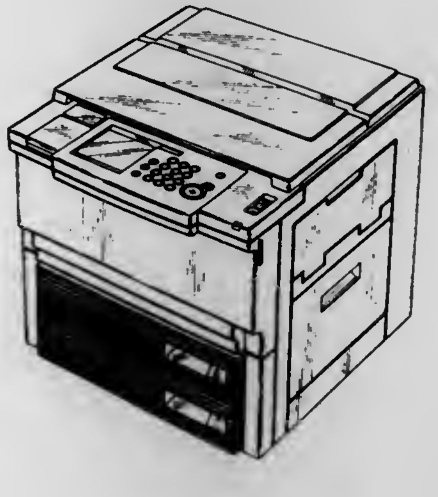
Filed Aug. 5, 1996, Ser. No. 57,958

Claims priority, application Japan, Feb. 5, 1996, 8-2707

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—39



386,518
IMAGE FORMING APPARATUS

Noriaki Miyamoto, Yokohama, and Ryoko Unishi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

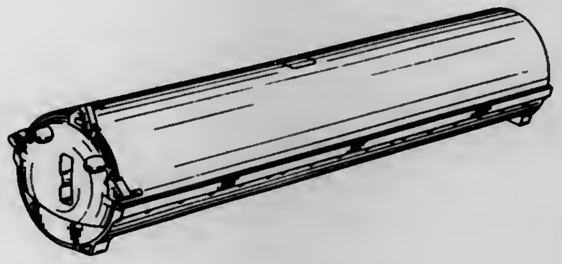
Filed Mar. 27, 1996, Ser. No. 52,298

Claims priority, application Japan, May 30, 1995, 7-15262

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—43



386,519
COMPUTER PRINTER

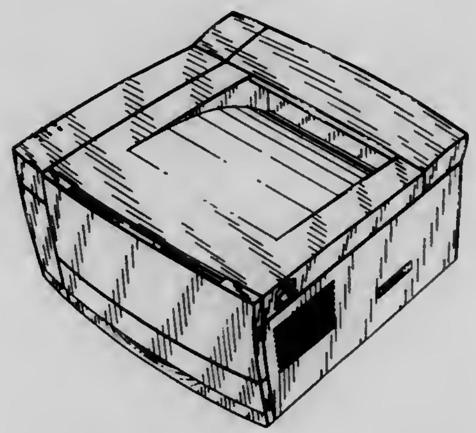
James C. Meschter, and Jonathan P. Ive, both of San Francisco, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 29, 1996, Ser. No. 53,014

Term of patent 14 years

LOC (6) Cl. 18 - *02*

U.S. Cl. D18—55



386,520
INK CARTRIDGE FOR PRINTER

Naoki Tashiro, Kawasaki; Toshihiko Ujita, Yamato; Teruo Arashima, Kawasaki; Yuji Hamasaki, Sagamihara; Hisashi Yamamoto, Hiratsuka, and Wataru Takahashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1995, Ser. No. 42,291

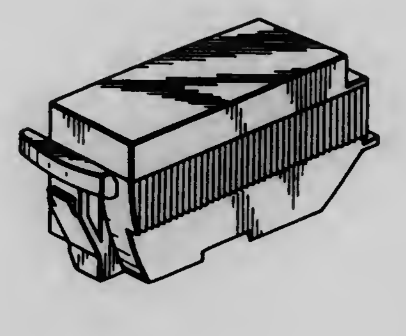
Claims priority, application Japan, Feb. 6, 1995, 7-2796

The portion of the term of this patent subsequent to Dec. 31, 2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 18 - *02*

U.S. Cl. D18—56



386,521
ELECTRONIC BOOK

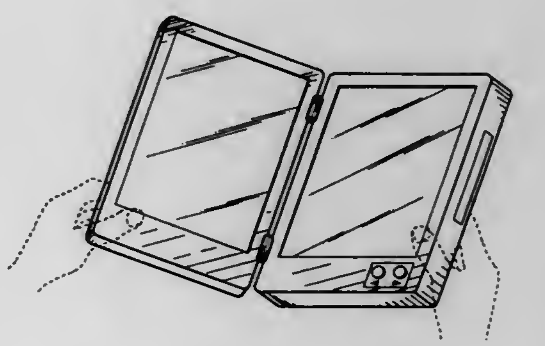
Allan M. Eisenbaum, 1742 S. Nome Way, Aurora, Colo. 80012

Filed Oct. 4, 1996, Ser. No. 60,723

Term of patent 14 years

LOC (6) Cl. 19 - *04*

U.S. Cl. D19—26



386,522
COVER FOR PLANNER DIARY ATLAS OR THE LIKE

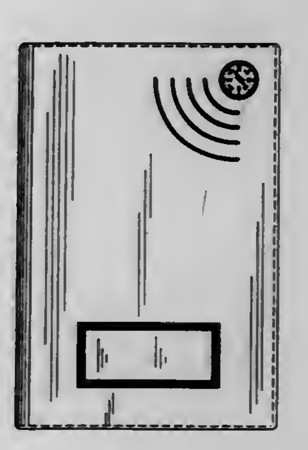
Fernst Van Osch, Drunen, Netherlands, assignor to Lase-It, Inc., Searingtown, N.Y.

Filed Dec. 2, 1996, Ser. No. 63,179

Term of patent 14 years

LOC (6) Cl. 19 - *04*

U.S. Cl. D19—26



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386,523
BOOK WITH AN EXTERNAL THREE DIMENSIONAL CHARACTER

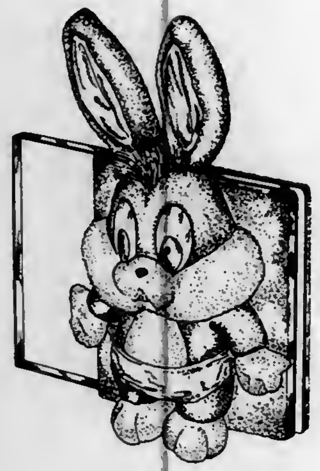
Paula Allen, Burbank, and Michael Harkavy, Encino, both of Calif., assignors to Warner Brothers, a Division of Time Warner Entertainment Company, L.P., Burbank, Calif.

Filed Nov. 2, 1995, Ser. No. 45,934

Term of patent 14 years

LOC (6) Cl. 19 - *04*

U.S. Cl. D19—29



386,524
BOOKMARK

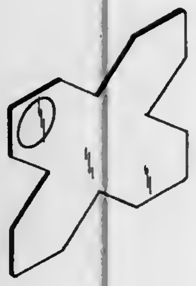
Kenneth A. Walker, 4199 W. 53rd Ave., Denver, Colo. 80212

Filed Jun. 4, 1996, Ser. No. 55,431

Term of patent 14 years

LOC (6) Cl. 19 - *99*

U.S. Cl. D19—34



386,525
GROOVED PEN

Michel Voegeli, Anieres, Switzerland, assignor to Christian Dior Couture, S.A., Paris, France

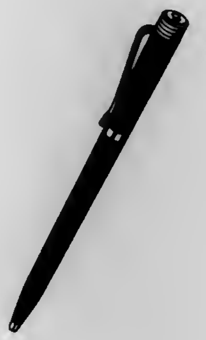
Filed Oct. 16, 1996, Ser. No. 61,138

Claims priority, application European Pat. Off., Apr. 16, 1996, DM036159

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—49



386,526
HOLDER FOR A RUBBER ERASER

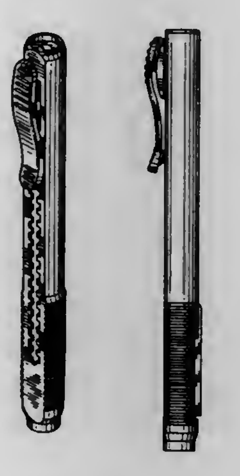
Kunio Ito, Funabashi, Japan, assignor to Pentel Kabushiki Kaisha, Japan

Filed Jan. 27, 1995, Ser. No. 34,099

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—53



386,527
DOCUMENT CLIP

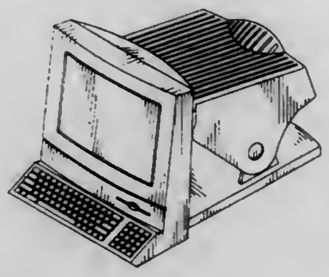
Hitoshi Suzuki, Tokyo, Japan, assignor to Hiromori Inc., Tokyo, Japan

Filed Nov. 27, 1996, Ser. No. 63,145

Term of patent 14 years

LOC (6) Cl. 19 - *02*

U.S. Cl. D19—65



386,528
PUNCH

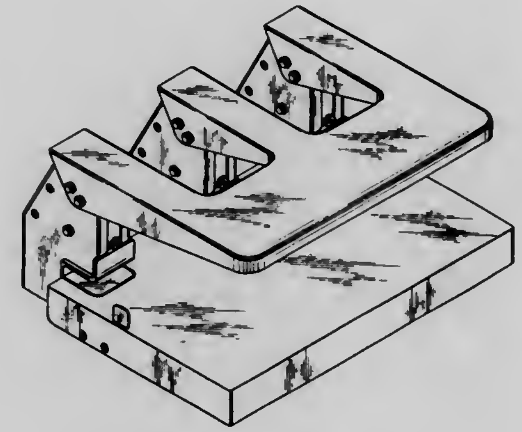
Chuzo Mori, Katsushika-ku, Japan, assignor to Carl Jimuki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 62,223

Term of patent 14 years

LOC (6) Cl. 19 - *02*

U.S. Cl. D19—72



386,529
MEMORY AID

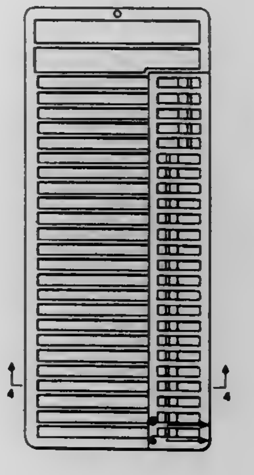
J. Ray Karvinen, 620 Sampson St., Butte, Mont. 59701

Filed Dec. 14, 1995, Ser. No. 47,908

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—18



386,530
WEARABLE HAND DISPLAY

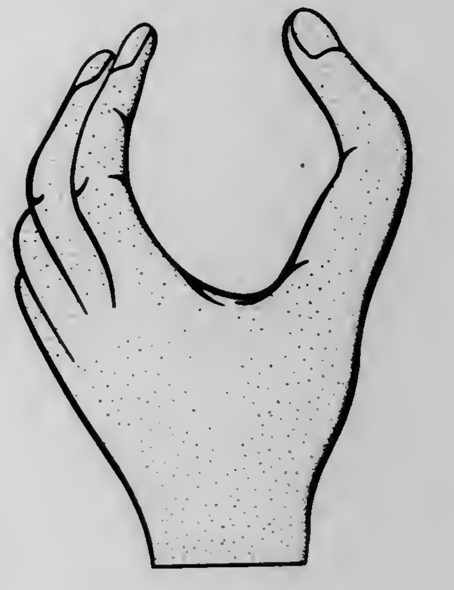
Richard Pesta, 19506 Auburn St., NW., Elk River, Minn. 55330

Filed May 28, 1996, Ser. No. 55,031

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—33



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386,531
ADJUSTABLE SIGN HOLDER

Mike T. Callas, 120 Gideons Point Rd., Tonka Bay, Minn. 55331

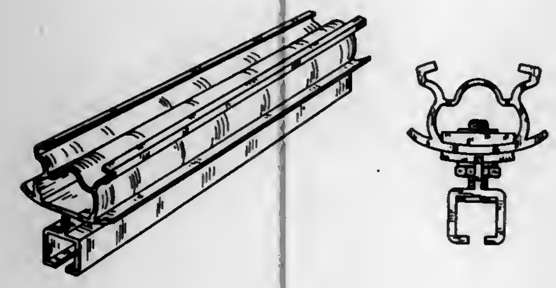
Filed Aug. 14, 1995, Ser. No. 42,570

The portion of the term of this patent subsequent to Aug. 20, 2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 20 - *02*

U.S. Cl. D20—40



386,532
CARD CADDY

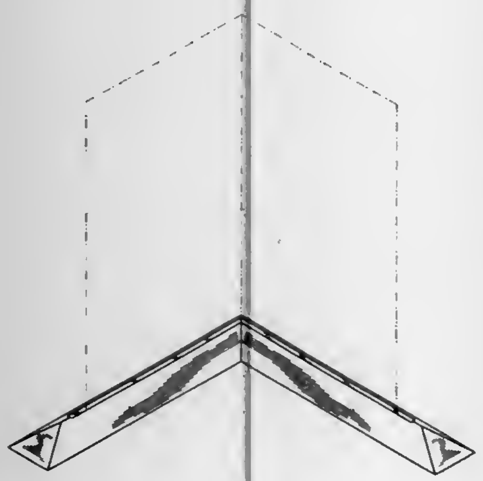
David M. Bass, 107 Pleasure Bay B-1, 245 Atlantic Ave., Long Beach, N.J. 07740

Filed Mar. 28, 1996, Ser. No. 52,349

Term of patent 14 years

LOC (6) Cl. 20 - *02*

U.S. Cl. D20—40



386,533
SPORTS BALL DISPLAY CASE

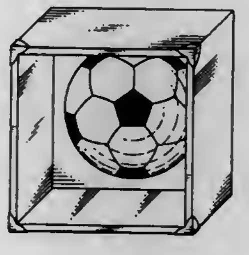
Robert M. Kvoka, 3323 Heritage Dr., Wilmington, Del. 19808

Filed Dec. 6, 1995, Ser. No. 47,513

Term of patent 14 years

LOC (6) Cl. 20 - *02*

U.S. Cl. D20—42



386,534
PRICE DISPLAY HOLDER FOR STORE SHELVES

Ola Ödmark, Uppsala, Sweden, assignor to Pricer Inc., Norwalk, Conn.

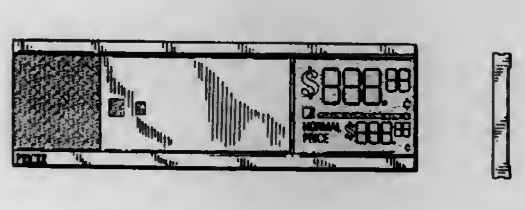
Filed Dec. 9, 1993, Ser. No. 16,169

Claims priority, application Sweden, Jun. 10, 1993, 93-1369; Dec. 7, 1993, 93-2736

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—43



386,535
PRICE DISPLAY HOLDER FOR STORE SHELVES

Ola Ödmark, Upsala, Sweden, assignor to Pricer Inc., Norwalk, Conn.

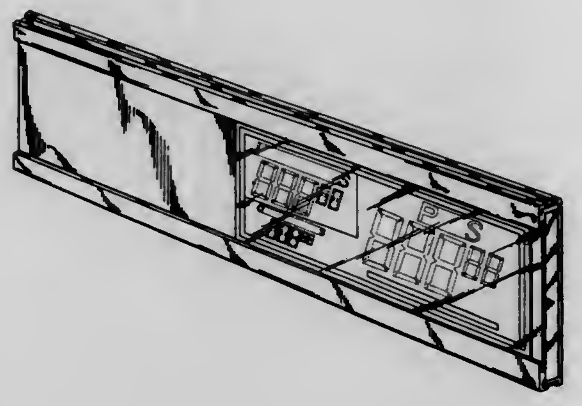
Filed Apr. 19, 1994, Ser. No. 21,504

Claims priority, application Sweden, Oct. 21, 1993, 93-2353

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—43



386,536
ADVERTISEMENT CARRYING DEVICE

Terje Borgen, Glennevn. 43, N-1476 Rasta, Norway

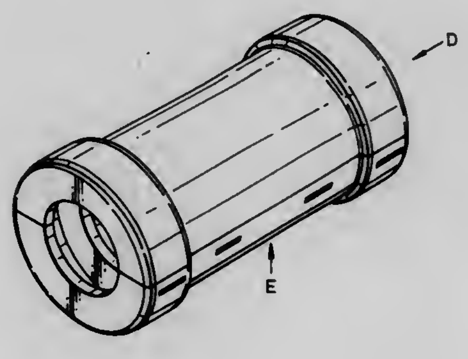
Filed Apr. 17, 1996, Ser. No. 53,190

Claims priority, application Norway, Oct. 19, 1995, 950801

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—43



386,537
SLAMMER GAME KIT

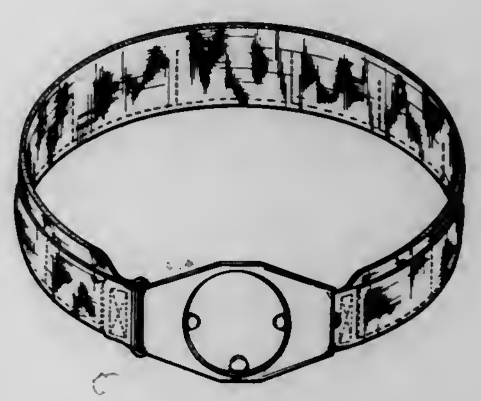
Gary W. Cox, 117 Joshua Rd., Stafford, Va. 22554

Filed Mar. 6, 1995, Ser. No. 35,721

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—5



386,538
DART BOARD

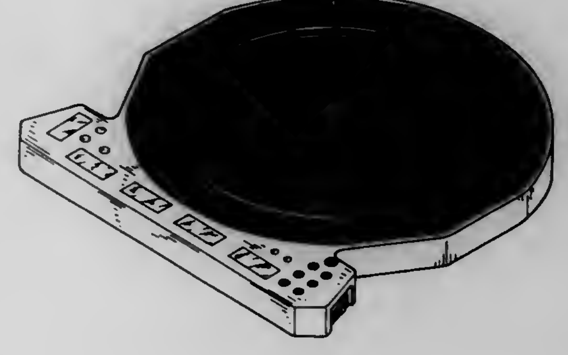
Hsi Tong Chu, 6F-1, No. 130, Tai Yuan North Road, Taichung, Taiwan

Filed May 31, 1996, Ser. No. 55,189

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—6



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386,539

TRAVEL GAME EMPLOYING CLIPBOARD WITH INDIVIDUAL MAGNETIZED ALPHABET SQUARES

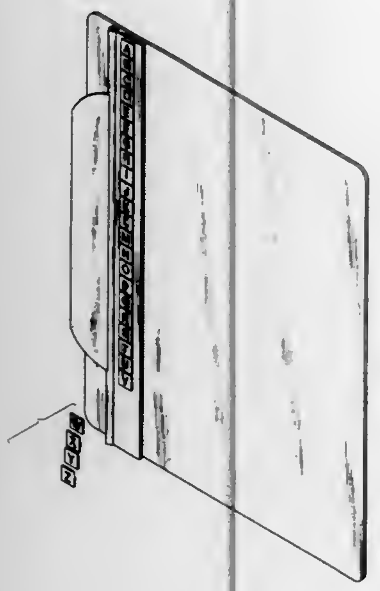
Duane E. Stevens, RR #1, Hopewell Cape, Albert Co., New Brunswick, Canada, E0A 1Y0

Filed May 20, 1996, Ser. No. 54,693

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—14



386,540

BOARD GAME

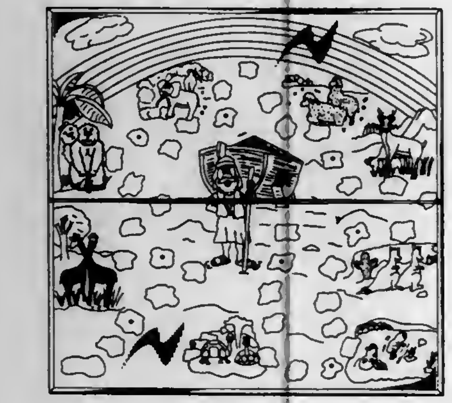
Salina J. Fowler, 2926 Old Alabama Rd., SW., McDonald, Tenn. 37353

Filed Jul. 15, 1996, Ser. No. 57,013

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—30



386,541

GAME BOARD

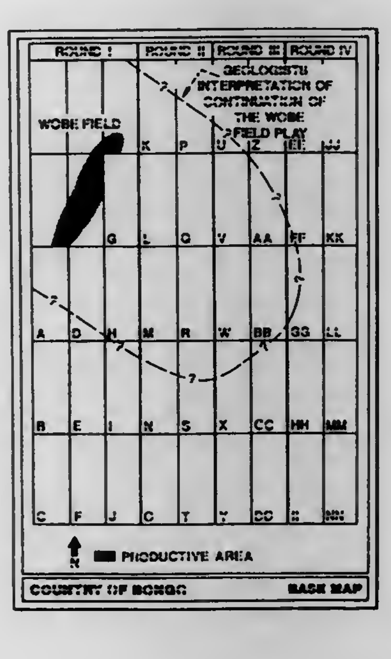
Marc Andrew Bond, Cookham Dean, United Kingdom, assignor to British Gas PLC, London, England

Filed May 24, 1995, Ser. No. 39,324

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—31



386,542

BOARD GAME

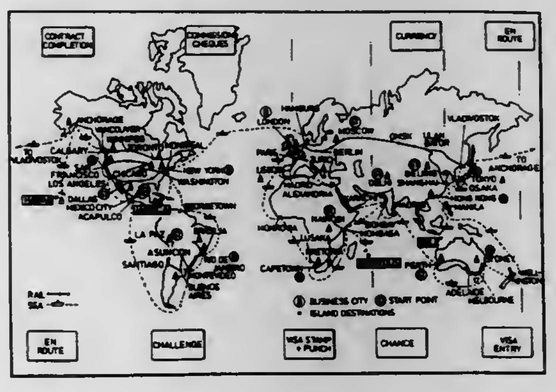
Barbara Tobias, and Ben Horton, both of 57 Chelford Road, Prestbury, Cheshire, United Kingdom, SK10 4PT

Filed Feb. 8, 1996, Ser. No. 50,077

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—31



386,543

OPTICAL BEAM GUN FOR A GAME MACHINE

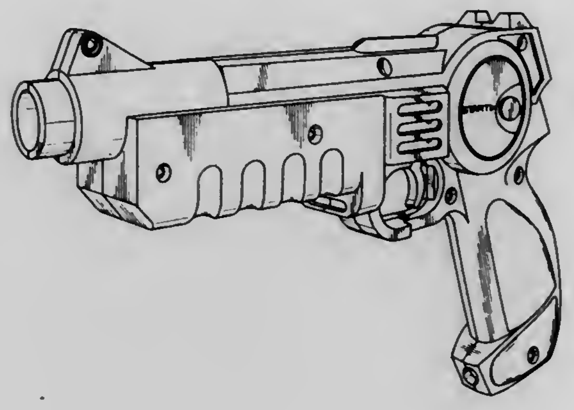
Noriyoshi Chikui, and Tooru Ookubo, both of Kobe, Japan, assignors to Konami Co., Ltd., Hyogo-ken, Japan

Filed Apr. 8, 1996, Ser. No. 52,923

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—48



386,544

COMPUTER GAME CONTROL APPARATUS

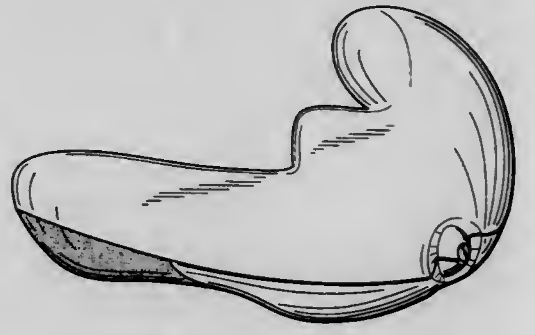
Jonathan Ken Kajikawa, Menlo Park; Masahiko Kawauchi, San Jose, both of Calif., and Scott Alan Henderson, New York, N.Y., assignors to Alps Electric (U.S.A.), Inc., San Jose, Calif.

Filed Aug. 19, 1996, Ser. No. 58,547

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—48



386,545

COMBINED HOLE AND EMBOSSMENT FOR A CONSTRUCTION TOY ELEMENT

Jacques Guegan, L'Hay les Roses; Francis Lecocq, Hames-Boucres, and Jean-Pierre Moussaud, Les Attaques, all of France, assignors to Meccano, S.A., Calais, France

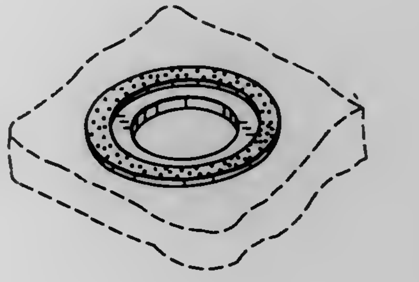
Filed Jul. 6, 1994, Ser. No. 25,817

Claims priority, application WIPO, Jan. 6, 1994, OMPIDM/028335

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—108



386,546

GUARDIAN ANGEL DOLL

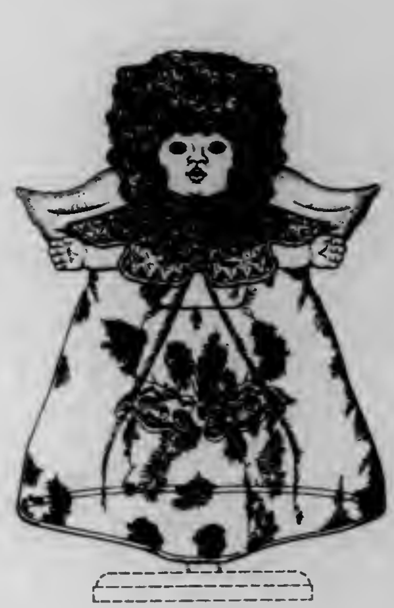
Lydia Hofmann, 2453 Lincoln Hwy. East, Lancaster, Pa. 17601

Filed Jan. 23, 1996, Ser. No. 49,321

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—169



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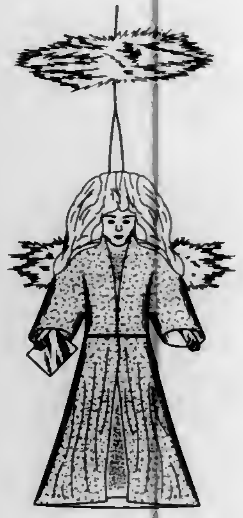
SUSPENDABLE GUARDIAN ANGEL DOLL

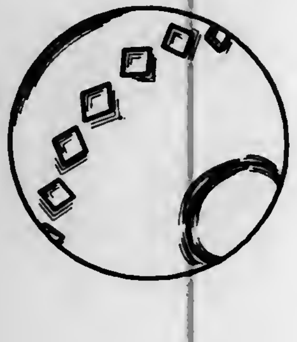
Geraldine L. Flug, 1611 Holliston Trail, Ft. Wayne, Ind. 46825
Filed Jul. 1, 1996, Ser. No. 56,514
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—169



386,548

PRACTICE GOLF BALL

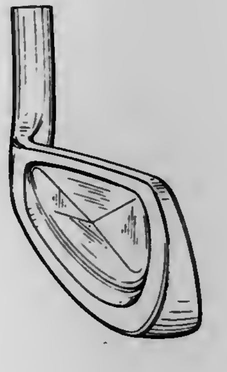
Ray C. Cullen, III, 11 Adir Dr., Shrewsbury, Mass. 01545
Filed Feb. 8, 1996, Ser. No. 50,079
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—205



386,549

GOLF CLUB HEAD

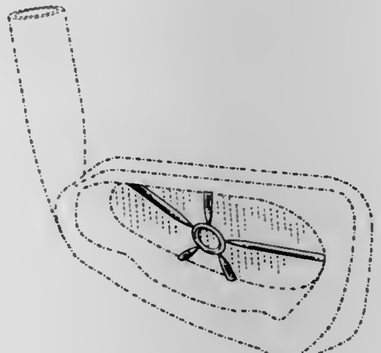
Kunihiko Takahashi, Musashino; Yasuto Imai, and Takehiko Asakuno, both of Higashikurume, all of Japan, assignors to Daowa Seiko Inc., Tokyo, Japan
Filed May 13, 1996, Ser. No. 54,345
Claims priority, application Japan, Nov. 13, 1995, 7-34183; Dec. 26, 1995, 7-39154
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—220



386,550

CAVITY INSERT FOR A GOLF CLUB HEAD

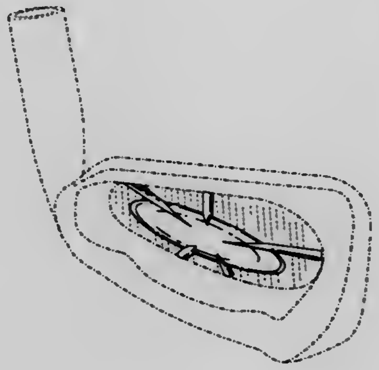
David E. Wright, Glendale, and John A. Solheim, Phoenix, both of Ariz., assignors to Karsten Manufacturing Corp., Phoenix, Ariz.
Division of Ser. No. 47,390, Dec. 1, 1995. This application Nov. 4, 1996, Ser. No. 62,681
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—221



386,551

CAVITY INSERT FOR A GOLF CLUB HEAD

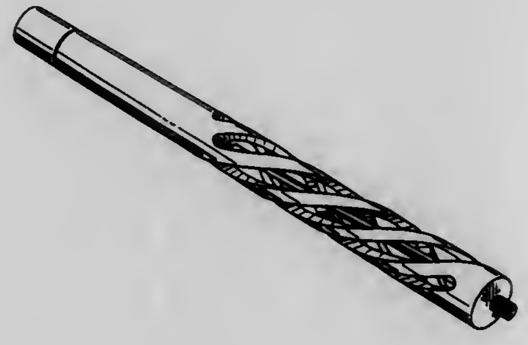
John A. Solheim, Phoenix; David E. Wright, Glendale, and Daniel J. Kubica, Phoenix, all of Ariz., assignors to Karsten Manufacturing Corp., Phoenix, Ariz.
Division of Ser. No. 47,390, Dec. 1, 1995. This application Nov. 21, 1996, Ser. No. 62,687
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—221



386,552

COMPOUND BOW STABILIZER

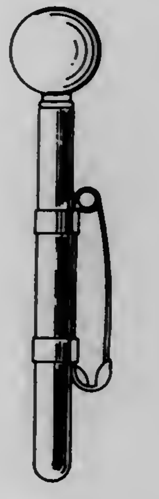
Chris Kunz, Rte. 1, Box 57, Calloway, Minn. 56537
Filed Jul. 8, 1996, Ser. No. 56,715
Term of patent 14 years
LOC (6) Cl. 22 - *01*
U.S. Cl. D22—107



386,553

COMBINED HOLDER AND HEAD FOR A SELF DEFENSE PIN

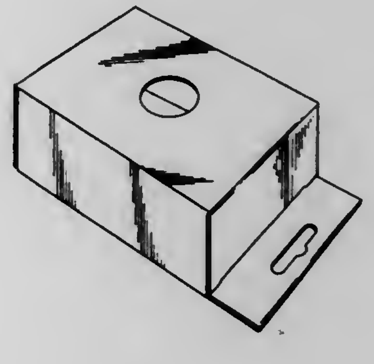
Mario Witold Polak, and Marie Louise Polak, both of 2462 E. La Jolla Dr., Tempe, Ariz. 85282-6049
Filed Jan. 3, 1996, Ser. No. 48,558
Term of patent 14 years
LOC (6) Cl. 22 - *02*
U.S. Cl. D22—117



386,554

MOUSE TRAP

Hugh A. Brewer, Cumming, Ga., assignor to Enforcer Products, Inc., Cartersville, Ga.
Filed Jan. 29, 1996, Ser. No. 49,459
Term of patent 14 years
LOC (6) Cl. 22 - *06*
U.S. Cl. D22—119



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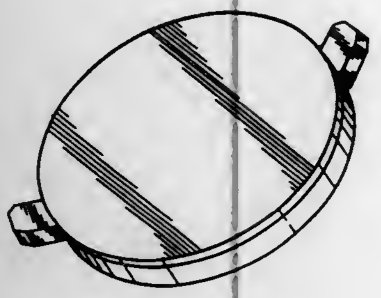
386,555

INSECT TRAP

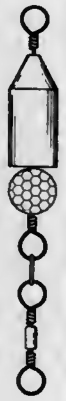
Kenneth Krug, 1824 Brownsville Rd., Trevose, Pa. 19053
Filed Jul. 10, 1995, Ser. No. 41,267
Term of patent 14 years
LOC (6) Cl. 22 - *06*
U.S. Cl. D22—122



386,556

FISHING LURE ATTACHMENT

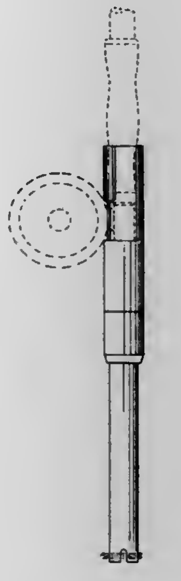
Kathy Magers, 5507 Yacht Club Dr., Rockwall, Tex. 75087
Filed Jul. 18, 1995, Ser. No. 41,553
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—126



386,557

FISHING ROD HOLDER

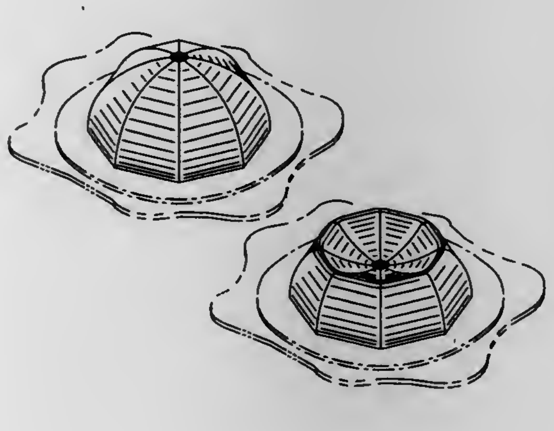
David Thompson, 4012 N. 30th Ave., Hollywood, Fla. 33020
Filed Jun. 10, 1996, Ser. No. 55,624
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—147



386,558

HAND PUMP FOR AN INFLATABLE STRUCTURE

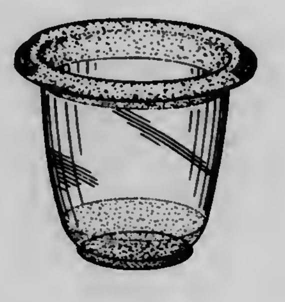
Bart W. Rietkerk, Hadley, Mass., assignor to Dielectrics Industries, Chicopee, Mass.
Filed Jun. 7, 1996, Ser. No. 55,548
Term of patent 14 years
LOC (6) Cl. 15 - *02*
U.S. Cl. D23—231



386,559

BABYBATH

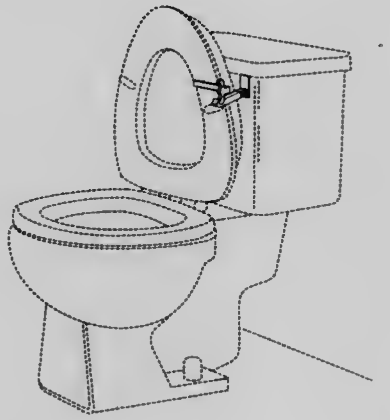
Anastatia Maria Belderok-Burghouts, Nervalaan 89, 6642 AK Beuningen, Netherlands
Filed May 5, 1995, Ser. No. 38,405
Claims priority, application Benelux TM/Des. Off., Nov. 7, 1994, 70230.00
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—278



386,560

COMBINED TOILET SEAT HANDLE AND HOLDER THEREFOR

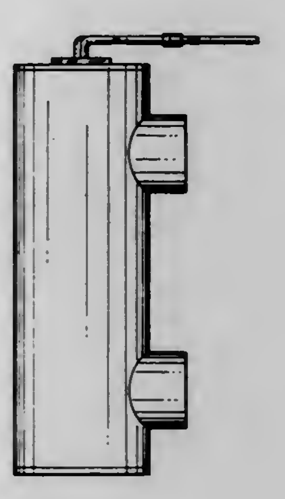
Dennis W. Doane, 103 Vista View Cir., Covington, Ky. 41017
Filed Oct. 7, 1996, Ser. No. 60,786
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—311



386,561

HEAT EXCHANGER

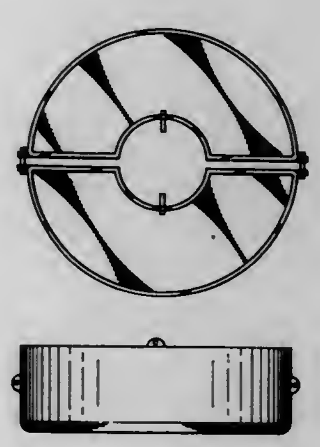
Craig Douglas Campbell, P.O. Box 133, Whitford, Auckland, New Zealand
Filed Apr. 25, 1996, Ser. No. 53,577
Claims priority, application New Zealand, Mar. 21, 1996, 27485
Term of patent 14 years
LOC (6) Cl. 23 - *03*
U.S. Cl. D23—330



386,562

FLUE-MOUNTED HUMIDIFIER

Peter C. Meie, P.O. Box 533, Crown Point, N.Y. 12928
Filed Jan. 16, 1996, Ser. No. 49,107
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—356



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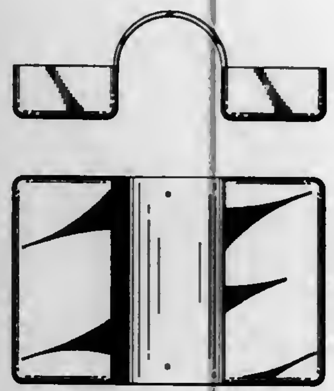
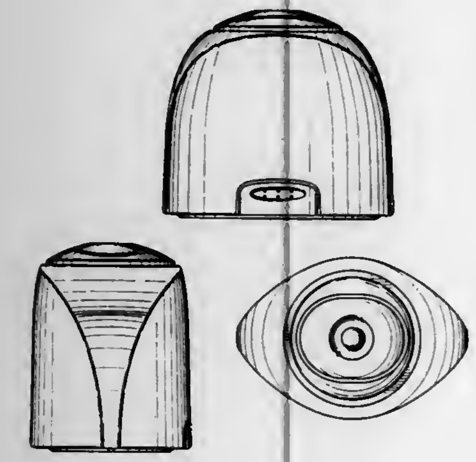
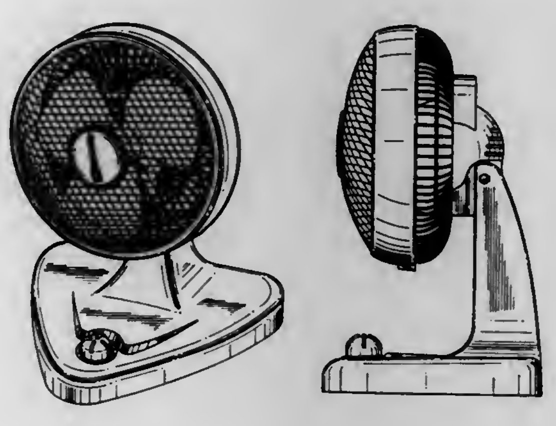
386,563
HUMIDIFIER FOR A HORIZONTAL FLUE
Peter C. Mele, P.O. Box 533, Crown Point, N.Y. 12928
Filed Jan. 23, 1996, Ser. No. 49,351
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—356



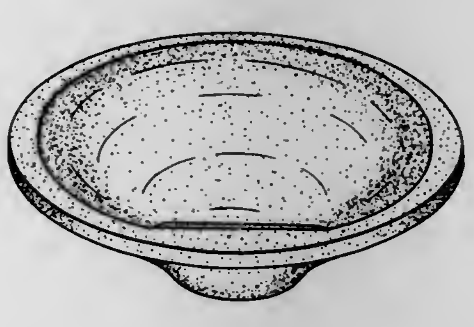
386,564
AIR TREATMENT APPARATUS
Damian Mycroft, London, England, assignor to Reckitt & Colman Products Limited, London, England
Filed Feb. 1, 1996, Ser. No. 49,845
Claims priority, application United Kingdom, Aug. 2, 1995, 2049279
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—369



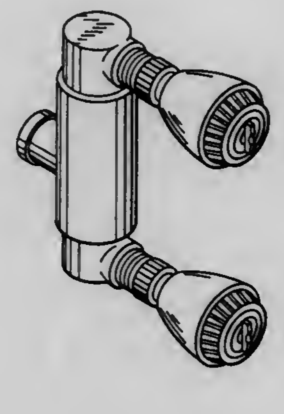
386,565
TABLE FAN
Rodney Jané, Westboro; Diane Allen, Marlborough, both of Mass.; Jui-Shang Wang, Taipei, Taiwan, and Stanley Gresens, Homewood, Ill., assignors to Duracraft Corp., Southborough, Mass.
Filed Jan. 16, 1996, Ser. No. 48,895
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—382



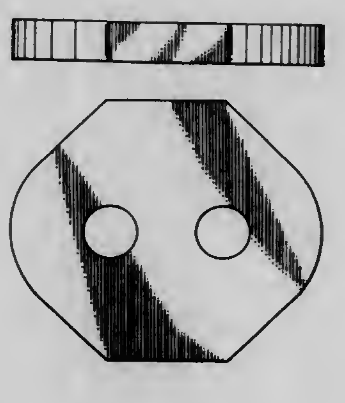
386,566
POOL FOUNTAIN
Stefan Zankow, 7001 Redlac Dr., Clifton, Va. 22024
Filed May 9, 1996, Ser. No. 54,324
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—201



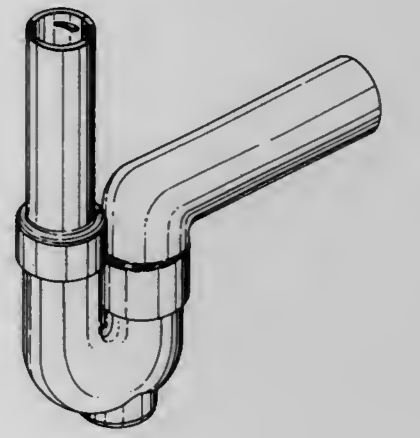
386,567
MULTI SHOWER HEAD
Richard Reeves, 3535 Hogan Cir., Cottonwood, Ariz. 86326
Filed Nov. 15, 1996, Ser. No. 62,456
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—213



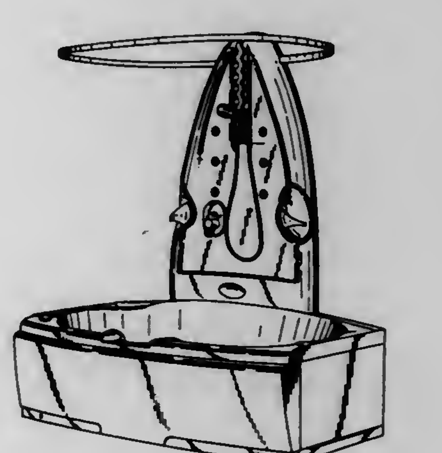
386,568
FLOW RATE ADJUSTING PLATE FOR A ROTARY NOZZLE TYPE MOLTEN METAL POURING UNIT
Tetsuya Yoshihara, Kanagawa-ken, Japan, assignor to NKK Corportion; Tokyo Yogyo Kabushiki Kaisha, both of Tokyo; Nippon Rotary Nozzle Co., Ltd., and Kokan Kikai Kogyo Kabushiki Kaisha, both of Kawasaki, all of Japan
Division of Ser. No. 32,456, Dec. 12, 1994, Pat. No. Des. 371,825, which is a continuation of Ser. No. 846,393, Mar. 4, 1992, abandoned. This application Nov. 20, 1995, Ser. No. 46,888
Claims priority, application Japan, Sep. 5, 1991, 3-026602; Sep. 5, 1991, 3-026603
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—237



386,569
THERMAL INSULATION FOR P-TRAP PIPING
Thomas W. Trueb, and Steven R. Trueb, both of Ellington, Conn., assignors to TrueBro, Inc., Ellington, Conn.
Continuation-in-part of Ser. No. 199,959, Feb. 22, 1994, Pat. No. 5,419,364, which is a continuation-in-part of Ser. No. 44,026, Apr. 8, 1993, Pat. No. 5,303,730, which is a continuation-in-part of Ser. No. 944,836, Sep. 14, 1992, Pat. No. 5,259,410, which is a continuation-in-part of Ser. No. 754,048, Sep. 3, 1991, Pat. No. 5,163,469, which is a continuation-in-part of Ser. No. 569,995, Aug. 20, 1990, Pat. No. 5,054,513. This application Apr. 21, 1995, Ser. No. 37,823
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—268



386,570
BATHTUB WITH FITTINGS
Marc Sadler, Treviso, Italy, assignor to Domino S.p.A., Pordenone, Italy
Filed Sep. 24, 1996, Ser. No. 60,218
Claims priority, application Italy, Mar. 26, 1996, PW96-0-000005
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—277



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TOILET TRAINING STEP

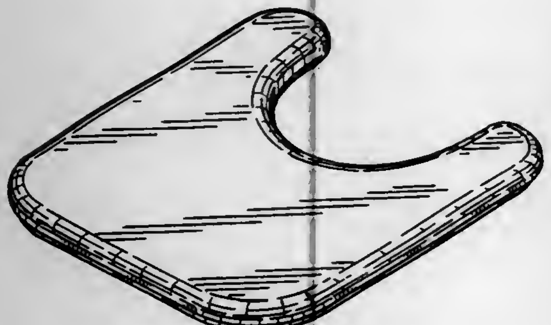
Patricia A. Wilhelm, 80 Winter Hill Cir., Montgomery, Ill. 60538

Filed Aug. 8, 1996, Ser. No. 58,096

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—303



386,572

SPRAY MISTING FAN AND BOTTLE

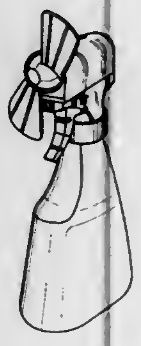
Lee Radtke, Lake Zurich; Linda M. Usher, Chicago, and Eric F. Junkel, Des Plaines, all of Ill., assignors to Circulair, Inc., Niles, Ill.

Filed Jun. 19, 1996, Ser. No. 56,012

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—328



386,573

GAS FIRED HEATER

Andrew Mark Wilson, Handsacre, England, assignor to Valor Limited, Birmingham, England

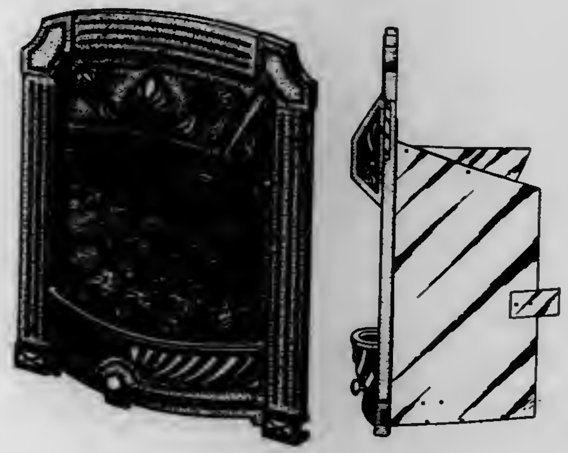
Filed Jun. 8, 1995, Ser. No. 41,146

Claims priority, application United Kingdom, Dec. 9, 1994, 2 043 818

Term of patent 14 years

LOC (6) Cl. 23 - *03*

U.S. Cl. D23—339



386,574

COMBINED MOTOR HOUSING, GLOBE AND BLADE IRONS UNIT FOR A CEILING FAN

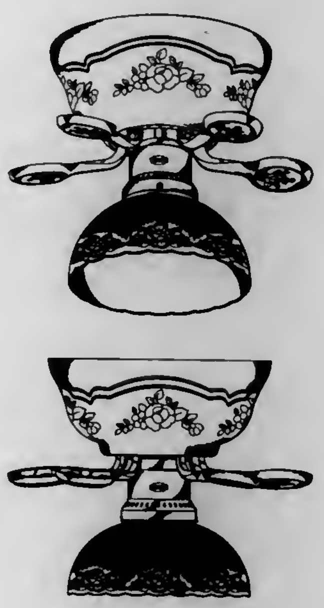
Jack W. Gee, II, Memphis, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.

Filed Mar. 26, 1996, Ser. No. 52,458

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



386,575

HUMIDIFIER

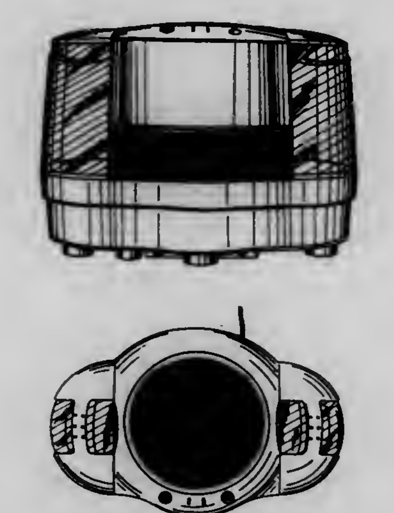
Bernard Chiu, Wellesley, Mass.; Jui-Shang Wang, Taipei, Taiwan; Richard M. O'Grady, Southington, and Robert L. Marvin, Farmington, both of Conn., assignors to Duracraft Corp., Southborough, Mass.

Filed Sep. 2, 1994, Ser. No. 27,955

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—356



386,576

HUMIDIFIER

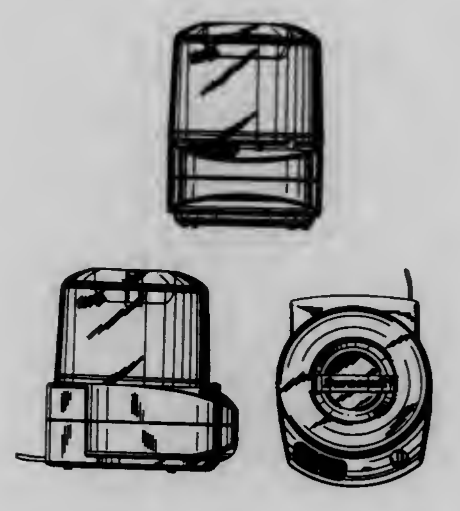
Jui-Shang Wang, Taipei, Taiwan; Robert L. Marvin, Jr., Farmington, Conn.; Richard M. O'Grady, Southington, Conn., and John Staton, Briston, Conn., assignors to Duracraft Corp., Southborough, Mass.

Filed Sep. 8, 1994, Ser. No. 28,141

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—356



386,577

MASONRY CHIMNEY ADAPTER

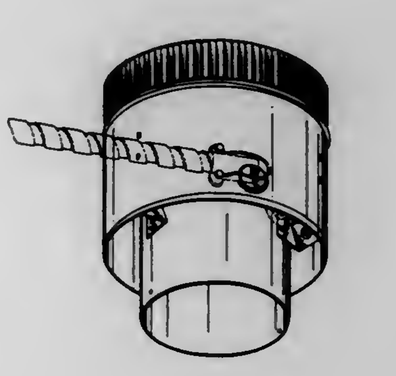
Paul M. Haydock, Zionsville, and Hall Virgil, Jr., Brownsburg, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 16, 1996, Ser. No. 60,295

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—374



386,578

FIREPLACE POKER

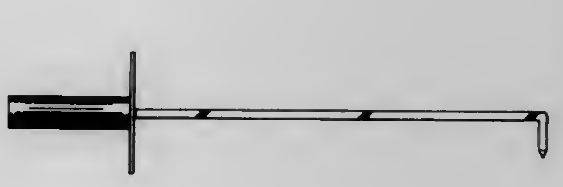
Peter C. Meie, P.O. Box 533, Crown Point, N.Y. 12928

Filed Sep. 27, 1995, Ser. No. 44,607

Term of patent 14 years

LOC (6) Cl. 07 - *08*

U.S. Cl. D23—403



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386,579

FRONT GRILL FOR A PORTABLE ELECTRIC FAN

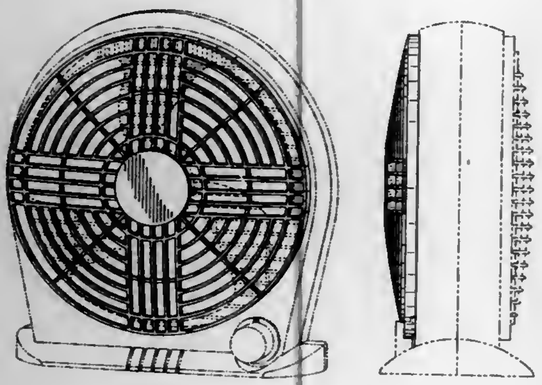
Rodney B. Jané , Westboro; John Longan, Natick, both of Mass.; Jui-Shang Wang, Taipei, Taiwan, and Stanley Gresens, Homewood, Ill., assignors to Duracraft Corp., Southborough, Mass.

Division of Ser. No. 39,775, May 23, 1995. This application Nov. 13, 1995, Ser. No. 46,293

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—412



386,580

PIERCED EAR CLEANING KIT

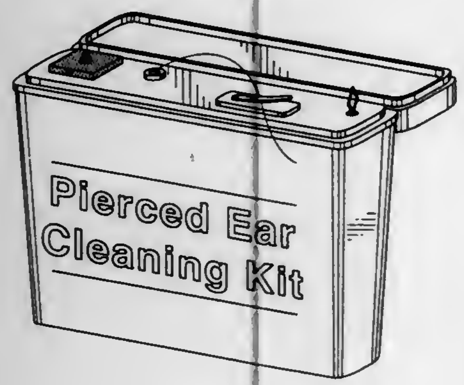
Richard P. Peavy, Sr., 2008 Northside Dr., Valdosta, Ga. 31602

Filed Mar. 22, 1996, Ser. No. 52,074

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—119



386,581

DIAPER

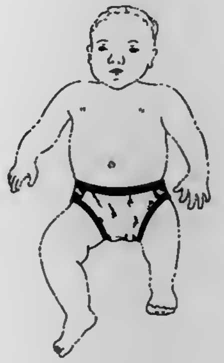
Giselher Grosskopf, 11201 Phoenix Way, Naples, Fla. 33999

Filed Dec. 27, 1994, Ser. No. 32,749

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—126



386,582

DISPOSABLE DIAPER WITH INTEGRAL PLASTIC BAG AND REUSABLE TAPE TAB

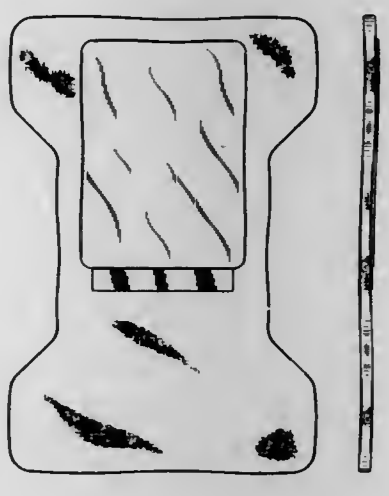
Gary R. Levine, 55 Garder Rd., Monroe, Conn. 06468

Filed Aug. 8, 1996, Ser. No. 58,104

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—126



386,583

PROXIMAL END OF A SURGICAL SUTURE SLOTTED KNOT PUSHER

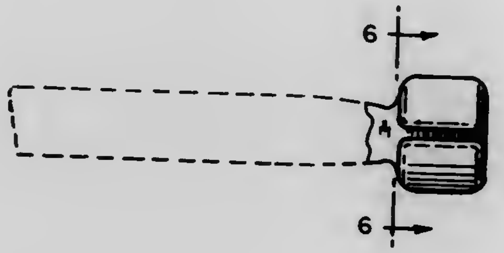
Michael C. Ferragamo, North Dighton; Joseph H. Sklar, Longmeadow, and Charles H. Brown, Jr., Wellesley, all of Mass., assignors to Acufex Microsurgical, Inc., Mansfield, Mass.

Continuation of Ser. No. 40,302, Jun. 7, 1995, abandoned, which is a division of Ser. No. 4,865, Feb. 16, 1993, Pat. No. Des. 360,687. This application Jan. 2, 1996, Ser. No. 48,825

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—145



386,584

TREATMENT COUCH

Rudolf Frei, Am Fischerrain 8, D-79199 Kirchzarten, Germany

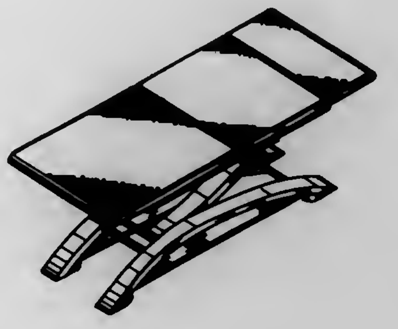
Filed May 18, 1995, Ser. No. 38,998

Claims priority, application Hague Agreement, Nov. 18, 1994, DN/031326

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—183



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18th DAY OF NOVEMBER, 1997

NOTE— Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Aalbers, Robert: *See—*
  - Oeste, Franz Dietrich, 5,689,798, Cl. 422-186.300.
- Aaron Medical Industries, Inc.: *See—*
  - Citronowicz, Moshe, 5,688,265, Cl. 606-30.000.
- Aasberg-Petersen, Kim: *See—*
  - Rostrup-Nielsen, Jens; Christiansen, Lars J.; and Aasberg-Petersen, Kim, 5,688,609, Cl. 429-15.000.
- Aastrom Biosciences, Inc.: *See—*
  - Palsson, Bernhard O.; Armstrong, R. Douglas; and Maluta, James, 5,688,687, Cl. 435-293.200.
- AB Volvo Penta: *See—*
  - Rodskier, Christian, 5,688,152, Cl. 440-83.000.
- ABB Power T&D Company Inc.: *See—*
  - Aufermann, Albert H.; and Karnbach, Robert S., 5,689,097, Cl. 218-157.000.
- Abbott Laboratories: *See—*
  - Adjei, Akwete L.; Lee, Dennis Y.; and Hlinak, Anthony J., 5,687,920, Cl. 241-65.000.
  - Barca, John G., 5,687,552, Cl. 53-490.000.
  - Garleb, Keith Allen; Wolf, Bryan Warren; Meulbroek, Jonathan Allan; and Wheeler, Keith Brian, 5,688,777, Cl. 514-54.000.
- Abbott Laboratories D-337/AP6D: *See—*
  - Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., 5,688,921, Cl. 530-405.000.
- Abdesaken, Fereydon: *See—*
  - Mayeros, William Edward, Jr.; and Abdesaken, Fereydon, 5,688,742, Cl. 504-116.000.
- Abe, Kimihiro: *See—*
  - Hatagishi, Yuji; and Abe, Kimihiro, 5,688,148, Cl. 439-701.000.
- Abe, Nobuaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Image signal processing device. 5,689,612, Cl. 386-109.000.
- Abe, Nobunori: *See—*
  - Oie, Masayuki; Abe, Nobunori; Tanaka, Hideyuki; Oikawa, Akira; and Miyata, Shuichi, 5,688,628, Cl. 430-176.000.
- Abe, Tetsuya; Fukuda, Toshio; and Fujiwara, Yoshio, to Sony Corporation. Thermal transfer recording medium. 5,688,737, Cl. 503-227.000.
- Abichandani, Jeevan S.; Beck, Jeffrey S.; McCullen, Sharon B.; and Olson, David H., to Mobil Oil Corporation. Ethylbenzene production process with ex situ selectivated zeolite catalyst. 5,689,025, Cl. 585-467.000.
- Abichandani, Jeevan S.; Beck, Jeffrey S.; Olson, David H.; Reischman, P. Thomas; Stern, David L.; and Venkat, Chaya R., to Mobil Oil Corporation. Selective ethylbenzene conversion. 5,689,027, Cl. 585-481.000.
- Abraham, Martin David, to Laser Industries Ltd. Laser microscope adaptor apparatus with auto-focus. 5,688,262, Cl. 606-18.000.
- Abramov, V. V.: *See—*
  - Joe, Sungsam; Lee, Kwangho; Nikolaichik, V. I.; Abramov, V. V.; Dontsova, E. P.; Tchebotar, A. M.; and Degtiareva, S. N., 5,688,849, Cl. 524-262.000.
- Abratech Corporation: *See—*
  - Jewett, Don Lee; and Zhang, Zhi, 5,687,724, Cl. 128-653.100.
- Abusleme, Julio A.; Guarda, Pier Antonio; and De Pasquale, Ralph, to Ausimont S.p.A. Process for preparing hydrogen-containing fluoropolymers by suspension (co)polymerization. 5,688,838, Cl. 522-33.000.
- Academy of Sciences of the Czech Republic, Institute of Organic Chemistry and Biochemistry of the: *See—*
  - Kim, Choung Un; Martin, John C.; Luh, Bing Uh; and Misco, Peter F., 5,688,778, Cl. 514-81.000.
- Accu-Sort Systems, Inc.: *See—*
  - Wurz, Albert; Scott, William; and Skokowski, Richard, 5,689,092, Cl. 177-145.000.
- Achleitner, Herbert: *See—*
  - Durchschlag, Gerald; and Achleitner, Herbert, 5,687,935, Cl. 246-257.000.
- Acquaviva, Thomas; Rees, James D.; and Durbin, John A., to Xerox Corporation. Simplified and higher productivity duplex document scanning systems. 5,689,792, Cl. 399-365.000.
- Active Control Experts, Inc.: *See—*
  - Lazarus, Kenneth B.; Lundstrom, Mark E.; Moore, Jeffrey W.; and Crawley, Edward F., 5,687,462, Cl. 29-25.350.
- Acushnet Company: *See—*
  - Aoyama, Steven, 5,688,192, Cl. 473-374.000.
  - Cavallaro, Christopher; Rajagopsian, Murali; Boehm, Herbert C.; and Harris, Kevin M., 5,688,191, Cl. 473-373.000.
- Adachi, Hideki: *See—*
  - Isemura, Keizo; Adachi, Hideki; Kaneko, Tokuharu; and Kutsuwada, Satoru, 5,689,759, Cl. 399-45.000.
- Adachi, Katsumi: *See—*
  - Hayakawa, Takashi; and Adachi, Katsumi, 5,689,778, Cl. 399-174.000.
- Adachi, Sumiaki: *See—*
  - Mizoguchi, Atushi; Kubo, Ichiro; Seguchi, Mashairo; and Adachi, Sumiaki, 5,689,105, Cl. 235-475.000.
- Adachi, Tomio: *See—*
  - Kashio, Shigetora; Sasashita, Katsutoshi; and Adachi, Tomio, 5,688,632, Cl. 430-281.100.
- Adachi, Tomohiko: *See—*
  - Ishikawa, Toshihiro; Doi, Ayumu; Okuda, Kenichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Yoshioka, Tooru, 5,689,264, Cl. 342-70.000.
- Adam, Gérard: *See—*
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,688,811, Cl. 514-321.000.
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,688,820, Cl. 514-367.000.
- Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., to Abbott Laboratories D-337/AP6D. Reagents and methods for the detection and qualification of thyroxine in fluid samples. 5,688,921, Cl. 530-405.000.
- Adamic, Raymond J., to Du Pont de Nemours, E. I., and Company. Ink jet inks containing long chain alcohols. 5,688,311, Cl. 106-20.00R.
- Adams, Brian M.; Pham, Hon; and Luch, Daniel, to Portola Packaging, Inc. Spill-reduction cap for fluid container. 5,687,865, Cl. 215-253.000.
- Adams, Charles Terrell: *See—*
  - Seamans, James Dallas; Adams, Charles Terrell; Dominguez, Wendy Beth; and Chen, Andrew An-Ju, 5,688,736, Cl. 502-219.000.
- Adams, Eddie Lee: *See—*
  - Shockley, Tina Renee; Adams, Eddie Lee; and Johnson, Wayne Buford, 5,689,417, Cl. 364-401.00R.
- Adams, Edward R.; and Ruch, Douglas C., to Donnelly Corporation. Modular panel assembly. 5,688,022, Cl. 296-214.000.
- Adams, Michael A.: *See—*
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3M: *See—*
- Berquist, David T.; Eisenberg, Peter M.; Grunes, Mitchell B.; Kenner, Martin A.; Kozak, Janelle J.; Kruse, John M.; Munson, Cindy L.; and Robins, Althea M., 5,689,666, Cl. 395-345.000.

420820Ontario Limited, c.o.b. Preferred Engineering Inc.: *See—*
- Davies, Bob; Davies, Sean; Goldenberg, Shaul; and Kupenthirarajan, Sinnathamby, 5,687,506, Cl. 49-260.000.

562186 Alberta Ltd.: *See—*
- Makowecki, Walter, 5,687,638, Cl. 99-353.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18th DAY OF NOVEMBER, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Chang, Chuan-Ming: *See—*
- Lin, Jyh-Feng; Chang, Chuan-Ming; Lee, Biing-Jye; and Jou, Ming-Jiunn, RE. 35,665, Cl. 257-94.000.

Hitachi, Ltd.: *See—*
- Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Miyamoto, Shoji; and Ihara, Hirokazu, RE. 35,663, Cl. 198-341.000.

Ihara, Hirokazu: *See—*
- Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Miyamoto, Shoji; and Ihara, Hirokazu, RE. 35,663, Cl. 198-341.000.

Industrial Technology Research Institute: *See—*
- Lin, Jyh-Feng; Chang, Chuan-Ming; Lee, Biing-Jye; and Jou, Ming-Jiunn, RE. 35,665, Cl. 257-94.000.

Jou, Ming-Jiunn: *See—*
- Lin, Jyh-Feng; Chang, Chuan-Ming; Lee, Biing-Jye; and Jou, Ming-Jiunn, RE. 35,665, Cl. 257-94.000.

Lee, Biing-Jye: *See—*
- Lin, Jyh-Feng; Chang, Chuan-Ming; Lee, Biing-Jye; and Jou, Ming-Jiunn, RE. 35,665, Cl. 257-94.000.

Lin, Jyh-Feng; Chang, Chuan-Ming; Lee, Biing-Jye; and Jou, Ming-Jiunn, to Industrial Technology Research Institute. Surface light emitting diode with electrically conductive window layer. RE. 35,665, Cl. 257-94.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
- Murata, Shinichi; Nakamura, Noboru; Yoshida, Michiyasu; and Miyamoto, Hideki, RE. 35,662, Cl. 123-90.160.

Miyamoto, Hideki: *See—*
- Murata, Shinichi; Nakamura, Noboru; Yoshida, Michiyasu; and Miyamoto, Hideki, RE. 35,662, Cl. 123-90.160.

Miyamoto, Shoji: *See—*
- Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Miyamoto, Shoji; and Ihara, Hirokazu, RE. 35,663, Cl. 198-341.000.

Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Miyamoto, Shoji; and Ihara, Hirokazu, to Hitachi, Ltd. Method and apparatus for transportation of materials. RE. 35,663, Cl. 198-341.000.

Murata, Shinichi; Nakamura, Noboru; Yoshida, Michiyasu; and Miyamoto, Hideki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Valve operating apparatus. RE. 35,662, Cl. 123-90.160.

Nakamura, Noboru: *See—*
- Murata, Shinichi; Nakamura, Noboru; Yoshida, Michiyasu; and Miyamoto, Hideki, RE. 35,662, Cl. 123-90.160.

Orimo, Masayuki: *See—*
- Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Miyamoto, Shoji; and Ihara, Hirokazu, RE. 35,663, Cl. 198-341.000.

Rolls-Royce plc: *See—*
- Searle, John Gilbert, RE. 35,664, Cl. 228-2.100.

Searle, John Gilbert, to Rolls-Royce plc. Friction welding. RE. 35,664, Cl. 228-2.100.

Suzuki, Yasuo: *See—*
- Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Miyamoto, Shoji; and Ihara, Hirokazu, RE. 35,663, Cl. 198-341.000.

Yoshida, Michiyasu: *See—*
- Murata, Shinichi; Nakamura, Noboru; Yoshida, Michiyasu; and Miyamoto, Hideki, RE. 35,662, Cl. 123-90.160.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Banko, Anton, to Surgical Design Corp. Ultrasonic handpiece design. B1 406,284, Cl. 606-169.000.

Bartlett, Mark: *See—*
- Findlay, Alexander; and Bartlett, Mark, B1 176,239, Cl. 198-321.000.

Baylor College of Medicine: *See—*
- Caskey, Charles T.; and Edwards, Albert O., B1 364,759, Cl. 435-6.000.

Caskey, Charles T.; and Edwards, Albert O., to Baylor College of Medicine. DNA typing with short tandem repeat polymorphisms and indentification of polymorphic short tandem repeats. B1 364,759, Cl. 435-6.000.

Chum, Pak-Wing S.: *See—*
- Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., B1 487,938, Cl. 428-332.000.

Cincinnati Milacron, Inc.: *See—*
- Sparer, Ronald M.; and Werle, Dale P., B1 062,052, Cl. 364-473.030.

Clorox Company: *See—*
- Kaaret, Thomas W., B1 478,356, Cl. 510-226.000.

Crane Productions, Inc.: *See—*
- Martin, John J., B1 458,282, Cl. 229-92.800.

deGroot, Jacquelyn A.: *See—*
- Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., B1 487,938, Cl. 428-332.000.

Denki Tetsushin Industries Co., Ltd.: *See—*
- Watabe, Tadatoshi; and Miyasaka, Shoichi, B1 210,930, Cl. 29-609.000.

Dow Chemical Company, The: *See—*
- Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., B1 487,938, Cl. 428-332.000.

Edwards, Albert O.: *See—*
- Caskey, Charles T.; and Edwards, Albert O., B1 364,759, Cl. 435-6.000.

Escalator Advertising Limited: *See—*
- Findlay, Alexander; and Bartlett, Mark, B1 176,239, Cl. 198-321.000.

Findlay, Alexander; and Bartlett, Mark, to Escalator Advertising Limited. Advertising fitting. B1 176,239, Cl. 198-321.000.

Fourgaut, Lue: *See—*
- LeDoux, Patrick; and Fourgaut, Lue, B1 985,196, Cl. 264-516.000.

Gaisser, Hermann, to Wangner Systems Corporation. Woven multilayer papermaking fabric having increased stability and permeability and method. B1 114,777, Cl. 428-137.000.

Geotech Lizens AG: *See—*
- Jaecklin, Felix P., B1 293,245, Cl. 405-272.000.

Invest America Counseling Services, Inc.: *See—*
- Nichols, Charles R., B1 219,880, Cl. 364-718.010.

Jaecklin, Felix P., to Geotech Lizens AG. Structural system and structural elements for use and construction of earth filled walls. B1 293,245, Cl. 405-272.000.

K-2 Corporation: *See—*
- Meibock, Antonin A.; and Svensson, John E., B1 437,466, Cl. 280-11.220.

Kaaret, Thomas W., to Clorox Company. Cyanoimides and compositions useful for bleaching. B1 478,356, Cl. 510-226.000.

Kolthammer, Brian W. S.: *See—*
- Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., B1 487,938, Cl. 428-332.000.

LeDoux, Patrick; and Fourgaut, Lue, to Pipe Liners, Inc. Pipe liner process. B1 985,196, Cl. 264-516.000.

Machinefabriek Meyn B.V.: *See—*
- Meyn, Cornelis, B1 269,721, Cl. 452-117.000.

Martin, John J., to Crane Productions, Inc. Card having magnetic sheet secured to one surface. B1 458,282, Cl. 229-92.800.

Meibock, Antonin A.; and Svensson, John E., to K-2 Corporation. In-line roller skate. B1 437,466, Cl. 280-11.220.

Meyn, Cornelis, to Machinefabriek Meyn B.V. Method and apparatus for processing poultry. B1 269,721, Cl. 452-117.000.

Miyasaka, Shoichi: *See—*
- Watabe, Tadatoshi; and Miyasaka, Shoichi, B1 210,930, Cl. 29-609.000.

Moshe, Eitan B., to Sun-Mate Corp. Vehicle starter cable. B1 367,846, Cl. D13-144.000.

Murray, John F., to Roll International Corporation. Retainer for attaching floral lid container. B1 521,990, Cl. 47-41.120.

Nichols, Charles R., to Invest America Counseling Services, Inc. Signal-processing and conversion systems. B1 219,880, Cl. 364-718.010.

Nu-Pipe, Inc.: *See—*
- Steketee, Campbell H., Jr., B1 244,624, Cl. 264-516.000.

Peller, Hyman H., to Raxxess Metalsmiths Inc. Electronic component rack. B1 452,951, Cl. 312-310.000.

Pipe Liners, Inc.: *See—*
- LeDoux, Patrick; and Fourgaut, Lue, B1 985,196, Cl. 264-516.000.

Raxxess Metalsmiths Inc.: *See—*
- Peller, Hyman H., B1 452,951, Cl. 312-310.000.

Ripplinger, Miriam P.: *See—*

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  - Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., B1 487,938, Cl. 428-332.000.
- Roll International Corporation: *See—*
  - Murray, John F., B1 521,990, Cl. 47-41.120.
- Sparer, Ronald M.; and Werle, Dale P., to Cincinnati Milacron, Inc. Logic controlled plastic molding machine with programmable operator interface. B1 062,052, Cl. 364-473.030.
- Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., to Dow Chemical Company, The. Silica supported transition metal catalyst. B1 487,938, Cl. 428-332.000.
- Steketee, Campbell H., Jr., to Nu-Pipe, Inc. Method of installing a new pipe inside an existing conduit by progressive rounding. B1 244,624, Cl. 264-516.000.
- Sun-Mate Corp.: *See—*
  - Moshe, Eitan B., B1 367,846, Cl. D13-144.000.
- Surgical Design Corp.: *See—*
  - Banko, Anton, B1 406,284, Cl. 606-169.000.
- Svensson, John E.: *See—*
  - Meibock, Antonin A.; and Svensson, John E., B1 437,466, Cl. 280-11.220.
- Wangner Systems Corporation: *See—*
  - Gaisser, Hermann, B1 114,777, Cl. 428-137.000.
- Watabe, Tadatoshi; and Miyasaka, Shoichi, to Denki Tetsushin Industries Co., Ltd. Method of manufacturing wound core. B1 210,930, Cl. 29-609.000.
- Werle, Dale P.: *See—*
  - Sparer, Ronald M.; and Werle, Dale P., B1 062,052, Cl. 364-473.030.
- Wooster, Jeffrey J.: *See—*
  - Spencer, Lee; Kolthammer, Brian W. S.; Ripplinger, Miriam P.; Wooster, Jeffrey J.; Chum, Pak-Wing S.; and deGroot, Jacquelyn A., B1 487,938, Cl. 428-332.000.

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- Abbott Laboratories: *See—*
  - McCallister, Patrick Edward; and Lippian, Joseph Michael, 386,414, Cl. D9-520.000.
  - McCallister, Patrick Edward; and Lippian, Joseph Michael, 386,415, Cl. D9-520.000.
- Able Systems Limited: *See—*
  - Sommerville, David J.; Oram, David K.; and Chalmers, Andrew B., 386,515, Cl. D18-4.000.
- Abraham, Paulette: *See—*
  - Mandell, Jonathan; Abraham, Paulette; and Hoss, Shawn, 386,352, Cl. D7-330.000.
- Acufex Microsurgical, Inc.: *See—*
  - Ferragamo, Michael C.; Sklar, Joseph H.; and Brown, Charles H., Jr., 386,583, Cl. D24-145.000.
- Adriaenssens, Stephan G., to N.V. Moerman. Connection sleeve for brush handles and wiper handles. 386,397, Cl. D8-396.000.
- Ahn, Sung Ae. Candy configuration. 386,285, Cl. D1-127.000.
- Alfonso, Pedro Marcos; and Sharp, Michael Horton, to International Business Machines Corporation. Computer cover. 386,478, Cl. D14-100.000.
- All-Rite Products, Inc.: *See—*
  - Hancock, Dennis H., 386,298, Cl. D3-218.000.
  - Hancock, Dennis H., 386,304, Cl. D3-262.000.
- Allen, Diane: *See—*
  - Jané , Rodney; Allen, Diane; Wang, Jui-Shang; and Gresens, Stanley, 386,565, Cl. D23-382.000.
- Allen, Paula; and Harkavy, Michael, to Warner Brothers, a Division of Time Warner Entertainment Company, L.P. Book with an external three dimensional character. 386,523, Cl. D19-29.000.
- Alps Electric Co., Ltd.: *See—*
  - Kageyama, Masaaki; Ito, Hideki; Koutaka, Yoshirou; Murakami, Takahiro; Katayama, Katsuyuki; and Chiba, Hiromi, 386,488, Cl. D14-115.000.
- Alps Electric (U.S.A.), Inc.: *See—*
  - Kajikawa, Jonathan Ken; Kawauchi, Masahiko; and Henderson, Scott Alan, 386,544, Cl. D21-48.000.
- Alves, Roger J.; and Nimpoeno, Roy, to Scosche Industries, Inc. Visor cassette holder. 386,467, Cl. D12-417.000.
- Ambar Diamonds Inc.: *See—*
  - Itzkowitz, Israel, 386,438, Cl. D11-34.000.
  - Itzkowitz, Israel, 386,439, Cl. D11-41.000.
  - Itzkowitz, Israel, 386,443, Cl. D11-91.000.
- Antonucci, Mark. Foldable spacer. 386,388, Cl. D8-354.000.
- Anusavice, Laura. Jewelry chain separator. 386,442, Cl. D11-87.000.
- Apple Computer, Inc.: *See—*
  - Meschter, James C.; and Ive, Jonathan P., 386,519, Cl. D18-55.000.
  - Thomas, Deanna M., 386,476, Cl. D14-114.500.
  - Thomas, Deanna M., 386,477, Cl. D14-114.300.
  - Thomas, Deanna M., 386,485, Cl. D14-114.500.
  - Thomas, Deanna M., 386,487, Cl. D14-114.800.
  - Thomas, Deanna M., 386,516, Cl. D14-114.500.
- Arashima, Teruo: *See—*
  - Tashiro, Naoki; Ujita, Toshihiko; Arashima, Teruo; Hamasaki, Yuji; Yamamoto, Hisashi; and Takahashi, Wataru, 386,520, Cl. D18-56.000.
- Article Chaussant Europeen (ARCHE): *See—*
  - Merceron, Jean-Paul, 386,288, Cl. D2-953.000.
- Asakuno, Takehiko: *See—*
  - Takahashi, Kunihiko; Imai, Yasuto; and Asakuno, Takehiko, 386,549, Cl. D21-220.000.
- ASOTV Partners Limited: *See—*
  - Rotchin, Dean, 386,327, Cl. D6-470.000.
- AST Research, Inc.: *See—*
  - Daly, John J.; Yoshimoto, Max; Salazar, Jeffrey; and Lee, Chia-Chun, 386,480, Cl. D14-106.000.
- Attinello, John Steven, to Goodyear Tire & Rubber Company, The. Tire tread. 386,471, Cl. D12-147.000.
- Azuma, Sadayoshi: *See—*
  - Matsumoto, Hiroyuki; Hiraoka, Takashi; Azuma, Sadayoshi; and Ohno, Akio, 386,500, Cl. D14-239.000.
- Baar, Kenneth W.; Corsaro, Paul R.; Pogue, Lonnie C.; Macowski, Brian; and Lee, David Kwock Bun, to Proxima Corporation. Integrated liquid crystal display projector. 386,509, Cl. D16-225.000.
- Bachmann, Helmuth. Planing floats for power boat. 386,465, Cl. D12-317.000.
- Backs, Jochen Philipp; Bennett, Stephen Edward; Biasotti, Mark; Larew, Mark B.; Law, John Matthew; Mathis, Everett Wayne; Motluck, Raymond; Nuttall, Michael John; and Schaffeld, John Henry, to Lucent Technologies Inc. Telephone stand. 386,496, Cl. D14-151.000.
- Bass, David M. Card caddy. 386,532, Cl. D20-40.000.
- Bausch & Lomb Incorporated: *See—*
  - Conway, Simon M., 386,513, Cl. D16-326.000.
- Belderok-Burghouts, Anastatia Maria. Babybath. 386,559, Cl. D23-278.000.
- Bender, Thomas M.: *See—*
  - Fitten, Timothy E.; Lay, Dieter F.; and Bender, Thomas M., 386,413, Cl. D9-503.000.
- Benmiloud, Ahmed Saad, to Paint Productions, Inc. Refuse bin grabber. 386,450, Cl. D12-15.000.
- Bennett, Stephen Edward: *See—*
  - Backs, Jochen Philipp; Bennett, Stephen Edward; Biasotti, Mark; Larew, Mark B.; Law, John Matthew; Mathis, Everett Wayne; Motluck, Raymond; Nuttall, Michael John; and Schaffeld, John Henry, 386,496, Cl. D14-151.000.
- Bergqvist, Hakan: *See—*
  - Jansson, Conny; Himberg, Hans; Bergqvist, Hakan; and Bobjer, Olle, 386,374, Cl. D8-52.000.
- Bernhardt Furniture Company: *See—*
  - O'Hare, Timothy M., 386,325, Cl. D6-436.000.
- Bernstein, I. Robert; Gaske, Joseph W.; and Flynn, Daniel J., to Triple-A Specialty Co. Motor vehicle tune-up kit container. 386,405, Cl. D9-415.000.
- Biasotti, Mark: *See—*
  - Backs, Jochen Philipp; Bennett, Stephen Edward; Biasotti, Mark; Larew, Mark B.; Law, John Matthew; Mathis, Everett Wayne; Motluck, Raymond; Nuttall, Michael John; and Schaffeld, John Henry, 386,496, Cl. D14-151.000.
- Black & Decker Inc.: *See—*
  - Davidson, Carl B.; Governale, Benjamin A.; and Place, Ricky A., 386,355, Cl. D7-378.000.
  - Davidson, Carl B., 386,357, Cl. D7-413.000.
- Black, Joseph D.; and McNamara, Harold C. Sheetrock utility knife. 386,381, Cl. D8-99.000.
- Bobjer, Olle: *See—*
  - Jansson, Conny; Himberg, Hans; Bergqvist, Hakan; and Bobjer, Olle, 386,374, Cl. D8-52.000.
- Bond, Marc Andrew, to British Gas PLC. Game board. 386,541, Cl. D21-31.000.
- Bono, James L.: *See—*
  - Gutting, Louis Yager; Bono, James L.; and Skidmore, John E., 386,407, Cl. D9-434.000.
- Borgen, Terje. Advertisement carrying device. 386,536, Cl. D20-43.000.
- Boston Technology, Inc.: *See—*
  - Rafuse, Susan; and Meade, John, 386,486, Cl. D14-114.500.
- Brandenburg, Allen E.; and Maldonado, John E., to Kimberly-Clark Worldwide, Inc. Liquid soap dispenser. 386,344, Cl. D6-544.000.
- Brewer, Hugh A., to Enforcer Products, Inc. Mouse trap. 386,554, Cl. D22-119.000.
- Bridgestone Corporation: *See—*
  - Tsukagoshi, Tetsuhito, 386,452, Cl. D12-141.000.
- Bridgestone/Firestone, Inc.: *See—*
  - Guspodin, James G., 386,453, Cl. D12-146.000.
  - Guspodin, James G., 386,454, Cl. D12-147.000.
- British Gas PLC: *See—*
  - Bond, Marc Andrew, 386,541, Cl. D21-31.000.

- Brodmann, Robert Alfred, to Design Knowledge International Labs, Inc. Wrist watch. 386,429, Cl. D10-39.000.
- Brooks, Mike; Simpson, Edgar H.; Kastner, Theodore A.; and Wurfbain, Diana A., to Rocky Shoes and Boots, Inc. Shoe upper. 386,292, Cl. D2-970.000.
- Brooks, Mike; Simpson, Edgar H.; Kastner, Theodore A.; and Wurfbain, Diana A., to Rocky Shoes and Boots, Inc. Shoe upper. 386,293, Cl. D2-970.000.
- Brooks, Mike; Simpson, Edgar H.; Kastner, Theodore A.; and Wurfbain, Diana A., to Rocky Shoes and Boots, Inc. Shoe upper. 386,294, Cl. D2-970.000.
- Brown, Charles H., Jr.: *See—*
  - Ferragamo, Michael C.; Sklar, Joseph H.; and Brown, Charles H., Jr., 386,583, Cl. D24-145.000.
- Bryant, Teddy R.: *See—*
  - England, Trent L.; Kuver, Walter D.; Bryant, Teddy R.; and Hanna, Shawn G., 386,473, Cl. D13-147.000.
- Bullshark Enterprises, Inc.: *See—*
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- C. & E. Fein GmbH & Co.: *See—*
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- Callas, Mike T. Adjustable sign holder. 386,531, Cl. D20-40.000.
- Campbell, Craig Douglas. Heat exchanger. 386,561, Cl. D23-330.000.
- Canon Information Systems, Inc.: *See—*
  - England, Trent L.; Kuver, Walter D.; Bryant, Teddy R.; and Hanna, Shawn G., 386,473, Cl. D13-147.000.
- Canon Kabushiki Kaisha: *See—*
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  - Ohwada, Masahito, 386,508, Cl. D16-202.000.
  - Takahashi, Masaki; and Sasaki, Hiroaki, 386,517, Cl. D18-39.000.
  - Tashiro, Naoki; Ujita, Toshihiko; Arashima, Teruo; Hamasaki, Yuji; Yamamoto, Hisashi; and Takahashi, Wataru, 386,520, Cl. D18-56.000.
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  - Kirk, Karl D., III; Mulhauser, Paul; and Fontayne, Diego, 386,404, Cl. D9-339.000.
- Carl Aug. Heinz Glashüttenwerke GmbH & Co. KG: *See—*
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- Carrier Corporation: *See—*
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  - Sommerville, David J.; Oram, David K.; and Chalmers, Andrew B.,, 386,515, Cl. D18-4.000.
- Chen, Tsang-Ming. Business card box. 386,308, Cl. D3-294.000.
- Cheng, Fu Chin, to Sysgration Ltd. Computer mouse. 386,483, Cl. D14-114.000.
- Chiba, Hiromi: *See—*
  - Kageyama, Masaaki; Ito, Hideki; Koutaka, Yoshirou; Murakami, Takahiro; Katayama, Katsuyuki; and Chiba, Hiromi, 386,488, Cl. D14-115.000.
- Chikui, Noriyoshi; and Ookubo, Tooru, to Konami Co., Ltd. Optical beam gun for a game machine. 386,543, Cl. D21-48.000.
- Ching-Tsai Wang: *See—*
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  - Hsu, Yun-Tung, 386,386, Cl. D8-333.000.
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- Choi, Byung-O; and Choi, Seung-myun, to Samsung Electronics Co., Ltd. Camcorder. 386,506, Cl. D16-202.000.
- Choi, Seung-myun: *See—*
  - Choi, Byung-O; and Choi, Seung-myun, 386,506, Cl. D16-202.000.
- Christian Dior Couture, S.A.: *See—*
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- Chu, Hsi Tong. Dart board. 386,538, Cl. D21-6.000.
- Cibuzar, Alan, to University of Minnesota, Regents of the. Buoy with solar cells. 386,433, Cl. D10-107.000.
- CIPA USA, Inc.: *See—*
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- Circulair, Inc.: *See—*
  - Radtke, Lee; Usher, Linda M.; and Junkel, Eric F., 386,572, Cl. D23-328.000.
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- Clementz, Michel; Feller, Gilbert; and Merx, Raymond, to Goodyear Tire & Rubber Company, The. Decorative band for a tire sidewall. 386,455, Cl. D12-152.000.
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  - Moskovich, Robert, 386,312, Cl. D4-104.000.
  - Moskovich, Robert, 386,313, Cl. D4-104.000.
  - Moskovich, Robert, 386,314, Cl. D4-104.000.
- Conway, Simon M., to Bausch & Lomb Incorporated. Eyewear front. 386,513, Cl. D16-326.000.
- Corsaro, Paul R.: *See—*
  - Baar, Kenneth W.; Corsaro, Paul R.; Pogue, Lonnie C.; Macowski, Brian; and Lee, David Kwock Bun, 386,509, Cl. D16-225.000.
- Costa, John D. Novelty musical picture frame. 386,317, Cl. D6-300.000.
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565	5,687,488
706	5,687,489
CLASS 34	
92	5,687,490
CLASS 36	
124	5,687,491
131	5,687,492
CLASS 38	
88	5,687,493
CLASS 39	
800	5,689,719
CLASS 40	
1.6	5,687,494
124.08	5,687,495
329	5,687,496
406	5,687,497
518	5,687,498
524	5,687,499
572	5,687,500
CLASS 42	
1.14	5,687,501
CLASS 44	
320	5,688,295
CLASS 47	
41.01	5,687,502
	5,687,503
41.12	B1 4,521,990
57.6	5,687,504
72	5,687,505
CLASS 48	
197 R	5,688,296
CLASS 49	
260	5,687,506
340	5,687,507
386	5,687,509
471	5,687,508
CLASS 52	
11	5,687,510
18	5,687,511
23	5,687,512
32	5,687,513
58	5,687,514
103	5,687,515
174	5,687,516
177	5,687,517
204.1	5,687,518
213	5,687,519
233	5,687,520
308	5,687,521
414	5,687,522
417	5,687,523
461	5,687,524
506.07	5,687,525
506.08	5,687,526
	5,687,527
514	5,687,528
582.2	5,687,529
592.6	5,687,530
596.1	5,687,531
656.3	5,687,532
656.9	5,687,533
664	5,687,534
713	5,687,535
719	5,687,536
726.3	5,687,537
731.7	5,687,538
745.15	5,687,540
748.1	5,687,539
CLASS 53	
54	5,687,541
122	5,687,542
136.4	5,687,543
136.5	5,687,544
284.7	5,687,545
397	5,687,546
	5,687,547
399	5,687,548
450	5,687,549
453	5,687,550
468	5,687,551
490	5,687,552
504	5,687,553
589	5,687,554
CLASS 55	
356	5,688,297
367	5,688,298
385.3	5,688,299
CLASS 56	
249	5,687,555
400.01	5,687,556
CLASS 57	
413	5,687,558
902	5,687,557
CLASS 60	
39.182	5,687,559
39.58	5,687,560
226.1	5,687,561
226.3	5,687,562
	5,687,563
235	5,687,564
274	5,687,565
327	5,687,566
413	5,687,567
424	5,687,568
641.2	5,687,569
655	5,687,570
737	5,687,571
753	5,687,572
CLASS 62	
3.6	5,687,573
55.5	5,687,574
	5,687,575
56	5,687,576
64	5,687,577
113	5,687,578
175	5,687,579
186	5,687,580
263	5,687,581
298	5,687,582
404	5,687,583
632	5,687,584
CLASS 63	
21	5,687,585
26	5,687,586
CLASS 65	
86	5,688,300
438	5,688,301
461	5,688,302
CLASS 66	
196	5,687,587
CLASS 68	
12.07	5,687,589
17 R	5,687,588
	5,687,590
212	5,687,591
CLASS 70	
14	5,687,592
16	5,687,593
495	5,687,594
CLASS 72	
8.3	5,687,595
14.8	5,687,596
21.4	5,687,597
21.5	5,687,598
62	5,687,599
69	5,687,600
149	5,687,601
202	5,687,602
250	5,687,603
265	5,687,604
347	5,687,605
424	5,687,613
CLASS 73	
1 J	5,689,057
9	5,689,058
23.31	5,689,059
24.04	5,689,060
40.5 R	5,689,061
73	5,687,606
104	5,689,062
105	5,689,063
	5,689,064
117.3	5,689,065
118.1	5,689,066
	5,689,067
152.02	5,689,068
290 R	5,687,607
304 C	5,687,608
322.5	5,687,609
462	5,689,069
643	5,689,070
861.84	5,689,071
862.541	5,689,072
863.01	5,689,073
CLASS 74	
333	5,687,610
411.5	5,687,611
421 A	5,687,612
459	5,687,614
475	5,687,615
551.1	5,687,616
564	5,687,617
573 F	5,687,618
594.6	5,687,619
640	5,687,620
650	5,687,621
CLASS 75	
352	5,688,303
712	5,688,304
CLASS 76	
107.1	5,687,622
CLASS 81	
60	5,687,623
434	5,687,624
CLASS 83	
74	5,687,625
719	5,687,626
745	5,687,627
	5,687,628
747	5,687,629
824	5,687,630
CLASS 84	
294	5,689,074
297 R	5,689,075
458	5,689,076
477 R	5,689,077
600	5,689,078
603	5,689,079
604	5,689,080
609	5,689,081
743	5,689,082
CLASS 91	
505	5,687,631
CLASS 92	
88	5,687,632
97	5,687,633
170.1	5,687,634
CLASS 95	
14	5,688,305
15	5,688,306
50	5,688,307
CLASS 96	
18	5,688,308
CLASS 99	
281	5,687,635
285	5,687,636
295	5,687,637
353	5,687,638
369	5,687,639
423	5,687,640
450.2	5,687,641
451	5,687,642
CLASS 100	
3	5,687,643
90	5,687,644
282	5,687,645
CLASS 101	
129	5,687,646
375	5,687,647
415.1	5,687,648
CLASS 102	
275.2	5,689,083
293	5,689,084
313	5,689,085
411	5,689,086
CLASS 104	
106	5,687,649
CLASS 105	
355	5,687,650
CLASS 106	
2	5,688,309
14.42	5,688,310
20 R	5,688,311
31.49	5,688,312
38.2	5,688,313
443	5,688,314
446	5,688,315
461	5,688,316
476	5,688,317
CLASS 108	
44	5,687,651
51.1	5,687,653
147	5,687,654
	5,687,655
561	5,687,652
CLASS 110	
216	5,687,656
234	5,687,657
347	5,687,658
CLASS 112	
470.01	5,687,659
470.03	5,687,660
470.18	5,687,661
475.08	5,687,662
CLASS 114	
44	5,687,663
61	5,687,664
74 R	5,687,665
90	5,687,666
243	5,687,667
249	5,687,668
270	5,687,669
312	5,687,670
315	5,687,671
CLASS 116	
34 R	5,687,672
CLASS 117	
1	5,688,318
13	5,688,319
75	5,688,320
200	5,688,321
CLASS 118	
52	5,688,322
326	5,688,323
401	5,688,324
410	5,688,325
419	5,688,326
500	5,688,327
505	5,688,328
	5,688,329
723 E	5,688,330
725	5,688,331
CLASS 119	
14.04	5,687,673
CLASS 122	
1 A	5,687,674
4 D	5,687,675
6 A	5,687,676
44.2	5,687,677
250 R	5,687,678
CLASS 123	
41.79	5,687,679
90.16	Re.35,662
90.17	5,687,681
90.6	5,687,680
179.3	5,687,682
182.1	5,687,683
184.55	5,687,684
188.8	5,687,685
195 P	5,687,686
196 S	5,687,687
196 W	5,687,688
198 E	5,687,689
198 R	5,687,690
337	5,687,691
339.1	5,687,695
436	5,687,692
446	5,687,693
479	5,687,694
516	5,687,696
520	5,687,697
571	5,687,698
673	5,687,699
688	5,687,700
CLASS 124	
1	5,687,701
25.6	5,687,703
CLASS 126	
25 R	5,687,704
229	5,687,705
263.01	5,687,706
299 D	5,687,707
362	5,687,708
CLASS 128	
203.12	5,687,709
203.15	5,687,710
205.24	5,687,712
206.21	5,687,713
207.14	5,687,714
207.18	5,687,715
630	5,687,716
	5,687,717
632	5,687,718
633	5,687,719
	5,687,721
	5,687,722
642	5,687,723
653.1	5,687,724
653.2	5,687,725
654	5,687,726
657	5,687,727
660.003	5,687,729
665	5,687,730
672	5,687,731
	5,687,732
692	5,687,733
696	5,687,734
	5,687,735
710	5,687,737
715	5,687,738
754	5,687,739
760	5,687,740
842	5,687,741
845	5,687,742
848	5,687,743
878	5,687,744
CLASS 131	
173	5,687,745
273	5,687,746
280	5,687,747
291	5,687,748
329	5,687,749
CLASS 132	
54	5,687,750
200	5,687,751
CLASS 134	
1.1	5,688,332
4	5,688,333
	5,688,334
19	5,688,335
42	5,688,336
115 R	5,687,752
CLASS 136	
213	5,689,087

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244	5,688,337

CLASS 137

43	5,687,753
179	5,687,754
182	5,687,755
202	5,687,756
382	5,687,757
460	5,687,758
486	5,687,759
497	5,687,760
558	5,687,761
588	5,687,762
625.33	5,687,763
625.43	5,687,764
627.5	5,687,765
812	5,687,766
855	5,687,767

CLASS 138

39	5,687,768
40	5,687,769
44	5,687,770
89	5,687,771
96 R	5,687,772
	5,687,773
121	5,687,774

CLASS 139

426 R	5,687,775

CLASS 141

11	5,687,776
18	5,687,777
59	5,687,778
105	5,687,779
286	5,687,780
316	5,687,781
346	5,687,782
364	5,687,783

CLASS 144

34.6	5,687,784

CLASS 148

194	5,688,339
261	5,688,340
505	5,688,341

CLASS 152

209 R	5,688,342
510	5,688,343
527	5,688,344
540	5,688,345

CLASS 156

60	5,688,346
89	5,688,347
197	5,688,348
200	5,688,349
213	5,688,350
214	5,688,351
228	5,688,352
256	5,688,353
267	5,688,354
272.8	5,688,355
331.7	5,688,356
345	5,688,357
	5,688,358
	5,688,359
	5,688,360
362	5,688,361
578	5,688,363
636.1	5,688,364
661.11	5,688,365
662.1	5,688,366

CLASS 160

236	5,687,785
370.21	5,687,786

CLASS 162

38	5,688,367
56	5,688,368
57	5,688,369
146	5,688,370
166	5,688,371
212	5,688,372
343	5,688,374
358.3	5,688,375

CLASS 164

98	5,687,787
456	5,687,788
481	5,687,789

CLASS 165

42	5,687,790

CLASS 166

250.07	5,687,791
327	5,687,792
342	5,687,793
363	5,687,794
387	5,687,795

CLASS 169

54	5,687,796

CLASS 172

311	5,687,798
540	5,687,799
811	5,687,800

CLASS 173

1	5,687,801
169	5,687,802

CLASS 174

21 C	5,689,088
52.4	5,689,089
121 A	5,689,090
255	5,689,091

CLASS 175

19	5,687,803
52	5,687,804
53	5,687,805
62	5,687,806
393	5,687,807

CLASS 177

145	5,689,092

CLASS 180

243	5,687,808
297	5,687,809
423	5,687,810
447	5,687,811

CLASS 181

157	5,689,093

CLASS 182

3	5,687,812
127	5,687,813

CLASS 184

3.2	5,687,814
7.4	5,687,815

CLASS 187

337	5,687,816
384	5,689,094

CLASS 188

72.3	5,687,817
73.35	5,687,818

CLASS 190

109	5,687,819

CLASS 192

43.2	5,687,820
52.4	5,687,821
84.81	5,687,822
84.961	5,687,823
85 CA	5,687,824
89.23	5,687,825
113.32	5,687,826
211	5,687,827
213.2	5,687,828

CLASS 194

317	5,687,829
318	5,687,830

CLASS 198

321	B1 5,176,239
341	Re.35,663
395	5,687,831
676	5,687,832
786	5,687,833

CLASS 200

5 R	5,689,095
38 R	5,689,096
336	5,687,834
400	5,687,835
569	5,687,836

CLASS 201

1	5,688,376

CLASS 202

205	5,688,377

CLASS 204

157.4	5,688,378
157.95	5,688,379
192.12	5,688,381
	5,688,382
192.2	5,688,380
192.24	5,688,383
229	5,688,384
237	5,688,385
263	5,688,387
298.22	5,688,388
298.25	5,688,389
426	5,688,390
478	5,688,391

CLASS 205

654	5,688,392
744	5,688,393

CLASS 206

5	5,687,837
147	5,687,838
204	5,687,839
216	5,687,840
217	5,687,841
233	5,688,394
308.1	5,687,842
315.3	5,687,843
372	5,687,844
423	5,687,845
	5,687,846
430	5,687,847
438	5,687,848
446	5,687,849

CLASS 208

130	5,688,395

CLASS 209

2	5,687,850
44.1	5,687,851
127.4	5,687,852
393	5,687,853

CLASS 210

130	5,688,396
136	5,688,397
167	5,688,398
178	5,688,399
195.3	5,688,400
199	5,688,401
355	5,688,402
727	5,688,403
734	5,688,404
748	5,688,405
	5,688,406

CLASS 211

59.2	5,687,854
65	5,687,855
70.6	5,687,856
89	5,687,857
121	5,687,858
189	5,687,859

CLASS 213

7	5,687,860

CLASS 215

11.3	5,687,861
40	5,687,862
216	5,687,863
253	5,687,865
256	5,687,866
303	5,687,867

CLASS 216

17	5,688,408
48	5,688,409
64	5,688,410
92	5,688,411

CLASS 218

157	5,689,097

CLASS 219

56	5,688,412
98	5,688,413
	5,688,414
121.41	5,688,415
121.48	5,688,416
121.52	5,688,417
121.71	5,688,418
137 R	5,688,419
145.23	5,688,420
230	5,688,421
491	5,688,422
501	5,688,423
531	5,688,424
633	5,688,426
732	5,688,427

CLASS 220

1.5	5,687,868
316	5,687,870
565	5,687,871
710	5,687,872
736	5,687,873
737	5,687,874

CLASS 221

45	5,687,875
259	5,687,876

CLASS 222

1	5,687,877
96	5,687,878
108	5,687,879
153.14	5,687,880
185.1	5,687,881
212	5,687,882
321.2	5,687,883
321.7	5,687,884
512	5,687,885
606	5,688,425
630	5,687,886

CLASS 223

85	5,687,887
94	5,687,888
111	5,687,889

CLASS 224

163	5,687,890
243	5,687,891
268	5,687,892
275	5,687,893
457	5,687,894
342	5,687,895
587	5,687,896

CLASS 227

8	5,687,897
	5,687,898
10	5,687,899

CLASS 228

2.1	Re.35,664
173.6	5,687,900
246	5,687,901

CLASS 229

75	5,687,903
92.8	B1 5,458,282
198.1	5,687,902
303	5,687,904

CLASS 235

101	5,689,098
105	5,689,099
380	5,689,100
383	5,689,101
462	5,689,103
467	5,689,102
472	5,689,104
475	5,689,105

CLASS 237

19	5,687,908

CLASS 239

4	5,687,905
265.35	5,687,907
276	5,687,909
	5,687,910
337	5,687,911
343	5,687,912
346	5,687,913
498	5,687,914
530	5,687,915

CLASS 241

1	5,687,916
21	5,687,917
23	5,687,918
60	5,687,919
65	5,687,920
86.1	5,687,921
259	5,687,922
260.1	5,687,923

CLASS 242

127	5,687,924
379.1	5,687,925
383.4	5,687,926
432.6	5,687,927
557	5,687,928

CLASS 244

116	5,687,930
118.1	5,687,929
151 B	5,687,931
163	5,687,932
169	5,687,933
208	5,687,934

CLASS 246

257	5,687,935

CLASS 248

48.2	5,687,936
51	5,687,937
74.1	5,687,938
122.1	5,687,939
188.2	5,687,940
210	5,687,941
223.41	5,687,942
331	5,687,943
349.1	5,687,944
442.2	5,687,945
530	5,687,946
612	5,687,947
635	5,687,948

CLASS 249

91	5,688,428

CLASS 250

226	5,689,106
231.1	5,689,107
239	5,689,108
251	5,689,109
252.1 A	5,689,110
287	5,689,111
309	5,689,112
343	5,689,114
363.07	5,689,115
363.09	5,689,116
492.23	5,689,117
505.1	5,689,118

CLASS 251

122	5,687,949
129.2	5,687,950
145	5,687,951
335.3	5,687,952

CLASS 252

8.61	5,688,429
62.62	5,688,430
67	5,688,431
	5,688,432
68	5,688,433
186.42	5,688,434
187.25	5,688,435
299.01	5,688,436
299.61	5,688,437
301.4 F	5,688,438
309	5,688,439
315.1	5,688,440
514	5,688,441
582	5,688,442

CLASS 254

133 R	5,687,953
134.3 FT	5,687,954
237	5,687,955

CLASS 256

31	5,687,956
34	5,687,957

CLASS 257

59	5,689,119
67	5,689,120
94	Re.35,665
139	5,689,121
184	5,689,122
190	5,689,123
192	5,689,124
200	5,689,125
306	5,689,126
329	5,689,127
331	5,689,128
341	5,689,129
342	5,689,130
357	5,689,132
361	5,689,133
659	5,689,134
676	5,689,135
679	5,689,136
	5,689,137
728	5,689,138
758	5,689,139
774	5,689,140

CLASS 259

8	5,687,906

CLASS 261

39.3	5,688,443
94	5,688,444
96	5,688,445
142	5,688,446

CLASS 264

1.33	5,688,447
54	5,688,448
	5,688,449
61	5,688,450
103	5,688,451
115	5,688,452
120	5,688,453
129	5,688,454
169	5,688,455
173.14	5,688,456
211	5,688,457
211.12	5,688,458
233	5,688,459
263	5,688,460
273	5,688,461
328.14	5,688,462
400	5,688,463
401	5,688,464
423	5,688,465
458	5,688,466
516	B1 4,985,196
	B1 5,244,624
517	5,688,467
555	5,688,468

CLASS 266

48	5,688,469
87	5,688,470

CLASS 267

136	5,687,958
140.12	5,687,959
273	5,687,960

CLASS 269

32	5,687,961
317	5,687,962

CLASS 271

119	5,687,963
195	5,687,964
241	5,687,965

CLASS 273

108.1	5,687,966
139	5,687,968
142 E	5,687,967
255	5,687,969
264	5,687,970
269	5,687,971

CLASS 277

38	5,687,972
67	5,687,973
102	5,687,974
167.5	5,687,975
207 A	5,687,976

CLASS 280

11.22	B1 5,437,466
18	5,687,977
30	5,687,978
47.19	5,687,979
204	5,687,980
405.1	5,687,981
607	5,687,982
609	5,687,983
641	5,687,984
650	5,687,985
728.2	5,687,986
	5,687,987
	5,687,988
	5,687,989
775	5,687,990
826	5,687,991

CLASS 283

117	5,687,992

CLASS 285

12	5,687,994
21	5,687,995
21.1	5,687,996
94	5,687,997
131	5,687,993
175	5,687,998
333	5,687,999

CLASS 290

52	5,689,141

CLASS 292

34	5,688,000
67	5,688,001
92	5,688,002
202	5,688,003
341.17	5,688,004
348	5,688,005

CLASS 293

120	5,688,006

CLASS 294

1.2	5,688,007
64.1	5,688,008
67.2	5,688,009
	5,688,010
74	5,688,011
82.32	5,688,012
99.1	5,688,013
115	5,688,014

CLASS 296

39.1	5,688,015
93	5,688,016

100	5,688,017
138	5,688,018
155	5,688,019
180.1	5,688,020
185	5,688,021
214	5,688,022

CLASS 297

188.2	5,688,023
217.1	5,688,024
238	5,688,025
341	5,688,026

CLASS 303

89	5,688,027
116.4	5,688,028
139	5,688,029

CLASS 307

10.5	5,689,142
109	5,689,143
130	5,689,144

CLASS 310

42	5,689,145
90	5,689,146
216	5,689,147
239	5,689,148

CLASS 312

223.2	5,688,030
257.1	5,688,031
	5,688,032
310	B1 5,452,951
348.4	5,688,033
408	5,688,034

CLASS 313

402	5,689,149
	5,689,150
495	5,689,151
532	5,689,152
586	5,689,153
635	5,689,154

CLASS 315

199	5,689,155
225	5,689,156
370	5,689,157
382.1	5,689,158

CLASS 318

254	5,689,159
281	5,689,160
563	5,689,161
599	5,689,162
603	5,689,163
701	5,689,164
	5,689,165
721	5,689,166
767	5,689,167
772	5,689,168
807	5,689,169
811	5,689,170

CLASS 320

2	5,689,171
15	5,689,172
35	5,689,173

CLASS 322

16	5,689,174
28	5,689,175

CLASS 323

222	5,689,176
241	5,689,177
282	5,689,178
283	5,689,179
359	5,689,180

CLASS 324

177	5,689,181
207.15	5,689,182
233	5,689,183
243	5,689,184
252	5,689,185
309	5,689,186
318	5,689,187
	5,689,188
	5,689,189
319	5,689,190
538	5,689,191
627	5,689,192
754	5,689,193
772	5,689,194

CLASS 326

41	5,689,195
86	5,689,196
110	5,689,197
121	5,689,198
325	5,689,204

CLASS 327

76	5,689,199
78	5,689,200
95	5,689,201
142	5,689,202
187	5,689,203
335	5,689,205
337	5,689,206
355	5,689,207
390	5,689,208
425	5,689,209

CLASS 330

54	5,689,210
266	5,689,211
286	5,689,212

CLASS 331

57	5,689,213
158	5,689,214

CLASS 333

17.3	5,689,215
33	5,689,216
116	5,689,217
125	5,689,218
127	5,689,219
189	5,689,220
202	5,689,221

CLASS 335

78	5,689,222
216	5,689,223
219	5,689,224
228	5,689,225

CLASS 338

308	5,689,227

CLASS 340

146.2	5,689,228
286.07	5,689,229
310.01	5,689,230
453	5,689,231
468	5,689,232
506	5,689,233
521	5,689,234
541	5,689,235
545	5,689,236
568	5,689,237
	5,689,238
572	5,689,239
573	5,689,240
575	5,689,241
652	5,689,242
825.07	5,689,244
825.19	5,689,246
825.3	5,689,243
825.31	5,689,247
825.49	5,689,245
853.1	5,689,248
901	5,689,249
904	5,689,250
978	5,689,251
991	5,689,252

CLASS 341

22	5,689,253
59	5,689,254
63	5,689,255
79	5,689,256
133	5,689,257
136	5,689,258
144	5,689,259
156	5,689,260
173	5,689,261

CLASS 342

5	5,689,262
51	5,689,263
70	5,689,264
124	5,689,265
165	5,689,266
174	5,689,267
196	5,689,268
357	5,689,269
	5,689,270
	5,689,271
373	5,689,272
407	5,689,273
417	5,689,274

CLASS 343

786	5,689,275
872	5,689,276
903	5,689,277

CLASS 345

74	5,689,278
82	5,689,279
89	5,689,280
94	5,689,281
100	5,689,282
132	5,689,283
145	5,689,284
161	5,689,285
348	5,689,286
427	5,689,287

CLASS 347

7	5,689,288
	5,689,289
	5,689,290
10	5,689,291
17	5,689,292
33	5,689,293
40	5,689,294
43	5,689,295
50	5,689,296
188	5,689,297

CLASS 348

7	5,689,298
	5,689,299
15	5,689,300
97	5,689,301
218	5,689,302
232	5,689,303
373	5,689,304
416	5,689,305
	5,689,306
419	5,689,307
529	5,689,308
584	5,689,309
595	5,689,310
674	5,689,311
699	5,689,312
715	5,689,313

CLASS 349

1	5,689,314
5	5,689,315
74	5,689,316
97	5,689,317
106	5,689,318
110	5,689,319
135	5,689,320
143	5,689,321
180	5,689,322

CLASS 351

41	5,689,323
169	5,689,324
208	5,689,325

CLASS 355

39	5,689,326

CLASS 356

4.01	5,689,327
	5,689,328
72	5,689,329
138	5,689,330
153	5,689,331
237	5,689,332
301	5,689,333
326	5,689,334
349	5,689,335
356	5,689,336
359	5,689,337
401	5,689,339
	5,689,340
418	5,689,341

CLASS 358

296	5,689,342
298	5,689,343
	5,689,344
299	5,689,345
426	5,689,346
444	5,689,347
475	5,689,348
500	5,689,349
504	5,689,350

CLASS 359

10	5,689,351
88	5,689,352
148	5,689,353
172	5,689,354
179	5,689,355
181	5,689,356
245	5,689,357
248	5,689,358
281	5,689,359
	5,689,360
284	5,689,361
305	5,689,362
334	5,689,363
350	5,689,364
362	5,689,365
392	5,689,366
495	5,689,367
497	5,689,368
557	5,689,369
603	5,689,370
609	5,689,371
623	5,689,372
646	5,689,373
652	5,689,374
699	5,689,375
717	5,689,376
727	5,689,377
813	5,689,378
829	5,689,379
846	5,689,380

CLASS 360

70	5,689,382
73.11	5,689,383
77.12	5,689,384
96.1	5,689,385
97.02	5,689,386
99.06	5,689,387
99.12	5,689,388
104	5,689,389
109	5,689,390
114	5,689,391
132	5,689,392
133	5,689,393

CLASS 361

56	5,689,394
93	5,689,395
111	5,689,396
115	5,689,397
189	5,689,398
191	5,689,399
683	5,689,400
685	5,689,401
686	5,689,402
695	5,689,403
697	5,689,404
737	5,689,405
796	5,689,406

CLASS 362

31	5,688,035
80	5,688,036
98	5,688,037
103	5,688,038
106	5,688,039
163	5,688,040
226	5,688,041
240	5,688,042
297	5,688,043
309	5,688,044

CLASS 363

21	5,689,407
50	5,689,408
56	5,689,409
	5,689,410
74	5,689,411
125	5,689,412
146	5,689,413

CLASS 364

136	5,689,414
172	5,689,415
185	5,689,416
401 R	5,689,417
420	5,689,418
424.055	5,689,421
424.06	5,689,419
	5,689,420
426.041	5,689,422
444.2	5,689,423
449.7	5,689,431
464.21	5,689,424
469.03	5,689,425
473.01	5,689,426
473.03	B1 5,062,052
474.04	5,689,427
480	5,689,428
481	5,689,429
483	5,689,430
490	5,689,432
	5,689,433
510	5,689,434
512	5,689,435
514 A	5,689,436
	5,689,437
514 R	5,689,438
	5,689,439
	5,689,440
525	5,689,441
550	5,689,442
551.01	5,689,443
554	5,689,444
559	5,689,445
560	5,689,446
571.03	5,689,447
718.01	B1 4,219,880
724.1	5,689,449
736	5,689,450
738	5,689,451
746.1	5,689,452

CLASS 365

45	5,689,453
49	5,689,454
96	5,689,455
145	5,689,456
149	5,689,457
159	5,689,458
185.28	5,689,459
189.05	5,689,462
189.07	5,689,460
189.11	5,689,461
200	5,689,463
	5,689,464
	5,689,465
201	5,689,466
	5,689,467
203	5,689,468
	5,689,469
	5,689,470
210	5,689,471
230.02	5,689,472
233	5,689,473

CLASS 366

129	5,688,045
152.2	5,688,046
337	5,688,047
343	5,688,048

CLASS 367

1	5,689,474
88	5,689,475

CLASS 368

10	5,689,476

CLASS 369

4	5,689,477
13	5,689,478
	5,689,479
14	5,689,480
30	5,689,481
32	5,689,482
	5,689,483
33	5,689,484
44.13	5,689,485
54	5,689,487
59	5,689,486
	5,689,488
75.2	5,689,489
77.2	5,689,490
109	5,689,491
112	5,689,492
124	5,689,493
126	5,689,494
275.1	5,689,497
275.4	5,689,495
	5,689,496

CLASS 370

216	5,689,498
235	5,689,499
	5,689,500
244	5,689,501
281	5,689,502
337	5,689,503
350	5,689,504
388	5,689,505
	5,689,506
389	5,689,507
391	5,689,508
395	5,689,512
396	5,689,309
445	5,689,510
545	5,689,511

CLASS 371

20.1	5,689,513
21.2	5,689,514
22.1	5,689,515
22.2	5,689,516
22.3	5,689,517
37.1	5,689,518

CLASS 372

18	5,689,519
38	5,689,520
50	5,689,521
75	5,689,522
82	5,689,523

CLASS 374

44	5,688,049
122	5,688,050
129	5,688,051

CLASS 375

200	5,689,524
206	5,689,525
	5,689,526
222	5,689,527
233	5,689,528
259	5,689,529
286	5,689,530
316	5,689,531
341	5,689,532
360	5,689,533
364	5,689,534
	5,689,535
376	5,689,536

CLASS 376

260	5,689,537
280	5,689,538

CLASS 377

20	5,689,539

CLASS 378

53	5,689,540
140	5,689,541
142	5,689,542
144	5,689,543
150	5,689,544
206	5,689,545

CLASS 379

34	5,689,546
58	5,689,547
59	5,689,548
61	5,689,549
89	5,689,550
142	5,689,551
145	5,689,552
202	5,689,553
219	5,689,554
220	5,689,555
355	5,689,557
410	5,689,556
430	5,689,558

CLASS 380

3	5,689,559
4	5,689,560
	5,689,561
9	5,689,562
23	5,689,563
25	5,689,564
	5,689,565
	5,689,566
	5,689,567
49	5,689,568
	5,689,569

CLASS 381

18	5,689,570
63	5,689,571
71.3	5,689,572
154	5,689,573
158	5,689,574

CLASS 382

118	5,689,575
124	5,689,576
128	5,689,577
137	5,689,579
143	5,689,580
156	5,689,581
176	5,689,582
181	5,689,583
190	5,689,584
229	5,689,585
232	5,689,586
	5,689,587
237	5,689,588
239	5,689,589
254	5,689,590
276	5,689,591
304	5,689,592

CLASS 383

38	5,688,052

CLASS 384

100	5,688,053
295	5,688,054
449	5,688,055

CLASS 385

11	5,689,593
24	5,689,594
27	5,689,595
	5,689,596
39	5,689,597
59	5,689,598
83	5,689,599
88	5,689,600
100	5,689,601
119	5,689,602
123	5,689,578
131	5,689,603
134	5,689,604
135	5,689,605
	5,689,606
136	5,689,607
139	5,689,608

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147	5,689,609

CLASS 386

46	5,689,610
	5,689,611
109	5,689,612

CLASS 392

407	5,689,613
416	5,689,614

CLASS 395

2.28	5,689,615
2.41	5,689,616
2.64	5,689,617
2.85	5,689,618
10	5,689,619
20	5,689,620
23	5,689,622
24	5,689,621
106	5,689,623
112	5,689,624
114	5,689,625
117	5,689,626
123	5,689,627
127	5,689,628
	5,689,629
182.06	5,689,630
182.09	5,689,631
	5,689,632
182.14	5,689,633
183.15	5,689,634
183.18	5,689,635
183.21	5,689,636
183.22	5,689,637
188.01	5,689,638
200.01	5,689,639
	5,689,640
200.02	5,689,641
200.04	5,689,642
200.05	5,689,643
200.06	5,689,644
200.1	5,689,645
200.15	5,689,646
	5,689,647
226	5,689,648
236	5,689,649
	5,689,650
237	5,689,651
	5,689,652
250	5,689,653
281	5,689,654
283	5,689,655
296	5,689,656
299	5,689,657
304	5,689,658
307	5,689,659
309	5,689,660
311	5,689,661
326	5,689,662
327	5,689,663
329	5,689,672
340	5,689,664
342	5,689,665
345	5,689,666
352	5,689,667
353	5,689,668
355	5,689,669
383	5,689,670
385	5,689,671
391	5,689,673
393	5,689,674
405	5,689,675
430	5,689,676
433	5,689,677
441	5,689,678
449	5,689,679
454	5,689,680
481	5,689,681
500	5,689,682
	5,689,683
	5,689,684
	5,689,685
	5,689,686
514	5,689,687
553	5,689,688
	5,689,689
555	5,689,690
557	5,689,691
558	5,689,692
565	5,689,693
581	5,689,694
	5,689,695
601	5,689,696
603	5,689,697
604	5,689,698
609	5,689,699
610	5,689,700
	5,689,701
611	5,689,702
614	5,689,703
615	5,689,704
617	5,689,705
	5,689,706
622	5,689,707
682	5,689,708
683	5,689,709
701	5,689,710
	5,689,711
704	5,689,712
736	5,689,713
750	5,689,714
	5,689,715
761	5,689,716
773	5,689,717
779	5,689,718
800	5,689,720
	5,689,721
	5,689,722
805	5,689,723
	5,689,724
825	5,689,725
830	5,689,726
840	5,689,727
858	5,689,728
872	5,689,729
876	5,689,730
882	5,689,731
884	5,689,732

CLASS 396

6	5,689,733
28	5,689,734
29	5,689,735
51	5,689,736
52	5,689,737
79	5,689,738
83	5,689,739
101	5,689,740
130	5,689,741
313	5,689,742
316	5,689,743
411	5,689,744
429	5,689,745
508	5,689,746
578	5,689,747
	5,689,748
611	5,689,749
614	5,689,750
626	5,689,751
	5,689,752
	5,689,753

CLASS 399

1	5,689,754
8	5,689,755
33	5,689,756
45	5,689,757
	5,689,758
	5,689,759
	5,689,760
	5,689,761
51	5,689,762
53	5,689,763
75	5,689,764
81	5,689,765
92	5,689,766
94	5,689,767
96	5,689,768
98	5,689,769
100	5,689,770
101	5,689,771
106	5,689,772
	5,689,773
111	5,689,774
121	5,689,775
174	5,689,776
	5,689,777
	5,689,778
237	5,689,779
249	5,689,780
252	5,689,781
281	5,689,782
284	5,689,783
285	5,689,784
302	5,689,785
307	5,689,786
308	5,689,787
328	5,689,788
331	5,689,789
343	5,689,790
353	5,689,791
365	5,689,792
374	5,689,793
388	5,689,794
407	5,689,795

CLASS 400

61	5,688,056
82	5,688,057
	5,688,058
578	5,688,059
701	5,688,060

CLASS 401

4	5,688,061
18	5,688,062
195	5,688,063

CLASS 403

24	5,688,064
51	5,688,065
297	5,688,066
305	5,688,067
325	5,688,068
340	5,688,069
356	5,688,070

CLASS 404

6	5,688,071

CLASS 405

43	5,688,072
45	5,688,073
63	5,688,074
	5,688,075
128	5,688,076
259.5	5,688,077
272	B1 4,293,245
286	5,688,078
	5,688,079

CLASS 407

101	5,688,080
115	5,688,081

CLASS 408

67	5,688,082
224	5,688,083

CLASS 409

202	5,688,084
259	5,688,085

CLASS 410

68	5,688,086
150	5,688,087

CLASS 411

3	5,688,088
43	5,688,089
55	5,688,090
149	5,688,091
533	5,688,092
552	5,688,093

CLASS 413

67	5,688,094

CLASS 414

12	5,688,095
152	5,688,096
272	5,688,097
277	5,688,098
537	5,688,099
547	5,688,100
713	5,688,101
724	5,688,102
752	5,688,103

CLASS 415

90	5,688,106
115	5,688,104
170.1	5,688,105

CLASS 416

97 R	5,688,107
213 R	5,688,108

CLASS 417

228	5,688,109
254	5,688,110
298	5,688,111
477.1	5,688,112
549	5,688,113

CLASS 418

48	5,688,114

CLASS 419

32	5,689,796
38	5,689,797

CLASS 420

94	5,688,471

CLASS 422

143	5,688,472
144	5,688,473
170	5,688,474
186.3	5,688,475
	5,689,798
294	5,688,476

CLASS 423

82	5,688,477
228	5,688,478
240 S	5,688,479
263	5,688,480
279	5,688,481
335	5,688,482
445 R	5,688,483
700	5,688,484

CLASS 424

1.65	5,688,486
	5,688,487
1.69	5,688,488
	5,688,489
9.52	5,688,490
49	5,688,491
	5,688,492
61	5,688,493
	5,688,494
65	5,688,495
70.122	5,688,496
73	5,688,497
78.02	5,688,498
78.35	5,688,499
93.1	5,688,500
93.6	5,688,501
94.3	5,688,502
94.64	5,688,503
141.1	5,688,504
145.1	5,688,505
165	5,688,485
184.1	5,688,506
	5,688,507
195.1	5,688,508
	5,688,509
	5,688,510
207.1	5,688,511
234.1	5,688,512
271.1	5,688,513
401	5,688,514
408	5,688,515
409	5,688,516
422	5,688,517
	5,688,518
426	5,688,519
434	5,688,520
439	5,688,521
445	5,688,522
448	5,688,523
449	5,688,524
450	5,688,525
	5,688,526
	5,688,527
	5,688,528
489	5,688,529
501	5,688,530
574	5,688,531
641	5,688,532

CLASS 425

123	5,688,533
145	5,688,534
	5,688,535
174.4	5,688,536
186	5,688,537
299	5,688,538
363	5,688,539
382 R	5,688,540
556	5,688,541

CLASS 426

36	5,688,542
93	5,688,543
118	5,688,544
120	5,688,545
534	5,688,546
573	5,688,547
577	5,688,548
646	5,688,549

CLASS 427

8	5,688,550
64	5,688,551
140	5,688,552
163.2	5,688,553
215	5,688,554
240	5,688,555
248.1	5,688,556
249	5,688,557
288	5,688,558
341	5,688,560
376.2	5,688,561
434.3	5,688,562
472	5,688,563
554	5,688,564
565	5,688,565

CLASS 428

1	5,688,566
11	5,688,567
18	5,688,568
31	5,688,569
35.7	5,688,570
36.1	5,688,571
36.91	5,688,572
40.1	5,688,573
64.1	5,688,574
76	5,688,575
100	5,688,576
113	5,688,577
136	5,688,578
137	B2 5,114,777
192	5,688,579
193	5,688,580
195	5,688,581
198	5,688,582
200	5,688,583
209	5,688,584
216	5,688,585
221	5,688,586
292	5,688,587
305.5	5,688,588
317.3	5,688,589
320.2	5,688,590
323	5,688,591
	5,688,592
332	B1 5,487,938
370	5,688,594
375	5,688,595
379	5,688,596
	5,688,597
409	5,688,599
421	5,688,600
457	5,688,601
458	5,688,598
481	5,688,602
532	5,688,603
542.2	5,688,604
611	5,688,605
615	5,688,606
639	5,688,607
696	5,688,608

CLASS 429

15	5,688,609
30	5,688,610
53	5,688,611
89	5,688,612
192	5,688,613
	5,688,614
210	5,688,615
223	5,688,616

CLASS 430

5	5,688,617
22	5,688,618
58	5,688,619
59	5,688,620
64	5,688,621
102	5,688,622
106.6	5,688,623
115	5,688,624
137	5,688,625
	5,688,626
157	5,688,627
176	5,688,628
254	5,688,629
264	5,688,630
270.1	5,688,631
281.1	5,688,632
284.1	5,688,633
296	5,688,634
464	5,688,635
517	5,688,636

CLASS 431

9	5,688,115

CLASS 432

12	5,688,116
103	5,688,117

CLASS 433

27	5,688,118
72	5,688,120
96	5,688,121
127	5,688,122
173	5,688,123

CLASS 434

11	5,688,124
72	5,688,125
128	5,688,126
226	5,688,136
247	5,688,137

CLASS 435

6	5,688,637
	5,688,639
	5,688,640
	5,688,641
	5,688,642
	5,688,643
	5,688,644
	5,688,645
	5,688,646
	5,688,647
	5,688,648
	5,688,649
	B1 5,364,759
7.1	5,688,651
	5,688,652
	5,688,653
7.21	5,688,654
	5,688,655
	5,688,656
7.23	5,688,657
	5,688,658
7.34	5,688,659
29	5,688,660
69.1	5,688,662
	5,688,663
69.2	5,688,664
	5,688,665
69.4	5,688,666
69.5	5,688,667
74	5,688,668
91.2	5,688,669
91.21	5,688,670
106	5,688,672
115	5,688,671
147	5,688,673
162	5,688,674
172.3	5,688,675
	5,688,676
240.1	5,688,677
240.2	5,688,678
	5,688,679
240.27	5,688,681
252.1	5,688,682
252.3	5,688,683
252.33	5,688,684
262	5,688,685
290.2	5,688,686
293.2	5,688,687
320.1	5,688,688
	5,688,689
334	5,688,690
354	5,688,692

CLASS 436

43	5,688,693
64	5,688,694
164	5,688,695
518	5,688,696
	5,688,697

CLASS 437

3	5,688,698
	5,688,699
29	5,688,700
	5,688,701
33	5,688,702
41	5,688,703
	5,688,704
43	5,688,705
45	5,688,706
48	5,688,661
51	5,688,707
	5,688,708
52	5,688,709
57	5,688,710
60	5,688,711
	5,688,712
	5,688,713
160	5,688,714
173	5,688,715
182	5,688,716
190	5,688,717
	5,688,718
194	5,688,719
195	5,688,720
203	5,688,721
228	5,688,723
235	5,688,724

CLASS 438

217	5,688,722
270	5,688,725
397	5,688,726

CLASS 439

66	5,688,127
73	5,688,128
79	5,688,129
	5,688,130
92	5,688,131
120	5,688,132
135	5,688,133
136	5,688,134
214	5,688,135
239	5,688,139
280	5,688,138
342	5,688,140
352	5,688,141
487	5,688,142
495	5,688,143
596	5,688,144
607	5,688,145
637	5,688,146
681	5,688,147
701	5,688,148
733.1	5,688,149

876	5,688,150

CLASS 440

11	5,688,151
83	5,688,152

CLASS 441

132	5,688,153

CLASS 442

59	5,688,154
179	5,688,155
180	5,688,156
340	5,688,157

CLASS 445

50	5,688,158

CLASS 451

1	5,688,159
5	5,688,160
45	5,688,161
92	5,688,162
342	5,688,163

CLASS 452

117	B1 5,269,721
122	5,688,164

CLASS 453

9	5,688,165
57	5,688,166

CLASS 454

56	5,688,168
153	5,688,167
184	5,688,169

CLASS 455

2	5,689,799
5.1	5,689,800
9	5,689,801
11.1	5,689,802
12.1	5,689,803
14	5,689,804
33.1	5,689,805
38.1	5,689,806
	5,689,807
51.2	5,689,808
54.1	5,689,809
54.2	5,689,810
	5,689,811
67.6	5,689,812
67.7	5,689,813
69	5,689,814
	5,689,815
74	5,689,816
79	5,689,817
83	5,689,818
86	5,689,819
	5,689,820
89	5,689,821
	5,689,822
	5,689,824
	5,689,825
	5,689,826
348	5,688,691

CLASS 459

89	5,689,823

CLASS 460

69	5,688,170

CLASS 463

20	5,688,172
29	5,688,173
37	5,688,174
61	5,688,175

CLASS 464

48	5,688,176
68	5,688,177

CLASS 472

31	5,688,178
59	5,688,179
116	5,688,180

CLASS 473

61	5,688,181
185	5,688,182
212	5,688,183
229	5,688,184
290	5,688,186
305	5,688,187
309	5,688,188
314	5,688,189
330	5,688,190
373	5,688,191
374	5,688,192
379	5,688,193
383	5,688,194
429	5,688,195
439	5,688,196
598	5,688,198

CLASS 474

49.1	5,688,199
80	5,688,200

CLASS 475

183	5,688,201
199	5,688,202
331	5,688,203

CLASS 477

46	5,688,204
110	5,688,205
155	5,688,207

CLASS 482

44	5,688,208
54	5,688,209
56	5,688,210
66	5,688,211
83	5,688,212
125	5,688,213
135	5,688,216

CLASS 483

1	5,688,214
66	5,688,215

CLASS 492

39	5,688,217

CLASS 493

151	5,688,218
357	5,688,219
446	5,688,197

CLASS 501

71	5,688,727
80	5,688,728
89	5,688,729
96	5,688,730
	5,688,731
138	5,688,732

CLASS 502

103	5,688,733
108	5,688,734
117	5,688,735
219	5,688,736
308	5,688,739
326	5,688,740
344	5,688,741

CLASS 503

227	5,688,737
	5,688,738

CLASS 504

116	5,688,742
	5,688,743
156	5,688,744
231	5,688,745

CLASS 508

101	5,688,746
208	5,688,747
363	5,688,748
486	5,688,749
497	5,688,750
518	5,688,751

CLASS 510

159	5,688,752
175	5,688,753
218	5,688,754
226	B1 5,478,356
254	5,688,755
369	5,688,756
376	5,688,757
516	5,688,758
526	5,688,759

CLASS 514

2	5,688,760
	5,688,761
	5,688,762
12	5,688,763
	5,688,764
	5,688,765
	5,688,766
	5,688,767
15	5,688,768
	5,688,769
16	5,688,770
19	5,688,771
25	5,688,772
44	5,688,773
46	5,688,774
54	5,688,775
	5,688,776
	5,688,777
81	5,688,778
169	5,688,780
179	5,688,781
180	5,688,782
183	5,688,783
186	5,688,784
210	5,688,785
	5,688,786
	5,688,787
211	5,688,788
214	5,688,789
	5,688,790
224.5	5,688,791
235.5	5,688,792
248	5,688,793
250	5,688,794
252	5,688,795
253	5,688,796
255	5,688,797
256	5,688,798
258	5,688,799
	5,688,800
	5,688,801
263	5,688,802
267	5,688,803
272	5,688,804
277	5,688,805
278	5,688,806
285	5,688,807
	5,688,808
303	5,688,809
311	5,688,810
321	5,688,811
324	5,688,812
	5,688,813
329	5,688,814
333	5,688,816
346	5,688,817
348	5,688,815
357	5,688,819
367	5,688,818
	5,688,820
371	5,688,821
375	5,688,822
376	5,688,823
378	5,688,824
423	5,688,825
443	5,688,826
565	5,688,828
605	5,688,829
651	5,688,830
938	5,688,831

CLASS 521

79	5,688,832
98	5,688,833
118	5,688,834
131	5,688,835
145	5,688,836
155	5,688,837

CLASS 522

33	5,688,838

CLASS 523

171	5,688,839
209	5,688,840
216	5,688,841
	5,688,843
335	5,688,842

CLASS 524

8	5,688,844
48	5,688,845
99	5,688,846
118	5,688,847
141	5,688,848
262	5,688,849
317	5,688,850
430	5,688,851
431	5,688,852
501	5,688,853
505	5,688,855
	5,688,856
555	5,688,858
590	5,688,857
591	5,688,859
710	5,688,860
762	5,688,861
780	5,688,862
839	5,688,863
858	5,688,864

CLASS 525

53	5,688,865
127	5,688,866
168	5,688,867
183	5,688,868
196	5,688,869
244	5,688,870
346	5,688,871
350	5,688,872
410	5,688,873
444	5,688,874
452	5,688,875
504	5,688,876
526	5,688,877
533	5,688,878

CLASS 526

89	5,688,879
127	5,688,880
	5,688,881
141	5,688,883
225	5,688,884
247	5,688,885
273	5,688,886
348.7	5,688,887

CLASS 528

22	5,688,888
40	5,688,889
51	5,688,890
73	5,688,891
76	5,688,892
146	5,688,893
176	5,688,894
183	5,688,895
196	5,688,896
242	5,688,897
272	5,688,898
279	5,688,899
301	5,688,900
310	5,688,901
313	5,688,902
328	5,688,903
	5,688,904
332	5,688,905
353	5,688,906
363	5,688,907
388	5,688,908
392	5,688,909
483	5,688,910

CLASS 530

324	5,688,911
329	5,688,912
330	5,688,913
350	5,688,914
	5,688,916
	5,688,917
380	5,688,915
387.7	5,688,918
388.23	5,688,927
388.25	5,688,919
391.1	5,688,928
395	5,688,920
405	5,688,921

CLASS 536

1.11	5,688,922
2	5,688,923
4.1	5,688,929
7.1	5,688,924
18.6	5,688,926
	5,688,930
20	5,688,931
22.1	5,688,933
23.1	5,688,935
23.5	5,688,936
	5,688,938
23.6	5,688,939
25.3	5,688,940
	5,688,941
186	5,688,925

CLASS 540

214	5,688,942
509	5,688,943
529	5,688,944

CLASS 544

235	5,688,945
242	5,688,946
264	5,688,947
276	5,688,948
281	5,688,949
354	5,688,950

CLASS 546

184	5,688,951
196	5,688,952
202	5,688,960
243	5,688,953
268	5,688,954
276.4	5,688,955
280.1	5,688,956
	5,688,957

CLASS 548

113	5,688,958
195	5,688,959
225	5,688,962
263.2	5,688,963
371.7	5,688,964
452	5,688,965
455	5,688,966
955	5,688,961

CLASS 549

23	5,688,968
71	5,688,969
262	5,688,970
361	5,688,971
369	5,688,972
430	5,688,973
441	5,688,974
458	5,688,976
510	5,688,977
531	5,688,975

CLASS 554

69	5,688,978
98	5,688,982

CLASS 556

56	5,688,979
81	5,688,980
116	5,688,981

CLASS 558

136	5,688,983
277	5,688,984
311	5,688,985
338	5,688,986
393	5,688,987

CLASS 560

25	5,688,988
26	5,688,989
39	5,688,990
55	5,688,991
82	5,688,992
245	5,688,993

CLASS 562

17	5,688,994
30	5,688,995
106	5,688,996
435	5,688,997
466	5,688,998
475	5,688,999
539	5,689,000
554	5,689,001

CLASS 564

153	5,689,002
278	5,689,003
328	5,689,004
399	5,689,006
402	5,689,007
420	5,689,005
479	5,688,854

CLASS 568

403	5,689,008
432	5,689,009
451	5,689,010
486	5,689,011
619	5,689,012
697	5,689,013
	5,689,014
	5,689,015
862	5,689,016
874	5,689,017
934	5,689,018

CLASS 570

167	5,689,019
216	5,689,020

CLASS 585

276	5,689,021
351	5,689,022
444	5,689,023
467	5,689,024
	5,689,025
475	5,689,026
481	5,689,027
512	5,689,028
659	5,689,029
724	5,689,030
734	5,689,031
802	5,689,032
833	5,689,033

CLASS 588

200	5,689,038

CLASS 600

1	5,688,220
121	5,688,221
156	5,688,222
200	5,688,224
215	5,688,223

CLASS 601

11	5,688,225
92	5,688,228

CLASS 602

18	5,688,229

CLASS 604

1	5,688,230
20	5,688,231
	5,688,232
	5,688,233
22	5,688,234
	5,688,235
23	5,688,236
53	5,688,237
77	5,688,238
96	5,688,239
110	5,688,240
	5,688,241
115	5,688,243
118	5,688,244
151	5,688,245
165	5,688,246
175	5,688,247
179	5,688,248
198	5,688,249
200	5,688,250
208	5,688,251
218	5,688,252
263	5,688,253
283	5,688,254
317	5,688,255
355	5,688,256
363	5,688,257
385.1	5,688,258
	5,688,259
904	5,688,260

CLASS 606

13	5,688,263
15	5,688,264
17	5,688,261
18	5,688,262
30	5,688,265
31	5,688,266
41	5,688,267
45	5,688,268
46	5,688,269
51	5,688,270
54	5,688,271
61	5,688,272
	5,688,273
	5,688,274
	5,688,275
73	5,688,276
88	5,688,279
	5,688,280
	5,688,281
90	5,688,282
96	5,688,283
	5,688,284
104	5,688,285
169	B1 4,406,284
185	5,688,286

CLASS 800

200	5,689,034
	5,689,035
	5,689,036
	5,689,037
205	5,689,039
	5,689,040
	5,689,041
	5,689,042
	5,689,043
	5,689,044
	5,689,045
	5,689,046
	5,689,047
	5,689,048
	5,689,049
	5,689,050
	5,689,051
	5,689,052
	5,689,053
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	5,689,056
235	5,689,054

VOL
1204
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NO
18
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UMI

CLASSIFICATION OF DESIGNS

D1—	127	386,285
D2—	712	386,286
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	953	386,288
	961	386,289
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	969	386,291
	970	386,292
		386,293
		386,294
	972	386,295
		386,296
	980	386,297
D3—	218	386,298
	229	386,299
	233	386,300
	247	386,301
		386,302
	255	386,303
	262	386,304
	271	386,305
	273	386,306
	294	386,307
		386,308
	318	386,309
	327	386,310
D4—	104	386,311
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		386,313
		386,314
	106	386,315
	138	386,316
D6—	300	386,317
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		386,320
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	370	386,322
	417	386,323
	420	386,324
	436	386,325
	451	386,326
	470	386,327
	480	386,328
	486	386,329
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	498	386,332
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	504	386,334
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		386,340
	525	386,341
	531	386,342
	532	386,343
	544	386,344
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	601	386,348
	610	386,349
D7—	312	386,350
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	360	386,354
	378	386,355
	413	386,357
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	605	386,360
	642	386,361
	693	386,362
	704	386,363
D8—	1	386,364
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		386,366
		386,367
		386,368
	5	386,369
	8	386,370
	14	386,371
		386,372
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	107	386,382
	313	386,383
	330	386,384
	331	386,385
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	354	386,388
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		386,392
	382	386,393
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		386,396
	396	386,397
D9—	305	386,398
	308	386,399
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	332	386,401
	337	386,402
	338	386,403
	339	386,404
	415	386,405
	433	386,406
	434	386,407
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	445	386,410
	457	386,411
	500	386,412
	503	386,413
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		386,415
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	523	386,417
	538	386,418
D10—	1	386,419
	30	386,420
		386,421
		386,422
		386,423
		386,424
		386,425
	31	386,426
	32	386,427
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	102	386,432
	107	386,433
	113	386,434
	128	386,435
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		386,437
D11—	34	386,438
	41	386,439
	43	386,440
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	87	386,442
	91	386,443
	92	386,444
	121	386,445
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	141	386,447
	157	386,448
D12—	11	386,449
	15	386,450
	110	386,469
	111	386,451
	141	386,452
	146	386,453
	147	386,454
		386,456
		386,470
		386,471
	152	386,455
	173	386,457
	187	386,472
	190	386,458
		386,459
	196	386,460
	209	386,461
	217	386,462
	218	386,463
	220	386,464
	317	386,465
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OFFICIAL GAZETTE
of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 25, 1997

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1200 O.G. 98, on July 29, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was decreased, effective October 1, 1997, and was announced in the *Official Gazette* at 1202 O.G. 47, on September 16, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1997, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1180.00
International fees	
Basic fee	530.00
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Designation fee per country or region	
— For the first 11 national or regional offices designated	128.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	128.00
— Confirmation fee	64.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

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— All claims presented satisfied provisions of PCT Article 33(2) to (4)	49.00	98.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	360.00	720.00
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— For each application containing a multiple dependent claim	135.00	270.00
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Sept. 9, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 22, 1994 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,365,607 through 5,367,705
Reissue Patents based on the above identified patents.

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Attention is drawn to the patents which were issued on Nov. 20, 1990 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,970,728 through 4,972,519
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on Nov. 18, 1986 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,622,696 through 4,624,014
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f))	$525.00
By other than a small entity	$1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f))	$1,050.00
By other than a small entity	$2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f))	$1,580.00
By other than a small entity	$3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f))	$65.00
By other than a small entity	$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable	$700.00
(2) unintentional	$1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED Sept. 17, 1997 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,541,129	06/557,896	09/17/85
4,541,144	06/618,023	09/17/85
4,541,153	06/577,585	09/17/85
4,541,154	06/549,214	09/17/85
4,541,162	06/509,329	09/17/85
4,541,164	06/493,786	09/17/85
4,541,166	06/502,629	09/17/85
4,541,168	06/665,829	09/17/85
4,541,182	06/559,876	09/17/85
4,541,188	06/463,978	09/17/85
4,541,201	06/525,501	09/17/85
4,541,206	06/542,793	09/17/85
4,541,227	06/520,394	09/17/85
4,541,231	06/526,751	09/17/85
4,541,233	06/609,774	09/17/85
4,541,234	06/612,434	09/17/85
4,541,235	06/612,445	09/17/85
4,541,238	06/482,406	09/17/85
4,541,239	06/614,061	09/17/85
4,541,243	06/514,167	09/17/85
4,541,244	06/551,709	09/17/85
4,541,248	06/561,891	09/17/85
4,541,255	06/580,327	09/17/85
4,541,259	06/289,452	09/17/85
4,541,262	06/515,575	09/17/85
4,541,266	06/580,549	09/17/85
4,541,270	06/585,321	09/17/85
4,541,273	06/548,166	09/17/85
4,541,276	06/519,597	09/17/85
4,541,279	06/551,613	09/17/85
4,541,290	06/594,379	09/17/85
4,541,291	06/520,878	09/17/85
4,541,293	06/391,436	09/17/85
4,541,297	06/498,503	09/17/85
4,541,299	06/586,821	09/17/85
4,541,308	06/453,301	09/17/85
4,541,309	06/570,657	09/17/85
4,541,311	06/354,381	09/17/85
4,541,317	06/541,298	09/17/85
4,541,319	06/574,675	09/17/85
4,541,326	06/626,122	09/17/85
4,541,333	06/679,863	09/17/85
4,541,335	06/675,975	09/17/85
4,541,338	06/541,999	09/17/85
4,541,344	06/422,882	09/17/85
4,541,345	06/591,446	09/17/85
4,541,350	06/667,946	09/17/85
4,541,351	06/612,027	09/17/85
4,541,352	06/502,310	09/17/85
4,541,358	06/555,715	09/17/85
4,541,363	06/612,260	09/17/85
4,541,372	06/565,323	09/17/85
4,541,373	06/668,123	09/17/85
4,541,378	06/621,183	09/17/85
4,541,385	06/543,719	09/17/85
4,541,389	06/620,054	09/17/85
4,541,394	06/689,270	09/17/85
4,541,439	06/371,370	09/17/85
4,541,449	06/489,494	09/17/85
4,541,452	06/659,374	09/17/85
4,541,462	06/641,899	09/17/85

Patent Number	Serial Number	Issue Date
4,541,473	06/582,707	09/17/85
4,541,486	06/501,261	09/17/85
4,541,490	06/529,305	09/17/85
4,541,495	06/575,949	09/17/85
4,541,503	06/536,380	09/17/85
4,541,521	06/678,370	09/17/85
4,541,522	06/386,939	09/17/85
4,541,528	06/600,985	09/17/85
4,541,536	06/603,192	09/17/85
4,541,542	06/588,396	09/17/85
4,541,543	06/675,778	09/17/85
4,541,548	06/523,129	09/17/85
4,541,549	06/476,886	09/17/85
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4,541,574	06/529,594	09/17/85
4,541,575	06/417,939	09/17/85
4,541,587	06/599,525	09/17/85
4,541,588	06/526,525	09/17/85
4,541,594	06/460,599	09/17/85
4,541,598	06/520,717	09/17/85
4,541,602	06/294,334	09/17/85
4,541,603	06/610,865	09/17/85
4,541,628	06/380,920	09/17/85
4,541,631	06/538,538	09/17/85
4,541,635	06/519,074	09/17/85
4,541,648	06/482,965	09/17/85
4,541,653	06/532,852	09/17/85
4,541,655	06/464,349	09/17/85
4,541,659	06/401,003	09/17/85
4,541,661	06/470,304	09/17/85
4,541,663	06/495,810	09/17/85
4,541,667	06/519,732	09/17/85
4,541,670	06/523,660	09/17/85
4,541,675	06/510,628	09/17/85
4,541,680	06/637,144	09/17/85
4,541,686	06/488,444	09/17/85
4,541,689	06/533,395	09/17/85
4,541,694	06/478,713	09/17/85
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4,541,700	06/515,833	09/17/85
4,541,713	06/570,361	09/17/85
4,541,715	06/456,296	09/17/85
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4,541,741	06/506,861	09/17/85
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4,541,768	06/541,743	09/17/85
4,541,770	06/552,795	09/17/85
4,541,777	06/358,248	09/17/85
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4,541,792	06/492,936	09/17/85
4,541,793	06/500,541	09/17/85
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4,541,824	06/569,773	09/17/85
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4,541,891	06/429,017	09/17/85
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4,541,906	06/611,114	09/17/85
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4,541,969	06/677,867	09/17/85
4,541,971	06/489,457	09/17/85
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4,541,982	06/558,357	09/17/85
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4,541,999	06/498,487	09/17/85
4,542,008	06/538,713	09/17/85
4,542,010	06/393,712	09/17/85
4,542,013	06/523,988	09/17/85
4,542,014	06/446,733	09/17/85
4,542,016	06/248,284	09/17/85
4,542,017	06/448,183	09/17/85
4,542,020	06/641,798	09/17/85
4,542,031	06/682,590	09/17/85
4,542,032	06/477,531	09/17/85
4,542,036	06/628,785	09/17/85
4,542,041	06/593,786	09/17/85
4,542,042	06/510,202	09/17/85
4,542,043	06/664,961	09/17/85
4,542,048	06/511,570	09/17/85
4,542,053	06/517,539	09/17/85
4,542,055	06/543,165	09/17/85
4,542,058	06/565,692	09/17/85
4,542,062	06/341,059	09/17/85
4,542,066	06/531,453	09/17/85
4,542,067	06/603,135	09/17/85
4,542,068	06/611,576	09/17/85
4,542,070	06/602,081	09/17/85
4,542,071	06/513,897	09/17/85
4,542,072	06/608,598	09/17/85
4,542,084	06/634,151	09/17/85
4,542,086	06/266,781	09/17/85
4,542,087	06/646,541	09/17/85
4,542,090	06/597,151	09/17/85
4,542,094	06/544,238	09/17/85
4,542,109	06/521,793	09/17/85
4,542,119	06/598,935	09/17/85
4,542,120	06/598,934	09/17/85
4,542,125	06/592,963	09/17/85
4,542,131	06/638,181	09/17/85
4,542,133	06/604,191	09/17/85
4,542,143	06/607,400	09/17/85
4,542,151	06/682,712	09/17/85
4,542,155	06/595,772	09/17/85
4,542,156	06/604,342	09/17/85
4,542,157	06/604,717	09/17/85
4,542,158	06/435,151	09/17/85
4,542,160	06/635,980	09/17/85
4,542,162	06/646,019	09/17/85
4,542,169	06/560,692	09/17/85
4,542,171	06/650,089	09/17/85
4,542,174	06/589,470	09/17/85
4,542,175	06/522,524	09/17/85
4,542,177	06/626,074	09/17/85
4,542,179	06/653,631	09/17/85
4,542,186	06/243,384	09/17/85
4,542,190	06/390,931	09/17/85
4,542,192	06/382,419	09/17/85
4,542,194	06/550,461	09/17/85
4,542,207	06/482,802	09/17/85
4,542,210	06/414,824	09/17/85
4,542,224	06/481,698	09/17/85
4,542,225	06/645,614	09/17/85
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4,542,257	06/604,548	09/17/85
4,542,263	06/587,240	09/17/85
4,542,265	06/496,730	09/17/85
4,542,269	06/602,166	09/17/85
4,542,270	06/542,209	09/17/85
4,542,275	06/478,535	09/17/85
4,542,276	06/572,674	09/17/85
4,542,281	06/585,724	09/17/85
4,542,282	06/609,733	09/17/85
4,542,285	06/646,688	09/17/85
4,542,292	06/364,202	09/17/85
4,542,300	06/524,321	09/17/85
4,542,305	06/468,754	09/17/85
4,542,309	06/468,447	09/17/85
4,542,312	06/596,823	09/17/85
4,542,313	06/620,937	09/17/85
4,542,319	06/385,641	09/17/85
4,542,322	06/602,086	09/17/85
4,542,323	06/499,670	09/17/85
4,542,332	06/562,338	09/17/85
4,542,345	06/492,698	09/17/85
4,542,350	06/515,280	09/17/85
4,542,351	06/415,797	09/17/85
4,542,352	06/505,568	09/17/85
4,542,353	06/558,223	09/17/85
4,542,358	06/455,457	09/17/85
4,542,368	06/351,501	09/17/85
4,542,369	06/522,057	09/17/85
4,542,377	06/453,019	09/17/85
4,542,393	06/496,759	09/17/85
4,542,397	06/599,427	09/17/85
4,542,404	06/388,037	09/17/85
4,542,408	06/528,262	09/17/85
4,542,412	06/463,111	09/17/85
4,542,416	06/528,664	09/17/85
4,542,417	06/384,364	09/17/85
4,542,422	06/440,406	09/17/85
4,542,424	06/356,742	09/17/85
4,542,425	06/452,566	09/17/85
4,542,427	06/593,189	09/17/85
4,542,431	06/333,578	09/17/85
4,542,433	06/528,505	09/17/85
4,542,438	06/413,400	09/17/85
4,542,440	06/548,141	09/17/85
4,542,443	06/520,977	09/17/85
4,542,453	06/350,513	09/17/85
4,542,457	06/457,178	09/17/85
4,542,468	06/405,283	09/17/85
4,542,473	06/427,859	09/17/85
4,542,475	06/443,928	09/17/85
4,542,496	06/525,464	09/17/85
4,542,499	06/425,858	09/17/85
4,542,505	06/551,080	09/17/85
4,542,506	06/393,323	09/17/85
4,542,508	06/553,571	09/17/85
4,542,515	06/551,431	09/17/85
4,542,517	06/304,755	09/17/85
4,542,519	06/462,431	09/17/85
4,542,526	06/543,817	09/17/85
4,542,527	06/494,254	09/17/85
4,864,654	07/191,081	09/12/89
4,864,655	07/231,506	09/12/89
4,864,658	07/213,629	09/12/89
4,864,661	07/260,463	09/12/89
4,864,662	07/036,878	09/12/89
4,864,665	07/233,229	09/12/89
4,864,672	07/165,254	09/12/89
4,864,673	07/217,939	09/12/89
4,864,675	07/148,523	09/12/89
4,864,677	07/173,270	09/12/89
4,864,684	07/252,883	09/12/89
4,864,685	07/158,904	09/12/89
4,864,687	07/297,518	09/12/89
4,864,689	07/188,683	09/12/89
4,864,700	07/287,136	09/12/89
4,864,701	07/290,705	09/12/89
4,864,713	07/203,683	09/12/89
4,864,717	07/277,670	09/12/89
4,864,718	07/216,346	09/12/89
4,864,727	07/194,528	09/12/89
4,864,729	07/211,792	09/12/89
4,864,730	07/172,640	09/12/89
4,864,733	07/155,234	09/12/89
4,864,736	07/199,625	09/12/89
4,864,737	07/218,966	09/12/89
4,864,738	07/221,328	09/12/89
4,864,739	07/025,764	09/12/89
4,864,744	07/293,319	09/12/89
4,864,746	07/261,834	09/12/89
4,864,751	07/067,450	09/12/89
4,864,753	07/127,659	09/12/89
4,864,754	07/119,597	09/12/89
4,864,758	07/115,989	09/12/89
4,864,761	07/087,462	09/12/89
4,864,764	07/214,460	09/12/89
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4,864,776	07/108,146	09/12/89
4,864,777	07/226,508	09/12/89
4,864,785	07/145,518	09/12/89
4,864,787	07/321,089	09/12/89
4,864,793	07/027,469	09/12/89
4,864,794	07/192,553	09/12/89
4,864,796	07/165,844	09/12/89
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4,864,798	07/254,382	09/12/89
4,864,801	07/175,414	09/12/89
4,864,802	07/226,817	09/12/89
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4,864,806	07/044,825	09/12/89
4,864,817	07/180,427	09/12/89
4,864,819	06/740,665	09/12/89
4,864,821	07/051,231	09/12/89
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4,864,840	07/025,229	09/12/89
4,864,846	07/259,523	09/12/89
4,864,861	07/224,566	09/12/89
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4,864,864	07/238,680	09/12/89
4,864,866	07/180,349	09/12/89
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4,864,909	07/275,284	09/12/89
4,864,911	07/175,438	09/12/89
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4,864,914	07/201,511	09/12/89
4,864,915	07/205,962	09/12/89
4,864,934	07/282,548	09/12/89
4,864,937	07/181,920	09/12/89
4,864,951	07/182,369	09/12/89
4,864,953	07/165,767	09/12/89
4,864,960	07/126,781	09/12/89
4,864,962	07/244,309	09/12/89
4,864,963	06/611,050	09/12/89
4,864,964	07/133,418	09/12/89
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Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

D. 336,078, Re. S.N. 29/051,765, Jan. 18, 1996, Cl. D14/107, OPTICAL SCANNER, Modest Khovaylo, Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.,* Attorney or Agent: William P. O'Meara, Ex. Gp.: 2901

5,110,647, Re. S.N. 08/896,989, July 18, 1997, Cl. 428/043, COVER FOR A VEHICLE AIR BAG, Juichiro Takada, Owner of Record: *Takata Corp., Tokyo, Japan,* Attorney or Agent: David D. Beatty, Ex. Gp.: 1508

5,186,399, Re. S.N. 08/392,396, Feb. 22, 1996, Cl. 241/34, DIGITAL CONTROL SYSTEM FOR A COFFEE GRINDER AND ASSOCIATED COFFEE BREWER, John T. Knepler, et. al., Owner of Record: *Bunn-O-Matic Corp., Springfield, Ill.,* Attorney or Agent: Richard Bushnell, Ex. Gp.: 3206

5,414,089, Re. S.N. 08/850,021, May 1, 1997, Cl. 546/243, LONG CHAIN CARBOXYLIC ACID IMIDE ESTER, Iwao Ebashi, et. al., Owner of Record: *Vital Heart Systems, Inc., Beverly, Mass.,* Attorney or Agent: Mary Katherine Baumeister, Ex. Gp.: 1201

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5,440,499, Re. S.N. 08/907,851, Aug. 8, 1997, Cl. 364/551.01, CONTINUOUS DUTY PRESS MONITORING SYSTEM, Robert F. Rasmussen, Owner of Record: *Inventor*, Attorney or Agent: John X. Garred, Ex. Gp.: 2414

5,444,305, Re. S.N. 08/916,280, Aug. 22, 1997, Cl. 365/207, SEMICONDUCTOR MEMORY CIRCUIT, Yoshinori Matsui, Owner of Record: *Nec Corp., Tokyo, Japan*, Attorney or Agent: Howard L. Bernstein, Ex. Gp.: 2511

5,552,849, Re. S.N. 08/908,423, Aug. 7, 1997, Cl. 354/275, VISUAL EXPOSURE INDICATING SYSTEM, Anthony DiRisio, et. al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: Robert L. Walker, Ex. Gp.: 2101

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,291,815, Reexam. No. 90/004,778, Oct. 1, 1997, Cl. 220/200, CERAMIC LID ASSEMBLY FOR HERMETIC SEALING OF A SEMICONDUCTOR CHIP, Richard Gordon, Owner of Record: *Semiconductor Packaging Materials Co. Inc., New York, N.Y.*, Attorney or Agent: Brian D. Ogonowsky, Skjerven Morrill MacPherson Franklin and Friel, San Jose, Calif., Ex. Gp.: 3207, Requester: Weil Gotshal and Manges, Menlo Park, Calif.

4,733,665, Reexam. No. 90/004,786, Oct. 6, 1997, Cl. 606/108, EXPANDABLE INTRALUMINAL GRAFT, AND METHOD AND APPARATUS FOR IMPLANTING AN EXPANDABLE INTRALUMINAL GRAFT, Julio C. Palmaz, Owner of Record: *Expandable Grafts Partnership, San Antonio, Tex.*, Attorney or Agent: John P. Milnamow, Dressler Rockey Milnamow and Katz, Ltd., Chicago, Ill., Ex. Gp.: 3301, Requester: Owner

4,739,762, Reexam. No. 90/004,785, Oct. 6, 1997, Cl. 606/108, EXPANDABLE INTRALUMINAL GRAFT, AND METHOD AND APPARATUS FOR IMPLANTING AN EXPANDABLE INTRALUMINAL GRAFT, Julio C. Palmaz, Owner of Record: *Expandable Grafts Partnership, San Antonio, Tex.*, Attorney or Agent: John P. Milnamow, Dressler Rockey Milnamow and Katz, Ltd., Chicago, Ill., Ex. Gp.: 3301, Requester: Owner

4,764,221, Reexam. No. 90/004,768, Sept. 29, 1997, Cl. 134/008, SILO CLEANING PROCESS, Wesley D. Hartwigsen, et. al., Owner of Record: *SMC Mining Co., c/o Zeigler Coal Holding, Fairview Heights, Ill.*, Attorney or Agent: Sharon E. Kohn, Kirkland and Ellis, Chicago, Ill.; Shell Oil Comp., Houston, Tex., Ex. Gp.: 1313, Requester: Spencer D. Conrad, Parkersburg, W. Va.

4,863,784, Reexam. No. 90/004,780, Oct. 7, 1997, Cl. 428/218, MULTILAYER FILM CONTAINING VERY LOW DENSITY POLYETHYLENE, Stanley Lustig, et. al., Owner of Record: *Viskase Corp., Chicago, Ill.*, Attorney or Agent: None, Ex. Gp.: 1317, Requester: American National Can Co., c/o Thomas W. Krause, Covington & Burling, Washington, D.C.

4,917,[illegible]43, Reexam. No. 90/004,769, Sept. 29, 1997, Cl. 446/014, TOY VEHICLE WITH TERMOCHROMIC MATERIAL, Keith Hippely, et. al., Owner of Record: *Mattel, Inc., Hawthorne. Calif.*, Attorney or Agent: Daniel F. Sullivan, Mattel Inc., El Segundo, Calif., Ex. Gp.: 3301, Requester: Matsui International Comp Inc., Gardena, Calif. c/o John James McGlew, McGlew and Tuttle, Scarborough, N.Y.

4,941,701, Reexam. No. 90/004,787, Oct. 6, 1997, Cl. 293/155, VEHICLE BUMPER, Norman S. Loren, Owner of Record: *Melea Ltd., Southfield, Mich.*, Attorney or Agent: Brooks and Cushman, Robert C. J. Tuttle, Southfield, Mich., Ex. Gp.: 3102, Requester: Owner

4,963,736, Reexam. No. 90/004,771, Sept. 30, 1997, Cl. 250/292, MASS SPECTROMETER AND METHOD AND IMPROVED ION TRANSMISSION, Donald J. Douglas, et. al., Owner of Record: *MDS Inc., Etobicoke, Ontario, Canada*, Attorney or Agent: John S. Pratt, Kilpatrick Stockton, Atlanta, Ga., Ex. Gp.: 2506, Requester: Owner

4,982,549, Reexam. No. 90/004,779, Oct. 2, 1997, Cl. 623/022, DUAL-RADIUS ACETUBULAR CUP COMPONENT, Harry E. Figgle, III, et. al., Owner of Record: *Osteonics Corp., Allendale, N.J.; Stryker Corp., Kalamazoo, Mich.*, Attorney or Agent: Lerner David Littenburg Krumholz & Mentlik, Westfield, N.J., Ex. Gp.: 3308, Requester: Owner

5,243,606, Reexam. No. 90/004,781, Oct. 3, 1997, Cl. 371/069, APPARATUS AND METHOD FOR DETECTING FAILURE OF AN EXTERNAL DEVICE BY A MICROCOMPUTER, Mitsuru Sugita, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Kevin T. LeMond, Townsend and Townsend and Crew, San Francisco, Calif., Ex. Gp.: 2413, Requester: Owner

5,374,298, Reexam. No. 90/004,782, Oct. 3, 1997, Cl. 075/645, COPPER SMELTING PROCESS, Moto Goto, et. al., Owner of Record: *Mitsubishi Materials Corp., Tokyo, Japan*, Attorney or Agent: Oblon Spivak McClelland Maier & Neustadt, Arlington, Va., Ex. Gp.: 1304, Requester: Ralph A. Dowell, Dowell and Dowell, Arlington, Va.

5,380,353, Reexam. No. 90/004,783, Oct. 3, 1997, Cl. 075/640, COPPER SMELTING APPARATUS, Moto Goto, et. al., Owner of Record: *Mitsubishi Materials Corp., Tokyo, Japan*, Attorney or Agent: Oblon Spivak McClelland Maier & Neustadt, Arlington, Va., Ex. Gp.: 1304, Requester: Ralph A. Dowell, Dowell and Dowell, Arlington, Va.

5,438,837, Reexam. No. 90/004,772, Sept. 30, 1997, Cl. 062/050.1, APPARATUS FOR STORING AND DELIVERING LIQUID CRYOGEN AND APPARATUS AND PROCESS FOR FILLING SAME, Bruce D. Caldwell, et. al., Owner of Record: *Oceaneering International Inc., Houston, Tex.*, Attorney or Agent: Marvin B. Eikenroht, Vaden Eickenroht & Thompson, Houston, Tex., Ex. Gp.: 3404, Requester: Owner

5,503,583, Reexam. No. 90/004,770, Sept. 29, 1997, Cl. 446/014, TOY WITH THERMOCHROMIC MATERIAL, Keith Hippley, et. al., Owner of Record: *Mattel, Inc., Hawthorne, Calif.*, Attorney or Agent: Daniel F. Sullivan, Mattel, Inc., El Segundo, Calif., Ex. Gp.: 3301, Requester: Matsui International Comp Inc., Gardena, Calif.

5,551,570, Reexam. No. 90/004,784, Oct. 3, 1997, Cl. 206/575, DECORATIVE PACKAGING SYSTEM INCLUDING A METHOD AND KIT THEREFOR, Pauline S. Shaffer, et. al., Owner of Record: *Tartan Paper Products, Englewood, Colo.*, Attorney or Agent: Timothy J. Martin, Lakewood, Colo., Ex. Gp.: 3208, Requester: Bleyer Industries, Inc., Valley Stream, N.Y.; c/o Weingram and Associates, Maywood, N.J.

5,650,703, Reexam. No. 90/004,773, Sept. 30, 1997, Cl. 318/587, DOWNWARD COMPATIBLE AGV SYSTEM AND METHODS, James V. Yardley, et. al., Owner of Record: *HK Systems, New Berlin, Wis.*, Attorney or Agent: Andrew J. Niles, Niles and Niles, Milwaukee, Wis., Ex. Gp.: 2107, Requester: Frederick S. Burkhart, Van Dyke, Gardner, Linn and Burkhart, Grand Rapids, Mich.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED SEPTEMBER 08, 1997 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
114,200	71/096,938	12/05/1916
114,228	71/093,630	12/05/1916
114,255	71/072,483	12/05/1916
114,260	71/097,087	12/05/1916
114,274	71/097,279	12/05/1916
341,045	71/381,698	12/01/1936
341,084	71/381,332	12/01/1936
341,087	71/381,527	12/01/1936
341,088	71/381,528	12/01/1936
341,132	71/381,125	12/01/1936
341,155	71/381,614	12/01/1936
341,185	71/380,404	12/01/1936
341,198	71/373,181	12/01/1936
341,205	71/381,215	12/01/1936
341,223	71/381,003	12/01/1936
341,254	71/379,404	12/01/1936
341,270	71/379,978	12/01/1936
341,281	71/379,665	12/01/1936
341,288	71/380,091	12/01/1936
341,296	71/380,134	12/01/1936
637,884	72/002,037	12/04/1956
637,885	72/002,284	12/04/1956
637,889	72/000,123	12/04/1956
637,891	72/003,934	12/04/1956
637,892	71/640,062	12/04/1956
637,897	71/671,132	12/04/1956
637,904	71/690,534	12/04/1956
637,909	71/700,039	12/04/1956
637,914	72/003,210	12/04/1956
637,915	72/005,010	12/04/1956
637,929	72/004,893	12/04/1956
637,939	71/698,395	12/04/1956
637,941	71/698,555	12/04/1956
637,942	71/700,205	12/04/1956
637,949	72/004,148	12/04/1956
637,956	72/004,659	12/04/1956
637,960	72/005,047	12/04/1956
637,962	71/684,890	12/04/1956
637,964	72/000,635	12/04/1956
637,977	72/000,532	12/04/1956
637,978	72/001,418	12/04/1956
637,981	72/003,024	12/04/1956
637,983	72/005,716	12/04/1956
637,985	72/006,018	12/04/1956
637,987	71/689,737	12/04/1956
637,990	72/003,493	12/04/1956
637,997	71/688,197	12/04/1956
638,001	72/001,911	12/04/1956
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638,013	72/004,385	12/04/1956
638,015	72/004,469	12/04/1956
638,019	71/668,175	12/04/1956
638,024	71/694,685	12/04/1956
638,026	71/696,456	12/04/1956
638,029	72/000,075	12/04/1956
638,032	72/004,470	12/04/1956
638,039	72/007,827	12/04/1956
638,053	72/007,817	12/04/1956
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638,066	72/002,665	12/04/1956
638,067	71/687,215	12/04/1956
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638,088	72/008,117	12/04/1956
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638,139	71/692,860	12/04/1956
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638,147	71/699,770	12/04/1956
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638,173	71/693,817	12/04/1956
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638,190	72/000,445	12/04/1956
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1,053,621	73/071,433	11/30/1976
1,053,622	73/047,422	11/30/1976
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1,053,635	73/085,424	11/30/1976
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1,053,643	73/056,331	11/30/1976
1,053,645	73/074,029	11/30/1976
1,053,646	73/081,546	11/30/1976
1,053,649	73/060,805	11/30/1976
1,053,652	73/085,371	11/30/1976
1,053,654	73/086,321	11/30/1976
1,053,657	73/063,546	11/30/1976
1,053,662	73/078,077	11/30/1976
1,053,665	73/082,799	11/30/1976
1,053,666	73/083,029	11/30/1976
1,053,667	73/083,030	11/30/1976
1,053,668	73/083,094	11/30/1976
1,053,669	73/047,474	11/30/1976
1,053,670	73/049,744	11/30/1976
1,053,672	73/077,800	11/30/1976
1,053,673	73/077,801	11/30/1976
1,053,675	73/039,129	11/30/1976
1,053,684	73/077,396	11/30/1976
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1,053,695	73/086,958	11/30/1976
1,053,696	73/087,214	11/30/1976
1,053,702	73/072,623	11/30/1976
1,053,703	73/073,973	11/30/1976
1,053,704	73/075,295	11/30/1976
1,053,705	73/077,638	11/30/1976
1,053,709	73/073,233	11/30/1976
1,053,711	73/025,489	11/30/1976
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1,053,723	73/064,666	11/30/1976
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1,053,761	73/070,827	11/30/1976
1,053,763	73/081,554	11/30/1976
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1,053,782	73/069,350	11/30/1976
1,053,789	73/077,973	11/30/1976
1,053,792	73/084,516	11/30/1976
1,053,793	73/084,838	11/30/1976
1,053,795	73/086,011	11/30/1976
1,053,796	72/422,064	11/30/1976
1,053,798	72/458,456	11/30/1976
1,053,801	73/047,984	11/30/1976

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrants at their last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Sun Food Products Corp., Boca Raton, Fla., Reg. No. 1,767,558, for the mark "SUN CHEF SUNBURGER AND DESIGN", Canc. No. 26,468.

Interpace Corp., Parispanny, N.J., Reg. No. 749,294, for the mark "Ceramaseal", Canc. No. 26,076.

JEAN BROWN
Technical Program Manager
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Errata

"All reference to Patent No. 5,683,440 to Ronald M. Katz, et. al., of Illinois, for TOTAL BODY COOLING SYSTEM appearing in the Official Gazette of November 4, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,684,150 to Hidefumi Yukimasa, et. al., of Japan, for N-CONTAINING, CONDENSED HETEROCYCLIC COMPOUNDS, THEIR PRODUCTION, AND THEIR USES appearing in the Official Gazette of November 4, 1997, should be deleted since no patent was granted."

"All reference to Patent No. 5,684,240 to Gynheung An, of Washington, for GENE CONTROLLING FLORAL DEVELOPMENT AND APICAL DOMINANCE IN PLANTS appearing in the Official Gazette of November 4, 1997, should be deleted since no patent was granted."

DEPARTMENT OF COMMERCE
[Docket No. 970428100-7256-02]
Patent and Trademark Office
37 CFR Parts 2 and 3
RIN 0651-AA87

Miscellaneous Changes to Trademark Trial and Appeal Board Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed rule; notice of hearing and reopening of comment period.

SUMMARY: The Patent and Trademark Office (PTO) will hold a public hearing, and reopen the comment period, on changes to certain rules and practices of the Trademark Trial and Appeal Board that were proposed in June of 1997. Interested members of the public are invited to testify at the public hearing and to submit written comments on these proposed changes.

DATES: The public hearing will be held on Wednesday, December 10, 1997, beginning at 9:00 a.m.

Those wishing to present oral testimony at the hearing must request an opportunity to do so no later than Friday, December 5, 1997.

Speakers may provide a written copy of their testimony for inclusion in the record of the proceedings no later than Wednesday, December 17, 1997.

Written comments will be accepted by the PTO until December 10, 1997.

Written comments and transcripts of the hearing will be available for public inspection on or about Wednesday, January 7, 1998.

ADDRESSES: The hearing will be held on Wednesday, December 10, 1997, beginning at 9:00 a.m. in the Commissioner's Conference Room, located on the 9th floor of Crystal Park 2, 2121 Crystal Drive, Arlington, Virginia 22202.

Requests to testify should be sent to Ellen Seeherman by telephone at (703) 308-9300, ext. 206, by facsimile transmission at (703) 308-9333, or by mail marked to her attention and addressed to Assistant Commissioner for Trademarks, Box TTAB-No Fee, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

Written comments may be sent by mail addressed to Assistant Commissioner for Trademarks, Box TTAB-No Fee, 2900 Crystal Drive, Arlington, Virginia 22202-3513, marked to the attention of Ellen J. Seeherman. Written comments may also be sent by facsimile transmission to (703) 308-9333, marked to the attention of Ellen J. Seeherman.

Written comments and transcripts of the hearing will be maintained for public inspection in Suite 900, on the 9th Floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

FOR FURTHER INFORMATION CONTACT: Ellen J. Seeherman, Administrative Trademark Judge, Trademark Trial and Appeal Board, by telephone at (703) 308-9300, ext. 206, or by mail marked to her attention and addressed to Assistant Commissioner for Trademarks, Box TTAB-No Fee, 2900 Crystal Drive, Arlington, Virginia 22202-3513 or by facsimile transmission marked to her attention and sent to (703) 308-9333.

SUPPLEMENTARY INFORMATION: A notice of proposed rulemaking to amend certain rules governing practice before the Trademark Trial and Appeal Board was published in the Federal Register on June 5, 1997 (62 FR 30802) and in the Official Gazette on June 24, 1997 (1199 TMOG 88). A number of the comments made in response to that notice suggested that a public hearing be held on the proposed rules changes. Accordingly, the PTO has decided to hold a public hearing on the proposed rules changes on December 10, 1997. Moreover, some trade organizations expressed the concern that, because the comment period occurred during the summer months, some practitioners and other interested parties and entities were not aware of the proposed amendments. Accordingly, the PTO has decided to reopen the comment period. All comments previously submitted will be considered together with any additional written comments which are submitted by December 10, 1997.

It should be noted that, in view of the comments already received, the PTO has determined that it will not adopt the proposed changes to Sections 2.120(d) and 2.120(h) regarding limiting the number of requests for production of documents and the requests for admission which may be served.

Oct. 29, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Certificates of Correction
For the Week of November 25, 1997

D. 378,760
D. 381,411
D. 381,528
D. 383,412
Re. 35,535
4,517,480
5,157,540
5,194,588
5,217,500
5,230,851
5,247,648
5,253,339
5,284,043
5,319,793
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Changes to Patent Practice and Procedure; Correction

The Patent and Trademark Office (PTO) published a notice of final rulemaking entitled "Changes to Patent Practice and Procedure" in the Official Gazette of October 21, 1997 (1203 Off. Gaz. Pat. Office 63). The comments on the changes to 37 CFR 1.16, 1.121, and 1.193 contained errors. In addition, the amendment to 37 CFR 1.17(q) contained a typographical error and the amendment to 37 CFR 1.121(a)(4) should have been withdrawn. This document clarifies the comments, corrects the typographical error, and removes the incorrect subsection.

In the "Changes to Patent Practice and Procedure" notice that was published in the Official Gazette of October 21, 1997 (1203 Off. Gaz. Pat. Office 63), make the following changes:

1. On page 65, second column, lines 8-10, delete the following sentence:

> Section 1.16 is amended to add new paragraphs (m) and (n) including the unassociated text following paragraphs (d) and (l).

2. On page 82, first column, lines 68-71, change the sentence--

> The ability to provide directions to the Office for the handwritten deletion of five words or less for each claim does not encompass deletion of equations, charts or other non-word material.

to--

> An equation, chart or other non-word material should **not** be amended by an instruction to delete (or add) only a part of the equation, chart, or non-word material. Rather, it should be amended by an instruction to delete the entire equation, chart, or non-word material and to add in its place the equation, chart or other non-word material to be substituted for the material that was deleted.

3. On page 82, second column, lines 7-11, delete the following paragraph:

> Paragraph (a)(4) of § 1.121 requires that any amendment presented in a substitute specification must be presented under the provision of this section either prior to or concurrent with the submission of the substitute specification. The paragraph contains material from canceled § 1.115.

4. On page 94, second column, lines 33-35, change the sentences--

> Thus, the Office does not consider such a rejection to constitute a "new ground of rejection" within the meaning of § 1.193(b). Nevertheless, § 1.193(b)(2) . . . .

to--

> Thus, the Office does not consider such a rejection to constitute a "new ground of rejection" within the meaning of § 1.193(a). Nevertheless, § 1.193(a)(2) . . . .

5. Section 1.17 on page 108, first column, lines 39-48, correct paragraph (q) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(q) For filing a petition to the Commissioner under a section listed below which refers to this paragraph 50.00

§ 1.41 - to supply the name or names of the inventor or inventors after the filing date without a cover sheet as prescribed by § 1.51(c)(1) in a provisional application.

§ 1.48 - for correction of inventorship in a provisional application.

§ 1.53 - to accord a provisional application a filing date or to convert a nonprovisional application filed under § 1.53(b) to a provisional application under § 1.53(c).

* * * * *

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6. Section 1.121 on page 117, second column, lines 61-64, correct paragraph (a)(4) as follows:

§ 1.121 Manner of making amendments.

(a) * * *

(4) [Reserved]

* * * * *

For further information contact Hiram H. Bernstein or Robert W. Bahr, Senior Legal Advisors, by telephone at (703) 305-9285; or by mail addressed to: Box Comments--Patents, Assistant Commissioner for Patents, Washington, DC 20231 marked to the attention of Mr. Bernstein; or by facsimile to (703) 308-6916.

Date: NOV - 6 1997

Bruce A. Lehman
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

October 6-10, 1997

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
10-8	EX EX	74/380,556 74/380,932	Nutrition Headquarters, Inc.	whether the matter asserted for registration functions as trademarks for the services recited in applicant's applications	Refusal Affirmed (in both cases)		a design consisting of a vertical arrangement of rectangles (in which the names and prices of applicant's products are displayed); a design consisting of a vertical arrangement of rectangles (in which the names and prices of applicant's products are displayed), with the word "FREE" enclosed within another rectangle to the side [both designs used in connection with mail order services for vitamin and mineral supplements, cosmetics, jewelry, wallets, housewares, kitchen accessories, health aids, and clothing accessories]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
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Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Box TTAB NO FEE	Interferences, motions, and extension requests.
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Box POST REG FEE	Affidavits, renewals, corrections and amendments.
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Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
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Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of online systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI^3) in Sunnyvale, California.

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Alabama	Auburn University Libraries	(334) 844-1747
	Birmingham Public Library	(205) 226-3620
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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
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	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6220
Connecticut	Hartford Public Library	Not Yet Operational
	New Haven Free Public Library	Not Yet Operational
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	Springfield: Illinois State Library	(217) 782-5659
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	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	Not Yet Operational
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	Cleveland Public Library	(216) 623-2870
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PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director	308-0661	12/27/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director	308-1235	04/05/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	02/29/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director	308-2351	03/13/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	06/22/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	09/11/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	11/24/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-3900	11/24/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3900	10/20/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	01/15/96
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-3900	05/30/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	11/17/95
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HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director	308-1113	10/14/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	02/27/96
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	11/22/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	12/04/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-2168	06/25/96

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term nf any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1997

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/20/97	08/11/97
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/26/97	07/21/97
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/27/97	08/18/97
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/26/97	07/14/97
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/26/97	07/11/97
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/26/97	06/18/97
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/27/97	08/07/97
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/18/97	08/08/97
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/24/97	06/20/97
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	08/25/97	—0—
Renewals (All Classes)	08/25/97	—0—
Section 12(c) Publications (All Classes)	08/25/97	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

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Training and Implementation Guide for the Final Rule entitled "Changes to Patent Practice and Procedure"

The U. S. Patent and Trademark Office (PTO), announces the availability of the *Training and Implementation Guide* for the Final Rule entitled "Changes to Patent Practice and Procedure." The *Training and Implementation Guide* will be offered for sale in paper for $40 per copy or on CD-ROM for $50 per copy. Information contained in the *Training and Implementation Guide* is also available at no cost on the PTO's Web site at **www.uspto.gov**.

A Notice of Proposed Rulemaking entitled "1996 Changes to Patent Practice and Procedure" was published in the Federal Register at 61 Fed. Reg. 49819 (September 23, 1996), and in the Official Gazette at 1191 Off. Gaz. Pat. Office 105 (October 22, 1996). A Final Rule (entitled "Changes to Patent Practice and Procedure") adopting a number of changes proposed in the Notice of Proposed Rulemaking has been published in the Federal Register and will be published in the Official Gazette. The changes made by the Final Rule will be effective on December 1, 1997.

Among the changes to the rules of practice included in the Final Rule are:

1) New procedures for filing continuation and divisional applications, including a new streamlined filing procedure (continued prosecution application or CPA);
2) Simplified requirements for oaths or declarations in reissue applications;
3) Simplified requirements for establishing lack of deceptive intent in petition practice, and in the filing of papers correcting improperly asserted small entity status;
4) Elimination of unnecessary requirements, such as certain types of petitions to correct inventorship under 37 C.F.R. § 1.48(a);
5) Changes in appeal practice, such as limitations on new grounds of rejection and increased admissibility of reply briefs;
6) New time frames for replies to Office actions, and for the revival of abandoned applications, and simplification of petitions for an extension of time;
7) Changes in the manner of naming inventors, for correction of inventorship errors, and for establishing small entity status in continuing and reissue applications; and
8) Provisions for multiple prior art protests by a single party.

The Training and Implementation Guide will contain:

1) The text of the entire Final Rule as published in the Federal Register, which includes the revised rule language, the preamble portion explaining the revisions, and an Index to the Final Rule;
2) A rule-by-rule summary and three by-topic summaries (four summaries in total), the three by-topic summaries including a two-page highlights of the significant revisions, a condensed summary of the significant revisions, and a detailed summary of the revisions;
3) Selected revised forms for filing applications;
4) An extensive set of Questions and Answers;

5) Copies of presentation slides developed for examiner training sessions, including slides comparing the old and new requirements for filing applications; and
6) A section on amendments in reissues and reexaminations.

Order forms are available at the Reception Desk, Patent Search Room, Crystal Plaza 3, Rm. 1A01; on the PTO's Web site; and by calling the Office of Electronic Information Products (OEIP) at 703-306-2600.

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Payments should be by check or money order payable to the Commissioner of Patents and Trademarks, or, with authorization, charged to a PTO deposit account, VISA®, or MasterCard®. Notebooks and CD-ROMs will be mailed by first-class mail to addresses in the United States, Canada, and Mexico, and by airmail to all other addresses; or, at the requestor's expense, by FedEx.

10/8/97
Date

Charles A Pearson for
Stephen G. Kunin
Deputy Assistant Commissioner for
Patent Policy and Projects

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REEXAMINATIONS

NOVEMBER 25, 1997

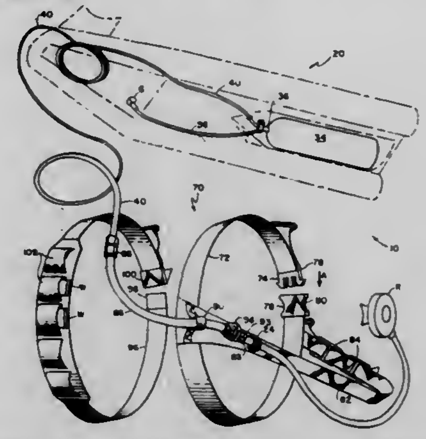
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,919,631 (3388th)
UNDERWATER DIVING SYSTEM

Michael V. Stafford, Placerville, Calif., assignor to Snuba International, Inc., Placerville, Calif.

Reexamination Request No. 90/004,495, Nov. 7, 1996.
Reexamination Certificate for Patent 4,919,631, issued Apr. 24, 1990, Ser. No. 190,631, May 5, 1988.
Int. Cl.^{6} B63C *11/20*

U.S. Cl. 441—40



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7–25** is confirmed.

Claims **1**, **26** and **27** are determined to be patentable as amended.

Claims **2–6**, dependent on an amended claim, are determined to be patentable.

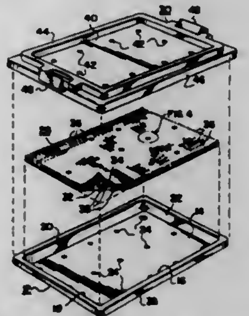
1. An underwater diving system, comprising in combination:
- a light-weight raft *which remains on the surface of the water while a diver explores underwater,*
- a source of compressed gas embodied as a scuba type tank of compressed gas normally carried on the back of a diver carried on said raft,
- a gas line from said source to **[**an underwater**]** *the* diver,
- and harness means connecting an end of said line, remote from said gas source, to the diver,
- whereby while the diver explores underwater, said raft is towed along and forces associated with towing are dissipated by said harness.

B2 5,098,676 (3388th)
STERILIZATION AND STORAGE CONTAINER TRAY

John A. Brooks, Jr., Manchester, N.H., assignor to Poly-Vac, Inc., Manchester, N.H.

Reexamination Request No. 90/004,567, Feb. 28, 1997.
Reexamination Certificate for Patent 5,098,676, issued Mar. 24, 1992, Ser. No. 637,625, Jan. 4, 1991.
Reexamination Certificate B1 5,098,676, issued Sep. 10, 1996.
Int. Cl.^{6} A61L *2/00*

U.S. Cl. 422—292



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is cancelled.

[1. A sterilization tray assembly for sterilizing, transporting, and storing instruments, comprising:
- a tray, having;
  - an upper tray section including a plurality of upper tray ports spaced in a predetermined pattern;
  - a lower tray section including a plurality of lower tray ports spaced in a predetermined pattern;
  - locking means for engaging said upper tray section and said lower tray section to form a sealing contact between said tray sections; and
- a flexible mat made of silicone rubber and sized to fit said tray, said mat being positioned between said tray sections and having an upper surface and a lower surface, said mat including;
  - a plurality of mat ports in said mat spaced in a predetermined pattern wherein said mat ports and said lower tray ports are in vertical alignment;
  - a plurality of upwardly tapered, vertical projections spaced in a predetermined pattern on said upper surface, said vertical projections having tips at their free ends to provide support for instruments above said upper surface;
  - a plurality of downwardly projecting support feet depending from said lower surface spaced in a predetermined pattern for spacing said lower surface above said lower tray section.**]**

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REISSUES

NOVEMBER 25, 1997

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

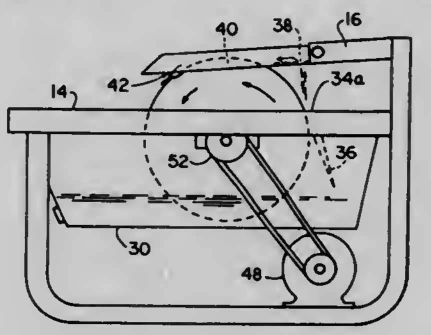
Re. 35,666
TILE SAW APPARATUS AND METHOD

Allen L. Smith, 80 S. 900 East #25, Provo, Utah 84606

Original No. 4,976,251, dated Dec. 11, 1990, Ser. No. 372,861, Jun. 28, 1989. Application for reissue Dec. 9, 1992, Ser. No. 987,696

Int. Cl.^{6} B24B *55/02;* **B26D** *7/08;* **B28D** *1/04*

U.S. Cl. 125—13.01 **10 Claims**



9. A portable table tile saw having a liquid reservoir, comprising:

a saw table having a perimeter edge;

a rotary saw blade protruding through said saw table, said rotary saw blade picking up liquid from said liquid reservoir as said rotary saw blade rotates, said picked up liquid being used to cool said rotary saw blade as said rotary blade cuts tile;

means for confining the circulation of liquid from the liquid reservoir to said rotary blade as it cuts and back to said reservoir with no significant splashing of said liquid from said table tile saw;

said confining means configured for permitting uninhibited cutting of a tile of any length past said rotary saw blade, said tile cutting not interfering with the confined circulation of liquid which cools the rotary blade;

a fence gauge having an elongate guide member to guide tile through the blade; and

means for clipping the fence gauge to the perimeter edge of said saw table so that said elongate guide member extends inwardly from any selected position that the fence gauge is clipped to said perimeter edge of said saw table, wherein the means for clipping the fence gauge to the perimeter edge of said saw table comprises

a bracket which is pivotally attached to said elongate guide member, with the bracket making engagement with the lower side of the perimeter edge of said saw table;

spring means that exert a biasing force to grip the perimeter edge of said saw table between the bracket and said guide member to hold the guide member in a secure position on the saw table, with said spring means being manually manipulated to move the bracket against the biasing force and release the grip on the perimeter edge of said saw table so that said fence gauge can be moved to another desired position along the perimeter edge of said saw table;

said bracket has an extension that extends away from said perimeter edge of said saw table;

said elongate guide member has an extension that extends from the pivotal attachment to said bracket in a direction away from said perimeter edge of said saw table so as to be spaced from and superimposed above the extension on said bracket; and

said spring means is positioned between the extensions on said guide member and said bracket.

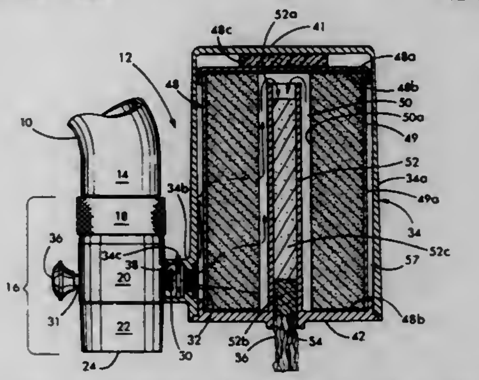
Re. 35,667
FAUCET-MOUNTED WATER FILTER WITH WALL INLET AND ANNULAR CHAMBER

Randy B. Heiligman, Minnetoka, Minn., assignor to Ultrapure Systems, Inc., Northbrook, Ill.

Original No. 5,017,286, dated May 21, 1991, Ser. No. 579,787, Sep. 10, 1990. Continuation of Ser. No. 488,700, Mar. 5, 1990, abandoned. Application for reissue Dec. 20, 1993, Ser. No. 170,492

Int. Cl.^{6} B01D *24/10*

U.S. Cl. 210—266 **41 Claims**



30. A water faucet-mounted water filter for filtering impurities from water received from a water faucet, the water filter comprising:

(a) a diverter including:

an upright diverter body with a water inlet at a top end thereof, the water inlet having an internally threaded swivel collar constructed to be connected to the water faucet for receiving unfiltered water and a water outlet at a bottom end of the diverter body opposite the water inlet for dispensing unfiltered water from the diverter to a sink or other receptacle;

a diverter outlet duct projecting from one side of the diverter body; and

a valve in the diverter body, the valve being movable from a first position where the unfiltered water enters the water inlet and exits the water outlet to a second position where the unfiltered water enters the water inlet and exits the diverter outlet duct;

(b) filter housing defining a filter chamber, the filter housing having:

a cylindrical side wall;

a top portion closed by a top wall integrally formed to the side wall;

a bottom portion closed by a separately formed bottom wall;

a boss extending from one of said walls of the filter housing and connecting the filter housing to the diverter outlet duct such that the filter housing is supported by the diverter body, the boss having an opening through the wall from which the boss extends and the diverter outlet duct being connected through the boss opening to the filter chamber; and

a dispensing opening positioned on the bottom wall for dispensing filtered water from the filter housing into the sink or other receptacle;

(c) a carbon block filter element positioned in the filter chamber such that the filter housing and the filter element are supported upon the diverter in close proximity to or in contact with the diverter, the filter element including a water inlet surface on a side wall thereof and a water outlet; an annular water distribution chamber surrounding the filter element, wherein the diverter outlet duct communicates through the annular water distribution chamber with the water inlet sur-

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face of the filter element, and wherein the water outlet of the filter element communicates with the dispensing opening of the filter housing such that the filtered water is dispensed from the filter housing.

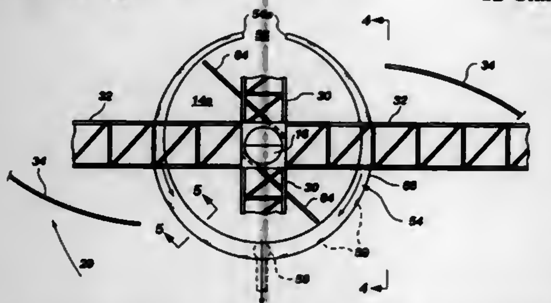
Re. 35,668
SLUDGE COLLECTION APPARATUS AND METHOD

Orris E. Albertson, 1915 Wasatch Dr., Salt Lake City, Utah 84108

Original No. 5,435,924, dated Jul. 25, 1995, Ser. No. 197,097, Feb. 16, 1994. Application for reissue Mar. 26, 1996, Ser. No. 621,689

Int. Cl.^{6} B07D *21/06*

U.S. Cl. 210—803 **12 Claims**



[1. In an apparatus for clarifying wastewater having a generally cylindrical tank with an open top and a closed bottom, a wastewater inlet for receiving influent wastewater into the tank, a rake arm mounted to rotate about a central axis of the tank, at least one scraper mounted on the rake arm and disposed adjacent the bottom of the tank for transport of sludge when the rake arm is rotated, and a wastewater outlet for discharging clarified effluent wastewater from the tank, an improved sludge collector comprising:

a generally bent elongate housing defining an interior cavity and disposed near the tank bottom, the housing being oriented in a generally horizontal plane and being bent generally around the tank's central axis;

a plurality of sludge inlets leading through the housing into the cavity and disposed so as to receive sludge directed toward the housing by the at least one scraper; and

a sludge outlet leading through the housing from the cavity for transportation of sludge from the cavity.]

Re. 35,669
RAM GUARD

Robert L. Paskey; Janice M. Paskey, both of 2561 Loganberry Cir., Seabrook, Tex. 77586; Curtis W. Paskey, 2011 Vince, Pasadena, Tex. 77502, and William D. Paskey, 1417 Harris, Pasadena, Tex. 77506

Original No. 5,310,217, dated May 10, 1994, Ser. No. 983,049, Nov. 30, 1992. Application for reissue Jun. 7, 1995, Ser. No. 399,234

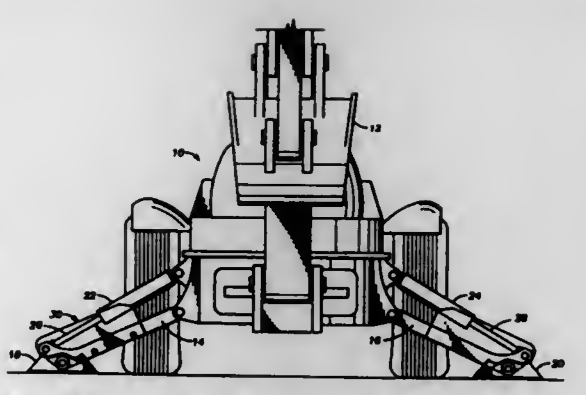
Int. Cl.^{6} B60R *19/00*

U.S. Cl. 280—763.1 **2 Claims**

1. A guard for an exposed piston rod which is attached to a stabilizer arm of an earth mover [which comprises] *said stabilizer arm having end pieces with a flat surface, said guard comprising*:

a plate which is *rigidly and non-pivotably* attached to said stabilizer arm and [extending] *extends* along and above the outside surface of said stabilizer arm adjacent to the exposed piston rod, said plate being a flat plate having a linear length *generally* greater than the length of the *exposed* piston rod and less than the length of the piston plus the fully exposed piston rod;

a second plate extending from said first plate which extends over the piston rod to cover the exposed piston rod; and



a third plate *attached to said second plate* which [attaches to] g *extends over the* flat surfaces of the end pieces of the stabilizer arm to which the piston rod is attached.

Re. 35,670
FLEXIBLE INFORMATION STORING DISK APPARATUS HAVING LAMINAR AIR FLOW

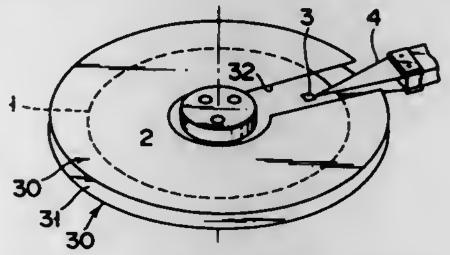
Makoto Imamura, Hayama-machi; Kazushi Tanimoto, Tokyo; Yoichiro Tanaka, Kawasaki; Yoshiaki Sonobe, Ichikawa, and Katsuyoshi Kitagawa, Urayasu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Original No. 5,189,574, dated Feb. 23, 1993, Ser. No. 431,387, Nov. 3, 1989. Application for reissue Apr. 20, 1994, Ser. No. 230,207

Claims priority, application Japan, Nov. 4, 1988, 63-278794

Int. Cl.^{6} G11B *5/60;15/64;17/32;21/20*

U.S. Cl. 360—103 **17 Claims**



1. An information storing disk apparatus comprising:

a flexible disk for storing reproducing information;

a means for rotating said disk to cause centrifugal force to act on said disk in a radial direction thereof, for keeping said disk flat, and for creating air flow on both sides of said disk in a circumferential direction thereof wherein air flow is created in the radial direction of said disk when said disk is rotated;

a pair of head sliders located to face both sides of said disk, respectively, at least one of the head sliders having means for reading and writing information [on and from] *from and on* said disk and each of said head sliders having air surface on which air force caused by a circumferential air flow acts to float said head slider from said disk;

supporting means for supporting said pair of head sliders, said supporting means serving to apply elastic force of said supporting means to each of said head sliders against the air force, and keeping said head sliders floating from said disk by a predetermined distance when the elastic force is balanced with the air force applied;

a straightening means for straightening the air flow in the radial direction of said disk, and for reducing the occurrence of turbulent flow in the air flow, said straightening means being located to face both sides of said disk with a predetermined distance interposed between each of said straightening means and a corresponding side of said disk, and having a pair of

stationary straightening surfaces each serving to straighten the air flow in the radial direction of said disk to prevent an occurrence of turbulent flow between each of stationary straightening surfaces and said disk, said straightening means having a pair of first stationary plates arranged to face both sides of said disk and said straightening surface being formed on that face of each of said first stationary plate which faces said disk, each of said first stationary plates being shaped like a circle having such a side that covers said disk, and having a cut-away portion for defining a space in which each of said head sliders can move on said disk in a radial direction thereof.

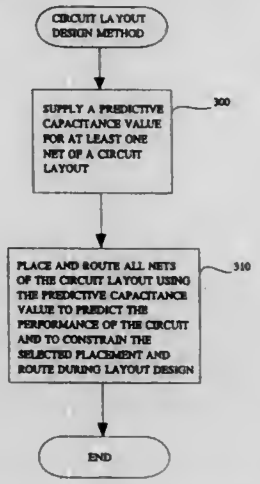
Re. 35,671
PREDICTIVE CAPACITANCE LAYOUT METHOD FOR INTEGRATED CIRCUITS

Mark R. Hartoog, Los Gatos, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Original No. 5,367,469, dated Nov. 22, 1994, Ser. No. 627,085, Dec. 13, 1990. Application for reissue Jul. 17, 1996, Ser. No. 683,618

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—491 **15 Claims**


CIRCUIT LAYOUT DESIGN METHOD
SUPPLY A PREDICTIVE CAPACITANCE VALUE FOR AT LEAST ONE NET OF A CIRCUIT LAYOUT
300
PLACE AND ROUTE ALL NETS OF THE CIRCUIT LAYOUT USING THE PREDICTIVE CAPACITANCE VALUE TO PREDICT THE PERFORMANCE OF THE CIRCUIT AND TO CONSTRAIN THE SELECTED PLACEMENT AND ROUTE DURING LAYOUT DESIGN
310
END

1. A method for designing circuit layouts, including simulating a circuit on a computer, comprising the steps of:

supplying a predictive capacitance value to the computer for at least one net of a circuit layout by calculating an average capacitance per unit wire length for the circuit layout and converting, via the average capacitance per unit wire length, the predictive capacitance for the at least one net of the circuit layout into a maximum wire length value for use as the layout design constraint;

using the estimated wire length value in the computer for predicting the performance of the circuit prior to the layout;

placing and routing all nets of the circuit layout on the simulated circuit using the at least one predictive capacitance value as a layout design constraint during the placing and routing.

Re. 35,672
SLANT PLATE TYPE COMPRESSOR WITH VARIABLE CAPACITY CONTROL MECHANISM

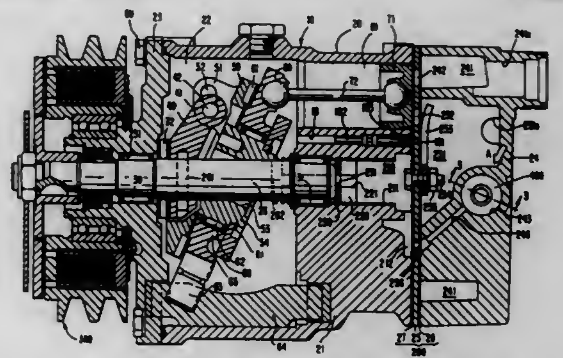
Yukihiko Taguchi, Maebashi, Japan, assignor to Sanden Corporation, Gunma, Japan

Original No. 5,332,365, dated Jul. 26, 1994, Ser. No. 957,370, Oct. 7, 1992. Application for reissue Apr. 4, 1996, Ser. No. 627,414

Claims priority, application Japan, Oct. 7, 1991, 3-081339 U; Oct. 23, 1991, 3-275824

Int. Cl.^{6} F04B *1/26*

U.S. Cl. 417—222.2 **5 Claims**



1. A slant plate type refrigerant compressor comprising:

a compressor housing enclosing a crank chamber, a suction chamber and a discharge chamber therein, said compressor housing comprising a cylinder block having a plurality of cylinders formed therethrough;

a piston slidably fitted within each of said cylinders;

drive means coupled to said pistons for reciprocating said pistons within said cylinders, said drive means including a drive shaft rotatably supported in said housing and coupling means for drivingly coupling aid drive shaft to said pistons such that rotary motion of said drive shaft is converted into reciprocating motion of said pistons, said coupling means including a slant plate having a surface disposed at an adjustable inclined angle relative to a plane perpendicular to said drive shaft, the slant angle changing in response to a change in pressure in said crank chamber relative to pressure in said suction chamber to thereby change the capacity of said compressor;

a first communication path linking said crank chamber with said suction chamber;

a first valve control mechanism disposed within said first communication path, said first valve control mechanism controlling fluid communication through said first communication path in response to changes in pressure in said suction chamber;

a second communication path linking said crank chamber with said discharge chamber, said first and second communication paths sharing a common portion linked to said crank chamber; and

a second valve control mechanism disposed within said second communication path, said second valve control mechanism responding to an external signal to open said second communication path to increase the pressure in said crank chamber to thereby reduce the capacity of the compressor, fluid communication through said first communication path being continuously controlled by said first valve control mechanism to maintain pressure in said suction chamber at a predetermined constant value as long as said second communication path is closed, hid second communication path being continuously opened as long as said first communication path is closed and said common portion being selectively coupled to the open one of said first or second communication paths.

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Re. 35,673
GOLF CLUB GRIP

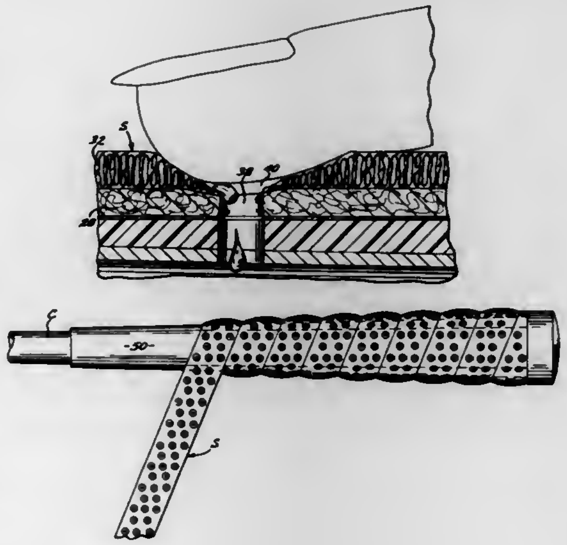
Ben Huang, 19472 Woodlands La., Huntington Beach, Calif. 92648

Original No. 5,571,051, dated Nov. 5, 1996, Ser. No. 421,376, Apr. 12, 1995. Application for reissue Jan. 8, 1997, Ser. No. 780,313

Int. Cl.^{6} A63B *53/14;49/08*

U.S. Cl. 473—302 **7 Claims**

1. The combination of a golf club shaft and a grip applied to said shaft, wherein the grip comprises an elongated strip of resilient material formed from an open-pored textile layer having an inner surface adhered to and abutting the golf club shaft, and a smooth polyurethane layer formed with closed pores, said polyurethane layer being bonded to the surface of the textile layer remote from the golf club shaft, with the pores of such polyurethane layer extending generally normal to the longitudinal axis of the golf club shaft, and wherein the longitudinal profile of the grip tapers in a straight line from one of its ends to its opposite end whereby when the strip is spirally wrapped about the golf club shaft, the longitudinal profile of such strip and shaft defines a grip that tapers in a straight line form one of its ends to its opposite end at an angle greater than the angle at which the golf club shaft tapers.



PLANT PATENTS

GRANTED NOVEMBER 25, 1997

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,126
FLORIBUNDA ROSE PLANT VARIETY NAMED 'WEKPLAPEP'

Thomas F. Carruth, Altadena, Calif., assignor to Weeks Wholesale Rose Grower, Inc., Upland, Calif.

Filed Jul. 1, 1996, Ser. No. 673,065

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. Plants of a new and distinct variety of floribunda rose substantially as described and illustrated herein.

10,127
PEACH TREE "GAYLA RICH"

Chris Floyd Zaiger, 929 Grimes Ave.; Gary Neil Zaiger, 1907 Elm Ave.; Leith Marie Gardner, 1207 Grimes Ave., and Grant Gene Zaiger, 4005 California Ave., all of Modesto, Calif. 95358

Filed Jul. 8, 1996, Ser. No. 676,919

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—43.1 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by its large size, vigorous, upright growth and a productive and regular bearer of large, firm, yellow flesh, clingstone fruit with good flavor and eating quality; the fruit is further characterized by having a high degree of attractive red skin color, having firm flesh with good handling and shipping quality, and in comparison to the early maturing May Crest Peach (U.S. Plant Pat. No. 4,064), the new variety matures in the same maturity season with greater production of larger size fruit.

10,128
PARTHENOCISSUS QUINQUEFOLIA PLANT VARIETY NAMED 'MONHAM'

Robert Fincham, Boring, Oreg., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed May 10, 1996, Ser. No. 644,293

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—54.1 **1 Claim**

1. A new and distinct *Parthenocissus quinquefolia* plant variety substantially as shown and described.

10,129
GERBERA PLANT NAMED 'TERFLORIN'

Lambertus Johannes Maria Stravers, Kudelstaart, Netherlands, assignor to Terra Nigra Holding B.V., De Kwakel, Netherlands

Filed Nov. 28, 1995, Ser. No. 566,579

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Gerbera plant named 'Terflorin' substantially as herein shown and described, characterized particularly as to novelty by its characteristics enumerated above.

10,130
NEW GUINEA IMPATIENS PLANT NAMED 'DUEADA'

Günter Dümmen, Rheinberg-Eversael, Germany, assignor to Dümmen Jungpflanzenkulturen, Rheinberg-Eversael, Germany

Filed Jun. 14, 1996, Ser. No. 663,948

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.6 **1 Claim**

1. A new and distinct cultivar of New Guinea Impatiens plant named 'Dueada', as illustrated and described.

10,131
NEW GUINEA IMPATIENS PLANT NAMED 'DUECONTO'

Marga Dümmen, Rheinberg-Eversael, Germany, assignor to Dümmen Jungpflanzenkulturen, Rheinberg-Eversael, Germany

Filed Jun. 17, 1996, Ser. No. 665,250

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.6 **1 Claim**

1. A new and distinct cultivar of New Guinea Impatiens plant named 'Dueconto', as illustrated and described.

10,132
DAHLIA PLANT NAMED BAWHI

Christoph Kleinhanns, Eisleben, Germany, assignor to Saatzucht Quedlinburg GmbH, Quedlinburg, Germany

Filed Jun. 3, 1996, Ser. No. 660,067

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.8 **1 Claim**

1. A new and distinct cultivar of Dahlia plant named Bawhi, as illustrated and described.

10,133
ANTHURIUM PLANT NAMED SUNDIAL

Ann E. Lamb, Sebring, and Robert D. Hartman, Lake Placid, both of Fla., assignors to Twyford International, Inc., Santa Paula, Calif.

Filed Apr. 9, 1996, Ser. No. 629,771

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct cultivar of Anthurium plant named 'Sundial', as illustrated and described.

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PATENTS

GRANTED NOVEMBER 25, 1997

ERRATA

For CLASS	See PATENT NO.
005–425	5,689,839
439–268	5,690,281
374–001	5,690,442
249–114	5,690,759
525–319	5,690,861
439–578	5,691,251
512–004	5,691,303
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368–010	5,691,932
347–217	5,691,961
372–020	5,691,989
396–153	5,692,118
396–634	5,692,188

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PATENTS

GRANTED NOVEMBER 25, 1997

GENERAL AND MECHANICAL

5,689,827

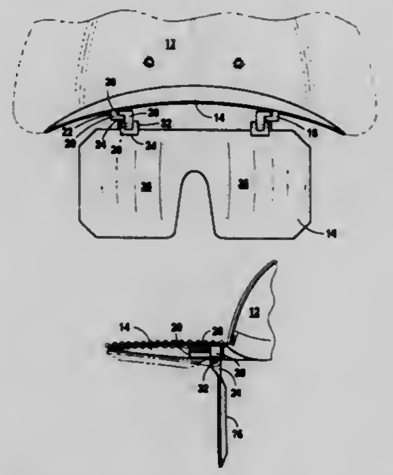
FASTENER ASSEMBLIES FOR COMBINATION VISOR AND EYESHIELD

Curtis J. Ryder, 9 Bitterblue La., San Antonio, Tex. 78218

Filed Mar. 13, 1996, Ser. No. 615,773

Int. Cl.^{6} A42B *1/06*

U.S. Cl. 2—10 **16 Claims**



1. In combination, an eyeshield, a visor, and a device for fastening said eyeshield to said visor, said device comprising:

at least one base permanently attached to the underside of said visor;

connector means for engaging said base so that the relative position of said base and said connector means remains fixed unless varied by a wearer; and

pivot means for coupling said eyeshield to said connector means so that said eyeshield can be positioned in an inoperative location approximately parallel to said visor, in an operative position approximately perpendicular to said visor, and at a plurality of positions therebetween;

said base further comprising an L-shaped cross-section with an upper and a lower leg, said lower leg having an upper surface and said upper leg having an interior surface made of alternating teeth and indentations;

said connector means further comprising an inverted, L-shaped member having a horizontal and a vertical leg, said connector means rests on said upper surface of said lower leg, contacts said interior surface via at least one tooth shaped to fit into said interior surface, and contains a passage parallel to said eyeshield; and

said pivot means further comprising at least one U-shaped member having two upper arms, said U-shaped member attached to said eyeshield and having aligned passages in each of said two upper arms, said U-shaped member capable of receiving that portion of said connector means containing said passage such that a connecting pin can be placed through said passages.

5,689,828

PROTECTIVE GLOVE FOR BASEBALL

Jung Y. Mah, 251 Parkview Ave., Willowdale, Ontario, Canada, M2N 3Z3

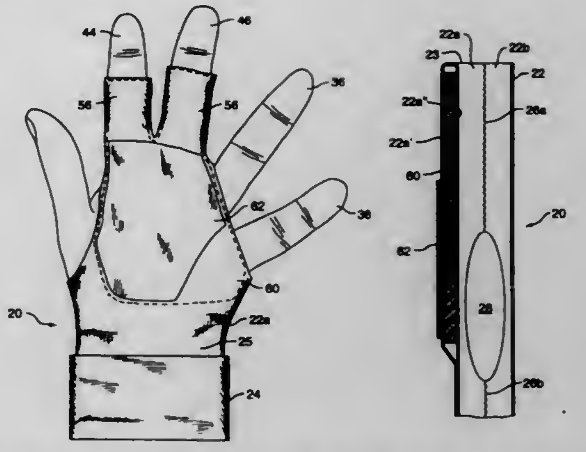
Filed Sep. 20, 1994, Ser. No. 309,437

Claims priority, application United Kingdom, Oct. 4, 1993, 9320383

Int. Cl.^{6} A41D *13/08*

U.S. Cl. 2—16 **12 Claims**

1. A partial glove for use by a wearer within a conventional baseball glove and comprising:



a main body portion having a front half and a back half securely joined together at portions of their respective edges, so as to form around the top perimeter of said main body portion a thumb hole, an opposed dual finger opening, and two finger extensions extending upwardly from said main body portion, with said two finger extensions being disposed between said thumb hole and said opposed dual finger opening, each of said two finger extensions having an individual finger opening in register therewith, and a hollow interior between said front and back halves;

said front half comprising outer and inner layers being securely joined together substantially around their respective edges;

a layer of resilient impact absorbing material interposed between said outer and inner layers and extending into each of said finger extensions; and,

a wrist band portion securely attached to said main body portion so as to substantially encircle a bottom portion of the main body portion.

5,689,829

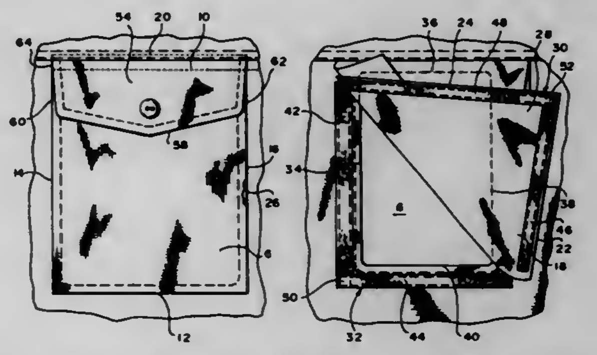
UPPER BODY GARMENT WITH CONCEALED ACCESS PORT AND CONCEALMENT METHOD

Walter T. Rose, Houston, Tex., assignor to Rose & Boone, Inc., Houston, Tex.

Filed Apr. 19, 1996, Ser. No. 634,977

Int. Cl.^{6} A41B *1/00;* **A41D** *13/00*

U.S. Cl. 2—77 **20 Claims**



1. A shirt-like garment for the upper body having a covered access port for access beneath the garment, said garment having a body portion and breast pocket outer panel portion, said body portion having a front body portion and a back body portion, the front body portion having a front surface and a back surface and defining the access port, the breast pocket outer panel portion being positioned on the front body portion in covering relationship with the access port, said breast pocket outer panel portion having

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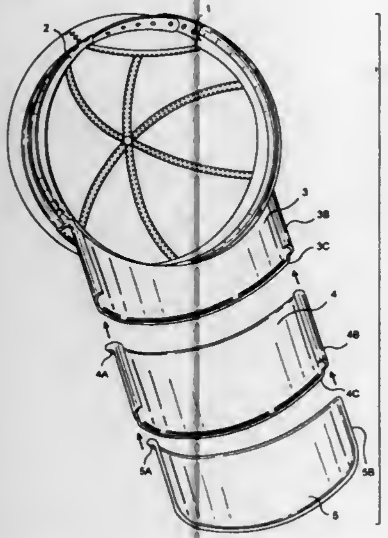
an upper edge, a lower edge, an inner edge, an outer edge, a front surface, and a back surface, the outer edge of the breast pocket outer panel portion being securely fastened to the front body portion of the garment, and the inner edge of the breast pocket outer panel portion being releasibly fastened to the from body portion of the garment.

5,689,830
RETRACTABLE VISOR

Trish Winsche Pflum, c/o Dr. Francis Pflum, 20 W. 13th St., New York, N.Y. 10011
Continuation of Ser. No. 420,682, Apr. 12, 1995, abandoned. This application Jul. 12, 1996, Ser. No. 679,316
Int. Cl.^{6} A42B *1/06*
U.S. Cl. 2—195.1 **1 Claim**

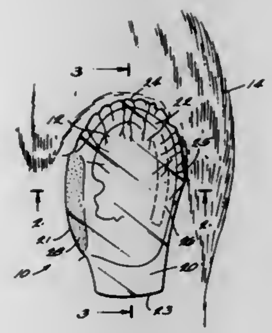


1. A retractable visor comprising:
a plurality of nested visor components slidably engaging one another comprised of a base visor component and at least one additional visor component;
each visor component having a rear edge, a front edge, and two curled edges extending longitudinally from the rear edge to the front edge, each curled edge having an exterior portion that forms a lateral edge and an interior portion that forms an annular slot, said lateral edge of the at least one additional visor component having a physically textured surface and the annular slot of each visor component having a physically textured surface;
wherein the lateral edge of each succeeding visor component is slidably disposed in the annular slot of each preceding visor component, and the physically textured surfaces cause frictional engagement between each mating lateral edge and annular slot thereby preventing uninitiated movement of the visor components relative to each other.

5,689,831
DISPOSABLE EAR COVER

Yvette L. Harris, 8820 W. Spokane, Milwaukee, Wis. 53224
Filed Apr. 10, 1996, Ser. No. 630,262
Int. Cl.^{6} A61F *11/14*
U.S. Cl. 2—209 **8 Claims**

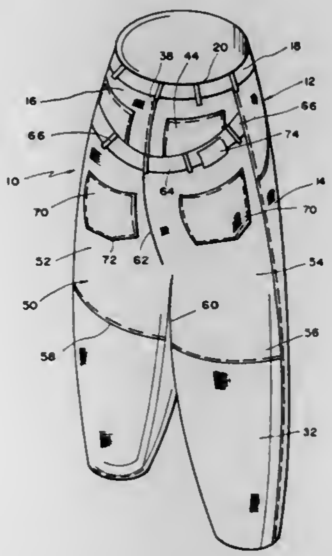
8. A disposable ear protector comprising a sheet of thin flexible material having top, bottom, front, and rear edges,
said top and rear edges being generally adapted to engage the curvature of a human ear,
a narrow flap of said flexible sheet material being located along said rear edge,



a pressure-sensitive adhesive coating on said flap adapted to be affixed to skin beneath a user's ear, whereby said protector can be held in place during use,
and wherein pressure-sensitive adhesive is also coated along a forward edge of said sheet.

5,689,832
SAGGING DOUBLE BOTTOM PANTS

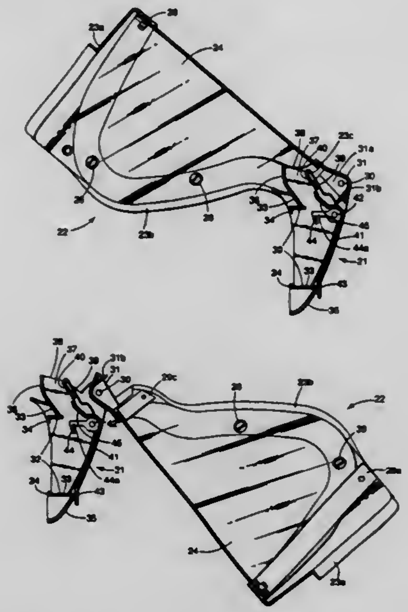
James T. Head, Hayward, Calif., assignor to Thurston Bilal, Hollywood, and Robert Lee Rodgers, Newark, both of Calif., a part interest
Filed Apr. 2, 1996, Ser. No. 626,377
Int. Cl.^{6} A41D *1/06*
U.S. Cl. 2—227 **13 Claims**



1. A sagging double bottom pants comprising a pair of pants including front and rear lower torso covering portions having a waistband at the upper edge thereof and depending leg covering portions to form pants, an added double bottom of fabric material attached to the pants and covering a portion of the rear torso covering portion and leg covering portions, said double bottom having an upper edge provided with an auxiliary waistband oriented below and in downwardly curved arcuate configuration in relation to the waistband of the pants to provide access between rear surfaces of the pants and the added double bottom.

5,689,833
EYE SHIELD FOR A RESPIRATORY MASK

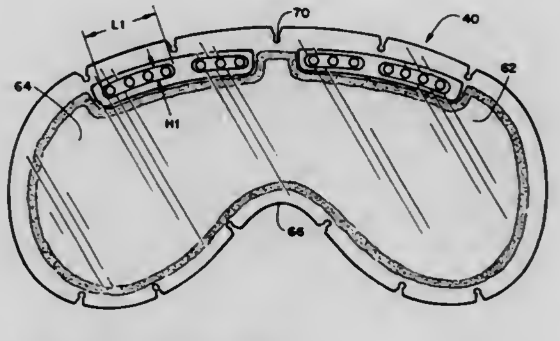
Peter B. Allen, Bracknel; David Cook, Durham, both of United Kingdom, and William A. Mittelstadt, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 3, 1995, Ser. No. 433,808
Int. Cl.^{6} A61F *9/02;* **A62B** *18/02*
U.S. Cl. 2—427 **5 Claims**



1. An eye shield for use in combination with a respiratory mask which is adapted to fit to, and seal against, the face of a wearer, the eye shield comprising an eye-shielding portion, and attachment means by which the eye shield can be releasably secured to the mask in positive engagement therewith and positioned to shield the eyes of a wearer without, in use, requiring means for securing the eye shield to the head of the wearer, a body portion in which the attachment means is formed and to which the eye shielding portion is attached, pivot means for pivotally attaching said eye shielding portion to said body portion between a first position in which the eye shielding portion extends across a wearer's forward line of vision and a second position in which said eye shielding portion extends below the wearer's forward line of vision.

5,689,834
GOGGLES

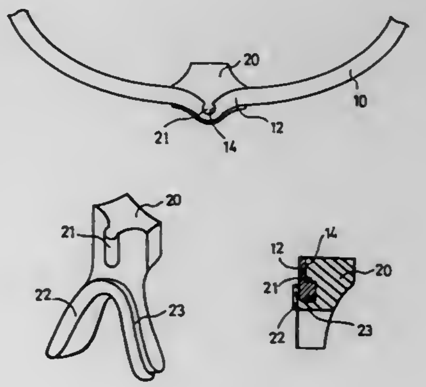
Ken Wilson, 5384 Linda Vista, Rd. #104, San Diego, Calif. 92110
Filed Dec. 24, 1996, Ser. No. 772,910
Int. Cl.^{6} A61F *9/02*
U.S. Cl. 2—436 **12 Claims**



1. A pair of goggles comprising:
a front wall frame having a lens aperture for removably receiving a lens that has integrally formed left and right eye portions; said front wall frame having a rear surface;
a rear frame member that is spaced rearwardly from said front wall frame; said rear frame member having a front surface and a rear surface;
a plurality of rib members each having a front end and a rear end; the respective front ends of said rib members being connected to said front wall frame at spaced intervals around the rear surface of said front wall frame; the respective rear ends of said rib members being connected to said rear frame member at spaced intervals around the front surface of said rear frame member; the laterally spaced rib members define air ventilation slots between each other;
an elongated rear foam cushion strip is secured to the rear surface of said rear frame member and it rests against a person's face when the goggles are being worn;
a lens assembly having a front lens and a rear lens; said front lens having a rear surface and said rear lens having a front surface; means for spacing said front lens from said rear lens; said lens assembly having a top edge and a bottom edge;
means for detachably securing said lens assembly in the lens aperture of the front wall frame of said goggles;
at least one elongated metal heat sink bar having a front surface and a rear surface; said rear surface being in contact with the front surface of said rear lens so that it will draw heat away from said rear lens when a person wears said goggles.

5,689,835
SPORTS GOGGLES HAVING AN ATTACHABLE NOSE PAD

David Yinkai Chao, 1120 Green Acre Rd., Towson, Md. 21204
Filed Oct. 29, 1996, Ser. No. 739,262
Int. Cl.^{6} G02C *5/12*
U.S. Cl. 2—446 **3 Claims**



1. A nose pad in combination with a pair of sports goggles, the sports goggles including a frame having a center frame portion for being supported on a nose of a wearer, the frame having an inward side adjacent the wearer and an outward side, the center frame portion having an upper frame portion provided with a vertically formed upwardly opening frame groove, the center frame portion also including a bottom frame portion;
the nose pad including an upper pad portion having a pad rib formed thereon for removable downward engagement into the frame groove;
the nose pad extending on the inward side of the frame from the upper frame portion to a lower pad portion of the bottom frame portion;
the lower pad portion having a flap which is deformable and extends under the bottom frame portion and extends upwardly to the outward side of the frame, the flap defining a pad channel for engaging with the bottom frame portion.

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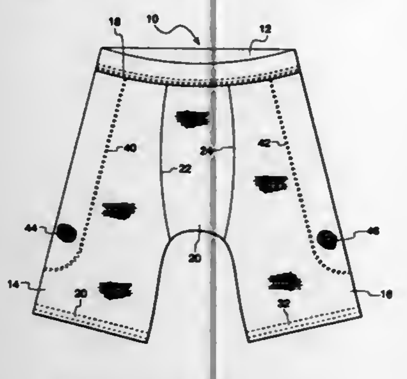
5,689,836
ATHLETIC PROTECTIVE UNDERGARMENT

Terence Michael Fee, Clarendon Hills, and Robert Finley McDavid, III, Downers Grove, both of Ill., assignors to McDavid Knee Guard, Inc., Chicago, Ill.

Continuation of Ser. No. 593,109, Feb. 1, 1996, abandoned, which is a continuation of Ser. No. 294,159, Aug. 22, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 806,649

Int. Cl.⁶ A41D *13/00*

U.S. Cl. 2—465 **16 Claims**



1. Athletic protective undergarment, capable of being worn under a pair of pants, and effective for protecting a wearer's hip and thighs while providing freedom of movement, air circulation and evaporation of perspiration, the undergarment comprising:
- a pair of trouser legs of stretchable fabric having four-way stretch characteristics;
- at least a pair of pads, each pad comprising a layer of four-way stretchable backing fabric laminated to a four-way stretchable foam substrate, the foam substrate positioned between the backing layer and the trouser legs, the pads effective to protect the wearer's hips and at least portions of the wearer's thighs;
- at least one stitched seam for nonremovably attaching the pads to the trouser legs; and
- the foam substrate being perforated to augment air circulation and cooling of the wearer's skin, the four-way stretch characteristics of the trouser legs, backing fabric and foam substrate permitting the trouser legs, backing fabric and foam substrate to stretch about the same amount when a given tension is applied to the garment.

5,689,837
WATER ACTUATED TOILET FAN

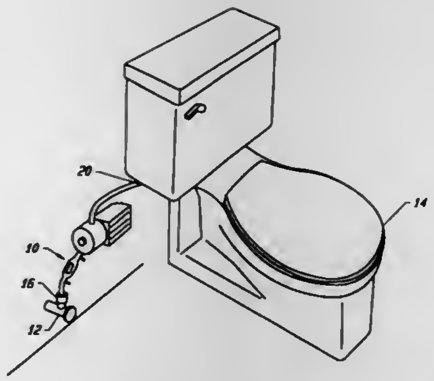
Thomas J. Katona, 1681 Barnett Cir., Pleasant Hill, Calif. 94523

Filed Jun. 11, 1996, Ser. No. 661,886

Int. Cl.⁶ E03D *9/03;9/04*

U.S. Cl. 4—214 **11 Claims**

1. In a conventional tank-type toilet having a toilet bowl, a tank, and a plumbing system with a water flow connected to the tank, the improvement comprising a water-actuated toilet fan connected to the plumbing system and to the tank, for the recirculation of the air, in the vicinity of the toilet exteriorly thereto, the toilet fan including:
- a housing external to the toilet having a water compartment and an air compartment;
- intake means connected to the plumbing system and to the water compartment of the housing for intake of the water flow for the toilet from the plumbing system;



- rotation means in the water compartment for transferring energy from the water flow through the water compartment into rotational motion;
- air recirculation means in the air compartment connected to the rotational means for transferring the rotational motion from the rotation means to an air flow, wherein the air compartment, is vented and has an opening for air flow leaving the air compartment the toilet fan including deodorization means for deodorizing air flow leaving the air compartment of the toilet fan; and
- outflow connection means connected to the water compartment of the housing for directing the water flow out of the toilet fan and into the tank.

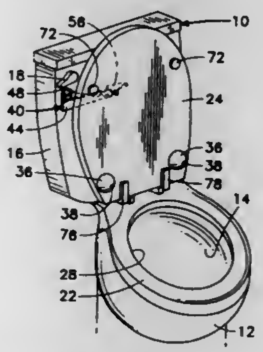
5,689,838
LOWERING APPARATUS FOR TOILET SEAT AND TOILET SEAT COVERS

Andrew R. MacKenzie, 23295 Park Basilico, Calabasas, Calif. 91302

Filed Jun. 28, 1996, Ser. No. 675,438

Int. Cl.⁶ A47K *13/10*

U.S. Cl. 4—246.1 **2 Claims**



1. A lowering apparatus for a toilet seat and toilet seat cover, said toilet seat and said toilet seat cover being hingedly mounted on a toilet bowl having a water tank mounted thereon wherein said water tank has a pivotally mounted flush lever mounted thereon, said water tank having an exterior sidewall, said toilet seat and said toilet seat cover being pivotally movable between an upper position and a lower position, said upper position locating said toilet seat cover directly adjacent said exterior sidewall of said water tank and locating said toilet seat directly adjacent said toilet seat cover, said lower position locating said toilet seat on said toilet bowl and said toilet seat cover on said toilet seat, said pivotally mounted flush lever mounted on said exterior sidewall of said water tank, said flush lever to be movable from an at rest position to an actuated position to empty water from said water tank, said lowering apparatus comprising:
- an elongated main body section adapted to be secured on said exterior sidewall of said water tank, said elongated main body section having an aft end and a fore end;

- a first lever movably mounted on said elongated main body section, said first lever located at said aft end, said first lever being located directly adjacent said flush lever;
- a second lever movably mounted within a single plane on said elongated main body section, said second lever located at said fore end, said second lever being positioned to contact said toilet seat cover when said toilet seat cover is located in said upper position, said second lever being pivotally mounted to said elongated main body section about a pivot axis, said pivot axis being located parallel to said exterior sidewall of said water tank, said pivot axis being vertically oriented; and
- a thin rod link pivotally connected to said first lever connecting said first lever and said second lever, whereby movement of said flush lever to said actuated position causes said first lever to be moved which moves said link which moves said second lever against said toilet seat cover causing said toilet seat cover and said toilet seat, if located in said upper position, to move to said lower position.

5,689,839
SPLIT SIDE GUARDS

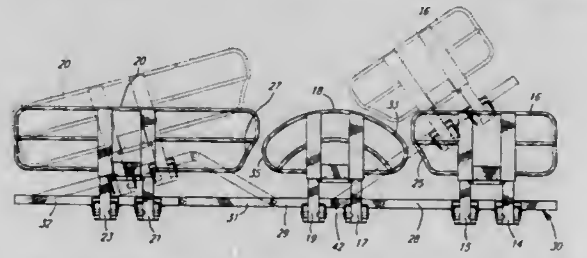
Eric Laganière, Ste-Foy, and Guy Lemire, Beaumont, both of Canada, assignors to Bertec Médical Inc., Quebec, Canada

Filed Aug. 19, 1996, Ser. No. 699,445

Claims priority, application Canada, Jul. 11, 1996, 2181021

Int. Cl.⁶ A47C *21/08*

U.S. Cl. 5—425 **5 Claims**



1. In a bed comprising a frame, a mattress deck mounted on said frame and including a series of at least two sections pivotally interconnected about a transversal pivot axis, support means mounted to each said sections, split side guards mounted to said support means, each of said split side guards comprising a series of at least two side guard units being disposed in generally co-planar relationship and mounted to the support means of the two said sections, respectively, said two side guard units having respective mutually adjacent profile portions moving along each other upon pivotal movement of at least one of said two sections of said mattress deck about the pivot axis, said two mutually adjacent profile sections being generally semicircular and centered on the pivot axis thereby allowing pivotal movement of said two side guard units as a result of pivotal movement of at least one of said two sections about the pivot axis, without contacting one another.

5,689,840
NO SPILL BEDPAN

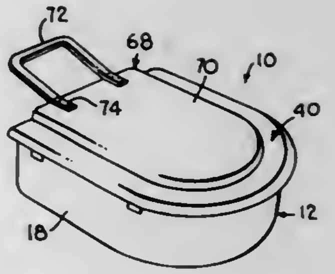
Delmar A. Kuhlman, Wichita, Kans., assignor to Comfort King, Inc., Wichita, Kans.

Filed Feb. 26, 1996, Ser. No. 606,561

Int. Cl.⁶ A61G *9/00*

U.S. Cl. 4—452 **10 Claims**

1. A bedpan comprising:
- an open topped pan having a back wall, a bottom surface, a pair of sidewalls and a front wall, said pan also having a seat secured thereto, said seat having an opening disposed in the center thereof and a retaining wall extending downwardly from said seat and into said pan; and
- a cover having a lid and a handle, wherein said handle extends rearwardly away from said back wall, said cover being



hingedly secured to said pan so that said lid is swingable between a closed position wherein said lid is generally parallel to said seat and an open position wherein said lid forms an obtuse angle with said seat; and
- wherein said lid abuts said seat when said lid is in its closed position; and
- wherein a distal end of said handle abuts said back wall when said lid is in the open position so that said lid is prevented from further rearward swingable movement.

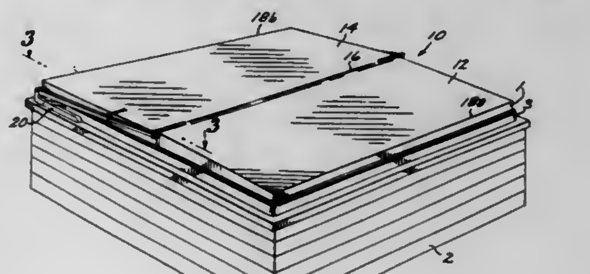
5,689,841
SPA COVER LIFT APPARATUS

Marc S. Black, 3240 Val Verde Ave., Long Beach, Calif. 90808, and Jeffrey D. Black, 4281 Candleberry Ave., Seal Beach, Calif. 90740

Continuation of Ser. No. 301,257, Sep. 6, 1994, Pat. No. 5,566,403. This application Oct. 22, 1996, Ser. No. 736,056

Int. Cl.⁶ E04H *4/06*

U.S. Cl. 4—498 **6 Claims**



1. An adjustable spa cover lifting kit for mounting on a spa and for engagement with a spa cover to lift said spa cover between respective open and closed positions, said spa cover lifting kit comprising:
- a mounting member for mounting on said spa;
- an adjustable lifting arm configured for pivotal connection at a first end with said mounting member;
- a support cylinder having proximate and distal ends, said proximate end being configured for pivotal connection to said mounting member and said distal end being configured for pivotal connection to said adjustable lifting arm; and
- a spa cover engagement assembly connected to said adjustable lifting arm at a predetermined position thereon and configured for releasable engagement with said spa cover.

5,689,842
BOWL GLOW SYSTEM

Michael A. Delaney, and Jeffries Arnez Jones, both of 7062 Hanover Pkwy. Apt. 2C, Greenbelt, Md. 20770

Filed Sep. 27, 1996, Ser. No. 720,047

Int. Cl.⁶ E03D *11/02*

U.S. Cl. 4—661 **6 Claims**

1. A Bowl Glow System comprising:

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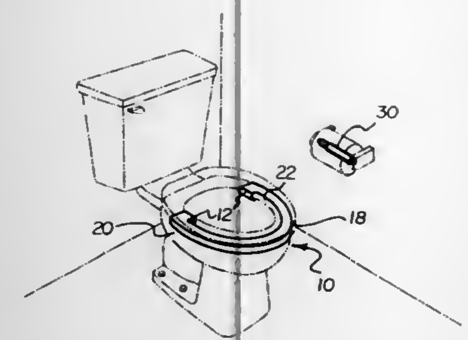


- a phosphorescent member comprising a substantially flat rim portion having a substantially arcuate shape adapted for resting on the upper surface of a toilet bowl rim, said rim portion having an inside edge for orienting toward the interior of the toilet bowl and an outside edge for orienting away from the interior of the toilet bowl, said rim portion also having first and second ends for positioning on the upper surface of the toilet bowl rim; and
- affixing means for affixing the phosphorescent member to a toilet bowl rim, said affixing means including a pair of discrete inner flanges, each of said pair of discrete inner flanges being connected to said inner edge of said rim portion at one of said first and second ends, and a continuous outer flange extending along the entire outer edge of said rim portion, thereby permitting said flanges to embrace a portion of said toilet bowl rim.

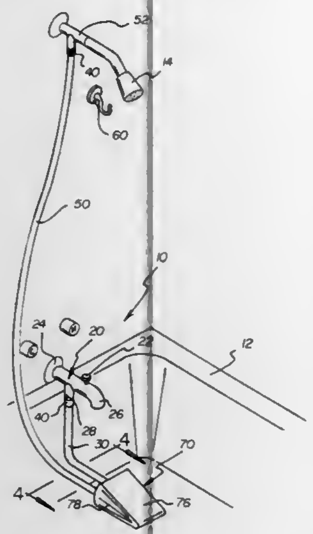
5,689,843
SHOWER WATER CONSERVATION SYSTEM

Rubin E. Duke, and Margaret Duke, both of 304 Buckhorn Rd., Manford, Ala. 36268

Filed Nov. 18, 1996, Ser. No. 749,516

Int. Cl.^{6} A47K *3/22*

U.S. Cl. 4—675 **6 Claims**



1. A Shower Water Conservation System comprising:
- a T-spigot having a first end adapted to be coupled to a water supply pipe, a second end and a third end;
- said second end having a shut-off valve;
- a first flexible tube removably coupled at one end thereof to said third end;
- a water control means matingly coupled to the opposite end of said first flexible tube, where by said water control means is positioned and adapted to be manually manipulated by a foot of the user to control water flow from said first flexible tube;
- a second flexible tube matingly coupled at one end thereof to said water control means opposite of said first flexible tube; and
- a T-coupler adapted to be secured mesial a shower head and a water supply pipe, where the opposite end of said second flexible tube is removably coupled to said T-coupler to supply water to said shower head.

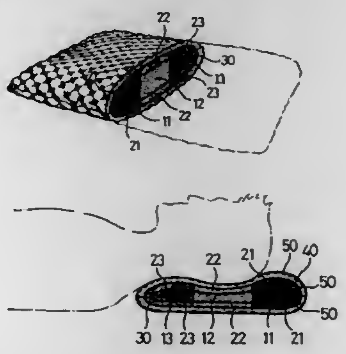
5,689,844
PILLOW

Hsin-Cheng Liu, No. 10-2. Wu Lin St., Shu Lin Chen, Taipei Hsien, Taiwan

Filed Jan. 28, 1997, Ser. No. 790,337

Int. Cl.^{6} A47G *9/02*

U.S. Cl. 5—636 **2 Claims**



1. A pillow having multiple layers comprising:
- an inner core integrally made from three different materials, comprising high elastic foam, soft foam and middle elastic foam, said inner core having a corrugated ridge surface thereof;
- at least an intermediate layer enclosing said inner core, said intermediate layer being made from three different materials, comprising high elastic foam, soft foam and middle elastic foam, said intermediate layer having a smooth inner surface and a corrugated outer surface; and
- a surface layer enclosing said intermediate layer which encloses said inner core, said surface layer being made from soft material and having a smooth inner surface and a corrugated outer surface;
- wherein a plurality of air gaps are formed by the interference fit between said corrugated outer surface and smooth inner surface of two adjacent layers.

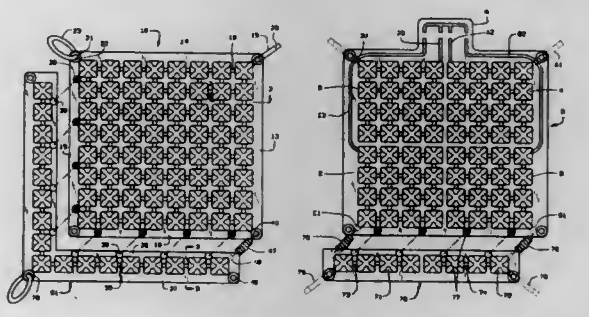
5,689,845
EXPANSIBLE AIR CELL CUSHION

Richard F. Sobieralski, St. Clair County, Ill., assignor to Roho, Inc., Belleville, Ill.

Filed Apr. 17, 1996, Ser. No. 633,463

Int. Cl.^{6} A47C *27/10*

U.S. Cl. 5—654 **25 Claims**



1. In a base cushion which comprises a base section and a top section bonded thereto, the top section having an array of upstanding inflatable flexible air cells, some of which are interconnected so that those interconnected air cells are at the same air pressure, and an independent fill nozzle for said air cells, the improvement comprising an add-on segment comprising a base section and a top section bonded thereto, the top section having upstanding flexible inflatable air cells, means for physically attaching the add-on segment to the base cushion along one or more peripheral edges, a conduit on the exterior of the base cushion pneumatically connected to the array of air cells, a second conduit on the exterior of the add-on segment and alignable with the base cushion conduit, and a connector positioned between and pneumatically connected to the said conduits on the exteriors of the air cells to pneumatically connect the base cushion air cell array to the add-on air cells.

5,689,846
LAUNDRY MACHINE WATER FLOW CONTROL

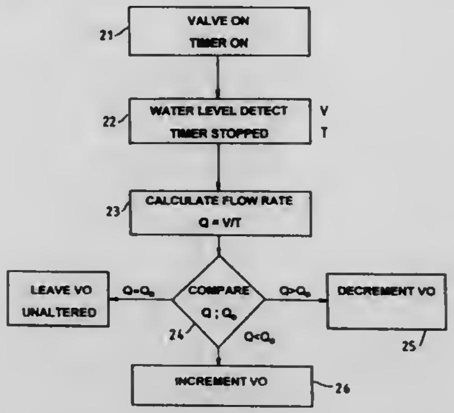
Neil Gordon Cheyne, and Jonathan David Harwood, both of Anckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Jul. 25, 1996, Ser. No. 686,380

Claims priority, application New Zealand, Jul. 26, 1995, 272650

Int. Cl.^{6} D06F *33/02;39/08*

U.S. Cl. 008—158 **4 Claims**



1. A method of adaptively controlling the flow rate of water into a laundry machine to a desired flow rate, said laundry machine having a wash cycle which includes at least one rinse phase, a proportional valve which determines the flow rate of cold water entering the machine and a controller which controls the operation of said machine including the opening and closing of said valve, said controller storing a value which determines the degree of opening of said valve to be used for admitting water into the machine during non-immersion rinse phases, wherein said method comprises:
- at an appropriate point in the wash cycle causing the controller to open said valve to an open position which corresponds to said stored value,
- allowing the machine to fill to or past a predetermined water level,
- measuring the time taken for the machine to fill to said predetermined level,
- calculating the flow rate of water passing through said valve from the measured time and the known volume at said predetermined level,
- comparing the calculated flow rate with said desired flow rate,
- and updating said stored value which determines the degree of opening of said value by

(a) decrementing said value by a predetermined amount if the calculated rate exceeds the desired rate, or (b) incrementing said value by a predetermined amount if the calculated rate is less than the desired rate, or (c) leaving said stored value unaffected if the calculated rate is substantially the same as the desired rate.

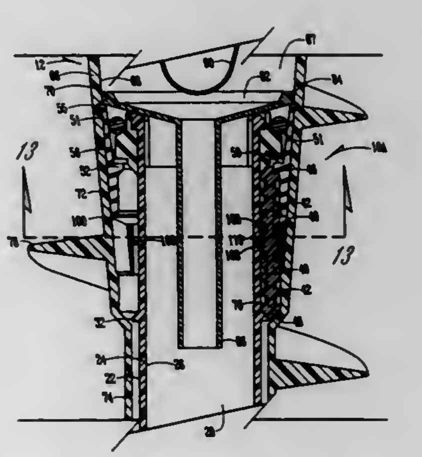
5,689,847
DOUBLE ACTION AGITATOR ASSEMBLY WITH AUGER WHEN NEEDED

Curtis J. Tremel; Craig M. Thies, and Michael D. Lafrenz, all of Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa

Continuation-in-part of Ser. No. 563,670, Nov. 28, 1995, Pat. No. 5,611,221. This application Aug. 16, 1996, Ser. No. 698,953

Int. Cl.^{6} D06F *17/08;17/10*

U.S. Cl. 8—159 **12 Claims**



1. An agitator assembly for a washing machine, comprising:
- an agitator body having an elongated barrel and being adapted for oscillating rotation;
- an auger body mounted on the barrel of the agitator body and having auger flighting thereon;
- a plurality of bearings between the agitator body and auger body to permit rotational movement of the auger body relative to the agitator body; and
- a friction ring between the bearings and the auger body to increase friction therebetween, such that the auger body oscillates with the agitator body until the friction is overcome, where after the auger body rotates relative to the agitator body.

7. A method of providing an augering action to a fabric load in a washing machine only when the augering action is needed to circulate the fabric load in a wash solution, the method comprising:
- mounting an auger upon an agitator in the washing machine;
- providing bearings between the auger and agitator such that the auger is rotatable relative to the auger;
- applying internal friction between the auger and agitator such that the auger oscillates with the agitator, and whereby the auger will rotate relative to the auger only when the fabric load exerts a force on the auger greater than the internal friction.

5,689,848
METHOD AND APPARATUS FOR DRY CLEANING TEXTILES

Hans-Udo Saal, and Ralf Mathias Saal, both of Bad Honnef, Germany, assignors to SATEC GmbH, Reinbreitbach, Germany

Filed Oct. 4, 1996, Ser. No. 726,383

Claims priority, application European Pat. Off., Nov. 5, 1995, 95115725; Nov. 7, 1995, 95117536

Int. Cl.^{6} D06B *23/20*

U.S. Cl. 8—159 **20 Claims**

1. Method for dry cleaning textiles comprising the steps of:
- washing said textiles with a solvent;
- drying said textiles using hot air;
- continuously measuring throughout the whole of said drying of said textiles, a concentration level of said solvent;

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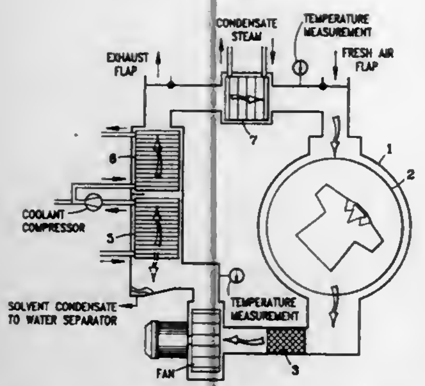


measuring continuously throughout the whole of said drying of said textiles, a temperature of said drying hot air;

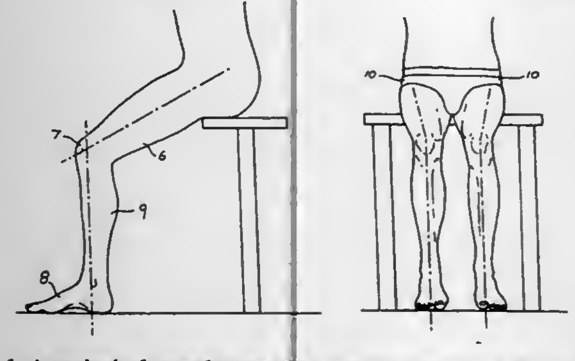
processing in a computer said measured concentration level of said solvent and said measured temperature of said drying hot air;

continuously controlling throughout the whole of said drying of said textiles, based upon said computer processing of said concentration level and said temperature, said temperature level of said drying hot air, said continuous controlling being a function of a relationship between said concentration level, acting as a pilot value, and temperature along a characteristic and to be not more than a predetermined highest temperature;

controlling continuously throughout the whole of said drying of said textiles said concentration level of said solvent, said controlling continuously being a function of said relationship between said concentration level, acting as said pilot value, and said temperature along said characteristic and to be not more than a predetermined highest concentration level; and

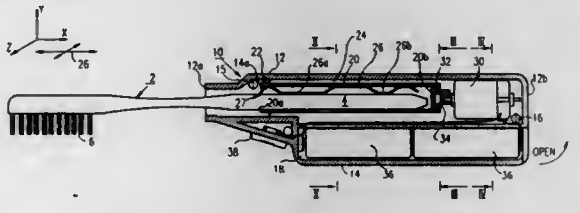
recovering said solvent after condensation.

5,689,849
BIO MECHANICAL CORRECTIVE DEVICES
Robert Charles, 49a Stephens Terrace, St. Peters, South Australia, Australia, 5069
PCT No. PCT/AU95/00004, § 371 Date Mar. 7, 1996, § 102(e) Date Mar. 7, 1996, PCT Pub. No. WO95/31161, PCT Pub. Date Nov. 23, 1995
PCT Filed Jan. 6, 1995, Ser. No. 605,039
Claims priority, application Australia, May 12, 1994, 651550
Int. Cl.⁶ A43D *7/14*
U.S. Cl. 12—146 M **6 Claims**



1. A method of manufacture of an orthotic comprising the steps of:
- taking an imprint of the foot;
- making a positive cast of the foot from the imprint;
- measuring angles of contact of the cast to determine the degree of forefoot roll and heel roll;
- forming the orthotic by moulding material to the cast;
- shaping the underside of the orthotic by angling the heel and forefoot regions to correct heel roll and forefoot roll of the foot; and
- detaching the orthotic from the cast, wherein the step of taking the imprint of the foot includes
- having a subject seated at a height such that the leg is bent at the knee at an angle of knee flexion of greater than 90 degrees with the foot contacting the ground,
- positioning the knee whereby the knee is facing forward in the sagittal plane, as determined by moving the knee through its normal range of movement, which will position the upper leg in correct alignment with respect to the hip and torso,
- positioning the lower leg vertically, the heel directly below the knee from a side on view, with both feet straight ahead and parallel with respect to one another, and
- positioning the ankle join in correct alignment as determined visually.

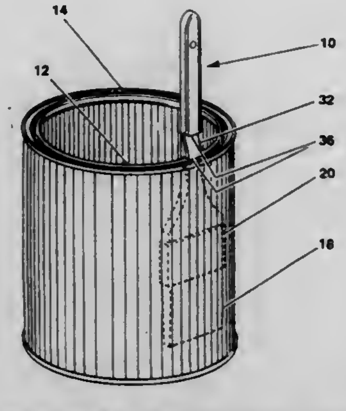
5,689,850
ACCESSORY DEVICE FOR TOOTHBRUSHES
Avraham Shekalim, Nesher, Israel, assignor to Eureka Technologies Innovation Engineering (1987) Ltd., Migdal, Israel
Filed Dec. 27, 1995, Ser. No. 579,099
Claims priority, application Israel, Dec. 30, 1994, 112207
Int. Cl.⁶ A46B *17/00*
U.S. Cl. 15—22.1 **12 Claims**



1. An accessory device for use with a toothbrush having a handle at one end and bristles at the opposite end, said device comprising:
- a housing grippable by a user's hand and having a longitudinal axis;
- a holder mounted by a pivotal mounting within the housing and having a longitudinal axis parallel to the longitudinal axis of the housing, said holder having an open end for removably receiving the handle of a toothbrush with the bristles of the toothbrush projecting externally of the housing;
- a leaf spring secured at one end to the holder adjacent to the open end of the holder and extending within the holder parallel to the longitudinal axis of the holder, said leaf spring being formed with a deformable projection extending inwardly of the holder and engageable with the handle of a toothbrush when inserted into the open end of the holder, the opposite end of the leaf spring being unsecured so as to slidably engage the inner surface of the holder;
- and a drive carried by said housing and coupled to said holder for cyclically pivotting said holder and the toothbrush held thereby.

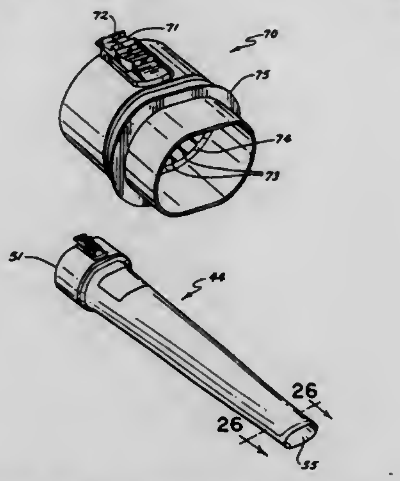
5,689,851
UNITARY HANDLE-HANGER
Norman H. de Sevren Jacquet, 20538 Barnard Ave., Walnut, Calif. 91789
Filed Oct. 24, 1996, Ser. No. 736,397
Int. Cl.⁶ A46B *15/00*
U.S. Cl. 15—159.1 **18 Claims**

1. A paint brush adapted to be supported on an inner sealing flange of a paint can, said brush comprising:
- (a) a brush body including an elongated handle having opposite first and second ends and an enlarged heel portion located at one of said ends, said heel portion including a plurality of bristles projecting therefrom, the brush having a front and a back side coinciding with the length of said enlarged heel portion;



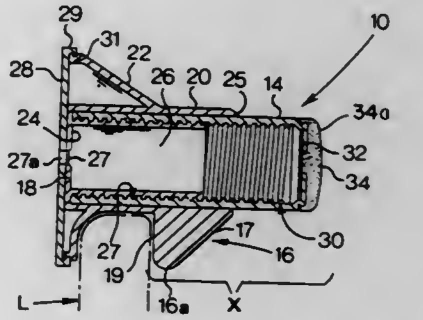
- (b) at least two recesses integrally formed in said body on one of said sides and located at spaced locations therealong, each of said recesses comprising a substantially flat portion extending toward said bristles and oriented at an acute angle with respect to the longitudinal axis of the handle, each of said recesses further having an upper portion thereof formed with a lip adjacent a substantially concave surface which extends downwardly in the general direction of the bristles; and
- (c) said recesses permitting the paint brush to be selectively supported at different distances with respect to a bottom of the paint can, each of the recesses further being configured so that they are adapted to contact the inner sealing flange at two points coinciding with an upper and a lower portion of the inner sealing flange.

5,689,852
PORTABLE BLOWER/VAC
Steven J. Svoboda, Bloomington, and Dean R. Toensing, Minnetonka, both of Minn., assignors to The Toro Company, Bloomington, Minn.
Division of Ser. No. 434,728, May 4, 1995, Pat. No. 5,560,078.
This application Mar. 21, 1996, Ser. No. 621,265
Int. Cl.⁶ A47L *5/14*
U.S. Cl. 15—405 **10 Claims**



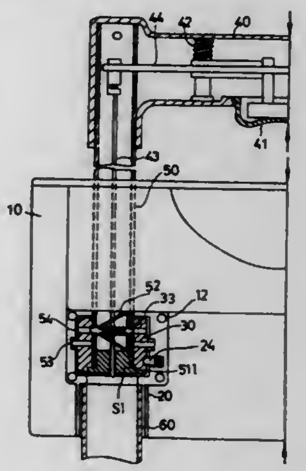
1. A convertible electric blower/vacuum comprising:
- (a) a housing, the housing including an air inlet opening and a housing outlet;
- (b) a blower tube comprising:
  - (i) an upstream end removably engageable with the housing outlet;
  - (ii) a downstream end; and
  - (iii) a plurality of longitudinal ribs extending along an internal surface of the blower tube from the upstream end toward the downstream end wherein the ribs engage the housing outlet when the blower tube is engaged over the housing outlet.

5,689,853
CLOSURE MEMBER RESTRAINING DEVICE
Hermanus Johannes Richard Lemmer, Pretoria, South Africa, assignor to Vector Designs (Proprietary) Limited, Sandton, South Africa
Filed Aug. 22, 1995, Ser. No. 517,627
Int. Cl.⁶ E05F *5/02*
U.S. Cl. 16—82 **21 Claims**



1. A closure restraining device for restraining a closure member having a handle formation thereon, the device comprising:
- a body mountable on a support surface adjacent the closure member;
- a buffer extending forwardly from the body and including a stop surface facing in a forward direction to stop the closure member at a predetermined distance from the support surface when it is opened; and
- a catch including a restraining surface engageable with a handle formation on the closure member, the restraining surface spaced rearwardly from the stop surface, the buffer and the catch being mounted for movement relative to one another to establish relative positions of adjustment between the catch and the stop surface to compensate for variations in the distance between the handle formation and the closure member, so that when the closure member is opened towards the support surface, the handle formation is engaged automatically by the catch and the buffer abuts the opened closure member, the buffer and catch being fixedly held in the respective relative positions.

5,689,854
ROTATABLE HANDLE ASSEMBLY FOR A SUITCASE
Jing Sheng Wang, No. 569, Ging Guo Road, Da Gia Town, Taichung Hsien, Taiwan
Filed Jul. 1, 1996, Ser. No. 672,974
Int. Cl.⁶ A47B *95/02*
U.S. Cl. 16—115 **7 Claims**



1. A rotatable handle assembly for a suitcase, said handle assembly comprising:

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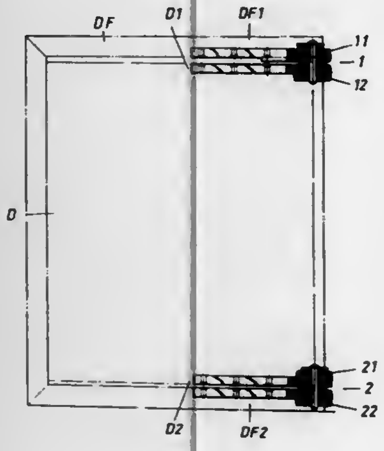
a housing for engaging in the suitcase, said housing including a room formed therein and including a pair of casings formed therein, said casings each including a chamber formed therein,
a pair of barrels rotatably received in said chambers of said casings, said barrels each including an orifice formed therein,
a pair of tubes slidably received in said room, said tubes each including a lower portion slidably engaged through said orifice of said barrel so as to allow said tube to be rotated in concert with said barrel, and
a handle secured on top of said tubes for operating said tubes;
said casings each including a conduit extended downward therefrom for receiving said tube, said tube and said barrel being allowed to rotate relative to said casing when said lower portion of said tube is disengaged from said conduit and when said lower portion of said tube is received in said barrel.

5,689,855

DOOR HINGE STRUCTURE

Jung-Chuan Tang, Yun Lin Shiann, Taiwan, assignor to Chuan Mau Products Co., Ltd., Yun Lin Shiann, Taiwan
Filed Dec. 12, 1996, Ser. No. 766,221
Int. Cl.⁶ E05D *7/04*
U.S. Cl. 16—235 **4 Claims**

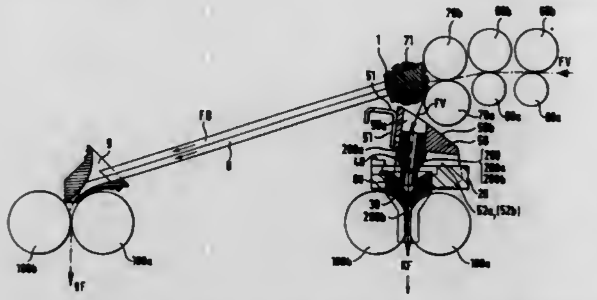


1. A door hinge structure comprising a first door hinge and a second door hinge connected between a door panel and a door frame at different elevations, for permitting the door panel to be turned relative to the door frame, wherein:
said first door hinge comprises a first leaf having a flat leaf body at one end and a leaf base at an opposite end, the leaf body of the first leaf of said first door hinge having a plurality of screw holes adapted for fastening to the door frame, the leaf base of the first leaf of said first door hinge having one end obliquely connected to the leaf body of the first leaf of said first door hinge, and an opposite end terminating in a half-round portion, the half-round portion of the first leaf of said first door hinge having a vertically disposed eccentric hole and a horizontal screw hole perpendicularly disposed in communication with the eccentric hole; a first bushing mounted within the eccentric hole of the first leaf of said first door hinge and having an eccentric through hole; a first tightening up screw threaded into the horizontal screw hole of the first leaf of said first door hinge to fix the first bushing of said first door hinge in place; a second leaf having a flat leaf body at one end and a leaf base at an opposite end, the leaf body of the second leaf of said first door hinge having a plurality of screw holes adapted for fastening to the door panel, the leaf base of the second leaf of said first door hinge having one end obliquely connected to the leaf body of the second leaf of said first door hinge; and an opposite end terminating in a half-round portion, the half-round portion of the second leaf of said first door hinge having a vertically disposed eccentric hole and a horizontal screw hole perpendicularly disposed in communication with the eccentric hole; a second bushing mounted within the eccentric hole of the second leaf of said first door hinge and having an eccentric through hole; a second tightening up screw threaded into the horizontal screw hole of the second leaf of said first door hinge to fix the second bushing of said first door hinge in place; and a pivot pin fastened to the eccentric through holes of the first bushing and second bushing of said first door hinge to secure the first leaf and second leaf of said first door hinge together, permitting them to be turned relative to each other;
said second door hinge comprises a first leaf having a flat leaf body at one end and a leaf base at an opposite end, the leaf body of the first leaf of said second door hinge having a plurality of screw holes adapted for fastening to the door panel, the leaf base of the first leaf of said second door hinge having one end obliquely connected to the leaf body of the first leaf of said second door hinge, and an opposite end terminating in a half-round portion, the half-round portion of the first leaf of said second door hinge having a vertically disposed eccentric hole and a horizontal screw hole perpendicularly disposed in communication with the eccentric hole; a first bushing mounted within the eccentric hole of the first leaf of said second door hinge and having an eccentric through hole; a first tightening up screw threaded into the horizontal screw hole of the first leaf of said second door hinge to fix the first bushing of said second door hinge in place; a second leaf having a flat leaf body at one end and a leaf base at an opposite end, the leaf body of the second leaf of said second door hinge having a plurality of screw holes adapted for fastening to the door frame, the leaf base of the second leaf of said second door hinge having one end connected to the leaf body of the second leaf of said second door hinge at an angle, and an opposite end terminating in a half-round portion, the half-round portion of the second leaf of said second door hinge having a vertically disposed eccentric hole and a horizontal screw hole perpendicularly disposed in communication with tile eccentric hole; a second bushing mounted within the eccentric hole of the second leaf of said second door hinge and having an eccentric through hole; a second tightening up screw threaded into the horizontal screw hole of the second leaf of said second door hinge to fix the second bushing of said second door hinge in place; and a pivot pin fastened to the eccentric through holes of the first bushing and second bushing of said second door hinge to secure the first leaf and second leaf of said second door hinge together, permitting them to be turned relative to each other.

5,689,856

SWIVELING FLEECE FUNNEL FOR FIBER SLIVER GUIDANCE WITHOUT GUIDING CHANNEL AND PROCESS FOR THE OPERATION OF SAME

Alfred Nauthe, Böhmfeld, and Wolfgang Göhler, Lenting, both of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany
Filed Mar. 27, 1996, Ser. No. 622,211
Claims priority, application Germany, Apr. 19, 1995, 295 06 107.3; Jul. 19, 1995, 295 11 918.7; Sep. 19, 1995, 195 35 347.1
Int. Cl.⁶ D01H *5/72;13/04;* **D01G** *15/46*
U.S. Cl. 19—157 **14 Claims**



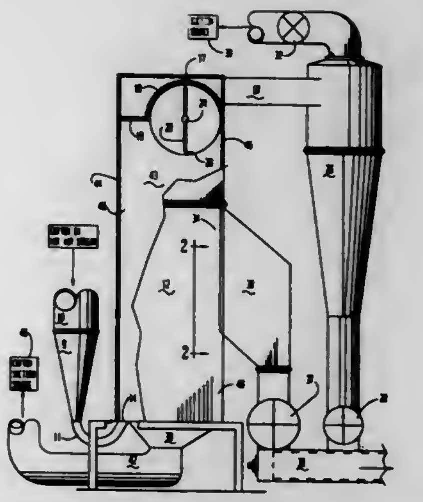
1. A fiber sliver guidance system for a textile machine drafting equipment wherein a fiber sliver is drafted by pairs of drafting rollers and conveyed by a pair of delivery rollers to a calendar device, said guidance system disposed between said delivery rollers and said calendar device and comprising:
a plurality of interconnected nozzle inserts defining an essentially air tight conveying channel between said delivery rollers and said calendar device, said channel having an axis defined by two axial segments which can be angled relative to each other;
at least one of said nozzle inserts being articulatable relative to said other nozzle inserts about a swivel axis, said articulatable nozzle insert defining one of said axial segments; and
wherein said articulatable nozzle swivels automatically from an operating position to a closed position upon a back up of fiber fleece in said fiber sliver channel, in said closed position said articulatable nozzle deflects said fiber fleece still produced by said drafting equipment from an operating conveying path through said fiber sliver channel to an area so as to keep said drafting equipment operationally unblocked.

5,689,857

AIR CUSHION CLEANER

Laurence O. Miller, Vernon, Tex., assignor to Kinlau Sheet Metal Works, Inc., Vernon, Tex.
Filed Jun. 5, 1996, Ser. No. 658,408
Int. Cl.⁶ D01B *1/00;* **D01G** *9/08*
U.S. Cl. 19—200 **15 Claims**

1. An air cushion cleaner for seed cotton comprising:
a) a vessel having a top, a bottom, and four panels extending from top to bottom, the vessel having a height, thickness and width, and is defined by an upper portion and a lower portion,
b) a distance from the top to bottom being the height,
c) a front panel and a back panel being two of the four panels, with a distance from the front to the back panel being the thickness,
d) two side panels being two of the four panels with a distance between the side panels being the width,
e) a cleaning chamber between the top, bottom, and four panels,
f) a screen at the upper portion of the vessel said screen defining a top of the cleaning chamber,

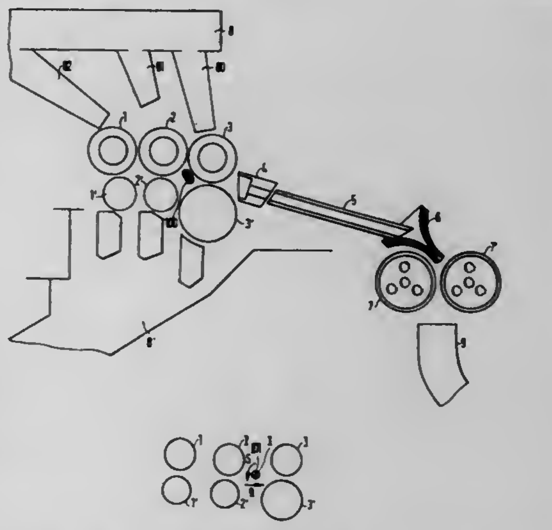


g) an inlet in the bottom portions of the front panel angled away from vertical upward toward the back panel,
h) inlet means connected to the inlet for blowing seed cotton carried in an air stream into the chamber,
I) a grate in the back panel,
j) a trash collector attached outside the chamber to the back panel,
k) a seed cotton outlet below the bottom,
l) a conveyor means connected to the cotton outlet for moving seed cotton from the chamber,
m) a dirty air outlet above the top, and
n) a dirty air duct means connected the dirty air outlet for moving at least a portion of the air from the inlet means from the chamber.

5,689,858

COMPRESSION BAR FOR A TEXTILE MACHINE DRAFTING DEVICE

Friedrich Hauner, Ingolstadt, and Alfons Zehndbauer, Wettstetten, both of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany
Continuation of Ser. No. 164,482, Dec. 9, 1993, abandoned.
This application Mar. 18, 1996, Ser. No. 617,262
Claims priority, application Germany, Dec. 17, 1992, 42 42 722.3
Int. Cl.⁶ D01H *5/60*
U.S. Cl. 19—262 **3 Claims**



1. A drafting device for drafting a textile fiber silver, said device comprising:

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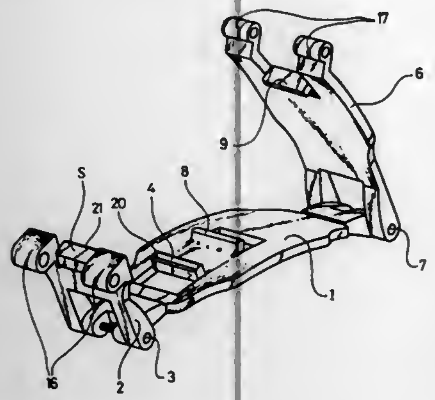
- a first set of drafting rollers and a second set of drafting rollers disposed directly adjacent and downstream from said first set of drafting rollers in a conveying path of said fiber silver;
- a main drafting zone defined directly between said first and second sets of drafting rollers having a width corresponding essentially to the width of said drafting rollers wherein said fiber silver is conveyed between said sets of drafting rollers and drafted by said directly adjacent sets of drafting rollers in said main drafting zone; and
- a compression bar having a substantially circular cross-section operably disposed between said directly adjacent sets of drafting rollers across said width of said main drafting zone, said compression bar disposed above said conveying path of said fiber silver and rotatable about a longitudinal axis through said compression bar to reduce contamination on said compression bar.

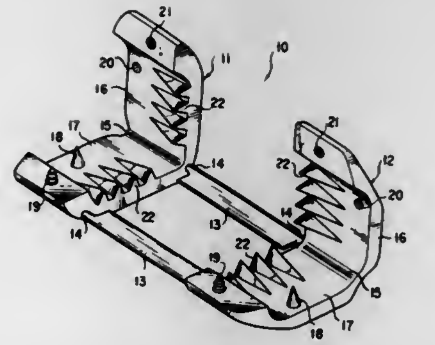
5,689,859
BRACELET CLASP WITH UNFOLDING BUCKLE
Cyril Cuche, Bienne, Switzerland, assignor to SMH Management Services AG, Biel, Switzerland
Filed Jun. 14, 1996, Ser. No. 663,927
Claims priority, application France, Jun. 15, 1995, 95 07145
Int. Cl.^{6} A44B *11/00*
U.S. Cl. 24—71 J **7 Claims**



1. A bracelet clasp with an unfolding buckle for receiving a first and a second bracelet strand, said clasp comprising a base plate on which at least a first hinged plate is capable of being folded, said base plate and said first hinged plate having first ends attached to each other by means of a first hinge and second ends connected to the first and second strands, respectively, said base plate and said first hinged plate comprising a catch device enabling them to catch onto each other in a closed position, said catch device comprising a first tongue emerging from the base plate and a second tongue emerging from the first hinged plate, said first and second tongues being back to back and head to tail when they are in said closed position in order to block the base plate and the first hinged plate in said closed position.

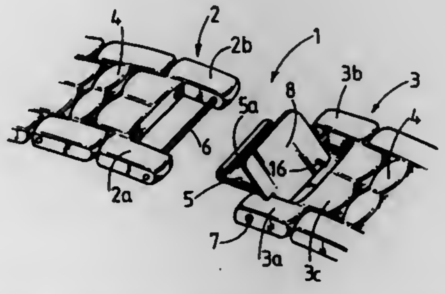
5,689,860
COUPLER FOR ELONGATE ARTICLE
Hiroshi Matoba, Toyama; Yoshinobu Takahashi, Uozu; Ryukichi Murai, Toyama, and Hirokazu Watanabe, Kurobe, all of Japan, assignors to YKK Corporation, Tokyo, Japan
Filed Jun. 19, 1996, Ser. No. 667,231
Claims priority, application Japan, Jun. 22, 1995, 7-180894
Int. Cl.^{6} A44B *21/00*
U.S. Cl. 24—115 F **10 Claims**

1. An elongate article coupler comprising:
- a pair of fitting parts each for retaining an end part of an elongate article; and



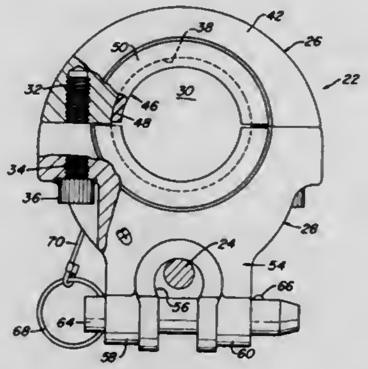
- a pair of connecting part disposed between said fitting parts and adapted to interconnect said fitting parts, each of the connecting parts having a breaking part adapted to be broken under a tension exceeding a prescribed level;
- ,wherein each of said fitting parts comprises an upper member and a lower member, each member having an aligned cavity extending from one end to the other end thereof, said upper member and said lower member closable together to engage the respective end part of the elongate article.

5,689,861
STRAP CLASP
Maurice Petignat, La Chaux-De-Fonds, Switzerland, assignor to Etablissements Sarran S.A., France
PCT No. PCT/IB95/00194, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO95/25447, PCT Pub. Date Sep. 28, 1995
PCT Filed Mar. 21, 1995, Ser. No. 714,088
Claims priority, application Switzerland, Mar. 22, 1994, 860/94
Int. Cl.^{6} A44C *5/20*
U.S. Cl. 24—265 WS **4 Claims**



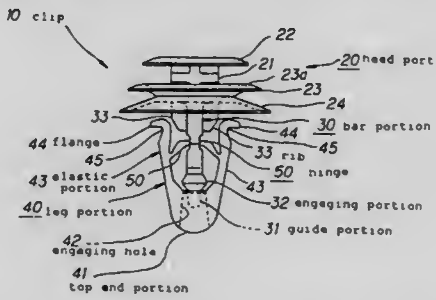
1. A strap clasp movable between an open and a closed position comprising, the clasp having a longitudinal axis, a locking member articulated around an articulation shaft which is positioned transverse to the longitudinal axis of the clasp, said locking member movable between a first turned up rest position and a second turned down working position, the locking member maintaining the clasp in its closed position when the locking member is in said working position, the locking member being operable to effect a translation movement parallel to said articulation shaft, a resilient return member associated with said locking member for said translation movement, said return member urging upon the locking member to maintain the locking member in said working position, said articulation shaft including a section of non-circular cross-sectional configuration, the locking member including a passageway for receiving said articulation shaft, said passageway having an ending portion of cross-sectional configuration which is substantially the same as the non-circular cross sectional configuration of the articulation shaft, whereby the ending portion of the passageway is engaged by the non-circular section of the articulation shaft when the locking member is in said working position.

5,689,862
SAFETY CLAMP
Glenn P. Hayes, Bedford, and Mark D. Matzner, Burleson, both of Tex., assignors to SPM, Inc., Fort Worth, Tex.
Filed May 2, 1996, Ser. No. 643,239
Int. Cl.^{6} A44B *11/25*
U.S. Cl. 24—284 **14 Claims**



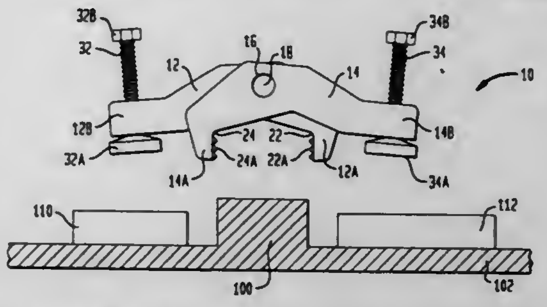
1. A safety device for a high-pressure flow line formed from sections of pipes that are coupled together, the device comprising:
- a pipe clamp formed into two halves that are configured to couple together about one of the pipe sections, the two halves of the clamp each having a recess configured to correspond to the exterior shape of said one of the pipe sections so that said one of the pipe sections is securely held between the two halves when coupled together, and wherein there are two insert grooves each formed on opposite sides of each half of the clamp adjacent to the recess;
- a cable for positioning generally along the length of the flow line;
- a cable engagement portion joined to one of the two halves, the cable engagement portion having a slot formed therein for receiving the cable, the engagement portion also having a bore generally transverse in relation to the slot; and
- a removable slot closure for retaining the cable within the slot, the slot closure including a pin that is passed through the bore of the engagement portion to close off the slot so that the cable is retained therein.

5,689,863
CLIP
Nobuya Sinozaki, Yokohama, Japan, assignor to Kabushiki Kaisha Piolax, Yokohama, Japan
Filed Mar. 29, 1996, Ser. No. 623,797
Claims priority, application Japan, Mar. 30, 1995, 7-073552
Int. Cl.^{6} A44B *17/00*; F16B *13/04;21/00*
U.S. Cl. 24—297 **4 Claims**



1. A clip for fastening an attachment to the surface of a plate comprising:
- a head portion stopping above the plate and being capable of fixing said attachment to said plate;
- a bar portion elongating from said head portion; and
- a leg portion, for engaging with a mounting hole formed on said plate,
  - said leg portion having a top end portion formed with an engaging hole for guiding the end side of said bar portion and at least a pair of elastic portions elongating from said top end portion toward said head portion,
  - said elastic portions being separated from each other by said bar portion,
  - said respective elastic portions being connected to said bar portion at a middle portion thereof by hinges capable of moving so as to widen said each elastic portion only when the bar portion is forced and moved axially into the inside of the leg portion, and
  - the end side of said bar portion being formed with an engaging portion which is forced into said engaging hole of the top end portion only when the bar portion is forced into the inside of the leg portion.

5,689,864
RIB CLAMP
James G. White, Bristol, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 3, 1997, Ser. No. 810,203
Int. Cl.^{6} A44B *21/00*
U.S. Cl. 24—514 **20 Claims**



1. A clamp which secures an object against a structure adjacent a rib of said structure, said clamp comprising:
- a first lever arm;
- a second lever arm pivotally coupled to said first lever arm at a pivot point wherein a portion of said first lever arm extends beyond said pivot point to form a first jaw and a portion of said second lever arm extends beyond said pivot point to form a second jaw opposing said first jaw;
- a first jack resting atop said object and coupled to said first lever arm wherein said pivot point is between said first jaw and said first jack, said first jack moving said first lever arm about said pivot point wherein said first jack applies pressure to said object to secure said object against said structure as said first jaw engages a first side of said rib; and
- a second jack resting atop said structure and coupled to said second lever arm wherein said pivot point is between said second jaw and said second jack, said second jack moving said second lever arm about said pivot point wherein said second jack applies pressure to said structure as said second jaw engages a second side of said rib opposite said first side of said rib.

5,689,865
CLAMPING DEVICE
Russell M. Weber, III, 1022 Gimblin St., St. Louis, Mo. 63147
Continuation of Ser. No. 347,507, Nov. 30, 1994, abandoned. This application Jun. 3, 1996, Ser. No. 656,706
Int. Cl.^{6} A44B *21/00*
U.S. Cl. 24—523 **2 Claims**

1. A clamp assembly for retaining a towel or similar non-rigid article said assembly comprising, in combination:

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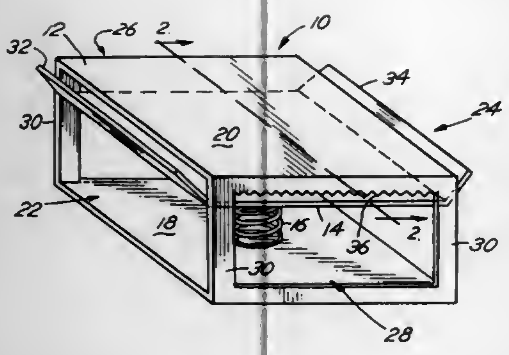


a) a housing having first and second opposed, generally rectangular, parallel spaced housing plates, said plates being substantially congruent and having a substantially identical length and width, said plates having four comers, said plates being connected one to the other at each of the comers by a connecting spacer at each corner to thereby define lateral openings between the plates along every side thereof so as to provide first and second pairs of opposed openings, the first one of said pair of opposed openings along the length edges of the opposed spaced plates including depending gripping serrations extending from an edge of said first plate toward the other, second spaced plate;

b) a pressure plate having a generally rectangular shape and defined by a length and width, the length being greater than the length of the housing plate length and the width being less than the housing plate width, said pressure plate defining a plane and being positioned intermediate the housing plates and generally parallel to said housing plates, said pressure plate retained along its width between the housing plates by the corner spacers, said serrations extending over the side of the pressure plate along its width;

c) a compression spring positioned between the second one of the housing plates and the pressure plate for biasing the pressure plate to the other, first housing plate and in a direction toward the serrations on the other, first housing plate, said spring positioned generally at the mid-point of the plates; and

d) said pressure plate including tabs integrally formed across the width and at the opposite sides of the length dimension of the pressure plate, said tabs extending upwardly from the plane of the pressure plate toward the first pressure plate and positioned for manual actuation and movement of the pressure plate against the force of the spring whereby an article may be positioned between the pressure plate and the first housing plate except for the upwardly-extending tabs and the serrations.

5,689,866
PLASTIC ZIPPER

Juichi Kasai, Tokyo; Yoshihiro Tomomoto, Osaka, and Osamu Uemura, Kanagawa, all of Japan, assignors to Showa High-polymer Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1996, Ser. No. 720,570

Claims priority, application Japan, May 30, 1995, 7-155445

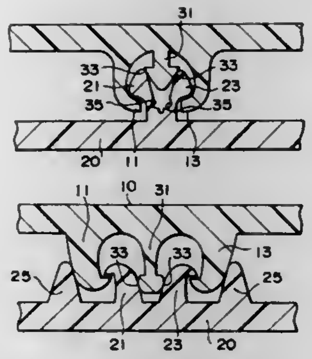
Int. Cl.⁶ B65D *33/00*

U.S. Cl. 24—587 **10 Claims**

1. A plastic zipper, comprising: a pair of female hooks (**11, 13**) and a pair of male hooks (**21, 23**) formed on the surface of respective plastic films (**10, 20**),

wherein an inside of the female hooks and an inside of the male hooks are engaged with each other to form a sealing section independent of a locking section which comprises a pair of female and male hooks of said zipper,

wherein the sealing section is formed between a groove-like tightening wall provided inside of the hooks on one side of the locking section and a pressing rib provided inside of the hooks on another, opposite side thereof,



wherein a section of the tightening wall inside of the hooks is shaped like a continuous groove which is narrower downward and wider upward, and

wherein the pressing rib and a surface of the tightening wall come in line contact to form the sealing section.

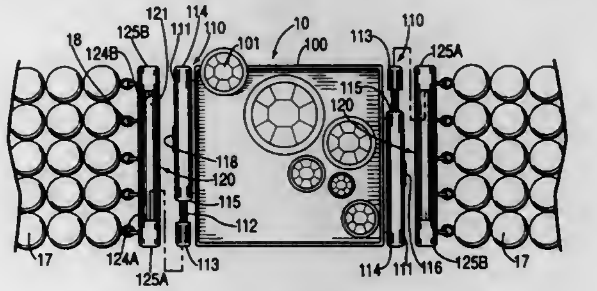
5,689,867
INTERCHANGEABLE CLASP

Teresa Katz, 153 W. 93rd St., New York, N.Y. 10025

Filed Sep. 30, 1996, Ser. No. 724,604

Int. Cl.⁶ A44B *17/00;* **A44C** *5/14*

U.S. Cl. 24—589 **6 Claims**



1. An interchangeable clasp comprising:

a clasp body; and

a plurality of connecting elements attached to said clasp body, said connecting elements selected from the group consisting of a connector member and a receiving recess, said connector member comprising

a hollow cylindrical sleeve having one closed end and one open end,

a rigid rod having a proximal end slidably mounted within said hollow cylindrical sleeve, and an opposite distal end extending through said open end, and

biasing means for biasing said distal end of said rigid rod toward a distal position and allowing for movement of said rigid rod between a proximal and a distal position relative to said hollow cylindrical sleeve, and

said receiving recess being cylindrical in dimension, having an opening to its exterior, and having a cap at each of its opposite ends for removably engaging said connector member when inserted through said opening and within said caps.

5,689,868
SPRINGLESS CLASP FOR WATCHBAND OR BRACELET

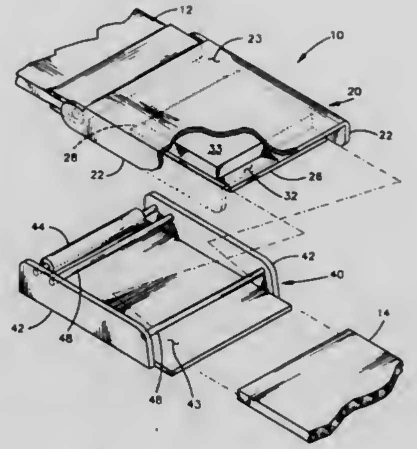
György Hartmann, Klopka u. 79, H-2084 Pilisszentiván, Hungary

Filed Jul. 15, 1996, Ser. No. 680,036

Int. Cl.⁶ A44C *5/20*

U.S. Cl. 24—685 **9 Claims**

1. A closure for connecting a first and a second free end of a band as might be used as a strap on a wrist watch wherein in use



said closure is maintained in tension by hoop stresses imposed on the band by the banded object, said closure comprising:

a. a first clasp element adapted for attachment to said first free end, said first free end applying a first tension to said first clasp element, and having a first hook member and a second, oppositely-directed and shorter hook member, the opening of said shorter hook member being directed in the direction of said first tension; and

b. a separable second clasp element adapted for attachment to said second free end, said second free end applying a second tension to said second clasp element in a direction opposite that of said first tension, and having a first hook-engaging member for slidably and releasably engaging said first hook member and, longitudinally spaced away from said first hook-engaging member, a second hook-engaging member for slidably and releasably engaging said second hook member, such hook-engaging members disposed in such positions that the engagement of both hook members with their respective hook-engaging members is possible only by first engaging said first hook member with the corresponding first hook-engaging member; sliding said first hook-engaging member deep into the throat of said first hook member, then engaging said second hook member with said second hook-receiving member while partially disengaging said first hook-engaging member from said first hook member,

wherein one said clasp element comprises opposing side walls joined by a top wall, thereby forming a cover that provides a smooth and neat appearance as it engages the second said clasp element and wherein said opposing tensions acting through said first and second clasp elements maintain complete engagement of said second hook while the partial engagement of said first hook maintains said first and second elements in close alignment.

5,689,869
HANDLE FOR A CASKET SHELL

John E. Linville, Batesville, Ind.; Dennis C. Laphan, Cincinnati, Ohio, and Anthony S. Casablanca, Batesville, Ind., assignors to Batesville Casket Company, Inc., Batesville, Ind.

Filed Mar. 28, 1996, Ser. No. 620,113

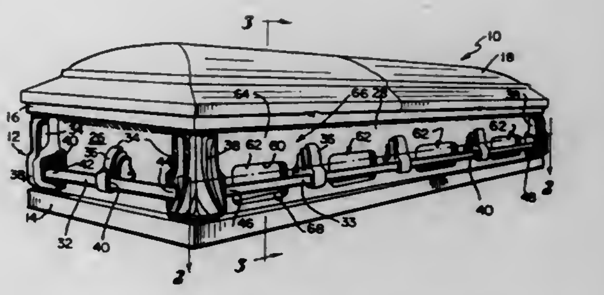
Int. Cl.⁶ A61G *17/00*

U.S. Cl. 27—2 **38 Claims**

1. A casket comprising

a bar, and

a casket shell spaced apart from the bar and including a side panel having an outwardly-facing side surface fixed relative to the bar, the side surface including an outer portion defining a generally vertical outer plane and a recessed portion positioned inwardly of the outer portion of the side surface and cooperating therewith to define a cavity positioned behind the bar so that a person carrying the casket can grip the bar



without engaging the side surface, the outer plane extending between the recessed portion and the bar.

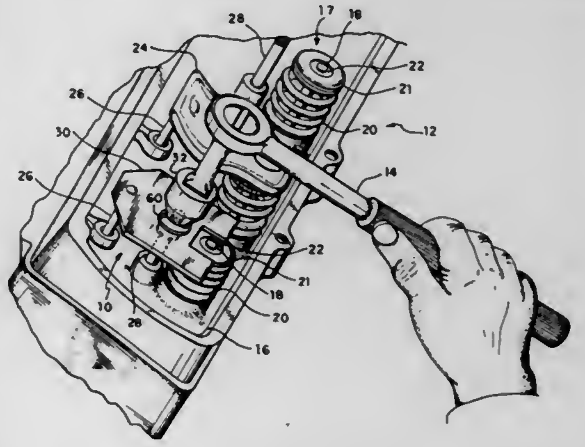
5,689,870
VALVE SPRING COMPRESSOR TOOL

Peter D. Robey, P.O. Box 87, Cedar Brook, N.J. 08018

Filed Sep. 16, 1996, Ser. No. 710,329

Int. Cl.⁶ B23P *19/04*

U.S. Cl. 29—217 **12 Claims**



1. A valve spring compressor tool for removing valve springs from an overhead valve engine of the type having a threaded rocker arm stud adjacent the valve spring and a push rod aligned with the rocker arm stud and the valve spring, the tool comprising:

a compressor plate having a first end with push rod engaging means and a second end with a spring engaging portion, and an aperture intermediate said first and second ends for receiving the rocker arm stud;

a crank down nut having a socket portion and a coaxial, reduced diameter neck portion, said socket portion having torque receiving means for receiving rotational torque applied to said crank down nut, and said neck portion having an internally threaded cylindrical counterbore axially extending into said neck portion to receive the rocker arm stud;

connecting means for connecting said crank down nut to said compressor plate;

torquing means for applying rotational torque to said crank down nut; and

whereby the rotational torque applied to said crank down nut in one direction causes said crank down nut axially to descend the rocker arm stud by threaded engagement between said counterbore and the rocker arm stud such that the downward axial movement of said crank down nut causes said compressor plate to pivot on the push rod and compress the spring.

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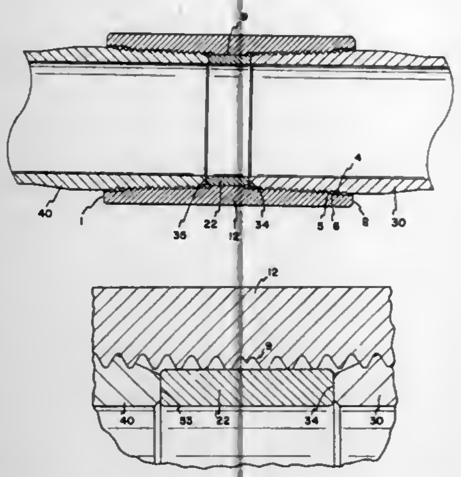
5,689,871
COUPLINGS FOR STANDARD A.P.I. TUBINGS AND CASINGS AND METHODS OF ASSEMBLING THE SAME

Kenneth J. Carstensen, 4540 N. 44th St. No. 70, Phoenix, Ariz. 85018

Continuation of Ser. No. 396,078, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 156,110, Nov. 22, 1993, abandoned, which is a division of Ser. No. 954,683, Sep. 30, 1992, Pat. No. 5,263,748, which is a continuation of Ser. No. 345,653, May 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 117,682, Nov. 5, 1987, Pat. No. 4,878,285, which is a division of Ser. No. 802,943, Nov. 27, 1985, Pat. No. 4,706,997, which is a continuation of Ser. No. 379,615, May 19, 1982, abandoned. This application Jun. 14, 1996, Ser. No. 664,169

Int. Cl.^{6} B21K *21/16*

U.S. Cl. 29—401.1 **7 Claims**



1. A method of converting a string of A.P.I. standard threaded tubing or casing so as to render it capable of being used in a given application meeting specific mechanical or corrosion resistance conditions that are more demanding than those specified by A.P.I. for the tubing or casing, wherein the tubing or casing pins are coupled together by collars, comprising the steps of:

forming a collar having A.P.I. standard internal threads extending from the collar ends toward and meeting at a central region, the crests of the threads in the central region being truncated to flattened surfaces defining a given diameter central bearing area with a constant maximum diameter defined by the flattened surfaces, without reduction of the effective length of the thread bearing region extending from each end, the length of the collar and the thread taper and thread cone in the thread bearing region being precisely controlled, said central bearing area being adapted for selectively receiving one of a number of different types of interior rings, said one interior ring having a selected length;

measuring mill pin ends of A.P.I. tubing or casing to use only those in which thread taper and dimension provide a fit not only within A.P.I. tolerance but also within predetermined limits tighter than the A.P.I. tolerance;

threading a first pin end into a mill end of the collar to a selected number of turns of engagement after the hand tight plane;

threading a second pin end into a field end of the collar to a selected number of turns of engagement after the hand tight plane; and

repeating the steps of threading pin ends into the mill and field ends of a plurality of formed collars to build up the string for the given application;

whereby a ring can be incorporated by inclusion in the central bearing area after the first pin is inserted to convert the central region of the collar to a smooth bore, a metal-to-metal seal or uninterrupted internally coated pipe; or by coupling the tubing or casing ends together without the interior ring, to enable use of the string of tubing or casing in applications requiring better properties and performance than that which can be provided by a string using the same tubing or casing but employing A.P.I. standard collars for coupling the successive tubing or casings.

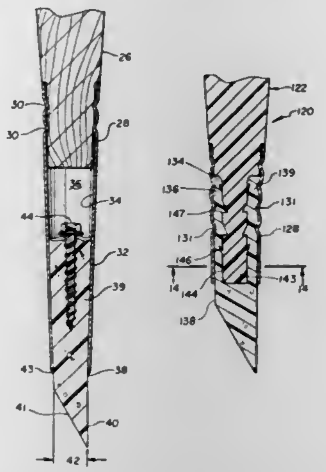
5,689,872
METHOD OF ASSEMBLING A SILICONE PAINT BRUSH ARTIST'S TOOL

Ladd B. Forsline, 201 S. Kemp St., Lyons, Pa. 19536

Division of Ser. No. 424,804, Apr. 19, 1995, Pat. No. 5,542,144. This application Aug. 6, 1996, Ser. No. 692,597

Int. Cl.^{6} B21D *39/00*

U.S. Cl. 29—515 **12 Claims**



1. A method of forming an artist's tool for application and manipulation of paint on a substrate, the method comprising the steps of:

providing a handle, the handle having a distal end and a proximal end;

providing a rigid ferrule adapted for attachment to the distal end of the handle so as, when attached, the ferrule extends distally from the handle and defines a tip carrying cavity adjacent the distal end of the handle;

providing a tip, formed of resilient silicone, the tip having a distally located paint contacting portion and a proximally located ferrule connecting portion;

inserting the tip into the ferrule with the ferrule connecting portion of the tip situated in the tip carrying cavity of the ferrule and the paint contacting portion extending distally from the ferrule;

expanding the ferrule connecting portion of the tip into locking contact within the tip carrying cavity of the ferrule by installing an insert into the ferrule connecting portion of the tip;

attaching the ferrule, with the tip inserted in the tip carrying cavity, to the distal end of the handle, thereby forming the device for application and manipulation of paint on a substrate.

10. A method of forming an artist's tool for application and manipulation of paint on a substrate, the method comprising the steps of:

providing a handle, the handle having a distal end and a proximal end, the distal end having an integral insert extending therefrom;

providing a rigid ferrule adapted for attachment to the distal end of the handle so as, when attached, the ferrule extends distally from the handle and defines a tip carrying cavity adjacent the distal end of the handle;

providing a tip, formed of resilient silicone, the tip having a distally located paint contacting portion and a proximally located ferrule connecting portion;

inserting the integral insert of the handle into the ferrule connecting portion of the tip;

placing the ferrule over the ferrule connecting portion of the tip and the distal end of the handle; and

crimping the ferrule to lock the tip to the handle.

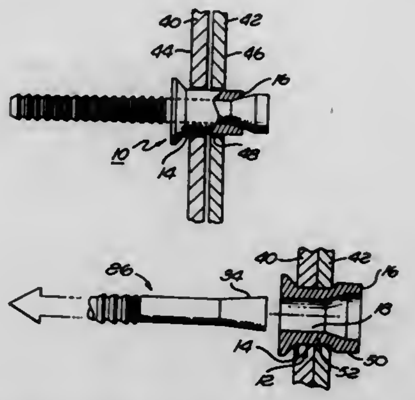
5,689,873
TACKING FASTENER

Ralph Luhm, La Habra, Calif., assignor to Allfast Fastening Systems, Inc., City of Industry, Calif.

Division of Ser. No. 584,111, Jan. 11, 1996, abandoned. This application Nov. 6, 1996, Ser. No. 746,132

Int. Cl.^{6} B23P *11/00*

U.S. Cl. 29—525.11 **11 Claims**



1. A method for creating a hole for a permanent fastener which fastens a first workpiece to an adjacent second workpiece, comprising the steps of:

a) providing a tacking fastener that includes a shank which has an inner channel, a first end, a second end and a conical shaped head which extends from said first end, said tacking fastener further includes a stem that extends through said inner channel of said shank and has a head located adjacent to said second end of said shank;

b) drilling a first hole through the first and second workpieces;

c) inserting said shank and said stem into said first hole so that said stem head extends from the second workpiece and said conical shaped head is adjacent to the first workpiece;

d) pulling said stem head through said inner channel to expand said shank and secure said shank to the first and second workpieces; and,

e) drilling said conical shaped head, said shank and the first and second workpieces a drill bit that has a diameter larger than a diameter of said conical shaped head.

5,689,874
WIRE CUT AND STRIP MECHANISM

David Alan College, Annville, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 20, 1996, Ser. No. 717,029

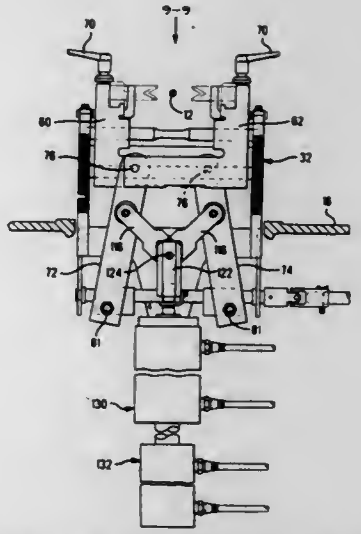
Int. Cl.^{6} H01R *43/28;* H02G *1/12*

U.S. Cl. 29—564.4 **12 Claims**

1. A wire cutting and stripping mechanism having a frame, first and second opposed tool holders on opposite sides of a wire path adapted for carrying wire cutting and stripping blades; said first and second tool holders coupled to said frame by means of a first coupling and arranged to move toward said wire path in two discrete amounts of movements, separable by a pause in movement, upon actuation of said first coupling, and an actuator for effecting said actuation of said first coupling, said actuator comprising:

(a) a first cylinder having a first housing and a first piston rod extending therefrom, said housing of said first cylinder being attached to said frame;

(b) a second cylinder having a second housing and second piston rod extending therefrom in operational engagement with said first coupling;



(c) means for actuation of one of said first and second cylinders so that said first discrete movement is effected; and

(d) means for actuation of the other of said first and second cylinders so that said second discrete movement is effected.

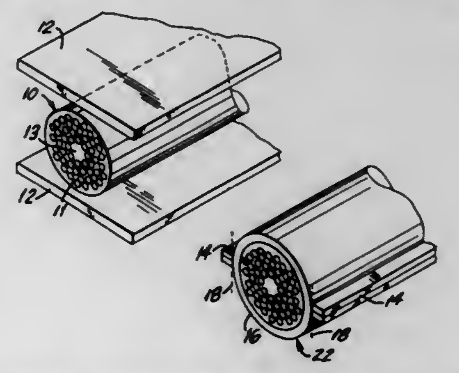
5,689,875
SUPERCONDUCTOR WITH HIGH VOLUME COPPER

Hem C. Kanithi, Cheshire, Conn., assignor to IGC Advanced Superconductors, Waterbury, Conn.

Division of Ser. No. 264,594, Jun. 23, 1994, abandoned. This application Jun. 14, 1996, Ser. No. 664,393

Int. Cl.^{6} H01B *12/00*

U.S. Cl. 29—599 **12 Claims**



1. A method for producing a clad superconductor, comprising the steps of:

(a) providing a prefabricated superconductive core having an outer surface and including superconducting elements within a matrix, said matrix including a first highly conductive stabilizing material;

(b) providing at least one strip of a second highly conductive stabilizing material, each said strip having an inner surface and a pair of longitudinal edges;

(c) positioning said at least one strip of said second highly conductive stabilizing material with said inner surface in contact with said outer surface of said core;

(d) applying heat and pressure to said at least one strip to wrap said at least one strip around said core until adjacent pairs of said edges make contact to form a seam;

(e) without using an intermediate bonding material, fusing substantially an entire inner surface of said at least one strip to said outer surface of said core and fusing said contacting adjacent edges together by said application of heat and pressure,

said at least one strip becoming a cladding layer for said core after said wrapping and fusing.

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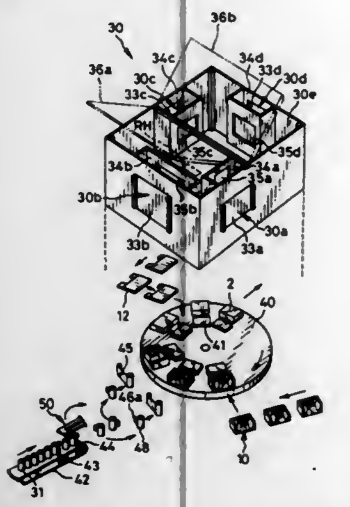
5,689,876
APPARATUS AND METHOD OF LOADING LENS-FITTED PHOTO FILM UNIT WITH PHOTO FILM

Chiaki Suzuki, and Yuzo Tsunekawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 247,558, May 23, 1994, abandoned.
This application Feb. 21, 1996, Ser. No. 605,717
Claims priority, application Japan, May 21, 1993, 5-120225
Int. Cl.⁶ B23P *21/00*
U.S. Cl. 29—722 **20 Claims**



1. An apparatus for assembling a lens-fitted photo film unit comprising a main body, a cassette containing chamber preloaded with a photo film cassette, and a photo film chamber for containing unexposed photo film in a roll form drawn out from said photo film cassette, said apparatus comprising:

a dark box comprising an outer wall defining an enclosed light-shielded compartment;

a plurality of cells formed on an inner periphery of said outer wall and located within said compartment, each cell being defined by an inner wall;

a plurality of outer openings formed in said outer wall, each outer opening corresponding with one of said cells, respectively;

a first shutter plate associated with each outer opening, each first shutter plate being movable from a first position in which its outer opening is covered thereby to a second position in which its outer opening is not covered thereby;

an inner opening formed in each inner wall between a center of said compartment and said outer wall;

a second shutter plate associated with each inner opening, each second shutter plate being movable from a first position in which its inner opening is covered thereby to a second position in which its inner opening is not covered thereby;

first transfer means for transferring a main body through a first of said outer openings and into a first of said cells, while the first shutter plate associated with said first outer opening is in its second position and the second shutter plate associated with a first of said inner openings is in its first position;

second transfer means for transferring said main body from said first cell through said first inner opening and into said compartment while said first shutter plate associated with said first outer opening is in its first position and said second shutter plate associated with said first inner opening is in its second position;

conveyor means disposed in said dark box, for receiving said main body from said second transfer means and for moving said main body to each of said cells;

third transfer means for transferring a photo film cassette through a second of said outer openings and into a second of said cells, while the first shutter plate associated with said second outer opening is in its second position and the second shutter plate associated with a second of said inner openings is in its first position;

fourth transfer means for transferring said photo film cassette from said second cell through said second inner opening and into said compartment, while said first shutter plate associated with said second outer opening is in its first position and said second shutter plate associated with said second inner opening is in its second position;

mounting means disposed in said compartment for mounting said photo film cassette into a cassette containing chamber of said main body, and for mounting photo film drawn out from said photo film cassette into a photo film chamber of said main body, after said main body has been received by said conveyor means;

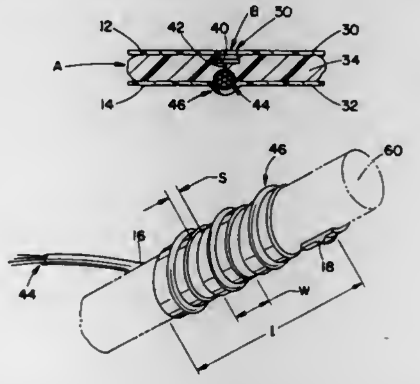
fifth transfer means for transferring said main body mounted with said photo film cassette and said photo film from said conveyor means through a third of said inner openings and into a third of said cells, while the second shutter plate associated with said third inner opening is in its second position and the first shutter place associated with a third of said outer openings is in its first position; and

sixth transfer means for transferring said main body mounted with said photo film cassette and said photo film from said third cell through a third outer opening, while said second shutter plate associated with said third inner opening is in its first position and said first shutter plate associated with said third outer opening is in its second position.

5,689,877
METHOD OF MANUFACTURING AN IMPLANTABLE HELICAL SPIRAL CUFF ELECTRODE

Warren M. Grill, Jr.; Matthew D. Tarler, both of Cleveland Heights, and John T. Mortimer, Chagrin Falls, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Division of Ser. No. 230,342, Apr. 20, 1994, Pat. No. 5,505,201.
This application Mar. 14, 1996, Ser. No. 618,195
Int. Cl.⁶ H01R *43/00*
U.S. Cl. 29—825 **6 Claims**



1. A method of manufacturing a cuff electrode comprising:

disposing, on a flexible insulating base sheet, an electrode defining a first longitudinal axis;

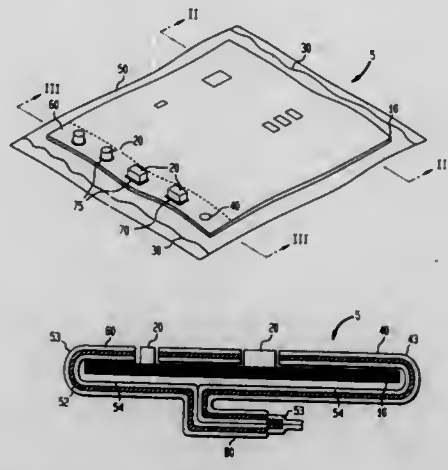
covering the base sheet with an insulating cover layer; and,

contracting the cover layer along an axis oblique to said first longitudinal axis such that the cover layer, the base sheet, and the electrode curl into a helix.

5,689,878
METHOD FOR PROTECTING ELECTRONIC CIRCUIT COMPONENTS

Donald William Dahringer, Glen Ridge; Philip Hubbauer, Millington; William Roger Lambert, Chester; Alan Michael Lyons, New Providence; Lloyd Shepherd, Madison, and John David Weld, Succasunna, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 17, 1996, Ser. No. 633,331
Int. Cl.⁶ G05K *5/06;9/00;* **H01L** *21/56*
U.S. Cl. 29—841 **9 Claims**



1. A method for protecting an electric assembly including a printed circuit board (PCB) having electronic components and separable connectors thereon, comprising the steps of:

forming a sheet of material having a plurality of openings therein into a tubular structure, the sheet of material including at least a metallic layer and an adhesive layer;

inserting the PCB into the tubular structure;

indexing and positioning the PCB such that the separate connectors are positioned under said openings in the tubular structure;

exposing the separable connectors through the openings in the tubular structure;

compressing the tubular structure against the PCB, thereby adhesively bonding between the tubular structure and the PCB;

connecting peripheral areas surrounding the PCB of the metallic layer to a circuit ground of the PCB;

forming a metallized flexible enclosure by crimping or connecting the sheet of material; and

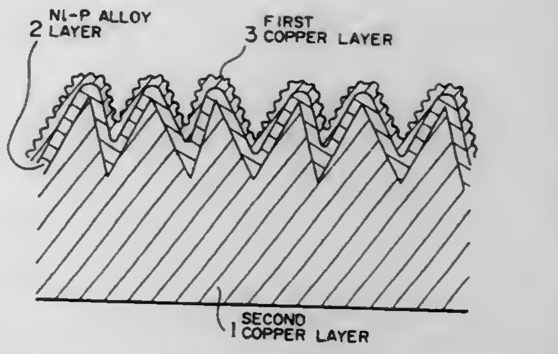
sealing the metallized flexible enclosure to form a hermetic seal, whereby the metallized flexible enclosure provides environmental protection and electromagnetic interference shielding to the electronic components while providing access to the separable connectors.

5,689,879
METAL FOIL FOR PRINTED WIRING BOARD AND PRODUCTION THEREOF

Naoyuki Urasaki; Kouichi Tsuyama, both of Shimodate; Kiyoshi Hasegawa, Yuki; Shuichi Hatakeyama, Shimodate; Akinari Kida, Tochigi-ken; Akishi Nakaso, and Hiroshi Nomura, both of Oyama, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Division of Ser. No. 59,658, May 12, 1993, Pat. No. 5,403,672.
This application Dec. 16, 1994, Ser. No. 357,734
Claims priority, application Japan, Aug. 17, 1992, 4/217815
Int. Cl.⁶ H05K *3/02*
U.S. Cl. 29—846 **19 Claims**

1. A process for producing a metal foil for printed wiring boards, which comprises



a step of roughening a surface of a second copper layer having sufficient strength to provide a supporting metal layer,

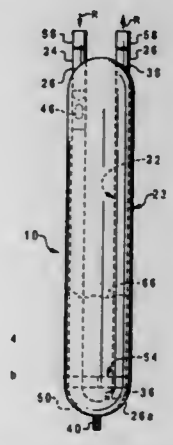
a step of forming a nickel-phosphorus alloy layer containing 1.1% by weight or more of phosphorus on the roughened surface of the second copper layer, and

a step of forming a first copper layer on the nickel-phosphorus alloy layer, followed by roughening of the surface of the first copper layer to provide a roughness finer than roughness of the second copper layer.

5,689,880
REFRIGERANT CIRCUIT ACCUMULATOR AND ASSOCIATED FABRICATION METHODS

Erwin H. Petty, Montgomery, Ala., assignor to Rheem Manufacturing Company, New York, N.Y.

Division of Ser. No. 379,732, Jan. 27, 1995, Pat. No. 5,570,589.
This application Nov. 21, 1995, Ser. No. 561,265
Int. Cl.⁶ B23P *15/00*
U.S. Cl. 29—890.06 **5 Claims**



1. A method of fabricating a refrigerant circuit accumulator, said method comprising the steps of:

providing a first, generally U-shaped metal tube with first and second leg portions respectively having open refrigerant inlet and outlet ends, and a curved, closed end;

forming a side wall refrigerant inlet opening in said first leg portion adjacent inwardly adjacent said open refrigerant inlet end thereof;

forming a refrigerant outlet opening in said first leg portion between said side wall refrigerant inlet opening and said open refrigerant inlet end of said first leg portion;

providing said first leg portion with deflector means interposed between said side wall refrigerant inlet opening and said refrigerant outlet opening and operative to intercept refrigerant exiting said refrigerant outlet opening and deflect the exiting refrigerant laterally outwardly from said first leg portion;

forming an oil inlet metering orifice in said first metal tube adjacent said closed end thereof;

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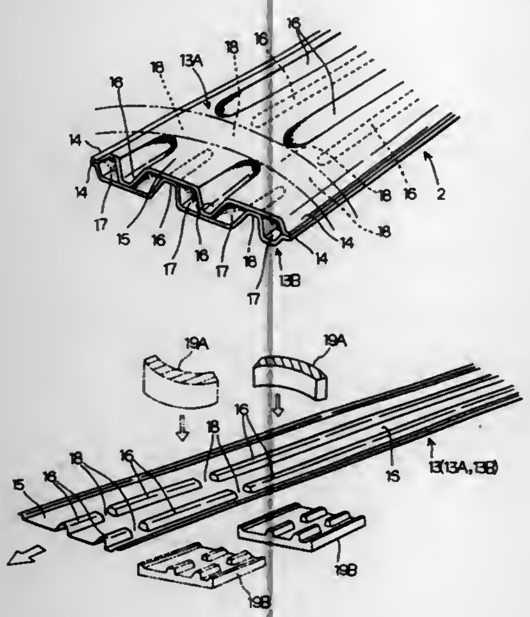
mounting filter means on said first metal tube for filtering fluid externally approaching said oil inlet metering orifice;
providing a second metal tube having open first and second open ends;
using a spinning process to inwardly deform and close said open first end of said second metal tube;
forming a spaced pair of holes in the closed first end of said second metal tube;
inserting said first metal tube, open ends first, and said filter means through said second open end of said second metal tube and through the interior of said second metal tube in a manner causing said open refrigerant inlet and outlet ends of said first metal tube to pass outwardly through said spaced pair of holes in the closed first end of said second metal tube and position said closed end portion of said first metal tube axially inwardly of said second open end of said second metal tube;
sealing said open refrigerant inlet and outlet ends of said first metal tube within said spaced pair of holes in the closed first end of said second metal tube; and
using a spinning process to inwardly deform and close said open second end of said second metal tube in a manner completely enclosing said closed end of said first metal tube within said second tube.

5,689,881
FLAT TUBE FOR HEAT EXCHANGER AND METHOD FOR PRODUCING SAME

Soichi Kato, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Jan. 23, 1996, Ser. No. 589,249
Claims priority, application Japan, Jan. 27, 1995, 7-011189
Int. Cl.^{6} B23P *15/26;* **F28F** *1/06*
U.S. Cl. 27—890.053 **2 Claims**

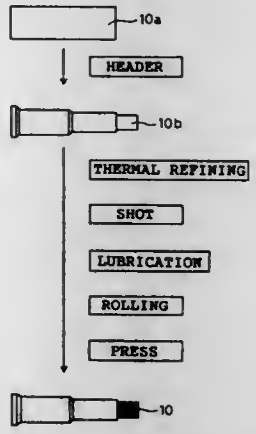


1. A method for producing a flat tube for a heat exchanger comprising the steps of:
forming long beads on two rectangular sections of a flat plate in a plurality of rows asymmetrically with respect to a center line extending in a longitudinal direction of the plate,
plastically deforming by pressing predetermined parts of the long beads so as to return the parts to the original flat plate, and
overlaying the two rectangular sections so as to make a flat tube such that the long beads on one rectangular section are brought into contact with the flat plate of the other section forming parallel channels in the longitudinal direction and passages in a direction perpendicular to the longitudinal direction.

5,689,882
METHOD OF PRODUCING A REAR WHEEL SPINDLE

Shigemitsu Adachi, Kasugai; Kazuo Nakagawa, Aichi-ken; Kiyoaki Tanidono, Kasugai, and Masaharu Tsuboi, Wako, all of Japan, assignors to TRW Steering Systems Japan Co. Ltd., Aichi-ken, and Honda Motor Co. Ltd., Tokyo, both of Japan

Filed Sep. 12, 1995, Ser. No. 527,072
Claims priority, application Japan, Dec. 8, 1994, 6-305180
Int. Cl.^{6} B21D *22/00*
U.S. Cl. 29—898.1 **12 Claims**

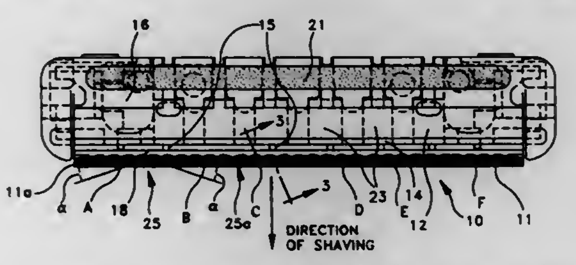


1. A method of producing an elongate spindle, said method comprising the steps of:
forging a piece of raw material into a work-in-process part having a spindle configuration in which said spindle configuration comprises a male screw portion, a bearing attachment portion, a knuckle press fit portion and a flange portion; and
placing said work-in-process part in a press and finishing peripheral exterior surfaces of said bearing attachment portion and said knuckle press fit portion with said press such that said exterior surfaces are substantially devoid of any microprotrusions.

5,689,883
SHAVING IMPLEMENT

Ernest A. Ortiz, Cheshire, and Evan N. Chen, Fairfield, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

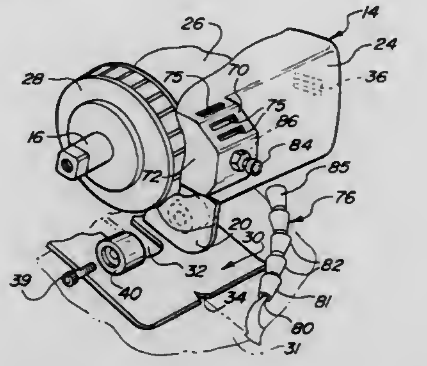
Filed May 8, 1995, Ser. No. 439,058
Int. Cl.^{6} B26B *21/06;21/40*
U.S. Cl. 30—34.2 **40 Claims**



1. A shaving implement for moving in a normal shaving direction, comprising:
at least one razor blade having a blade edge extending in a direction perpendicular to said shaving direction;
a shaving head which secures said at least one razor blade; and
said shaving head including a skin-contacting element having leading and trailing edges parallel to said blade edge, wherein said skin-contacting element includes a plurality of adjoining sections, each section comprising a plurality of rows of parallel, flexible skin-engaging ridges, and wherein ridges in adjoining sections extend alternately at positive and negative angles relative to the direction of said blade edge.

5,689,884
CIRCULAR SAW WITH BLOWER

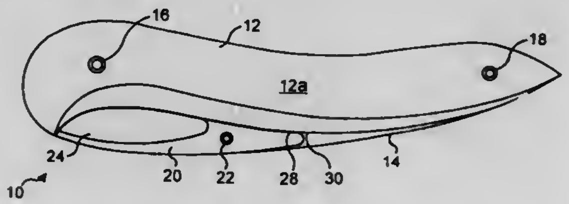
Richard Wershe, 31958 Nardelli, Roseville, Mich. 48066
Continuation-in-part of Ser. No. 342,860, Nov. 21, 1994, Pat. No. 5,539,985. This application Apr. 22, 1996, Ser. No. 636,796
Int. Cl.^{6} B25F *3/00*
U.S. Cl. 30—123.3 **4 Claims**



1. In a circular saw power tool having a blade protective housing, a lead guide mounted in front of said blade protective housing for resting on a piece of wood; a hub mounting adapted to mount a circular saw blade, a motor rotatably driving said hub mounting, a motor housing mounted about said motor, a cooling fan mounted to said motor within said motor housing for directing air about said motor and out through a vent nozzle in said motor housing; the improvement characterized by:
said vent nozzle constructed to mount a self supporting conduit that has a free standing distal end that directs air from the vent nozzle to the lead guide for blowing saw dust away from said lead guide when said motor is on and rotating said saw blade; and
said vent nozzle connected to a funnel section that is integrally formed in said motor housing.

5,689,885
KNIFE WITH BLADE-MOUNTED PIVOTAL LOCKBACK LATCH

Andrew L. Walston, 325 N. 160th St., Seattle, Wash. 98133
Filed Apr. 8, 1996, Ser. No. 629,076
Int. Cl.^{6} B26B *1/04*
U.S. Cl. 30—160 **26 Claims**

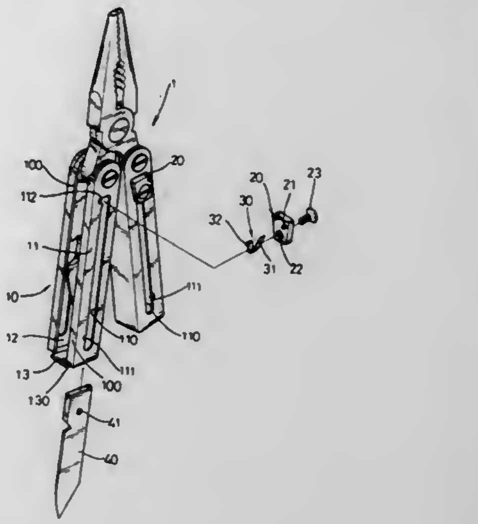


1. A knife comprising:
(a) a handle that includes two opposed sides and a back, said sides defining an opening that is disposed opposite the back;
(b) a blade that is pivotally attached to the handle at a first pivot point and rotatable about the first pivot point between a closed position wherein the blade is at least partially disposed within the opening between the two sides of the handle, and an open position in which the blade is exposed; and
(c) a lockback lever that is pivotally attached to the blade at a second pivot point that is spaced apart from the first pivot point along the blade, said lockback lever engaging the back of the handle to lock the blade in the open position.

5,689,886
TOOL ASSEMBLY

Shih-yuan Yeh, No. 2-4, Chenhsing Rd., Taiping Hsiang, Taichung Hsien, Taiwan

Filed Jun. 13, 1996, Ser. No. 661,295
Int. Cl.^{6} B26B *1/08;11/00*
U.S. Cl. 30—162 **5 Claims**



1. A tool assembly comprising:
a housing having two side walls each having an inner face and an outer face, a chamber defined in said housing and located between said two side walls, at least one of said two side walls of said housing having an elongate slot vertically defined therein and communicating with said chamber, an upper recess and a lower recess defined in upper and lower portions of said at least one side wall and each communicating with said elongate slot respectively;
a blade received in said chamber and mounted on the inner face of said at least one side wall, a bore transversely defined in said blade and communicating with said elongate slot;
a control member mounted on the outer face of said at least one side wall and slidable along said elongate slot, a stub formed on said control member and detachably received in one of said upper recess and said lower recess, a hole defined in said control member and aligning with said bore;
a substantially V-shaped biasing member received in said elongate slot and abutting between said blade and said control member, said biasing member including a pressing portion urged on said stub of said control member and an abutment rested on said at least one side wall in said elongate slot; and
a positioning member extending through said hole, said biasing member, and said elongate slot, and securely engaged in said bore.

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5,689,887
HEDGE SHEAR

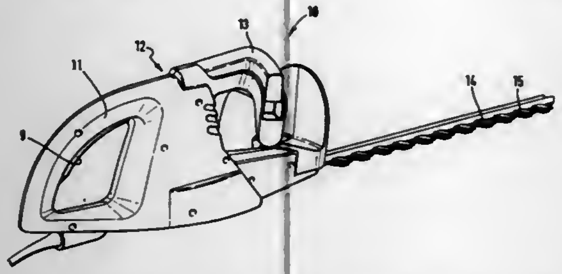
Peter Heywood, Filderstadt; Helmut Achtzehnter, Stuttgart, and Theodor M. J. Brouwers, Kaatsheuvel, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 3, 1996, Ser. No. 656,759

Claims priority, application Germany, Jun. 28, 1995, 195 22 971.1

Int. Cl.^{6} B26B *15/00*

U.S. Cl. 30—220 **13 Claims**



1. A motor-driven hedge shear, comprising a housing; a pair of edge shear cutters extending in a longitudinal direction outwardly of said housing; means for reciprocatingly driving said hedge shear cutters in opposite directions and including a motor shaft; a coulisse transmission provided between said means and said hedge shear cutters; cutter holders provided for supporting said hedge shear cutters and having coulisse ears, said coulisse transmission including toothed gears provided with crank pins engaging in said coulisse ears; a central shaft supporting said toothed gears and having ends rotatably supported in said housing, two of said toothed gears of said coulisse transmission being arranged on said central shaft so as to be axially spaced from one another, said two toothed gears having sides which face one another and are provided with said crank pins formed as eccentrically arranged circular discs, said coulisse ears surrounding and slidingly guiding said crank pins, each of said crank pins having a first opening surrounding said central shaft and being connected with an adjoining one of said toothed gears so as to be rotated by the latter.

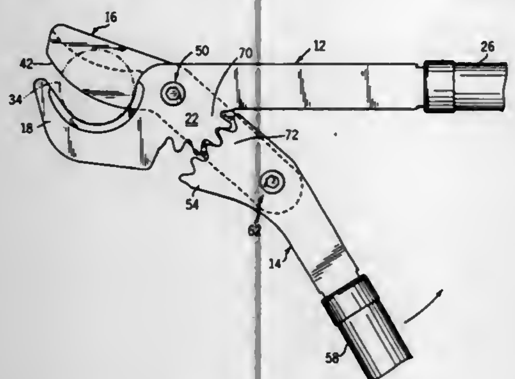
5,689,888
VARIABLE FORCE TOOL

Erkki Olavi Lindén, Billnäs, Finland, assignor to Fiskars Consumer Oy Ab, Billnas, Finland

Filed Aug. 20, 1996, Ser. No. 702,122

Int. Cl.^{6} B26B *13/00*

U.S. Cl. 30—250 **20 Claims**



11. A variable force lopper, comprising:
- a metal plate having a first pivot point, a forwardly extending blade and a rearwardly extending tang provided with a second pivot point spaced apart from the first pivot point;
- a first elongated member pivotally connected to the plate at the first pivot point, the first member having a forwardly extending jaw configured to cooperate with the blade to sever a workpiece received in a bight formed by the jaw, a rearwardly extending arm, and a first gear segment intermediate the jaw and the arm;
- a second elongated member having a rearwardly extending portion and an opposed second gear segment, the second member being pivotally connected to the plate at the second pivot point so that the first and second gear segments are intermeshing in first and second regions, respectively; and

means for imparting a variable cutting force to the workpiece as the blade travels across the bight.

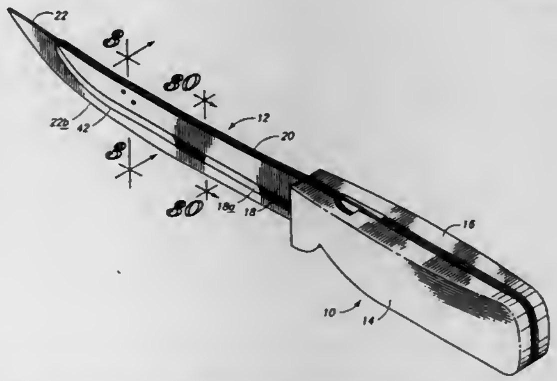
5,689,889
KNIFE WITH REPLACEABLE CUTTING ELEMENT

Steven D. Overholt, 4275 D. J. Dr., Missoula, Mont. 59803

Filed Aug. 28, 1996, Ser. No. 697,615

Int. Cl.^{6} B26B *5/00*

U.S. Cl. 30—332 **14 Claims**



1. A knife having a handle section and a blade section, said blade section comprising a pair of opposed flanking side members, each side member having a top edge and a bottom edge and an inner surface, a blade insert locator positioned between said side members so as to provide a slot extending through said side members between the side member inner surfaces and around said blade insert locator, said slot having a top opening between the side member top edges and a bottom opening between the side member bottom edges with the top and bottom openings extending from said handle section to said blade insert locator and from said blade insert locator to outer ends of said side members, and a replaceable blade insert having a length and width configured so that said insert can be inserted through said slot between said handle section and said blade insert locator from the top opening to the bottom opening and engaged with said blade insert locator so as to retain by said blade insert locator and confined between the inner surfaces of said side members and held therebetween.

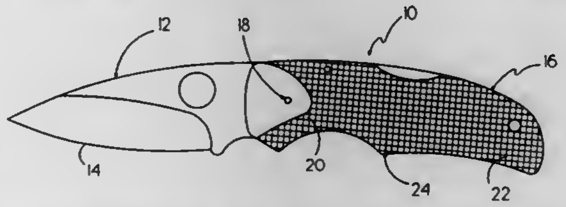
5,689,890
GRIP SURFACE

Louis S. Glesser, Golden, Colo., assignor to Spyderco, Inc., Golden, Colo.

Filed May 21, 1996, Ser. No. 651,666

Int. Cl.^{6} B26B *1/10*

U.S. Cl. 30—340 **24 Claims**



1. A knife comprising an outer surface adapted to be gripped by the hand of a user, wherein said outer surface comprises:

- (a) a plurality of first discrete protuberances, said first protuberances comprising at least a side portion and a substantially planar upper surface that is angled in a first planar direction relative to said outer surface, said planar upper surface and said side portion forming at least an upper edge associated with each of said first protuberances, said side portions progressively increasing in height relative to said outer surface as the distance from a preselected line or point on said outer surface increases; and
- (b) a plurality of second discrete protuberances, said second protuberances comprising at least a side portion and a substantially planar upper surface that is angled in a second planar direction relative to said outer surface, said planar upper surface and said side portion forming at least an upper edge associated with each of said second protuberances, said side portions progressively increasing in height relative to said outer surface as the distance from a preselected line or point on said outer surface increases wherein said second planar direction is different than said first planar direction to provide slip resistance in at least two directions.

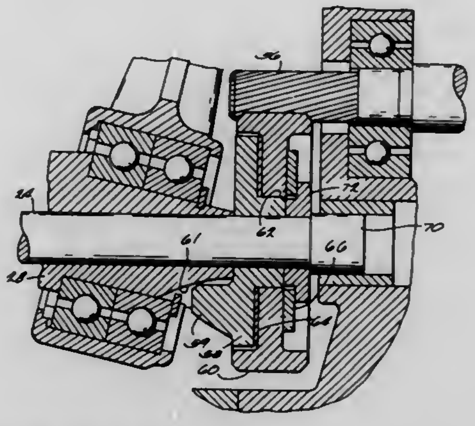
5,689,891
CLUTCH MECHANISM FOR RECIPROCATING SAWS

Thomas R. Bednar, Pewaukee, and Scott L. Kidney, Hubertus, both of Wis., assignors to Milwaukee Electric Tool Corp., Brookfield, Wis.

Continuation-in-part of Ser. No. 444,069, May 18, 1995, Pat. No. 5,566,458, and a continuation-in-part of Ser. No. 443,784, May 18, 1995, Pat. No. 5,662,023, each which is a continuation-in-part of Ser. No. 354,518, Dec. 13, 1994, abandoned, and a continuation-in-part of Ser. No. 354,560, Dec. 13, 1994, abandoned. This application May 30, 1996, Ser. No. 658,889

Int. Cl.^{6} B23D *49/10;* **F16D** *7/02*

U.S. Cl. 30—394 **18 Claims**



1. A reciprocating saw comprising:
- a housing;
- a spindle mounted for reciprocating motion within said housing;
- a gear rotatably mounted within said housing;
- a wobble shaft rotatably mounted within said housing and having an end adjacent said gear;
- a wobble plate rotatably mounted on said wobble shaft and connected to said spindle; and
- a clutch drivingly connecting said gear to said wobble shaft, said clutch including a clutch driver rotatably positioned within said housing adjacent said wobble shaft, said clutch driver including a recess in driving engagement with said end of said wobble shaft.

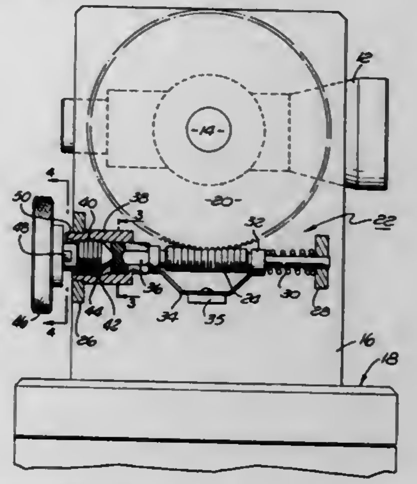
5,689,892
TWO-SPEED CONTINUOUS TANGENT SCREW

Michael Beckingham, Auckland, New Zealand, assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Mar. 7, 1996, Ser. No. 612,167

Int. Cl.^{6} G01C *1/02*

U.S. Cl. 33—292 **14 Claims**



1. An adjustment mechanism for a theodolite which has a telescope that is coupled to a friction gear, comprising:
- a worm gear coupled to the friction gear, wherein rotation or translation of said worm gear rotates the friction gear and moves the telescope;
- a sleeve coupled to said worm gear; and,
- a lead screw that is coupled to said sleeve and said worm gear, said lead screw being rotated in a first direction to engage said sleeve and to rotate said sleeve, said worm gear and the friction gear, said lead screw also being rotated in a second opposite direction to translate said worm gear and rotate the friction gear.

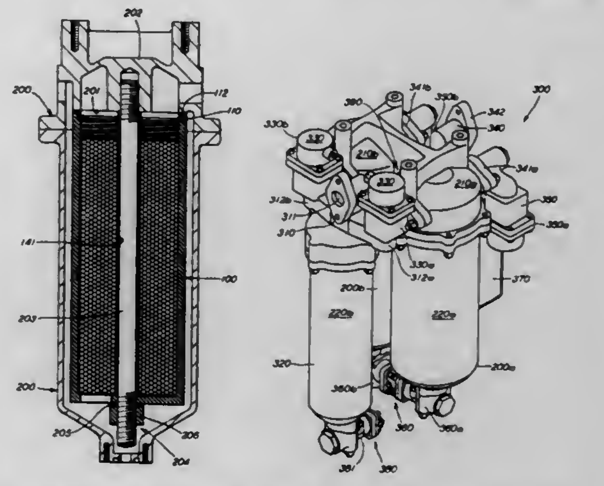
5,689,893
DESICCANT CANISTER WITH POSITIONING BORE

Matthew D. Mitsch, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 13, 1996, Ser. No. 713,471

Int. Cl.^{6} F26B *21/06*

U.S. Cl. 34—80 **17 Claims**



8. A desiccant canister assembly for use in a gas dryer system, said desiccant canister assembly comprising:
- (a) a pair of concentrically disposed casings, each having an upper end and a lower end, such that a cylindrical opening is defined between said casings;

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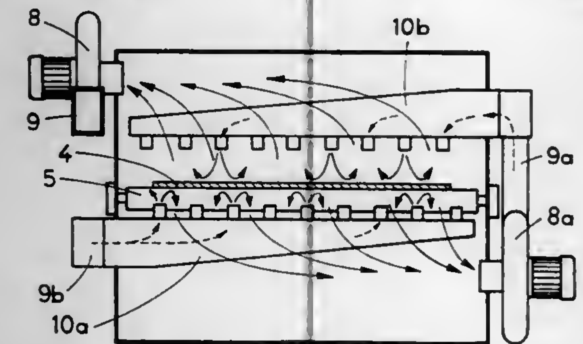
(b) a pair of end caps a bottom of which affixed to said lower ends of said pair of casings and a top of which affixed to said upper ends of said pair of casings, each of said end caps defining openings therein for allowing flow of gas through said cylindrical opening;
(c) a bottom porous plate situated approximate a bottom of said cylindrical opening against said bottom end cap;
(d) a top porous plate slidably disposed within said cylindrical opening near said upper ends of said casings;
(e) a moisture absorbing material disposed within said cylindrical opening between said top and said bottom porous plates;
(f) a means for compacting said moisture absorbing material between said top and said bottom porous plates; and
(g) a means for aligning and securably retaining said desiccant canister assembly within a desiccant canister assembly housing of said gas dryer system.

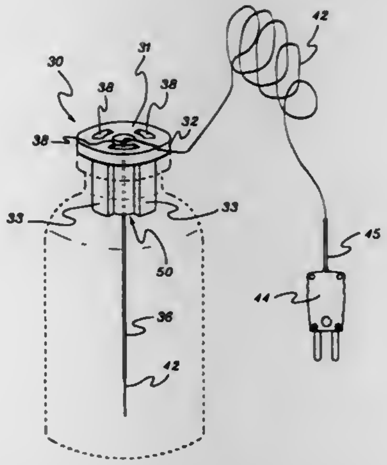
5,689,894
COOLING SYSTEM FOR ANNEALING MATERIAL CONTINUOUSLY MOVING ON A TRANSPORT MEANS
Peter Helmut Ebner, Bergham 168, A-4060 Leonding, Austria
Filed Oct. 22, 1996, Ser. No. 735,522
Claims priority, application Austria, Oct. 23, 1995, 1751/95
Int. Cl.⁶ F26B *19/00*
U.S. Cl. 34—86 **2 Claims**



1. A cooling system for annealing material (4) in the form of plates, strips or bulk material continuously moving on a transport means (5), where the cooling system consists of a plurality of zones (1, 2, 3) in which the annealing material (4) is treated on its upper and/or lower surface with an oblique blast of cooling medium in the form of air or gas emerging from nozzles of nozzle bars (10, 10*a*, 10*b*) fed by blowers (7, 8, 8*a*, 11), characterized in that only the last zone (3) disposed on the outlet end for the annealing material (4) is connected to the supply (7) of pressurized fresh cooling medium, and upon formation of the oblique blast a collecting fan (8, 8*a*, 10) is provided for the cooling medium, which urges the cooling medium into a distribution box (9, 9*a*, 12) to which the nozzle bars (10, 10*a*, 10*b*) are connected, which likewise have a collecting fan (8, 11) including a distributor (9) for the preceding zone (2, 1), where this set-up or arrangement is repeated up to the first zone (1) disposed on the inlet end for the annealing material, whose collecting fan (13) finally leads to the outside.

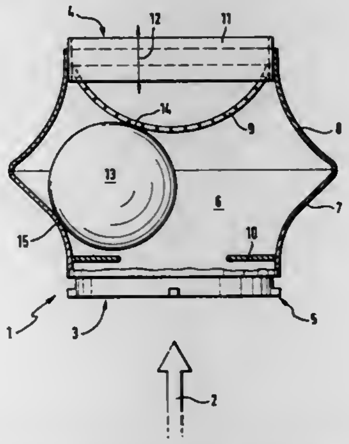
5,689,895
PROBE POSITIONING DEVICE FOR A FLASK FREEZE DRYING
David T. Sutherland, Kingston, N.Y.; Alan P. MacKenzie, Mercer Island, Wash., and Dean B. Wise, Shokan, N.Y., assignors to S.P. Industries, Inc., The Virtis Division, Gardiner, N.Y.
Filed Oct. 31, 1996, Ser. No. 742,259
Int. Cl.⁶ F26B *13/30*
U.S. Cl. 34—92 **21 Claims**

1. A device for positioning a probe in a flask, said device comprising:



a stopper adapted to be secured to an open end of said flask, said stopper having a center opening and at least one radial opening spaced from said center opening, said at least one radial opening allowing for fluid communication between inside of said flask and outside of said flask when the stopper is secured to the open end of the flask; and
a guide tube held within said center opening and extending into the flask when the stopper is secured to the open end of the flask, said guide tube being sized to receive the probe and allow the probe to extend from the guide tube into the flask, wherein said center opening with the guide tube and probe held therein allows substantially no fluid communication between the inside of the flask and the outside of the flask when the stopper is secured to the open end of the flask.

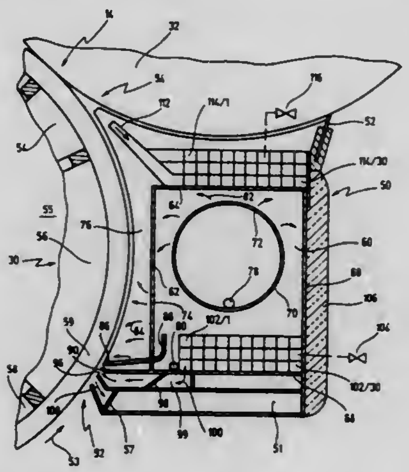
5,689,896
PULSATOR FOR A HAIR DRYER
Norbert Smetana, Kronberg, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany
Filed Dec. 12, 1996, Ser. No. 764,348
Int. Cl.⁶ A45D *00/00*
U.S. Cl. 34—97 **32 Claims**



1. A pulsator attachment for an air-moving hair care appliance having an air-moving means and an air discharge opening, comprising
a housing defining an air inlet opening and an air outlet opening and an air receiving chamber therebetween in communication with said inlet and outlet openings, said air inlet opening being adapted to communicate with said appliance air discharge opening,
said chamber being bounded by lateral and at least partially transverse wall portions of said housing between said air inlet and said air outlet openings, and

a freely moveable body held captive within the chamber and displaceable by air entering said air inlet,
whereby air entering said air inlet opening moves the body and air exiting said air outlet opening is alternately deflected by said moving body.

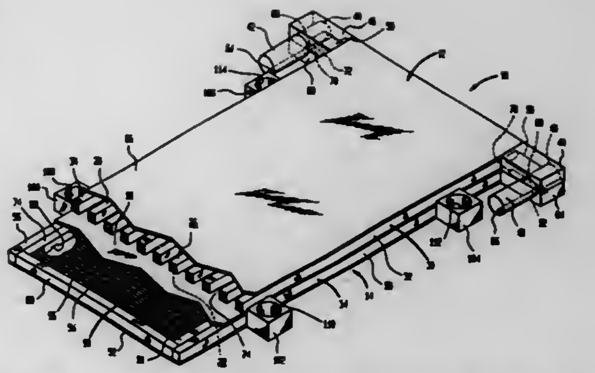
5,689,897
STEAM BLAST BOX AND METHOD FOR THE ZONE-WISE TEMPERATURE CONTROL OF A TRAVELING PAPER WEB
Christian Schiel, Heidenheim, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Germany
Filed Sep. 17, 1996, Ser. No. 714,849
Claims priority, application Germany, Sep. 18, 1995, 195 34 573.8
Int. Cl.⁶ D21F *5/00*
U.S. Cl. 34—114 **15 Claims**



1. A steam blast box for applying steam to a web of paper being conducted over a roll of a paper making machine, the blast box comprising:
walls defining a steam blast chamber, the walls and the chamber extending along the length of the roll transverse to the direction of web travel on the roll, the walls of the chamber including a front wall which faces toward and is spaced away from the web on the roll, defining a steam propagation space between the front wall of the chamber and the web on the roll;
the chamber being adapted to receive steam fed to the chamber, the front wall having steam outlet openings therethrough arrayed along the length of the roll through which steam exits into the steam propagation space for contacting the web on the roll;
an air outlet channel having an outlet directed toward the roll upstream of the path of movement of the web and the roll past the steam propagation space, and the outlet channel extending along the length of the roll for delivering air to the web upstream of the steam propagation space.

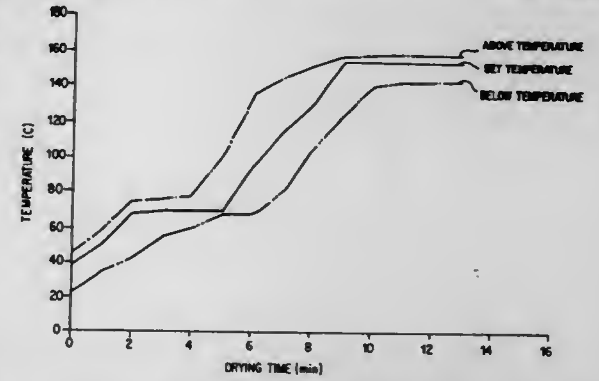
5,689,898
FREEZE DRYER SHELF
Ernesto Renzi, Youngstown, N.Y., assignor to The BOC Group, Inc., New Providence, N.J.
Division of Ser. No. 849,846, Mar. 12, 1992, Pat. No. 5,519,946. This application Mar. 7, 1996, Ser. No. 610,817
Int. Cl.⁶ A01F *25/12*
U.S. Cl. 34—239 **7 Claims**

1. In a freeze drier shelf adapted to support articles to be freeze dried within a freeze drying chamber of a freeze drier and having internal flow channels for circulating a diathermic fluid within the shelf, the diathermic fluid adapted to be cooled by a refrigerant



such that moisture within the articles freezes while the articles are being supported by the shelf, the improvement comprising:
the freeze dryer shelf comprising a top diathermic fluid section adapted to support the articles and a bottom refrigerant section in good thermal contact with the top diathermic fluid section;
the top diathermic section having the flow channels for the diathermic fluid;
the bottom refrigerant section having flow passages for circulating the refrigerant through the lower refrigerant section such that the diathermic fluid is cooled while circulating through the freeze drier shelf;
a first set of inlet and outlet means for introducing and discharging the diathermic fluid into and from the diathermic fluid section of the freeze dryer shelf, respectively; and
a second set of inlet and outlet means for introducing and discharging the refrigerant into and from the refrigerant section of the freeze dryer shelf, respectively.

5,689,899
METHOD FOR DRYING AUTOMOBILE PAINTS
Ber Szenker, Munich, and Johann Benning, Anzing, both of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany
PCT No. PCT/EP94/03467, § 371 Date Apr. 29, 1996, § 102(e) Date Apr. 29, 1996, PCT Pub. No. WO95/12102, PCT Pub. Date May 4, 1995
PCT Filed Oct. 21, 1994, Ser. No. 637,627
Claims priority, application Germany, Oct. 28, 1993, 43 36 857.3
Int. Cl.⁶ F26B *3/34*
U.S. Cl. 34—270 **19 Claims**



1. A method for drying painted automobile bodies or parts thereof which are painted with a one-pack paint in a method having a heating period followed by a holding period at a temperature reached for drying, the method comprising the steps of:
performing a heating phase exclusively using a pure infrared oven for the paint to be dried; and
interrupting the heating phase for at least two minutes when the paint to be dried reaches a temperature of at least 50° C. and at most 80° C.

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5,689,900

DRYING APPARATUS AND DRYING METHOD

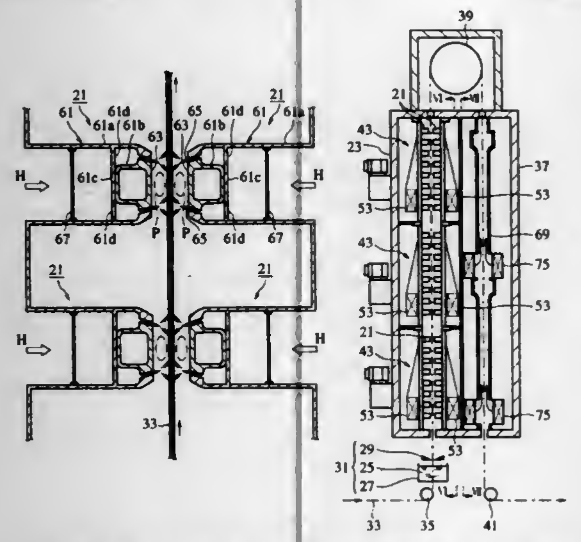
Gen Takayama, Kanagawa-ken; Tsutomu Horikoshi, Saitama-ken; Shigeo Kasahara, Kanagawa-ken; Yoshiyuki Sakai, Shizuoka-ken; Toshihiko Kusago, Shizuoka-ken, and Yasuhiro Kuroki, Shizuoka-ken, all of Japan, assignors to Toshiba Battery Co., Ltd., and Toshiba Kikai Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 20, 1996, Ser. No. 700,001

Claims priority, application Japan, Aug. 21, 1995, 7-211674; Aug. 21, 1995, 7-211766

Int. Cl.⁶ F26B *13/00*

U.S. Cl. 34—631 **3 Claims**



1. A drying apparatus in which a flexible beltlike sheet, on which a coating liquid has been applied to both of opposite surfaces, is conveyed in the vertical direction and the coating liquid is dried during conveying in the vertical direction, said drying apparatus comprising:

air-blowing nozzles disposed opposite to one another at a distance from the beltlike sheet on which the coating liquid has been applied, each air-blowing nozzle having an end face part facing said beltlike sheet and located vertically between slit-shaped blowholes extended in the direction of width of said beltlike sheet.

5,689,901

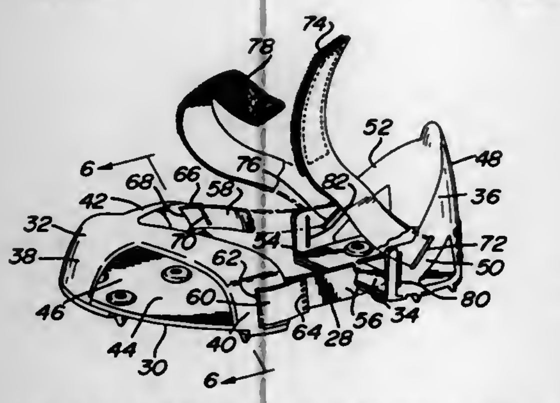
FOOTWEAR WITH TWO-PIECE SOLE

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976, and Jonathan Bell, Philadelphia, Pa., assignors to Michael Bell, Warrington, Pa.

Filed Feb. 15, 1996, Ser. No. 601,924

Int. Cl.⁶ A43C *15/00;15/06;15/02;15/04*

U.S. Cl. 36—7.6 **8 Claims**



1. A device for wearing on the foot of a person to render the person resistant to slipping when walking, the person's foot having a sole, a toe portion, a heel portion, an instep portion, a medial side, and a lateral side, said device comprising a front section, a rear section, and flexible hinge means,

(a) said front section including a front sole portion and toe box means mounted over said front sole portion, said toe box means being adapted for accommodating therein the toe portion of the person,

(b) said rear section including a rear sole portion and heel retention means mounted over said rear sole portion, said heel retention means being arranged for accommodating therein the heel portion of the person, with a portion of the sole of the person between said front section and said rear section being uncovered by said device, said heel retention means including one pair of openings, one of said openings being on the medial side of the person's foot and the other of said openings being on the lateral side of the person's foot,

(c) said flexible hinge means comprising first and second straps respectively interconnecting said toe box and said heel retention means along the medial and lateral sides of the person's foot, said first strap being secured to said front section on the medial side of the person's foot and having a free end adapted to be extended through said opening in said heel retention means on the medial side of the person's foot, said other of said straps being secured to said front section on the lateral of the person's foot and having a free end arranged to be extended through said opening in said heel retention means on the lateral side of the person's foot, whereupon said straps extend generally parallel to said sole portions of said front and rear sections between said sections, said free ends of said first and second straps being arranged to be releasably secured together by releasably securable hook and loop fastening means located thereon, said straps being located above said front sole portion and said rear sole portion of said device, whereupon said straps do not contact the ground when said device is in place on the person's foot.

5,689,902

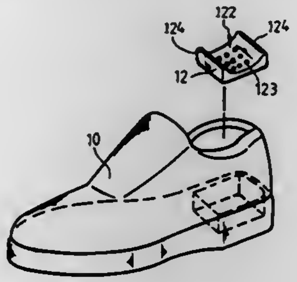
FOOTWEAR FOR DOING EXERCISE AND FOOT-MASSAGING

Wen-Der Juang, 2F, No. 26-27, Lane 624, Sec2, Chung Shan Road, Jang Huah City, Taiwan

Filed Sep. 13, 1996, Ser. No. 713,291

Int. Cl.⁶ A43B *21/32;13/18;* **A61F** *5/14*

U.S. Cl. 36—37 **6 Claims**



1. A footwear having an outsole provided in a heel portion thereof with a recess dimensioned to receive therein securely and removably a cushion block, said cushion block having a planar surface and an arcuate surface opposite in location to said planar surface, said arcuate surface being provided thereon with a plurality of rigid knobs made integrally therewith, said arcuate surface being defined by two straight peak edges opposite in location to each other.

5,689,903

PROTECTIVE WATERPROOF SHOE

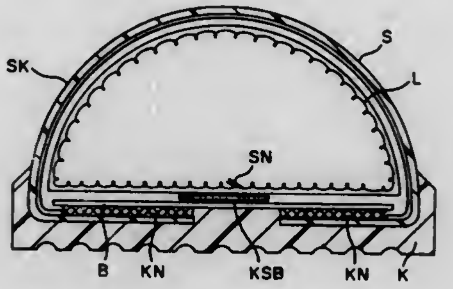
Johann Aumann, Bergham 2, D-83052 Bruckmuhl, Germany

Filed Oct. 18, 1995, Ser. No. 544,517

Claims priority, application Germany, Dec. 2, 1994, 44 43 002.7

Int. Cl.⁶ A43C *13/14;* **A43B** *13/28;23/26*

U.S. Cl. 36—77 R **4 Claims**



1. Footwear with:

(a) a shaft;

(b) a laminate lining the shaft, having a waterproof and water vapor permeable functional layer;

(c) an insole connected to the laminate;

(d) a waterproof plastic outsole injection molded to the lower part of the shaft;

(e) wherein the shaft material itself ends at a certain distance from the outsole side end of the laminate in the middle foot area and heel area; and

(f) wherein the outsole side end of the shaft material itself is connected to the insole and the outsole-side end of the laminate in a middle foot area and heel area of the footwear through a connection material formed by a porous connection material which can be penetrated by the outsole material when the latter is in the liquid state during the injection molding process;

characterized by

(g) a rigid protective cap which is arranged in a toe area of the footwear between the shaft and the laminate and whose underside facing the outsole goes under the insole over a predetermined width;

(h) a bootie consisting of a laminate which is arranged in the toe area on the side of the insole facing the foot where it lines the inside of the footwear; and

(I) wherein the shaft material is connected to the insole circumference in the toe area on the side of the insole facing the outsole by a glued connection.

5,689,904

HARD PLATE FOR SPIKED TRACK SHOES

Akira Kataoka, Kobe; Masanobu Inohara, Akashi; Ryuichi Tsukita; Toshio Suma, both of Kobe, and Kiyohiro Saito, Akashi, all of Japan, assignors to Asics Corporation, Japan

Division of Ser. No. 465,752, Jun. 6, 1995, Pat. No. 5,581,913, which is a division of Ser. No. 361,477, Dec. 22, 1994, Pat. No. 5,483,760, which is a continuation of Ser. No. 68,128, May 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 58,065, May 5, 1993, abandoned. This application Sep. 4, 1996, Ser. No. 706,235

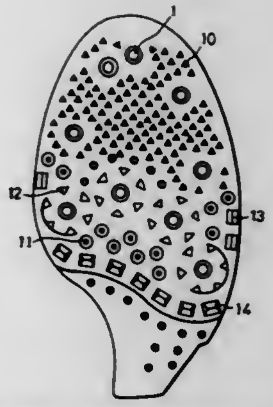
Claims priority, application Japan, May 13, 1992, 4-146297; Apr. 23, 1993, 5-97704; May 13, 1993, 5-111927

Int. Cl.⁶ A43B *5/00;* **A43C** *15/00*

U.S. Cl. 36—129 **4 Claims**

1. A hard plate for a spiked track shoe comprising:

a propulsion region for gripping ground surface and suppressing rearward slippage of the track shoe relative to the ground surface, said propulsion region being provided with a plurality of small projections of a substantially overall anterior forefoot portion in at least about half the forefoot portion; and



a braking region and a balance and acceleration region on a posterior forefoot portion for respectively buffering landing impact on the ground surface and rapidly gripping the ground surface upon landing, and for maintaining right and left balances on contact with the ground surface and providing a propulsion force at a start dash moment, said braking and balance and acceleration regions being provided with a plurality of first projections each having a shape of a truncated cone, a plurality of second projections each having a shape of a longitudinally placed triangular prism, a plurality of third projections each having a shape of a laterally placed triangular prism, and a plurality of fourth projections each having a shape of a laterally placed prismatoid.

5,689,905

HYDRAULIC SHOVEL WITH ARM INCORPORATING BREAKER

Yasuhiro Ibusuki, Kanagawa, Japan, assignor to Komatsu Ltd., Tokyo, Japan

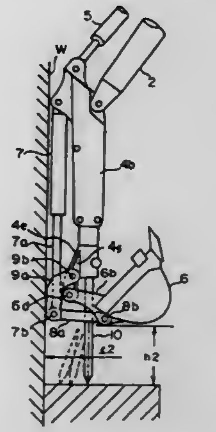
PCT No. PCT/JP94/01408, § 371 Date Feb. 29, 1996, § 102(e) Date Feb. 29, 1996, PCT Pub. No. WO95/06786, PCT Pub. Date Sep. 3, 1995

PCT Filed Aug. 25, 1994, Ser. No. 604,942

Claims priority, application Japan, Aug. 30, 1993, 5-238921

Int. Cl.⁶ E02F *3/96*

U.S. Cl. 37—403 **14 Claims**



1. A hydraulic shovel with an arm incorporating a breaker, comprising:

a boom pivotally connected to a hydraulic shovel;

the arm incorporating the breaker and pivotally connected to an end of said boom;

an arm cylinder pivotally connected between said arm incorporating the breaker and said boom;

a bucket having a pair of bucket brackets fixed thereto, each bucket bracket having one end pivotally connected to a bracket provided on an end of said arm incorporating said breaker;

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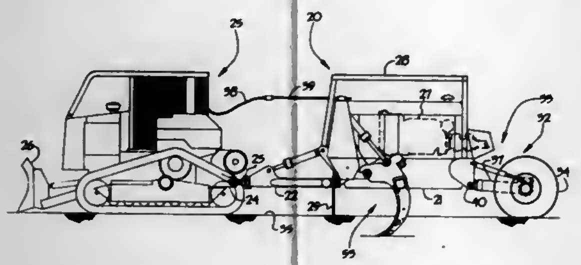
a pair of bucket links each having one end pivotally connected to one of said bucket brackets and the other end pivotally connected to an intermediate link;
the intermediate link having one end pivotally connected to the bracket provided on the end of said arm incorporating the breaker and the other end pivotally connected to one of said bucket links; and
a bucket cylinder having one end connected to said arm incorporating the breaker and the other end connected to said intermediate link and said bucket links;
wherein breaker work is performed with a chisel which, while said bucket is in a tilted condition, is attachable to the arm incorporating the breaker through a space defined between the pair of the bucket brackets and between the pair of bucket links at predetermined distances therefrom, and, while said bucket is in a dumping condition, is attachable to the same arm incorporating the breaker while said bucket is in the dumping condition.

5,689,906
METHOD AND APPARATUS FOR PREPARING GROUND SURFACE FOR TREE PLANTING

Douglas W. Dillman, Manning; Timothy W. Vinge, Fairview; Allen A. Pusch, Calgary; Minoru Saruwatari, Calgary, and S. Carl Zanon, Calgary, all of Canada, assignors to Canadian Forest Products, Inc., Vancouver, Canada

Filed Jun. 19, 1996, Ser. No. 665,896
Int. Cl.⁶ E02F *3/00*
U.S. Cl. 37—418 **16 Claims**

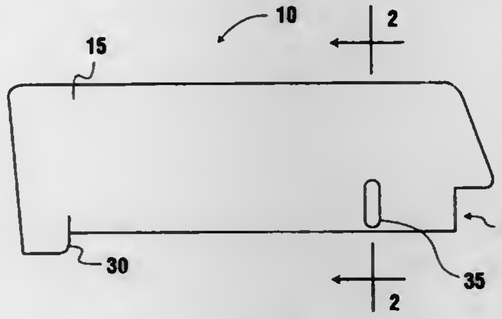


1. An apparatus for forming mounds on the ground surface in preparation for tree planting during movement in a direction of forward travel at a selected ground speed of the apparatus over said ground surface, said apparatus comprising:.
a framework,
ground engaging means supporting said framework above the ground surface for said movement in the direction of travel,
mound forming scoop means carried by and depending beneath said framework,
said scoop means including an integral member defining an earth collection and directing front surface having a concave shape in cross-section taken in a vertical plane extending in the direction of travel,
said curved surface of said scoop means having a lower portion extending downwardly and forwardly and terminating at a lowermost tip,
operating means for first pivoting said scoop means about a pivotal axis in one direction through an operating cycle from an initially raised retracted position downwardly to an earth penetrating and mound depositing position and then secondly pivoting said scoop means about said pivotal axes in an opposite direction upwardly to said raised retracted position,
said pivot axis being disposed forward and above said surface whereby said tip swings downwardly and forwardly during the movement to a maximum earth penetration position,
said operating means including a powered actuator means for swinging said scoop means downwardly at a velocity related to the ground speed for causing said tip to penetrate the ground at a substantially constant rate over a distance of forward travel to a maximum penetration and to then swing said scoop means back in an upwardly direction at a speed related to the ground speed to cause said scoop means to raise abruptly relative to the forward travel to the fully retracted position.

5,689,907
INERT WEIGHTED MAGAZINE

Bennie W. Cooley, 3415 Rawson St., Idaho Falls, Id. 83406

Filed Jan. 24, 1997, Ser. No. 787,273
Int. Cl.⁶ F41A *9/61*
U.S. Cl. 42—50 **14 Claims**

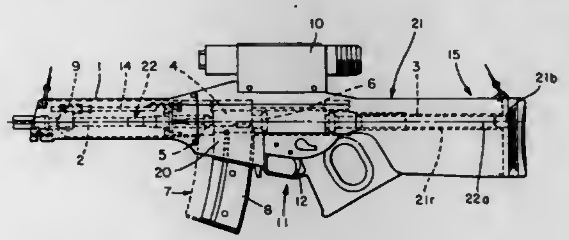


1. An inert magazine for replacing a loaded magazine in a gun having a magazine well, the inert magazine comprising:
(a) a ballast sized and shaped to be received into the magazine well of the gun, the ballast weighing approximately the same as a weight of the loaded magazine of the gun; and,
(b) means for removably retaining the ballast in the magazine well of the gun.

5,689,908
RIFLE CONSTRUCTION WITH SWING-TYPE BARREL

Rudolf Brandl, Dornhan, Germany, assignor to Heckler & Koch GmbH, Germany

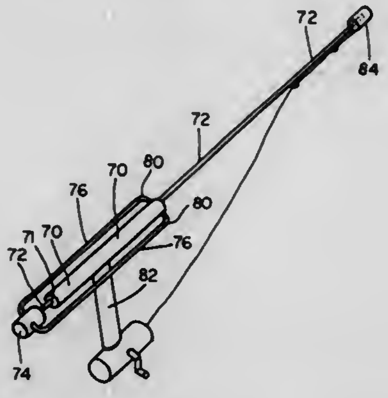
Filed Aug. 5, 1996, Ser. No. 694,658
Claims priority, application Germany, Aug. 10, 1995, 195 29 483.1
Int. Cl.⁶ F41A *21/48*
U.S. Cl. 42—77 **20 Claims**



1. A combination rifle construction adapted to fire cartridges of a first caliber in a first operable mode and cartridges of a second caliber in a second operable mode, comprising:
a longitudinally extending barrel assembly including a first rifle barrel disposed at one end of the assembly and a second rifle barrel disposed at the opposite end of the assembly, each of said barrels disposed in back-to-back relation; and
a rifle housing including a recess adapted for alternatively engaging the barrel assembly in the operable modes such that, in the first operable mode, the first rifle barrel is oriented for firing cartridges of said first caliber while the second rifle barrel is received within the housing, and in the second operable mode, the second rifle barrel is oriented for firing cartridges of said second caliber while the first rifle barrel is received within the housing.

5,689,909
PROJECTING FISHING POLE

Clyde L. Cheney, Jr., 462 Sego Ave., Salt Lake City, Utah 84111
Division of Ser. No. 316,840, Oct. 3, 1994, Pat. No. 5,507,112. This application Mar. 26, 1996, Ser. No. 621,890
Int. Cl.⁶ A01K *91/02*
U.S. Cl. 43—19 **1 Claim**

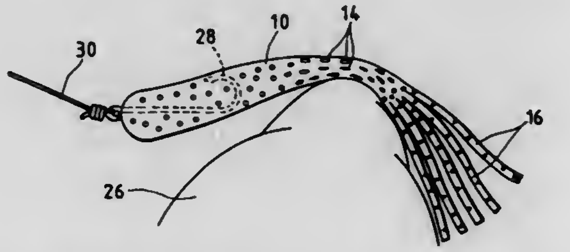


1. A fishing pole comprising
an elongate, tubular handle having first and second ends, said handle having an elongate, linear passage extending from the first end to the second end thereof;
means for attaching a fishing reel to said handle;
an elongate rod having a proximal end and a distal end, said rod being received coaxially through said elongate passage in said handle for longitudinal sliding movement back and forth in said elongate passage, with the distal end of said rod extending from the first end of said handle to form a distal end of said fishing pole, and with the proximal end of said rod extending from the second end of said handle;
a hand grasp on the proximal end of said rod; and
an elongate elastic member that is located on the outside of said handle and extends from said handle to said hand grasp,
whereby said hand grasp and said rod can be pulled backward to extend said elastic member and when said hand grasp is released, the rod is rapidly projected forward and will project a weight and a line from the distal end of said rod.

5,689,910
ARTIFICIAL BAIT

Seiji Kato, Saitama, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 231,478, Apr. 22, 1994, abandoned. This application Jun. 19, 1996, Ser. No. 666,058
Claims priority, application Japan, Apr. 28, 1993, 5-125125
Int. Cl.⁶ A01K *85/00*
U.S. Cl. 43—42.24 **9 Claims**

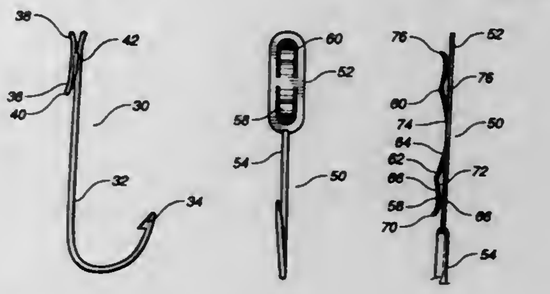


1. An artificial bait having a main body and a plurality of skirt portions formed of elastic material having flexibility and light transmissive properties, wherein said main body and said skirt portions contain a plurality of air bubbles embedded therein, said plurality of air bubbles being light transmissive and deformable upon deformation of said main body and said skirt portions to alter a path of light being transmitted through said main body and said skirt portions to enhance fish attracting characteristics, wherein said air bubbles are visible from an outside of said main body.

5,689,911
EASY TIE FISH HOOK

Chun Shiong Lin; Jefferson Lin; Philip Lin; Thomas Lin, and Ziu Eng Xu, all of 7809 Carter Dr. #7, Overland Park, Kans. 66204

Filed Feb. 16, 1996, Ser. No. 601,351
Int. Cl.⁶ A01K *91/04;83/00*
U.S. Cl. 43—43.16 **19 Claims**

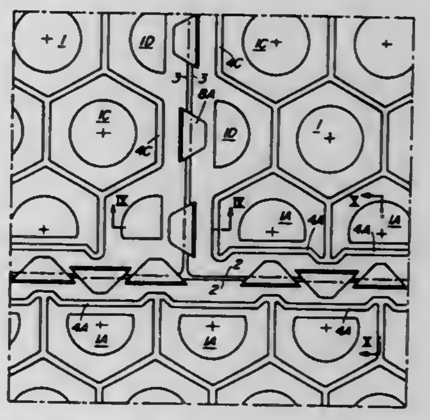


1. A fishing hook comprising:
a shank portion having a hook at one end; and
a slotted portion formed at an end of said shank portion opposite said hook, said slotted portion having an area distal said end in surface-to-surface contact with a surface of said shank portion, said slotted portion comprising:
a first slotted portion opening toward said end of said shank portion opposite said hook; and
a second slotted portion opening in a direction opposite said first slotted portion, each of said first and second slotted portions for receiving a fishing line therein.

5,689,912
HONEYCOMB PLATE FOR LAWNS

Eugen Prestele, Albert-Greiner-Strasse 73, D-86161 Augsburg, Germany

Filed Dec. 20, 1995, Ser. No. 575,455
Claims priority, application Germany, Dec. 22, 1994, 94 20 485.3 U
Int. Cl.⁶ A01G *9/02*
U.S. Cl. 47—1.01 **4 Claims**



1. A honeycomb lawn plate for seeding surfaces comprising peripherally closed chambers having an open top and a hexagonal cross-section, and peripherally open chambers on at least two opposite plate edges, the maximum cross-section of the peripherally open chambers being half as large as the cross-section of the peripherally closed chambers, wherein the peripherally closed

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chambers are located between peripherally open chambers, the peripheral walls of the peripherally closed chambers are located at a distance from at least one of the opposite plate edges, and the sequence of peripherally closed chambers and peripherally open chambers alternates on the opposite plate edges so that a zigzag channel is obtained between adjacent plates.

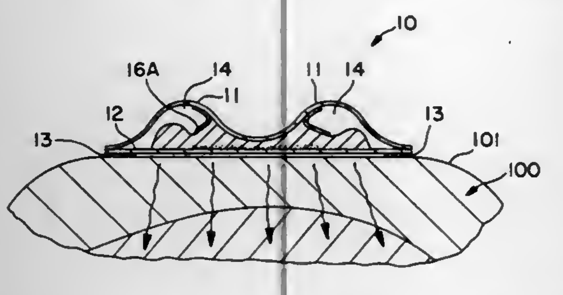
5,689,913
PLANT DEVELOPMENT AFFECTING DEVICE AND METHOD

Randolph M. Beaudry, East Lansing, Mich., assignor to Board of Trustees operating Michigan State University, East Lansing, Mich.

Continuation of Ser. No. 503,986, Jul. 19, 1995, abandoned, which is a division of Ser. No. 385,350, Feb. 8, 1995, Pat. No. 5,525,130. This application Aug. 16, 1996, Ser. No. 698,773

Int. Cl.^{6} A01C *1/00*

U.S. Cl. 47—1.5 **6 Claims**



1. A method for affecting the development of a living plant material which comprises:

(a) providing a device for use on a living plant material to affect development of the plant material which device comprises a container means containing separate compositions which generate a development affecting gas when selectively combined, wherein the container means has a layer which is pervious to the gas upon generation of the gas; and an adhesive on an exposed portion of the container means around the layer so that the device can be sealed on the plant material to release the gas through the layer into the plant material; and

(b) applying the container means to the plant material with the adhesive; and releasing the gas to the plant material by combining the compositions, wherein the development of the plant material is affected by the gas.

5,689,914
METHOD OF HYBRID CROP PRODUCTION USING DEHYDRATED POLLEN FROM STORAGE

John Andrew Greaves; Alan Francis Hawkins, both of Ankeny, Iowa, and Raymond Russotti, Hudson, N.H., assignors to Zenco (No. 4) Limited, London, England

Continuation-in-part of Ser. No. 282,629, Jul. 29, 1994, Pat. No. 5,596,838, which is a continuation-in-part of Ser. No. 260,184, Jun. 15, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,471

Int. Cl.^{6} A01G *7/00;* **A01H** *5/00;1/02*

U.S. Cl. 47—58 **17 Claims**

1. A method of producing reproductive crop material formed from at least two parents, the first parent providing the female portion of the reproduction and at least one second parent providing the male pollen portion of the reproduction, comprising the steps of:

a) planting the first parent which contributes the female portion of the crop;

b) providing preserved pollen, which has been preserved by a pulsed pressure evacuation system that reduces pollen moisture content prior to cryogenic storage and providing said preserved pollen mechanically to the female portion of the first parent; and

c) harvesting the reproductive crop material from the first parent.

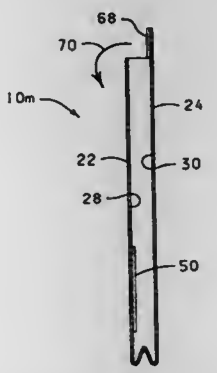
5,689,915
SLEEVE HAVING A DETACHABLE PORTION FOR FORMING A POT COVER

Donald E. Weder; Joseph G. Straeter, both of Highland, and William F. Straeter, Breese, all of Ill., assignors to Southpac Trust International, Inc.

Continuation of Ser. No. 608,390, Feb. 28, 1996, Pat. No. 5,628,146, and a continuation-in-part of Ser. No. 218,952, Mar. 25, 1994, Pat. No. 5,595,048, which is a continuation-in-part of Ser. No. 95,331, Jul. 21, 1993, Pat. No. 5,428,939, said Ser. No. 608,390is a continuation of Ser. No. 457,186, Jun. 1, 1995, Pat. No. 5,572,849, which is a continuation of Ser. No. 386,859, Feb. 10, 1995, Pat. No. 5,493,009, which is a continuation-in-part of Ser. No. 237,078, May 3, 1994, Pat. No. 5,625,979, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851. This application Aug. 30, 1996, Ser. No. 709,233

Int. Cl.^{6} A01G *9/02*

U.S. Cl. 47—72 **40 Claims**



1. A flexible sleeve for containing a pot having a floral grouping disposed therein, the flexible sleeve comprising:

a flattened body having a closed lower end, an open upper end, an outer peripheral surface, and an inner peripheral surface surrounding an inner retaining space, the sleeve further comprising:

a lower portion having an inner retaining space for enclosing the pot,

an upper portion connected to the lower portion and sized to substantially surround and encompass the floral grouping when the pot and floral grouping are disposed within the sleeve, the upper portion detachable from the lower portion via perforations positioned in a predetermined pattern, and

holding means comprising a cohesive bonding material for holding a portion of the sleeve adjacent the pot when the sleeve is opened and the pot is disposed within the inner retaining space thereby holding the lower portion of the sleeve in a position about the pot and the upper portion of the sleeve in a position about the floral grouping.

5,689,916
WINDOW PARTICULARLY FOR INSTALLATION IN AN INCLINED ROOF SURFACE

Jan Fahlen Jensen, Søborg, and Klaus Kornerup, Birkerød, both of Denmark, assignors to V, Kann Rasmussen Industri A/S, Søborg, Denmark

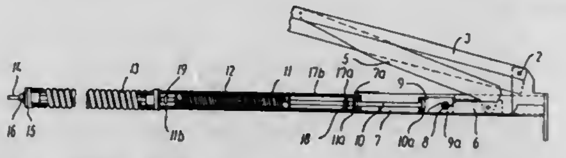
PCT No. PCT/DK94/00461, § 371 Date May 31, 1996, § 102(e) Date May 31, 1996, PCT Pub. No. WO95/16097, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 9, 1994, Ser. No. 652,509

Claims priority, application Denmark, Dec. 10, 1993, 1383/93

Int. Cl.^{6} E05D *15/30*

U.S. Cl. 49—252 **2 Claims**



1. A window, particularly for installation in an inclined roof surface, having an opening angle and comprising a main frame (1) having a top and a frame (3,4) hinged to the top thereof as well as a frame lifting arm (5) inserted between the main frame and the frame, said arm having two ends, one end pivotally connected with a lateral member of one of the main frame and the frame, and its other end pivotally connected with a slide shoe (6) which in a longitudinally displaceable manner is connected with the corresponding lateral member of the other of the frame and the main frame, and which is associated with a pre-stressed lifting spring (13), as a first coupling member (8) on the slide shoe is adapted to be brought into engagement with a second coupling member (9) connected with the lifting spring when installing the window at the installation site, characterized in that an auxiliary spring (12) is located between the slide shoe (6) and the lifting spring (13), pre-stressing of which can be adjusted depending on the roof inclination, by means of a manually operated adjusting element, to exert a parallel spring force for supplementing the spring force from the lifting spring within a given range of the opening angle of the window.

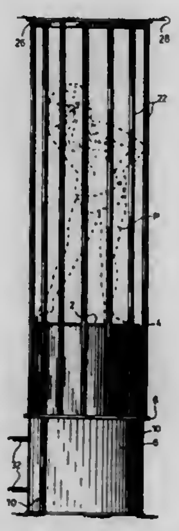
5,689,917
VERTICALLY MOVABLE STAGE ASSEMBLY

Daniel St-Germain, 1812, Rang St-Edouard, St-Simon Québec, Canada, J0H 1Y0

Filed May 13, 1996, Ser. No. 648,631

Int. Cl.^{6} E04H *3/26*

U.S. Cl. 52—7 **5 Claims**



1. A mobile self-standing stage unit comprising:

a) a main ground-engaging casing, defining a flooring member, freely engageable over ground, an integral peripheral upstanding wall having a top edge, and a access opening circumscribed by an upright wall top edge;

b) a ram member, defining a cylinder section, fixedly mounted in upright position to said casing flooring member, and a piston section defining an inner section, slidingly engaged into said cylinder section, and an outer end;

c) a platform, having an underface with a central area transversely anchored to said piston outer end of said ram member, and an opposite top face adapted to stably support at least one performer spacedly over ground, said platform template being diametrally smaller than said casing access opening;

d) hydraulic power means, carried within said casing and operatively connected to said ram member for continuous, long-lasting, up and down reciprocating motion of said platform over said main casing;

e) a number of upright post members defining top and bottom ends, said post members fixedly mounted at their bottom ends to said main casing upright wall top edge and fixedly connected at their top ends to a transverse top panel, wherein an open upright see-through cage is formed over said casing, said platform freely reciprocatable under power from said hydraulic power means through a lower section of said cage between a first downward limit position, approximately within said casing access opening, and a second upward limit position, intermediate said casing accessing opening and said top panel, so that a performer supported by the platform may move up and down therewith without contacting said top panel; wherein said mobile stage unit is destined to be freely mounted in upright condition over ground spacedly under the room ceiling and to be completely portable and freely movable as a single unit from one location to another, without special tools nor skilled labour and without modification to the ground surface.

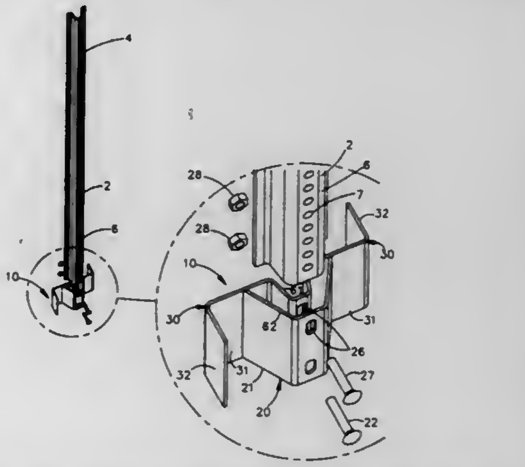
5,689,918
SIGN POST STABILIZER

Paul Johnson, 304 Spring Ave. North, Lake Preston, S. Dak. 57249

Filed Sep. 10, 1996, Ser. No. 711,794

Int. Cl.^{6} E04H *17/22*

U.S. Cl. 52—153 **5 Claims**



1. A Sign Post Stabilizer for stabilizing a sign post having a lower section driven into the ground, said sign post being of a channel type having an elongate planar web portion, a pair of laterally spaced angled portions each being joined to an edge of said web portion at a corner such that each said angled portion forms an obtuse angle with the plane of said web portion, and a flange portion extending out from each said angled portion in a direction substantially parallel to said web portion, said sign post stabilizer comprising:

a post sleeve having an inner channel wall and an outer channel wall collectively defining a passage for receiving a sign post

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therethrough such that said post sleeve is positionable about a sign post for securing to the lower section of said sign post;

wherein said outer channel wall comprises an elongate outer central wall portion and a pair of outer slant wall portions, each said outer slant wall portion being connected to a lateral side of said outer central wall portion and slanting away from said outer central wall portion at an obtuse outer angle with respect to the plane of said outer central wall portion such that the distance between said outer slant wall portions increases away from said outer central wall portion;

wherein said inner channel wall comprises an elongate inner central wall portion and a pair of inner slant wall portions, each said inner slant wall portion being connected to a lateral side of said inner central wall portion and slanting away from said inner central wall portion at an obtuse inner angle with respect to the plane of said inner central wall portion such that the distance between said inner slant wall portions increases away from said inner central wall portion;

wherein said inner and outer central wall portions are in a spaced and substantially parallel relationship to each other, said obtuse outer angle being greater than said obtuse inner angle such that said inner and outer slant wall portions diverge from each other away from said central wall portions to accommodate therebetween the flange portion of a sign post extending through the passage of said post sleeve; and

a pair of wing members each extending outward from the inner slant wall portions of said post sleeve in a direction substantially parallel to said inner and outer central wall portions, the outer slant wall portion of each said outer channel wall portion being connected to a said wing member laterally outward from said inner slant wall portion, the part of each said wing member between said inner and outer slant wall portions providing a surface for abutting against the flange portion of a sign post in a substantially parallel relationship;

wherein a lateral portion of each said wing member is bent at a wing angle along an axis substantially parallel to the longitudinal axis of a signpost extending through the passage though said post sleeve.

5,689,919

BASE ISOLATED BUILDING OF WIND RESISTING TYPE

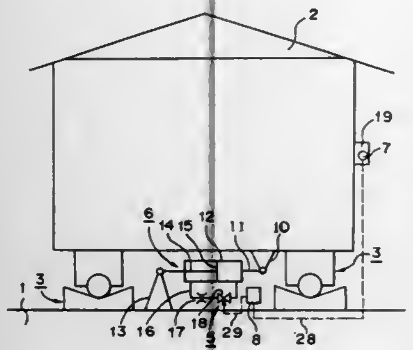
Kenichi Yano, Tokyo, Japan, assignor to Kajima Corporation, Tokyo, Japan

Filed Sep. 9, 1996, Ser. No. 711,264

Claims priority, application Japan, Sep. 21, 1995, 7-243477

Int. Cl.^{6} E04H *9/02*

U.S. Cl. 52—167.6 **4 Claims**



1. A base isolated building of wind resisting type having a base portion thereof supported by a foundation through a rolling bearing, the building comprising a vibration control device with a releasable rigid connector disposed between the building and the foundation, an earthquake detector mounted on the building, and a release controller connected to output from said earthquake detector and said rigid connector, the release controller being adapted to release said releasable rigid connector in response to output signal from the earthquake detector, whereby normally the building being securely fixed to the foundation against wind pressure by the rigid connector of the vibration control device, while upon occurrence of earthquake, the rigid connector is released by the release controller in response to the output from the earthquake detector so as to control vibration of the building by a combination of said rolling bearing and said vibration control device.

5,689,920

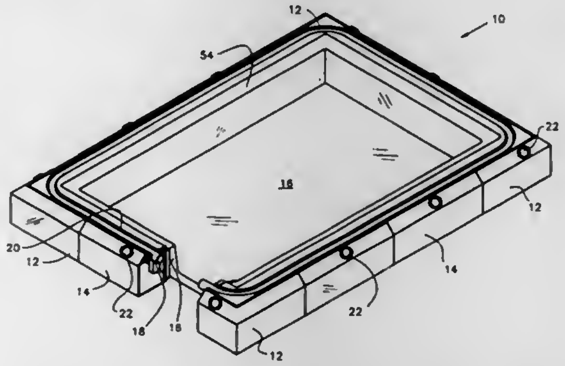
MODULAR CONTAINMENT SYSTEM FOR HAZARDOUS MATERIALS

Jeffrey A. Hallsten, Sacramento, Calif., assignor to Hallsten Corporation, North Highlands, Calif.

Continuation-in-part of Ser. No. 4,917, Jan. 19, 1993, Pat. No. 5,454,195. This application Jun. 7, 1995, Ser. No. 482,731

Int. Cl.^{6} B65G *5/00*

U.S. Cl. 52—169.1 **2 Claims**



1. A containment system for receiving and collecting materials leaked or spilled from containers or dropped from an industrial process or other activity conducted over a containment area, comprising:

a series of portable berm modules, each formed of a relatively lightweight material and having a hollow interior, and with a stable cross section to resist outward tipping, each berm module having a bottom with a load-bearing perimeter lying generally in a plane and having a base width which is great enough relative to the berm module's height that with the berm module filled with water, it will not tend to tip outwardly when the containment area holds liquid of water's density up to about half the height of the berm module, and with interconnection means on each berm module for interlocking the module with immediately adjacent modules so as to form a perimeter assembly with a plurality of the berm modules connected end to end to define the containment area,

fill means permitting filling of the modules with water, sand or other suitable ballast material to add stability to the modules when assembled together into the perimeter assembly, and

liner means formed of imperforate plastic sheet material, for overlying the containment area and extending at least partially up onto the berm modules of the perimeter assembly, to thereby contain solid or liquid materials within the containment area.

5,689,921

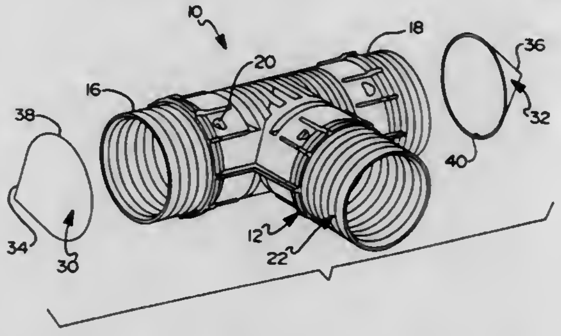
FOOTING CONNECTOR AND METHOD OF USE

Douglas C. Carlton, 1115 Heatherwood, Flint, Mich. 48532

Continuation-in-part of Ser. No. 216,150, Aug. 22, 1994, Pat. No. 5,560,163, which is a continuation of Ser. No. 198,515, Feb. 18, 1994. This application Sep. 11, 1995, Ser. No. 526,750

Int. Cl.^{6} E04G *15/06*

U.S. Cl. 52—169.5 **13 Claims**



1. A connector for use with a collar and tubing in forming a fitting, the connector comprising:

(a) at least a first hollow leg, the leg having a thread formed thereon, the leg being threadably connectable to a collar, and

(b) at least one end cap integrally formed on and contiguous with the first hollow leg the at least one end cap projecting outwardly from the first hollow leg and being severable therefrom.

5,689,922

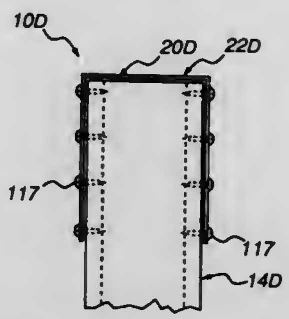
STRUCTURAL FRAMING SYSTEM

Larry Randall Daudet, Schererville, Ind., assignor to Dietrich Industries, Inc., Hammond, Ind.

Continuation of Ser. No. 381,078, Jan. 31, 1995. This application Jan. 21, 1997, Ser. No. 785,883

Int. Cl.^{6} E04B *2/58*

U.S. Cl. 52—210 **7 Claims**



1. Load-bearing metal framing for building construction, said framing comprising:

an upwardly-extending one-piece jamb member;

a downwardly-open one-piece header member having a header web portion and a pair of walls along opposite side edges of said web portion, said pair of walls extending substantially perpendicular from said web portion a first distance to define an opening therebetween for receiving an end of said upwardly extending one-piece jamb member therein such that said header member transfers at least a portion of a load received on said header member to said jamb member, each said wall member of said header member being fixedly attached to said jamb member; and

a downwardly-open one-piece upper channel member fixedly connected to at least one of said jamb member and said header member and spanning a juncture of said jamb and header members, said upper channel member having a web portion and a pair of flanges along opposite side edges of said web portion, said pair of flanges extending substantially perpendicular from said web portion a second distance that is shorter than said first distance, wherein said web portion of said header member is in abutting contact with said web portion of said upper channel member and said flanges are in abutting contact with said corresponding walls of said header member to provide lateral support thereto.

5,689,923

DEVICE FOR SECURING STEEL REINFORCING OR PRESTRESSING MEMBERS IN AN ANCHORAGE

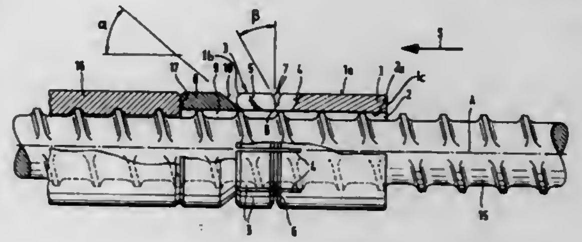
Antonius Winkeljann, Landsberg; Werner Kaibach, Buchloe, and Franz Böhm, Kaufering, all of Germany, assignors to Hilti Aktiengeschaft, Fürstentum, Liechtenstein

Filed Apr. 10, 1996, Ser. No. 630,190

Claims priority, application Germany, Apr. 11, 1995, 195 13 202.5

Int. Cl.^{6} E04C *3/10*

U.S. Cl. 52—223.13 **6 Claims**



1. A device for securing steel reinforcing or prestressing members (15) in an anchorage (14), the device comprising an axially extending cylindrical anchoring sleeve (1) having an axis (A), a first end, a second end, an inside surface and an outside surface, said anchoring sleeve (1) having a throughbore extending between the first and second ends and an axially extending deformation section (3) extending from the first end towards the second end, said deformation section being subdivided into at least six bending elements (5) by laterally spaced slots extending axially from the first end toward the second end, and said deformation section (3) having an unexpanded state and an expanded state, an annular expanding element (8) having an outside surface and an inside surface forming a throughbore (9) free of threads, said expanding element (8) having a first end and a second end with said second end arranged to contact the first end of said anchoring sleeve (1) and forming a contact surface (10) for the bending elements (5) at the first end of said anchoring sleeve, said contact surface (10) being inclined at an angle to the axis (A) of said anchoring sleeve, said expanding element being displaceable in the direction of the axis (A) against the deformation section (3) of said anchoring sleeve (1) for radially outwardly displacing said bending element (5) against a receiving bore (11) surface (12) in said anchorage, said anchoring sleeve (1) being arranged in the expanded state to be secured by a positive lock in an annular undercut in the receiving bore (11) against the anchorage (14), said contact surface forms an angle of inclination (α) with the axis (A) of said anchoring sleeve in the range of approximately 30° to 80°, said deformation section (3) having a length in the axial direction of said anchoring sleeve so that the outside diameter of said bending elements at the first end of said anchoring sleeve in the expanded anchorage state amounts to at the maximum 140% of the outside diameter of the first end of said anchoring sleeve in the unexpanded state.

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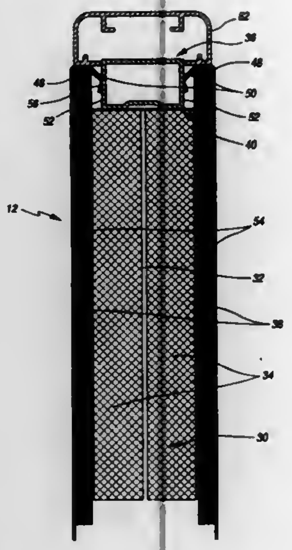
5,689,924
CONSTRUCTION OF MODULAR OFFICE PANEL SYSTEMS

Timothy R. Mason, Muscatine, Iowa, assignor to Hon Industries, Inc., Muscatine, Iowa

Filed Oct. 7, 1996, Ser. No. 729,833

Int. Cl.⁶ E04H *3/00*

U.S. Cl. 52—239 **9 Claims**



1. A modular office panel system comprising:
a central core;
a rigid frame surrounding said core;
a pair of generally rigid panel members each disposed on opposite sides of said core;
a channel member having a central portion disposed between said frame and said core and having sides extending from said central portion around sides of said frame, said channel member sides terminating in reversely bent portions defining flanges that engages said rigid panel members, said reversely bent portions each defining a resilient edge portion in engagement with a side of said frame;
a decorative outer covering over said panel members;
wherein said covering is retained over said panel members by insertion of marginal edges of said covering between said sides of said frame and said resilient edge portions of said channel member.

5,689,925

Patent Not Issued For This Number

5,689,926
MODULAR PANEL SYSTEM

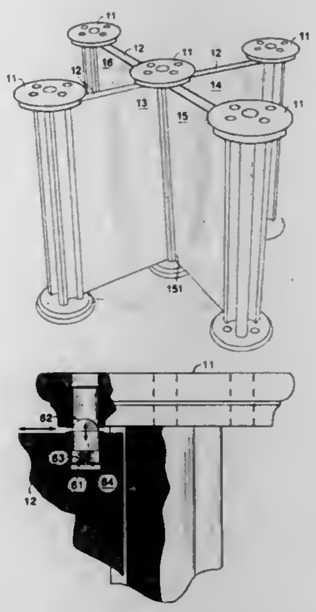
Gregory Nichols, Box 3214, Nantucket, Mass. 02584

Filed Oct. 5, 1995, Ser. No. 539,420

Int. Cl.⁶ E04B *1/00*

U.S. Cl. 52—282.2 **2 Claims**

1. A modular panel system comprising:
(a) at least one panel; and
(b) a first plurality of panel supports, each panel support having:
  (i) a member having first and second ends;
  (ii) a base, disposed at the first end, shaped to support the member in a free-standing upright position;
  (iii) a cap disposed at the second end; and
  (iv) panel retaining means, mounted in at least one of the cap and base, for removably retaining an appropriately configured edge of a vertically oriented panel between the cap and the base so as to permit (i) the panel edge's attachment to, and removal from, the panel support without use of tools and (ii) while the panel's edge is retained by the panel support, rotational movement of the panel about an axis defined approximately by the edge, wherein



the panel retaining means includes, mounted in at least one of the base and the cap, one of (i) a spring-loaded element having a direction of travel that is parallel to the edge when the edge is being retained therein and (ii) a recess for receiving the spring-loaded element;
the panel's edge has two ends, and at least one end includes the other of the spring-loaded element and the recess;
the base and the cap each include one of (i) a spring-loaded element having a direction of travel that is parallel to the edge when the edge is being retained therein and (ii) a recess for receiving the spring-loaded element: and
each end of the panel 's edge includes the other of the spring-loaded element and the recess.

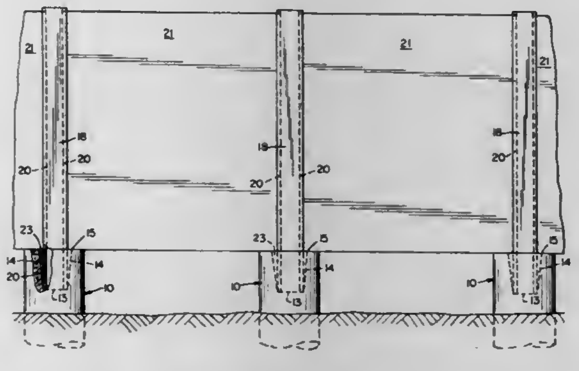
5,689,927
CONCRETE POST USABLE WITH A SOUND BARRIER FENCE

Larry E. Knight, Sr., P.O. Box 187, Glyndon, Md. 21071

Filed Jan. 22, 1997, Ser. No. 787,105

Int. Cl.⁶ E02D *27/42*

U.S. Cl. 52—297 **13 Claims**



1. A fence post combination comprising an elongated, vertical, cylindrical, concrete footing embedded in the ground with a top exposed portion having a flat top, a depression located in a central portion of said flat top, said depression having a base and a plurality of side walls forming an opening in the flat top, a plurality of vertical reinforcing rods embedded in said concrete footing and extending substantially the entire length thereof, said vertical reinforcing rods being arrayed around said depression, a plurality of reinforcing rings embedded in said concrete footing and surrounding said depression, said reinforcing rings and reinforcing rods serving to strengthen said concrete footing surrounding said depression, a precast concrete post vertically mounted in said depression with the bottom of the post seated on the base of the depression, and a quantity of quick setting, high strength grout filling a space in the depression surrounding the post to bond the post to the footing.

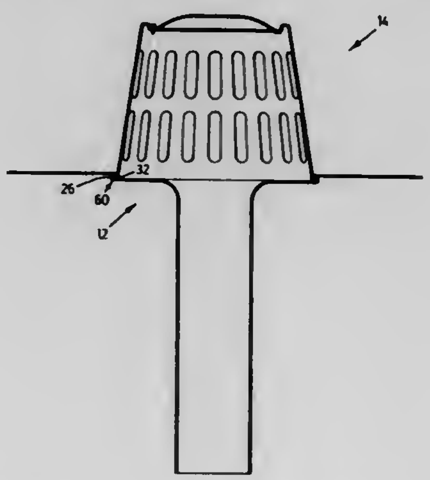
5,689,928
ROOF DRAIN AND METHOD FOR MAKING SAME

Neil Brian Fisher Rasksen, Bolton, Canada, assignor to Metalcraft Spinning & Stamping (Tor.) Ltd., Etobicoke, Canada

Filed Feb. 26, 1996, Ser. No. 606,708

Int. Cl.⁶ E04B *1/70*

U.S. Cl. 52—302.1 **11 Claims**



1. A device that drains water from a flat roof surface, said roof surface having a drainage pipe located there below, comprising:
(a) connecting means for providing connections between the roof surface and the drainage pipe, comprising a conduit having a top and a bottom, the bottom being shaped to be coupled to the drainage pipe, and a roof flange extending peripherally outwardly around the top of the conduit having an outer portion with a flat top surface and a recessed inner portion connected to the outer portion by a shoulder portion;
(b) straining means for straining debris from the water entering the drainage pipe, comprising a strainer basket having a substantially hollow interior, an open bottom face, an open top face, side walls having a top edge and a bottom edge and containing a plurality of apertures, and a strainer flange extending peripherally outwardly around the bottom edge of the side walls having an outside dimension sized to fit within the recessed inner portion of the roof flange, wherein the shoulder portion of the roof flange is crimped over the strainer flange to non-removably rigidly couple the straining means to the connecting means; and
(c) closeable access means for closing the top face of the straining means and providing selective access to the interior of the straining means.

5,689,929
EARTHQUAKE AND WEATHER RESISTANT, FAIL-SAFE CONSTRUCTION BLOCK

Bob G. Newsom, Virgie, Ky., assignor to Advanced Building Technologies, Inc., Olive Hill, Ky.

Filed Oct. 12, 1995, Ser. No. 542,131

Int. Cl.⁶ E04H *12/00*

U.S. Cl. 52—648.1 **19 Claims**

1. A construction unit comprising fail-safe construction blocks wherein each of said fail-safe construction block comprises:
a bottom frame including a bottom frame lower section defining the geometric foot print of said fail-safe construction block and constituting one element of a male/female coupling and a bottom frame upper section including a "U" channel;
a top frame including a top frame upper section constituting a second element of said male/female coupling and a top frame lower section including a "U" channel;
a plurality of panels, each of which includes an upper edge positioned within said "U" channel of said top frame and a lower edge positioned within said "U" channel of said lower frame; and
said top and bottom frames include interlocking means on sides of said frames for engaging mating interlocking means of the other similar block when said top and bottom frames of two similar fail-safe construction blocks are interfit one over the other, said interlocking means interlocks said fail-safe construction blocks.

5,689,930
HEAT REFLECTIVE AND/OR ABSORBENT MATERIAL

David John Anderson, 8 Westmere Drive, Mill Hill, London, United Kingdom, NW7 3HE

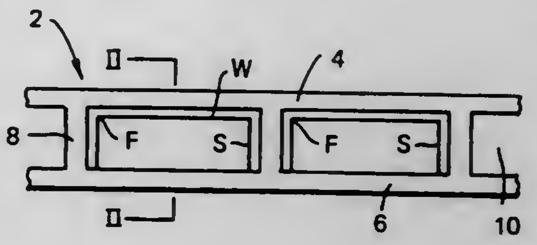
PCT No. PCT/GB94/00589, § 371 Date Sep. 21, 1995, § 102(e) Date Sep. 21, 1995, PCT Pub. No. WO94/21869, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 22, 1994, Ser. No. 530,228

Claims priority, application United Kingdom, Mar. 22, 1993, 9305903; Aug. 12, 1993, 9316736

Int. Cl.⁶ E04C *2/54*

U.S. Cl. 52—786.11 **9 Claims**



3. A glazing panel with comprises a plurality of generally parallel passageways to provide box sections, each box section having walls of relatively transmissive material, at least some of the passageways containing a rigid length of sheet material selected from the group consisting of relatively heat reflective material, relatively heat absorbent material and relatively heat absorbent and reflective material, the length of sheet material comprising a major web portion and side portions extending between opposed inner walls of the box section passageway, and at least one side portion separated from the major web portion by a longitudinal fold line and having a free edge remote from the fold line, the side portion being in contact with another inner wall of the box section.

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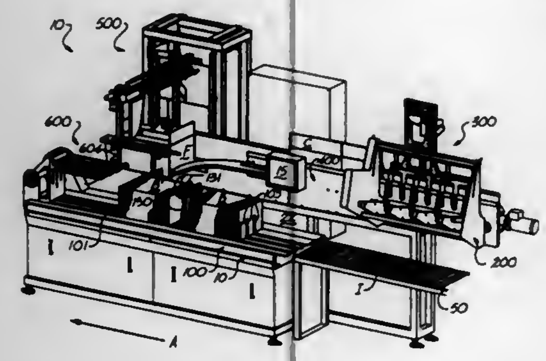
5,689,931
CASE ERECTOR WITH A-B DETECTION

Jimmy R. Bridges, Charlotte, N.C.; Phillip S. LaChapelle, Tega Cay, S.C., and Claude E. Monsees, Charlotte, N.C., assignors to Roberts Systems, Inc., Charlotte, N.C.

Division of Ser. No. 519,240, Aug. 25, 1995. This application Aug. 26, 1996, Ser. No. 703,134

Int. Cl.^{6} B65B *57/02*

U.S. Cl. 53—64 **2 Claims**



1. A case packing device comprising:
- a source of flattened and folded cases, said cases comprising a mixture of an A-type and B-type cases said A and B-type cases being distinguished whether they open to the left or right respectively,
- an assembly for separating a single case when said source of cases and for feeding said separating case to a case unfolding mechanism, said case unfolding mechanism having;
- a left and a right stationary case unfolding plow;
- a plurality of grippers for gripping said case;
- a mechanism for moving said gripper to hold said case against said plow thereby unfolding said case;
- a mechanism for lowering said grippers to lower said unfolded case over a group of articles to be cased;
- a sensing mechanism positioned on said packing device, said sensing mechanism detecting whether the said folding case is an A or B-type case;
- means for moving an A-type folded case to a first point within said case unfolding mechanism wherein said A-type case is an operative engagement for unfolding the said right plow and said B-type folded case is by means positioned at a second point within said case unfolding mechanism wherein said second point is down-stream of said first position and said B-type case is in operative engagement with said left plow.

5,689,932
QUICK CHANGE METHOD AND APPARATUS FOR FILLING AND CAPPING MACHINES

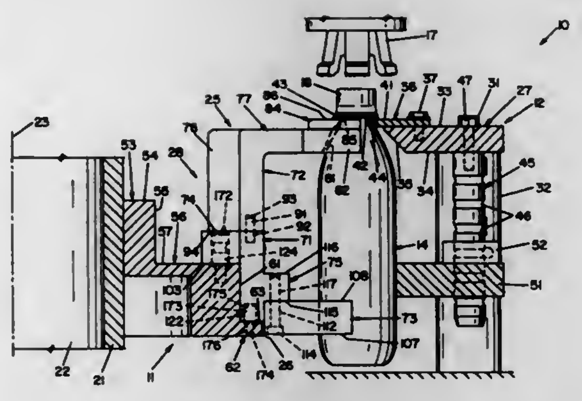
Michael H. Peronek, Strongsville, and Daniel L. Goodell, Tallmadge, both of Ohio, assignors to FCI, Inc., Cleveland, Ohio

Filed May 13, 1996, Ser. No. 645,556

Int. Cl.^{6} B65B *59/04;7/28*

U.S. Cl. 53—201 **36 Claims**

1. A method of replacing neck support assemblies at a station on a bottling maching for filling or capping containers having a generally circular cross-section to accommodate different size containers comprising:
- providing a rotatable star wheel means for moving said containers through said machine;
- providing said individual neck support assemblies about the periphery of said star wheel means including first and second neck support assemblies for each said station, each of said plurality of individual neck support assemblies having pocket support means for holding said containers and a star wheel support portion attached to said star wheel means;
- providing piston means on each said neck support assembly for moving between a locked position and an unlocked position;



- providing clamp pin means on said star wheel means for cooperating with said piston means;
- depressing said piston means of said first neck support assembly and lifting said neck support assembly off of said star wheel means;
- providing said second neck support assembly at said station and depressing said piston means;
- lowering said second neck support assembly over said clamp pin means; and
- releasing said piston means whereby said piston means engages said clamp pin means to assume said locked position.

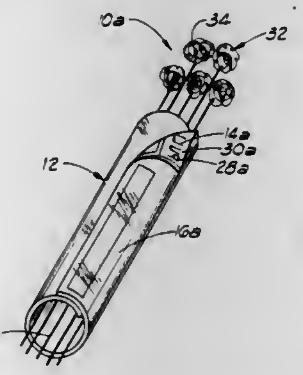
5,689,933
WRAPPING MATERIAL HAVING A PULL TAB AND PULL INDICIA FOR WRAPPING A FLORAL ARRANGEMENT AND METHOD

Donald E. Weder; Joseph G. Straeter, both of Highland, and William F. Straeter, Breese, all of Ill., assignors to Southpac Trust International, Inc.

Continuation of Ser. No. 373,821, Jan. 17, 1995, abandoned, which is a division of Ser. No. 963,882, Oct. 20, 1992, Pat. No. 5,408,803, which is a continuation-in-part of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 963,882is a continuation-in-part of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application May 31, 1995, Ser. No. 455,871

Int. Cl.^{6} B65B *11/04;25/02*

U.S. Cl. 53—399 **54 Claims**



16. A method for both wrapping a wrapping material about a floral arrangement and removing said wrapping material from said wrapped floral arrangement, comprising the steps of:

- providing a wrapping material for wrapping a floral arrangement, comprising:
  - a sheet of material having an upper surface, a lower surface and an outer periphery, the sheet of material further comprising a pull tab having an adhesive disposed on at least a portion thereof, the pull tab having pull indicia thereon, the pull tab sized to be grasped between an operator's thumb and forefinger, the sheet of material sized to wrap about and substantially surround and encompass a floral arrangement;
- providing a floral arrangement having an upper end consisting of a flower portion and a lower end consisting of a stem portion;
- disposing the floral arrangement on the sheet of material;
- wrapping the sheet of material about the floral arrangement by overlapping at least one portion of the sheet of material with at least one other portion of the sheet of material, the portions of the sheet of material overlapped so that the pull tab and the pull indicia are exposed on the outside of the wrapping;
- connecting the overlapping portions of the sheet of material by adhesively contacting and connecting one overlapping portion with at least one other overlapping portion via the adhesive on the pull tab, wherein at least a portion of the pull tab overlaps at least a portion of the sheet of material, said portion of the pull tab adhesively contacting and connecting to said portion of the sheet of material thereby forming a wrapper about the floral arrangement, the wrapper substantially encompassing and surrounding a substantial portion of the floral arrangement;
- releasing the pull tab from the wrapper by grasping the pull tab between an operator's thumb and forefinger and lifting the pull tab away from the wrapper, thereby releasing the adhesive connection;
- removing said wrapper from said floral arrangement by pulling the pull tab, said pulling causing the overlapped portion of the sheet of material near the pull tab to lift away from the underlying portion of the sheet of material, thereby causing the wrapper to gently unwrap from the floral arrangement, said unwrapping and removal of the sheet of material being accomplished without causing damage to the floral arrangement.

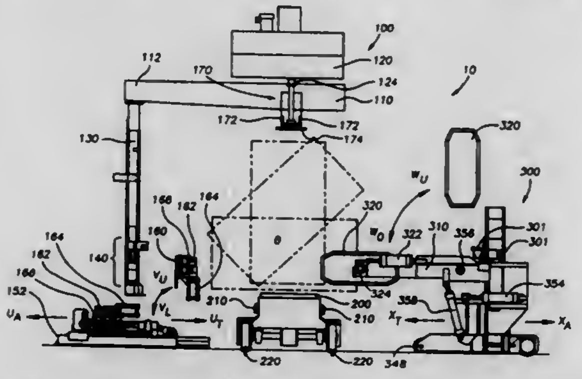
5,689,934
METHOD AND SYSTEM FOR WRAPPING A BALE

Philip G. Scherer, Ft. Lauderdale; Werner K. Diehl, Parkland, both of Fla., and Gale W. Huson, Glenview, Ill., assignors to Mima Incorporated, Glenview, Ill.

Filed Apr. 26, 1996, Ser. No. 639,202

Int. Cl.^{6} B65B *13/02;41/18*

U.S. Cl. 53—399 **18 Claims**



7. A method for wrapping a bale with wrapping material, comprising the steps of:
- supporting a bale on a support platform in a first orientation and positioning said bale disposed upon said support platform at a wrapping station;
- providing bale wrapping means for applying wrapping material about a bale disposed at said wrapping station and while said bale is disposed in a predetermined orientation;
- providing an upender carriage adjacent to said wrapping station wherein said upender carriage is movable between lowered and raised positions;
- mounting a pair of arms upon said upender carriage wherein said arms are movable with respect to said upender carriage between lowered and raised positions, and wherein said pair of arms are also movable with respect to said upender carriage toward and away from each other;
- mounting a pair of bale clamping members upon said pair of arms wherein said bale clamping members are pivotally movable with respect to said pair of arms between first and second positions;
- activating said bale wrapping means so as to wrap side portions of said bale with wrapping material supplied by said bale wrapping means in a first wrap application and while said bale is disposed in said first orientation;
- disposing said upender carriage at its lowered position;
- disposing said pair of arms at their lowered positions and moving said pair of arms toward each other such that said pair of bale clamping members disposed at said first position can engage said bale disposed upon said support platform at said wrapping station and in said first orientation;
- moving said upender carriage to its raised position so as to lift said clampingly engaged bale from said support platform;
- rotating said pair of bale clamping members from said first position to said second position such that said bale is rotated from said first orientation to a second orientation;
- moving said upender carriage from its raised position to its lowered position so as to place said rotated bale upon said support platform in said second orientation;
- moving said pair of arms away from each other so as to disengage said pair of bale clamping members from said bale, and moving said pair of arms to said raised positions so as to remove said pair of arms from the vicinity of said bale;
- wrapping side portions of said rotated bale not wrapped during said first wrap application, with wrapping material supplied by said bale wrapping means in a second wrap application; and
- removing said wrapped bale from said wrapping station.

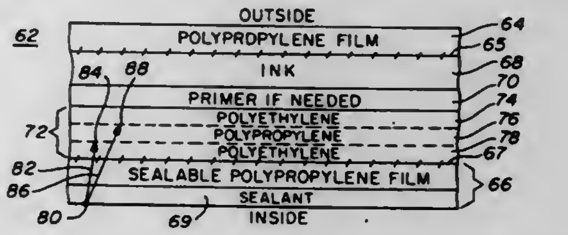
5,689,935
PRODUCT PACKAGE HAVING RELIABLE OPENABILITY

William J. Derkach, Lewisville, Tex.; Robert E. Hawkins, Cordova, Tenn., and Bruce Kinsman, McRae, Ark., assignors to Recot, Inc., Calif., and Bryce Corporation, Tenn.

Filed Mar. 11, 1996, Ser. No. 613,412

Int. Cl.^{6} B65B *61/18*

U.S. Cl. 53—412 **2 Claims**



1. A method of forming a package of a plastic product, the package having a substantially predictable line of failure along an elongated seam that opens the package when force is applied to the elongated seam, the method comprising the steps of:
- forming a plastic body portion having a substantially cylindrical shape and having opened ends;
- forming said body portion of a laminate using a polyethylene/polypropylene/polyethylene extrudate laminated between an inner sealant plastic film layer and an outer plastic film layer;
- sealing the inner surface of one end of the body portion to form a package with a seam closing the one end of the package prior to a product being inserted therein; and

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sealing the inner surface of the other end of the body portion to close the package with a second seam after product is inserted therein, the polyethylene and polypropylene in the extrusion laminate having different melt temperatures to form said predictable line of failure along the interface between said polyethylene and said polypropylene

said line of failure opening said package when a separating force is applied to said second seam without tearing down said outer plastic film layer.

5,689,936
METHOD AND APPARATUS FOR MANUFACTURING TAGGED INFUSION PACKAGES

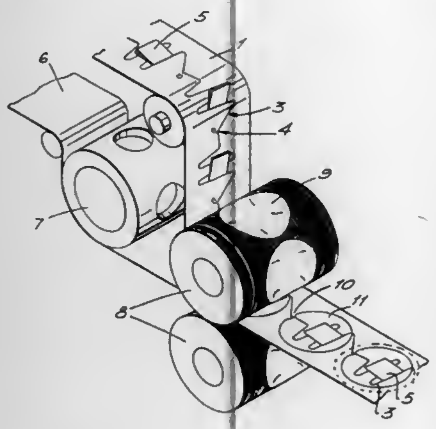
Alan George Kenney, Over, England, assignor to A.G. (Patents) Limited (British company), London, England

Division of Ser. No. 104,135, Oct. 12, 1993, Pat. No. 5,511,359. This application Apr. 29, 1996, Ser. No. 638,795

Claims priority, application United Kingdom, Feb. 14, 1991, 9103156; WIPO, Feb. 14, 1992, PCT/GB92/00265

Int. Cl.⁶ B65B *29/04;61/14*

U.S. Cl. 53—413 **14 Claims**



1. Apparatus for manufacturing tagged infusion packages having tags comprising a string member attached to the package and having an end intended to be gripped by a user, comprising:

means for providing a travelling web;

means for forming a travelling two-ply web using said web as at least one layer thereof;

means for defining successive infusion containing pockets in said two-ply web;

means for cutting said pockets from said two-ply web to form packages of predetermined shape; and

means for attaching said string members to the packages; wherein

said means for attaching said string members to the packages includes:

a drum which is rotatably mounted so as to cooperate with said web or said two-ply web;

a plurality of pins provided on the periphery of the drum;

means for supplying string to the drum;

means for guiding the string around the pins; and

means for transferring the string from the periphery of the drum to said cooperating web and attaching it thereto.

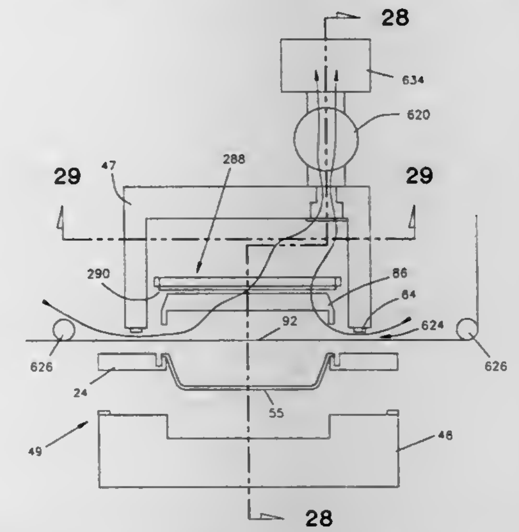
5,689,937
METHOD FOR PACKING FOOD

Michael P. Gorlich, and Robert F. McPherson, Jr., both of Hilton Head Island, S.C., assignors to World Class Packaging Systems, Inc., Hilton Head Island, S.C.

Continuation-in-part of Ser. No. 386,961, Feb. 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 154,756, Nov. 18, 1993, Pat. No. 5,419,097. This application Mar. 5, 1996, Ser. No. 611,272

Int. Cl.⁶ B65B *31/00*

U.S. Cl. 53—433 **15 Claims**



1. A method of securing a film to a tray to make a modified atmosphere package, comprising the steps of:

covering said tray with film inside a substantially closed chamber;

maintaining an atmosphere having a gas concentration different than normal atmosphere inside the closed chamber;

sealing said film to said tray;

severing excess film from said tray; and

automatically exhausting atmosphere from within said chamber to the outside of the chamber so as to cool the chamber and control the temperature inside said chamber and inletting replacement gas from a location below the location from which atmosphere is exhausted so as to encourage upward exhaust gas flow.

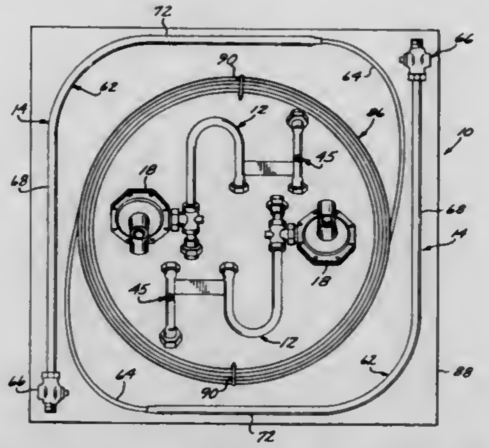
5,689,938
METHOD OF FABRICATING AND INSTALLING GAS SERVICE LINE COMPLETION KIT

Robert W. Lyall, Huntington Beach; Jeffrey W. Lyall, Orange, and Mark E. Huetinck, Brea, all of Calif., assignors to R. W. Lyall & Company, Inc., Corona, Calif.

Continuation-in-part of Ser. No. 325,135, Oct. 20, 1994, Pat. No. 5,501,331. This application Aug. 28, 1995, Ser. No. 520,095

Int. Cl.⁶ B65B *35/30;* **B65D** *85/00;* **F16L** *41/08*

U.S. Cl. 53—445 **23 Claims**



1. A method of mass producing gas service field installation kits at a factory for providing service line connections through respective gas meters having respective meter inlets and outlets arranged in respective predetermined orientations between a gas distribution main line and respective gas service inlet pipe fittings, each spaced a predetermined distance away from said distribution main, the method comprising the steps of:

determining said predetermined orientation and said predetermined distance;

forming an integral gas meter mounting assembly by selecting first and second metallic pipes of respective predetermined lengths, bending said first and second pipes to form in said first pipe a turn-back U fitting having first inlet and outlet ends, and in said second pipe an elbow having second inlet and outlet ends, selecting a bracket and affixing said turn-back U fitting and said elbow thereto to orient said outlet end of said turn-back U fitting and said inlet end of said elbow in a complementary orientation relative to said predetermined orientation for connection to the respective said meter inlets and outlets, selecting a pressure regulator having regulator inlet and outlet fittings, and coupling said outlet fitting of said pressure regulator to said first inlet end of said turn-back U fitting;

forming an integral riser assembly by selecting a metallic L-shaped riser pipe of a selected length to define a vertical riser length having an upper end and a horizontal riser length having a bottom end, selecting plastic tubing of a length greater than said selected length, telescoping said bottom end of said riser pipe over a free end of said plastic tubing so that an excess length of said plastic tubing projects from said bottom end to terminate in an excess end, coupling said free end of said plastic tubing to said upper end of said riser pipe to form a gas impermeable seal, selecting a shut-off valve of the type having valve inlet and outlet fittings, and coupling said inlet fitting of said valve to said upper end of said riser pipe;

coiling said excess length of said plastic tubing pipe in a coil;

packaging said riser assembly and said gas meter mounting assembly together to form said kit; and

storing said kit for subsequent installation.

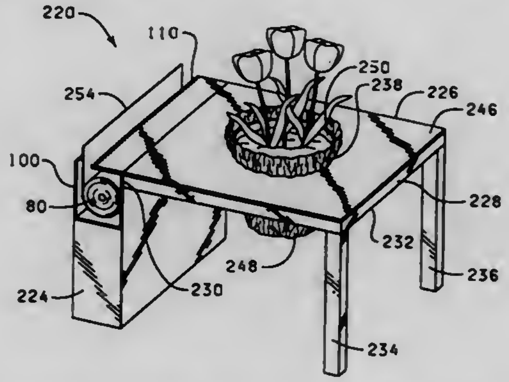
5,689,939
METHOD FOR WRAPPING VARIOUS SIZED FLOWER POTS AND FLORAL GROUPINGS

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Division of Ser. No. 473,913, Jun. 7, 1995, Pat. No. 5,611,192. This application Nov. 18, 1996, Ser. No. 751,296

Int. Cl.⁶ B65B *11/00*

U.S. Cl. 53—464 **11 Claims**



1. A method for wrapping various sized flower pots, the method comprising the steps of:

selecting a jig from a plurality of jigs, each jig having an upper surface, a lower surface, and a jig opening extending through the upper surface and the lower surface, the jig opening of each jig sized to receive a portion of a flower pot and the jig opening of each jig sized differently than the jig openings of the other jigs such that the plurality of jigs accommodate various sized flower pots;

separating a sheet of material from a roll of sheet material;

placing the sheet of material separated from the roll of sheet material on the upper surface of the selected jig such that the sheet of material is disposed over the jig opening of the selected jig;

disposing one of the flower pots on the sheet of material; and

inserting at least a portion the flower pot into the jig opening of the selected jig with the sheet of material positioned between the flower pot and the jig so as to cause the jig to form the sheet of material about the flower pot.

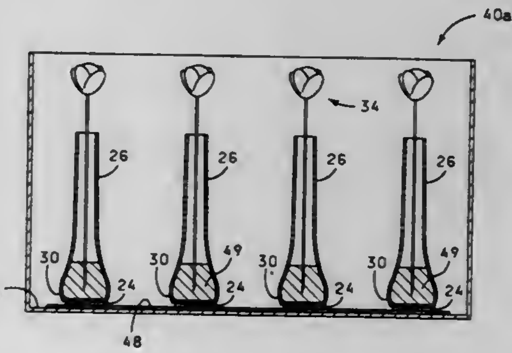
5,689,940
METHOD FOR TRANSPORTING ITEMS IN A CARTON

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Continuation of Ser. No. 271,409, Jul. 6, 1994, Pat. No. 5,522,205, which is a continuation-in-part of Ser. No. 242,485, May 13, 1994, Pat. No. 5,564,567, which is a continuation-in-part of Ser. No. 202,058, Feb. 25, 1994, Pat. No. 5,411,137, which is a continuation of Ser. No. 93,109, Jul. 16, 1993, Pat. No. 5,311,992, which is a continuation-in-part of Ser. No. 892,441, Jun. 2, 1992, Pat. No. 5,240,109, which is a continuation of Ser. No. 831,767, Feb. 5, 1992, Pat. No. 5,148,918, which is a continuation-in-part of Ser. No. 692,329, Apr. 26, 1991, Pat. No. 5,092,465. This application May 31, 1996, Ser. No. 656,679

Int. Cl.⁶ B65B *15/00;23/20;61/22*

U.S. Cl. 53—475 **28 Claims**



1. A method for delivering a floral grouping to a predetermined destination, comprising:

providing a support surface having a connecting bonding material disposed upon a portion thereof;

providing a floral container having a floral grouping disposed therein, the floral container having an exterior surface engageable to the connecting bonding material;

disposing the floral container upon the support surface;

causing the exterior surface of the floral container to engage the connecting bonding material on the support surface bondingly connecting the floral container to the support surface wherein the floral container is rendered substantially immobile upon the support surface; and

transporting the support surface with the floral container to the predetermined destination.

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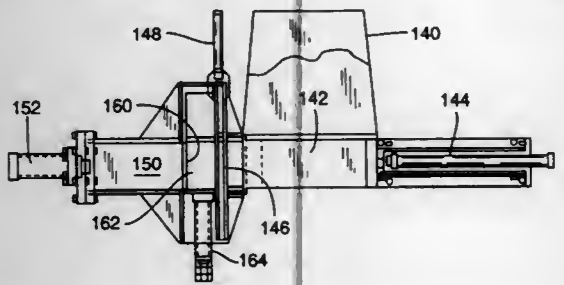
5,689,941
HIGH DENSITY COMBINATION DRY HAY AND HAYLAGE/SILAGE LIVESTOCK FEED-MAKING APPARTUS

John M. Gombos, Ellensburg, Wash.; Moshe Leashno, Long Beach, Calif.; James Alan Cooper, Rupert, Id.; Jeffrey Kay Cooper, Oakley, Id.; Lawrence Kay Cooper, and Daniel Leroy Peterson, both of Burley, Id., assignors to A.C.X. Trading, Inc., Ellensburg, Wash.

Division of Ser. No. 250,796, May 27, 1994, abandoned. This application Jan. 31, 1996, Ser. No. 595,017

Int. Cl.^{6} B65B *1/24*

U.S. Cl. 53—529 **1 Claim**



1. A compression apparatus for compressing livestock feed comprising:

a hopper for receiving the feed;

means for precompressing the feed;

a first compression chamber coupled to the hopper to receive the precompressed feed therefrom;

gate shearing means interposed between the first compression chamber and the precompression means;

a first ram movable along a longitudinal axis of the first compression chamber and having a first pusher plate for pushing the precompressed feed along the longitudinal axis of the first compression chamber to produce a compressed block of mixed feed product;

a second, reduced volume compressed chamber operatively connected to the first compression chamber at a distal end of the first compression chamber for receiving compressed feed pushed from the first compression chamber by the first pusher plate, wherein the first pusher plate defines one side of the second compression chamber when the first ram is fully extended, the second compression chamber having an opening at one end thereof for discharging the compressed feed; and

a second ram movable along a longitudinal axis of the second compression chamber, the second ram having a second pusher plate for pushing the compressed blocked of mixed feed product along the longitudinal axis of the second compression chamber.

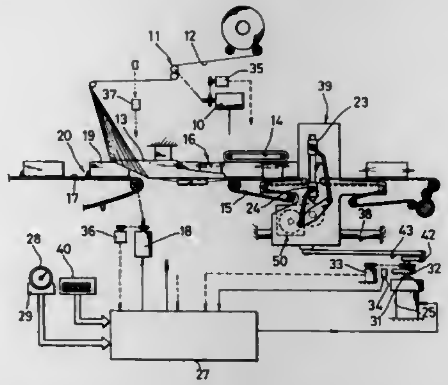
5,689,942
DRIVE MOTOR CONTROLLING APPARATUS FOR USE IN PACKAGING MACHINE

Yasutaka Suga, Ibaraki, Japan, assignor to Ibaraki Seiki Machinery Company, Ltd., Osaka-fu, Japan

Filed Jun. 25, 1996, Ser. No. 673,154

Int. Cl.^{6} B65B *9/06;51/30*

U.S. Cl. 53—550 **7 Claims**



1. An apparatus for use in a packaging machine for controlling the operations of a film transportation motor for transporting a continuous elongated film web through a tube forming means to form the film web into a continuous film tube, an article feeding motor for feeding articles to be packaged into the film tube at equidistant intervals from an entrance side of the tube forming means, a frame driving motor for reciprocating a frame in the same direction as the transportation of the film tube on an exit side of the tube forming means, said frame supporting a pair of sealers, and a sealer opening-closing motor for opening and closing the pair of sealers to cross seal the film tube between adjacent articles to be packaged, said sealer opening-closing motor being mounted on the frame, rotational speeds of said motors being controlled to interrelate with each other, said apparatus comprising:

a timing means for outputting a signal for every rotation of a shaft of the frame driving motor;

a rotational angle division detecting means for outputting a multiplicity of pulse signals by subdividing an rotational angle of the shaft of the frame driving motor;

a cycle determining means for determining a cycle of the frame driving motor based on a reference pulse generated by a reference pulse generator for generating micropulse pulses;

a means for determining a rotation cycle of each of the four motors based on respective data outputted from the rotational angle division detecting means and the cycle determining means;

a means for determining a cyclic variable speed of the frame driving motor based on numerical data on the size of articles to be packaged inputted from an input device, by comparing the pulse outputted from the rotational angle division detecting means with the reference pulse generated by the reference pulse generator; and

a cycle offset correcting means for correcting cycle offsets of the film transportation motor and the article feeding motor by comparing pulses outputted from encoders respectively connected to the film transportation motor and the article feeding motor with the signal outputted from the timing means.

5,689,943
APPARATUS FOR TENSIONING PACKING STRAPS AND SECURING THE ENDS TOGETHER

Hubert Wehr, Bornheim, Germany, assignor to Cyklop GmbH, Germany

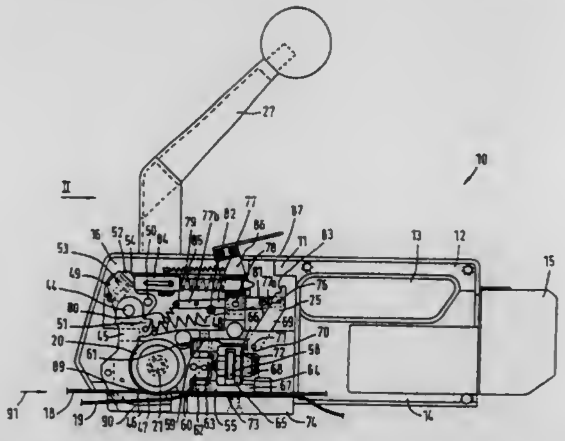
PCT No. PCT/DE94/01234, § 371 Date Apr. 25, 1996, § 102(e) Date Apr. 25, 1996, PCT Pub. No. WO95/11163, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 18, 1994, Ser. No. 605,114

Claims priority, application Germany, Oct. 21, 1993, 9316072 U

Int. Cl.^{6} B65B *67/08*

U.S. Cl. 53—592 **25 Claims**



1. An apparatus for tensioning and securing together two sections of a packing strap comprising a tensioning wheel, a swivel lever, pressure plate means which cooperates with said tensioning wheel for selectively providing tension to the sections of said packing strap, closing means for pressing together and securing together said sections of said packing strap, and opening means for lifting said closing means from said sections of said packing strap and releasing the tension on said sections by said pressure plate means, said pressure plate means including a distance holder and a pressure plate, said distance holder engaging one of said strap sections and said pressure plate engaging said other strap section when providing tension to said packing strap, said swivel lever connected to said tensioning wheel by connector means for selectively rotating said tensioning wheel, and said swivel lever includes an actuator for selectively engaging said opening means on an actuator area wherein said actuator upon engagement with said opening means at said actuation area causing said opening means to disengage said closing means and to disengage said pressure plate means from said sections of said packing strap.

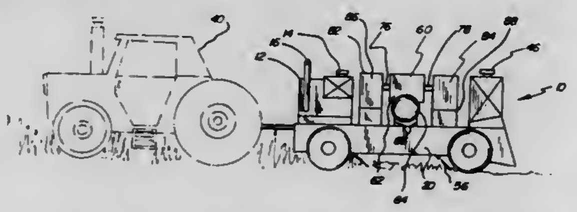
5,689,944
WEEDER AND MULCHER APPARATUS

Ivan Mirosevic, P.O. Box 298, Elcajon, Calif. 92022

Filed Nov. 9, 1995, Ser. No. 556,165

Int. Cl.^{6} A01D *19/00*

U.S. Cl. 56—16.8 **1 Claim**



1. A weeder and mulcher apparatus for use in an orchard, a vineyard and farmland comprising in combination:

a combustion engine having a generally rectangular fuel tank positioned thereon and an exhaust pipe extending therefrom, the engine being capable of generating electrical energy;

a generally rectangular trailer having a front end, a rear end and a trailer body therebetween, the front end of the trailer having a trailer hitch extending therefrom, the trailer body being supported above the ground by a pair of front wheels and a pair of rear wheels, each wheel pair being coupled to an axle attached to a bottom surface of the trailer, the trailer capable of being moved by coupling the trailer hitch to a tractor for pulling of the trailer;

a generally rectangular tank having a tank top and a pair of fluid lines extending therefrom, the tank being mounted on a top surface of the trailer adjacent the rear end, the tank being capable of containing an amount of fluid therein, the tank top being capable of sealing the fluid within the tank for allowing a continuous flow of the fluid into the fluid lines, the tank being opaque to allow monitoring of the fluid level therein;

an air compressor having a housing unit and a compression tank being supported by a pair of legs, the air compressor being centrally mounted onto the top surface of the body of the trailer and providing one hundreds pounds per square inch of working air, the housing unit having a front side and a back side, the front side having a front air line extending therefrom, the back side having a back air line extending therefrom, the compressor being powered by the electrical energy generated by the engine;

a pair of high pressure pumps having a top end and a bottom end, the pair of pumps forming a first pump and a second pump, the first pump being positioned between the air compressor and the engine on the top surface of the trailer, the second pump being positioned between the air compressor and the tank on the top surface of the trailer, the first pump capable of receiving pressurized air through the front air line of the air compressor near the top end, the second pump capable of receiving pressurized air through the back air line of the air compressor near the top end;

each pump being capable of receiving fluid through one of the pair of fluid lines of the tank near the bottom end of each pump, each pump being an air driven pump capable of placing the fluid of the tank under pressure for generating a fluid pressures between about 3000 to 20,000 pounds per square inch, each pump having extending therefrom a pressure pipe for transporting fluid being placed under pressure by one of the pumps, each pressure pipe extending beyond the bottom surface of the trailer; and

a plurality of fluid jets having a threaded end and a fluid projecting end, the threaded end being coupled with the pressure pipes, each fluid jet being projected downwardly at an angle from the bottom surface of the trailer for projecting the pressurized fluid towards the ground at a trajectory of about sixty degrees with respect to the ground, the plurality of fluid jets by expelling the pressurized fluid in a et stream at the trajectory of about sixty degrees allows weeds to be cut and mulched into soil of any consistency for use as organic humus as the trailer is pulled by the tractor.

5,689,945
DRAWING UNIT FOR A FINE-SPINNING MACHINE, IN PARTICULAR A JET-SPINNING MACHINE

Martin Tobler, Wetzikon; Reto Debrunner, Winterthur, and Martin Witschi, Schaffhausen, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

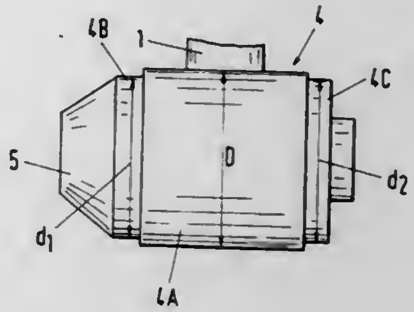
PCT No. PCT/CH92/00226, § 371 Date Dec. 13, 1993, § 102(e) Date Dec. 13, 1993, PCT Pub. No. WO93/10291, PCT Pub. Date May 27, 1993

PCT Filed Nov. 16, 1992, Ser. No. 90,084

Claims priority, application Switzerland, Nov. 21, 1991, 03 411/91

Int. Cl.^{6} D01H *5/28;13/04*

U.S. Cl. 57—315 **20 Claims**



1. A drafting arrangement for a fine spinning frame the drafting arrangement having at least one pair of input rollers, an apron drafting zone and a pair of output rollers having a nip line, characterized in that a pressure roller of the pair of output rollers is provided with a cap which is non-rotationally arranged in the drafting arrangement and which is provided with a yarn guiding surface which is suitable for guiding a yarn to the nip line of the pair of output rollers.

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5,689,946
OPENING ROLLER FOR AN OPEN-END SPINNING ARRANGEMENT

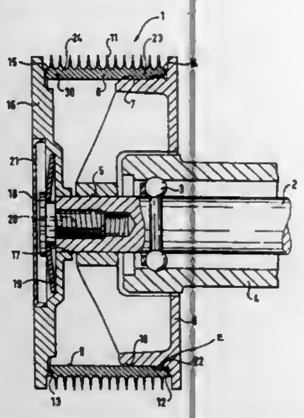
Friedbert Schmid, Bad Überkingen, Germany, assignor to Spindelfabrik Süssen, Schurr Stahlecker & Grill GmbH, Süssen, Germany

Filed Aug. 6, 1996, Ser. No. 693,016

Claims priority, application Germany, Aug. 26, 1995, 195 31 495.6

Int. Cl.^{6} D01H *4/32*

U.S. Cl. 57—408 **13 Claims**



1. An opening roller for an open-end spinning arrangement comprising a combing ring with combing structure which can be slid onto a base body and which is supported between two clamping surfaces, which combing ring is provided with only one centering surface on its inner circumferential surface, for fixing the same radially on a cylindrical guiding surface of the base body,
   wherein the combing ring includes end face stopping surfaces arranged to engage the clamping surfaces,
   wherein the centering surface is limited to an axial end area of the inner circumferential surface and the part of the inner circumferential surface located outside of this end area is free from counter-surfaces of the base body, and
   wherein the centering surface is shorter in axial direction than the part of the inner circumferential surface located outside of the centering surface.

5,689,947
WATCH CHAIN

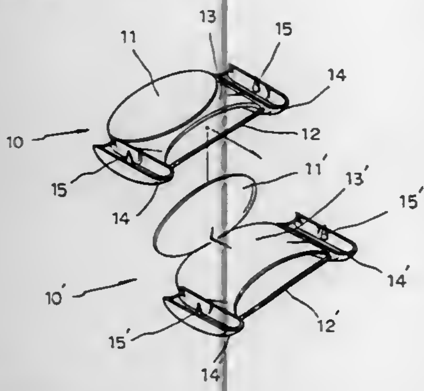
Tae Woo Yoo, 807, 1-Dong, Hanyang, Apt. 32-5, Banpo-dong, Seocho-ku, Seoul, Rep. of Korea

Filed Nov. 8, 1996, Ser. No. 745,784

Claims priority, application Rep. of Korea, Jul. 19, 1996, 96-21268

Int. Cl.^{6} F16G *13/00*

U.S. Cl. 59—80 **7 Claims**



1. A watch chain comprising:
first and second sets of linked bases, each base including:
   a first body,
   a pair of parallel extending portions connected to opposite edges of the body,
   a projection positioned on a bottom of at least one extended portion for applying a finger-pressure,
   a beam fixedly mounted to and extending between ends of the extended portions, and
   an arm having one end connected with the body and being movable between a raised position for inserting the beam of a second base between said arm and said first body, and a folded position to fix the beam of the second base between said arm and said first body;
a lock member connected to one end of the first set of linked bases; and
a link member connected to one end of the second set of linked bases.

5,689,948
METHOD OF OPERATING A REHEAT POWER PLANT WITH STEAM INJECTION

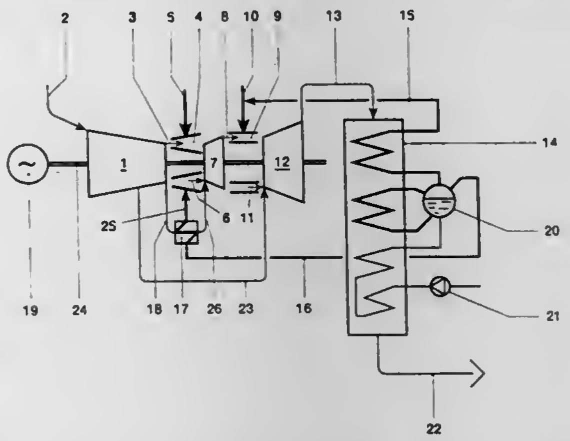
Hans-Ulrich Frutschi, Riniken, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland

Filed Mar. 1, 1996, Ser. No. 609,683

Claims priority, application Germany, Mar. 7, 1995, 195 08 018.1

Int. Cl.^{6} F02C *3/30;7/12*

U.S. Cl. 60—39.05 **10 Claims**



1. A method of operating a power station plant which includes a gas-turbine group and a waste-heat steam generator arranged downstream through which exhaust gases from the gas-turbine group flow, the gas-turbine group including a compressor unit, a first combustion chamber acting downstream of the compressor unit, a first turbine acting downstream of the first combustion chamber, a second combustion chamber acting downstream of the first turbine, and a second turbine acting downstream of the second combustion chamber, the combustion chambers being operated with a fuel, comprising the steps of injecting a portion of the steam produced in the waste-heat steam generator downstream of the compressor unit, directing another portion of the steam produced in the waste-heat steam generator through at least one heat exchanger through which compressor air flows to heat said another portion of the steam, and injecting steam from said heat exchanger into a unit of the gas-turbine group downstream of the compressor unit.

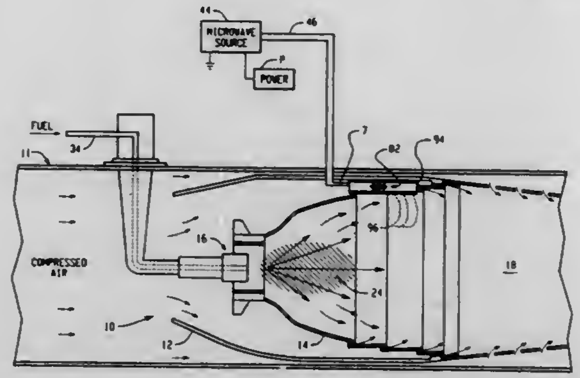
5,689,949
IGNITION METHODS AND APPARATUS USING MICROWAVE ENERGY

Dennis M. DeFreitas, Oxford, N.Y.; Timothy W. Darling, Los Alamos, N. Mex.; Albert Migliori, Santa Fe, N. Mex., and Daniel E. Rees, Los Alamos, N. Mex., assignors to Simmonds Precision Engine Systems, Inc., Akron, Ohio

Filed Jun. 5, 1995, Ser. No. 463,834

Int. Cl.^{6} F02C *7/26*

U.S. Cl. 60—39.06 **15 Claims**



1. Ignition apparatus comprising: a combustor; means for supplying a combustible mixture into said combustor; a body defining a resonator cavity therein; and a microwave energy source including a microwave emitter for emitting microwave energy into the cavity at a frequency within a resonant response of the cavity to produce a plasma in free space in the cavity; said body having at least one opening therein that permits the plasma to be exposed to the combustible mixture of the combustor for ignition thereof.

5,689,950
ION THRUSTER WITH GRAPHITE ACCELERATOR GRID

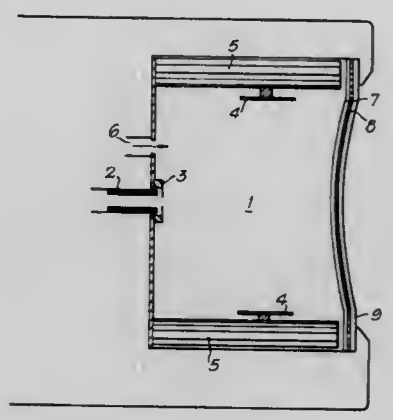
Peter Smith, Hamshire, United Kingdom, assignor to Matra Marconi Space UK Limited, United Kingdom

Filed Feb. 21, 1996, Ser. No. 604,337

Claims priority, application United Kingdom, Mar. 20, 1995, 9505610

Int. Cl.^{6} F03H *1/00*

U.S. Cl. 60—202 **10 Claims**



1. An ion thruster comprising a chamber in which propellant is ionized, and an accelerator grid whereby a reactive thrust is provided by a flow of ions out of the chamber, wherein the grid comprises a grid layer which includes graphite and a support layer for supporting the grid layer which includes graphite.

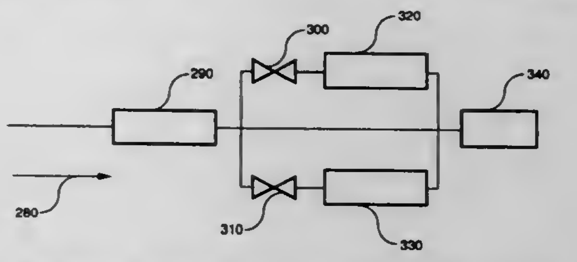
5,689,951
METHOD AND APPARATUS FOR PRESSURE PULSE ARCJET STARTING

John M. Sankovic, Brecksville, and Francis M. Curran, Avon, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 236,855, May 2, 1994, Pat. No. 5,540,046. This application Mar. 26, 1996, Ser. No. 626,742

Int. Cl.^{6} F03H *1/00;* **H05H** *5/00*

U.S. Cl. 60—203.1 **3 Claims**



1. A method of arcjet starting, said arcjet starter including a power processing unit, a propellant source, a first valve serially connected to said propellant source, a first gas generator serially connected to said first valve, a second valve serially connected to said propellant source, a second gas generator serially connected to said second valve and arcjet thruster serially connected to said first and second valve, wherein said second valve and said second gas generator are arranged in parallel with said first valve and said first gas generator, said method comprising the steps of:
   simultaneously opening said first valve and closing said second valve whereby propellant flows from said propellant source through said gas generator to said arcjet thruster thereby creating a first pressure in said arcjet thruster,
   cycling said second valve open and close whereby a pressure pulse is created thereby producing a second pressure in said arcjet thruster,
   utilizing said power processing unit to initiate high voltage pulses in said arcjet thruster as said second pressure monotonically decreases to said first pressure thereby starting said arcjet thruster.

5,689,952
EXHAUST GAS-PURIFYING SYSTEM FOR INTERNAL COMBUSTION ENGINES

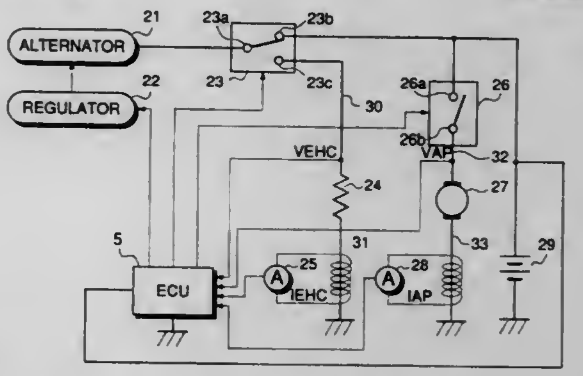
Hiroaki Kato; Takashi Komatsuda; Yuichi Shimasaki; Akihisa Saito; Tetsu Teshirogi; Takuya Aoki; Hideo Furumoto, all of Wako, and Takayoshi Nakayama, Haga-gun, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 634,466

Claims priority, application Japan, Apr. 21, 1995, 7-120649

Int. Cl.^{6} F01N *9/00*

U.S. Cl. 60—277 **8 Claims**



1. An exhaust gas-purifying system for an internal combustion engine having an exhaust system, comprising:

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- an alternator driven by said engine, for generating electric power;
- regulator means for controlling voltage generated by said alternator;
- an electrically-heated catalyzer arranged in said exhaust system of said engine, said catalyzer being connected to said alternator to be electrically heated by said electric power generated by said alternator;
- aging degree-detecting means for detecting a degree of aging of said electrically-heated catalyzer; and
- regulator control means for controlling said regulator means to control said voltage generated by said alternator and supplied to said electrically-heated catalyzer, according to said degree of aging of said electrically-heated catalyzer detected by said aging degree-detecting means.

5,689,953
COOLING SYSTEM FOR A LIQUID-COOLED ENGINE

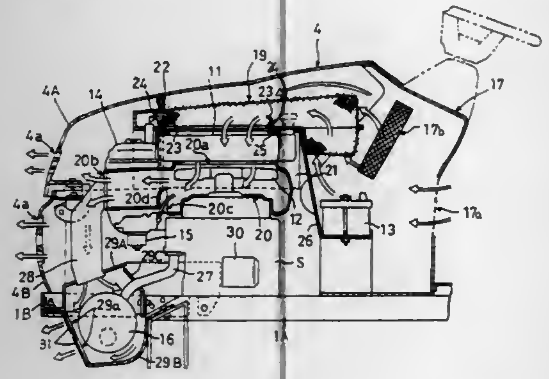
Nobuyuki Yamashita; Ryozo Imanishi; Masaki Hayashi; Kazuaki Knrohara; Masatake Murakawa; Katsuhiko Uemura, and Eriya Harada, all of Sakai, Japan, assignors to Kubota Corporation, Japan

Filed Mar. 28, 1996, Ser. No. 623,561

Claims priority, application Japan, Mar. 29, 1995, 7-71112; Sep. 6, 1995, 7-228755; Sep. 6, 1995, 7-228756

Int. Cl.^{6} F01P ***1/00; 1/08;*** **F01N** ***3/02***

U.S. Cl. 60—316 **20 Claims**



1. In a cooling system for a liquid-cooled engine mounted as a vertical engine on a vehicle, said improved cooling system comprising:

- a radiator disposed above said engine;
- a muffler disposed in a region below said engine;
- an air intake guide for guiding cooling air to said radiator from outside;
- an exhaust guide having an exhaust opening for guiding a large part of the cooling air having flowed past said radiator, forwardly of said vehicle;
- a cooling fan coupled to said engine for producing air currents flowing from said air intake guide past said radiator to said exhaust guide; and
- guide means provided for at least one side of said exhaust guide opening for guiding part of the cooling air having flowed past said radiator to said muffler, and for guiding a remainder of the cooling air forwardly of said vehicle through said exhaust guide.

5,689,954
EXHAUST GAS MANIFOLD FOR AN INTERNAL COMBUSTION ENGINE AND METHOD OF MAKING SUCH EXHAUST GAS MANIFOLD

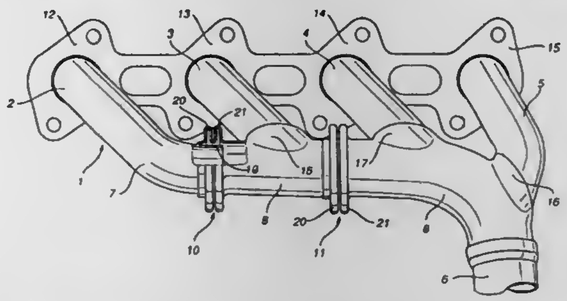
Henning Blöcker, Stelle; Pierre Bonny, Hamburg; Thomas Hülsberg, Rosengarten, and Ralf Pünjer, Hamburg, all of Germany, assignors to Mercedes-Benz A.G., Stuttgart, Germany

Filed Mar. 15, 1996, Ser. No. 616,670

Claims priority, application Germany, Apr. 13, 1995, 19514020.6

Int. Cl.^{6} F01N ***7/00***

U.S. Cl. 60—322 **8 Claims**



1. An exhaust manifold, particularly for an internal combustion engine having at least two cylinders, said exhaust manifold having at least two exhaust branches and both a first pipe section and a second pipe section disposed between two of the at least two adjacent exhaust branches, said first pipe section comprising a multi-layered wall structure including at least two material layers and including an expansion compensation structure formed integrally with the multilayered wall structure, said expansion compensation structure comprising a bellows structure with at least two expansion accommodating corrugations, said second pipe section comprising a single-layered wall structure and including an elongated stub portion formed at one end of the second pipe section, said elongated stub portion axially disposed as a gas flow guide pipe extending inside said bellows structure, and said first and second pipe sections each including a radially disposed neck portion for joining each of the pipe sections with the corresponding exhaust branch, wherein each radially disposed neck portion is formed integrally with the corresponding pipe section.

5,689,955
HYDROSTATIC TRANSAXLE HAVING IMPROVED BRAKE DESIGN

Ray M. Hauser, Decatur, Ill., and Alan W. Johnson, Ames, Iowa, assignors to Hydro-Gear Limited Partnership, Sullivan, Ill.

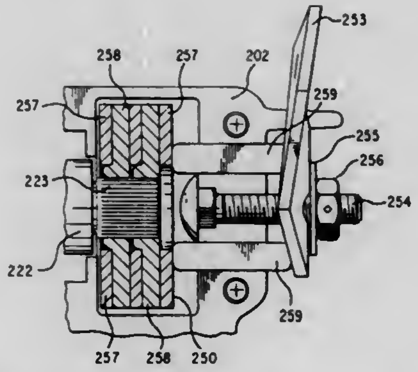
Division of Ser. No. 613,371, Mar. 11, 1996, which is a continuation of Ser. No. 260,807, Jun. 16, 1994, Pat. No. 5,501,640, which is a continuation of Ser. No. 025,272, Mar. 2, 1993, Pat. No. 5,330,394, which is a division of Ser. No. 917,858, Jul. 22, 1992, Pat. No. 5,314,387, which is a continuation-in-part of Ser. No. 727,463, Jul. 9, 1991, Pat. No. 5,201,692. This application Jun. 17, 1996, Ser. No. 664,671

Int. Cl.^{6} F16D ***31/02***

U.S. Cl. 60—442 **9 Claims**

1. A transaxle for use in transferring a driving force created by a vehicle engine to a pair of wheels, comprising:

- a housing comprised of a lower section and an upper section joined along a split line, said lower section and said upper section each have a mating half-round section formed therein;
- a hydraulic pump unit disposed within said housing being drivingly linked to said vehicle engine;
- a hydraulic motor unit disposed within said housing being drivingly linked to said hydraulic pump unit;
- a rotatable motor shaft disposed within said housing being drivingly linked to said hydraulic motor;



- an axle shaft associated with said housing upon which said pair of wheels are mounted being drivingly linked to said rotatable motor shaft;
- a brake assembly disposed within said housing comprising at least one rotor plate and at least one stator plate; and
- a pin movably positioned between said half-round sections for use in urging said at least one stator plate into frictional engagement with said at least one rotor plate for use in slowing or stopping said rotatable motor shaft.

5,689,956
HYDRAULIC VARIABLE SPEED DRIVE

Elena Canosa Reboredo, Calle Mayor de Serria 216, E-08017 Barcelona, Spain

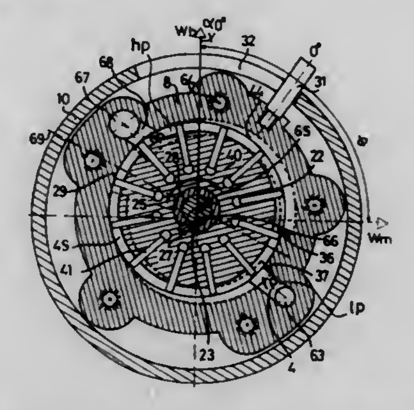
PCT No. PCT/ES95/00123, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO96/14524, PCT Pub. Date May 17, 1996

PCT Filed Nov. 6, 1995, Ser. No. 669,416

Claims priority, application Spain, Nov. 8, 1994, 9402300

Int. Cl.^{6} F16D ***39/00***

U.S. Cl. 60—491 **9 Claims**



1. Variable speed drive assembly of the type that comprise an hydraulic pump and an hydraulic motor, in which the power transmission is achieved by means of a fluid circulating in close circuit between them, such that the flow rate displaced by the hydraulic pump must be received by the hydraulic motor and subsequently returned to the hydraulic pump, and in which both the hydraulic pump and the hydraulic motor are vane pumps, constituted by a cylinder (**29**,**39**) and a rotor (**40**,**50**) from which emerge radially vanes (**41**,**51**) which, by extending outwards to fit against the inner wall of said cylinder (**29**,**39**) and laterally to fit against two covers (**30**,**55**), form cells that are fluidtight from each other, one or both of said covers being provided with a central opening to let the shafts of the rotors (**40**,**50**) protrude outwards therethrough, any rotation ratio between the rotor (**40**) of the hydraulic pump and the rotor (**50**) of the hydraulic motor, between zero and a maximum value, being achieved by varying the eccentricity of the rotor (**40**) of the hydraulic pump, of the rotor (**50**) of the hydraulic motor or of both, characterized in that:

- the cylinder (**29**) of the hydraulic pump, the cylinder (**39**) of the hydraulic motor and their respective end covers (**30**,**55**) form an integral body constituting the variable drive assembly, the cylinders having geometric axes (**65**,**66**) that are parallel but not coincident, and the only possible movement of said variable drive assembly being rotation with respect to a third geometric axis (**23**) that is static with respect to a support member (**10**,**11**) and parallel to said geometric axes (**65**,**66**) of the cylinders;
- the rotor (**40**) of the hydraulic pump and the rotor (**50**) of the hydraulic motor have a common geometric axis (**22**), with a static and eccentric position with respect to said support member (**10**,**11**), parallel to the geometric axes (**65**,**66**) of the cylinders of the hydraulic pump and the hydraulic motor and displaced a distance (E) with respect to said third geometric axis (**23**), both rotors (**40**,**50**) being able to turn independently from each other with respect to said common geometric axis (**22**);
- the rotation of said variable drive assembly is actuated from the outside and causes, through a variation of the eccentricity of the rotors (**40**,**50**) with respect to their respective cylinders (**29**,**39**), the effect of variation of said rotation ratio between the rotor (**40**) of the hydraulic pump and the rotor (**50**) of the hydraulic motor, the position of the variable drive assembly with respect to said support member being defined by an angle α, $\alpha=0$ corresponding to a starting position in which the cylinder (**29**) of the hydraulic pump and its rotor (**40**) are concentric.

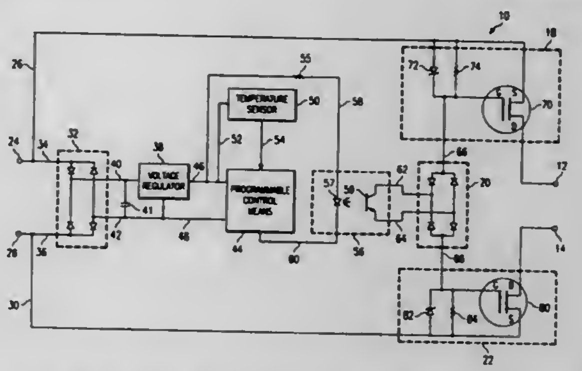
5,689,957
TEMPERATURE CONTROLLER FOR LOW VOLTAGE THERMOELECTRIC COOLING OR WARMING BOXES AND METHOD THEREFOR

Roger S. DeVilbiss, Dallas, Tex., and Harry C. Powell, Shipman, Va., assignors to Thermotek, Inc., Carrollton, Tex.

Filed Jul. 12, 1996, Ser. No. 682,840

Int. Cl.^{6} F25B ***21/02***

U.S. Cl. 62—3.7 **18 Claims**



1. A control system for a thermoelectric device to maintain the temperature in a storage compartment at a set point, said control system comprising:

- a pair of input terminals for receiving a DC voltage thereacross;
- a pair of output terminals for connecting to the thermoelectric device;
- a first switch means operatively connected between one terminal of the pair of input terminals and one terminal of the pair of output terminals, said first switch means connecting said one terminal of the pair of input terminals to said one terminal of the pair of output terminals when enabled by the application of the DC voltage to said pair of input terminals with a predetermined polarity of the DC voltage being applied to said one terminal of the pair of input terminals;
- a second switch means operatively connected between the other terminal of the pair of input terminals and the other terminal of the pair of output terminals, said second switch means connecting said other terminal of the pair of input terminals to

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said other terminal of the pair of output terminals when said second switch means is enabled;

a first diode network operatively connected between said first and second switch means for electrically connecting said first switch means and said second switch means and enabling said second switch means when said first diode network is enabled;

coupling means operatively connected to said first diode network to enable said first diode network when said coupling means is enabled;

sensor means providing an output indicative of the temperature in the storage compartment;

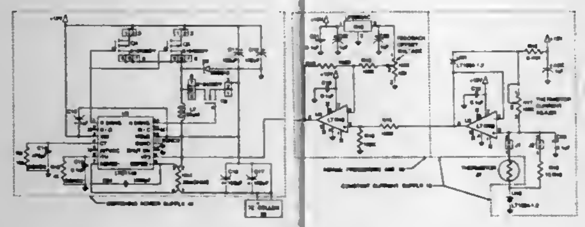
programmable control means receiving the output from said sensor means and providing an output to said coupling means to enable said coupling means, said output from said programmable control means being determined by the amount of deviation of the sensed temperature in the storage compartment from the set point temperature; and

a second diode network operatively connected between said pair of input terminals and said programmable control means to provide the correct polarity of the DC voltage to said programmable control means regardless of which input terminal of the pair of input terminals is provided the plus polarity of the DC voltage.

5,689,958
HIGH EFFICIENCY THERMAL ELECTRIC COOLER DRIVER

Mark W. Gaddis; Peter S. Durkin, and Charles E. Moeller, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1996, Ser. No. 721,920
Int. Cl.^{6} F25B *21/02*; H01S *3/04*
U.S. Cl. 62—3.7 **2 Claims**



1. A portable switching thermal regulator which regulates the temperature of an attached portable field medical laser and comprising:

a portable current supply which produces a driver signal wherein said current supply has a power source providing a constant current supply using a direct current battery and a processing circuit, wherein said power source has a voltage of between 3.8 volts and 16 volts;

a circuit for supplying current;

a thermistor which adjusts said output signal of said constant current supply with changes of temperature to produce a thermally adjusted output signal;

a signal processing amplifier which receives and amplifies said thermally adjusted output signal to produce an amplified thermally adjusted output signal;

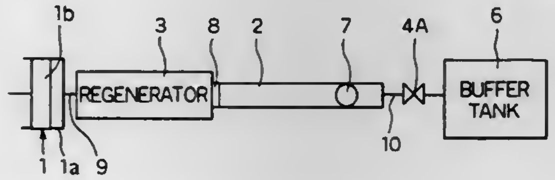
a switching power supply which receives said amplified thermally adjusted output signal, produces an output driver signal that increases as said amplified thermally adjusted output signal decreases and decreases as said amplified thermally adjusted output signal increases, and communicates said output driver signal to a cooler; and

a means for communicating said output signal to a cooler.

5,689,959
PULSE TUBE REFRIGERATOR AND METHOD OF USING THE SAME

Shinichi Yatsuzuka, and Yasumasa Hagiwara, both of Kariya, Japan, assignors to Advanced Mobile Telecommunication Technology Inc., Nisshin, Japan

Filed Mar. 27, 1996, Ser. No. 622,146
Claims priority, application Japan, Oct. 12, 1995, 7-264187
Int. Cl.^{6} F25B *9/00*
U.S. Cl. 62—6 **18 Claims**



1. A pulse tube refrigerator comprising:

a compression part;

a regenerator having a first end connected to said compression part;

a cooling part having a first end connected to a second end of said regenerator;

a pulse tube having a first end connected to a second end of said cooling part;

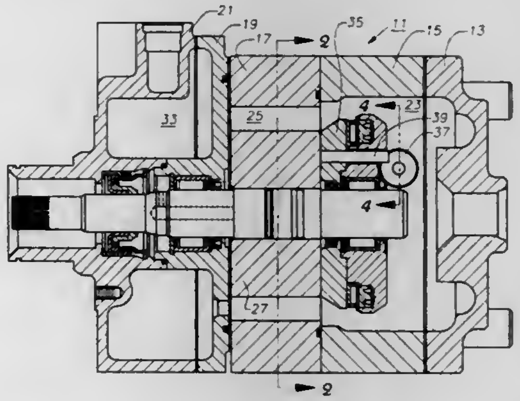
a high-temperature section connected to a second end of said pulse tube; and

a travel member, in said pulse tube, for moving together with working fluid in said pulse tube to separate working fluid on an end of said pulse tube most proximate to said high-temperature section and working fluid on an end of said pulse tube most proximate to said cooling part from each other.

5,689,960
CONTROL CURVE FOR VARIABLE DELIVERY COMPRESSOR

David E. Bearint, Decatur, Ill., assignor to Zexel USA Corporation, Decatur, Ill.

Filed Feb. 19, 1997, Ser. No. 802,115
Int. Cl.^{6} G01M *19/00*
U.S. Cl. 62—77 **12 Claims**



1. A method of adjusting an air conditioner compressor for a selected vehicle, the compressor having an intake valve which is varied by a valve actuator controlled by control pressure supplied by an adjustable control valve, the method comprising:

(a) installing the compressor in the vehicle with a compressor having a first control valve and operating the vehicle under a selected high demand operating condition;

(b) sensing suction pressure, discharge pressure, and grill air temperature off an air conditioner blower while the vehicle is being operated under the high demand operating condition;

(c) adjusting the first control valve while it remains installed in the compressor to provide a desired suction pressure set point at which the grill air temperature at the high demand operating condition is satisfactory;

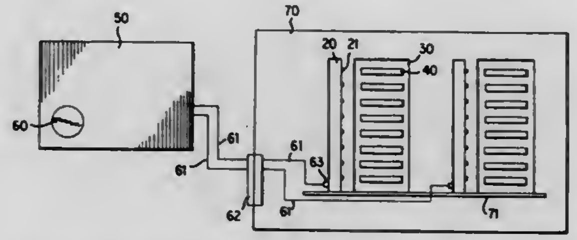
(d) operating the vehicle at a selected low demand operating condition, and determining evaporator outlet pressure at the low demand operating condition; and

(e) if the evaporator outlet pressure is not a desired magnitude, removing the first control valve from the compressor and installing in the compressor a second control valve which has a control curve with a different slope of suction pressure versus discharge pressure than the first control valve, then repeating steps (b) through (e) until the desired suction pressure set point is reached and the desired evaporator outlet pressure is reached.

5,689,961
ICE SEEDING APPARATUS FOR CRYOPRESERVATION SYSTEMS

Maury Cosman, Woburn, Mass., assignor to Organogenesis Inc., Canton, Mass.

Filed Jan. 30, 1996, Ser. No. 593,587
Int. Cl.^{6} F24F *3/16*
U.S. Cl. 62—78 **18 Claims**



14. Ice seeding apparatus for the cryopreservation of biological samples with a fluid from a fluid source comprising:

a freezing chamber;

a rack for use in the freezing chamber, the rack for holding containers of biological samples at a number of different location, the rack having a top plate, a bottom plate, a plurality of parallel rails extending perpendicular to the top and bottom plates and rigidly connected to the top and bottom plates, the rails having members for supporting containers of biological samples, and a removable retaining bar that extends in parallel to the rails, such that when the bar is positioned for retaining, the bar helps to keep the containers in a desired location on the rack; and

a sprayrail for receiving fluid from the fluid source and having a number of nozzles for discharging fluid, the sprayrail and the nozzles being positioned to be close to the containers of biological samples when the containers are held on the rack.

5,689,962
HEAT PUMP SYSTEMS AND METHODS INCORPORATING SUBCOOLERS FOR CONDITIONING AIR

Alexander P. Rafalovich, Indianapolis, Ind., assignor to Store Heat and Produce Energy, Inc., Indianapolis, Ind.

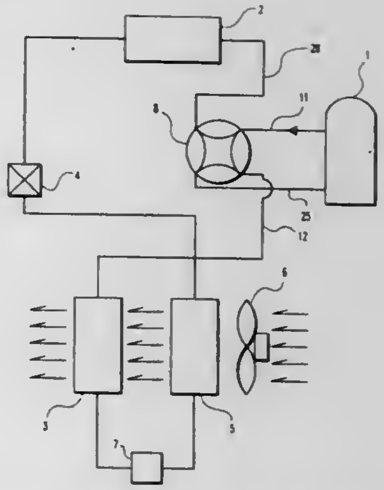
Filed May 24, 1996, Ser. No. 653,673
Int. Cl.^{6} F25D *17/06*
U.S. Cl. 62—90 **7 Claims**

4. A method for dehumidifying air, comprising:

condensing refrigerant in a condenser;

expanding refrigerant after exiting the condenser in a pressure reduction device to a predetermined pressure above an evaporating pressure of the refrigerant;

subcooling refrigerant after exiting the pressure reduction device in a subcooler;



evaporating refrigerant after exiting the subcooler in an evaporator;

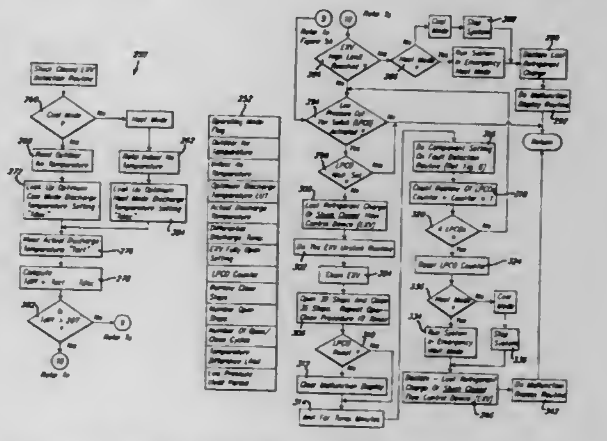
passing a forced stream of the air against said evaporator wherein it forms a cooled and dehumidified air stream; and

passing the cooled and dehumidified air stream against the subcooler wherein it is heated.

5,689,963
DIAGNOSTICS FOR A HEATING AND COOLING SYSTEM

Vijay Bahel, Sidney; Hank Millet, Piqua; Mickey Hickey, Sidney; Hung Pham, Dayton; Gregory P. Herroon, Piqua, and Gerald L. Greschl, Dayton, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 433,619, May 3, 1995, Pat. No. 5,623,834.
This application Sep. 12, 1996, Ser. No. 712,904
Int. Cl.^{6} F25B *49/02*
U.S. Cl. 62—129 **10 Claims**



1. A controller for a heat pump system which operates in heating and cooling modes and is of the type having a compressor for discharging refrigerant through an expansion valve (EXV) into a heat exchanger, comprising:

a first sensor for sensing a first parameter indicative of the actual temperature of the refrigerant discharged from said compressor; and

at least one control processor having means for effecting a diagnostic procedure that:

(a) determines an optimum discharge temperature;

(b) generates a differential temperature by taking the difference between the actual discharge temperature and the optimum discharge temperature; and

(c) executes a low pressure diagnostic procedure if said differential temperature is less than a first parameter.

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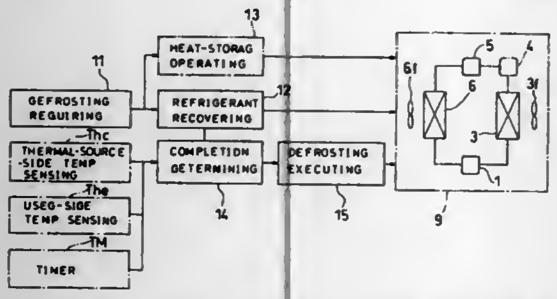
5,689,964
OPERATION CONTROL DEVICE FOR AIR CONDITIONER

Hiroyuki Kawakita; Satoshi Takagi, and Hideki Tsutsumi, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Japan
PCT No. PCT/JP94/01784, § 371 Date Jun. 15, 1995, § 102(e) Date Jun. 15, 1995, PCT Pub. No. WO95/12098, PCT Pub. Date May 4, 1995
PCT Filed Oct. 25, 1994, Ser. No. 454,276
Claims priority, application Japan, Oct. 29, 1993, 5-272011
Int. Cl.^{6} F24F *11/02;* **F25B** *47/02*
U.S. Cl. 62—151 **8 Claims**



1. In an air conditioner comprising a refrigerant circuit (9) in which a compressor (1), a thermal-source-side heat exchanger (3) having a thermal-source-side fan (3*f*), an expansion mechanism (5) freely adjustable in opening and a used-side heat exchanger (6) having a used-side fan (6*f*) are sequentially connected and which is operable in at least heating cycle operation, an operation control device for said air conditioner comprising:

defrosting requiring means (11) for outputting a defrosting requiring signal to require defrosting operation;

refrigerant recovering means (12) for fully closing the opening of the expansion mechanism (5) with the refrigerant circuit (9) in a heating cycle when the defrosting requiring means (11) outputs a defrosting requiring signal, thereby recovering refrigerant;

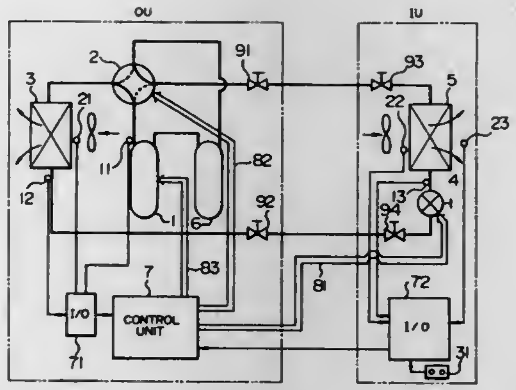
completion determining means (14) for determining whether the recovery of refrigerant by the refrigerant recovering means (12) is completed;

defrosting executing means (15) for executing defrosting operation when the completion determining means (14) outputs a completion signal that the recovery of refrigerant is completed; and

thermal-source-side temperature sensing means (Thc) for sensing a refrigerant temperature Tc of the thermal-source-side heat exchanger (3), wherein the completion determining means (14) receives a sensed temperature signal from the thermal-source-side temperature sensing means (Thc) and outputs a completion signal when the refrigerant temperature Tc of the thermal-source-side heat exchanger (3) at the present time drops to or more than a specified difference from a reference refrigerant temperature Tcl of the thermal-source-side heat exchanger (3) at the time before the expansion mechanism (5) is fully closed.

5,689,965
AIR CONDITIONER

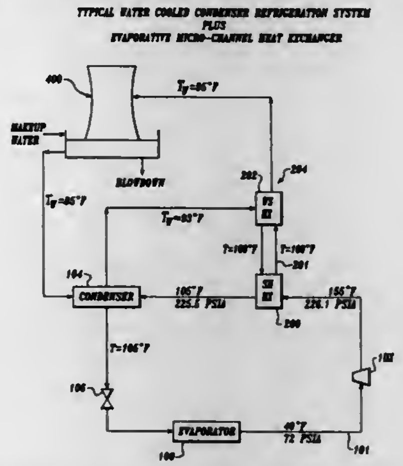
Hiroshi Takenaka, Shimizu; Hirokiyo Terada, Shizuoka; Minetoshi Izushi; Kensaku Oguni, both of Shimizu; Makoto Nagai, Yaizu; Shunji Sasaki; Yasuji Sakuma, both of Shimizu, and Kenji Tokusa, Shizuoka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 170,861, Dec. 21, 1993, abandoned. This application Nov. 18, 1996, Ser. No. 751,791
Claims priority, application Japan, Jan. 11, 1993, 5-002570
Int. Cl.^{6} F25B *41/00;* **G05D** *23/00*
U.S. Cl. 62—211 **6 Claims**



1. An air conditioner comprising:
a first unit including a compressor and a heat exchanger;
at least one second unit, each second unit including a heat exchanger and temperature sensors;
a refrigerant circuit, connecting the compressor and the heat exchanger of the first unit with the heat exchanger of each second unit, through which a refrigerant flows;
a refrigerant pressure reduction means disposed in the refrigerant circuit and provided in each second unit; and
a control unit, provided in the first unit, for controlling the refrigerant pressure reduction means in each second unit, to which control unit temperature data from the temperature sensors in the at least one second unit are inputted; and wherein
the control unit in the first unit calculates a controlled variable of the refrigerant pressure reduction means of each second unit in response to the inputted temperature data and outputs a pulse train to the refrigerant pressure reduction means in each second unit to directly control the refrigerant pressure reduction means to open to a desired opening degree thereof corresponding to the calculated controlled variable.

5,689,966
METHOD AND APPARATUS FOR DESUPERHEATING REFRIGERANT

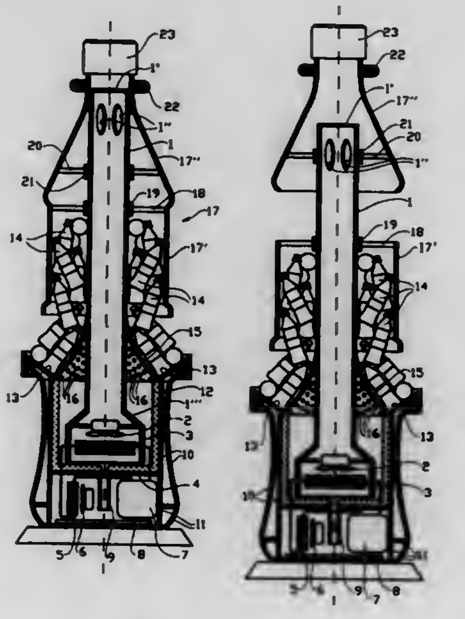
James A. Zess, Kelso; M. Kevin Drost, and Charles J. Call, both of Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.
Filed Mar. 22, 1996, Ser. No. 620,516
Int. Cl.^{6} F25B *27/00;* **F25D** *17/02*
U.S. Cl. 62—238.6 **15 Claims**


TYPICAL WATER COOLED CONDENSER REFRIGERATION SYSTEM
PLUS
EVAPORATIVE MICRO-CHANNEL HEAT EXCHANGER
400
MAKEUP WATER
BLOWDOWN
CONDENSER
EVAPORATOR
72 PSIA
101
106
108
104

1. An apparatus for de-superheating a primary refrigerant exiting a compressor, the apparatus comprising:
(a) a first heat exchanger placed between the compressor and a condenser, said first heat exchanger having a primary side for receiving the superheated primary refrigerant, and a secondary side for receiving an intermediate refrigerant in a liquid state, wherein said superheated primary refrigerant is de-superheated while said intermediate refrigerant is evaporated, wherein a pressure of said intermediate refrigerant is substantially matched to a pressure of said primary refrigerant; and
(b) a second heat exchanger connected to the first heat exchanger, for receiving said evaporated intermediate refrigerant and exchange heat to a heat sink fluid thereby condensing the evaporated intermediate refrigerant.

5,689,967
BOTTLE COOLER

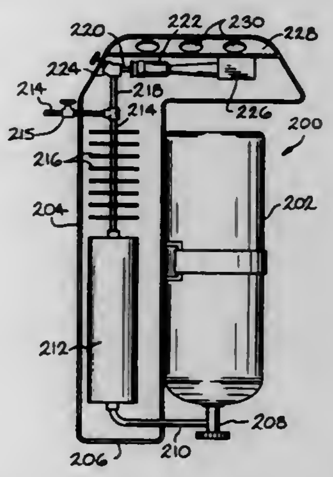
Jan Egil Fløysvik, Sandnes, Norway, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
PCT No. PCT/NO95/00031, § 371 Date Oct. 18, 1996, § 102(e) Date Oct. 18, 1996, PCT Pub. No. WO95/21560, PCT Pub. Date Aug. 17, 1995
PCT Filed Feb. 13, 1995, Ser. No. 693,317
Claims priority, application Norway, Feb. 14, 1994, 940486
Int. Cl.^{6} A47F *3/04*
U.S. Cl. 62—255 **7 Claims**



1. A bottle cooler wherein bottles, cans and similar containers, are offered for sale in cooled condition, comprising a cooling machine (3, 5, 7) for cooling air which is supplied to the bottles (14), characterized in that the bottle cooler is built up on a standing pipe (1) which, below, is assigned a blowing/fan means (2) in order to drive cooled air up through the pipe (1) which, above, is provided with at least one opening (1") through which the cooled air flows out from the pipe (1) which in the upper portion thereof, is surrounded by a downwardly open hood (17), said hood being comprised of two relatively axially displaceable parts, an upper displaceable hood part (17") and a lower fixed hood part (17'), said hood parts cooperating to conduct cooled air downwardly towards the bottles (14), with said lower fixed hood part (17') having an open lower end and defining a refillable storage chamber for the bottles (14) and a bottle supporting shelf (13) disposed below the open end of said lower hood part (17') to define a bottle display area between said lower hood part (17') and said shelf (13), said display area including a perforated supporting wall (15) to allow the cooled air supplied to the bottles (14) to flow back to the cooling machine (3, 5, 7).

5,689,968
APPARATUS FOR PROVIDING A CONDITIONED AIRFLOW INSIDE A MICROENVIRONMENT AND METHOD

Dominick J. Frustaci, Williamsville, and James P. Dominiak, Cheektowaga, both of N.Y., assignors to Figgie International Inc., Willoughby, Ohio
Continuation-in-part of Ser. No. 426,022, Apr. 21, 1995, Pat. No. 5,572,880. This application Oct. 2, 1996, Ser. No. 720,706
Int. Cl.^{6} F25D *23/12;* **F17C** *9/02;9/04;* **A61M** *15/06*
U.S. Cl. 62—259.3 **27 Claims**



1. An air conditioning apparatus adapted to provide a conditioned airflow within a microenvironment, wherein the apparatus operates as independent of the user's breathing requirements, which comprises:
a) container means for holding a compressed gas wherein the container means holding the compressed gas is characterized as having been refrigerated prior to use;
b) ejector means provided outside the container means and in fluid flow communication with the inside thereof, wherein the refrigerate, compressed gas is movable from the container means and through the ejector means to expand the compressed gas to provide a motive gas stream and to concomitantly lower the temperature of the ejector means;
c) venturi means for receiving the motive gas stream to create a reduced pressure zone;
d) housing means provided with an inlet for admitting air outside of the housing means therein, wherein the reduced pressure zone draws the outside air into the housing means to flow over and contact the ejector means to cool and dehumidify the outside air and thereby provide a conditioned airflow; and
e) discharge means in airflow communication with the combined conditioned airflow and the motive gas stream to discharge them into the microenvironment to cool and dehumidify the user.

5,689,969
AIR CONDITIONER CONDENSER FILTERING SYSTEM

Mitch Conroy, 128 Premium Way, Mississauga Ontario, Canada, L5B 1A2
Filed Jul. 1, 1996, Ser. No. 673,516
Int. Cl.^{6} B01D *39/00;39/08;* **F25D** *23/12*
U.S. Cl. 62—262 **3 Claims**

1. An Air Conditioner Condenser Filtering System comprising:
a swaged rectangular shaped frame;
a filtering means secured to the frame; and
a securing means for removably attaching the frame over an air intake vent of a window air conditioner, where the frame completely surrounds the air intake vent;
wherein the securing means includes a first magnetic strip fixed to a side of the frame for magnetically holding said frame in a

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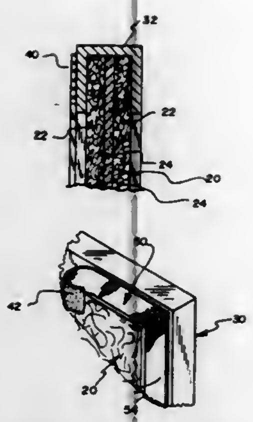
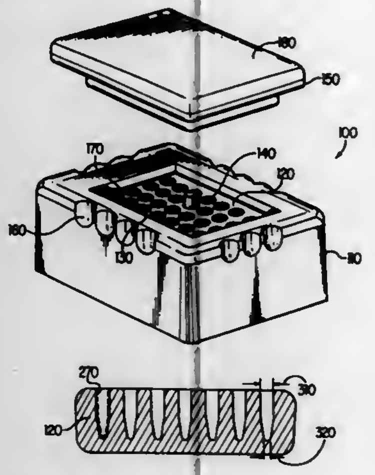


substantially sealed condition against said housing of said air conditioner about said air intake vent,
wherein the filtering means includes:
at least two layers of a fiber filter; and
at least one foam filter positioned mesial the two layers of fiber filter;
wherein the frame includes:
a top member extending the horizontal width of the air intake vent;
a left side member orthogonally secured to the top member projecting vertically downward the vertical height of the air intake vent;
a bottom member orthogonally secured to the left side member opposite of the top member projecting the horizontal width of the air intake vent; and
a right side member orthogonally secured to the bottom member opposite of the left side member projecting vertically upward and engaging the end of the top member opposite of the left side member forming a hollow rectangular shape; and
wherein the securing means further includes a second magnetic strip secured to the window air conditioner surrounding the air intake vent by a length of securing tape, where the first magnetic strip magnetically demountably engages the second magnetic strip.

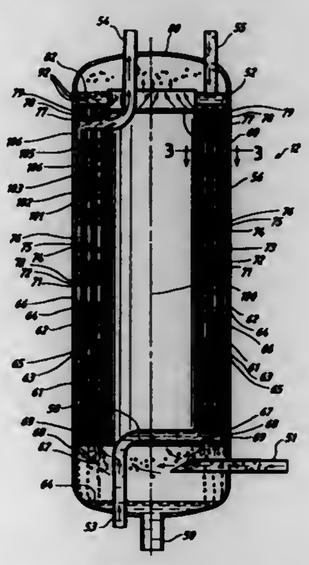
5,689,970
ENZYME COOLER WITH POROUS FOAM REFRIGERANT BLOCK
Nicholas J. Chopas, Germantown, Md., assignor to Life Technologies, Inc., Gaithersburg, Md.
Filed Feb. 7, 1996, Ser. No. 597,799
Int. Cl.^{6} F25D *3/08*
U.S. Cl. 62—372 **27 Claims**



1. A cooler, comprising:

a foam block having a substantially porous inner portion covered by a substantially leakproof skin, said foam block being configured to contain a coolant within cells of said porous inner portion, said foam block defining a well therein, wherein said well is configured and arranged to receive a workpiece and to provide for the efficient transfer of heat between said coolant and said workpiece.

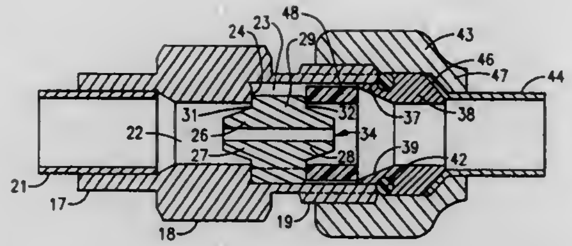
5,689,971
ABSORPTION COOLING SYSTEM UTILIZING HELICAL ABSORBERS
Donald Kuhlenschmidt, Evansville, Ind., and Michael W. Klintworth, Covington, Ohio, assignors to Gas Research Institute, Chicago, Ill.
Continuation-in-part of Ser. No. 532,241, Sep. 22, 1995, abandoned. This application Jan. 11, 1996, Ser. No. 584,189
Int. Cl.^{6} F25B *15/12;37/00*
U.S. Cl. 62—484 **17 Claims**



1. An absorber for use in an absorption cooling system comprising:
a plurality of substantially concentric cylinders defining a plurality of annular spaces between the cylinders;
the annular spaces including a solution space for carrying a solution and an adjacent heat transfer fluid space for carrying a heat transfer fluid, the cylinder between the solution space and heat transfer fluid space being thermally conductive to allow heat transfer between the solution and the heat transfer fluid;
a first generally helical coil rod located in the solution space and defining a first generally helical passage within the solution space; and
a second generally helical coil rod located in the heat transfer fluid space and defining a second generally helical passage within the heat transfer fluid space.

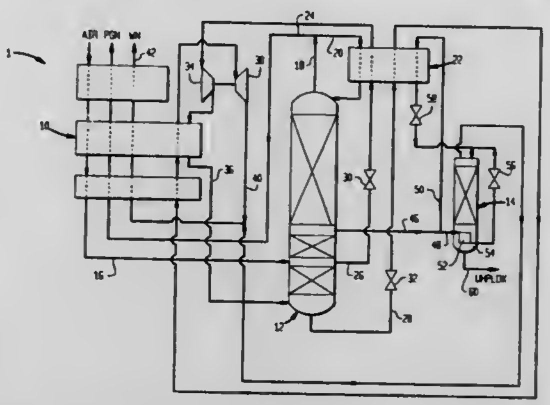
5,689,972
REFRIGERANT EXPANSION DEVICE
Don A. Schuster, Martinsville; Jeffrey L. Jones, Beech Grove; Loren D. Hoffman, and Jeffery A. Storie, both of Indianapolis, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 25, 1996, Ser. No. 755,618
Int. Cl.^{6} F25B *41/06*
U.S. Cl. 62—511 **9 Claims**

1. A refrigerant expansion device for use in a refrigeration system having an evaporator coil, a compressor and a condenser coil in serial flow relationship, comprising:



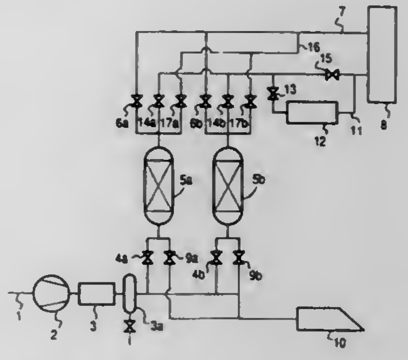
a body with a first internal bore fluidly interconnecting a discharge tube at its one end with a second internal bore near its other end;
said body having an annular shoulder extending generall radially outwardly from said first intenal bore to said second internal bore;
a piston disposed in said second bore and having a metering orifice for controlling the flow of refrigerant therethrough and into said body first bore;
said piston having a generally radially extending shoulder for axially engaging said body shoulder;
a retainer secured in said second body other end and having a bore for conducting the flow of refrigerant therethrough; and
a ring disposed between said retainer and said piston, said ring having end surfaces engaging corresponding end surfaces of said piston and retainer such that said piston shoulder is held tightly against said body shoulder to minimize leakage of refrigerant therebetween.

5,689,973
AIR SEPARATION METHOD AND APPARATUS
Joseph P. Naumovitz, Lebanon, and Charles M. Brooks, North Plainfield, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.
Filed May 14, 1996, Ser. No. 649,147
Int. Cl.^{6} F25J *3/00*
U.S. Cl. 62—652 **10 Claims**



1. An air separation method comprising:
cooling compressed and purified air stream to a temperature suitable for its rectification;
rectifying said air stream to produce an oxygen containing vapor fraction lean in heavy components;
dividing an oxygen-rich stream composed of the oxygen containing vapor fraction into two subsidiary streams; and
separately condensing said two subsidiary streams and stripping said two subsidiary streams in a stripping column of light components of said air stream so that ultra-high purity liquid oxygen is produced as column bottoms within said stripping column;
one of said two subsidiary streams being condensed through indirect heat exchange with said column bottoms of said stripping column, thereby to produce boil-up within said stripping column.

5,689,974
METHOD AND APPARATUS FOR PRE-PURIFICATION FOR AIR CRYOGENIC SEPARATION PLANT
Atsushi Fujita, and Morimitsu Nakamura, both of Kawasaki, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan
Filed May 24, 1996, Ser. No. 653,253
Claims priority, application Japan, May 25, 1995, 7-126921; May 8, 1996, 8-113956
Int. Cl.^{6} F25J *3/04*
U.S. Cl. 62—644 **16 Claims**



1. A pre-purification method for an air cryogenic separation plant which continuously purifies feed air by being provided with a plurality of reciprocally-used adsorption columns filled with adsorbents for adsorbing impurities such as water vapor and carbon dioxide from said feed air; said pre-purification method for an air cryogenic separation plant comprising:
a) an adsorption step wherein pressurized feed air is fed into an adsorption column and impurities are removed from said feed air;
b) a depressurization step wherein the pressure inside said adsorption column is reduced to approximately atmospheric pressure;
c) a heating step wherein purge gas which does not contain impurities is fed into said adsorption column in order to heat-regenerate said adsorbent, wherein said heating is performed at a heating temperature within the range of 100°–250° C., and the purge gas ratio of said purge gas to said feed air is within a range of 20–60%;
d) a cooling step wherein the inside of said adsorption column is cooled to an adsorption operation tempaerature by means of said purge gas; and
e) a repressurization step wherein the adsorption column is repressurized;
wherein said adsorption step is performed by feeding pressurized feed air at a temperature of 10°–45° C. and a superficial velocity of 5–40 cm/s into said adsorption column which has been filled with water adsorbent and carbon dioxide adsorbent arranged so that said water adsorbent is closer to an air entry side of said adsorption column.

5,689,975
AIR SEPARATION
John Douglas Oakey, Godalming, and Paul Higginbotham, Guildford, both of England, assignors to The BOC Group plc, Windlesham, England
Filed Oct. 9, 1996, Ser. No. 728,517
Claims priority, application United Kingdom, Oct. 11, 1995, 95020812; Sep. 9, 1996, 9618789
Int. Cl.^{6} F25J *3/00*
U.S. Cl. 62—653 **12 Claims**

1. An air separation process comprising:
separating in a double rectification column, comprising a higher pressure rectification column and a lower pressure rectification column, a flow of compressed vaporous air into an oxygen-rich fraction and a nitrogen-rich fraction;

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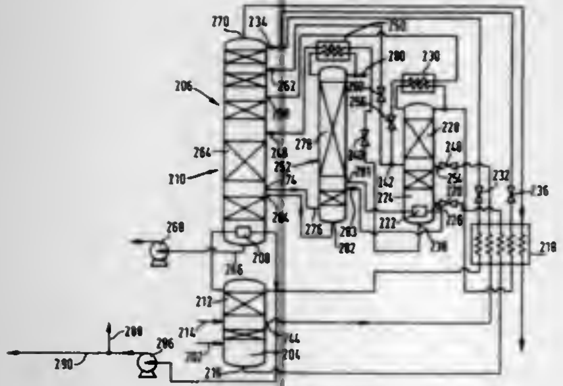


separating in a side rectification column an argon fraction from an argon-enriched oxygen vapour stream withdrawn from an intermediate outlet of the lower pressure rectification column;

taking an oxygen-rich liquid air stream from the higher pressure rectification column;

introducing a vaporous oxygen-enriched air stream is introduced into the lower pressure rectification column through an inlet above the said intermediate outlet;

separating at least part of said oxygen-enriched liquid air stream is separated in an intermediate pressure rectification column at a pressure between the pressure at the bottom of the higher pressure rectification column and that at the said inlet to the lower pressure rectification column to form a liquid air stream further enriched in oxygen and a vapour depleted of oxygen;

vaporizing at least one stream of the further enriched liquid so as to form part or all of the said vaporous oxygen-enriched air stream;

condensing a flow of the oxygen-depleted vapour;

introducing at least part of the condensed oxygen-depleted vapour into the lower pressure rectification column;

reboiling the intermediate pressure rectification column by a stream of vapour withdrawn either from a section of the lower pressure rectification column extending from said intermediate outlet to said inlet or from the side rectification column; and

withdrawing a liquid stream of a mixture comprising oxygen and nitrogen is withdrawn from an intermediate mass exchange region of the intermediate pressure rectification column and employing said liquid stream in condensing the flow of oxygen-depleted vapour.

5,689,976

REINFORCED GLOVE AND METHOD FOR FORMING THE SAME

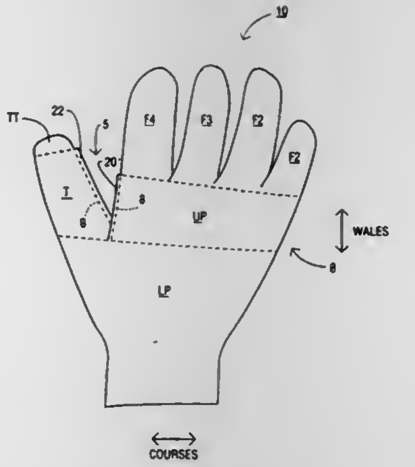
Harold F. Plemmons, Naples, Fla., and James R. Peet, Nottinghamshire, England, assignors to Ansell Edmont Industrial, Inc., Coshocton, Ohio

Filed Oct. 24, 1996, Ser. No. 738,035

Int. Cl.^{6} D04B *7/34;* **A41D** *19/00;19/02*

U.S. Cl. 66—174 **13 Claims**

1. A glove having a front ply, a back ply, a thumb, and an upper palm, said thumb having an inner edge adjacent said upper palm and said upper palm having an inner edge adjacent said thumb, said front ply having at least one wale extending along at least one of said inner edges which is interknitted with at least one wale of said back ply to form a reinforced section.



5,689,977

CIRCULAR KNITTING MACHINE WITH JACQUARD PATTERN CONTROL MECHANISM

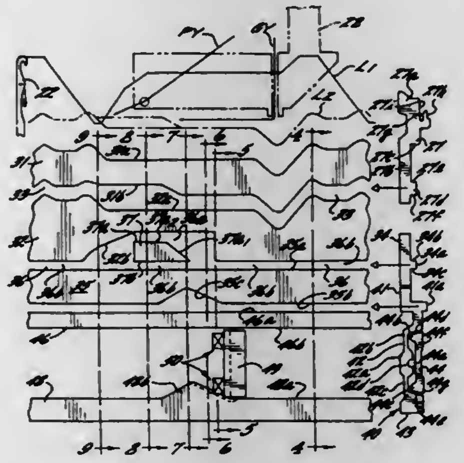
Shozo Yorisue, Hyogo; Takao Shibata, Osaka, and Shinji Hashihiro, Hyogo, all of Japan, assignors to Precision Fukuhara Works, Ltd., Japan

Continuation-in-part of Ser. No. 674,017, Jul. 1, 1996. This application Dec. 23, 1996, Ser. No. 771,519

Claims priority, appilcation Japan, Jul. 4, 1995, 7-192439; Oct. 9, 1995, 7-287863

Int. Cl.^{6} D04B *15/78*

U.S. Cl. 66—219 **18 Claims**



1. In a circular knitting machine having knitting instrumentalities for forming knit fabric including a rotating member having a plurality of grooves in which said knitting instrumentalities are slidably mounted, the improvement comprising control means for controlling said knitting instrumentalities to produce jacquard knit fabric, said control means comprising

a plurality of rocker bar supporting members each slidably mounted in one of the grooves along with one of said knitting instrumentalities, each of said plurality of rocker bar supporting members including at least one butt protruding therefrom,

a plurality of elongate rocker bars formed free of butts and having magnetically attractable opposite end portions and each being pivotally mounted on one of said plurality of rocker bar supporting members for movement about a medial pivot, the opposite end portions of said elongate rocker bar being selectively movable between operative and inoperative positions,

magnetic attracting means operatively associated with the opposite end portions of said elongate rocker bars for selectively attracting one of said magnetically attractable opposite end portions to pivot said elongate rocker bars and selectively move one of the opposite end portions to said operative position and the other of the opposite end portions to said inoperative position,

rocker bar operating cam means engageable with the end portion of said rocker bar in said operative position for either moving the rocker bar and the rocker bar supporting member assembly from a retracted position to an extended position for engagement and movement said knitting instrumentality or maintaining the rocker bar and the rocker bar supporting member assembly in said retracted position, and

control cam means engageable with said knitting instrumentalities for controlling said knitting instrumentalities and for moving the instrumentalities to at least one knitting position upon movement of the rocker bar supporting member to the extended position and for maintaining said knitting instrumentality in a non-knitting position when the rocker bar supporting member is in the retracted position.

5,689,978

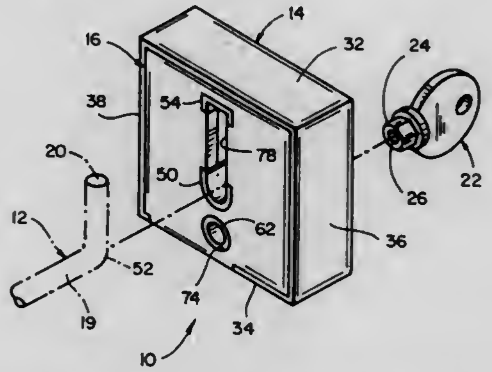
SECURITY LOCK FOR MERCHANDISE DISPLAY HOOKS

Thomas Elwood Eklof, and Walter Matt Poterbin, both of Santa Cruz County, Calif., assignors to Santa Cruz Industries, Santa Cruz, Calif.

Filed Jul. 24, 1995, Ser. No. 506,235

Int. Cl.^{6} E05B *73/00*

U.S. Cl. 70—62 **1 Claim**



1. A lock for use with a key to secure merchandise products onto a hook of the type having an upturned hook tip on the end of an elongate rod which is adapted for mounting onto a pegboard or other support, the lock comprising the combination of a housing having an internal cavity, said housing including a bottom having an opening, means providing a cradle within said cavity for seating said hook tip, means providing a slot in the housing for enabling ingress of said hook tip into the cavity to a seated position for a lock latched mode, said slot further enabling egress of said hook tip from the cradle and out of the cavity for a lock released mode, latch means comprising a latch moveable to and from a latched position at which the hook tip is captured in said seated position in the cradle, means for releasably holding the latch in said latched position and for enabling the latch to move toward an unlatched position for enabling the hook tip to be unseated from the cradle for egress out of the cavity, said latch including an operating portion which projects at least partially out of said opening when the latch is moved away from said latched position whereby the operating portion is exposed to a user who can push the operating portion for moving the latch back toward said latched position, said operating portion being in a position withdrawn from said opening completely within said housing when the latch is in said latched position for minimizing the risk of unauthorized tampering with the lock, and means responsive to operation of said key for moving the latch toward said unlatched position.

5,689,979

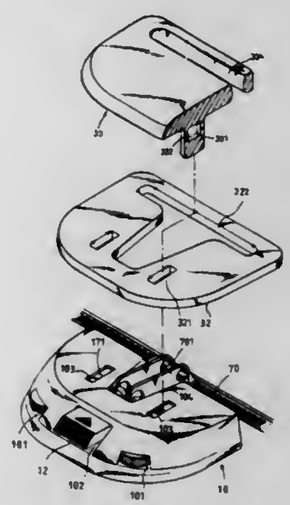
ZIPPER LOCK FOR LUGGAGE CASE CAPABLE OF LOCKING A BINDING STRAP

Chen-Te Yu, Suite 2, 7F. No. 95-8 Chang Ping Road, Sec. 1, Taichung, Taiwan

Filed May 6, 1996, Ser. No. 643,381

Int. Cl.^{6} E05B *65/52;67/38*

U.S. Cl. 70—69 **6 Claims**



1. A zipper lock attached to a luggage case capable of locking sliders of a double zipper and a binding strap comprising:

a zipper lock having a housing and means for closing said housing;

said housing comprising a cam rectangular opening at a center of an arcuate slopped portion, a pair of windows symmetrically arranged at two corners adjacent said rectangular opening, a pair of concaves partitioned by a projection at a center of a flat portion opposite to said arcuate slopped portion thereof and a pair of first latching slots symmetrically formed through an upper wall thereof adjacent said concaves;

a pair of first cylinder posts, a pair of second cylinder posts and a pair of pivots spacedly projected downward at their predetermined positions from the inner surface of said upper wall;

means for attaching said zipper lock onto said luggage case projected downward from predetermined positions inside said housing;

an enclosed U-shaped bulk head surrounding said projection and said concaves having a pair of lateral portions of said U-shaped bulk head connected to an inner wall of said flat portion thereof each having a second latching slot therethrough in communication with said concaves, a transverse portion connected to one end of said projection having a first spring seat on a center thereof, said projection having a concave on an inner side, a transverse abutment connecting the lateral portions of said U-shaped bulk head and the other end of said projection having means for fastening said means for closing said housing projected downward from an under side thereof;

a pair of second spring seats respectively formed abutting an inner surface of side walls thereof;

projecting means for fastening said means for closing said housing at four corners inside said housing;

two sets of positioning means spacedly projected downward from inner surface of said upper wall thereof positioned symmetrically relative to said U-shaped bulk head and adjacent said second spring seats;

a pair of triangular side walls abutting said opening and bridged by a second transverse abutment on the bottom of which has a pair of protrudent means centrally projected downward and a recess on an inward side between said protrudent means;

a push button slidingly disposed into said opening, said push button having a stem projected downward from a bottom thereof and engageable into said recess of said second transverse abutment, a pair of retaining means projected outward from fore corners and stopped against an inward edge of said

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triangular side walls, a wedged portion projected inward from the middle of fore end between said retaining means and a rectangular recess centrally formed at the fore end thereof beneath said wedge portion;

an actuating means slidingly disposed into said housing beneath said push button, said means having a rectangular flat portion received into said rectangular recess of said push button, a hollow wedged portion capable of enclosing said wedged portion of said push button, an aperture centrally formed through a bottom, a third spring seat centrally formed at a fore end made in registry with said first spring seat and biased by a first spring means therebetween and a support stem projected upward from a top thereof;

a pair of first latching pivoted means each having a sleeve pivoted onto said first posts in symmetrical manner, a latch towards said second latching slots extended outward from a periphery of said sleeve and a lever extended outward from an opposite periphery of said sleeve and intersecting each other with their intersection stopped against the support stem of said actuating means and the wedged portion therebetween;

a pair of coupling means each having a sleeve pivoted onto said second posts in symmetrical manner, a first extension extended from a periphery of said sleeve having a perpendicular portion stopped into the aperture of said actuating means therein and a second extension extended from an opposite periphery of said sleeve having a hook at free end thereof engageable with a recess of a combination lock which has a pair of dials pivoted onto said pair of pivots inside said housing and biased by a pair of second spring means and accessible from outside of said pair of windows;

a pair of second latching means slidingly disposed into said housing between said first latching means and said second spring seats and limited by said positioning means, said second latching means each having a hollow rectangular body, a beveled latch which is made in registry with said first latching slots at an upper portion thereof and a fourth spring seat at an outward end for biasing a third spring means with said second spring seat therebetween;

a spring plate for ejecting the pull tabs of said double zipper secured to said means for fastening said housing and said means for closing said housing therebetween, said spring plate having a U-shaped body, a pair of screw holes through a transverse portion of said U-shaped body made in registry with said fastening means and a pair of lateral portions inserted through said concaves;

said means for closing said housing having a first flat body conforming with the bottom of said housing and a plurality of screw holes adjacent four corners made in registry with said projecting means for mounting said means for closing said housing onto said housing by means of fasteners;

a binding strap capable of locking into said first latching slots of said zipper lock, said strap comprising a strap, a coupling means crossing bound into said strap, a locking means bound to one end of said strap and a buckle bound to the other end of said strap and through the body thereof;

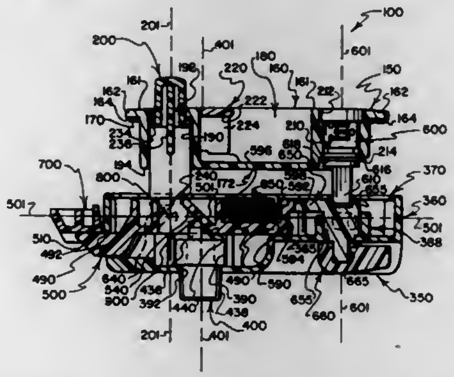
said coupling means having a second flat body conforming with the shape of said zipper lock, a pair of third latching slots through the body made in registry with said first latching slots of said housing and an aperture adjacent a flat portion for securing said strap therein;

said locking means having a third flat body conforming with the shape of said coupling means, a pair of locking tabs each having an eyelet therein spacedly projected outward from a flat surface thereof, an ejecting means projected downward between said locking tabs and an aperture adjacent a flat portion for fastening said strap therein.

5,689,980
PUSH BUTTON LOCK

Lee S. Welnerman, Medina, and Scott A. Arthurs, Brunswick, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Jan. 29, 1996, Ser. No. 593,702
Int. Cl.^{6} E05C *1/12*
U.S. Cl. 70—208 **32 Claims**



1. A push-button lock for mounting on a door panel or the like at the location of a door panel opening having a front end region that opens through a front surface of the door panel and a rear end region that opens through a rear surface of the door panel, comprising:

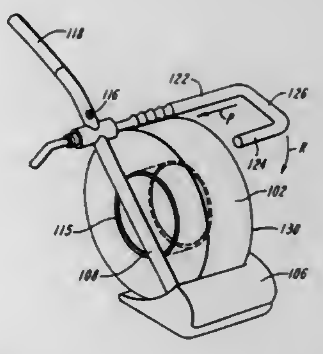
- a) flush mountable means including a flush mountable housing having a front surface defined in part by a relatively thin, perimetrically extending mounting flange that also defines a rear surface configured to overlie front surface portions of a door panel that`surround a front end region of a door panel opening at a location where the lock is to be mounted so as to close the front end region of the opening, with the flush mountable housing also having central portions that are configured to extend rearwardly into the front end region of the door panel opening when the rear surface of the mounting flange is positioned to closely overlie said front surface portions, with the rearwardly extending central portions defining a finger-receiving recess that opens through said front surface, and a first push button passage that opens through said front surface at a first button opening, and that extends rearwardly from the first button opening and through the central portions of the flush mountable housing;
- b) surface mountable means including a surface mountable housing having spaced front and rear faces that border central portions of the surface mountable housing which are perimetrically bounded by side wall means that connects the front and rear faces, with the rear face of the surface mountable housing having peripheral portions that are configured to overlie rear surface portions of the door panel that surround the rear end of the door panel opening at said location so as to close the rear end of the opening, with said central portions of the surface mountable housing defining a slide bolt passage 1) that is oriented transversely relative to the first push button passage, 2) that intersects the first push button passage, and 3) that has a passage end opening defined where the slide bolt passage opens through said side wall means, with said central portions of the surface mountable housing also defining a second push button passage 1) that substantially parallels the first push button passage, 2) that intersects with the slide bolt passage, and 3) that opens through said front face at a second button opening;
- c) fastener means for mounting the flush mountable housing and the surface mountable housing on the door panel by clamping the flush mountable housing and the surface mountable housing toward each other at said location so that the flush mountable housing and the surface mountable housing close said front and rear end regions of the door panel opening, respectively;
- d) an elongate slide bolt slidably mounted in the slide bolt passage for movement between latched and unlatched positions, with the slide bolt defining end formation means for projecting from said passage end opening when the slide bolt is in its latched position for latchingly engaging a suitably configured striker to latch the door panel in a closed position, and for retracting to disengage the striker when the slide bolt is in its unlatched position, with the slide bolt also defining 1) a first inclined cam surface that extends in a first plane that faces toward the first push button passage at an intersection of the first push button passage with the slide bolt passage, and 2) a second inclined cam surface that is oppositely inclined relative to the first inclined cam surface in that the second inclined cam surface extends in a second plane that faces away from the first push button passage and toward the second push button passage at an intersection of the second push button passage with the slide bolt passage;
- e) biasing means for biasing the slide bolt away from its unlatched position toward its latched position;
- f) first push button means slidably mounted in the first push button passage having an outer end region that is configured to project from said first button opening when the first push button means is in a normal position, and that can be moved to an operated position by depressing the outer end region of the first push button means, with the first push button means also defining first inner end means configured to engage and cooperate with the first inclined cam surface of the slide bolt when the first push button means is moved to its operated position to cause the slide bolt to retract to its unlatched position in opposition to the action of said biasing means;
- g) second push button means slidably mounted in the second push button passage having an outer end region that is configured to project from said second button opening when the second push button means is in a normal position, and that can be moved to an operated position by depressing the outer end region of the second push button means, with the second push button means also defining second inner end means configured to engage and cooperate with the second inclined cam surface of the slide bolt when the second push button means is moved to its operated position to cause the slide bolt to retract to its unlatched position in opposition to the action of said biasing means;
- h) wherein a selected one of said first and second inclined cam surfaces is defined by a single inclined surface situated within a cavity formed within the slide bolt at a location substantially centered between opposite sides of the slide bolt passage, and said other of the first and second inclined cam surfaces is defined by a pair of identically inclined surface portions formed on the slide bolt adjacent said opposite sides of the slide bolt passage, with the pair of identically inclined surface portions being located along the length of the slide bolt in sufficiently close proximity to said cavity to nest at least a portion of said cavity therebetween; and,
- i) wherein a selected one of the first and second inner end means is defined by a single, centrally located projection that extends into said cavity to engage said single inclined surface, and the other of the first and second inner end means is defined by a pair of spaced projections that extend into engagement with said pair of identically inclined surfaces.

5,689,981
ANTI-THEFT VEHICLE WHEEL LOCK

Nicholas Paolo DeLuca, Jamaica Plain, Mass.; Alvin L. Ramsey, Berkeley; Edward M. Lee, Mtn. View, both of Calif.; Patricia Ann Foote, Allston, Mass.; Shin John Choi, Houston, Tex., and Arlene A. Guerra, Sterling Heights, Mich., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 21, 1994, Ser. No. 361,792
Int. Cl.^{6} B60R *25/00;* **B62H** *5/14*
U.S. Cl. 70—226 **19 Claims**

1. An apparatus for immobilizing an annular tire of a vehicle, said tire having an outer radius and diameter, an inner radius and an annular radius, an outer face and an inner face, and a width therebetween, said apparatus comprising:

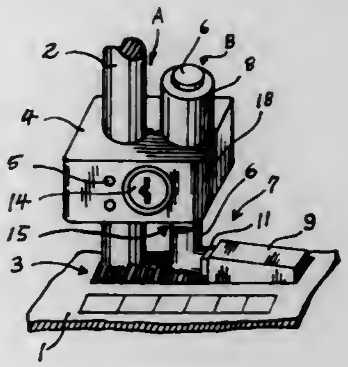


- a. a chock, having a tire circumference engaging surface and a around engaging surface;
- b. an elongated facing bar, having first and second ends, which facing bar is connected to said chock at said first end, such that said facing bar is located in a tire facing plane that is perpendicular to both said around engaging surface and said tire circumference engaging surface and which tire facing plane, in use, is parallel to and adjacent the outer face of a tire to be immobilized;
- c. an engaging bar, that is connected to said facing bar, spaced away from said chock approximately one outer diameter of a tire to be immobilized, said engaging bar comprising:
  - i.) a first, generally elongated straight section having a first and a second end, that is connected near its first end perpendicularly to said facing bar, and that is also oriented perpendicular to said tire facing plane; and
  - ii.) a second section that is shorter than said first straight section, and that is free at a first end and joined at a second end to said end of said first section, such that an angle between said first section and a portion of said second section is between –45° and +45°;
- d. means for adjustably attaching said engaging bar to said facing bar, such that:
  - i). said engaging bar is translatable perpendicularly to said tire facing plane, relative to the facing bar; and
  - ii). said second section is rotatable around an axis coaxial with said first section; and
- e. a lock that locks said engaging bar at a desired position relative to said facing bar.

5,689,982
GEAR SHIFTING LEVEL LOCK FOR AUTOMOBILE

Martin Mingyang Chang, 1657 Huntington Dr., #323D, Duarte, Calif. 91010

Continuation-in-part of Ser. No. 437,420, May 12, 1995, abandoned. This application Mar. 21, 1996, Ser. No. 619,985
Int. Cl.^{6} G05G *5/06;* **F05B** *65/12;* **B60R** *25/06*
U.S. Cl. 70—247 **3 Claims**



1. An anti-theft device for the gearshift lever of an automotive vehicle equipped with an automatic transmission, the gearshift lever extending essentially vertically through a slot opening on the central console of the vehicle, the anti-theft device comprising a

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body member adapted to surround and firmly engage a lower portion of the gearshift lever, a L-shaped latching member adapted to be engaged into and occupying said slot opening and a locking member adapted to locking and unlocking the movement of said latching member thereof, said body member being provided with a first vertical passage adapted to be securely attached to said lever, a second vertical passage adapted to slidingly receive the vertical rod portion of said latching member, a collar structure extending upwardly from said second passage and a locating pin extending inwardly into said second passage, said latching member being provided with a vertical rod and an essentially horizontal and telescopingly adjustable side arm thereof, said vertical rod having an upper arcuate notch located to the opposite side of said arm, a lower arcuate notch at right angle to said upper notch and an inverted T-shaped pin-receiving groove to the opposite side of said upper notch, said side arm having a threaded rectangular block matching in shape to said slot opening and a pairing nut with which said side arm can be adjusted to occupy essentially the entire slot opening therein, the orientation of said notches, groove, pin and locking member being such that said upper notch will engage a tumbler mechanism of said locking member and said pin will reach to the top of said inverted T groove when said side arm is lowered into said slot opening while the gearshift lever is placed at the parking position for the locking function of said anti-theft device and said lower notch will engage said tumbler mechanism of said locking member and said pin will reach to the end of the horizontal branch of said inverted T groove whenever said side arm is raised completely from said slot opening and turned away at right angle to the direction of said opening for the arresting of said latching member in the unlocking function of said device thereof, said tumbler mechanism being partially flat and intersecting at least a portion of said second passage for the locking and unlocking of said latching member in said respective functions thereof, and means for attaching and securing said body member to said gearshift lever.

5,689,983

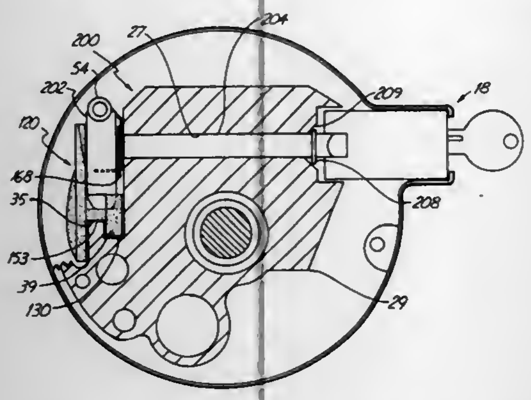
IGNITION RACK AND SECTOR GEAR FOR A STEERING COLUMN

James S. McCoolidge, Omaha, Nebr., assignor to Omaha Auto Safety, Inc., Omaha, Nebr.

Continuation of Ser. No. 398,365, Mar. 3, 1995, abandoned, which is a continuation-in-part of Ser. No. 350,233, Dec. 6, 1994, abandoned, which is a continuation-in-part of Ser. No. 301,348, Sep. 6, 1994, abandoned. This application Nov. 5, 1996, Ser. No. 743,921

Int. Cl.^{6} B60R *25/02*

U.S. Cl. 70—252 **24 Claims**



1. A steering column having a steering shaft for turning wheels of a vehicle, the vehicle having an electrical switch mounted therein, the steering column comprising:

an inner structure;

a locking bolt slidably disposed in the inner structure to selectively lock rotation of the steering shaft;

a key receiving assembly disposed on the inner structure and rotatable to a locked position wherein the steering shaft is locked;

a sector gear receiving an end of the locking bolt in a recess and having teeth disposed on a side of the inner structure opposite the key receiving assembly and having an integral shaft portion extending through an aperture in the inner structure and coupled to the key receiving assembly;

a separate fastener secured to an end of the shaft portion remote from the teeth that prevents axial displacement of the shaft portion from the key receiving assembly out of the aperture, said fastener having an outer diameter greater than the diameter of the shaft portion between the fastener and the sector gear; and

an ignition rack having a longitudinal member with teeth thereon mating with the teeth of the sector gear, the ignition rack being linearly displaceable with rotation of the sector gear and coupleable to the electrical switch to operate the electrical switch.

5,689,984

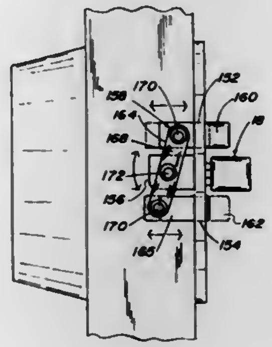
SECURITY LOCK SYSTEM

Sorin Diculescu, and Margaret Ellis, both of 1420 Atlantic Shores Blvd., Apt. 324, Hallandale, Fla. 33009

Continuation-in-part of Ser. No. 360,164, Dec. 20, 1994, abandoned. This application Apr. 30, 1996, Ser. No. 641,219

Int. Cl.^{6} E05B *13/00*

U.S. Cl. 70—416 **1 Claim**



1. A security device for blocking the unlocking of a dead-bolt, the device comprising;

a face plate and a rotatable mm knob located on an exterior side of the face plate, the face plate being adapted to be positioned on an interior face of a door to allow the turn knob to be hand operated with the door in a closed position, the turn knob having locked and unlocked positions, wherein the mm knob is adapted for operating the dead-bolt between corresponding locked and unlocked positions, the faceplate also having first and second apertures extending therethrough, the apertures located on opposite sides of the turn knob, the turn knob having a substantially bar-shaped exterior portion adapted for operation by hand and an interior portion extending through the face plate for connection to the dead-bolt,

a turn knob blocking mechanism comprising;

a fulcrum bar having a near end affixed to an interior side of the face plate opposite the turn knob,

a generally C-shaped linkage composed of first and second parallel laterally spaced bars and a third intermediate bar that is substantially perpendicular to the first and second bars, the first and second bars each being pivotally connected at a near end to opposite ends of the intermediate bar, the first and second bars also having far ends positioned adjacent a corresponding one of the first and second apertures of the face plate, the intermediate bar being pivotally connected at a substantially center portion to a far end of the fulcrum bar thereby allowing rotation of the intermediate bar such that the far end of one or the other first and second bars can be

alternatively projected outwards through the corresponding one of the first and second apertures of the faceplate,

the C-shaped linkage being arranged for pivoting between two extreme positions;

a first unblocking position, wherein the far end of one of the first and second bars is projected outwards of its corresponding aperture and the far end of the other of the first and second bars is substantially flush with the exterior surface of the face plate such that the turn knob is free to be rotated between its locked and unlocked positions, and

a blocking position which is achieved by hand pressing the far end of the projecting bar into a second position that is substantially flush with the exterior surface of the face plate, thereby rotating the intermediate bar about its connection to the fulcrum bar and causing the far end of the other of the first and second bars to be projected outwards of its corresponding aperture into a position which is adapted to contact the exterior portion of the turn knob to block rotation of the turn knob to its unlocked position, thereby preventing the dead-bolt from being unlocked,

the C-shaped linkage being returned to its unblocked position by hand pressing the far end of the projecting bar to a position that is substantially flush with the faceplate, thereby reversing rotation of the intermediate bar.

5,689,985

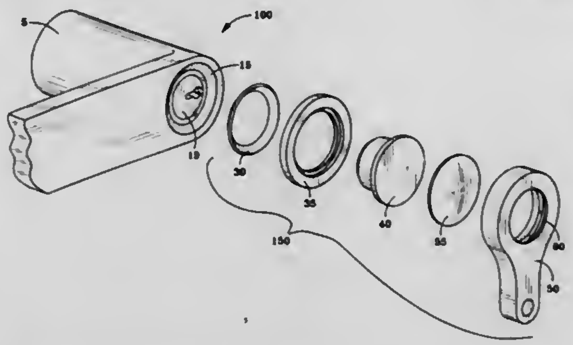
ELECTRONIC TOUCH KEY PROVIDING A TACTILE PRESSURE SIGNAL FOR AN ELECTRONIC LOCK

L.C. Derek Chamberlain, Colorado Springs, Colo., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Sep. 29, 1995, Ser. No. 536,820

Int. Cl.^{6} E05B *17/00*

U.S. Cl. 70—438 **13 Claims**



1. An electronic touch key for operating an electronic lock in an electronic lockset, comprising:

a key handle having front and rear surfaces;

an electronic touch button mounted to the front surface of said key handle, for touching and operating an electronic lock as the key handle is moved toward the lock with said front surface facing the electronic lock; and

means, mounted to the rear surface of said key handle, for providing a tactile signal when said electronic touch button has been touched to a lock with a proper force, the means for providing a tactile signal comprising a convex spring diaphragm mounted with its convex surface facing outward from the rear surface of said key handle.

5,689,986

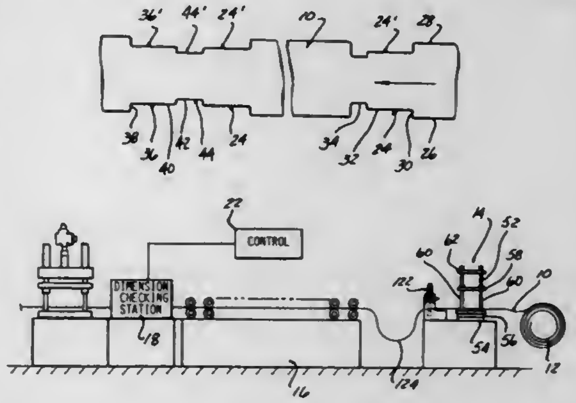
APPARATUS AND METHOD FOR PRENOTCHING AND DIMENSIONALLY MEASURING A ROLL FORMED PART

John F. Jacobs, Jr., 16169 Anstell Ct., Mt. Clemens, Mich. 48044

Filed Sep. 18, 1996, Ser. No. 715,436

Int. Cl.^{6} B21D *28/26*

U.S. Cl. 72—7.4 **21 Claims**



1. A method for forming a roll formed part from a metal strip having opposed longitudinally extending side edges, the method comprising the steps of:

successively forming a plurality of longitudinally spaced first notches each having longitudinally opposed first and second edges in one side edge of a metal strip by notch forming means;

roll forming the strip to a formed configuration by passing the strip progressively through a plurality of roller sets;

sensing a notch dimension in the strip after roll forming;

comparing the sensed notch dimension with a nominal notch dimension; and

if a difference is detected between the sensed notch dimension and the nominal notch dimension, adjusting the longitudinal position of the notch forming means to reduce the difference toward zero.

5,689,987

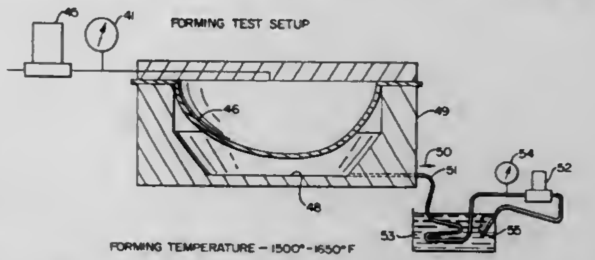
METHOD FOR DETERMINING THE PROPER PROGRESS OF A SUPERPLASTIC FORMING PROCESS BY MONITORING GAS-MASS OUTFLOW

Ken K. Yasui, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Hungtington Beach, Calif.

Filed Sep. 27, 1996, Ser. No. 721,480

Int. Cl.^{6} B21D *26/02*

U.S. Cl. 72—60 **8 Claims**



1. A method for monitoring a superplastic forming process in forming equipment that introduces forming gas to deform a sheet of superplastically formable material into a forming die including:

determining the initial volume of the forming die into which the sheet is to be formed;

determining the temperature of the gas within the forming die at which exhaust gas-mass flow measuring equipment is going to start measuring the exhaust gas flow from the forming die;

determining the ambient pressure and temperature;

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calculating the cumulative gas-mass that should be exhausted from the forming die from the initial conditions of temperature of the gas within the forming die, the ambient temperature and ambient pressure using the formula $v=mRT/p$ where m is the mass of gas at absolute temperature, T, p is pressure and R is a constant that depends on the units used;

measuring the cumulative exhaust gas-mass that exhausts from the forming die, said measuring being at ambient temperature and pressure; and

comparing the actual cumulative exhaust gas-mass of the process against the calculated cumulative exhaust gas-mass to determine when the sheet has formed into the forming die.

5,689,988
CNC-CONTROLLED PIPE BENDING MACHINE

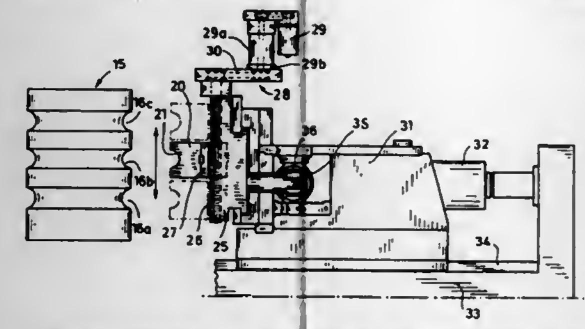
Rigobert Schwarze, Olpener Strasse 460-474, 51109 Cologne, Germany

Filed Jul. 29, 1996, Ser. No. 688,107

Claims priority, application Germany, Aug. 22, 1995, 195 30 805.0

Int. Cl.⁶ B21D *7/04;9/05*

U.S. Cl. 72—157 **3 Claims**



1. A CNC-controlled pipe bending machine comprising a bending template (**15**), means for rotating the bending template (**15**), clamping jaw means (**18**) for pressing the pipe (**14**) against the bending template (**15**), a pipe supporting rail (**20**) for engaging an unbent pipe portion of the pipe (**14**), means mounting said supporting rail (**20**) for height adjustment on a pipe supporting rail carrier (**25**), advance drive means (**35**) for displacing the pipe supporting rail (**20**) in the longitudinal direction during the bending process, control unit means (**22**) for controlling the bending process, drive means (**28**) for stepless height adjustment positioning of the pipe supporting rail (**20**), said drive means (**28**) being responsive to a height command signal delivered to said drive means (**28**) by the control unit means (**22**), and said height command signal corresponds at least to one of tool data and pipe supporting rail data input into said control unit means (**22**) whereby pipe supporting rail (**20**) adjustment is effected rapidly and automatically.

5,689,989
METHOD FOR THE ZIGZAG-LIKE FOLDING OF A STRIP-LIKE FOIL

Philipp Süess, Seuzach; Martin Bär, Hettlingen; Xaver Stöckli, Richterswil, and Rainer Stöckli, Schindellegi, all of Switzerland, assignors to Sulzer Chemtech AG, Winterthur, Switzerland

Filed Apr. 24, 1996, Ser. No. 636,809

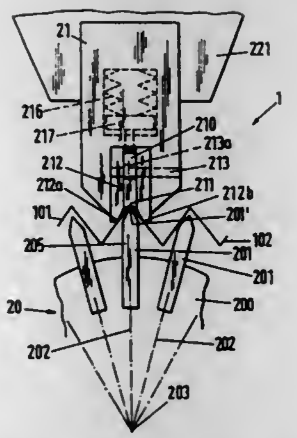
Claims priority, application European Pat. Off., Apr. 25, 1995, 95810274

Int. Cl.⁶ B21D *13/08*

U.S. Cl. 72—187 **13 Claims**

1. A method for the zigzag-like folding of a strip-like foil, the method comprising:

prepleating with a zigzag-like or wave-like folding pattern such that apex lines of the folding have constant predetermined spacings; and



follow-up forming of the folding by tumble pressing at a follow-up forming station, the tumble pressing comprising pinching the strip-like foil between a reciprocating coining tool and a toothed roll such that a folded edge with a predetermined radius of curvature is generated along each of the apex lines.

5,689,990
SHEET MATERIAL, METHOD OF PRODUCING SAME AND ROLLS FOR USE IN THE METHOD

Geoffrey Thomas Deeley, Oldbury, United Kingdom, assignor to Hadley Industries PLC, United Kingdom

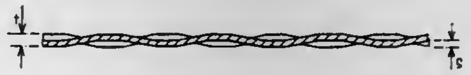
PCT No. PCT/GB93/01117, § 371 Date Apr. 15, 1995, § 102(e) Date May 15, 1995, PCT Pub. No. WO94/12294, PCT Pub. Date Jun. 9, 1994

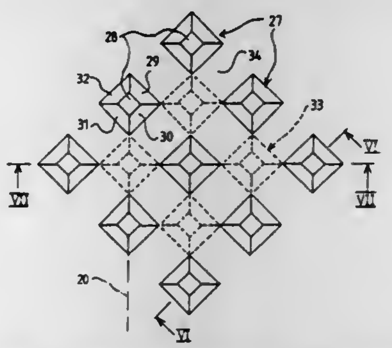
PCT Filed Feb. 8, 1993, Ser. No. 436,354

Claims priority, application United Kingdom, Nov. 21, 1992, 9224452

Int. Cl.⁶ B21D *49/00*

U.S. Cl. 72—196 **14 Claims**





1. A method of cold rolling sheet material, the method comprising passing sheet material having plain surfaces and a gauge g between rolls rotated at the same speed and in opposite directions, rows of teeth being present on the outside surface of the rolls, each tooth having four flanks of involute form and each flank facing in a direction between an axial direction and a circumferential direction, the rolls being spaced apart by a distance such that the teeth on one roll extend into gaps between teeth on the other roll, whereby the projections are formed on both surfaces of the sheet during its passage between the rolls, and a corresponding depression underlies each projection on the other surface of the sheet, the relative positions of the projections and depressions being such that lines drawn on a surface of the sheet between adjacent rows of projections and depressions are non-rectilinear, and the overall thickness t of the deformed sheet material is no more than four times the gauge g and the length is reduced by no more than 15%.

5,689,991
PROCESS AND DEVICE FOR PRODUCING HOT-ROLLED STEEL STRIP

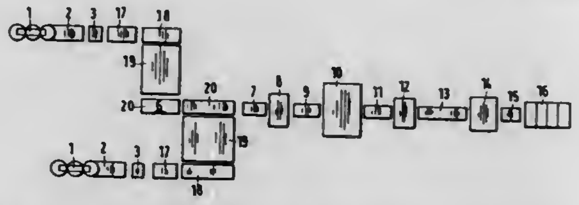
Werner Kircher, Ratingen, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Mar. 27, 1996, Ser. No. 624,786

Claims priority, application Germany, Mar. 28, 1995, 195 12 953.9

Int. Cl.⁶ B21B *27/06*

U.S. Cl. 72—202 **6 Claims**



6. An apparatus for producing hot-rolled steel strip from strip-form cast feedstock, comprising:

a curved continuous casting machine with horizontal run-out;

cross-cutting means arranged at the run-out of the casting machine for separating solidified feedstock into lengths of roughed strip;

compensating furnace means arranged downstream of the cross-cutting means for heating the feedstock to a rolling temperature;

a reversing Steckel mill arranged downstream of the compensating furnace means and including upstream and downstream Steckel furnaces for rolling the strip;

a multi-stand finishing train arranged downstream of the Steckel mill;

a temperature-controlled temporary storage furnace between the reversing Steckel mill and the multi-stand finishing train, the temporary storage furnace including coiler means for coiling up the roughed strip after it leaves the reversing Steckel mill and for uncoiling the roughed strip prior to introduction into the multi-stand finishing train.

5,689,992
DRAW-PROCESSING OF CAN BODIES FOR SANITARY CAN PACKS

William T. Saunders, deceased, late of Weirton, by Cleo Saunders, executrix, and William H. Dalrymple, Weirton, both of W. Va., assignors to Weirton Steel Corporation, Weirton, W. Va.

Continuation of Ser. No. 155,511, Nov. 22, 1993, Pat. No. 5,590,558, which is a continuation-in-part of Ser. No. 596,854, Oct. 12, 1990, Pat. No. 5,343,729, and a continuation-in-part of Ser. No. 866,661, Apr. 8, 1992, Pat. No. 5,409,130, and a continuation-in-part of Ser. No. 14,263, Feb. 5, 1993, Pat. No. 5,263,354, and a continuation-in-part of Ser. No. 53,458, Apr. 27, 1993, Pat. No. 5,347,839, said Ser. No. 866,661is a division of Ser. No. 573,548, Aug. 27, 1990, Pat. No. 5,119,657, said Ser. No. 14,263is a division of Ser. No. 831,624, Feb. 21, 1986, Pat. No. 5,014,536, which is a continuation of Ser. No. 712,238, Mar. 15, 1985, abandoned, said Ser. No. 53,458is a division of Ser. No. 490,781, Mar. 8, 1990, Pat. No. 5,209,099.

This application Nov. 22, 1996, Ser. No. 753,266

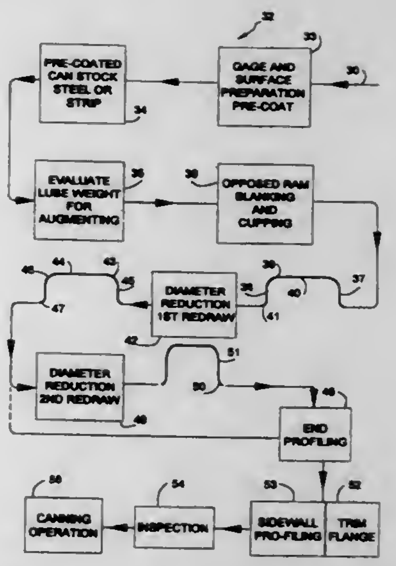
The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.⁶ B21D *22/22*

U.S. Cl. 72—347 **4 Claims**

1. Apparatus for draw-processing, free of sidewall ironing, precoated sheet metal can stock into a precoated one-piece cylindrical-configuration cup-shaped work product, comprising, in combination,

means for supplying circular-configuration cut blanks of precoated planar can stock consisting essentially of flat-rolled sheet metal substrate of preselected starting thickness gauge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30
PRE-COATED CAN STOCK STEEL OR STRIP
34
GAGE AND SURFACE PREPARATION PRE-COAT
EVALUATE LUBE WEIGHT FOR AUGMENTING
35
36
OPPOSED RAM BLANKING AND CUPPING
46
44
43
45
DIAMETER REDUCTION 1ST REDRAW
38
39
40
37
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47
42
DIAMETER REDUCTION 2ND REDRAW
51
50
49
48
END PROFILING
56
54
53
52
CANNING OPERATION
INSPECTION
SIDEWALL PRO-FILING
TRIM FLANGE

which has been prepared for and precoated on both planar surfaces of the substrate with a surface coating, including an organic polymeric coating and draw-processing lubricant for each such can stock surface, cupping press means, including draw-forming tooling means,

which move coaxially in relation to a centrally-located axis to provide for draw-forming the precoated cut blank, free of sidewall ironing, to form a one-piece cup-shaped work product,

the one-piece cup-shaped work product including

a centrally-located axis which coincides with the centrally-located axis of the tooling during fabrication of such work product,

a substantially-planar closed endwall of circular configuration in plan view disposed such that the centrally-located axis intersects the circular configuration endwall in perpendicular relationship to the geometric center of such endwall,

a cylindrical-configuration sidewall, which is symmetrically disposed with respect to and uniformly spaced from the centrally-located axis, defining an open end for the cup-shaped work product,

a unitary juncture between the planar endwall and cylindrical sidewall, the unitary juncture having a curved configuration as viewed in cross section in a plane which is defined by including the centrally-located axis, and

a can body flange extending around substantially the full perimeter at the open end of the cup-shaped work product as drawn, the flange being oriented radially-outwardly in a plane which is in substantially perpendicular transverse relationship to the centrally-located axis so as to provide a uniform sidewall height between such open end flange and the unitary juncture of the cup-shaped work product, with

substrate of the closed endwall, between its geometric center and the unitary juncture, having a thickness gauge substantially equal to the preselected starting gauge for the flat-rolled sheet metal substrate as supplied, and

sidewall substrate which is free of an increase in thickness gauge above such preselected starting gauge throughout the height of the sidewall from a location contiguous to the unitary juncture to a location contiguous to the flange at the open end of the cup-shaped work product;

the draw-forming tooling means, including

(a) a cupping die presenting:

(i) an internal wall defining a die cavity having a circular configuration in a plane which is perpendicularly transverse to the centrally-located axis,

(ii) a curved surface, as viewed in cross section in a plane which is defined by including such centrally-located axis, defining an entrance zone into such die cavity,

the cupping die cavity entrance zone presenting a curvilinear configuration surface about which such coated substrate is drawn into such cavity,

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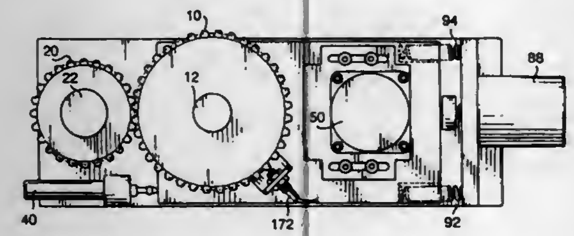
such cupping die entrance zone, as projected onto a plane which is perpendicularly-transverse to such centrally-located axis, having a radial dimension within a range which exceeds such predetermined starting thickness gauge but is less than about five times such starting gauge, and
  (iii) a planar clamping surface in substantially perpendicular transverse relationship to such centrally-located axis circumscribing the cavity entrance zone;
(b) a cupping punch presenting:
  (i) an endwall for forming an endwall for such work product, such work product endwall having a substantially-planar configuration portion disposed in substantially perpendicular transverse relationship to such centrally-located axis,
  (ii) a cylindrical sidewall, symmetrically-disposed with relation to such centrally-located axis, and
  (iii) a unitary juncture, extending between such punch endwall and punch sidewall, having a curvilinear configuration surface as viewed in cross section in a plane which includes such centrally-located axis,
  such unitary juncture curvilinear-configuration surface, as projected onto such perpendicularly-transverse plane, having a radial dimension in a range of about twenty-five times to about forty times such substrate starting thickness gauge,
  the cupping punch being disposed for coaxial relative movement into, and from, the cupping die cavity; and
(c) a clamping element circumscribing the cupping punch, the clamping element presenting:
  (i) a planar clamping surface in substantially perpendicular transverse relationship to such centrally-located axis for coacting with the planar clamping surface of the cupping die for clamping pre-coated planar can stock between such planar clamping surfaces, and
  (ii) an interior sidewall of cylindrical-configuration circumscribing the cupping punch.

5,689,993
DOUBLE FLANK MESHING TEST METHOD

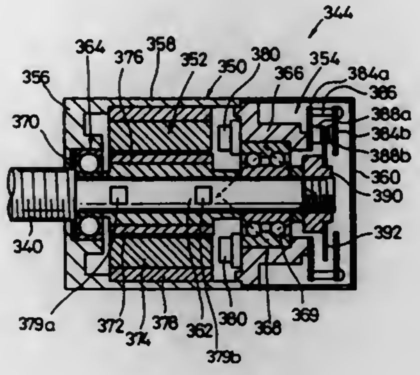
Sigeru Matsumoto, Tokyo, Japan, assignor to Kokusai Keisokuki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 21, 1995, Ser. No. 426,812
Int. Cl.^{6} G01M *13/02*
U.S. Cl. 73—162 **6 Claims**



1. A method for double flank meshing testing, said method comprising the steps of:
(a) mounting a master gear having unknown run-out and a reference test gear having unknown run-out to rotate intermeshed without backlash, said master gear being movable with reference to said reference test gear and biased to follow said reference test gear, and a total number of teeth of said reference test gear having no common factors with a total number of teeth of said master gear;
(b) rotating said master gear so that said reference test gear rotates a number of times corresponding to said number of teeth of said master gear without disengaging said master gear from said reference test gear;
(c) during said rotation of said master gear, measuring displacements of said master gear with reference to said reference test gear, said displacement measurements taken with reference to a predetermined tooth of said test gear and said displacement measurements taken only once per said rotation of said reference test gear;
(d) recording said displacement measurements;
(e) determining a compensation value for each tooth of said master gear based on said recorded displacements;
(f) replacing said reference test gear with another test gear and measuring displacements of said master gear with reference to said another test gear, said another test gear having unknown run-out; wherein said another test gear rotates once and said measurement with reference to said another test gear is taken with reference to every tooth of said another test gear during said rotation of said another test gear; and
(g) determining a compensated displacement value for each tooth of said another test gear by subtracting said determined compensation value corresponding to each tooth of said master gear from said measured displacements of said master gear with reference to said another test gear, thereby to calculate a run-out value for said another test gear based on said compensated displacement values.

5,689,994
ACTUATOR AND ACTUATOR SYSTEM

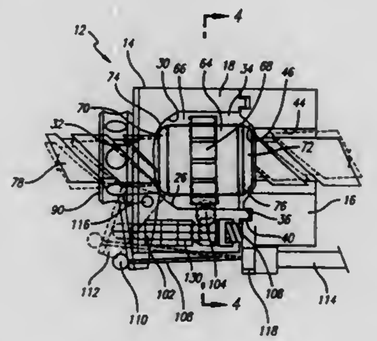
Shigekazu Nagai, and Masahiko Suzuki, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 12, 1994, Ser. No. 321,771
Claims priority, application Japan, Oct. 12, 1993, 5-280124; Nov. 10, 1993, 5-281203; Dec. 28, 1993, 5-336574
Int. Cl.^{6} F16H *25/20*
U.S. Cl. 74—89.15 **9 Claims**



1. An actuator comprising:
an electric motor having a rotatable shaft;
a drive force transmitting shaft for converting rotary motion from said electric motor into linear motion; and
a table mechanism movable by the linear motion from said drive force transmitting shaft to convey a workpiece carried on said table mechanism;
said rotatable shaft and said drive force transmitting shaft being integrally formed with each other;
first and second bearings, wherein said second bearing comprises a double angular ball bearing having two parallel arrays of balls, said rotatable shaft being supported at opposite ends thereof by said first and second bearings;
a casing which bouses both the electric motor and an encoder unit, said encoder unit comprising a pair of sensors mounted in said casing and further comprising an encoder disk interposed between said sensors, said encoder disk being integrally coupled to said rotatable shaft; and
an encoder frame housed in said casing, said pair of sensors being mounted on said encoder frame, wherein said second bearing is supported in said encoder frame.

5,689,995
ACTUATOR THAT ADJUSTS TO SIDE LOADS AUTOMATICALLY BY PIVOTING INTERNALLY

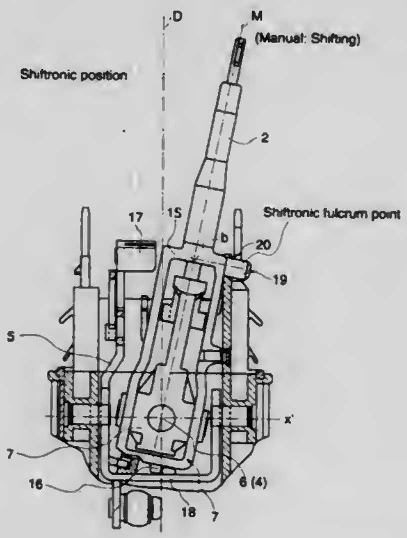
Donald T. Heckel, Jr., Simi Valley, Calif., assignor to P. L. Porter Co., Woodland Hills, Calif.
Filed Feb. 1, 1996, Ser. No. 595,300
Int. Cl.^{6} F16H *25/24*
U.S. Cl. 74—89.15 **18 Claims**



1. A linear actuator comprising a housing including an open space defined by curved inwardly facing walls, a leadscrew traversing the housing, a gear nut in the housing around the leadscrew and rotating in response to axial movement of the leadscrew relative to the gear nut, the gear nut defining curved outer walls, at least a portion of each of the curved outer walls of the gear nut being in spaced relation to an adjacent curved inwardly facing wall of the housing, the housing mounting the leadscrew for pivoting to change the axis of rotation of the gear nut within the housing.

5,689,996
SHIFTING MEANS FOR AN AUTOMATIC TRANSMISSION IN A MOTOR VEHICLE

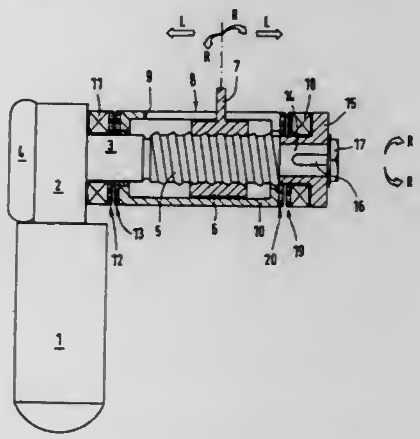
Metin Ersoy, Walluf, Germany, assignor to Lemförder Metallwaren AG, Lemförde, Germany
Filed Feb. 5, 1996, Ser. No. 597,041
Claims priority, application Germany, Jul. 17, 1995, 195 26 059.7
Int. Cl.^{6} F16H *59/02*
U.S. Cl. 74—335 **8 Claims**



1. A shifting device for an automatic transmission of a motor vehicle, the shifting device comprising:
a housing;
a shift gate connected to said housing;
a selector lever movable within said shift gate, said selector lever being pivotable manually into shift positions associated with shifting for stepwise shifting of gears of the automatic transmission;
a crosspiece pivotably mounted in said housing about a crosspiece axis, said crosspiece including
locking means with receiving locations laterally offset relative to one another, said receiving locations being associated with said shift positions, and
universal joint means, said selector lever being mounted in said universal joint means for pivotal movement about a shifting axis orthogonal to and in a same plane as said crosspiece axis, and for mounting said selector lever in a universal joint-like manner;
spring force means acting on said selector lever at right angles to a longitudinal direction of said shift gate in said shift positions;
an intermediate part pivotably mounted on said housing about an axis, said intermediate part having an upper opening, said selector lever passing through said upper opening;
bearings in said housing for pivotably mounting said intermediate part;
transmission connection means connected to said intermediate part, whereby pivoting movement of said intermediate part results in movement of said transmission connection means; and
selector member coupling means for coupling said selector lever to said intermediate member and allowing relative movement between said selector lever and said intermediate member whereby said selector lever is manually pivotable—in an auxiliary shift position of one of said shift positions—around said bearings in a direction of a selection movement for bridging over switching contacts for the stepwise shifting of the gears of the transmission without moving said intermediate part.

5,689,997
ELECTRIC GEARSHIFT MECHANISM FOR CHANGE-SPEED GEARBOXES OF MOTOR VEHICLES

Gerhard Schaller, Koeln-Lovenich, Germany, assignor to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Jul. 24, 1996, Ser. No. 685,735
Claims priority, application Germany, Jul. 24, 1995, 195 27 893.3
Int. Cl.^{6} F16H *61/34*
U.S. Cl. 74—335 **18 Claims**



1. An electric gearshift mechanism for a change-speed gearbox with selector gates for a motor vehicle comprising:
an electric motor; and
a gear shifting member for providing two substantially mutually transverse shifting movements, said member including a threaded spindle having an axis of rotation drivably connected to said motor; a nut carried by said spindle having a finger for

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preselecting selector gates; linear guide means for guiding said nut along said axis; and, clutch means for connecting said nut and said spindle to rotate together so as to rotate the finger.

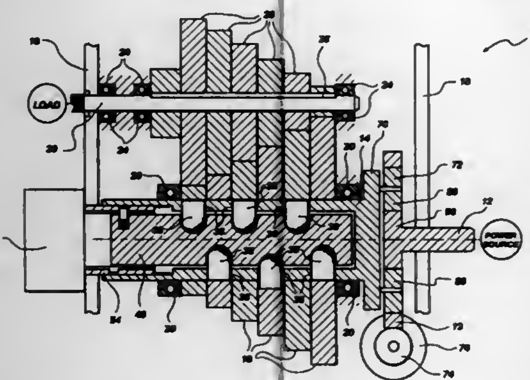
5,689,998
CONTINUOUS-TORQUE VARIABLE-SPEED TRANSMISSION

Gary D. Lee, Woodland Hills, Utah, assignor to The Anchored Corporation, Woodland Hills, Utah

Continuation-in-part of Ser. No. 220,501, Mar. 31, 1994, Pat. No. 5,542,310. This application Jul. 15, 1994, Ser. No. 276,024

Int. Cl.^{6} F16H *3/08;3/38*

U.S. Cl. 74—371 **24 Claims**



1. A variable speed transmission apparatus for changing the speed of a driven member relative to the speed of a driving member, comprising:

a plurality of driven gears;

a plurality of annular cam gears each in continuous driving engagement with a corresponding one of said driven gears, each of said cam gears having an inner cam surface with at least one peak and at least one valley;

a hollow drum mounted for rotation about an axis and having a plurality of apertures extending from an inner drum surface to an outer drum surface, at least one of said apertures corresponding to each of said cam gears, and said cam gears being mounted for rotation about said outer drum surface with said inner cam surface opposite to said at least one corresponding aperture;

a plurality of detents, one corresponding to each of said drum apertures and each arranged for reciprocating radial movement within its corresponding drum aperture;

a shift member mounted within said drum for axial rotation about said drum axis, said shift member comprising one or more cam surfaces disposed radially around the rotational axis of the shift member for respectively engaging said detents to hold the engaged detent in a first position at which it engages the valley of the corresponding cam gear, and a second position at which the detent is in a disengaged position;

positioning means for selectively rotating said shift member in either axial direction relative to said drum so as to cause a selected detent to engage the valley of its corresponding cam gear such that a driving connection is made between said driving member and said driven member through said engaged cam gear, the inner cam surface of said cam gears and the outer cam surface of said shift member being contoured relative to each other to time the axial rotation of said shift member such that said axial movement may commence only about when the peak of the cam gear to be disengaged from its corresponding detent is substantially aligned with the valley of an adjacent cam gear to be engaged by its corresponding detent, and said axial movement may cease only about when the valley of the cam gear to be disengaged is substantially aligned with the peak of the adjacent cam gear to be engaged; and

reconciling means for matching the relative speed of the driving member with that of the driven member during disengagement and engagement between selected cam gears.

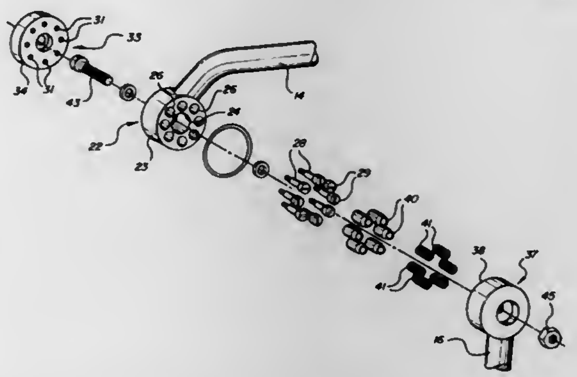
5,689,999
ADJUSTABLE ROTARY LOCKING AND UNLOCKING APPARATUS

Robert A. Wiley; Dwight S. Gay, and Michael J. Larkin, all of Millington, Mich., assignors to Gunnell, Inc., Millington, Mich.

Filed Aug. 18, 1995, Ser. No. 516,749

Int. Cl.^{6} G05G *5/06*

U.S. Cl. 74—527 **16 Claims**



1. Adjustable rotary locking and unlocking apparatus for respectively disabling and enabling relative rotary movement, said apparatus comprising:

a) a first member having a first hub;

b) a second member having a second hub;

c) means coupling said hubs for relative rotation of said hubs and said members about a common axis;

d) a plurality of arcuately spaced locking pins carried by one of said hubs for movements relative thereto between retracted and projected positions;

e) a plurality of arcuately spaced sockets in the other of said hubs,

f) the spacing and number of said locking pins being different from the spacing and number of said sockets but said locking pins and said sockets being uniformly spaced radially from said axis,

g) each of said sockets being of such size as to accommodate any one of said locking pins,

h) relative rotation of said hubs about said axis enabling different ones but fewer than all of said locking pins to register with said sockets;

i) means for moving any one of said locking pins that is in register with one of said sockets to its projected position in said one of said sockets thereby locking said hubs and said members against relative rotation; and

j) means for moving any one of said locking pins from its projected position in said one of said sockets to its retracted position thereby unlocking said hubs and said members and enabling relative rotation therebetween.

5,690,000
BRAKE PEDAL WITH SELF-ALIGNING BRACKET

Robert Wayne Terrel, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.

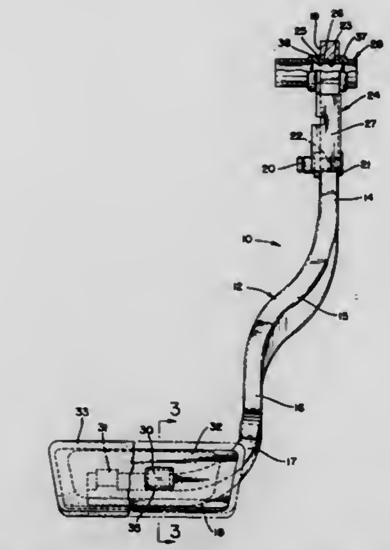
Filed Mar. 13, 1996, Ser. No. 614,754

Int. Cl.^{6} G05G *1/16*

U.S. Cl. 74—560 **3 Claims**

1. A brake pedal assembly comprising:

a pedal arm with two projections formed as one-piece with the pedal arm;



a plate capable of supporting a foot pad positioned over the projections and fixed thereon by staking of the projections;

a brushing holder fixed on the brake pedal assembly by two beads formed by an external enlargement of the busing holder; and

a bracket fixed in position on the brake pedal assembly by the busing holder wherein the bracket includes an opening which is received over the busing holder and an arm which is positioned against the pedal arm, the arm self-aligning the bracket on the brake pedal assembly.

5,690,001
TRANSMISSION ASSEMBLY FOR TRACTORS

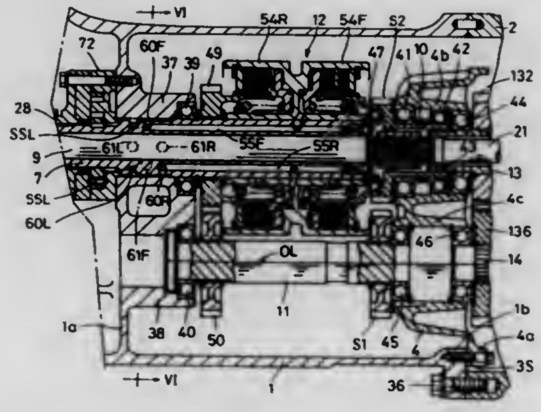
Mizuya Matsufuji, Sanda, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Continuation of Ser. No. 441,438, May 15, 1995, Pat. No. 5,599,247. This application Jun. 27, 1996, Ser. No. 671,511

Claims priority, application Japan, Jun. 15, 1994, 6-158090; Dec. 6, 1994, 6-330106

Int. Cl.^{6} F16H *61/26;57/02*

U.S. Cl. 74—606 R **25 Claims**



1. A transmission assembly for tractors which comprises:

a front housing (1) including an open rear end;

a first speed change mechanism (12) disposed within said front housing (1);

a transmission casing (2) including an open front end and being fastened to the rear end of said front housing (1);

a second speed change mechanism (15) disposed within said transmission casing (2), said second speed change mechanism being connected to said first speed change mechanism (12) such that said second speed change mechanism is powered by said first speed change mechanism; and

a bearing support frame (4) disposed within a rear end portion of said front housing for supporting a rear end portion of said first speed change mechanism (12), said bearing support frame being fixedly secured to said front housing (1) using bolts (35) each having a head portion which is located within a front end portion of said transmission casing (2).

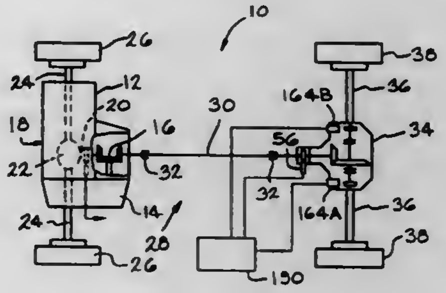
5,690,002
METHOD OF OPERATING A VEHICLE DIFFERENTIAL

Dan J. Showalter, Plymouth, Mich., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Mar. 6, 1996, Ser. No. 612,626

Int. Cl.^{6} B60K *17/16*

U.S. Cl. 74—650 **20 Claims**



1. A method of operating a differential having a pair of output axles and a modulating clutch operatively associated with each axle, comprising the steps of

sensing the primary drive shaft speed of a vehicle and each secondary axle speed,

determining whether either of the secondary axle speeds is slower than the primary drive shaft speed,

averaging the secondary axle speeds to determine the input speed to the secondary differential,

determining whether the average primary driveline speed is faster than the average secondary differential input speed, and

activating the modulating clutch in the differential associated with the faster rotating secondary axle.

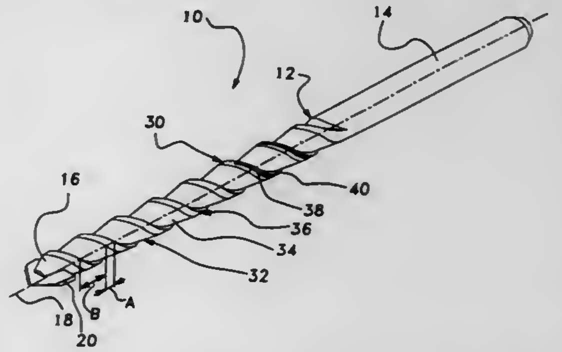
5,690,003
METHOD OF FORMING A DRILL BIT WITH DEBRIS CONVEYING FLUTE

Michael R. Resendez, Elgin, S.C., and James B. Mason, Worcester, Mass., assignors to Black & Decker Inc., Newark, Del.

Division of Ser. No. 513,372, Aug. 10, 1995, Pat. No. 5,641,028. This application Jun. 13, 1996, Ser. No. 662,543

Int. Cl.^{6} B21K *5/04*

U.S. Cl. 76—108.6 **5 Claims**



1. A method of forming a drill bit with a chucking end, a cutting end and at least one flute between the ends, the at least one flute

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including a web means and a debris channel, the web means including a first surface and a second surface, comprising the steps of:

providing a pair of rotating dies;

providing a blank;

moving said blank into said dies;

impressing said flute into said blank by deforming walls of the blank along the length of the blank by cold rolling said blank between said pair of rotating dies and during passing of said blank through said rotating dies, forming said first surface substantially parallel to a shank longitudinal axis and continuous with a debris channel surface, and forming said second surface at an angle from about 100° to about 120° with respect to the shank longitudinal axis, wherein said second surface extends inwardly, forming the base of said debris channel, and during said cold rolling forming said debris channel surface between said first surface and said second surface, and forming a side wall of said debris channel such that the side wall is at an angle of from about 10° to 20° with respect to said shank longitudinal axis and creating a ratio of axial length of said first surface to axial length of said debris channel surface at about 2:1 to 4:1.

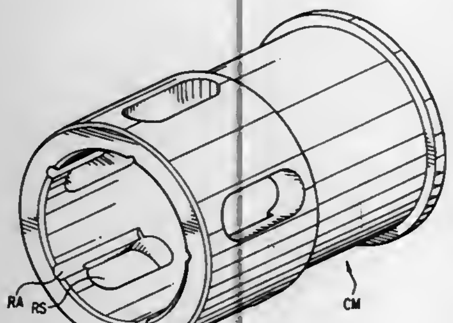
5,690,004
STUD DRIVER AND REMOVER HAVING CORE RELIEF RECESS PREVENTING THE STUD FROM BEING JAMMED IN CORE

Edward J. Weber, Girard, and Jerry L. Rounds, Erie, both of Pa., assignors to Titan Tool Company, Fairview, Pa.

Filed Mar. 20, 1996, Ser. No. 619,801

Int. Cl.^{6} B25B *13/50*

U.S. Cl. 81—53.2 **3 Claims**



1. A tool driven by a driving adapter for driving and removing a stud relative to a workpiece comprises:

a main ring with an axial bore, one end of the bore being located adjacent the driving adapter and the opposite end being located proximate a stud;

a core member mounted within the bore of the main ring for limited axial and rotary movement relative to the main ring, said core member including a plurality of roll slots;

a plurality of rolls carried by the corresponding roll slots of the core member; and

a plurality of recess areas located adjacent each corresponding one of said roll slots for accommodating a deformed, wave-shaped portion of said stud formable when said stud is being removed from said workpiece.

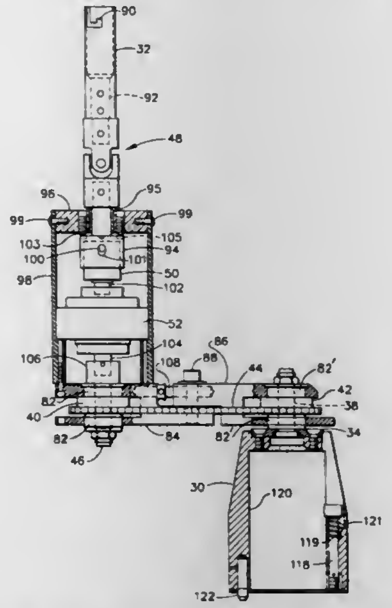
5,690,005
TOOL FOR REMOTELY INSTALLING AND TORQUING TIE ROD NUT WITH LIMITED VERTICAL ACCESS

Wing G. Jung, Cupertino, and John Allan Sies, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 22, 1995, Ser. No. 532,201

Int. Cl.^{6} B25B *17/00*

U.S. Cl. 81—57.3 **20 Claims**



1. A tool for remotely torquing a nut having limited vertical access, comprising:

a pole adaptor for coupling to an end of a handling pole;

a drive shaft operatively coupled to said pole adaptor so that said drive shaft is rotated in response to rotation of said pole adaptor in a torquing mode;

first support means for rotatably supporting said drive shaft;

a nut driver for coupling to the nut to be torqued;

a driven shaft operatively coupled to said nut driver so that said nut driver is rotated in response to rotation of said driven shaft;

second support means for rotatably supporting said driven shaft;

a drive system for converting rotation of said drive shaft into rotation of said driven shaft, wherein an axis of rotation of said drive shaft and an axis of rotation of said driven shaft are parallel but not coaxial;

means for slidably coupling said first support means to said second support means for mutual sliding in a direction generally perpendicular to said axis of rotation in an unfastened state; and

means for fastening said first support means relative to said second support means, thereby preventing said mutual sliding.

5,690,006
INFINITELY SLIDE-ADJUSTABLE SOCKET EXTENDER FOR SOCKET WRENCHES

Doyle H. Pulliam, P.O. Box 234, Horatio, Ark. 71842

Filed May 21, 1996, Ser. No. 651,946

Int. Cl.^{6} B25B *23/16*

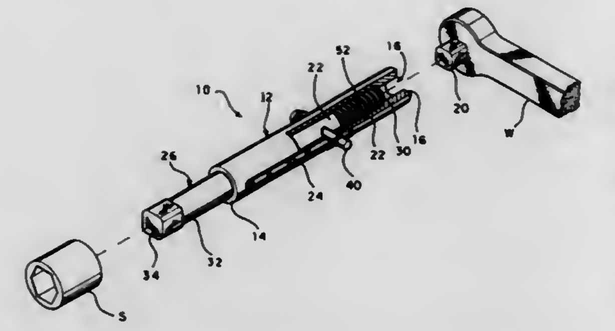
U.S. Cl. 81—177.2 **4 Claims**

1. A wrench socket extender, comprising:

a tubular member having an open end, an opposite closed end portion provided with a polygonal axial recess, two axially extending slots disposed between said open end and said closed end portion, each of said two axially extending slots disposed on radially opposite sides of said tubular member;

a shaft member having a first end slidably extending into said tubular member and a second end extending out of said tubular member and being provided with an axial male member being polygonal in cross section, said shaft member further having a radial bore proximate said first end with a removable pin passing through said bore and extending laterally beyond each of said two axially extending slots; and,

biasing means for biasing said shaft member provided within said tubular member and disposed between said closed end portion and said first end.



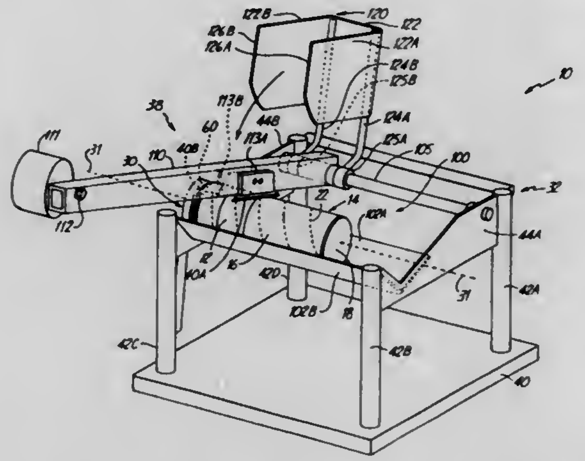
5,690,007
CUTTING APPARATUS FOR OBTAINING A SPECIMEN OF A FOOD PRODUCT CONTAINER

Robert A. Strange, Andover; Debra A. Crea, Stillwater, and Joseph G. Anton, Brooklyn Park, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 12, 1996, Ser. No. 615,169

Int. Cl.^{6} B23B *5/14*

U.S. Cl. 82—70.1 **21 Claims**



1. A cutting apparatus for cutting a specimen of a selected dimension from a food product container, the cutting apparatus comprising:

a mandrel comprising:

a first portion insertable in the food product container having an outer surface adapted to engage an inner surface of the food product container so that rotation of the mandrel causes rotation of the food product container; and

a second portion having a first guide member;

a support base for supporting the mandrel for rotation thereon, the support base having a second guide member operable with the first guide member to maintain an axial position of the mandrel during rotation; and

a knife assembly movably joined to the support base, the knife assembly having spaced-apart cutting knives engageable with an outer surface of the food product container for obtaining the specimen.

5,690,008
METHOD FOR DELIVERING ROLLED ROD TO A COOLING BED

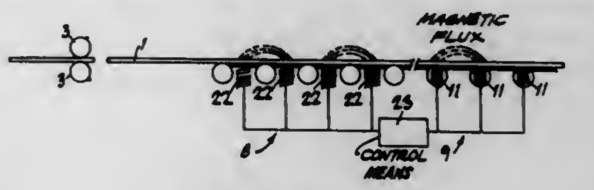
David Teng Pong, 1 Connaught Place, Hong Kong, Hong Kong

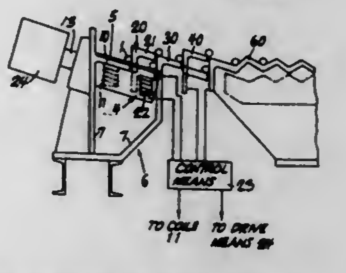
Division of Ser. No. 73,736, Jun. 8, 1993, Pat. No. 5,413,207.

This application Apr. 28, 1995, Ser. No. 431,292

Int. Cl.^{6} B26D *7/06*; B65G *47/26*

U.S. Cl. 83—26 **5 Claims**





1. A method of delivering longitudinally advancing lengths of rolled rod to a cooling bed comprising:

longitudinally advancing rolled rod through a shearing means to a run-in table whereat the rod travels on peripheral surfaces of longitudinally spaced rollers which are disposed transversely of the longitudinally advancing rod;

applying downward pulling force through selected ones of said rollers at a downstream portion of the run-in table to pull a leading portion of the longitudinally advancing rolled rod against the selected rollers at said downstream portion of the run-in table to prevent bouncing of said leading portion of the rod on said rollers;

laterally displacing said rolled rod along sold rollers of said run-in table to a position in readiness for being lifted from said run-in table by a lifting apron while said rolled rod is longitudinally advancing on said rollers;

then applying braking force to a trailing end portion of said longitudinally advancing length of rolled rod by braking means located at the run-in table upstream of said selected rollers; and

thereafter, lifting the rolled rod from the rollers by raising the lifting apron to transport the rod to a cooling bed.

5,690,009
ROLL SHEET CUTTER MECHANISM FOR USE IN IMAGE FORMING APPARATUS

Masahiko Nakao; Katsuhiro Yoshiuchi, and Keizo Yamamoto, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1995, Ser. No. 569,446

Claims priority, application Japan, Jan. 11, 1995, 7-002885

Int. Cl.^{6} B26D *5/20*; G03G *15/00*

U.S. Cl. 83—76.8 **3 Claims**

1. A roll sheet cutter mechanism for cutting an elongated roll sheet paid out from a feed reel and transported in a predetermined transportation direction along a transportation path that includes a guide-plate, which is disposed in the transportation path at a position downstream of the roll sheet cutter mechanism along the transportation direction, the roll sheet cutter mechanism and the guide plate forming a gap therebetween, the being large enough to permit entry of a leading edge of the roll sheet, the roll sheet cutter mechanism comprising:

an elongated stationary blade disposed on one side of the transportation path and extending in a direction perpendicular to the transportation direction;

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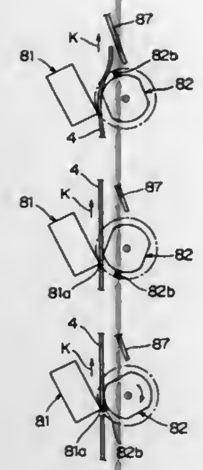


a rotary blade, disposed opposite to the stationary blade on the other side of the transportation path and adapted to rotate about an axis extending parallel to the longitudinal direction of the stationary blade, for cutting, at a cutting position, the roll sheet in cooperation with the stationary blade, the rotary blade having a blade portion;

rotary blade driving means for rotatably driving the rotary blade along a rotational direction such that the blade portion thereof moves along the transportation direction when the blade portion is in the transportation path; and

control means for controlling the operation of the rotary blade driving means;

the control means controlling the rotary blade driving means to cause the rotary blade to stop at a guiding position downstream of the cutting position along the rotational direction so as to guide the roll sheet in the transportation direction during a period between a first time point that is a predetermined time period before a leading edge of the roll sheet passes over the rotary blade and a second time point that is a predetermined time period after the leading edge of the roll sheet passes over the rotary blade,

wherein the rotary blade at the guiding position covers the gap and guides the leading edge of the roll sheet toward a surface opposite to the transportation path of the guide plate to thereby prevent the roll sheet leading edge from entering the gap;

the control means further controlling the rotary blade driving means to cause the rotary blade to start rotation in the rotational direction after the second time point so that the rotary blade is led to a cutting stand-by position before a tail edge portion of the roll sheet passes over the rotary blade, the cutting stand-by position being upstream of the cutting position along the rotational direction.

5,690,010

APPARATUS IN FORGING MACHINE TO CUT MATERIAL

Masahiko Amari, Nagoya, and Michio Hayashi, Kasugai, both of Japan, assignors to Asahi Sumac Kabushiki Kaisha, Alchiken, Japan

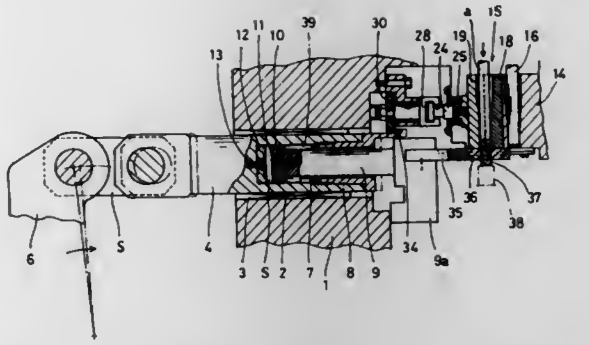
Filed Nov. 1, 1995, Ser. No. 551,376

Claims priority, application Japan, Nov. 9, 1994, 6-301485

Int. Cl.^{6} B26D *5/08;7/02*

U.S. Cl. 83—198 **2 Claims**

1. A machine for performing work on stock material including an apparatus for automatically cutting the stock material into individual lengths,



said machine having a cutter arbor cyclically driven reciprocably along a given path wherein the cutter arbor moves forwardly in each cycle for cutting an individual length of the stock material and retracts rearwardly in each cycle after cutting an individual length of stock material;

said machine further having a cutter holder mounted on said cutter arbor and a cutter mounted on said cutter holder for cutting the individual length from the stock material in each cutting cycle, wherein the individual lengths are transferable for subsequent work to be performed by said machine

said apparatus comprising:

a shear die for holding the stock material during successive cutting cycles while the individual lengths are being cut therefrom;

said shear die having two die portions comprising a stationary die portion and a movable die portion for jointly defining a die cavity for holding the stock material axially therein while the individual lengths are cut successively from the stock material;

said die cavity having a diameter for firmly clamping and holding the stock material during cutting;

biasing means for constantly applying a biasing force on the movable die portion toward the stationary die portion;

mounting means for slidably mounting the cutter holder on the cutter arbor and in an initial position such that an impact portion of the cutter holder is spaced relative to an impact portion of the cutter arbor in said given path when said cutter arbor is retracted for allowing the cutter arbor to subsequently travel forwardly and engage the cutter holder at said respective impact portions and to transport the cutter holder along therewith to effect cutting of the individual length of stock material in each cutting cycle after the cutter arbor reaches maximum velocity traveling forwardly, whereby the cutter is moved by said cutter arbor at a maximum velocity in each cutting cycle for cutting the individual lengths of stock material successively;

means for restoring said cutter holder to said initial position when the cutter arbor retracts in each cutting cycle so that said cutter holder is thereby ready for a next successive cutting of another individual length of the stock material; and

release means on the cutter arbor for rendering the biasing means ineffective and separating the movable die portion from the stationary die portion when the cutter holder is fully retracted in each cutting cycle to open the die cavity for allowing advancing of the stock material in the cavity for cutting of a next successive length therefrom, and

wherein said release means under control of the cutter arbor renders the biasing means effective for biasing the movable die portion toward the stationary die portion and jointly clamping the stock material when the cutter arbor starts to move forwardly for cutting of the stock material; whereby the stock material is held firmly for a next successive cutting of an individual length of the stock material.

5,690,011

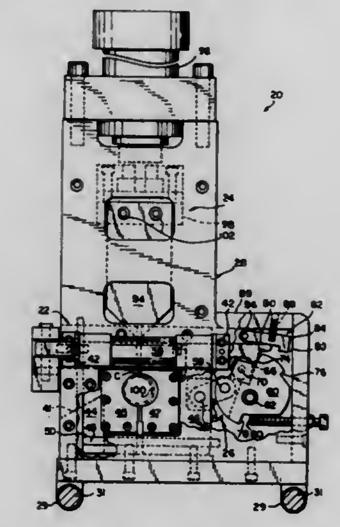
HYDRAULIC DOUBLE-CUT TUBE CUTOFF

Donald R. Hill, and James A. Gafkowski, both of c/o Hill Engineering, 930 N. Villa Ave., Villa Park, Ill. 60181

Filed Oct. 6, 1995, Ser. No. 540,015

Int. Cl.^{6} B23D *21/00*

U.S. Cl. 83—319 **22 Claims**



1. An apparatus for cutting a workpiece moving in a predetermined path relative to a support, said apparatus comprising:

a carriage;

means for mounting the carriage to a support for movement relative to a support to follow movement of a workpiece moving in a predetermined path;

clamping means on the carriage for clamping a workpiece to the carriage,

said clamping means having an open position and a closed position;

first means on the carriage movable between a first position and a second position for making a scarf cut in a workpiece; and

means for moving the clamping means from its open position to its closed position as an incident of the first means moving from its first position towards its second position.

5,690,012

CUTTING MODULE FOR WEB PRODUCTS AND CUTTING DEVICE EQUIPPED WITH AT LEAST ONE SUCH MODULE

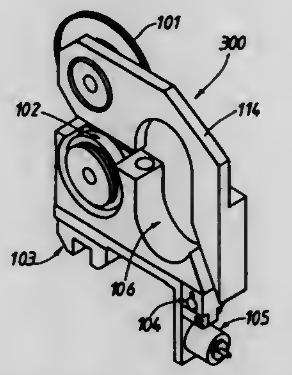
Christophe Louis Michel Blandin, and Pascal Philibert Bossu, both of Chalon-Sur-Saone, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1996, Ser. No. 620,519

Claims priority, application France, Apr. 10, 1995, 95 04490

Int. Cl.^{6} B26D *1/20*

U.S. Cl. 83—507 **10 Claims**



1. Cutting module for slitting web products, comprising:

a circular knife element and a circular bedknife element, each presenting a specific radius and a periphery and being rotatively mounted on a frame in such a way that their respective axes are substantially parallel to one another, the distance between said axes being such that the respective periphery of the knife and bedknife cooperate with each other in order to slit a web passing between said elements;

an eccentric ring having a cylindrical external surface presenting a first axis rotatable in a corresponding opening of the frame and an internal cylindrical surface having a first diameter and presenting a second axis distant from the first axis and parallel to said first axis;

an intermediate member having an external cylindrical surface presenting said first diameter in order to cooperate with the internal surface of said eccentric ring and an internal cylindrical surface adapted to receive and immobilize roller bearings in order to permit rotation of one of said elements with respect to the frame;

said intermediate member and said eccentric ring being provided with cooperating thread in order to be screwed one on the other and first blocking means having a first position wherein said eccentric ring and said intermediate member are immobilized with respect to each other;

second blocking means for temporarily immobilizing said one circular element with respect to the intermediate member; and

third blocking means having a first position wherein the eccentric ring is immobilized with respect to the frame and a second position wherein the eccentric ring could be rotated with respect to the frame in order to modify the distance between the axes of said circular knife and bedknife elements wherein the knife is mounted fixedly on a knife carrier rotatably mounted on said intermediate member.

5,690,013

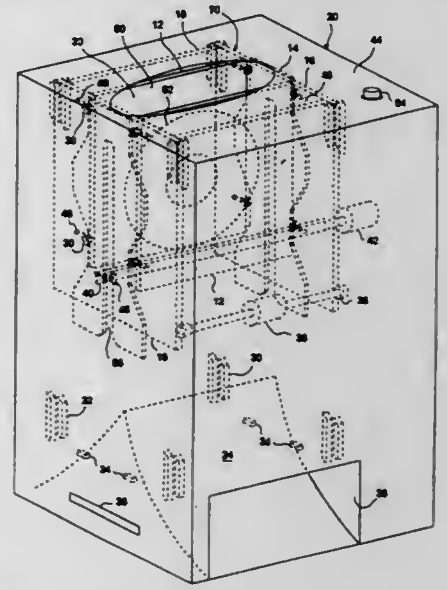
AUTOMATIC SELF-ADJUSTING AND SELF-CENTERING BAGEL SLICING METHOD AND APPARATUS

David A. Kanarek, 509 Appletree La., Deerfield, Ill. 60015, and Lawrence S. Kanarek, 910 Westbourne La., Buffalo Grove, Ill. 60089

Filed Mar. 18, 1996, Ser. No. 617,280

Int. Cl.^{6} B26D *3/08*

U.S. Cl. 83—762 **15 Claims**



8. A bagel slicer comprising:

a housing having a top;

means for supporting a transport mechanism for movement in said housing;

a cutting edge positioned in said housing;

receiving means in said top for receiving a bagel in said housing;

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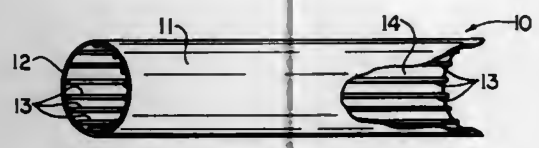
biased securing means in said transport mechanism for grasping said bagel in a slicing attitude with respect to said cutting edge;
means for reciprocating said cutting edge;
means for moving one of said transport mechanism and said cutting edge with respect to the other of said transport mechanism and said cutting edge, and
means for controlling said biased securing means to release said bagel after slicing.

5,690,014
SMALL DIAMETER IONIZING CORD FOR REMOVING STATIC CHARGE

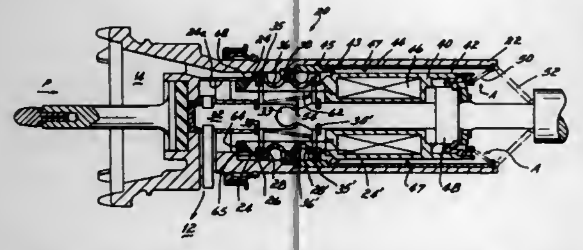
William J. Larkin, 27 Parsons Dr., Swampscott, Mass. 01907
Continuation-in-part of Ser. No. 247,051, May 20, 1994, Pat. No. 5,501,899. This application Jun. 5, 1995, Ser. No. 464,973
Int. Cl.⁶ D04C *1/00*
U.S. Cl. 87—13 **6 Claims**



1. A small diameter ionizing cord for removing static charge from insulative material flowing or being propelled through an apparatus, said ionizing cord having an outer surface and comprising three or more strands of electrically non-conductive fibers braided to form a cord having an effective diameter of about 0.5 mm to about 6 mm, at least one of said strands being a static control strand including a multiplicity of electrically conductive microfibers being in electrically conductive communication with one another along the length of said strand, said microfibers providing a multiplicity of ionizing points disposed along the length of said cord and exposed at said outer surface such that, when said strand is electrically grounded or electrically charged, air between said ionizing points and said material passing said outer surface is sufficiently ionized to remove static charge from said material.

5,690,015
PNEUMATIC BRAKE BOOSTER

Erwin Michels, Kail, and Peter Schlüter, Kammerforst, both of Germany, assignors to Lucas Industries public limited company, United Kingdom
PCT No. PCT/EP94/03535, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO95/12511, PCT Pub. Date May 11, 1995
PCT Filed Oct. 27, 1994, Ser. No. 615,274
Claims priority, application Germany, Nov. 2, 1993, 43 37 361.5
Int. Cl.⁶ F15B *9/10*
U.S. Cl. 91—369.1 **16 Claims**

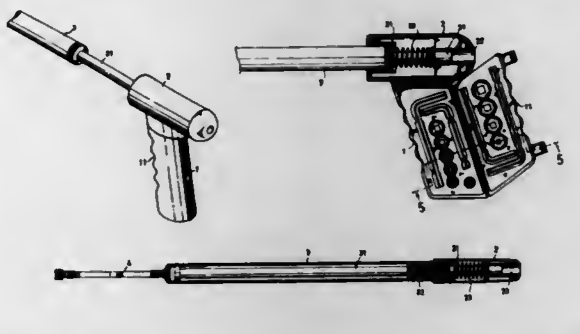


1. A pneumatic brake booster comprising a housing (**10**) which is divided into a vacuum chamber (**14**) and a working chamber (**12**), in which

a dual valve arrangement (**20**) having a first valve means (**24**, **26**) between the vacuum chamber (**14**) and the working chamber (**12**) and a second valve means (**24'**, **26'**) between the ambient atmosphere (A) and the working chamber (**12**) is arranged at the housing (**10**), in which
the valve arrangement (**20**)
in an inoperative position, allows having pressure levels in the vacuum chamber (**14**) and in the working chamber (**12**) separate from the atmosphere (A),
in an operative position, keeps the vacuum chamber (**14**) sealed off and allows communication between the atmosphere (A) and the working chamber (**12**),
in normal operation, the first valve means (**24**, **26**) and the second valve means (**24'**, **26'**) are adapted to be actuated by a common actuating rod (**34**), and
in a controlled operation, when the actuating rod (**34**) effects an opening of the first valve means (**24**, **26**), an electromagnetic actuator (**40**, **46**) which is independent of the actuating rod (**34**) prevents communication between the vacuum chamber (**14**) and the working chamber (**12**) by a sealing element (**64**) coupled to the electromagnetic actuator (**40**, **46**), the electromagnetic actuator (**40**, **46**) so preventing said communication by moving the sealing element (**64**) into a position preventing a passage through the first valve means (**24**, **26**).

5,690,016
TIRE PUMP AND TOOL BOX COMBINATION

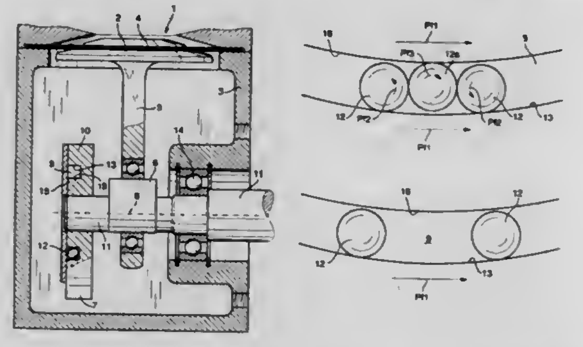
George Hwang, No. 65, Lane 45, Kwang Fu E. Rd., Pei Tou Hsiang, Changhwa Hsien, Taiwan
Filed Jun. 3, 1996, Ser. No. 656,836
Int. Cl.⁶ F01B *31/00*
U.S. Cl. 92—58.1 **3 Claims**



1. A tire pump and tool box combination comprising a tire pump having a piston rod reciprocated to pump air, and a tool box coupled to one end of said piston rod outside said tire pump, said tool box including a tool holding portion and a cylindrical connector, said tool holding portion having one end connected to said cylindrical connector, said one end of said tool holding portion extending from said cylindrical connector a length sufficient for grasping by hand, said tool holding portion having a corrugated outer surface portion for facilitating the grasping by hand and for reciprocating said piston rod, said cylindrical connector sharing a common axis with said piston rod and coupled to said piston rod,
said cylindrical connector having a first hole at one end adapted for receiving one end of said tire pump and through which said piston rod passes, and a second hole at an opposite end longitudinally connected to said first hole and to which said piston rod is fixedly connected by plugging, and
said tool holding portion having first and second halves opening along a longitudinal axis thereof for inserting and removing tools therefrom.

5,690,017
DIAPHRAGM PUMP WITH AT LEAST ONE RECIPROCATING PISTON AND BALANCING DEVICE THEREFOR

Heinz Riedlinger, Bremen, Germany, assignor to KNF Neuberger GmbH, Freiburg, Germany
Filed Jan. 17, 1997, Ser. No. 785,736
Claims priority, application Germany, Jan. 19, 1996, 196 01 839.0
Int. Cl.⁶ F01B *19/00*
U.S. Cl. 92—100 **18 Claims**

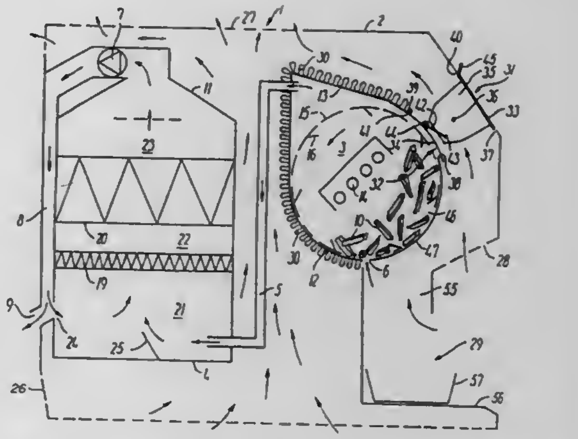


1. A diaphragm pump (**1**) comprising at least one diaphragm (**4**) and, fastened to the diaphragm, a reciprocating piston (**2**) acted upon by a connecting rod (**5**) which, in turn, is acted upon and driven at an end facing away from the reciprocating piston (**2**) by one of an eccentric (**6**) and a cranked portion of a drive shaft, the diaphragm pump's rotating masses and at least part of its oscillating masses being balanced by at least one counterweight (**7**) fixedly mounted thereon and moving in synchronism therewith, an annular cavity (**9**) within a co-rotating housing (**10**) arranged concentrically to an axis of rotation (**8**) about which the eccentric (**6**) or the cranked portion of the drive shaft revolve during operation of the diaphragm pump (**1**), the annular cavity (**9**) having a radial width bounded by an outer surface (**13**) and an inner surface (**16**), at least two rolling elements (**12**) arranged in said cavity (**9**) which are capable of rolling freely on the outer surface (**13**) serving as a raceway, the annular cavity (**9**) having an interior which is devoid of liquid and empty except for the rolling elements (**12**), and the radial width of the annular cavity (**9**) slightly exceeding a radial diameter of the rolling elements (**12**), in such a way that, as a result of an unbalance present during start-up of the diaphragm pump, the rolling elements (**12**) are movable to and fro between the outer and inner surfaces (**13**, **16**), so that during start-up the rolling elements (**12**) are initially entrainable in a circumferential direction due to a sliding friction between themselves and the outer and inner surfaces (**13**, **16**).

5,690,018
APPARATUS FOR HEAT TREATMENT OF A PARTICULAR FOOD PRODUCT

Ejner Bjorn Hansen, Pedarstrupvej 9, DK-5210 Odense NV, Denmark
PCT No. PCT/DK94/00431, § 371 Date Jul. 15, 1996, § 102(e) Date Jul. 15, 1996, PCT Pub. No. WO95/13734, PCT Pub. Date May 26, 1995
PCT Filed Nov. 15, 1994, Ser. No. 640,832
Claims priority, application Denmark, Nov. 19, 1993, 1306/93
Int. Cl.⁶ A47J *37/00;37/04;* **F24C** *7/00;15/16*
U.S. Cl. 99—330 **20 Claims**

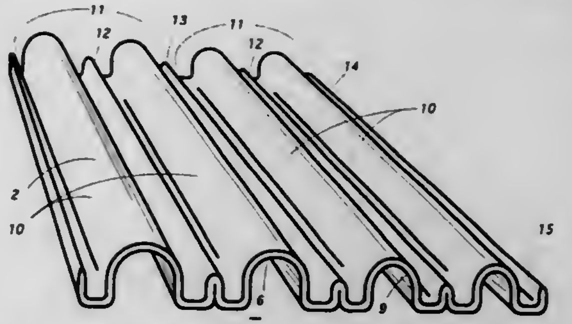
1. A cooking apparatus for cooking a food product, said apparatus comprising:
a chamber for receiving the food product to be cooked;
a heat source for applying heat to said chamber;
a ventilator for releasing gases developed within said chamber through an outlet canal to the exterior of the cooking apparatus;



a filter device operatively coupled to said ventilator for purifying the gasses developed within said chamber;
an air connection path between said chamber and said filter device, wherein said air connection path acts as a convector of the heat developed within said chamber.

5,690,019
BREAD BUN MOLD

Alonzo Andrew Barker, deceased, late of Menominee, Mich.; Lucille M. Barker, heir, Rennes Health Center East, Peshtigo, Wis. 54157; Barbara Lam, heir, 1209 Amsterdam, Madison, Wis. 53716; Lawrence Barker, heir, N2257 0-1 Dr., Menominee, Mich. 49858; Cecilia Ross, heir, N1281 River Rd., Menominee, Mich. 49858; Phillip Barker, heir, 1121 37th Ave., Menominee, Mich. 49858; Mark Barker, heir, W5896 #6 Rd., Menominee, Mich. 49858; Owen Barker, heir, 1713 23rd Ave., Menominee, Mich. 49858; Roy Barker, heir, 821 16th Ave., Menominee, Mich. 49858; Alice Romsek, heir, 1751 Scott Creek Dr., Belmont, Mich. 49306; Walter Barker, heir, 2409 21st St., Menominee, Mich. 49858; Christine Mueller, heir, N1960 River Dr., Menominee, Mich. 49858, and Leo J. Barker, heir, 1210 15th St., Menominee, Mich. 49858
Filed Dec. 13, 1994, Ser. No. 354,619
Int. Cl.⁶ A47J *37/01*
U.S. Cl. 99—428 **6 Claims**



1. A molding utensil for all or a portion of a hot dog or other sandwich bun, the utensil comprising a generally extended surface comprising an upper portion;
the surface being bounded by:
  side edges, disposed parallel one another;
  a proximal edge; and
  a distal edge;
the surface's upper portion comprising one of:
    a singular semitubular elevation; and
  a plurality of semitubular elevations disposed therein parallel the side edges, each semitubular elevation comprising:
    height between one-eighth inch and two inches;
    ends coterminous with the proximal and distal edges of the utensil's surface;

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the surface's upper portion further comprising:
  side ridges defining the side edges of the surface, the side ridges comprising:
    ends coterminous with the utensil surface's proximal and distal edges;
the surface's upper portion further comprising:
  interior ridges disposed between each semitubular elevation plural in number, each ridge comprising:
    an end coterminous with the utensil surface's proximal and distal edges;
    when plural in number, one of:
      uniformity in height; and
      substantially shorter height for every other one of them, whereby a folding hinge is formed between two adjoining buns baked upon the utensil.

5,690,020
KOJI PRODUCTION SYSTEM

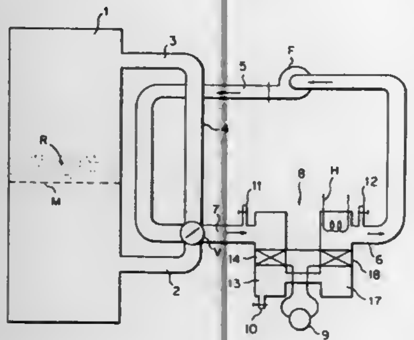
Masanobu Kitani, 17-15, Nagasaki 2-chome, Toshima-ku, Tokyo; Mitsunobu Kitani, and Haruhiko Kitani, both of Tokyo, all of Japan, assignors to Masanobu Kitani, and Hakuyo Co., Ltd., both of Tokyo, Japan

Filed Nov. 13, 1996, Ser. No. 748,404

Claims priority, application Japan, Nov. 15, 1995, 7-319798

Int. Cl.⁶ A23L *1/00;1/34;3/00*

U.S. Cl. 99—470 **11 Claims**



1. A koji production system capable of producing koji at a large scale or an extremely small scale depending on the demand, and also capable of finely adjusting the water content of koji rice grains, comprising arranging a cooling and dehumidifying chamber and a heating chamber by means of a heat-pump process with a freezing cycle used in the circuit thereof, wherein both the chambers are arranged as separate chambers and connected through a passage to each other and wherein secondary heaters are arranged in the heating chamber.

5,690,021
STRAINER INSERT FOR BLENDER

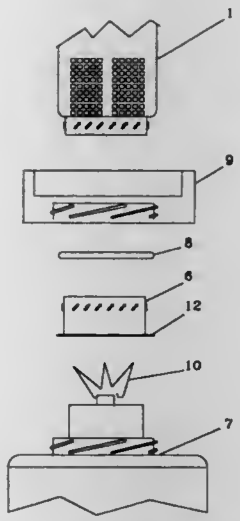
Ronald Grey, 11172 Western Ave., Stanton, Calif. 90680

Filed Mar. 11, 1996, Ser. No. 613,616

Int. Cl.⁶ A23N *1/00;* **B02C** *15/00;* **B04B** *5/10*

U.S. Cl. 99—513 **3 Claims**

1. A device for mounting in a blender mixing chamber and attachment to a blender base having a blender blade comprising:
  a mounting base having a mounting base flange circumferentially attached around the mounting base such that the mounting base may be placed on the blender base with a sealing ring mounted on the mounting base flange and an attachment ring mounted on the mounting base and attached to the blender base to retain the mounting base and sealing ring in the mixing chamber;
  a strainer chamber having a plurality of strainer openings defined therein; and



the strainer chamber having a means for attachment to the mounting base such that the blender blade is contained in the strainer chamber.

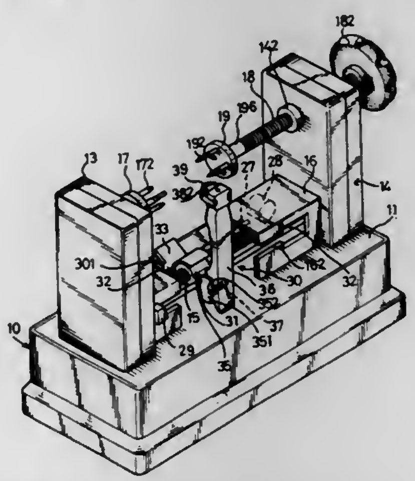
5,690,022
PEELING DEVICE

Liao-chu Chai, No. 2, Taming Lane, Hsinkuang Rd., Taiping City, Taichung Hsien, Taiwan

Filed Dec. 11, 1996, Ser. No. 764,149

Int. Cl.⁶ A23N *7/00;* **A47J** *17/04;43/28*

U.S. Cl. 99—590 **6 Claims**



1. A peeling device comprising:
a base having a top plate and a bottom plate, a first hole defined in said top plate near a first end of said base;
a motor disposed in said base and located between said top plate and said bottom plate;
said top plate having a first end portion disposed to a first end thereof and said first hole communicating with an interior of said first end portion, said top plate having a second end portion disposed to a second end thereof and located opposite to said first end portion;
a transmitting means disposed in said first end portion and mechanically connected to said motor via said first hole;
a first lead screw rotatably supported between said first end portion and said second end portion, one end of said first lead screw securely connected to said transmitting means;
a movable member movably engaged with said first lead screw and a knife pivotally connected to said movable member, and
a first fork member having one end thereof fixedly connected to said transmitting means and the other end thereof having a plurality of first spikes extending longitudinally therefrom, a second fork member movably extending from said second end portion with a plurality of second spikes extending from said second fork member facing to said first spikes.

5,690,023
TENSIONING AND SEALING APPARATUS FOR STRAPPING AN OBJECT WITH A BAND

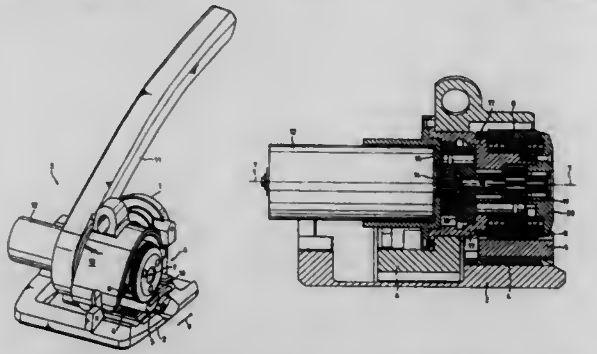
Nikolaus Stamm, Thalwil, and Flavio Finzo, Würenlos, both of Switzerland, assignors to Orgapack AG, Dietikon, Switzerland

Filed May 24, 1996, Ser. No. 652,934

Claims priority, application Switzerland, May 26, 1995, 01571/95

Int. Cl.⁶ B65B *13/18*

U.S. Cl. 100—29 **8 Claims**



1. Tensioning and sealing apparatus for strapping an object with a band, which apparatus comprises a housing (1) having a tensioning unit (3) for retaining two ends of the bands which are to be sealed and for tensioning the same and having a sealing unit for connecting the two mutually overlapping ends, the tensioning unit (3) exhibiting a tensioning shoe (5) and a drivable tensioning wheel (8) which is fastened on a pivotable rocker (6) and is intended for pressing the band against the tensioning shoe (5) and for gripping the same upon rotation, characterized in that the tensioning wheel (8) is driven with the aid of a drive motor (12) which is arranged coaxially with the tensioning wheel (8) and is connected to the tensioning wheel (8) via a gear mechanism arranged coaxially with the tensioning wheel (8).

5,690,024
WASTE PAPER COLLECTING DEVICE

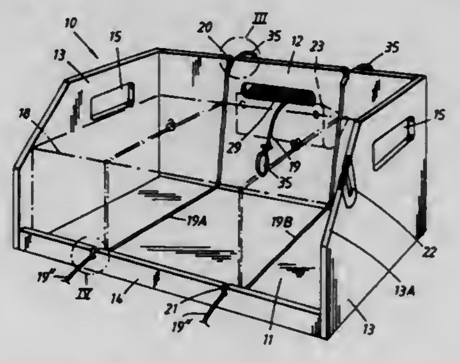
Olle Järund, Badbergsgatan 3, S-450 71, Fjällbacka, Sweden

Filed Feb. 20, 1996, Ser. No. 604,109

Claims priority, application European Pat. Off., Mar. 14, 1995, 95850056.3

Int. Cl.⁶ B65B *27/08*

U.S. Cl. 100—34 **22 Claims**



1. A device for collecting and bundling paper material comprising:
a receptacle having a substantially rectangular-shaped bottom and a back wall, two spaced apart side walls coupled to the bottom and back walls;
holders for retaining a pair of string lengths in a position running substantially vertically along the inside of the back wall to the bottom of the receptacle and substantially horizontally along the bottom wall to the front edge of the receptacle, the string lengths having end portions easily accessible at the top of the back wall and the front edge, respectively, the paper material being packed by tieing the paper material together with the string lengths and obtaining a package of paper material which can be lifted from the receptacle;
at least one knife element disposed in a slit made in at least one of the walls for use when cutting the string into suitable lengths; and
a box disposed on an exterior surface of one of the walls the box loosely retaining a string bobbin, the free end of the string emanating from the bobbin passing through an aperture in the wall into the receptacle such that the string can be pulled out from the bobbin to a suitable length, cut by the knife element and arranged in the holders.

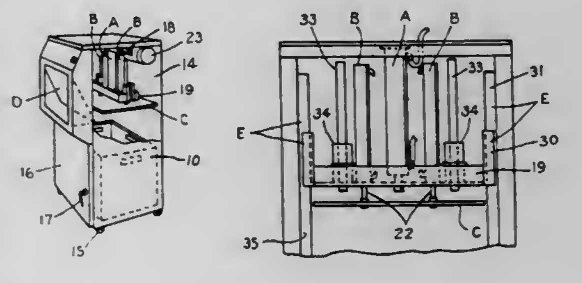
5,690,025
TRASH RECEPTACLE AND COMPACTOR FOR USE IN PUBLIC AREAS AND METHOD

Bobby Leonard Hawkins, 2 Manley Rd., Travelers Rest, S.C. 29690

Filed Jan. 16, 1996, Ser. No. 586,405

Int. Cl.⁶ B30B *9/30*

U.S. Cl. 100—35 **14 Claims**



10. The method of collecting and compacting trash in a public area comprising the steps of:
providing an upright trash receiving housing;
positioning a generally horizontally disposed power operated assembly including a movable support and a compaction plate depending therefrom for vertical movement in said housing for compacting trash in a lower compacting compartment in vertical alignment therewith;
hinging a trash receiving door for pivotal movement in said housing which, when pivoted to open position with said compaction plate in raised retracted position extends inwardly beneath said compaction plate providing a passageway of sufficient size to permit passage of trash directly beneath said compaction plate into said compacting compartment;
guiding and positioning said power operated assembly on a vertical trackway during application of compacting force and during retraction to raised position; and
guiding and positioning said compaction plate for vertical movement in respect to said movable support; and
exerting a compaction stroke of such length as to compact said trash in the lower compacting compartment by incremental movements between said horizontal support, said movable support and said compaction plate;
whereby a low profile compactor may provide for the introduction of trash beneath the compaction plate when in raised retracted position.

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5,690,026
ARRANGEMENT FOR TRANSFERRING WORKPIECES THROUGH A SUCCESSION OF MACHINING STATIONS

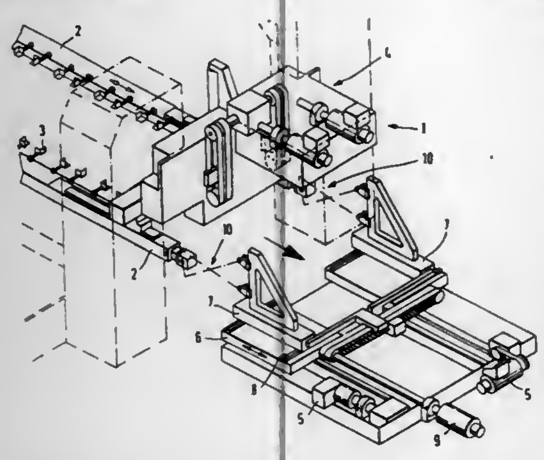
Karl Thudium, Waeschenbeuren; Walter Rieger, Goeppingen, and Andreas Dangelmayr, Ottenbach, all of Germany, assignors to Schuler Pressen GmbH & Co., Germany

Filed Feb. 22, 1996, Ser. No. 605,663

Claims priority, application Germany, Feb. 22, 1995, 195 06 077.6

Int. Cl.⁶ B30B *15/30;* **B65G** *25/00;* **B21D** *43/05*

U.S. Cl. 100—207 **3 Claims**



1. Arrangement for transferring workpieces through a succession of machining stations, comprising two spaced parallel transport rails, a traverse hingedly connectable with each of said rails, and motors for moving the transport rails, via each traverse, at least one of horizontally in a longitudinal direction thereof, and horizontally toward one another, wherein, between the transport rails and the motors for the horizontal movement of the transport rails arranged on the traverse, a compensating guide is provided which has at least two struts and a double-armed lug with three hinge points, each of the struts, on the traverse-side, being disposed in a hinged manner at one hinge point respectively, the other end of the struts each being mounted on one of the hinge points of the double-armed lug, and the third hinge point of the double-armed lug being mounted in hinged manner on the transport rail.

5,690,027
STENCIL PRINTER HAVING INK LEAKAGE PREVENTING CONSTRUCTION

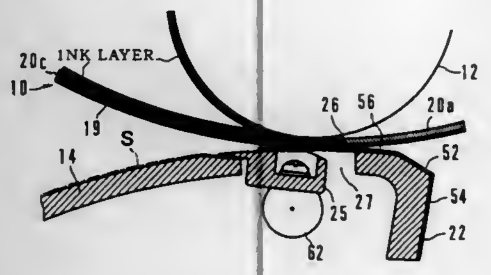
Yasuhiro Takahashi, and Koji Nakayama, both of Inashiki-gun, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Jul. 24, 1996, Ser. No. 685,719

Claims priority, application Japan, Jul. 31, 1995, 7-214075

Int. Cl.⁶ B41L *13/06*

U.S. Cl. 101—120 **3 Claims**



1. A stencil printer comprising a printing drum having a perforated construction at a circumferential portion thereof except two annular edge portions extending along opposite axial ends of a cylindrical configuration thereof and a strip of stencil sheet leading end mounting portion extending between said two annular edge portions along a generatrix of the cylindrical configuration, an inking roller provided inside of said printing drum so as to supply ink to said perforated circumferential portion of said printing drum from the inside thereof, and a back press roller having a clamp for mounting a leading end of a print sheet thereto provided along a generatrix thereof, said printing drum and said back press roller being arranged in proximity and parallel to one another and adapted to rotate in directions opposite to one another so as to execute a stencil printing such that the ink supplied to said perforated portion of said printing drum by said inking roller is selectively transferred through a stencil sheet mounted around said printing drum to provide a printed image of ink on a print sheet supplied between said printing drum and said back press roller with a leading end portion thereof being held by said clamp, wherein the stencil printer further comprises a strip of elastic sheet mounted on said back press roller along a generatrix thereof so as to cover said clamp.

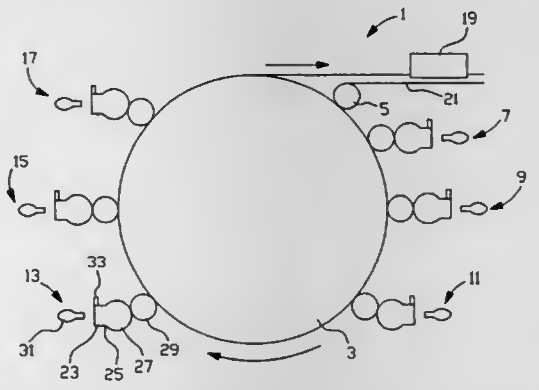
5,690,028
WET TRAPPING METHOD AND APPARATUS FOR LOW VISCOSITY RADIATION CURED PRINT

Philip W. Schick, Knowlton, N.Y., assignor to Cavanagh Corporation, Flemington, N.J.

Filed Jun. 6, 1996, Ser. No. 659,632

Int. Cl.⁶ B41F *5/16*

U.S. Cl. 101—211 **20 Claims**



1. A method of printing ink upon a continuous substrate using a printing apparatus comprising the steps of:

(a) feeding a continuous substrate around a central impression cylinder that rotates so as to successively pass the substrate through at least one face roll and a plurality of inking stations;

(b) heating ink located at each inking station to a first predetermined temperature, said predetermined temperature being higher than a second predetermined temperature of said central impression cylinder of said substrate wherein the viscosity of said ink is dropped low enough so that said ink will be transferred to said substrate;

(c) applying a first ink from a first inking station to the substrate wherein the temperature of the first ink decreases and the viscosity increases as the first ink is pulled off a first printing plate in the direction of the substrate;

(d) applying an intermediate ink from an intermediate inking station to the substrate wherein previously applied ink on the substrate has a lower temperature and a higher viscosity than said intermediate ink, causing said previously applied ink to pull said intermediate ink off an intermediate printing plate in the direction of the substrate;

(e) repeating step (d) at each one of the remaining of said plurality of inking stations;

(f) curing the inked substrate which has passed through said plurality of inking stations at a curing station.

5,690,029
RUBBER-BLANKET CYLINDER ENGAGEMENT AND DISENGAGEMENT DEVICE

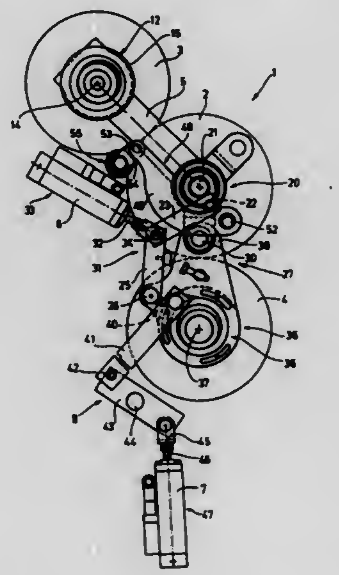
Bernd Herrmann, Malsch, and Hans-Jürgen Kusch, Neckargemünd, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Continuation of Ser. No. 541,630, Oct. 10, 1995, abandoned. This application Jan. 27, 1997, Ser. No. 789,489

Claims priority, application Germany, Oct. 8, 1994, 44 35 986.1

Int. Cl.⁶ B41F *7/02*

U.S. Cl. 101—2.18 **10 Claims**



1. In combination with a rotary printing press having a plate cylinder rotatable about a plate cylinder axis, a rubber-blanket cylinder, and an impression cylinder, a rubber-blanket cylinder engagement and disengagement device, comprising swivel arms whereon the rubber-blanket cylinder is journalled, said swivel arms being articulated at a frame of the rotary printing press about the rotational axis of the plate cylinder, an actuating device for swivelling said swivel arms such that said rubber-blanket cylinder approaches the impression cylinder under a given force, and an adjustable stop device disposed at a side of the frame for limiting swivelling motion of said swivel arms so as to bring about a setting thereof in a rubber-blanket cylinder engagement position, said stop device having at least one supporting element formed with a large supporting surface by which said stop device cooperates with the rubber-blanket cylinder.

5,690,030
DELIVERY SYSTEM FOR A PRINTING PRESS

Martin Greive, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

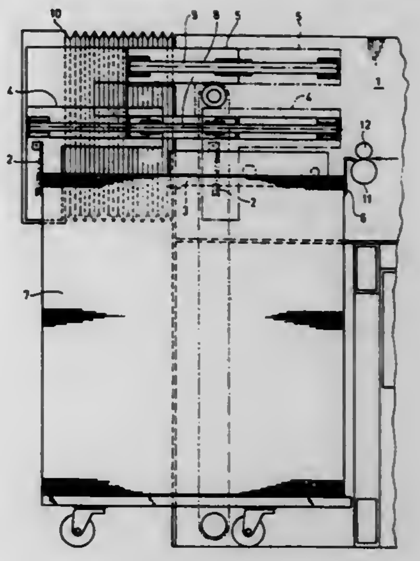
Filed Feb. 20, 1996, Ser. No. 603,935

Claims priority, application Germany, Feb. 18, 1995, 195 05 599.3

Int. Cl.⁶ B41F *13/24*

U.S. Cl. 101—232 **10 Claims**

1. In combination, a printing press and a chainless delivery system therefor, comprising adjustable sheet stops disposed in a horizontal plane, the delivery system being subdivided into a part proximate to the press and a part distal to the press, one of said sheet stops being a rear sheet stop fixedly connected to said distal part of the delivery system, said distal part being adjustable horizontally, together with said fixedly connected rear sheet stop, in a direction towards and away from the printing press for adjusting a size of the delivery system to a format size being processed in the printing press.



5,690,031
AERIAL CABLEWAY HAVING A MOVEMENT TAKE UP MODULE

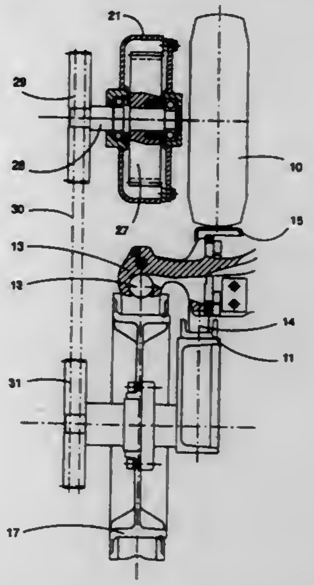
Alain Bach, Voreppe, and Jean-Pierre Rastello, Grenoble, both of France, assignors to Pomagalski S. A., France

Filed Oct. 8, 1996, Ser. No. 727,043

Claims priority, application France, Oct. 25, 1995, 95 12680

Int. Cl.⁶ B61B *11/00*

U.S. Cl. 104—168 **6 Claims**



1. An overhead cable transport installation comprising:

a continuous aerial cable, a load supporting detachable grip adapted to be coupled to and decoupled from said cable at a station, a transfer rail provided at the station, a girder extending along the transfer rail, friction sheaves successively arranged along the transfer rail and having spindles rotatably mounted on said girder, a drive plate rigidly secured to said grip and cooperating with said friction sheaves to propel the grip along the transfer rail, belt drive means having belts and pulleys amounted on the friction sheave spindles for drivingly interconnecting the successive friction sheaves, a cable support sheave for supporting said cable and having a spindle with a belt pulley mounted thereon, a movement take up module comprising one of said friction sheaves, a drive pulley drivingly connected to said belt pulley of the cable support

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sheave, and a cog-wheel transmission between said drive pulley and said one friction sheave to invert the direction of rotation of said friction sheave with respect to the drive pulley, said drive pulley and said cog-wheel transmission being supported by said girder.

5,690,032
DEVICE FOR PREVENTING REVERSE RUN OF CARRIER OF TROLLEY CONVEYOR

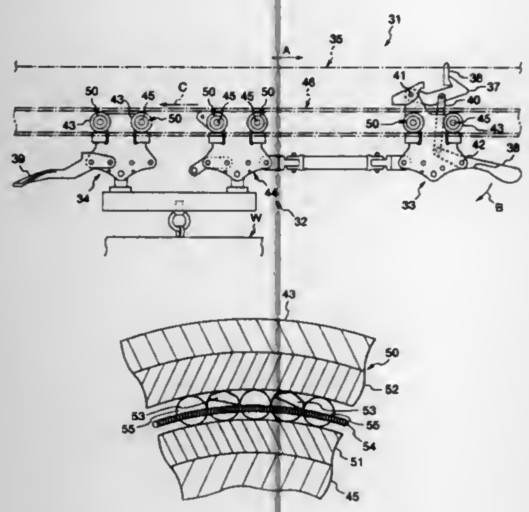
Takao Koga, Nabari, and Shozo Adachi, Kashiwara, both of Japan, assignors to Tsubakimoto Chain Co., Osaka-fu, Japan

Filed Feb. 13, 1996, Ser. No. 600,612

Claims priority, application Japan, Feb. 15, 1995, 7-049316

Int. Cl.⁶ B61B *9/00*

U.S. Cl. 104—172.1 **1 Claim**



1. Trolley conveyor system having a rail, a carrier containing running rollers adapted to rotatably engage said rail, a drive chain having an engageable and disenageable pusher dog operative for selectively connecting and disconnecting said drive chain with respect to said carrier, and means for preventing reverse run of said carrier on said rail, said reverse run preventing means including, with respect to at least one of said running rollers, a support shaft for rotatably supporting said one running roller and an over-running clutch, said over-running clutch comprising:

an outer race installed on an inner surface of said running roller,

an inner race fixedly secured to said support shaft,

a plurality of circumferentially spaced rollers interposed between an inner surface of said outer race on an outer surface of said inner race,

a cam disposed between adjacent rollers, said cam, intermediate its axial ends, containing a first portion having an effective width less than the space between said inner surface of said outer race and said outer surface of said inner race and a second portion having an effective width defined by surface portions on opposite sides of said cam greater than the space between said inner race and said outer race, said surface portions being interconnected by a line having a constant angular displacement with respect to a common centerline of said races, an extension of at least one axial end of said cam having a chordal surface extending transverse to said line, and an annular spring disposed between said chordal surface and said outer surface of said inner race and operative to bias said surface portions into sliding contact with said race surfaces, whereby said cam is effective to permit relative rotation between said races in one direction and to prevent relative rotation between said races in an opposite direction.

5,690,033
DEFORMABLE GANGWAY BETWEEN TWO LOADING PLATFORMS CARRIED BY SUCCESSIVE CHASSIS, NOTABLY PERTAINING TO RAILRODS

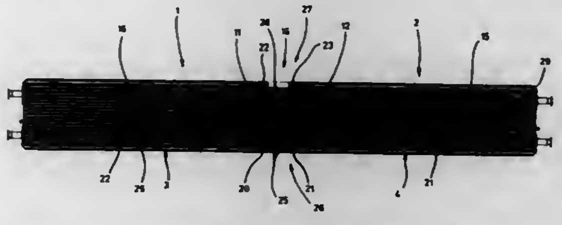
Jean-Luc Andre, Obernai, France, assignor to Lohr Industrie, Hangenbieten, France

Filed Sep. 14, 1995, Ser. No. 528,090

Claims priority, application France, Sep. 16, 1994, 94 11229

Int. Cl.⁶ B61D *17/00*

U.S. Cl. 105—3 **20 Claims**



1. A deformable gangway interconnecting two carrier platforms of two adjacent chassis with one another, said gangway extending over a connecting articulation between the two adjacent chassis to facilitate carrying a load located between the two interconnected carrier platforms;

wherein said gangway comprises two lateral connecting elements which are each connected with adjacent end portions of said two adjacent chassis, said two lateral connecting elements support a deformable structure therebetween, when an area of said deformable structure supports a load, said load supporting area becomes fixed, relative to said two lateral connecting elements, while a remaining unloaded area of said deformable structure remains movable, relative to said two lateral connecting elements, to compensate for contraction and expansion resulting from relative movement between said two adjacent end portions of said two carrier platforms during travel.

5,690,034
COMPOSITE-MATERIAL PUSH-PULL LINK BAR FOR RAIL VEHICLES

Wolfgang Schähl, Henningsdorf; Peter Weichelt, Schönwalde; Ulrich Rudolph, Berlin; Günter Spur, Berlin, and Hartmut Mohr, Berlin, all of Germany, assignors to ABB Daimler-Benz Transportation (Deutschland) GmbH, Henningsdorf, Germany

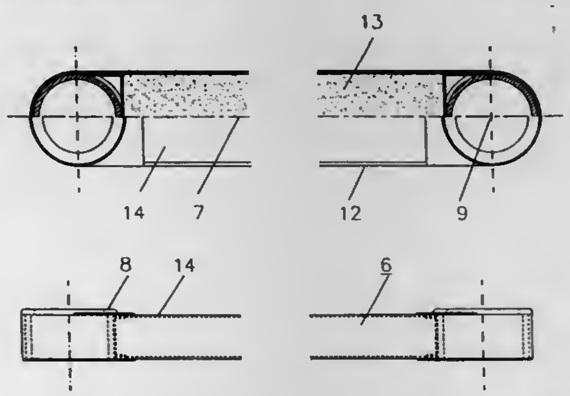
PCT No. PCT/DE94/01069, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO95/09754, PCT Pub. Date Apr. 13, 1995

PCT Filed Sep. 15, 1994, Ser. No. 624,501

Claims priority, application Germany, Oct. 6, 1993, 43 34 629.4; Jun. 28, 1994, 44 22 579.2

Int. Cl.⁶ B61F *5/50*

U.S. Cl. 105—199.1 **10 Claims**



1. A composite push-pull bar for use in a rail vehicle, comprising:

end-side connecting elements for axial introduction of compressive and tractive forces; and

a rod-shaped structural element disposed between the end-side connecting elements for take-up and transmission of the compressive and tractive forces, the rod-shaped element comprising:

a longitudinally extending core;

a prestressed composite winding, including a defined number of wrappings of one or several reinforcing fibers embedded in a cured matrix material, applied in a longitudinal direction of the core so as to leave opposite longitudinal sides of the core not covered by the winding, the winding extending over the connecting elements; and

two skins arranged on the opposite longitudinal sides of the core not covered by the winding to form a sandwich structure with the core and which remain rigid under compression in their longitudinal direction.

5,690,035
VIBRATION-DAMPING MATERIAL, ITS MANUFACTURING METHOD, AND STRUCTURAL SECTION FOR TRANSPORT VEHICLE

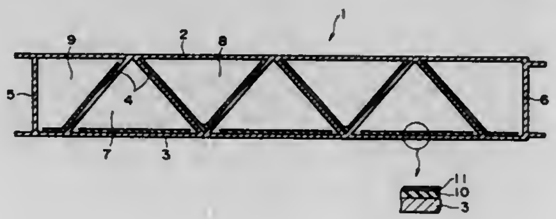
Tadashi Hatayama, Tokyo; Ichiro Yamagiwa, Kobe; Kenshi Maekawa, Shimonoseki; Kenji Iwai, Tokyo; Toshimitsu Tanaka; Mamoru Taniuchi, both of Kobe; Reiji Sanuki, Shimonoseki; Isamu Ueki, Shimonoseki; Toshihiko Sasaki, Shimonoseki; Akio Sugimoto, and Kazuhisa Fujisawa, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 194,321, Feb. 8, 1994, abandoned. This application Nov. 5, 1996, Ser. No. 743,800

Claims priority, application Japan, Feb. 8, 1993, 5-044640; Aug. 6, 1993, 5-215039; Sep. 21, 1993, 5-259027; Sep. 22, 1993, 5-259386; Dec. 29, 1993, 5-352533

Int. Cl.⁶ B61D *17/10*

U.S. Cl. 105—452 **4 Claims**



1. An extruded aluminum vibration damping section comprising:

two planar plates;

supporting means connecting said two planar plates, the two planar plates and the supporting means being integrally formed as an extruded aluminum section and having a truss shape; and

vibration damping resin located between said two planar plates such that the integral formation of said extruded aluminum section is maintained,

wherein said supporting means connecting two said planar plates comprises ribs connecting said planar plates and arranged such that holes are defined by the surfaces of said ribs and the inner surfaces of said planar plates, and wherein said vibration damping resin located between said two planar plates is located on a substantial portion of an inner surface of one of said planar plates and only on surfaces of said ribs opposite said one of said planar plates.

5,690,036
TABLE PROVIDED WITH A CUP-HOLDING THROUGH-HOLE

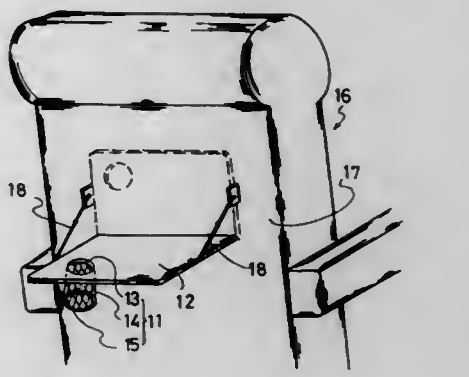
Akira Hasegawa, Ibaragi, Japan, assignor to Eifuku Sangyo Co., LTD, Toyko, Japan

Filed Jul. 2, 1996, Ser. No. 677,328

Claims priority, application Japan, Dec. 25, 1995, HEI7-351011

Int. Cl.⁶ A47B *23/00*

U.S. Cl. 108—25 **5 Claims**



1. A table, which comprises a table plate, a through-hole formed in the table plate for cup holding, said though-hole having a periphery, a bag having an open top fixed along the periphery of the through-hole, and a bottom member attached to the bottom of the bag and adapted to be detachably fitted in the through-hole, said bottom member being formed of a ring-like spring which is diametrically contractile.

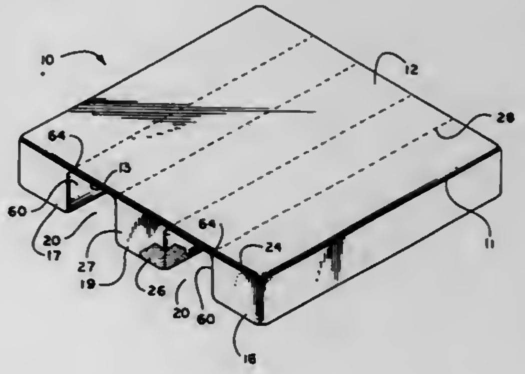
5,690,037
LIGHTWEIGHT FOLDABLE PALLET AND RELATED LIFTING APPARATUS

Melvin B. Hill, 408 Arbor Ridge Rd., Stone Mountain, Ga. 30087

Filed Jun. 22, 1995, Ser. No. 493,673

Int. Cl.⁶ B65D *19/00*

U.S. Cl. 108—51.3 **2 Claims**



1. A foldable and reusable soft pallet intended for supporting a load and moving the load by means of a lifting mechanism having a pair of laterally-separated forks, each fork having a top member and a side member extending downwardly from the top member, and the lateral separation between the forks being selectably variable between a proximal separation and a distal separation, the pallet comprising:

a flexible platform formed of flexible textile material and having an upper surface operative to receive the load;

first and second support blocks affixed in laterally spaced apart relation on a lower surface of the flexible platform to support

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the flexible platform and a load received thereon in elevated relation to a ground surface when the support blocks rest on the ground surface;

at least one other support block affixed on the lower surface of the flexible platform, the other support block extending between and parallel to the first and second support blocks so as to further support the flexible platform and the load in elevated relation to the ground surface, with the other support block laterally spaced apart from the first and second support blocks to define elongated regions for receiving the forks in proximal separation beneath the lower surface of the flexible platform without interference with the support blocks;

the first and second support blocks each having a side face depending from the lower surface of the flexible platform and facing the respective fork-receiving regions so that distal separation of the forks in said regions engages the side faces by the confronting side members of the forks and urges apart the first and second support blocks, thereby applying lateral tension to the flexible platform sufficient to support the load thereon when the forks lift the pallet above the ground surface and applying a force moment to the first and second support blocks sufficient to maintain said support blocks substantially level when the pallet is lifted;

the flexible platform having tensile strength sufficient to withstand the lateral tension applied thereto by the first and second support blocks while supporting a predetermined load;

the flexible platform being sufficiently flexible to permit nondestructive folding intermediate the support blocks without weakening the flexible platform for subsequent unfolding and reuse, so that the support blocks rest approximately one alongside the other, thereby substantially reducing the overall size of the folded pallet for shipping or storing; and

the textile material of the flexible platform having sufficient tensile strength to withstand said lateral tension.

5,690,038

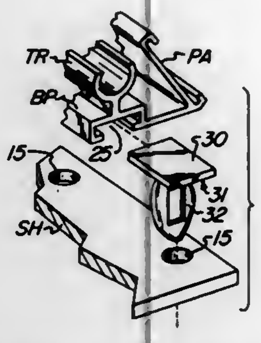
METHOD AND APPARATUS FOR SELECTIVE ENGAGEMENT OF SHELF SEPARATION STRUCTURES

William Merit, and Jo Merit, both of 575 Esplanade, No. 106, Redondo Beach, Calif. 90277

Filed Nov. 13, 1995, Ser. No. 556,519

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 108—60 **3 Claims**



1. In a shelf separating assembly characterised by a shelf, an extrusion including an elongate base plate securable to said shelf, an elongate split tubular mount fixed along one side of said base plate in spaced relationship therewith, and a plurality of separator members each provided with a split end fitting conformed for selective resilient engagement on said tubular mount to align said separator members on said shelf generally orthogonal relative said extrusion, the improvement comprising:

a slotted groove formed longitudinally in said base plate on a side thereof opposite to said one side fixed to said tubular mount;

attachment means conformed for selective engagement between said extrusion and said shelf, including a generally planar base piece defined by an upper and a lower surface and dimensioned in section for sliding receipt in said groove, and a resilient projection extending generally orthogonal from said lower surface to project through the slot of said groove; and

a plurality of openings formed in said shelf each dimensioned in section for selected conforming receipt of said resilient projection.

5,690,039

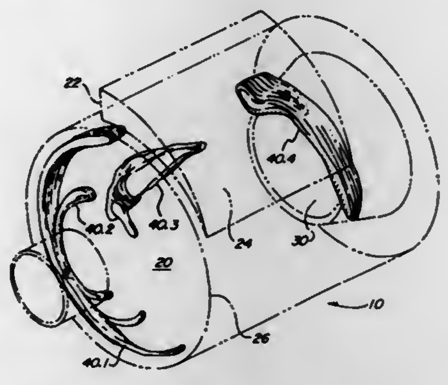
METHOD AND APPARATUS FOR REDUCING NITROGEN OXIDES USING SPATIALLY SELECTIVE COOLING

Richard J. Monro, Ridgefield, and Peter D. Marx, Bethel, both of Conn., assignors to RJM Corporation, Ridgefield, Conn.

Filed Jun. 17, 1996, Ser. No. 664,679

Int. Cl.^{6} F23D *1/02;* F23J *15/02*

U.S. Cl. 110—264 **15 Claims**



1. A method for reducing the production of NO_x from a combustion zone fed with a fuel and combustion air which establishes a flow pattern inside the combustion zone resulting in at least one identifiable zone embedded inside the combustion zone where NO_x tends to be produced, comprising the steps of:

producing a spatially distinct stream of cooling fluid at a predetermined location in a portion of the combustion air flow; with said location selected so that the stream of cooling fluid is entrained by the combustion air flow to intersect the embedded identifiable zone inside the combustion zone; and

applying said cooling fluid to said predetermined location in an amount sufficient to be entrained by the combustion air flow through a part of the combustion zone and reach the embedded identifiable zone so as to reduce its temperature for a reduction of NO_x generated from said identifiable zone without significantly affecting temperatures of gases in the combustion zone outside said identifiable zone.

5,690,040

PRESSER FOOT DEVICE FOR FEEDING ELASTIC MEMBER

Koichi Nakayama, and Shinji Kojima, both of Utsunomiya, Japan, assignors to The Singer Company N.V., Curaco, Netherlands Antilles

Filed Jun. 5, 1996, Ser. No. 659,211

Claims priority, application Japan, Jun. 7, 1995, 7-163118

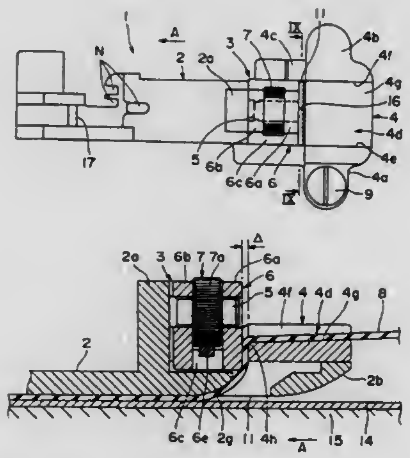
Int. Cl.^{6} D05B *29/08;35/06*

U.S. Cl. 112—235 **5 Claims**

1. A presser foot device of a sewing machine comprising:

a presser foot;

a tension mechanism disposed on the presser foot, the tension mechanism including a threaded screw member projecting from the presser foot toward a feeding end of the presser foot, a rigid presser member having a recess and a bore extending along an axial length of the presser member;



a nut having a threaded bore, the nut positioned within the recess of the presser member such that the bore of the nut axially coincides with and is axially fixed in position with respect to the bore of the presser member, the nut and the presser member being positioned on the screw member such that threads of the screw member and the bore of the nut intermesh, the nut being rotatable along the screw member, whereby the presser member is axially movable with the nut along the screw member; and

a guide member disposed at a feeding end of the presser foot in opposing relationship to the presser member, the guide member and the presser member defining a gap therebetween for receiving an elastic member to extend through the gap in order to supply tension to the elastic member, the gap being adjustable by the movable presser member for varying the tension of the elastic member.

5,690,041

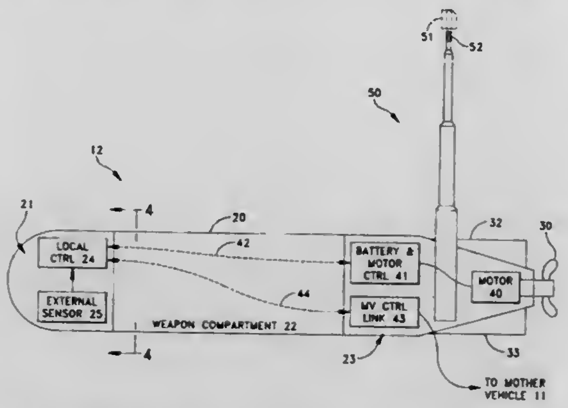
UNMANNED UNDERSEA VEHICLE SYSTEM FOR WEAPON DEPLOYMENT

Christopher F. Hillenbrand, Bristol, and Donald T. Gomez, Little Compton, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1995, Ser. No. 540,611

Int. Cl.^{6} B63G *8/28*

U.S. Cl. 114—21.2 **6 Claims**



1. An unmanned undersea vehicle system comprising:

a remote-controlled, unmanned undersea vehicle having (i) a hull enclosing a weapon compartment including means for receiving a plurality of weapons longitudinally along the length of the vehicle, the hull including doors proximate the weapon receiving means, (ii) an erectable observation mast for obtaining environmental information, (iii) control means for controlling the deployment of the weapon by expelling the weapon from the weapon compartment thence to become fired, and (iv) means operative to provide compensation countervailing a redistribution of the mass of the vehicle which would otherwise occur when the weapon is expelled from the weapon compartment to thereby stabilize the vehicle against effects of expelling the weapon, said countervailing means including a plurality of buoyancy chambers positioned within the hull, each buoyancy chamber located proximate an associated one of the weapon receiving means, each buoyancy chamber being initially empty and having sufficient capacity so that it can be loaded with seawater whose mass approximates mass of one of said weapons, and controllable valve means for controllably enabling seawater surrounding the hull to fill the buoyancy chamber;

a mother vehicle for generating command information for controlling the control means and for receiving unmanned undersea vehicle status information from said unmanned undersea vehicle and processing it for use in generating the command information; and

a communication link for interconnecting said unmanned undersea vehicle and said mother vehicle to facilitate transfer of command information from said mother vehicle to said unmanned undersea vehicle and to further facilitate transfer of unmanned undersea vehicle status information from said unmanned undersea vehicle to said mother vehicle.

5,690,042

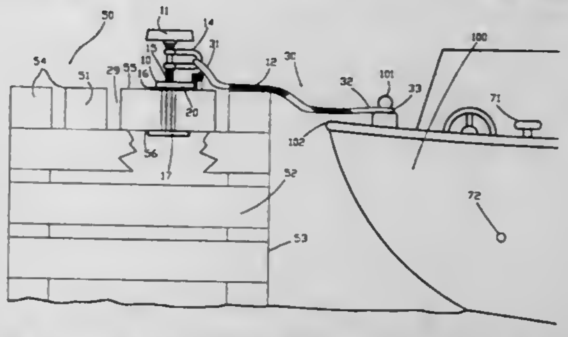
MOORING DEVICE AND SECURING DEVICE FOR WATERCRAFT AND METHODS OF MAKING THE SAME

Darrell G. Bentley, P.O. Box 609, Licking, Mo. 65542

Continuation-in-part of Ser. No. 544,972, Mar. 3, 1996, abandoned. This application Sep. 30, 1996, Ser. No. 723,383

Int. Cl.^{6} B63B *21/00*

U.S. Cl. 114—230 **20 Claims**



1. In a mooring device adapted for mooring a craft to a docking platform having spaced decking elements of uniform thickness, the mooring device having a means for securing a line thereto and comprising a body in rigid T-bar form having a shaft and an elongated head secured transversely to one end thereof wherein the head is sufficiently narrow to fit between the decking elements, the shaft further having a flat plate mounted thereon for slideable movement toward and away from the head with a biasing means associated with the plate to urge the head toward the plate, the improvement wherein said mooring device has locking means associated therewith for lockably securing said mooring device to said docking platform.

5,690,043

AUTOMATIC ROBE BUNDLING DEVICE

Gerald J. Muscara, 336 Golf View Rd., North Palm Beach, Fla. 33408

Filed Oct. 18, 1996, Ser. No. 733,593

Int. Cl.^{6} B63B *21/00*

U.S. Cl. 114—230 **10 Claims**

1. An automatic bundling device for a mooring line comprising a rewinding pulley having a rewinding cord, a plurality of clamp-

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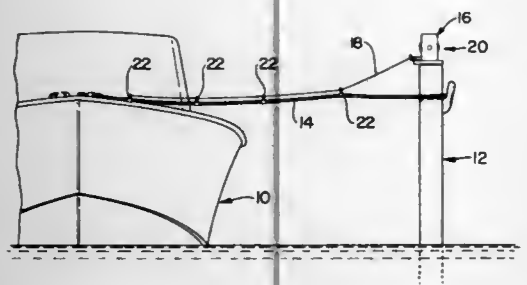


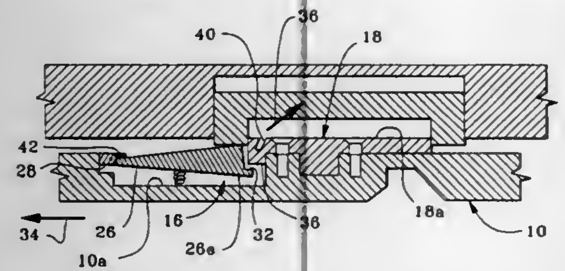
ing means affixed to said mooring line at spaced intervals, one end of said cord being tied to the last spaced clamping means and eyelets attached to each of said other of said plurality of clamping means for being disposed in sliding relationship with said cord passing through each of said other of said plurality of clamping means.

5,690,044

SYSTEM FOR SHOCK HARDENING A TORPEDO NOSE FAIRING BEARING PLATE ASSEMBLY

Christa M. Reise, Portsmouth, and James C. Butts, Charlestown, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 16, 1997, Ser. No. 778,069
Int. Cl.^{6} B63B *8/32*
U.S. Cl. 114—238 **6 Claims**



1. A system for shock hardening and controlling deformation of a bearing plate, the plate transferring loads from a first member bearing against the plate to a second member bearing against the plate, the system comprising:
- a tang affixed to one end of the bearing plate and adjacent the first member, the tang providing an increased bearing surface between the first member and the plate, the tang further providing an increased bending resistance in the plate in a direction toward the second member; and
- a slot cut into a surface of the bearing plate remote from the first member, the slot encouraging the deformation of the plate in a direction away from the second member.

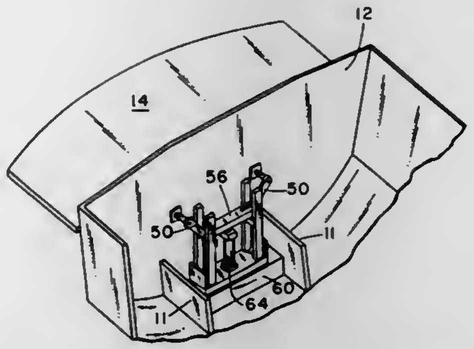
5,690,045

PERSONAL WATERCRAFT LIFT AT TRANSOM

Mark W. Gauthier, Grand Haven, Mich., assignor to Marine Automation, Inc., Grand Haven, Mich.

Filed Oct. 10, 1996, Ser. No. 728,826
Int. Cl.^{6} B63B *35/40*
U.S. Cl. 114—259 **17 Claims**

1. A transom mountable lifting device for a boat which includes a transom having an interior and an exterior;
said lifting device comprising:
- a platform for location at said transom exterior;
- a pair of external pivot arms for location at said transom exterior, operably associated with said platform to move up or down therewith;



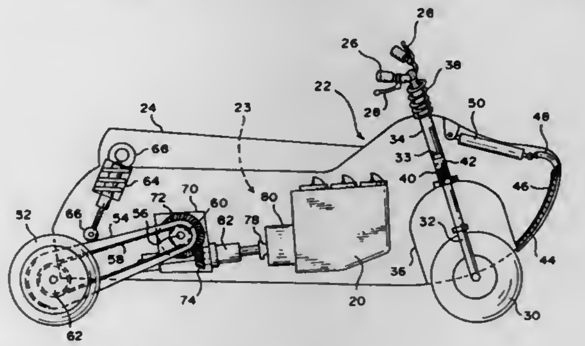
- said pair of external pivot arms being arranged in mirror image to each other and movable up or down simultaneously to lift or lower said platform;
- a pair of pivot shafts extendable through said transom between its interior and exterior;
- said pair of external pivot arms being connected to said pivot shafts to pivot therewith;
- a pair of internal pivot arms for location at said interior of said transom, in mirror image to each other, and operably connected to said pivot shafts to pivot therewith; and
- a power actuator for location at said transom interior, operably associated with said pair of internal pivot arms, and movable to shift said pair of internal pivot arms, said pair of pivot shafts, and said pair of external pivot arms to lift or lower said platform.

5,690,046

AMPHIBIOUS VEHICLES

Albert S. Grzech, Jr., 383 Argyle Ave., Pasadena, Md. 21122

Filed Sep. 23, 1996, Ser. No. 717,720
Int. Cl.^{6} B63B *35/00*
U.S. Cl. 114—270 **24 Claims**



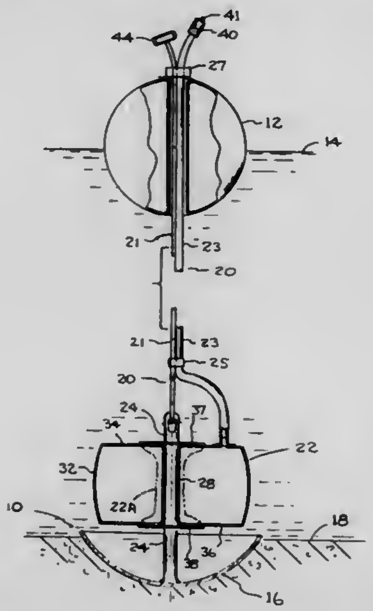
1. An amphibious vehicle, comprising:
- a body having a front and a rear;
- a heat engine having an ambient air cooling system primarily employed for cooling the engine during travel on land, and an external water cooling system primarily for cooling the engine during travel in water;
- said body having a sealed interior with said engine housed in said sealed interior;
- a retractable and steerable front wheel located at the front of said body;
- at least one retractable rear wheel located at the rear of said body;
- at least one of said wheels being rotatably drivable by said engine;
- a propulsion unit for propelling said vehicle in water;
- said propulsion unit being drivable by said engine;
- said engine being directly cooled by a re-circulating liquid coolant; and
- said cooling systems including a heat exchanger having an air chamber through which ambient air flows, a liquid coolant chamber through which said liquid coolant of said engine flows, and a surface exposed outside said body in contact with external water during water travel.

5,690,047

BUOYANT ANCHORAGE MECHANISM

William C. Holmes, Rte. 123, South Harpswell, Me. 04079

Filed Sep. 23, 1996, Ser. No. 710,875
Int. Cl.^{6} B63B *21/24*
U.S. Cl. 114—294 **6 Claims**



1. A raisable-lowerable anchorage mechanism comprising:
- an anchor adapted to assume an operating position on the sea bottom or an inactive raised position at the sea surface;
- an inflatable-deflatable float means carried by said anchor;
- a surface vessel operable to support the anchor in its raised position;
- air pressure-generating means on said vessel;
- air conduit means connecting said air pressure-generating means to said float means, whereby said float means can be inflated or deflated from the sea surface; and
- said anchor comprising an elongated rod, and said float means comprising an annular float encircling said rod.

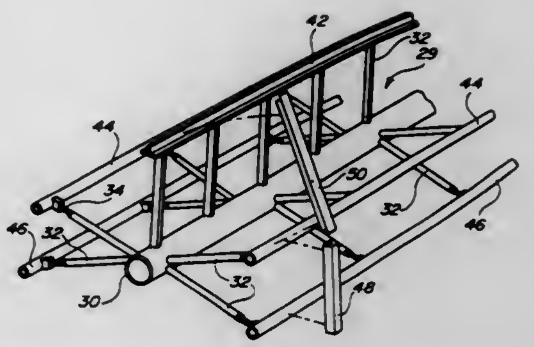
5,690,048

BOAT HULL CONSTRUCTION

John Friesen, 827 Pt. Pelee Drive; Jake Friesen, 789 Pt. Pelle Drive, both of Leamington, Ontario, Canada, N8H 3V4, and Henry Friesen, 43 Bruce Avenue, Leamington, Ontario, Canada, N8H 4C4

Filed Apr. 23, 1996, Ser. No. 636,581
Int. Cl.^{6} B63B *3/16;3/26*
U.S. Cl. 114—356 **15 Claims**

1. A shell for forming portions of a boat hull, comprising:
- a plurality of laterally spaced frame members;
- a plurality of longitudinal frame pieces connected to said plurality of frame members, said frame members extending between said longitudinal frame pieces in a direction that is generally perpendicular to said longitudinal frame pieces;
- an outer skin layer permanently fixed to one side of said frame members;
- an inner skin layer permanently fixed to another side of said frame members such that a cavity exists between said inner and said outer skin layers, said frame members being inside said cavity; and



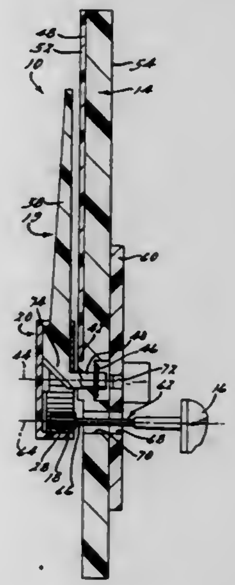
- a foam material within said cavity, said foam being injected into said cavity as a liquid, each of said frame members having a web portion extending between opposed side walls, said web portion and said side walls extending along a longitudinal length of said frame members, said web portion including a plurality of openings spaced along the longitudinal length of said web portions, said openings in said web portions allowing said liquid foam to pass through said openings such that said foam may fill said cavity.

5,690,049

COMPACT GAUGE ASSEMBLY

James E. Marshall, Southfield, and Chandresekar R. Karur, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 5, 1996, Ser. No. 596,810
Int. Cl.^{6} G01D *13/00*
U.S. Cl. 116—284 **20 Claims**



1. An instrument cluster gauge assembly, comprising:
- a plate member;
- a pointer assembly rotatable relative to said plate member about a first axis;
- said pointer assembly including:
  - a pointer cap having an internal surface,
  - a driven surface on at least a portion of said internal surface, and
  - a pointer fixed relative to said pointer cap;
- a motor having a drive shaft; and
- a driver coupled to said drive shaft for drivingly engaging said driven surface and rotating said pointer assembly.

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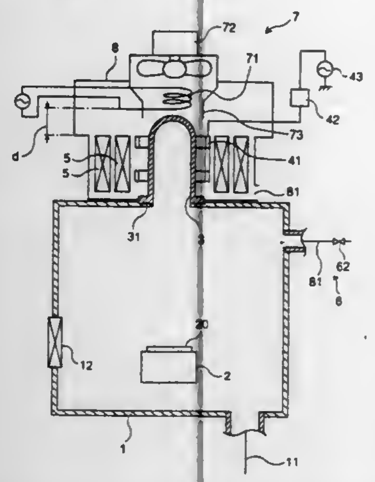
5,690,050
PLASMA TREATING APPARATUS AND PLASMA TREATING METHOD

Hiroshi Doi, Tokyo, Japan, assignor to Anelva Corporation, Fuchi, Japan
Filed May 7, 1996, Ser. No. 643,945
Claims priority, application Japan, May 10, 1995, 7-136001
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 118—723 MP **13 Claims**



1. A plasma treating apparatus for treating a surface of a substrate with plasma, comprising:

means for generating plasma in a dielectric container having an outside surface using high frequency power; and

a hot air heating system for heating the dielectric container by blowing hot air to the outside surface of the dielectric container;

the hot air heating system includes means for directing the hot air to a central location of and substantially uniformly around the dielectric container so that the dielectric container is uniformly heated.

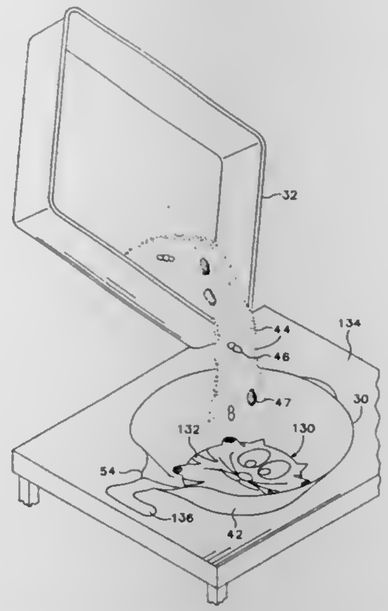
5,690,051
PET LITTER SEPARATION SYSTEM INCLUDING PULL-OUT COVER

Greg L. Fisher, P.O Box 434, West Linn, Oreg. 97068, and Robert D. MacDonald, 147 5th St., Lake Oswego, Oreg. 97034
Continuation-in-part of Ser. No. 525,971, Sep. 7, 1995. This application Jun. 27, 1996, Ser. No. 673,772
Int. Cl.^{6} A01K *1/035*
U.S. Cl. 119—166 **15 Claims**

1. A pet litter separation system comprising:

(a) a separation device of open-centered construction having an upper end, a lower end and a sidewall interconnecting said ends, said upper end forming an open mouth for receiving filterable material from a litter tray including reusable pet litter granules and clumped waste products, said lower end defining a separation member forming openings of suitable size for permitting passage of said reusable pet litter granules while blocking passage of said clumped waste products; and

(b) an independently movable cover, unattached to said separation device, said cover having a first flexible portion positionable inside said device in overlying relationship to said separation member so that when said filterable material is deposited into said device from said tray, said reusable pet litter granules are prevented by said first flexible portion from exiting through said separation member, said cover including means for facilitating removal of said first flexible portion out from beneath said filterable material in such a manner that said first flexible portion substantially conforms to the contour of said separation member and a portion of said sidewall adjacent said separation member as said first flexible portion is removed from beneath said filterable material, so that said reusable pet litter granules are free to pass though said separation member.



5,690,052
METHOD FOR SORBING LIQUID USING GROUND WHEAT GRAIN LITTER

James H. Sladek, Battle Lake, Minn., assignor to Pet Care Systems, Inc., Detroit Lakes, Minn.
Continuation of Ser. No. 437,146, May 5, 1995, abandoned. This application Sep. 16, 1996, Ser. No. 713,097
Int. Cl.^{6} A01K *1/01*
U.S. Cl. 119—171 **9 Claims**

1. A method for sorbing an aqueous liquid utilizing a ground wheat grain litter, said method comprising the step of:

(a) situating a ground wheat grain litter to be contacted by an aqueous liquid to be sorbed,

wherein said ground wheat grain litter consists essentially of a ground whole wheat grain.

5,690,053
APPARATUS FOR SUSPENDING A REEF, REEF-BED, OR LIVE SAND FILTER, SINGULARLY OR IN COMBINATION, IN AN AQUARIUM

Frank A. Strange, Jr., 6871 Temperance Pt. St., Westerville, Ohio 43802
Filed Dec. 9, 1996, Ser. No. 761,944
Int. Cl.^{6} A01K *63/00*
U.S. Cl. 119—248 **20 Claims**

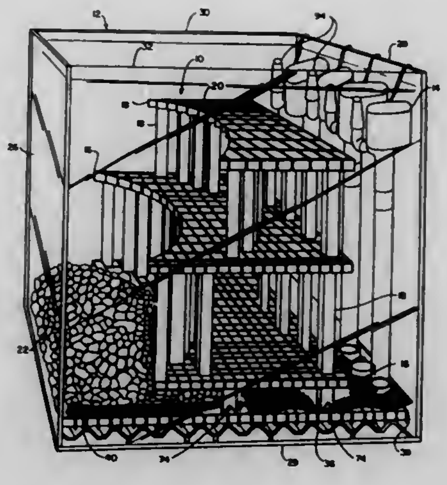
1. An aquarium, comprising:

a front, a back, sides and a bottom joined together to form an enclosure to hold water;

a first shelf in said enclosure;

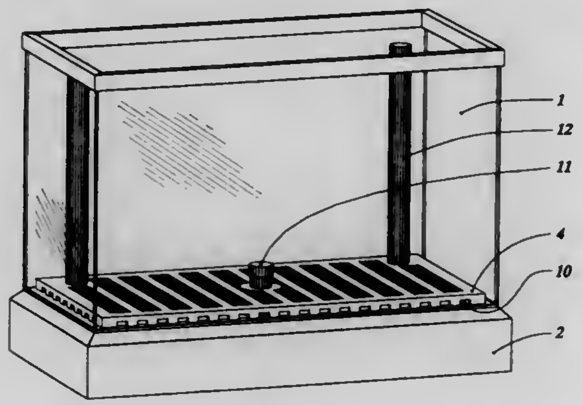
at least one post supporting said first shelf above said bottom and holding said shelf horizontal, said post having a first end supported by said bottom and a second end extending to near said shelf, said shelf being of louvered eggcrate to allow free circulation of water through the shelf, said eggcrate having a plurality of vertically extending square apertures,

said first shelf being joined to said at least one post by a first fitting having two tapered ends, one of said tapered ends extending into one of said square apertures, the other of said tapered ends projecting into a recess in said at least one post, said recess in said at least one post being at said second post end, said first fitting being bonded to both said first shelf and said post to form a rigid joint.



5,690,054
AQUARIUM SYSTEM

Steven D. Allen, 94 Sunrise Ct., Fletcher, N.C. 28732
Filed Apr. 1, 1996, Ser. No. 626,727
Int. Cl.^{6} A01K *63/04*
U.S. Cl. 119—259 **4 Claims**

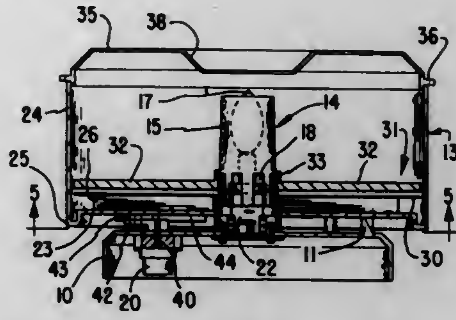


1. An aquarium system wherein water is filtered by drawing aquarium water through a filter system below which wastes concentrate in an accumulation area from which the wastes are drawn off, said system comprising:

a watertight fish tank of transparent material having sides extending vertically from a bottom, lower support flanges, an undergravel filter, composed of a rigid support grating with outflow towers and side inlet holes allowing passage of water from said tank into and through said undergravel filter, supported on said lower support flanges, said bottom being made of transparent or translucent material, having segments sloping toward a drain opening, said segments forming an accumulation area extending from the lower support flanges to a lowest point, said drain opening located at said lowest point, a drain hose connected to said drain opening, a valve located within said drain hose, and an extension of said drain hose, all supported by an exterior base with support legs at each corner of said watertight fish tank, said support legs of a height at least sufficient to support said drain hose and valve above any support surface, said base comprising said support legs, removable base side sections on each side of said base, and removable fastening means for each base side section.

5,690,055
TABLE-TOP INCUBATOR

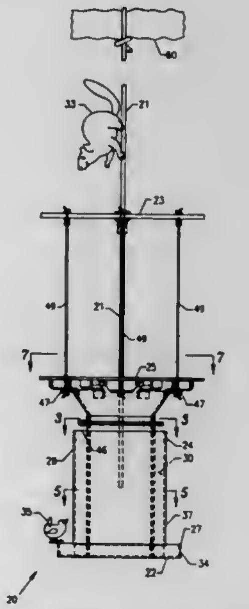
Thomas W. Wenstrand, 1702 Oakland Mills Rd., Mt. Pleasant, Iowa 52641, and Allen Watson, 300 West Jackson St., Salem, Iowa 52649
Filed Aug. 26, 1996, Ser. No. 701,998
Int. Cl.^{6} A01K *41/00;41/06*
U.S. Cl. 119—309 **13 Claims**



1. A table-top incubator for hatching eggs comprising a base, central member on said base, said central member including means to provide heat for air, and means to provide circulation of air, container means surrounding said central member and rotatable about said central member and slidable relative to said base, said container means providing a support for said eggs, and turning means held stationary by said central member adapted to roll said eggs as said support is moved relative to said central member.

5,690,056
SQUIRREL PROOF BIRD FEEDER

Thomas K.E. Korb, 3935 Donley, Rochester Hills, Mich. 48309
Filed Aug. 8, 1996, Ser. No. 693,993
Int. Cl.^{6} A01K *39/01*
U.S. Cl. 119—52.3 **15 Claims**



1. A bird feeder comprising: a cable for suspending said bird feeder from an object such as a tree, said cable defining a vertical axis; a platform attached at a center portion thereof to said cable; an annular feeder suspended from a peripheral portion of said platform; a plurality of cables for suspending said feeder from said platform, each of said cables spaced an equal distance from said axis and having an upper portion attached to said peripheral portion and a lower portion attached to a peripheral portion of said feeder; and a trap located below said platform, said trap having a

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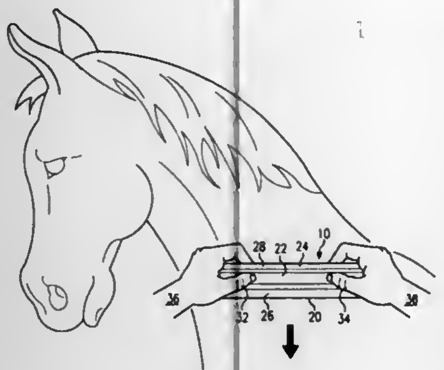
plurality of radial segments mounted thereon, and adapted to tilt, and a means for resiliently mounting each of said segments to said feeder.

5,690,057
TOOTHLESS ELASTOMERIC SHEDDING BLADE

Jack B. Curry, Springtown, Tex., assignor to JMK International, Inc., Weatherford, Tex.
Filed Sep. 18, 1996, Ser. No. 716,518
Int. Cl.^{6} A01K *13/00*
U.S. Cl. 119—623 **21 Claims**



1. An elastomeric shedding blade, comprising:

a body consisting of a cured resilient elastomeric compound, said body exhibiting a modulus of elasticity of 200 to 900 and a durometer reading of 40 to 90 points on a Shore A Scale;

a maximum thickness of said body defined in a first direction, a width of said body in a second direction normal to said first direction and being a multiple of said depth, a length of said body in a third direction normal to said first and second directions and being a multiple of said width, said length taken between two opposed ends; and

at least one blade portion extending substantially between said ends forming an acute angle, said body being sufficiently resiliently elastic in said first direction so that said blade portion can be manually conformed to an arcuate surface of an animal body part having a diameter much less than said length.

5,690,058

Patent Not Issued For This Number

5,690,059
TRAINING COLLAR

Jeff Woods, 2523 Wexford Bayne Rd., Franklin Park, Sewickley, Pa. 15143
Filed Apr. 16, 1996, Ser. No. 632,844
Int. Cl.^{6} A01K *1/06*
U.S. Cl. 119—856 **17 Claims**

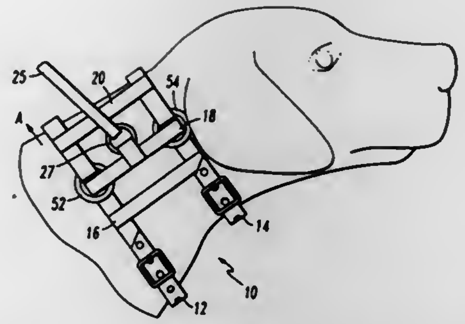
1. An apparatus for training animals comprising:

(a) a first collar defining a perimeter;

(b) a second collar defining a perimeter;

(c) means for spacing the first collar from the second collar at a distance;

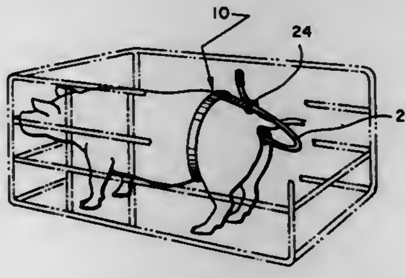
(d) means for simultaneously changing the lengths of the perimeters of the first and second collars such that when the perimeters of the first and second collars are reduced a constant pressure is applied to the neck of an animal; and



(e) means for limiting the changing of the first and second perimeters such that each has a maximum perimeter and a minimum perimeter, wherein when the collars are reduced to their respective minimum perimeters, the animal is prevented from being harmed and when the collars are increased to their respective maximum perimeters, the animal is prevented from escaping from the first and second collars.

5,690,060
BELT FOR SELF-INSEMINATION OF SOWS

Patrick E. Dumoulin, and Michael W. Dumoulin, both of 16N393 Walker Rd., Hampshire, Ill. 60140
Filed Oct. 23, 1995, Ser. No. 546,667
Int. Cl.^{6} A01K *21/00*
U.S. Cl. 119—858 **5 Claims**

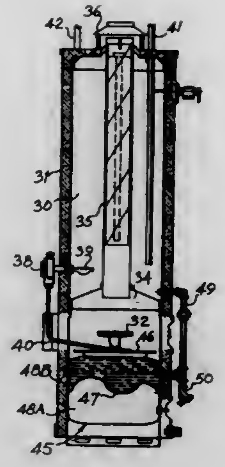


1. A self-insemination belt for use in the artificial insemination of sows using a catheter or the like, said belt comprising a body strap of sufficient length to be wrapped around and secured to the sow at the sow's stomach just ahead of the hind legs of the sow, the body strap having two free ends, fastening means at the free ends of the body strap to provide for adjustable and detachable connection of the free ends so that the body strap will fit sows of varying size, a single back strap fixedly attached to the body strap between said free ends and extending transversely to the body strap so as to lay on the sow's back, the back strap terminating in a free end, fastening means combined with the free end of the back strap, and a flexible catheter holding strap releasably secured to the fastening means of the back strap and having free ends connectable to each other to grip and hold the catheter used in the insemination.

5,690,061
WATER HEATER WITH EXPANSION TANK

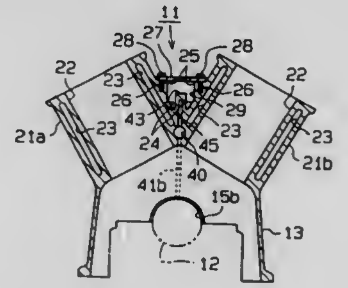
Juan A. Lopez, 120 King Arthur Ct., Fayetteville, Ga. 30214
Filed Feb. 26, 1996, Ser. No. 613,760
Int. Cl.^{6} F22B *5/00*
U.S. Cl. 122—17 **6 Claims**

1. A hot water heater comprising a water tank for receiving a quantity of water, heating means for heating said water tank and said quantity of water therein, an inlet pipe for supplying water to said water tank and an outlet pipe for discharging water from said water tank, an expansion tank disposed beneath said water tank, movable means in said expansion tank separating said tank into an air compartment and a water compartment, and pipe means for connecting the interior of said water tank with the water compartment of said expansion tank so that, when said quantity of water in said water tank is heated by said heating means, the expanded volume can flow through said pipe means into said expansion tank.



5,690,062
CYLINDER BLOCK STRUCTURE FOR V-TYPE ENGINE

Satoshi Yamada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan
Filed Sep. 30, 1996, Ser. No. 723,249
Claims priority, application Japan, Oct. 6, 1995, 7-260394
Int. Cl.^{6} F01P *11/08*
U.S. Cl. 123—41.33 **21 Claims**



1. A cylinder block structure for a V-type engine that supports a crankshaft, wherein said crankshaft has a plurality of journals, said structure comprising:

a plurality of bearings for supporting said journals;

a pair of cylinder banks arranged in a V-shape;

a valley defined between the banks, wherein the valley extends in the direction of the crankshaft;

a coolant passage through which coolant flows to cool the cylinder block and which includes said valley;

first oil passage through which lubricating oil for the engine flows, said first oil passage being arranged to extend along the coolant passage in the longitudinal direction thereof;

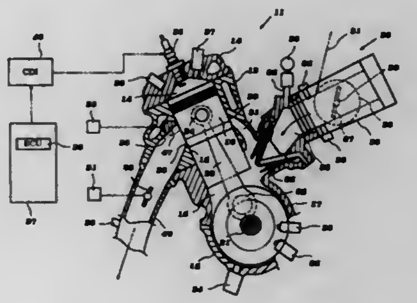
a bearing oil passage for supplying the lubricating oil to one of the journals, wherein said bearing oil passage is formed in one of the bearings, and wherein the bearing oil passage has an exit communicating with an associated one of the journals and an entrance communicating with the first oil passage, and wherein the lubricating oil is introduced to the bearing oil passage via its entrance and is supplied to the journal via its exit;

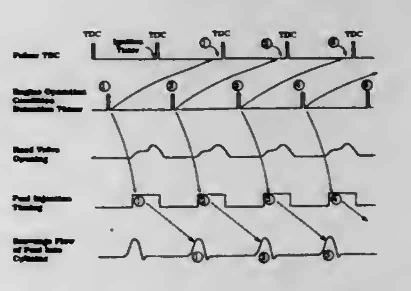
a projection provided in the valley, wherein said projection includes an oil cooling passage, such that oil flows from the first oil passage to the oil cooling passage; and wherein said oil cooling passage has an opening communicating with the first oil passage; and

wherein said opening is located at a position opposed to the entrance of the bearing oil passage with respect to the first oil passage, and wherein lubricating oil from the first oil passage is supplied to the oil cooling passage when lubricating oil enters the bearing oil passage from the first oil passage.

5,690,063
ENGINE CONTROL SYSTEM

Yu Motoyama, and Takeru Ibara, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Jul. 12, 1996, Ser. No. 679,292
Claims priority, application Japan, Jul. 18, 1995, 7-203910
Int. Cl.^{6} F02D *17/00;41/26*
U.S. Cl. 123—73 A **20 Claims**





1. A two-cycle, crankcase compression, internal combustion engine comprised of a cylinder block having a cylinder bore closed at one end to form a combustion chamber and closed at the other end to form a crankcase chamber, a piston reciprocating in said cylinder bore, a crankshaft rotatably journaled within said crankcase chamber and driven by said piston, an induction system for admitting an air charge into said crankcase chamber, scavenge passage means for communicating said crankcase chamber with said combustion chamber for transmitting a charge thereto, a spark plug for firing a charge in said combustion chamber, an exhaust system for discharging a burnt charge from said combustion chamber, a fuel injector for injecting fuel into the air charge that is transferred into said combustion chamber through said scavenge passage, means for sensing at least one engine running condition, and control means for controlling the timing and duration of the injection of fuel from said fuel injector from said sensed engine running condition and for controlling the initiation of firing of said spark plug during the succeeding cycle of engine operation when the controlled charge enters the combustion chamber through the scavenge passage means from said sensed engine running condition.

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5,690,064
ELECTROMAGNETIC VALVE DRIVING APPARATUS FOR DRIVING A VALVE OF AN INTERNAL COMBUSTION ENGINE

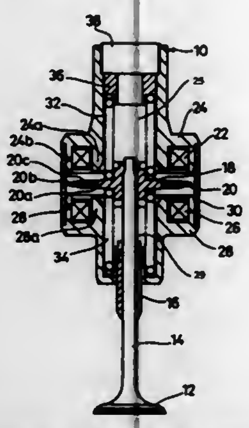
Takashi Izuo, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 14, 1995, Ser. No. 528,450

Claims priority, application Japan, Sep. 22, 1994, 6-228164

Int. Cl.^{6} F01L *9/04*

U.S. Cl. 123—90.11 **21 Claims**



1. An electromagnetic valve driving apparatus for driving a valve of an internal combustion engine by an electromagnetic attractive force, said valve driving apparatus comprising:

a plunger holder formed of a first material fixedly secured to said valve; and

a plunger having a through hole which has a diameter substantially the same as an outer diameter of an outermost circumferential portion of said plunger holder, wherein an inner circumference of said plunger is fixedly secured to the outermost circumferential portion of said plunger holder and wherein the plunger is formed of a second material having a higher magnetic property than said first material.

5,690,065
METHOD AND DEVICE FOR OPTIMIZING AIR FILLING IN AN INTERNAL COMBUSTION ENGINE CYLINDER

Willem Nicolaas Janse van Vuuren, Tabb, Va., assignor to Siemens Automotive S.A., Toulouse, France

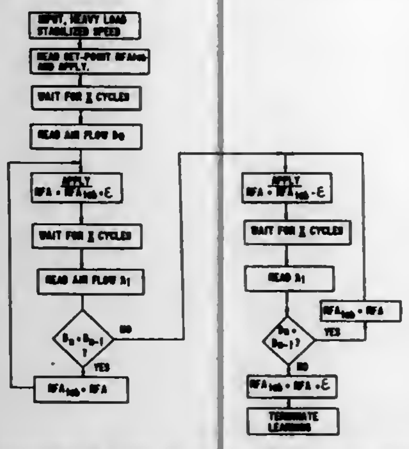
PCT No. PCT/EP94/03617, § 371 Date May 10, 1996, § 102(e) Date May 10, 1996, PCT Pub. No. WO95/13458, PCT Pub. Date May 18, 1995

PCT Filed Nov. 3, 1994, Ser. No. 646,284

Claims priority, application France, Nov. 10, 1993, 93 13436

Int. Cl.^{6} F01L *9/02;* **F02D** *13/02;41/14;41/24*

U.S. Cl. 123—90.16 **7 Claims**



2. In combination with an internal combustion engine having a cylinder, an intake valve associated therewith, and a lifter for lifting the intake valve in a controlled fashion, a device for optimizing an air supply into the cylinder of the internal combustion engine, the device comprising:

a lifter control for variably controlling the lifter; a memory in which values of a closure lag for closing the intake valve under a heavy load are stored as a function of the engine speed; a load sensor sensing a load on the engine and issuing a load signal representing the load on the engine; means for issuing an opening signal representing a full opening of a throttle valve of the engine; and a control apparatus for controlling said lifter control, said control apparatus receiving the load signal from said load sensor and receiving the opening signal, said control apparatus including:

means for gradually varying, at a stabilized engine speed under a heavy load, a closure lag applied to the intake valve in steps;

comparison means for comparing the respective loads measured by said load sensor before and after each successive step in the variation; and

means for updating the stored value of the lag to the current stabilized speed, when the comparison means indicate an increase in the measured load.

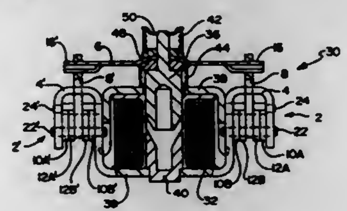
5,690,066
ENGINE VALVE CONTROL ACTUATOR WITH KNEE ACTION LINKAGE

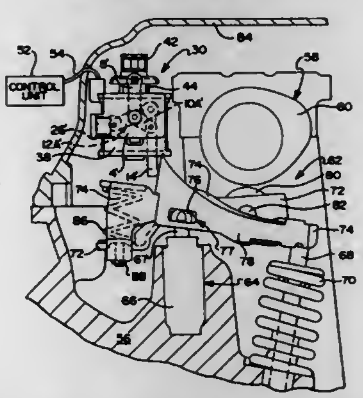
Keith Hampton, Ann Arbor, and David M. Preston, Clarkston, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1996, Ser. No. 723,078

Int. Cl.^{6} F01L *1/18;13/00;* **F02D** *13/06*

U.S. Cl. 123—90.16 **15 Claims**





15. A valve control system for an internal combustion engine including a cylinder head, an engine poppet valve and a camshaft having a cam lobe formed thereon, said control system comprising:

a lash adjuster mounted on said cylinder head having a plunger;

a link pin adapted to pivot on said plunger;

an outer rocker arm nonrotatably supported on said link pin and engageable with said engine poppet valve;

an inner rocker arm having a saddle portion for rotatably contacting said link pin and adapted for rotation relative to said outer rocker arm, said inner rocker arm engaging said cam lobe;

a biasing spring contacting said inner rocker arm and said outer rocker arm for forcing said outer rocker arm into engagement with said poppet valve and said inner rocker arm into contact with said cam lobe;

a slidable latch member for selectively linking said inner rocker arm and said outer rocker arm for rotation in unison with said link pin about said pivot point in response to a force applied by said cam lobe to said inner rocker arm, and for selectively unlinking said inner and said outer rocker arms for independent rotation, said latch member extending from approximately one end of said outer rocker arm at said poppet valve along said outer rocker arm toward said link pin;

a linkage housing;

a solenoid housing attached to said linkage housing;

a coil for creating an electromagnetic field upon introduction of an electrical current disposed within said solenoid housing;

a stator disposed within said coil;

an armature extending into said coil within relatively close proximity to said stator where said armature contacts said stator when said coil is energized;

a return spring for applying a separation force between said armature and said stator;

an actuator plate slidingly connected to said armature and adapted to be forced toward said coil by said armature upon introduction of an electrical current into said coil by said armature;

a primary link having a first end connected to said actuator plate and a second end disposed within a cavity in said linkage housing;

an output link rotatably connected to said linkage housing and extending to contact said engine latchable rocker arm;

a first connecting link having a first end rotatably connected to said second end of said primary link and having a second end rotatably connected to said linkage housing;

a second connecting link having a first end rotatably connected to said second end of said primary link and having a second end rotatably connected to said output link; and

wherein when said electromagnetic actuator is energized, said first connecting link is in substantial axial alignment with said second connecting link.

5,690,067
ARRANGEMENT FOR THE OPERATION OF VALVES OF INTERNAL COMBUSTION ENGINE

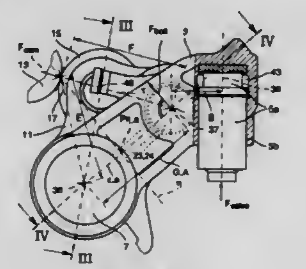
Christoph Reckzügel, Hohenstadt, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

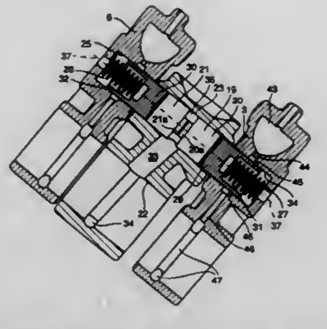
Filed Feb. 5, 1997, Ser. No. 795,517

Claims priority, application Germany, Feb. 10, 1996, 196 04 943.1

Int. Cl.^{6} F01L *1/26;13/00;* **F02D** *13/06*

U.S. Cl. 123—90.16 **5 Claims**





1. An arrangement for operating intake and exhaust valves of an internal combustion engine having a cylinderhead with overhead valves and an overhead camshaft rotatably supported so as to extend longitudinally on said cylinderhead, said arrangement comprising at least one valve actuating lever and one coupling lever pivotally supported in side by side relationship on a lever support shaft extending parallel to said cam shaft, said coupling lever being in engagement with said camshaft along an engagement line for actuation of said coupling lever by a cam of said camshaft, said coupling lever and said valve actuating lever having guide bores with axes disposed at the same distance from the axis of said lever support shaft so that they can be brought into axial alignment, a coupling bolt disposed in said guide bores, actuating means for selectively moving said coupling bolt into and out of a coupling lever and valve actuating lever coupling position, a hydraulic valve clearance compensating element disposed in a bore formed at the end of said valve actuating lever, said lever support shaft having an axis of rotation and said guide bores having a center axis spaced from said axis of rotation of said lever support shaft by a distance which is greater than the distance between said guide bore center axis and the center axis of said valve clearance compensating element, wherein, in a coupled state of said coupling and valve actuating levers, the axis of rotation of said support lever shaft, the center axis of said guide bores, and the engagement line of said cam define in a plane transverse to the longitudinal axis of said cylinderhead approximately an isosceles triangle whose sides of equal length are formed by the distance between said engagement line and said axis of rotation of said lever support shaft and by the distance between the engagement line of said cam and said center axis, said camshaft being disposed between said intake and exhaust valves and at least partially above said valve actuating and coupling levers.

5,690,068
ARRANGEMENT FOR MOUNTING AN AIR INTAKE MODULE ON AN INTERNAL COMBUSTION ENGINE

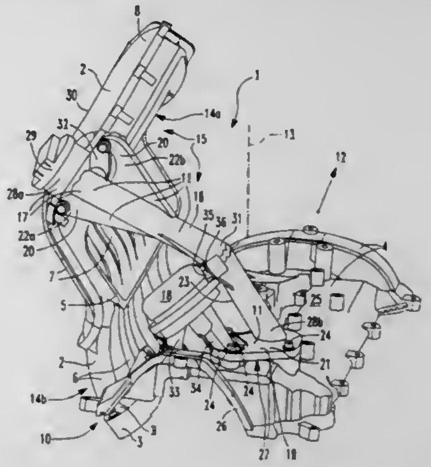
Josef Astner; Lucian Betke, both of Stuttgart; Angela Breymayer, Altbach, and Manfred Wamser, Markgröningen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Dec. 4, 1996, Ser. No. 760,069

Claims priority, application Germany, Dec. 21, 1995, 195 48 024.4

Int. Cl.^{6} F02M *25/10;* **F01M** *11/04*

U.S. Cl. 123—184.21 **5 Claims**



1. An arrangement for mounting an air intake module on an internal combustion engine including a cylinder head and a cylinder head cover, said air intake module comprising an air collector and air induction pipes mounted on said cylinder head and extending therefrom upwardly to said air collector, said arrangement including an oil filler pipe extending between said air intake module and said cylinder head cover and being mounted thereon at a location spaced from the location where said air induction pipes are mounted to said cylinder head so as to form a bracing structure for said air intake module.

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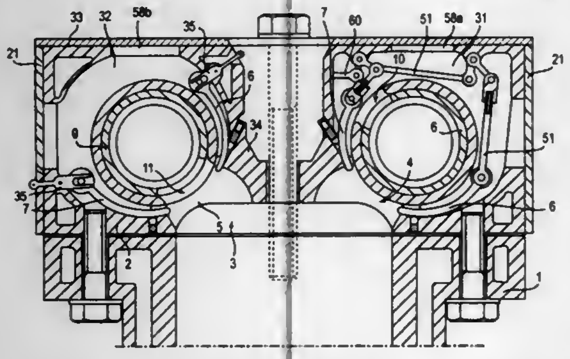
5,690,069
INTERNAL COMBUSTION ENGINE HAVING ROTARY DISTRIBUTION VALVES

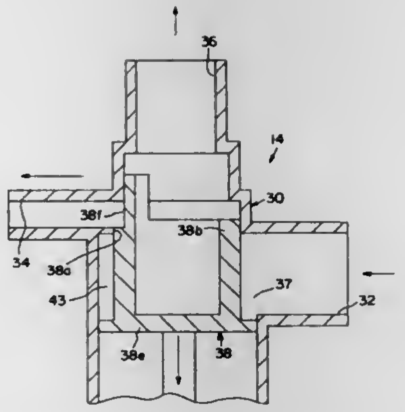
Maurice Huwarts, 19, rue Jean Crespon, Nimes 30900, France
PCT No. PCT/FR95/00362, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO95/26460, PCT Pub. Date Oct. 5, 1995
PCT Filed Mar. 23, 1995, Ser. No. 704,674
Claims priority, application France, Mar. 25, 1994, 94 03932
Int. Cl.^{6} F01L *7/02;7/16;7/18*
U.S. Cl. 123—490.2 **12 Claims**



1. A multi-cylinder internal combustion engine comprising at least one set of cylinders (**1**) whose combustion chambers (**3**) are eacb provided with an intake port (**4**) and an exhaust port (**5**), which intake ports (**4**) and exhaust ports (**5**) of said set of cylinders (**1**) are disposed in alignment, the distribution means which allow for the opening and closure of said intake ports (**4**) and exhaust ports (**5**) comprising two rotary pipes (**T-8**, **T-9**) of circular cross-section, each of which is formed by a plurality of hollow valves (**S***a*, **8***b*) aligned end to end and in communication with one another, so as to allow the free circulation of the gaseous fluids inside and from one end to the other of the rotary pipes (**T-8**, **T-9**) whose lateral wall is provided with a plurality of apertures (**10***a*, **10***b*, **10***c*, **10***d*; **11***a*, **11***b*, **11***c*, **11***d*), the number of which corresponds to the number of cylinders to be served or supplied, one (**T-8**) of which rotary pipes allows the opening and closure of the aligned intake ports (**4**) of the set of cylinders (**1**), while the second (**T-9**) allows the opening and closure of the aligned exhaust ports (**5**) of said set of cylinders, characterized in that the rotary intake pipe (**T-8**) and the rotary exhaust pipe (**T-9**) are housed in an intake manifold (**31**) and an exhaust manifold (**32**), respectively, each of which delimits a space or chamber which surrounds said intake pipe (**T-8**) and said exhaust pipe (**T-9**), respectively, which chambers (**31**, **32**) are impermeably separated and disposed so as to allow the free circulation of gaseous fluids outside and along said rotary distribution pipes (**T-8**, **T-9**), from one end to the other of said intake manifold (**31**) and exhaust manifold (**32**).

5,690,070
APPARATUS FOR GOVERNING THE IDLING RPM OF AN INTERNAL COMBUSTION ENGINE

Friedrich Wendel, Weissach; Johannes Meiwes, Markgroningen; Albert Gerhard, Tamm; Uwe Hammer, Schwieberdingen; Dieter Dick, Muhlacker, and Robert Torno, Bietigheim-Bissingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
PCT No. PCT/DE95/00506, § 371 Date Jun. 28, 1996, § 102(e) Date Jun. 28, 1996, PCT Pub. No. WO96/07821, PCT Pub. Date Mar. 14, 1996
PCT Filed Apr. 12, 1995, Ser. No. 637,800
Claims priority, application Germany, Sep. 6, 1994, 44 31 711.5
Int. Cl.^{6} F02M *69/32*
U.S. Cl. 123—339.25 **3 Claims**



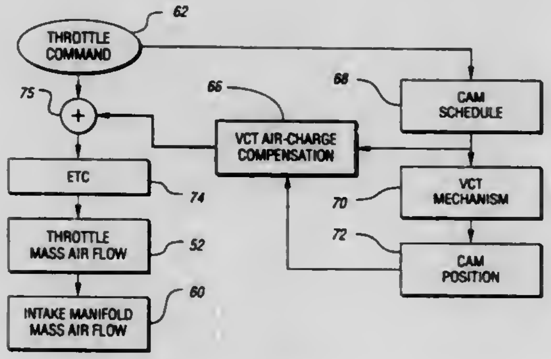
1. An apparatus for governing an idling rpm of an internal combustion engine by controlling a quantity of operating medium that is supplied from a source of an operating medium to the engine via at least two flow lines, comprising a first valve opening cross section at a first valve opening for a first flow line and a second valve opening cross section at a second valve opening for a second flow line which are controllable by means of associated valve closing devices, the first flow line leads to a fuel metering device and the second flow line leads to an intake conduit of the engine downstream of a throttle valve disposed in an intake conduit, and the valve closing devices are adjustable from a closing position into an opening position by means of an adjusting drive with increasing activation of the adjusting device, the valve closing devices include two valve closing members (**38***a*, **38***b*), which are embodied as valve slides, said valve closing members have a sealing face embodied as complementary to a sealing face (**34***a*, **36***a*), surrounding the valve opening (**34**, **36**), of a housing (**30**), and are provided on a component (**38**, **38***c*) movable in a housing (**30**) and are combined into a single unit (**38***c*) extending over an arc angle, said single unit is provided on an outer jacket face with a recess (**38***d*, **38***f*), that extends over an arc angle between the valve closing members (**38***a*, **38***b*), upon movement of the movable component (**38**), beginning at a closed position in which an inlet (**32**) of the housing (**30**) communicates with the operating medium source (**10**) is closed relative to the interior (**37**) of the housing, an increasingly larger quantity of operating fluid is initially supplied to a first outlet (**34**), through said recess which forms the first flow line (**20***a*) branching off from the housing (**30**), and that only then, upon a further movement of the movable component (**38**) in a specified direction of movement a flow cross section for the second flow line (**20***b*) is uncovered by the second valve closing member (**38***b*) via the interior (**37**) of the housing (**30**) which leaves via a second outlet (**36**) of the housing (**30**).

5,690,071
METHOD AND APPARATUS FOR IMPROVING THE PERFORMANCE OF A VARIABLE CAMSHAFT TIMING ENGINE

Mrdjan J. Jankovic, Birmingham, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Oct. 28, 1996, Ser. No. 741,063
Int. Cl.^{6} F02M *7/00*
U.S. Cl. 123—436 **10 Claims**

1. A control method of compensating air charge variation in an engine caused by camshaft transients produced by a variable camshaft timing mechanism comprising a sequence of the following steps:

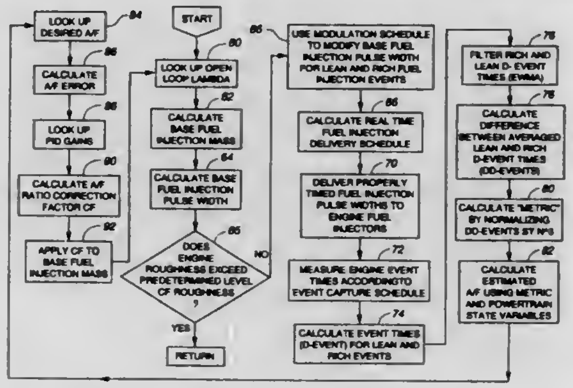
calculating an air charge compensation value based on a cam schedule and engine operating conditions;



adjusting the intake manifold mass air flow as a function of said compensation value to thereby reduce said variation.

5,690,072
METHOD AND SYSTEM FOR DETERMINING AND CONTROLLING A/F RATIO IN LEAN ENGINES

Garth M. Meyer, Dearborn, and Joseph R. Asik, Bloomfield Hills, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Dec. 13, 1996, Ser. No. 768,002
Int. Cl.^{6} F02D *41/14*
U.S. Cl. 123—436 **18 Claims**


LOOK UP DESIRED A/F
84
CALCULATE A/F ERROR
86
LOOK UP PID GAINS
88
CALCULATE A/F RATIO CORRECTION FACTOR CF
90
APPLY CF TO BASE FUEL INJECTION MASS
92
START
60
LOOK UP OPEN LOOP LAMBDA
62
CALCULATE BASE FUEL INJECTION MASS
64
CALCULATE BASE FUEL INJECTION PULSE WIDTH
65
DOES ENGINE ROUGHNESS EXCEED PREDETERMINED LEVEL OF ROUGHNESS ?
NO
YES
RETURN
66
USE MODULATION SCHEDULE TO MODIFY BASE FUEL INJECTION PULSE WIDTH FOR LEAN AND RICH FUEL INJECTION EVENTS
68
CALCULATE REAL TIME FUEL INJECTION DELIVERY SCHEDULE
70
DELIVER PROPERLY TIMED FUEL INJECTION PULSE WIDTHS TO ENGINE FUEL INJECTORS
72
MEASURE ENGINE EVENT TIMES ACCORDING TO EVENT CAPTURE SCHEDULE
74
CALCULATE EVENT TIMES (D-EVENT) FOR LEAN AND RICH EVENTS
76
FILTER RICH AND LEAN D-EVENT TIMES (EWMA)
78
CALCULATE DIFFERENCE BETWEEN AVERAGED LEAN AND RICH D-EVENT TIMES (DD-EVENTS)
80
CALCULATE "METRIC" BY NORMALIZING DD-EVENTS BY N^3
82
CALCULATE ESTIMATED A/F USING METRIC AND POWERTRAIN STATE VARIABLES

1. A method for determining air/fuel ratio of an internal combustion engine having a fuel injector and controlling the engine accordingly, the method comprising:

sensing an engine coolant temperature and generating a corresponding temperature signal;

sensing a cylinder air mass and generating a corresponding air mass signal;

modulating a base fuel pulse width to the fuel injector according to a predetermined event schedule including a rich fuel pulse width relative to the base fuel pulse width and a lean fuel pulse width relative to the base fuel pulse width based on the temperature signal and the air mass signal;

determining a rich event time in response to the rich fuel pulse width and a lean event time in response to the lean fuel pulse width;

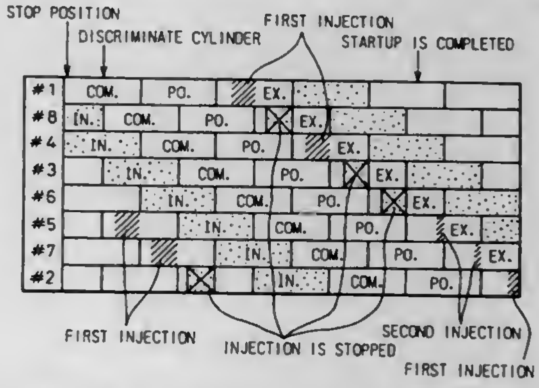
determining a metric based on the rich event time and the lean event time;

determining the air/fuel ratio based on the metric, the temperature signal and the air mass signal; and

controlling the engine based on the determined air/fuel ratio.

5,690,073
FUEL INJECTION CONTROL DEVICE OF A MULTI-CYLINDER ENGINE

Naohide Fuwa, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jun. 5, 1996, Ser. No. 658,550
Claims priority, application Japan, Jun. 9, 1995, 7-143308
Int. Cl.^{6} F02D *41/06;41/36*
U.S. Cl. 123—443 **13 Claims**



1. A fuel injection control device of a multi-cylinder engine, comprising:

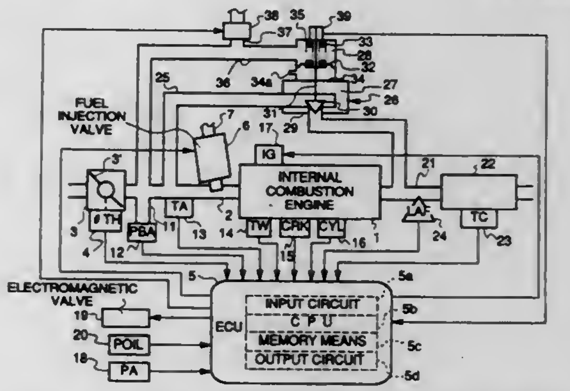
at least one sensor for monitoring a condition that affects the ease with which the engine is started and generating a sensor output signal;

a processor responsive to the at least one sensor output signal to generate a fuel injection signal indicating at least one first cylinder into which a full amount of fuel is to be injected and at least one second cylinder into which a reduced amount of fuel is to be injected, said first and second cylinders being selected to provide ease of starting; and

a fuel injection controller responsive to said fuel injection signal to inject the full amount of fuel into the at least one first cylinder and to inject the reduced amount of fuel into the at least one second cylinder.

5,690,074
FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ken Ogawa, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha
Filed Aug. 6, 1996, Ser. No. 692,713
Claims priority, application Japan, Aug. 10, 1995, 7-224498
Int. Cl.^{6} F02M *51/00*
U.S. Cl. 123—491 **16 Claims**



1. In a fuel injection control system for an internal combustion engine having an intake passage having an inner wall surface, and at least one combustion chamber, said fuel injection control system including fuel supply amount-calculating means for calculating an amount of fuel to be supplied to said engine, based on operating

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conditions of said engine including at least load on said engine, adhering fuel amount-calculating means for calculating an amount of fuel adhering to said inner wall surface of said intake passage of said engine, by the use of adhering fuel parameters representative of transfer characteristics of fuel injected into said intake passage, carried-off fuel amount-calculating means for calculating an amount of fuel to be carried off from said fuel adhering to said inner wall surface of said intake passage into said at least one combustion chamber, by the use of said adhering fuel parameters, corrected fuel injection amount-calculating means for calculating a corrected fuel injection amount by correcting of said amount of fuel calculated by said fuel supply amount-calculating means according to said amount of fuel adhering to said inner wall surface of said intake passage and said amount of fuel to be carried-off from said fuel adhering to said inner wall surface, and fuel injection control means for injecting fuel in said corrected fuel injection amount into said intake passage;

the improvement comprising:

after-start time period-measuring means for measuring a time period elapsed after said engine is started; and

after-start correction amount-calculating means for calculating an after-start correction amount of said corrected fuel injection amount according to said time period elapsed after said engine is started;

wherein said corrected fuel injection amount-calculating means calculates said corrected fuel injection amount based on said after-start correction amount of said corrected fuel injection amount until said time period elapsed after said engine is started reaches a predetermined time period.

5,690,075

METHOD OF AND APPARATUS FOR CONTROLLING FUEL INJECTION IN INTERNAL COMBUSTION ENGINE

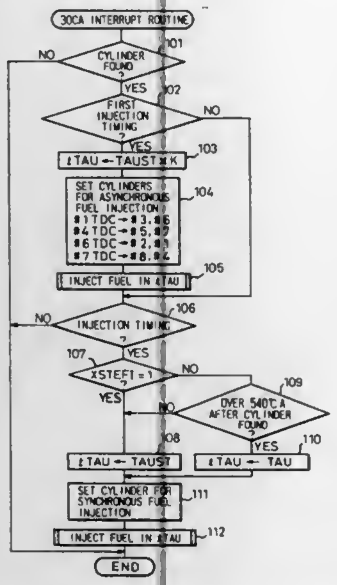
Hiroshi Tanaka, and Naohide Fuwa, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 30, 1996, Ser. No. 705,966

Claims priority, application Japan, Sep. 5, 1995, 7-227836

Int. Cl.^{6} F02M *51/00*

U.S. Cl. 123—491 **2 Claims**



1. An apparatus for controlling fuel injection in an internal combustion engine by injecting fuel in a cranking quantity at the start of the engine and in a post-cranking quantity after the engine is started, comprising:

means for determining whether or not the speed of the engine is above a reference speed;

means for determining whether or not fuel in the cranking quantity has been injected into every cylinder of the engine; and

means for switching the quantity of fuel to be injected from the cranking quantity to the post-cranking quantity if it is determined that the engine speed is above the reference speed and that fuel in the cranking quantity has been injected into every cylinder.

5,690,076

EVAPORATIVE FUEL-PROCESSING SYSTEM FOR INTERNAL COMBUSTION ENGINES

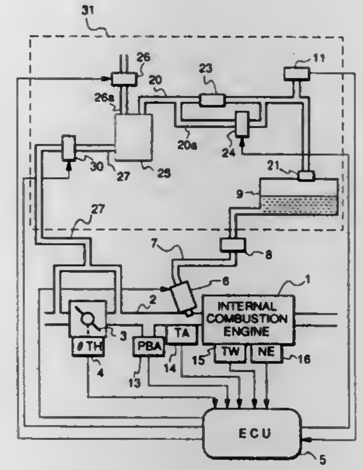
Akira Hashimoto; Hideo Moriwaki; Yoshiaki Matsuzono; Sachito Fujimoto, all of Wako, and Satoshi Kiso, Tochigi-ken, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1996, Ser. No. 609,748

Claims priority, application Japan, Mar. 3, 1995, 7-070535

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—520 **8 Claims**



1. An evaporative fuel-processing system for an internal combustion engine having an intake system, and a fuel tank, comprising:

an evaporative emission control system including a canister having an adsorbent accommodated therein, for adsorbing evaporative fuel generated in said fuel tank, and an air inlet port communicating with atmosphere, a charging passage extending between said canister and said fuel tank, a purging passage extending between said canister and said intake system, a purge control valve arranged across said purging passage, and a vent shut valve for opening and closing said air inlet port of said canister;

pressure-detecting means for detecting pressure within said evaporative emission control system;

open-to-atmosphere means for relieving said interior of said evaporative emission control system to said atmosphere, by closing said purging valve and opening said vent shut valve;

tank state-detecting means for detecting a pressure state within said fuel tank, based on an output from said pressure-detecting means during operation of said open-to-atmosphere means; and

determining means for determining whether said evaporative emission control system is normal, based on a result of the detection by said tank state-detecting means.

5,690,077

INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

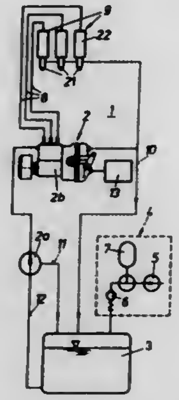
Herwig Ofner, Stübing, and Peter Herzog, Graz, both of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H., Graz, Austria

Filed Mar. 22, 1996, Ser. No. 620,570

Claims priority, application Austria, Mar. 23, 1995, 518/95

Int. Cl.^{6} F02M *21/02*

U.S. Cl. 123—525 **10 Claims**



1. Injection system for an internal combustion engine operating on self-igniting liquefied gas as a fuel, comprising an injection unit per cylinder for direct injection of the fuel into a combustion chamber, a fuel tank, a fuel delivery device for drawing fuel comprising self-igniting liquefied gas from said fuel tank and delivering said fuel to said injection unit, said fuel tank being configured as a low-pressure storage tank, and a pressure control unit connected to said storage tank for maintaining a constant interior pressure within said storage tank at a level above the vapor pressure of said liquefied gas, said pressure control unit including a gas pumping unit which is connected to an interior of said storage tank via at least one check valve, and wherein the injection system is leakage-free.

5,690,078

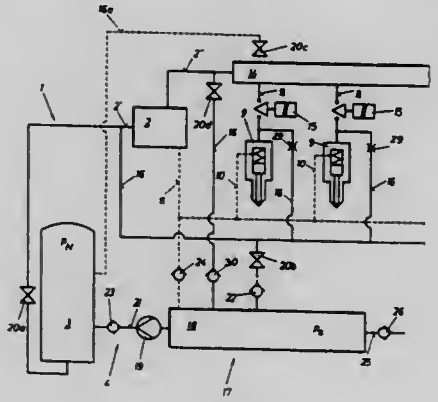
INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Herwig Ofner, Stübing, Austria, assignor to AVL Gesellschaft Für Verbrennungskraftmaschinen und Messtechnik mbH. Prof. Dr. Dr. h.c. Hans List, Graz, Austria

Continuation-in-part of Ser. No. 621,253, Mar. 25, 1996, abandoned. This application Oct. 8, 1996, Ser. No. 727,305

Int. Cl.^{6} F02B *43/00*

U.S. Cl. 123—529 **16 Claims**



1. An injection system for an internal combustion engine operating on self-igniting liquefied gas as a fuel, comprising: an injection unit per cylinder for direct injection of said fuel into a combustion chamber, and a fuel tank, and a fuel delivery device for drawing said fuel from said fuel tank and delivering it to a injection unit, wherein said fuel tank is configured as a low-pressure storage tank, and wherein at least one pressurized part of said injection system can be depressurized by means of a shut-down device, said shut-down device including at least one pressure relief line which is controlled by at least one valve and leads into a tank of low pressure level.

5,690,079

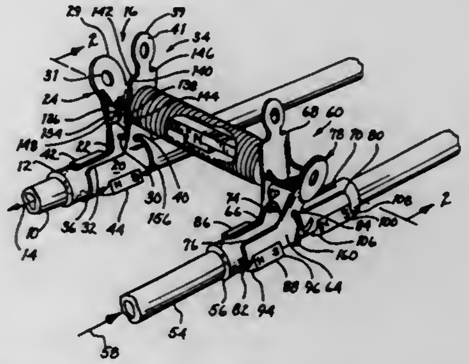
APPARATUS FOR ENHANCING FUEL EFFICIENCY OF A VEHICLE

Douglas R. Craig, 427 Ash St., Henderson, Nev. 89015

Continuation-in-part of Ser. No. 394,252, Feb. 24, 1995, abandoned. This application May 24, 1996, Ser. No. 653,455

Int. Cl.^{6} F02M *27/04*

U.S. Cl. 123—538 **7 Claims**



1. An apparatus for enhancing the fuel efficiency of a gasoline powered vehicle of the type which has a fuel injector that takes fuel through a fuel intake line and returns fuel through a fuel return line, comprising:

an intake magnet;

means for fixedly disposing said intake magnet on the intake line with the north pole of said intake magnet downstream of its south pole;

a return magnet;

means for fixedly disposing said return magnet proximal to the return line with the north pole of said return magnet upstream of its south pole;

a crossover magnet; and

means for disposing said crossover magnet between the intake and return lines with the north pole of said crossover magnet closest to the fuel injector, said crossover disposition means comprising a coil spring that has ends respectively connected to said intake and return disposition means with coils of said spring around said crossover magnet.

5,690,080

FUEL HEATER FOR HEATING LIQUID FUEL UNDER PRESSURE FOR AN INTERNAL INJECTION ENGINE

Robertus J. Pelgrim, Borne; Arnold M. Brouwers, Wierden; Edward E. Grutterink, Aadorp; Daniel van't Veen, Borne, and Arthur A. Pouwels, Albergen, all of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 17, 1995, Ser. No. 503,170

Claims priority, application Netherlands, Jul. 7, 1995, 9401209

Int. Cl.^{6} F02M *31/00*

U.S. Cl. 123—549 **8 Claims**

1. A fuel heater for heating liquid fuel under pressure in an internal combustion injection engine comprising a pill made of

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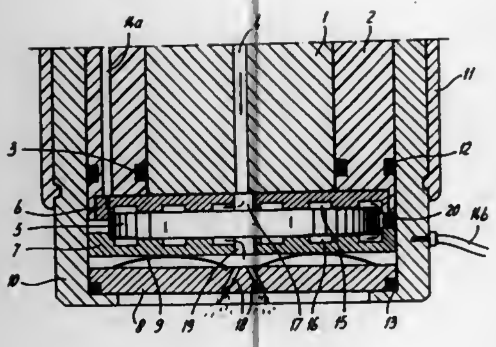


material with a positive temperature coefficient (PTC) having a top side and a bottom side surface with at least one of said top and bottom side surfaces covered by a heatsink, characterized in that at least one narrow groove is contained adjacent each of the top and bottom side surfaces in at least said PTC pill or said at least one heatsink so that the fuel supplied under pressure can flow in the at least one narrow groove at the top side surface of the pill from the central region towards the edge of the pill, and then into the at least one narrow groove at the bottom side surface of the pill from the edge of the pill to central region to thereby heat the fuel and maintain it under pressure.

5,690,081

CYLINDER HEAD FOR A LIQUID-COOLED MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

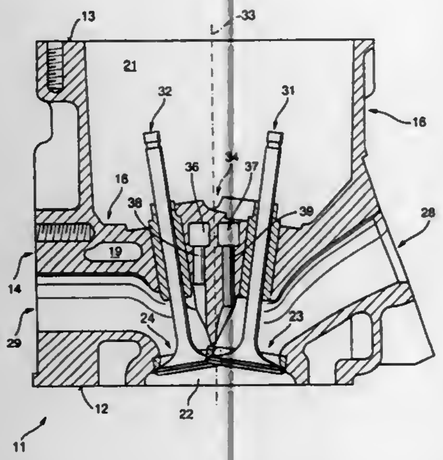
Janusz Kwiatkowski, Stuttgart, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

Filed Jul. 22, 1996, Ser. No. 685,942

Claims priority, application Germany, Aug. 30, 1995, 195 31 875.7

Int. Cl.^{6} F02M *25/07*

U.S. Cl. 123—570 **9 Claims**



1. A cylinder head for a liquid cooled multi-cylinder internal combustion engine, comprising: a casing with a coolant space, at least one inlet passage and at least one outlet passage for each cylinder extending through said coolant space, an inlet valve and an outlet valve mounted in said cylinder for closing and opening said inlet and outlet passages respectively, and an integrated channel system extending through said cylinder head and comprising at least a first channel with connecting branches to said outlet passages and a second channel with connecting branches to said inlet passages, said first and second channels are longitudinal channels extending over the length of said engine.

5,690,082

STRUCTURE FOR SUPPORTING EGR VALVE IN ENGINE

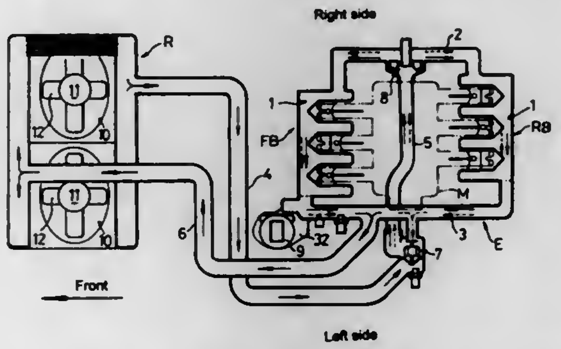
Masatoshi Tanioka, and Koji Tsuchida, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1996, Ser. No. 711,464

Claims priority, application Japan, Sep. 13, 1995, 7-234837

Int. Cl.^{6} F02M *25/07;* **F01P** *3/12;3/20*

U.S. Cl. 123—570 **18 Claims**



1. A structure for supporting an EGR valve in an engine, comprising a water passage provided separately from an intake manifold and connected to a water jacket provided in a cylinder head of the engine, said water passage being integrally formed with a valve mounting seat for supporting said EGR valve and a gas passageway connected to said EGR valve.

5,690,083

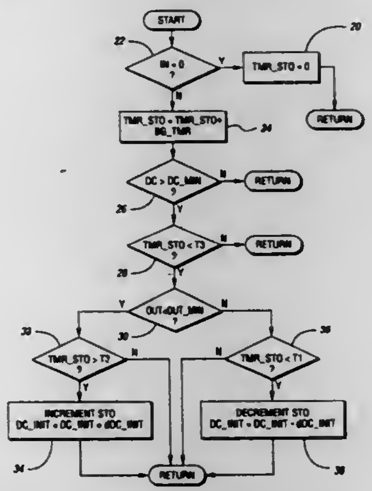
EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Alexander Y. Gopp, Ann Arbor, and Shailesh Patel, Garden City, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Oct. 21, 1996, Ser. No. 734,567

Int. Cl.^{6} F02M *25/07;* **H01H** *47/00*

U.S. Cl. 123—571 **10 Claims**



1. A method of adaptively adjusting a controller start to open calibration value in an exhaust gas recirculation (EGR) control system comprising a sequence of the following steps:

activating EGR control with a signal including an initial duty cycle value in response to an input signal from an engine control system;

comparing an output signal representing EGR valve output to a predetermined signal threshold;

adjusting said initial duty cycle value if following activation, said output signal reaches said threshold before a predetermined lower time interval has expired or after a predetermined upper time interval has expired.

5,690,084

BREATHER STRUCTURE FOR BLOW-BY GAS IN INTERNAL COMBUSTION ENGINE

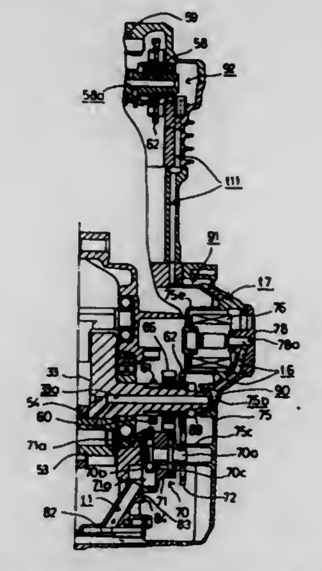
Tohru Gunji; Atsushi Sawa, and Shinji Saitoh, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1996, Ser. No. 680,262

Claims priority, application Japan, Ang. 11, 1995, 7-227161

Int. Cl.^{6} F01M *13/04*

U.S. Cl. 123—572 **20 Claims**



1. A breather structure for a blow-by gas in an internal combustion engine having auxiliary machinery provided in a crank chamber of said internal combustion engine for centrifugally separating oil from the blow-by gas by rotation of a rotor portion, integrated with a crank shaft of said auxiliary machinery, and a breather passage, for introducing the blow-by gas from which the oil content is separated to the outside of the crank chamber, formed in a cover for covering side portions of said auxiliary machinery comprising:

a substantially cylindrical wall having a center axis substantially identical to a rotational center axis of said rotor portion of said auxiliary machinery formed to project from said auxiliary machinery cover to said rotor portion;

an outlet communicating with said breather passage formed in a base portion of said substantially cylindrical wall; and

a discharge port in communication inwardly of said substantially cylindrical wall in the rotational direction of said rotor portion of said auxiliary machinery for communicating from the inside to the outside of said substantially cylindrical wall, said discharge port being formed in said substantially cylindrical wall.

5,690,085

CONTROL CIRCUIT FOR IGNITION COIL

Atsunobu Kawamoto, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

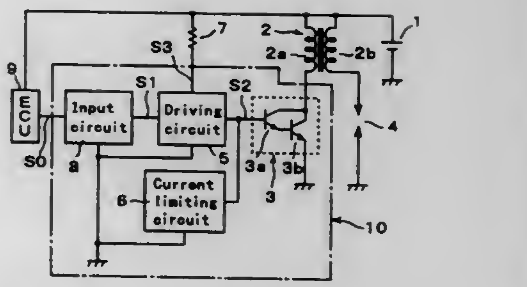
Filed Oct. 25, 1996, Ser. No. 738,282

Claims priority, application Japan, Apr. 26, 1996, 8-107163

Int. Cl.^{6} F02P *3/05*

U.S. Cl. 123—644 **7 Claims**

1. An ignition coil control circuit which controls, in accordance with a signal from an ECU, a current flowing to a primary coil of an ignition coil for impressing a high voltage to an ignition plug,



said ignition coil control circuit comprising:

a switching circuit for switching the primary coil of said ignition coil;

a driving circuit for driving said switching circuit;

a control signal output circuit for generating and outputting a driving control signal to said driving circuit in accordance with the signal from said ECU; and

a current limiting circuit for detecting a value of a current applied to said primary coil by said switching circuit and controlling said switching circuit so as to make said current not larger than a predetermined value,

wherein said control signal output circuit uses the signal from said ECU as its power source, and said current limiting circuit uses a switching driving signal output from said driving circuit as its power source.

5,690,086

AIR/FUEL RATIO CONTROL APPARATUS

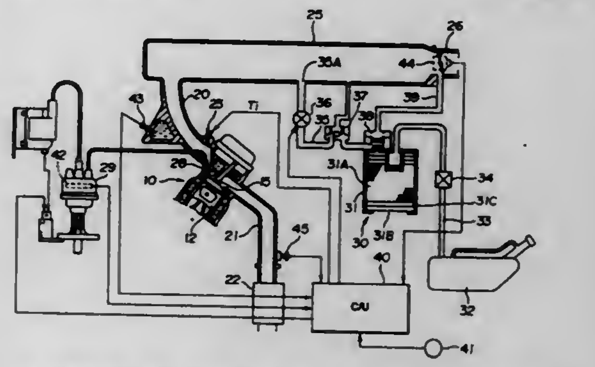
Akihiro Kawano, Sagamihara; Hatsuo Nagaishi, Yokohama, and Yoshiaki Yoshioka, Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Sep. 10, 1996, Ser. No. 716,844

Claims priority, application Japan, Sep. 11, 1995, 7-232575; Sep. 22, 1995, 7-244997

Int. Cl.^{6} F05D *41/14*

U.S. Cl. 123—674 **17 Claims**



1. An apparatus for use with an internal combustion engine having a throttle valve located in an induction passage for controlling the amount of air supplied to the engine through the induction passage and an exhaust passage through which exhaust gases are discharged from the engine to the atmosphere, to control flow of fuel vapor purged from a fuel vapor trap into the engine through a purge passage having a purge control valve provided therein, comprising:

means for sensing engine operating conditions;

means for sensing an amount of air supplied into the engine;

means for sensing an air/fuel ratio of an air/fuel mixture supplied to the engine;

means for controlling the purge control valve to permit fuel vapor purge through the purge passage based on the sensed engine operating conditions;

means for calculating an air/fuel ratio feedback control correction factor to correct the air/fuel ratio within a predetermined range based on the sensed air/fuel ratio;

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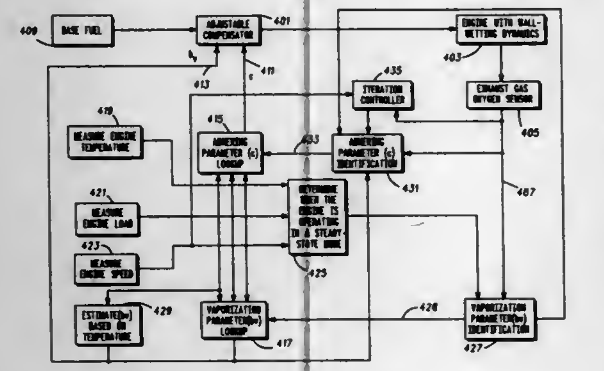
means for sensing an amount of fuel vapor introduced through the purge passage into the engine;
means for calculating a purge rate of the sensed fuel vapor amount with respect to the sensed air amount;
means for calculating a deviation between the air/fuel ratio feedback correction factor calculated with the fuel vapor purge and the air/fuel ratio feedback correction factor calculated without the fuel vapor purge;
means for calculating a gain value based on the calculated purge rate and the calculated air/fuel ratio feedback control correction factor deviation only during the fuel vapor purge;
a memory for storing gain values in respective memory locations addressable by different fuel vapor amounts;
means for storing the calculated gain value in the memory in a memory location corresponding to the sensed fuel vapor amount to update a gain value stored previously in the memory location;
means for reading a gain value stored in the memory in the memory location corresponding to the sensed fuel vapor amount;
means for calculating a value for the amount of fuel supplied to the engine based on the read gain value and the sensed engine operating conditions; and
means for controlling the amount of fuel supplied to the engine according to the calculated value therefor.

5,690,087
EGO BASED ADAPTIVE TRANSIENT FUEL COMPENSATION FOR A SPARK IGNITED ENGINE

Darren A. Schumacher, Ypsilanti, and Kevin J. Bush, Northville, both of Mich., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 13, 1996, Ser. No. 713,914
Int. Cl.⁶ F02D *41/14*

U.S. Cl. 123—675 **17 Claims**


400
BASE FUEL
ADJUSTABLE COMPENSATOR
401
ENGINE WITH WALL-WETTING DYNAMICS
403
b_v
413
c
411
435
ITERATION CONTROLLER
EXHAUST GAS OXYGEN SENSOR
405
419
MEASURE ENGINE TEMPERATURE
415
ADHERING PARAMETER (c) LOOKUP
433
ADHERING PARAMETER (c) IDENTIFICATION
431
407
421
MEASURE ENGINE LOAD
DETERMINE WHEN THE ENGINE IS OPERATING IN A STEADY-STATE MODE
423
MEASURE ENGINE SPEED
425
ESTIMATED(bv) BASED ON TEMPERATURE
429
VAPORIZATION PARAMETER(bv) LOOKUP
417
428
VAPORIZATION PARAMETER(bv) IDENTIFICATION
427

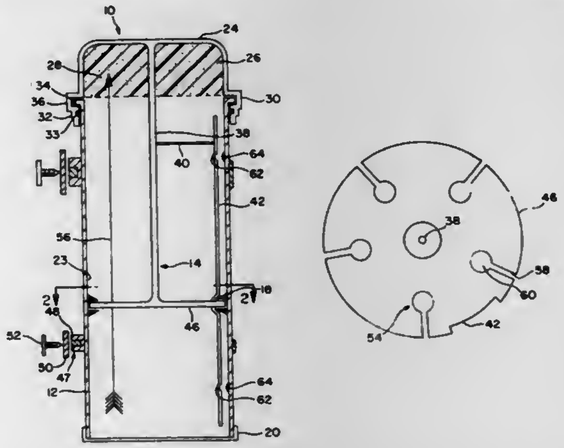
1. A method of adaptive transient fuel compensation for an engine comprising the steps of:
injecting an identifying fuel charge into the engine;
measuring a duration between when the identifying fuel charge is injected in the step of injecting, and when a binary-type exhaust gas oxygen sensor switches state;
translating the duration measured in the step of measuring a duration, into an estimate of a fraction of fuel evaporated in a fuel intake system of the engine (b_v);
estimating a fraction of fuel adhering to the fuel intake system of the engine (c) dependent on the (b_v) determined in the step of translating; and
adjusting a base fuel charge to the engine, dependent on the (b_v) determined in the step of translating and the (c) determined in the step of estimating.

5,690,088
ROTATING ENCLOSED QUIVER

Steven W. Ruble, Rte. 3, Box 160, Clearville, Pa. 15535

Filed May 28, 1996, Ser. No. 654,329
Int. Cl.⁶ F41B *5/06*

U.S. Cl. 124—25.7 **14 Claims**



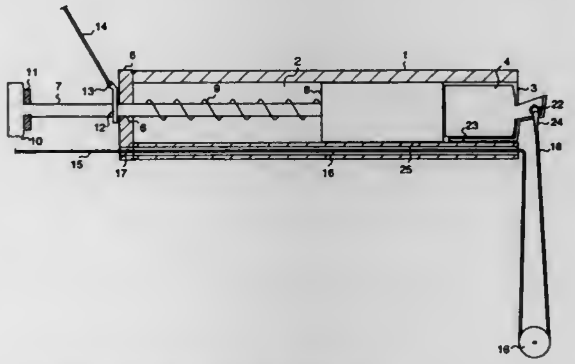
1. A quiver for arrows, comprising:
a housing provided with openings in opposite ends of said housing and a third opening in said housing, said third opening being at least large enough to permit insertion and removal of arrows;
cover for fitting onto one of said openings in said opposite ends of said housing and capable of rotating about one of said opposite ends of said housing;
means for retaining said arrows in said housing having a plurality of notch-shaped openings therein, each notch-shaped opening receiving one of said arrows therein, said means for retaining said arrows being attached to said cover for rotation therewith; and
a means for opening and shutting said third opening, said means for opening and shutting said third opening being attached to said means for retaining said arrows.

5,690,089
MECHANICAL HAND GRENADE LAUNCHER

John Patrick Ward, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1996, Ser. No. 713,933
Int. Cl.⁶ F41B *7/00*

U.S. Cl. 124—26 **2 Claims**



1. A hand grenade launcher, comprising:
a launch tube with an open end into which a hand grenade may be inserted;
an end cap attached to said launch tube at the end opposite to which the hand grenade may be inserted;

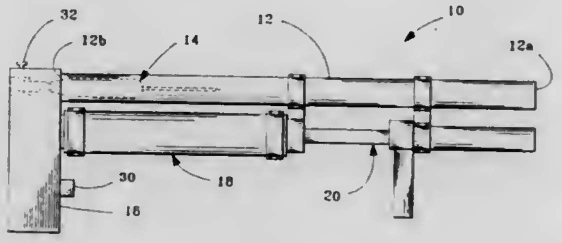
a plunger rod protruding through an aperture in said end cap and reciprocating in said launch tube;
a plunger pusher attached to said plunger rod within said launch tube;
a spring disposed between said end cap and said plunger pusher within said launch tube;
a charging handle attached to said plunger rod outside said launch tube;
a safety pin extending through an aperture in said plunger rod outside said launch tube; and
a first lanyard attached to said safety pin.

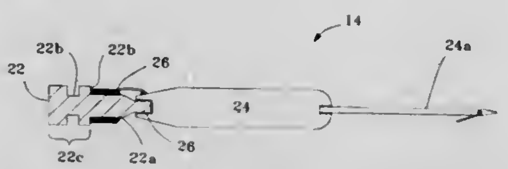
5,690,090
LANYARD RETAINER FOR A SPEARGUN PROJECTILE

Laurent C. Bissonnette, 160 Sea Meadow Dr., Portsmouth, R.I. 02871

Filed Jun. 17, 1996, Ser. No. 668,034
Int. Cl.⁶ F41B *11/00;11/08*

U.S. Cl. 124—80 **10 Claims**





1. A retainer for a length of lanyard connected at one end to a projectile for use in an underwater gun, the retainer comprising:
a joint means for removably attaching the projectile to the retainer;
a spindle portion for attaching the other end of the lanyard and for receiving the length of the lanyard in a wound manner; and
a rear portion removably secured to the underwater gun.

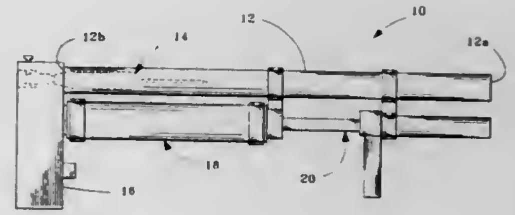
5,690,091
SPEARGUN PROJECTILE ASSEMBLY

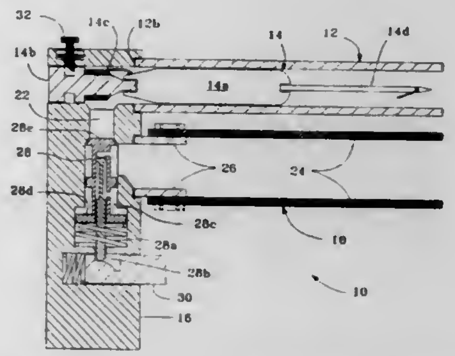
Laurent C. Bissonnette, 160 Sea Meadow Dr., Portsmouth, R.I. 02871

Filed Jun. 17, 1996, Ser. No. 668,035
Int. Cl.⁶ F41B *11/00*

U.S. Cl. 124—80 **5 Claims**

1. A projectile assembly for breech loading into an underwater gun using water under pressure to launch a projectile from a barrel, the projectile assembly comprising:
a plug portion for sealing a breech end of the barrel; and
a dart portion connected to the plug portion, the water under pressure entering the barrel at a location intermediate the plug portion and the dart portion causing the dart portion to separate from the plug portion, the dart portion serving as the projectile launched from the barrel by the gun.



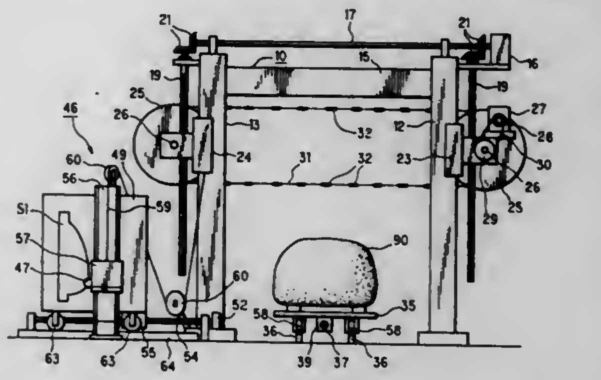


5,690,092
APPARATUS FOR CUTTING A STONE MEMBER SO AS TO HAVE A CURVED SURFACE

Shingo Ogyu, 2-6-13, Yahei, Kawaguchi, Saitama 332, Japan

Filed Jun. 21, 1996, Ser. No. 668,231
Int. Cl.⁶ B28D *1/08*

U.S. Cl. 125—21 **9 Claims**



1. An apparatus for cutting a stone member so as to have a curved surface, which comprises:
an endless wire saw disposed horizontally and driven by an electric motor and having a plurality of cutting parts including a diamond powder cutting part and being movable vertically by an electric motor, and a carriage supporting and feeding a stone member and being movable in the cross direction underneath said wire saw by an electric motor;
an optical following device having a table movable in one direction for supporting a model member made of sheet of material, and
an optical sensor which follows the contour of said model member and is attached to a movable member which is movable in an orthogonal direction with respect to a direction of movement said table along a guide member disposed in a prescribed position, wherein the length of movement of said wire saw in a vertical direction is a prescribed ratio with respect to the length of movement of said optical sensor, and the length of movement said carriage is a prescribed ratio with respect to the length of movement of said table.

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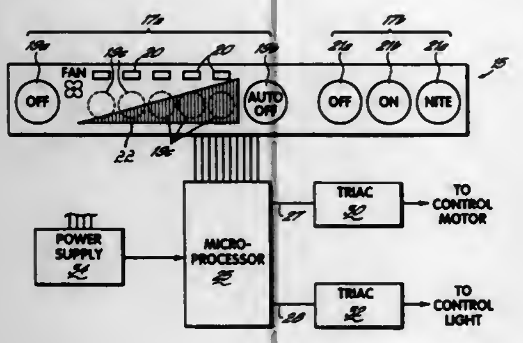
5,690,093
VENTILATOR CONTROLLER WITH VARIABLY ADJUSTABLE FAN AND LIGHT

Anthony L. Schrank, Fairfield, Ohio; Robert Voosen, Randolph, and Chris Hentschel, Kingston, both of Mass., assignors to Nutone, Inc., Cincinnati, Ohio, a part interest

Filed Jan. 19, 1995, Ser. No. 375,554

Int. Cl.^{6} F24C *15/20*

U.S. Cl. 126—299 D **22 Claims**



1. A ventilator for a human-habitable structure, comprising
a fan motor,
a fan driven by said fan motor,
a control circuit electrically connected to said fan motor for providing electrical power to said fan motor,
a keypad including a plurality of adjustment keys electrically coupled to said control circuit,
said control circuit responding to simultaneous depression of a group of at least two of said adjustment keys and in response causing said fan motor to drive said fan at one of a plurality of possible fan speeds.

5,690,094
GAS FLAME KETTLE

Naftali Sheinfeld, Mobile Post N. Yehuda; Shmuel Huss, Jerusalem, and Ilya Shmuelson, Lod, all of Israel, assignors to Etzion Metal Works, Yehuda, Israel

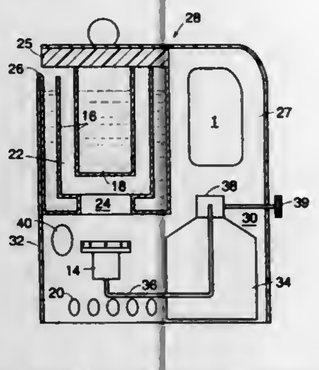
PCT No. PCT/US94/09689, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO95/07440, PCT Pub. Date Mar. 16, 1995

PCT Filed Aug. 29, 1994, Ser. No. 637,706

Claims priority, application Israel, Sep. 9, 1993, 106.960

Int. Cl.^{6} F24H *1/00*

U.S. Cl. 126—350 R **13 Claims**



1. An automatic shut-off, gas-flame heated, self-contained kettle, comprising:
a housing;
a gas burner contained within said housing;
a container for the fluid to be heated, positioned within said housing and above said burner;
a chamber within said housing for containing a compressed gas container;
a gas feed line leading from said compressed gas container to said gas burner;
exhaust ducts leading from an area above said burner, through said container, and out of a surface of said housing, whereby excess heat and combustion gases are exhausted in heat-exchange contact with fluid in said container via said ducts, for augmented heating of said fluid with simultaneous protection and insulation of said housing; and
an automatic shut-off valve for closing said gas feed line, said valve being operatively linked to a plurality of sensors which close said valve
in the absence of a flame at the burner; or
in the absence of fluid in said fluid container; or
on the attainment of a preset temperature within said fluid.

5,690,095
EMERGENCY ESCAPE BREATHING APPARATUS

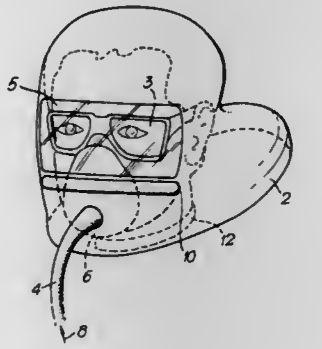
Michael Harvey Glynn, and Thomas Norbron, both of Hampshire, United Kingdom, assignors to Protector Technologies Limited, Lancashire, United Kingdom

Filed May 21, 1996, Ser. No. 651,708

Claims priority, application United Kingdom, May 24, 1995, 9510457

Int. Cl.^{6} A62B *17/00*

U.S. Cl. 128—201.23 **20 Claims**



1. Emergency escape breathing apparatus comprising supply means for connection to a supply of breathable gas; a hood made of flexible material; an inner mask in communication with the supply means; resilient means for holding the inner mask in position when in use; and a member attached to the inner mask which extends at least the width of the head of a wearer of the apparatus and which is at least semi-rigid so as to urge the inner mask against the wearer's face when the apparatus is worn whereby the semi-rigid member serves the dual function of maintaining the hood away from the wearer's face as the apparatus is donned and urging the mask against the users face once the apparatus is in place on the wearer's head.

5,690,096
PEDIATRIC OXYGENATION DEVICE

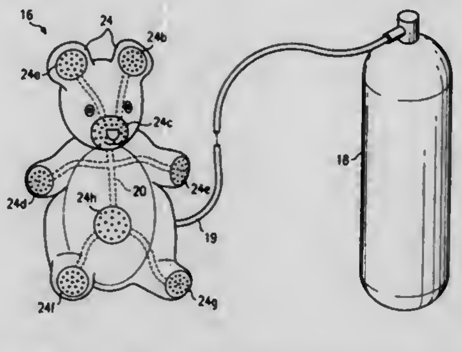
John M. Burch, 2712 Kingston, Plano County, Plano, Tex. 75074

Filed Mar. 14, 1996, Ser. No. 615,099

Int. Cl.^{6} A61M *16/00*

U.S. Cl. 128—204.18 **18 Claims**

1. An oxygenation device comprising:
a plaything to be held by a patient near the patients face;
internal tubing disposed within said plaything and terminating in a plurality of outlet ports disposed at different regions of the plaything such that the plaything can be held in various orientations with at least one of said outlet ports proximate the patients nose and mouth areas.



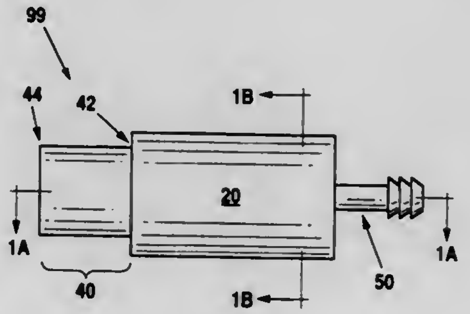
5,690,097
COMBINATION ANESTHETIC MASK AND OXYGEN TRANSPORT SYSTEM

Gregory L. Howard, and Michelle Bowman-Howard, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 31, 1996, Ser. No. 656,387

Int. Cl.^{6} A62B *7/00*

U.S. Cl. 128—205.11 **11 Claims**



1. An oxygenation adaptor for an oronasal mask, the adaptor comprising
a substantially hollow rebreathing chamber having an internal volume;
a room air port sealingly coupled to said rebreathing chamber and communicating with said rebreathing chamber internal volume;
a substantially hollow and substantially cylindrical mask connector portion having a first end, a second end, and an axis substantially centered and extending between said first and second connector portion ends, said mask connector portion first end being sealingly coupled to said rebreathing chamber and communicating with said rebreathing chamber internal volume for coupling said rebreathing chamber to an oronasal mask, said mask having a thickness;
elongated tubular fresh gas injection means comprising a longitudinal fresh gas channel, said longitudinal fresh gas channel having a proximal fresh gas inlet and at least one distal fresh gas outlet, each said distal fresh gas outlet being substantially within said mask connector portion, and substantially within said thickness of said mask, for delivering a fresh gas flow substantially into the mask.

5,690,098
SERVO GAS REGULATING VALVE

Nils T. Ottestad, Tonsberg, Norway, assignor to Ottestad Breathing System A/S, Husoysund, Norway

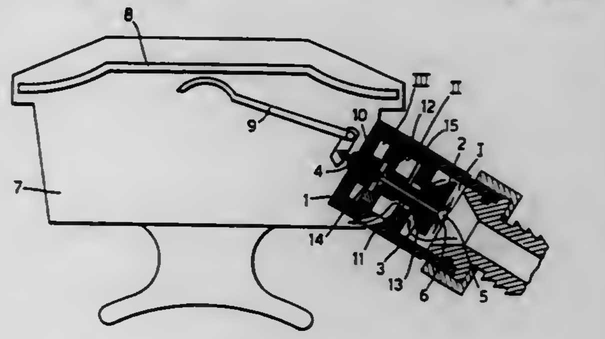
PCT No. PCT/NO94/00160, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO95/09674, PCT Pub. Date Apr. 13, 1995

PCT Filed Oct. 4, 1994, Ser. No. 619,767

Claims priority, application Norway, Oct. 5, 1993, 933551

Int. Cl.^{6} A62B *9/02*

U.S. Cl. 128—205.24 **4 Claims**



1. A servo gas regulating valve comprising:
a housing having an inlet chamber and an outlet chamber,
a servo chamber arranged in the housing at the opposite side of the outlet chamber relative to the inlet chamber, and which is separated from the outlet chamber by means of a pressure sensitive movable means,
a main valve having a main valve body cooperating with a seat facing said inlet chamber and separating the inlet chamber from the outlet chamber,
said main valve body being fixed to a central portion of the pressure sensitive movable means, and having an axial channel therethrough which, in open condition, connects the inlet chamber to the servo chamber, and
a control valve comprising an externally operable control valve body cooperating with a seat arranged at the end of the axial channel opening into the inlet chamber.

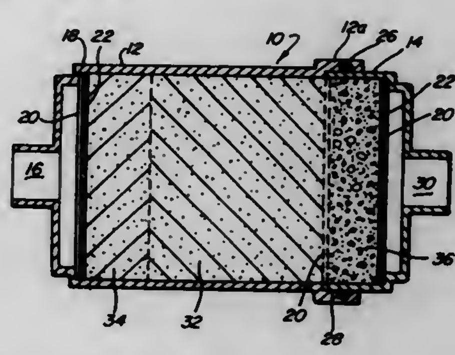
5,690,099
METHOD AND APPARATUS FOR REVITALIZING EXHALED AIR

Vladimir Victorovich Abramov, Moscow, Russian Federation, and Robert M. Hamilton, Brea, Calif., assignors to Life Support Technologies, Inc., Pensacola, Fla.

Filed Jul. 22, 1996, Ser. No. 681,126

Int. Cl.^{6} A61M *15/00*

U.S. Cl. 128—202.26 **33 Claims**



1. A method of treating exhaled air to reduce the CO_2 content thereof and to increase the O_2 content thereof comprising the steps of:
a) passing the exhaled air through a peroxide and/or superoxide of one or more metals of the groups consisting of the alkali

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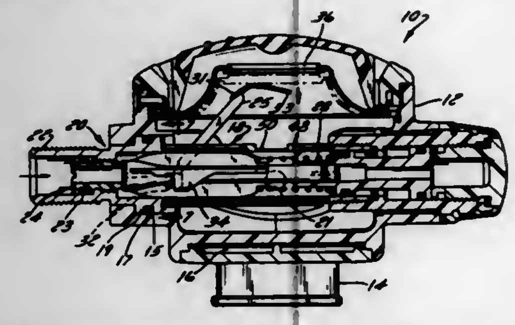
and alkaline-earth metals to reduce the CO_2 content and increase the O_2 content; and
b) adding moisture to the air resulting from the previous step to reduce the temperature thereof.

5,690,100
SCUBA DIVING BREATHING REGULATOR

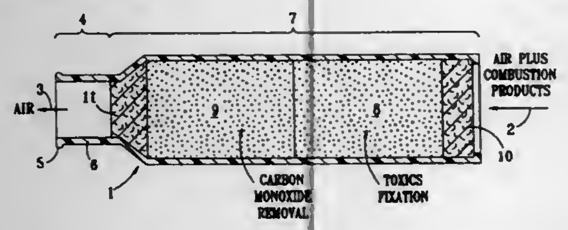
Mitchell P. Pomerantz, Highland Park, Ill., assignor to Johnson Worldwide Assoc., Inc., Sturtevant, Wis.
Filed Aug. 23, 1996, Ser. No. 702,093
Int. Cl.^{6} A62B *7/04*
U.S. Cl. 128—205.24 **5 Claims**



1. A breathing regulator for scuba diving, said regulator comprising:
a housing having a high pressure gas inlet and discharge outlet;
a pressure regulator valve assembly operatively connected to said inlet, said assembly including a brass tube operatively connected to said gas inlet,
a valve poppet mounted in said tube to control the flow of high pressure gas through said tube,
a spring mounted in said tube to bias the valve poppet to a closed position,
a lever connected to open the valve poppet,
a diaphragm operatively positioned to engage the lever to open the valve poppet on a drop in pressure in the housing and means for insulating the brass tube to prevent icing of the tube.

5,690,101
PORTABLE AIR PURIFIER WITH CHEMICAL REACTION ZONE

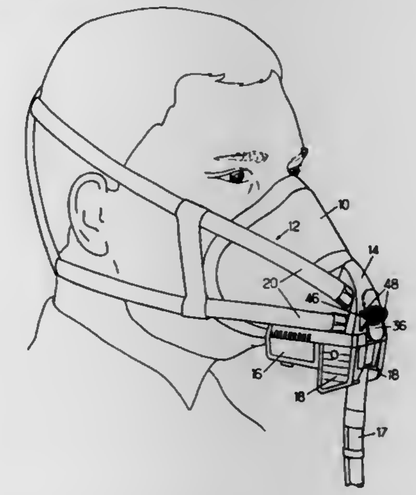
Helmuth W. Kutta, 1110 Lookout Dr., Richardson, Tex. 75080
Continuation-in-part of Ser. No. 502,611, Jul. 14, 1995, abandoned. This application Jul. 30, 1996, Ser. No. 688,605
Int. Cl.^{6} A62B *7/10;7/00*
U.S. Cl. 128—205.27 **36 Claims**



1. A portable air purifier device for emergency use by an individual in an atmosphere that contains air which has been contaminated with one or more combustion products, said combustion products comprising at least in part a mixture of particulate matter, carbon monoxide and other toxic chemical entities, said device comprising an elongated hollow body having an atmosphere inlet end and an outlet end, said outlet end terminating in a mouthpiece so that said atmosphere can be inhaled by way of a human user's mouth sequentially through said inlet end, body and mouthpiece, said body comprising a plurality of zones for treating said contaminated air as it passes therethrough, one of said plurality of zones is a carbon monoxide removal and fixation zone being adapted to remove said carbon monoxide and to fix it to a porous substrate and another one of said plurality of zones is a toxic chemical reaction and fixation zone adapted to chemically react with said other toxic chemical entities having a porous support material impregnated with reaction chemicals for conversion of said toxic entities to solid defined compounds and to liquid non-volatile defined compounds which remain fixed to said support material, whereby said contaminated air can be purified sufficiently to allow breathing of same by said human user for a predetermined short time period.

5,690,102
HEAD HARNESS FOR A RESPIRATORY MASK

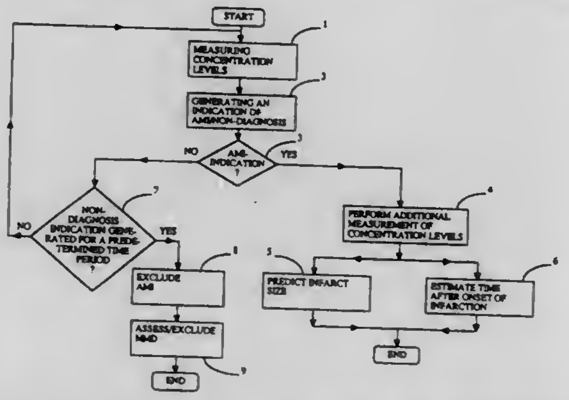
Fernand Bertheau, Plaisir, and Patrick Maire, Rambouillet, both of France, assignors to Intertechnique, Plaisir, France
Continuation of Ser. No. 184,479, Apr. 21, 1988, abandoned. This application May 16, 1990, Ser. No. 523,832
Claims priority, application France, Apr. 22, 1987, 87 05682
Int. Cl.^{6} A62B *18/08*
U.S. Cl. 128—207.11 **15 Claims**



1. Head harness for respiratory mask having:
at least one expandable strap whose ends are connected to the mask and which has an element inflatable by pressurized gas for lengthening the strap to a predetermined size, sufficient to position it over the head of a user, and
manually controlled means having control valve means for optionally admitting pressurized gas up to a complete inflation pressure into said element to when manually actuated to increase said element in size and for venting said element to atmosphere in order to cause the strap to contact the head and to maintain the mask, when released,
wherein said manually controlled means further comprises selection valve means in series flow relation with said control valve means which, in one condition, fully vents the inflatable element through said control valve means and, in an another condition, limits said venting and maintains a predetermined residual pressure, lower than the complete inflation pressure in said element.

5,690,103
DETECTION/EXCLUSION OF ACUTE MYOCARDIAL INFARCTION USING NEURAL NETWORK ANALYSIS OF MEASUREMENTS OF BIOCHEMICAL MARKERS

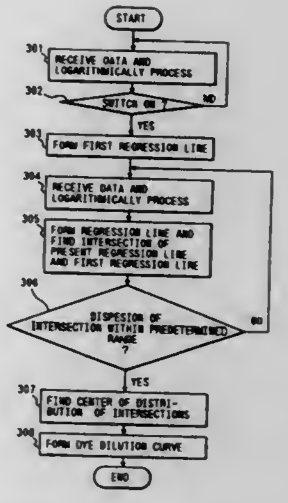
Torgny Lars Groth, Döbelnsgatan 24A, S-752 37 Uppsala, and Johan Ellenius, Geijersgatan 15B, S-752 26 Uppsala, both of Sweden
Filed Jun. 20, 1996, Ser. No. 668,260
Int. Cl.^{6} A61B *5/14*
U.S. Cl. 128—632 **35 Claims**


START
1
MEASURING CONCENTRATION LEVELS
3
GENERATING AN INDICATION OF AMI/NON-DIAGNOSIS
3
NO
AMI-INDICATION ?
YES
7
NON-DIAGNOSIS INDICATION GENERATED FOR A PREDETERMINED TIME PERIOD ?
NO
YES
4
PERFORM ADDITIONAL MEASUREMENT OF CONCENTRATION LEVELS
8
EXCLUDE AMI
5
PREDICT INFARCT SIZE
6
ESTIMATE TIME AFTER ONSET OF INFARCTION
ASSESS/EXCLUDE MMD
9
END
END

1. A method for early detection of acute myocardial infarction (AMI) in a patient, comprising the steps of:
measuring, with a predetermined timing and at at least two different time instances occurring within 3 hours from admission of said patient, concentration levels of at least two biochemical markers of AMI in plasma of said patient, said at least two biochemical markers having different rates of appearance in said plasma at AMI;
generating an indication of AMI based on a first predetermined set of said concentration levels and first empirical data comprising concentration levels obtained from previous patients with AMI/non-AMI and a preclassification of the presence/absence of AMI in said previous patients by using a neural network structure trained with said first empirical data to detect marker-patterns of AMI; and
predicting the infarct size based on a second predetermined set of said concentration levels and second empirical data comprising concentration levels obtained from previous patients with different infarct sizes and a preclassification of the infarct sizes of said previous patients, whereby an early detection of AMI and an early infarct size prediction are obtained.

5,690,104
APPARATUS AND METHOD FOR MEASURING OXYGEN SATURATION IN BLOOD AND APPARATUS AND METHOD FOR MEASURING CONCENTRATION OF LIGHT-ABSORBING MATERIALS IN BLOOD

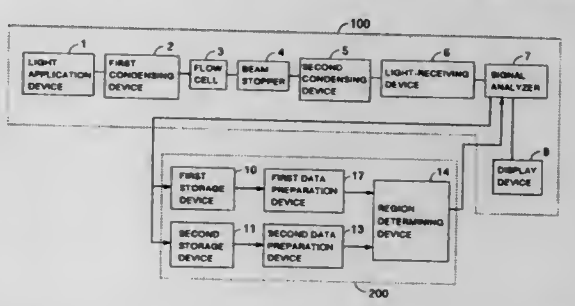
Michio Kanemoto; Naoki Kobayashi, and Takuo Aoyagi, all of Tokyo, Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan
Division of Ser. No. 458,656, Jun. 2, 1995. This application Jun. 10, 1996, Ser. No. 661,169
Claims priority, application Japan, Jun. 2, 1994, 6-121346
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 128—633 **4 Claims**


START
301
RECEIVE DATA AND LOGARITHMICALLY PROCESS
302
SWITCH ON ?
NO
YES
303
FORM FIRST REGRESSION LINE
304
RECEIVE DATA AND LOGARITHMICALLY PROCESS
305
FORM REGRESSION LINE AND FIND INTERSECTION OF PRESENT REGRESSION LINE AND FIRST REGRESSION LINE
306
DISPESION OF INTERSECTION WITHIN PREDETERMINED RANGE ?
NO
YES
307
FIND CENTER OF DISTRIBUTION OF INTERSECTIONS
308
FORM DYE DILUTION CURVE
END

1. An apparatus for measuring the concentration of light-absorbing materials in blood comprising:
light generating means for projecting light beams of two different wavelengths to a living body;
photo sensing means for receiving light beams transmitted through the living body and for converting received light beams into electrical signals;
regression line computing means for forming at least two regression lines for at least two periods, using values, at a plurality of time points, of said electrical signals output from said photo sensing means, wherein coordinates of points on said at least two regression lines refer to an ordinate and an abscissa which represent the magnitudes of said electrical signals;
bloodless level computing means for computing a bloodless level of said received light beams using intersections of extensions of said at least two regression lines;
absorbance calculating means for computing a blood absorbance of said received light beams of different wavelengths by using said bloodless level computed by said bloodless level computing means and said electrical signals; and
concentration computing means for computing the concentration of light absorbing materials in blood using said absorbance computed by said absorbance calculating means.

5,690,105
METHOD AND APPARATUS FOR DETERMINING A PARTICLE CRITERION AND PARTICLE ANALYZER USING THE CRITERION

Kimiyo Shibata, Kakogawa, and Yoshihiro Mishima, Kobe, both of Japan, assignors to Toa Medical Electronics Co., Ltd., Hyogo, Japan
Filed Jul. 3, 1996, Ser. No. 674,103
Claims priority, application Japan, Jul. 4, 1995, 7-168751
Int. Cl.^{6} A61B *5/000*
U.S. Cl. 128—637 **20 Claims**



9. A device for determining a particle criterion to set a judgement region as the particle criterion in a distribution data of particles of a specimen to be analyzed and to analyze the particles of the specimen based on particles which appear in the judgement region, comprising:
first storage means for storing each distribution data of a first specimen group which belongs to a first category;
second storage means for storing each distribution data of a second specimen group which belongs to a second category;
first data preparation means for preparing a first fundamental distribution data by accumulating each distribution data of the first specimen group;

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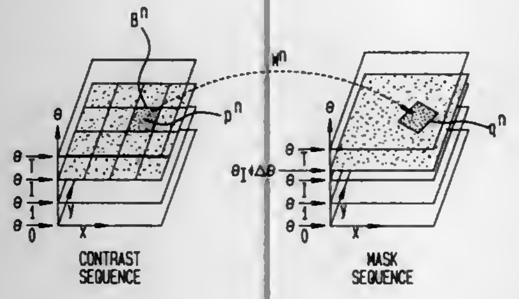
second data preparation means for preparing second fundamental distribution data by accumulating each distribution data of the second specimen group; and

region determining means for determining, as the particle criterion for the specimen to be analyzed, a region on the distribution data where peculiar particles exist in the first or second category by comparing the first fundamental distribution data with the second fundamental distribution data.

5,690,106
FLEXIBLE IMAGE REGISTRATION FOR ROTATIONAL ANGIOGRAPHY

Ali Reza Bani-Hashemi, Belle Mead, and Sumitro Samaddar, Plainsboro, both of N.J., assignors to Siemens Corporate Research, Inc., Princeton, N.J.
Filed Jun. 30, 1995, Ser. No. 491,325
Int. Cl.^{6} A61B ***6/00***
U.S. Cl. 128—653.1 **18 Claims**



1. A digital subtraction angiography method useful for rotational 2D imaging of a selected volume of a body, comprising the following steps:

acquiring first and second volumes of 2D data sets representative of a series of rotationally offset 2D images of substantially the same selected volume in the body, the first and second data sets being acquired at different times corresponding to a pre- and a post, respectively, application of a process to the body to differentially affect imaging characteristics of the selected volume;

determining common reference points for spatially corresponding sub-areas in each image of the series of rotationally offset 2D images in the first and second data sets;

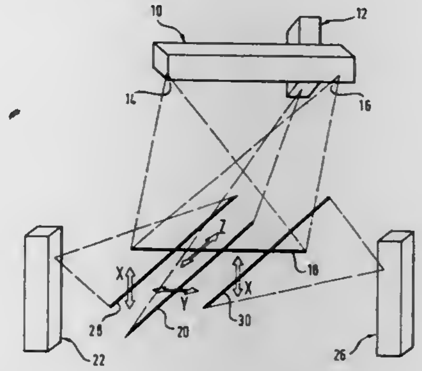
comparing in a 3D spatial manner data in sub-areas of the second data set with data in corresponding sub-areas in at least two of the rotationally offset 2D images of the first data set in order to determine a new reference point in each of the sub-areas of the first data set which results in a best match of the spatial similarity of the data in a corresponding sub-area of the second data set;

spatially interpolating new data for sub-areas of the first data set using the new reference points determined above and the originally acquired data of the first data set, thereby generating a new first data set for the selected volume; and

subtracting the new first data set from the second data set, thereby generating a subtraction data set representative of a series of 2D images of the selected volume in which the given portion is accentuated.

5,690,107
METHOD FOR POSITIONING AND MARKING A PATIENT AT A DIAGNOSTIC APPARATUS

Karsten Hofmann, Bleckede, Germany, assignor to Lap GmbH Laser Applikationen, Luneberg, Germany
Filed Apr. 24, 1996, Ser. No. 637,229
Claims priority, application Germany, Jul. 8, 1995, 195 24 951.8
Int. Cl.^{6} A61B ***6/00***
U.S. Cl. 128—653.1 **5 Claims**



1. A method of marking a patient for a radiation treatment of a zone of said patient, said treatment using a radiation source having a focus, a selectable angle of divergence and an isocenter about which said radiation source can be rotated in a vertical plane, with said focus thus describing a circle, with said method including the following steps:

determining the coordinates of the location and extension of said radiation zone of said patient by means of a computer tomograph;

selecting the direction of said radiation with respect to the body of said patient and said divergent angle;

positioning said patient such that said center of said radiation zone coincides with said isocenter;

generating a first laser beam by a line laser which is vertically displaceable and rotatable about a horizontal axis, said line laser being adjusted such that said laser beam intersects said focus and is tangent to said radiation zone on one side;

marking the line thus projected on the skin of said patient;

projecting a second laser beam by said line laser or a second line laser such that its beam intersects said focus and is tangent to said radiation zone on the opposite side; and

marking the second line thus projected on said skin of said patient.

5,690,108
INTERVENTIONAL MEDICINE APPARATUS

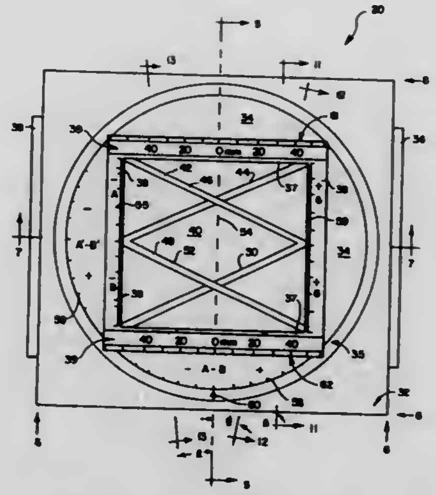
Donald W. Chakeres, 2274 Club Rd., Columbus, Ohio 43221
Continuation of Ser. No. 345,243, Nov. 28, 1994, abandoned. This application Feb. 21, 1997, Ser. No. 804,062
Int. Cl.^{6} A61B ***5/05***
U.S. Cl. 128—653.1 **12 Claims**

1. Apparatus for utilization in a medical procedure that also involves the use of medical imaging equipment having a cross-sectional imaging plane and a monitor which displays a patient cross-sectional image currently being taken at the equipment cross-sectional imaging plane, and comprising:

an apparatus base member adapted to be placed in a position that is stationary relative to a patient's body target of interest and that intersects the medical imaging equipment cross-sectional imaging plane;

an apparatus frame member being supported by and rotatable about a substantially vertical axis relative to said apparatus base member;

a reference pattern carried by said apparatus frame member, having a principal axis and having pattern elements comprised of a material and size for placement and imaging at the medical imaging equipment cross-sectional imaging plane and visibly displayed in cross-section on the medical imaging equipment monitor to provide linear measurements proportionally indicating on the medical imaging equipment monitor an angular position and separation distance of said reference pattern principal axis relative to the medical imaging equipment cross-sectional imaging plane;

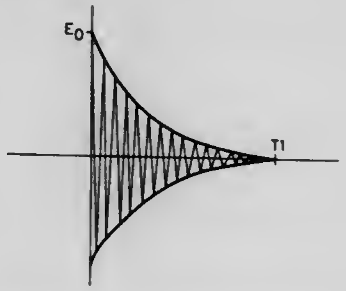


a graduated angular position scale affixed to one of said apparatus base member and said apparatus frame member; and

a position indicator element co-operating with said graduated angular position scale and affixed to the other of said apparatus base member and said apparatus frame member to indicate an angular position of said frame member.

5,690,109
METHOD OF DESTRUCTIVE, NONINVASIVE HYPERPYREXIA OF TISSUES AND ORGANISMS UTILIZING NUCLEAR MAGNETIC RESONANCE

Rakesh Govind, 10409 Stone Ct., Cincinnati, Ohio 45242, and Robert G. Loomis, 5500 Cody Rd., Independence, Ky. 41051
Filed Jun. 23, 1995, Ser. No. 493,924
Int. Cl.^{6} A61B ***5/055;17/39***
U.S. Cl. 128—653.2 **16 Claims**



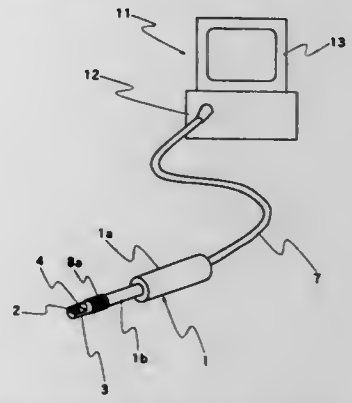
1. A method of selectively heating targeted cells within a specimen, comprising the steps of:

(a) determining at least one combination of magnetic field strength and radio wave frequency (strength-frequency combination) at which said targeted cells will resonate when said magnetic field and said electromagnetic radiation are applied to said specimen orthogonal to one another; and

(b) applying a magnetic field and a radio frequency wave to said targeted cells, the strength of said magnetic field and the frequency of said radio wave corresponding to said strength-frequency combination to said targeted cells, in order to cause nuclear magnetic resonance in said targeted cells, thereby increasing the temperature of said targeted cells.

5,690,110
ULTRASOUND SCANNER HEAD

Toshizumi Tanaka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed Feb. 14, 1996, Ser. No. 601,506
Claims priority, application Japan, Feb. 17, 1995, 7-052035
Int. Cl.^{6} A61B ***8/00***
U.S. Cl. 128—660.1 **10 Claims**



1. An mechanical scan type ultrasound scanner head for ultrasound examination systems, said scanner head comprising:

an ultrasound scanner head assembly movable along a subject to be ultrasonically scanned;

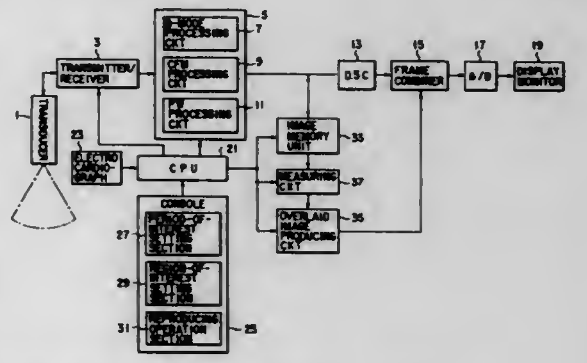
an ultrasound transducer element mounted on said ultrasound scanner head assembly to transmit and receive ultrasound signals at predetermined intervals while said scanner head assembly is moved along said subject for a scanning operation;

a rotary tracking member mounted on said scanner head assembly in the proximity of said ultrasound transducer element for rotation about an axis fixed relative to and at a rate commensurate with the distance of movement of said ultrasound transducer element; and

a position measuring means connected to said rotary tracking member to measure the distance of travel of said ultrasound transducer element from an initial position of a scanning operation by way of rotational angle of said rotary tracking member.

5,690,111
ULTRASOUND DIAGNOSTIC APPARATUS

Hiroyuki Tsujino, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 19, 1995, Ser. No. 574,695
Claims priority, application Japan, Dec. 27, 1994, 6-325568
Int. Cl.^{6} A61B ***8/06***
U.S. Cl. 128—660.04 **9 Claims**



1. An ultrasound diagnostic apparatus comprising:

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means for repeatedly scanning a plane section of a human body under examination by ultrasound waves with a given cycle to thereby obtain receiving signals;

ultrasonic image producing means responsive to said receiving signals for successively producing ultrasonic images with said given cycle;

storing means for storing ultrasonic images with time information;

setting means for setting a period of interest;

readout means connected to said setting means responsive to said set period of interest for sequentially and selectively reading ultrasonic images which are a part of said stored ultrasonic images corresponding to said period of interest from said storing means with said given cycle so that said read ultrasonic images are repeatedly displayed as moving images;

overlaid image producing means for producing an overlaid image containing an ROI marker and repeatedly outputting said overlaid image with said given cycle;

combining means connected to said storing means and said overlaid image producing means for combining each of said ultrasonic images corresponding to said period of interest and said overlaid image for said period of interest;

displaying means for displaying said ultrasonic images combined with said overlaid image as moving images;

position changing means for changing the position of said ROI marker in said overlaid image so that said ROI marker will shift on said moving images; and

measuring means for obtaining measured values in the position of said ROI marker.

5,690,112

Patent Not Issued For This Number

5,690,113

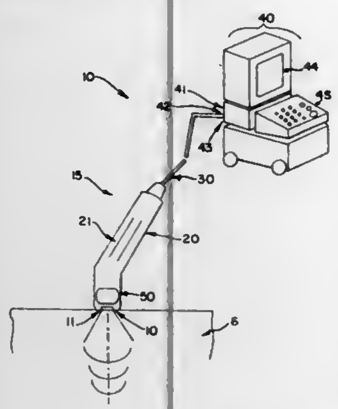
METHOD AND APPARATUS FOR TWO DIMENSIONAL ULTRASONIC IMAGING

John William Sliwa, Jr., Los Altos, and Stacey T. Baba, Saratoga, both of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed Jun. 14, 1996, Ser. No. 664,126

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—660.07 **16 Claims**



1. A non-real time ultrasonic imaging system for scanning a body the system comprising:

an untethered probe adapted for use on the exterior surface of the body and having an ultrasonic transducer, capable of transmitting signals and receiving signals along a scanline, wherein the scanline is fixed in orientation and unmovable with respect to the untethered probe;

ultrasound electronic in communication with the probe, the ultrasound electronics transmitting signals and receiving signals from the probe;

means on the probe for sensing position information relating to the scanline; and

means in communication with the sensing means and coupled to the electronics for computing the spatial position and the orientation of the scanline relative to a coordinate system and transmitting the scanline orientation and spatial position to the electronics wherein the electronics identifies each scanline by a unique spatial address;

a memory coupled to the electronics for storing the addressed scanlines;

a display coupled to the memory and electronics for displaying an image generated by the electronics from the addressed scanlines, wherein the movement of the probe results in the accumulation of multiple spatially addressed scanlines displayable as an image in a scanplane.

5,690,114

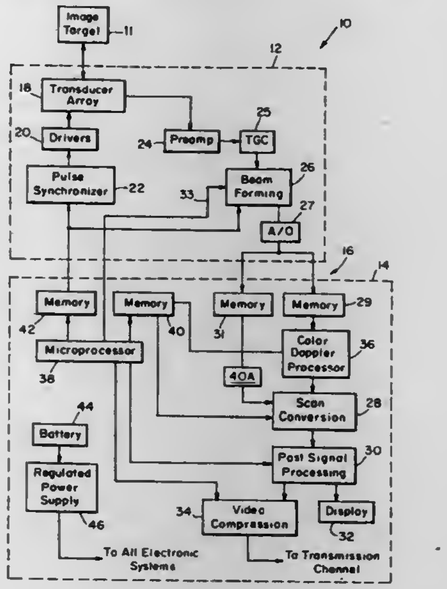
PORTABLE ULTRASOUND IMAGING SYSTEM

Alice M. Chiang, Weston, and Steven R. Broadstone, Woburn, both of Mass., assignors to TeraTech Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 496,804, Jun. 29, 1995. This application Feb. 12, 1996, Ser. No. 599,816

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—661.01 **55 Claims**



1. An ultrasound imaging system comprising:

an array of ultrasonic transducers that receives reflected ultrasonic signals from a region of interest, the transducers converting the received ultrasonic signals into electrical signals; and

beam forming circuitry that receives the electrical signals, said beam forming circuitry comprising:

- a programmable sample selection circuit for each transducer, said sample selection circuit controlling sampling of the electrical signals such that each electrical signal is sampled during one of plural preset timing windows,
- a delay circuit electrically connected to the programmable sample selection circuit that delays a sampled electrical signal from the sample selection circuit; and
- a control circuit connected to the programmable sample selection circuit and the delay circuit such that the sampled electrical signals can be used to generate an electrical representation of the region of interest.

5,690,115

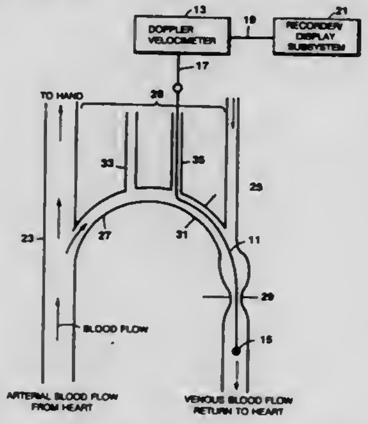
DETECTING VASCULAR STENOSIS IN CHRONIC HEMODIALYSIS PATIENTS

Charles L. Feldman, 233 Maynard Rd., Framingham, Mass. 01701; Kenneth Kleinman, 4334 Jubilo Dr., Tarzana, Calif. 91356, and Thomas Shook, 404 S. Irving Blvd., Los Angeles, Calif. 90020

Filed Sep. 21, 1995, Ser. No. 531,940

Int. Cl.^{6} A61B *8/06*

U.S. Cl. 128—661.08 **45 Claims**


13
DOPPLER VELOCIMETER
19
21
RECORDER/ DISPLAY SUBSYSTEM
17
TO HAND
38
33
35
25
23
27
31
11
29
BLOOD FLOW
15
ARTERIAL BLOOD FLOW FROM HEART
VENOUS BLOOD FLOW RETURN TO HEART

1. A method of detecting an occlusion in a blood conduit of a hemodialysis patient comprising:

inserting a velocity detector into an examined blood conduit at a selected site;

measuring velocity of the blood flow in a first region of the examined blood conduit;

moving said velocity detector to a second region of the examined blood conduit;

measuring velocity of the blood flow in at least a second region of the examined blood conduit;

and comparing the velocities measured in the different regions to obtain an indication of an occlusion in said blood conduit.

5,690,116

METHOD FOR AUTOMATIC MEASUREMENT OF THE DOPPLER ANGLE AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Antoine Goujon, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

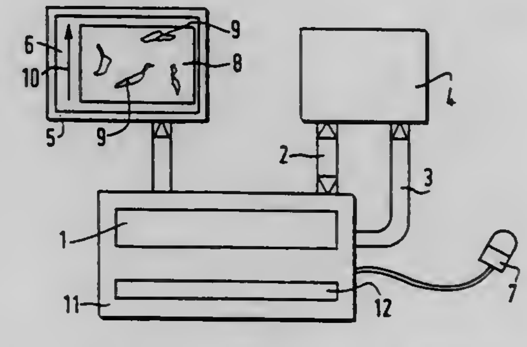
PCT No. PCT/IB95/01055, § 371 Date Aug. 6, 1996, § 102(e) Date Aug. 6, 1996, PCT Pub. No. WO96/17549, PCT Pub. Date Jun. 13, 1996

PCT Filed Nov. 24, 1995, Ser. No. 687,473

Claims priority, application France, Dec. 7, 1994, 94 14729; European Pat. Off., Nov. 10, 1995, 95203071

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—661.08 **11 Claims**



1. A method for automatic determination of Doppler angle DA, enclosed by the direction of an echographic excitation and the axis of a relevant blood vessel in an ultrasonic echographic grey-level image, on the basis of prior designation of an initial point situated in the vicinity of the axis of the relevant vessel, comprising the following steps:

a) first isotropic tracing of rays from said initial point which traverse the entire echographic image and forming a histogram of grey levels of selected points which are regularly distributed along said rays,

b) applying an image processing algorithm to said histogram in order to classify the grey levels of said selected points into at least two classes CL_1, CL_2, . . . , two adjacent classes being separated by thresholds T_1, T_2, . . . , expressed in grey levels, one of the classes CL_i, bounded by a lower threshold T_{i-1}, being representative of walls of blood vessels in said image,

c) second tracing of rays from said initial point, during which the grey level of each point of each ray is compared with the threshold T_{i-1} and each ray is restricted to the first end point PI encountered whose grey level is equal to or higher than T_{i-1}, and producing a representation of said relevant blood vessel in the form of a first local mark which is composed of triangular sectors which have said starting point within said first local mark in common,

d) determining a slope (a) of the regression line of said first local mark by applying a linear regression method to the N pixels, having the coordinates x(n) and y(n) of said first local mark, as:

$$a = \frac{N(S)x(n)y(n) - (S)x(n)(S)y(n)}{N(S)x(n)x(n) - (S)x(n)(S)x(n)}$$

where:

$$(S) = \sum_{n=1}^{n=N}$$

e) and calculating a Doppler angle as:

DA=Arc tg (a).

5,690,117

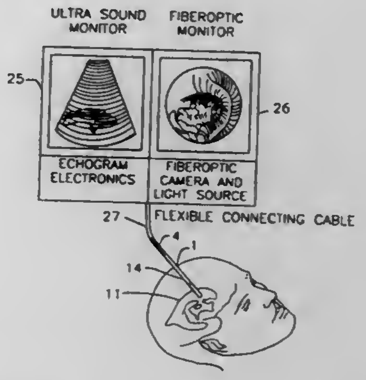
ULTRASONIC-FIBEROPTIC IMAGING VENTRICULAR CATHETER

John W. Gilbert, 898 McMeekin Pl., Lexington, Ky. 40502

Filed Mar. 20, 1995, Ser. No. 407,464

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—662.06 **15 Claims**



1. A surgical apparatus, comprising:

a) a catheter having a proximal end and a distal end and provided with a longitudinal bore therethrough;

b) a stylet having a proximal end and a distal end and provided with a longitudinal bore therethrough, said stylet sized and adapted for selective disposal within said longitudinal bore of said catheter;

c) an ultrasonic imaging means disposed within said longitudinal bore of said stylet; and

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d) a fiberoptic imaging means disposed within said longitudinal bore of said stylet.

5,690,118

METHOD AND APPARATUS FOR CORRECTING NON-PHYSIOLOGICAL VARIATIONS IN ECG SIGNALS

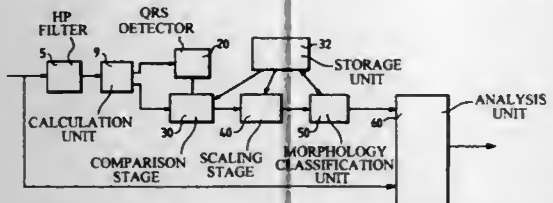
Leif Sörnmo, Lund; Peter Karlsson, and Lena Lundström, both of Stockholm, all of Sweden, assignors to Siemens Elema AB, Solna, Sweden

Filed Aug. 28, 1996, Ser. No. 704,108

Claims priority, application Sweden, Sep. 1, 1995, 9503019

Int. Cl.^{6} A61B *5/0402*

U.S. Cl. 128—696 **23 Claims**



1. A method for correcting for non-physiological variations in ECG signals, comprising the steps of:

(a) recording ECG signals from a patient using a plurality p of electrodes over successive heartbeats to obtain an ECG signal for each heartbeat of said successive heartbeats;
(b) conditioning and digitizing at least a portion of each of said ECG signals to obtain m signal samples;
(c) storing said signal samples in an m×p measuring matrix;
(d) providing a predetermined reference matrix; and
(e) minimizing a difference between said measuring matrix and said predetermined reference matrix by performing at least one matrix operation on said measuring matrix selected from the group of matrix operations consisting of translation, time synchronization, rotation and scaling, to obtain a corrected matrix.

5,690,119

METHOD AND SYSTEM FOR MEASURING HEARTBEAT RATE USING TELEMETRIC DATA TRANSMISSION

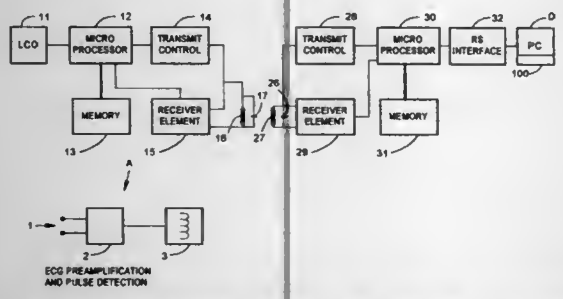
Pekka Rytky, Oulu; Erkki Loponen, Ruukki, and Tapani Lähdesmäki, Oulu, all of Finland, assignors to Polar Electro Oy, Kempele, Finland

Filed May 30, 1996, Ser. No. 652,713

Claims priority, application Finland, May 31, 1995, 952657

Int. Cl.^{6} A61N *5/04*

U.S. Cl. 128—706 **30 Claims**



1. A method for measuring heartbeat rate using two-way inductive data transmission, said method comprising the steps of:

(a) measuring a heartbeat rate signal from an object to be measured by using a means for detecting, storing and transmitting said heartbeat rate signal;
(b) storing heartbeat data, corresponding to said heartbeat rate signal, within said means for detecting, storing and transmitting said heartbeat rate signal;
(c) transferring said heartbeat data by inductive coupling from said means for detecting, storing and transferring said heartbeat rate signal to a data transfer unit;
(d) transferring said heartbeat data from said data transfer unit to a data processing unit; and
(e) prior to step (a), transferring data comprising at least one setting parameter from said data processing unit to said means for detecting, storing and transmitting said heartbeat rate signal, through said data transfer unit, by inductive coupling between said data transfer unit and said means for detecting, storing and transmitting said heartbeat rate signal.

5,690,120

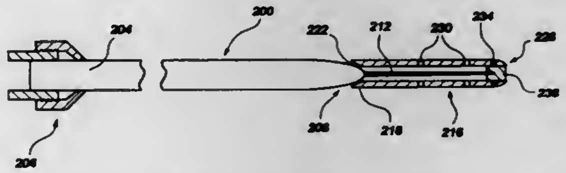
HYBRID CATHETER GUIDE WIRE APPARATUS

Stephen C. Jacobsen; Clark Davis, and John Lippert, all of salt Lake City, Utah, assignors to Sarcos, Inc., Salt Lake City, Utah

Filed May 24, 1996, Ser. No. 653,199

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—772 **21 Claims**



1. A hybrid catheter guide wire for introduction into a vessel pathway to guide a catheter to a predetermined location, comprising a thin elongate solid body of material having a sloping portion which tapers to a narrow section having a thinner distal termination, and a thin elongate tubular body of material attached co-linearly to the distal end of the solid body and which abuts but is not attached to the sloping portion such that a hollow is formed between the tubular body and the narrow section, at least some portion of the tubular body having greater lateral flexibility than the solid body.

5,690,121

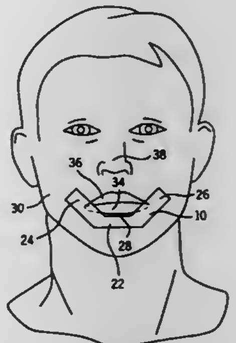
CLEARING NASAL PASSAGE PRODUCT

Dale D. Miller, 4801 Indigo Dr., Wausau, Wis. 54401

Filed Nov. 28, 1995, Ser. No. 563,653

Int. Cl.^{6} A61F *11/00*

U.S. Cl. 128—858 **10 Claims**



1. A clearing nasal passage product made of a flexible sheet having a hypo-allergenic adhesive back, the product comprising:

a chin support portion having a first end and a second end;
a first cheek attachment portion extending generally upward from the first end of the chin support portion; and
a second check attachment portion extending generally upward from the second end of the chin support portion;
wherein the product is sized so that the chin support portion fits on a user's face underneath the user's mouth when the product is adhered to the user's face, the first and second cheek attachment portions adhere to the user's face at locations higher than the user's mouth, an upper edge of the chin support portion supports a user's lower lip to help keep the user's mouth naturally closed when the user is sleeping, and an area above the upper edge of the chin support portion and between the first cheek attachment portion and the second cheek attachment portion is completely open so that the product does not substantially cover the user's mouth.

5,690,122

ABDOMINAL BELT

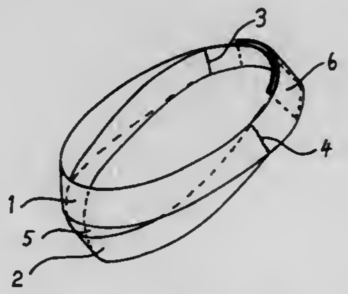
Georg Weber-Unger, Kufstein, Austria, assignor to Anita International Dr. Helbig GmbH & Co. KG, Brannenburg, Germany

Filed Oct. 16, 1996, Ser. No. 732,144

Claims priority, application Germany, Oct. 19, 1995, 195 40 234.0

Int. Cl.^{6} A61F *5/37*

U.S. Cl. 128—876 **7 Claims**



1. An abdominal belt having two elastic supporting straps extending substantially over the abdominal region of a user, and releasable connecting means in the region of the back of a user; said two supporting straps extending in a substantially longitudinal direction and being arranged to overlap in an imbricated manner substantially in the abdominal region of said user; and wherein upper and lower borders respectively, of two of said supporting straps (1, 2) successively oriented relative to each other, are connected to each other by a longitudinally and transversely extending elastic fabric bridge (5).

5,690,123

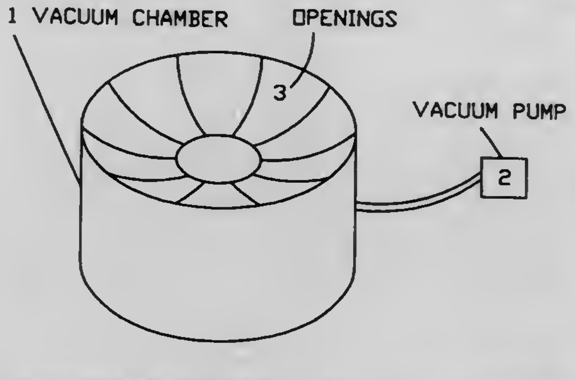
METHOD OF ALTERING THE SHAPE OF THE CORNEA

Antonio Medina, P.O. Box 2355, Costa Mesa, Calif. 92628

Filed Jul. 15, 1996, Ser. No. 680,497

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 128—898 **1 Claim**



1. A method for altering the shape of the cornea, comprising the steps of:

placing the openings of a vacuum chamber in contact with the surface of the cornea of the eye;
applying a vacuum to said vacuum chamber, said vacuum being of such pressure to exert a force towards said vacuum chamber on the portion of the cornea placed on said openings, said force causing stress and strain of said portion of the cornea, with said strain being beyond the elastic range of the cornea;
holding said vacuum for a length of time such that the cornea extends beyond its elastic range in said openings under the force exerted by said vacuum.

5,690,124

Patent Not Issued For This Number

5,690,125

APPARATUS FOR IMPARTING COMBINED SIDEWISE AND ROTARY MOVEMENTS TO RECEPTACLES FOR ROD-SHAPED SMOKERS' PRODUCTS

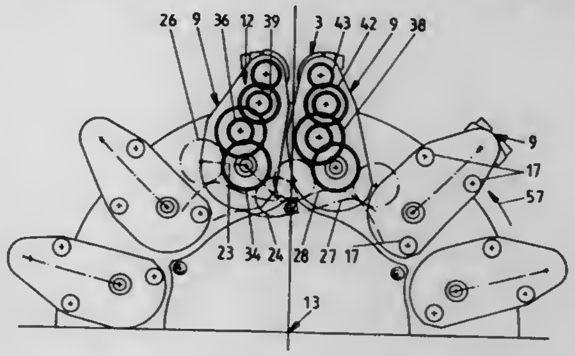
Helmut Niemann, Ahrensburg, and Nikolaus Häusler, Wohltorf, both of Germany, assignors to Hauni Maschinenbau AG, Hamburg, Germany

Filed Aug. 28, 1996, Ser. No. 704,366

Claims priority, application Germany, Sep. 7, 1995, 195 32 943.0

Int. Cl.^{6} A24C *5/60*

U.S. Cl. 131—281 **20 Claims**



1. Apparatus for manipulating receptacles for elongated rod-shaped articles of the tobacco processing industry during transport of receptacles at an article treating station, comprising means for conveying the receptacles in a predetermined direction along an arcuate path at least substantially transversely of the elongated articles in the receptacles; means for temporarily moving the receptacles relative to the means for conveying counter to said direction at said station; and means for rotating the receptacles about longitudinal axes of the receptacles at least during temporary movement of the receptacles relative to said means for conveying.

5,690,126

TOBACCO FILTER MATERIALS AND TOBACCO FILTER AS PRODUCED BY USING THE SAME

Hiroyuki Matsumura, and Tohru Shibata, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 17, 1996, Ser. No. 733,704

Claims priority, application Japan, Oct. 20, 1995, 7-297382

Int. Cl.^{6} B29C *44/22*

U.S. Cl. 131—343 **18 Claims**

1. A tobacco filter material in the form of a sheet having a web structure, which comprises (1) a cellulose ester short staple and (2) a binder fiber selected from the group consisting of polysaccharides or derivatives thereof and biodegradable polymers, and having a binding property with respect to said short staple.

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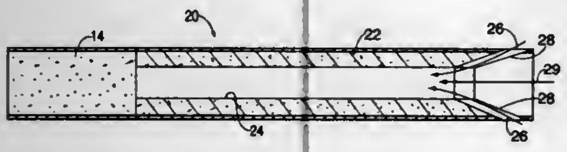
5,690,127
HOLLOW CIGARETTE

John J. Chapman, and David R. Smart, Jr., both of Greensboro, N.C., assignors to Lorillard Tobacco Company, New York, N.Y.

Continuation-in-part of Ser. No. 281,909, Jul. 28, 1994, abandoned. This application Apr. 10, 1996, Ser. No. 630,550

Int. Cl.^{6} A24B *15/28*

U.S. Cl. 131—364 **17 Claims**



1. A hollow cigarette comprising a combustible rod comprised of tobacco particles and a binder, said rod having opposite ends, wherein one of said opposite ends is intended to be lit, wherein said rod has an annular wall defining a hollow passage extending therethrough to allow air to enter said one end and air and smoke pass freely through said hollow passage and out the opposite end, wherein said rod has an external diameter in the range of 5–10 mm, wherein said hollow passage has a diameter in the range of 0.5–6.5 mm, and wherein said rod has a density less than 0.6 g/cc such that the lit end burns in the shape of an inverted, concave fire cone, thereby creating a high temperature at the entrance to said hollow passage, such that incomplete combustion products are re-burned as they enter the hollow passage, thereby enhancing the combustion process.

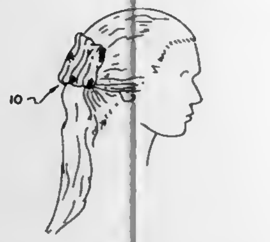
5,690,128
DECORATIVE HAIR STYLING AND RETAINING ACCESSORY

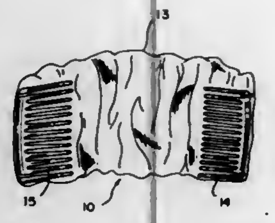
Kristina M. Grimes, 12720 Dulcinea Pl., Lakeridge, Va. 22192

Filed Jul. 30, 1996, Ser. No. 688,411

Int. Cl.^{6} A45D *24/04*

U.S. Cl. 132—128 **5 Claims**





1. A decorative hair styling and retaining accessory, comprising;
a pair of elongate, spaced apart elastic bands having opposite ends;
a decorative cover enclosing the elastic bands and capable of expanding and contracting with the elastic bands;
a pair of combs each having opposite side edges removably attached to respective opposite ends of the elastic bands, whereby the hair of the wearer may be gathered in a desired style and the combs inserted into the wearer's hair in opposed relationship toward one another on opposite sides of the gathered hair, with the elastic bands and decorative cover extending across the gathered hair to hoist it in place and to provide a decorative accessory; and
the opposite ends of the elastic bands formed into loops and an end-most tooth at each side edge of each comb received in the loops of the respective elastic bands to releasably hold the combs to the elastic bands.

5,690,129
TREATING HAIR WITH QUATERNIZED AMINOALKYL DIMETHYL POLYSILOXANE/POLYETHYL OXAZOLINE

Elnhard Bünning, Seeheim-Jugenheim, Germany, assignor to Goldwell GmbH, Germany

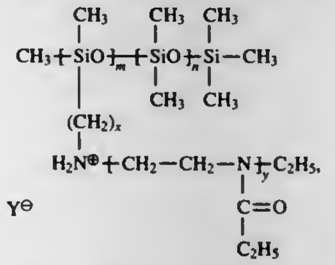
Division of Ser. No. 503,974, Jul. 19, 1995, Pat. No. 5,618,525. This application Jan. 29, 1997, Ser. No. 790,960

Claims priority, application Germany, Jul. 28, 1994, 44 26 794.0

Int. Cl.^{6} A61K *7/075*

U.S. Cl. 132—200 **1 Claim**

1. Method for treating split hair ends comprising the step of applying to split hair ends a quaternized aminoalkyl dimethyl polysiloxane/polyethyl oxazoline copolymer of the formula



$$\mathrm{CH_3}\left[\underset{\substack{|\\(\mathrm{CH_2})_x\\|\\ \mathrm{H_2N^{\oplus}}\left[\mathrm{CH_2-CH_2-}\underset{\substack{|\\ \mathrm{C=O}\\|\\ \mathrm{C_2H_5}}}{\mathrm{N}}\right]_y\mathrm{C_2H_5},}}{\overset{\substack{\mathrm{CH_3}\\|}}{\mathrm{SiO}}}\right]_m\left[\underset{\substack{|\\ \mathrm{CH_3}}}{\overset{\substack{\mathrm{CH_3}\\|}}{\mathrm{SiO}}}\right]_n\underset{\substack{|\\ \mathrm{CH_3}}}{\overset{\substack{\mathrm{CH_3}\\|}}{\mathrm{Si}}}-\mathrm{CH_3}\qquad \mathrm{Y^{\ominus}}$$

wherein m and n each stand for integers of from 20 and 10,00, x is a number between 1 and 5, and y is a number from 5 to 500, Y^{63} being an anion, incorporated in at least one solvent.

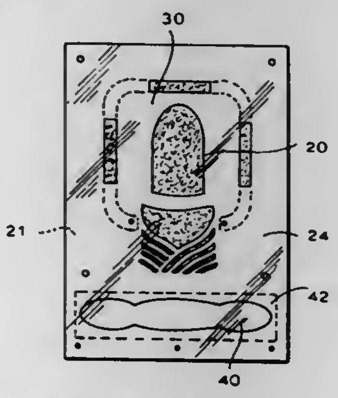
5,690,130
COSMETIC SAMPLER WITH INTEGRAL APPLICATOR

Anthony J. Gunderman, Phoenix; David Moir, Annapolis, both of Md., and Robert M. O'Connell, deceased, late of Belle Mead, N.J., by Jo O'Connell, executrix, assignors to Color Prelude Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 857,993, Mar. 26, 1992, which is a continuation-in-part of Ser. No. 306,394, Feb. 6, 1989, Pat. No. 5,192,386, which is a division of Ser. No. 199,175, May 26, 1988, Pat. No. 4,848,378, which is a division of Ser. No. 875,172, Jun. 17, 1986, Pat. No. 4,751,934. This application Jan. 20, 1995, Ser. No. 375,739

Int. Cl.^{6} A45D *34/00*

U.S. Cl. 132—319 **40 Claims**



1. A cosmetic sampler, comprising:
a base having an upper surface;
a unit dose of cosmetic screen printed on the upper surface of said base at a first location; and
an integral applicator for sampling said screen printed unit dose of cosmetic, said applicator being die-cut in a desired shape and disposed on the upper surface of said base at a second location different from said first location.

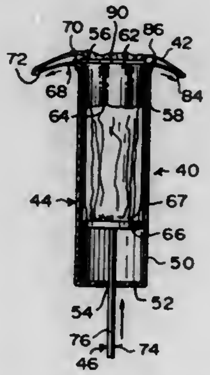
5,690,131
UMBRELLA

Bernard Volgt, 15 High St., Hicksville, N.Y. 11801

Filed May 28, 1996, Ser. No. 654,228

Int. Cl.^{6} A45B *13/00*

U.S. Cl. 135—19.5 **26 Claims**



1. An improved hand-held umbrella which comprises:
a) a fabric canopy;
b) a central shank assembly having:
  i) an outer tube having a closed bottom end with a central aperture therethrough and an open top end; and
  ii) an inner tube having a closed bottom end with a central aperture therethrough, an open top end and a plurality of longitudinal slots radially spaced thereabout, said inner tube being smaller in diameter than said outer tube; and
c) means for deploying said fabric canopy from and retracting said fabric canopy into the top of said central shank assembly.

5,690,132
CATCH-FREE SAFETY UMBRELLA

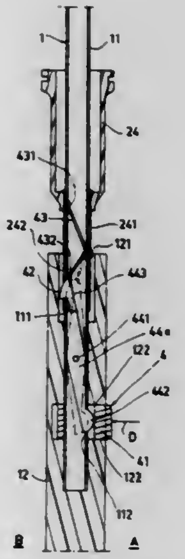
Chung-Kuang Lin, and Jung-Jen Chang, both of Taipei Hsien, Taiwan, assignors to Fu Tai Umbrella Works, Ltd., Taipel Hsein, Taiwan

Filed Dec. 26, 1996, Ser. No. 773,115

Int. Cl.^{6} A45B *25/14*

U.S. Cl. 135—24 **1 Claim**

1. A safety umbrella comprising:
a central shaft having a grip formed on a hollow lower tube of the central shaft, said grip having a central hole formed in an upper central portion of said grip;
a rib means for securing an umbrella cloth thereon having a runner of the rib means slidably held on said central shaft; and
a control means formed in the grip for controlling the opening or closing of the umbrella;
the improvement which comprises:
said runner including an extending sleeve protruding downwardly from said runner having a latch hole formed in the extending sleeve; and
said control means including: a push button slidably held in a button hole transversely formed in the grip adjacent to a first side of the grip; a latch resiliently held in said lower tube of the central shaft to normally resiliently protrude outwardly through an inner latch hole formed in the lower tube to be confined in the central hole within the grip towards the second side of the grip opposite to the first side of the grip; a restoring spring resiliently retained in the lower tube for normally urging the latch outwardly for engaging the latch hole formed in the extending sleeve of the lower runner when folding the umbrella by lowering the extending sleeve of the lower runner into the central hole of the grip; and a transmission member seesawly pivotally mounted in the lower tube by a pivot having a depression end formed on a lower end of the transmission member and protruding towards the first side of the grip to be opposite to the latch end and to be normally contacted with the push button, and having a latch end formed on an upper end of the transmission member to connect the latch, with the latch and the latch end of the transmission member normally resiliently urged by the restoring spring to protrude the latch outwardly towards the second side of the grip and to seesawly bias the depression end formed on the lower end of the transmission member outwardly towards the first side of the grip to simultaneously urge the push button outwardly beyond the button hole of the grip, ready for a depression by an umbrella user for opening the umbrella from a folded or closed umbrella.



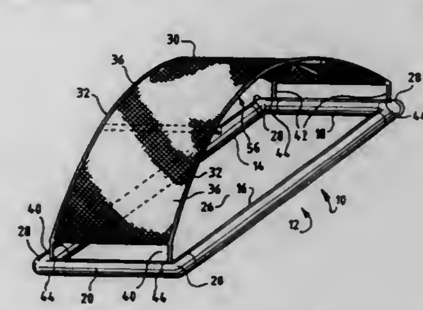
5,690,133
FLOATING SUN SHIELD

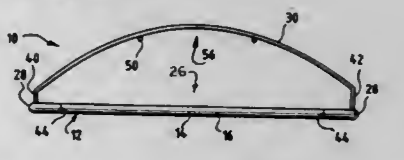
Bruce Capwell, 5555 Flat River Rd., Greene, R.I. 02827

Filed Oct. 23, 1996, Ser. No. 731,962

Int. Cl.^{6} A45B *23/00*

U.S. Cl. 135—124 **21 Claims**





1. A floating sun shield apparatus comprising:
a frame having a longitudinal axis and a transverse axis, at least a portion of the frame formed from rigid hollow members;
the frame having a perimeter defining a throughway providing an unobstructed open area within the perimeter to create a user area within;

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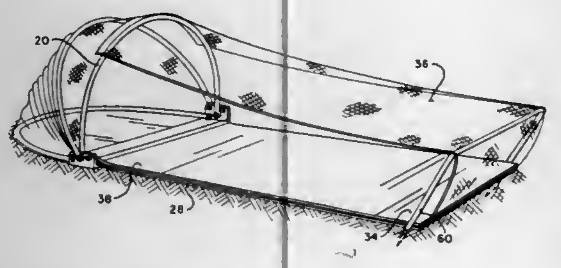
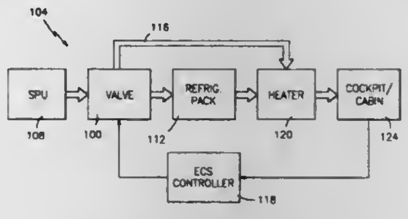
a canopy operatively coupled to the frame and disposed over the user area, the canopy configured to substantially block sunlight from the user area;
canopy support rods releasably attached to the frame at opposite ends of the frame, the support rods configured to support the canopy over the user area;
the canopy having sides configured to engage the canopy support rods; and
the frame configured to be buoyant in water such that the frame maintains the canopy over the user area when the frame is placed in water.

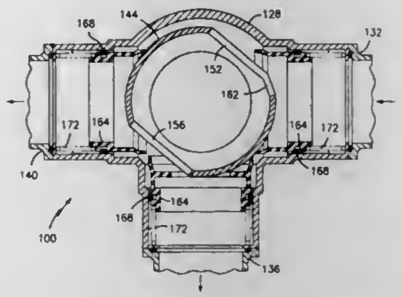
5,690,134
PORTABLE SUNSHADE CANOPY
William E. McCauley, 2121 Valderas Dr., No. 41, Glendale, Calif. 91208
Filed Dec. 23, 1996, Ser. No. 772,973
Int. Cl.^{6} E04H ***15/44***
U.S. Cl. 135—133 **13 Claims**



1. Portable sunshade apparatus for ground-based deployment, comprising:
a first strip of a flexible material that is generally impermeable to water having first and second ends and a pair of opposite lateral edges;
a mounting base fixedly secured to the material strip inwardly of the strip first end and extending transversely of the strip lateral edges, said mounting base having first and second opposite ends;
a second strip of a flexible material permitting a portion of incident light to pass therethrough secured to the first strip second end and extending back over the first strip;
a length of a soft-to-the-touch material secured to the mounting base and extending over the second strip and underlying first strip;
first and second indexing plate means affixed respectively to the mounting base opposite ends;
a first element having two ends fixedly secured to the respective indexing plates and extending over the first strip adjacent the first strip first end;
second and third elements each having two opposite ends which are respectively pivotally connected to the indexing plate means, said second and third elements being so constructed that they can be selectively pivotally moved past each other from a first position where the second element is closer to the first mounting base to a second position where the third element is closer to the first mounting base;
means for interconnecting the first strip first end to the third element while said first strip slidingly contacting the second element; and
an extent of flexible material that will allow a predetermined portion of incident light to pass therethrough interconnecting the second and third elements.

5,690,135
DIVERTER VALVE WITH SHUTOFF FEATURE
John M. Dehais, Windsor, Conn., assignor to United Technologies Corporation, Windsor Locks, Conn.
Filed Feb. 6, 1996, Ser. No. 597,672
Int. Cl.^{6} F16K ***17/38***
U.S. Cl. 137—79 **15 Claims**

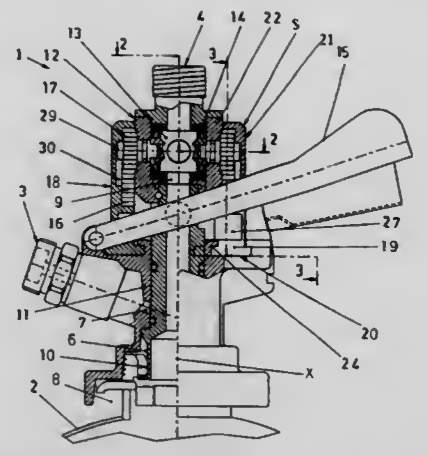




1. An environmental control system, comprising:
a. a source of air;
b. a refrigeration package for selectively cooling the air from the source of air;
c. a bypass line for transporting a selective portion of the air from the source of air around the refrigeration package;
d. a valve for selectively connecting, depending upon a position of a movable valve element in a sequence of a plurality of positions, wherein the valve element is in the form of a gate rotatable over an angular range of motion having a maximum range of 90°, the air from the source of air solely to the refrigeration pack when the valve element is in a first position in the sequence of positions, to both the refrigeration pack and the bypass line when the valve element is in a second position in the sequence of positions, to solely the bypass line when the valve element is in a third position in the sequence of positions, and to neither the refrigeration pack nor the bypass line when the valve element is in a fourth position in the sequence of positions; and
e a controller for monitoring an output temperature of air from the environmental control system and for controlling the position of the movable valve element in response thereto.

5,690,136
DEVICE FOR RAPID CONNECTING-UP OF PRESSURIZED CONTAINERS IN DRINKS DISPENSER PLANTS
Goffredo Celli, Coriano, Italy, assignor to Celli, S.p.A., Coriano, Italy
Filed May 31, 1996, Ser. No. 656,520
Claims priority, application European Pat. Off., May 31, 1995, 95830232
Int. Cl.^{6} B65D ***57/54;*** **F16K** ***31/54***
U.S. Cl. 137—212 **19 Claims**

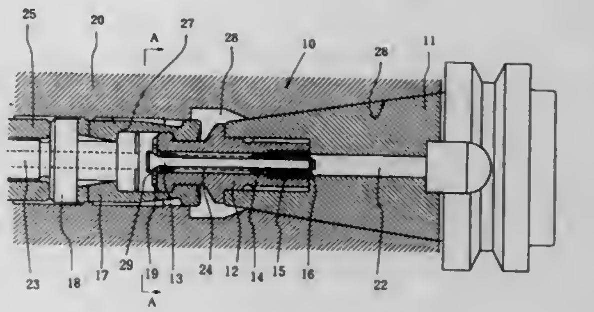
1. A device for rapid connecting-up of drink containers in drinks dispenser plants provided with a gas introduction line and a drink delivery line, comprising:
a body of a head of the device having a cavity defining a three-way passageway, a first passageway is connectable to the gas introduction line, a second passageway connectable to the container and a third passageway connectable to the drink delivery line;



a tubular element having a lateral wall and arranged in the cavity of the body such that the drink can flow from the second passageway into the third passageway while placing said lateral wall of said tubular element against the first passageway, said tubular element being associated with said cavity such as to be slidable along an axial direction thereof between a first and a second end run position, in one position the lateral wall prevents the introduction of a gas medium into a drink container, while in another position the gas can flow the second passageway and into the drink container, thereby forcing the drink from the drink container through the third passageway and into the drink delivery line;
a drink intercept valve including a valve seat and an obturator, which said obturator is provided within said cavity of said body and rotatable relative to said valve seat for preventing said drink from flowing between the third passageway and the delivery line, which obturator is connected with said tubular element;
a two-way command lever operatively connected with both said tubular element and said obturator;
at least one mechanical link for interconnection of said obturator with said tubular element, said mechanical link contained internally of said body and comprising at least two elements which are each kinematically interconnected so as to be reciprocally roto-translatable within a portion of said body adjacent the tubular element, said first element being arranged parallel to said axial direction of said tubular element, said second element being rotatable along said first element and enmeshed with said obturator within said body adjacent said tubular element so as to impress thereon a rotation of said obturator, which rotation is correlated with a movement of said tubular element and said first and second elements by the actuation of said command lever, whereby such actuation defines said end run positions.

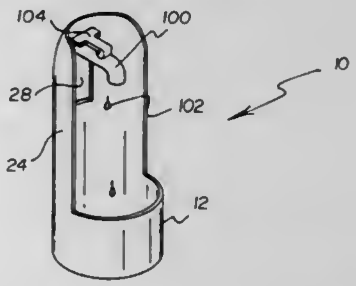
5,690,137
SPINDLE DEVICE
Shigeru Yamada, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Japan
Filed Jul. 31, 1996, Ser. No. 688,873
Claims priority, application Japan, Aug. 11, 1995, 7-226084
Int. Cl.^{6} B08B ***5/00;*** **B23B** ***27/10;*** **B23Q** ***3/12;11/12***
U.S. Cl. 137—240 **9 Claims**

1. A spindle device for supplying an air for cleaning and a coolant for cooling and lubricating, comprising:
a tool holder (**11**) having a coolant passage (**22**) through which a coolant is supplied;
a spindle (**10**) having a support portion (**26**) formed at a front end thereof for accepting the tool holder (**11**);
a drawing bolt (**25**) having a through-hole for supplying air and a coolant and movably arranged in the spindle (**10**) for clamping and unclamping the tool holder (**11**) accepted on the support portion (**26**) of the spindle (**10**);



a pull stud (**12**) attached on the tool holder (**11**), said pull stud comprising a valve seat; and
a valve (**13**) comprising a valve member cooperating with said valve seat, said valve member having a first flow passage, said valve seat having a second flow passage, said first and second flow passages forming a bypass to provide fluid communication from the through-hole to a discharge path between the tool holder and the spindle when said valve is temporarily closed by seating the valve member against the valve seat,
the valve (**13**) being located in association with the coolant passage (**22**) and the through-hole, the valve (**13**) being so constructed as to open and close according to the movement of the drawing bolt (**25**) in such a manner that the valve (**13**) opens so as to connect the through-hole to the coolant passage (**22**) when the tool holder (**11**) is clamped, and the valve (**13**) temporarily closes so as to shut the connection between the through-hole and the coolant passage (**22**) when the tool holder (**11**) is unclamped,
wherein a coolant can be supplied from the through-hole to the coolant passage (**22**) via the valve (**13**) when the tool holder (**11**) is clamped, and air can be supplied from the through-hole through said bypass and discharge path when the tool holder (**11**) is unclamped.

5,690,138
RECEPTACLE FOR A DRIPPING SPIGOT
Lawrence W. Fuller, 240 Mariposa Ave., Sierra Madre, Calif. 91024
Filed Oct. 11, 1996, Ser. No. 728,966
Int. Cl.^{6} F16K ***23/00;*** **B67D** ***1/16***
U.S. Cl. 137—312 **8 Claims**



1. A receptacle for a dripping spigot for catching spigot leakage to prevent damage to a table top and floors comprising, in combination:
a base member having an open upper end, a closed lower end and a cylindrical side wall therebetween, the closed lower end having a conical member integral with an inner surface at a central location thereof, the conical member extending upwardly to a height level with the open upper end, a base of the conical member having a diameter equal to a diameter of the closed lower end, the conical member serving to absorb splashing from leakage that would otherwise occur if contacting a flat surface;
a back splash member extending upwardly from the open upper end of the base member, the back splash member having an

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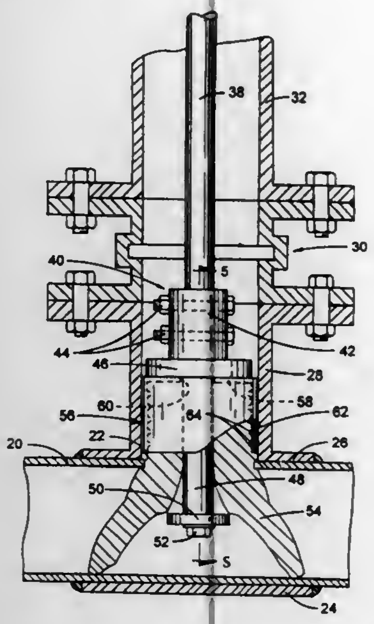
elongated and arcuate configuration, the back splash member having a radius of curvature greater than half of a radius of curvature of the open upper end of the base member;

a securement aperture formed through the back splash member downwardly of an upper end thereof, the securement aperture having a planar lower edge, opposed planar side edges and an arcuate upper edge, the securement aperture dimensioned for removably receiving a spigot therethrough for attachment of the receptacle to the spigot and freely extending therefrom and supported thereby to catch drips therefrom.

5,690,139
VALVE CONSTRUCTION

Kevin P. Murphy, 4 Carlisle Dr., Oak Brook, Ill. 60521; Garland Y. Smith, 605 Lakeside Dr., Hinsdale, Ill. 60521-5168, and Anthony S. Zummer, 135 S. LaSalle St., Chicago, Ill. 60603

Filed Jul. 1, 1996, Ser. No. 674,118
Int. Cl.^{6} F16K *43/00*; F16L *55/132*
U.S. Cl. 137—317 **20 Claims**



1. In a conduit stopper for use with a nozzle, said nozzle sealingly mounted on an elongated conduit, said conduit stopper selectively interrupting the flow of a fluid through the interior of the conduit, said conduit having an aperture communicating with the nozzle for receiving the conduit stopper, said conduit stopper having a linear actuator connected thereto, said conduit stopper including a plug holder connected to the linear actuator for movement of the plug holder within the nozzle, the improvement comprising a retainer cap connected to the plug holder moveable longitudinally within the nozzle, said retainer cap having a cylindrical sidewall within said nozzle and extending along a length therein toward said apertures, an elongated deformable sealing element having one end secured in the retainer cap and an opposite end positioned in the interior of the conduit for sealing engagement therewith to interrupt the flow of fluid through the conduit, said cylindrical sidewall having internally thereof means to secure the one end of the sealing element to the interior of the retainer cap, whereby deformation of said opposite end of the sealing element by fluid pressure in the conduit does not affect the retention of the one end of the sealing element in the cylindrical sidewall and in the nozzle to maintain a seal in the conduit and at the aperture to prevent leakage in the nozzle.

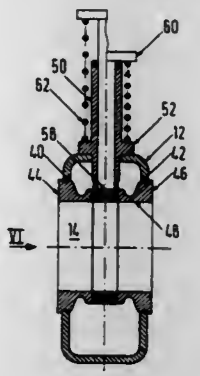
5,690,140
DISTRIBUTION ASSEMBLY FOR THE SELECTIVE CONNECTION OF FLUID LINES OF A FIRST GROUP OF LINES WITH FLUID LINES OF A SECOND GROUP OF LINES

Martin Skibowski, Blomeweg 20, D-22147 Hamburg, and Michael Jakubik, Hüllenkamp 146, D-22149 Hamburg, both of Germany

Filed Sep. 4, 1996, Ser. No. 707,371

Claims priority, application Germany, Sep. 7, 1995, 195 32 942.2

Int. Cl.^{6} F17D *3/00*
U.S. Cl. 137—597 **8 Claims**



1. A distribution assembly for the selective connection of fluid lines of a first group of lines with fluid lines of a second group of lines, characterized by the following features:

first stationary ducts (12) connected to said lines of said first group of lines;

second stationary ducts (14) connected to said lines of said second group of lines, said second ducts having a constant cross section along their length and configured to be cleaned by a line scraper, said second ducts intersecting said first ducts, with an intersecting portion leaving a passage within each of said first ducts for the flow of a fluid in to and from said second ducts;

a shutoff valve for each said intersecting portion of said second ducts (14) located within a respective one of said first ducts (12), said valve having a valve member which selectively shuts off and opens a fluid connection between each said intersecting portion and a selected one of said first ducts (12), said valve member being connected to an actuating member (56) which extends outwardly of said first ducts;

actuation means (72) for said actuating member (56);

wherein said first ducts (12) are defined by first tubes having opposing wall portions facing said second ducts (14) and

wherein said valve member has a cross section substantially identical to the cross section of the second ducts to form a passage aligned with said second ducts (14), said valve member being radially displaceable relative to said second ducts (14) to form a lateral outlet with respect thereto and projecting into said first ducts in an open position thereof to open said lateral outlet;

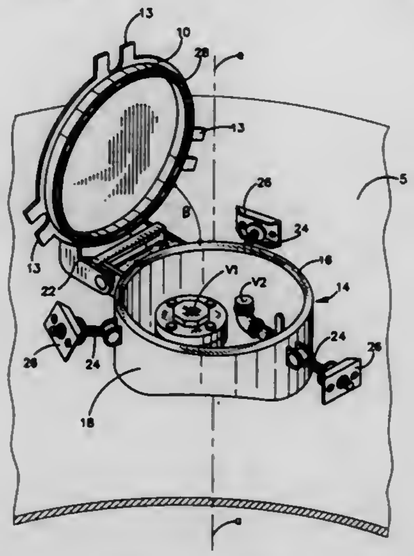
wherein said intersecting portion is formed by two tube pieces (44, 46) which are inserted into said first ducts (12), said tube pieces forming a gap therebetween, and said valve member (48) being sealingly displaceable within said gap; and

wherein each said intersecting portion (44, 46) projects a small extent beyond said first ducts, and said first ducts (12) are pressed against each other transverse to a longitudinal direction thereof, so that said intersecting portions (44, 46) sealingly abut each other.

5,690,141
VALVE COVERS

St. George Creaghe, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Filed May 17, 1996, Ser. No. 652,628
Int. Cl.^{6} F16K *27/08*
U.S. Cl. 137—382 **28 Claims**



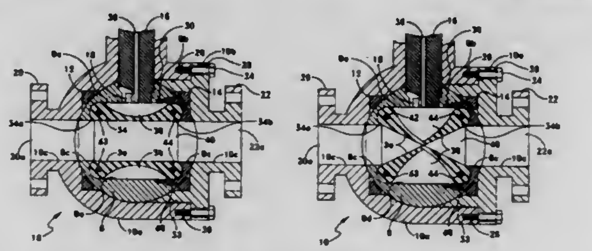
1. A valve cover adapted for sealably protecting valves of a storage or transportable container having an imaginary center line, said cover comprising:

a) a lid having a perimeter;
b) a rim having a sealing surface, said rim being rigidly attached to or integral with said container and surrounding one or more valves connected to said container;
c) a hinge connecting said lid to said rim, said hinge being free-floating to permit horizontal self-alignment of said lid with said rim upon placement of said lid in contact with said sealing surface;
d) securing means attached to said rim or said container for securing said lid to said rim; and
e) elastomeric means disposed proximate to said perimeter for creating and maintaining a seal between said lid and said sealing surface when said lid is secured to said rim.

5,690,142
VARIABLE ORIFICE BALL VALUE

Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1996, Ser. No. 700,746
Int. Cl.^{6} F16K *5/10*
U.S. Cl. 137—614.17 **19 Claims**



1. A variable orifice ball valve comprising:

an external housing having a longitudinal fluid bore formed through the external housing;

a ball member rotatably positioned within said external housing having a longitudinal fluid bore formed through said ball member and defining an inner wall therethrough, said ball member having a pressure port formed therein in communication between an outer surface of said ball member and said ball member fluid bore;

an elastically expansible sleeve member secured to said inner wall of said ball member, said elastically expansible sleeve member including opposing end portions and a middle section, the middle section being relatively thinner than the opposing end portions, only the opposing end portions being secured to the inner wall of said ball member, said elastically expansible sleeve member further defining a variable sized fluid port on a surface of said elastically expansible sleeve member facing an interior of said ball member;

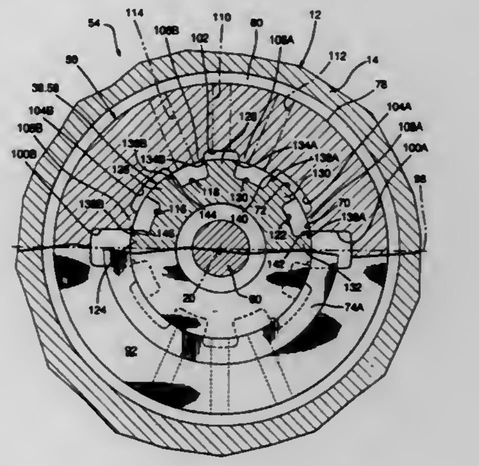
means for securing said elastically expansible sleeve member to the inner wall of said ball member, said elastically expansible sleeve member defining an expansible chamber at a location between the inner wall of said ball member and the elastically expansible sleeve member as defined by said means for securing; and

a valve stem extending from said ball member and through said external housing, said valve stem including a valve stem port formed therethrough and positioned in communication with said pressure port for supplying pressurization to the expansible chamber.

5,690,143
VALVE FOR POWER STEERING GEAR

Joel Edward Birsching, Unionville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1996, Ser. No. 633,874
Int. Cl.^{6} F15B *9/10;13/04*
U.S. Cl. 137—625.23 **1 Claim**



1. A valve for a power steering gear including

a tubular valve body,

a cylindrical valve spool inside of said valve body rotatable relative to said valve body from an open center position,

abutment means limiting rotation of said valve spool relative to said valve body to a limit position,

a pair of symmetric fluid flow paths in said valve from a pressure slot in said valve body to respective ones of a pair of return slots in said valve body,

non-metering orifice means responsive to rotation of said valve spool relative to said valve body from said open center position to isolate a first one of said pair of symmetric flow paths from said pressure slot, and

metering orifice means responsive to rotation of said valve spool relative to said valve body from said open center position to progressively throttle fluid flow through a second one of said pair of symmetric flow paths until fluid flow therein is blocked,

characterized in that said metering orifice means comprises:

a first metering orifice in said second one of said pair of symmetric flow paths defined between a linear edge of said

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return slot in said valve body and a linear edge of a first external land on said valve spool having a metering flat thereon

said first metering orifice having a maximum flow area in said open center position of said valve spool and zero flow area at an intermediate position of said valve spool in which said linear edge of said return slot circumferentially overlaps only said metering flat,

said linear edge of said return slot circumferentially overlapping said first external land beyond said metering flat thereon at said limit position of said valve spool to define a first seal against fluid leakage from said second one of said pair of symmetric flow paths, and

a second metering orifice in said second one of said pair of symmetric flow paths in series flow relationship with said first metering orifice defined between a linear edge of a closed intermediate slot in said valve body between said pressure slot and said return slot and a linear edge of a second external land on said valve spool having a metering flat thereon,

said second metering orifice having a maximum flow area in said open center position of said valve spool equal to said maximum flow area of said first metering orifice in said open center position of said valve spool and zero flow area at said intermediate position of said valve spool in which said linear edge of said closed intermediate slot circumferentially overlaps only said metering flat on said second external land,

said linear edge of said closed intermediate slot circumferentially overlapping said second external land beyond said motoring flat thereon at said limit position of said valve spool to define a second seal against fluid leakage from said second one of said symmetric flow paths toward said return slot,

said second seal cooperating with said first seal in doubling the effective overlap between said valve body and said valve spool corresponding to rotation of said valve spool between said intermediate position and said limit position.

5,690,144

DIRECTIONAL CONTROL VALVE FOR SWITCHING THE MODE OF OPERATION IN A HEAT TRANSFER SYSTEM

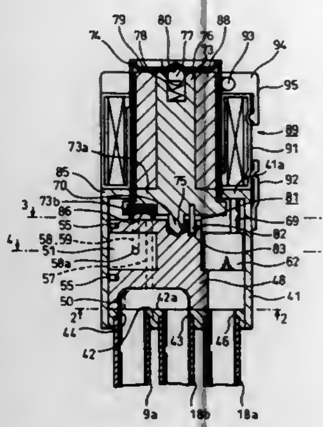
Ikuo Takahashi, Utsunomiya, Japan, assignor to Ranco Japan Ltd., Tokyo, Japan

Filed Nov. 3, 1995, Ser. No. 552,876

Claims priority, application Japan, Nov. 4, 1994, 6-271307

Int. Cl.^{6} F16K *11/00*

U.S. Cl. 137—625.43 **5 Claims**



1. A directional control valve for switching the mode of operation in a heat transfer system which includes a compressor, for compressing a refrigerant with discharge and suction ports, first and second heat exchangers, and an expansion valve provided between the first and second heat exchangers, comprising:

a cylindrical valve body with a high pressure port which is fluidly connected to the discharge port through a conduit, a low pressure port which is fluidly connected to the suction port though a conduit, first and second ports which are connected to the first and second heat exchangers respectively through conduits;

a first valve element which is enclosed within the valve body, and rotational between first and second rotational positions about the axis of the valve body;

means for rotating the first valve element between the first and second positions;

the first valve element including means for fluidly connecting, at the first rotational position, the high pressure port to the second port, and connecting the low pressure port to the first port, and at the second rotational position, connecting the high pressure port to the first port, and connecting the low pressure port to the second port to switch the flow direction of the refrigerant

first and second pressure chambers which are integrally formed with the first valve element;

means for fluidly connecting the first and second pressure chambers to the high pressure port;

means for selectively fluidly connecting one of the first and second chambers to the low pressure port; and

the first valve element rotating from first rotational position to the second rotational position when the second pressure chamber is fluidly connected to the low pressure port due to the pressure difference between the first and second pressure chambers, and rotating from second rotational position to the first rotational position when the first pressure chamber is connected to the low pressure port due to the pressure difference between the first and second pressure chambers.

5,690,145

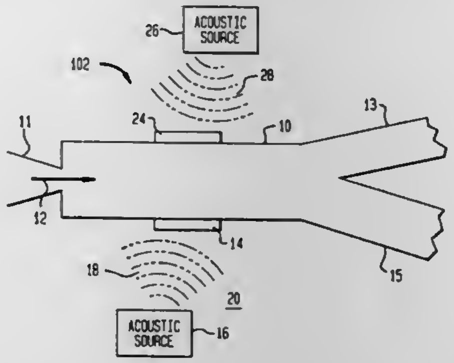
FLUIDIC DEVICE CONTROLLED BY REMOTELY LOCATED ACOUSTIC ENERGY SOURCE

Robert Kuklinski, Portsmouth, and Stuart C. Dickinson, Bristol, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1996, Ser. No. 695,840

Int. Cl.^{6} F15C *1/04*

U.S. Cl. 137—828 **18 Claims**



1. A fluidic device for controlling the path of a fluid, comprising:

a control chamber for transporting said fluid;

at least one window incorporated in said control chamber that permits acoustic waves impinging on said window to pass therethrough into said chamber;

a source for producing said acoustic waves, said source being remotely located with respect to said control chamber; and

a coupling medium acoustically coupling said acoustic waves to said at least one window.

5,690,146

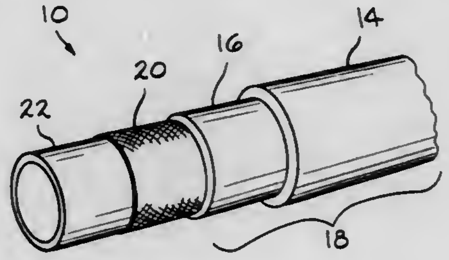
HOSE AND METHOD FOR WEAR DETECTION

David A. Stammen, Sylvania, Ohio, assignor to Aeroquip Corporation, Maumee, Ohio

Filed Aug. 20, 1996, Ser. No. 700,036

Int. Cl.^{6} F16L *11/04*

U.S. Cl. 138—36 **16 Claims**



1. A hose comprising:

an outer cover consisting essentially of an opaque-colored outer layer and an opaque-colored inner layer, both said layers having a continuous thickness along the length of the hose, wherein the layers have different colors and wherein abrasion of the outer layer reveals the color of the inner layer thereby acting as a wear indicator for the outer cover.

5,690,147

METHOD AND APPARATUS FOR INSULATING

Ian Cridland, Vanloese, Denmark; A. M. Ettema, Herten, Netherlands; Kjeld Jepsen, Slangerup, and Joergen Skjold Petersen, Roskilde, both of Denmark, assignors to Rockwool International A/S, Hedenbusene, Denmark

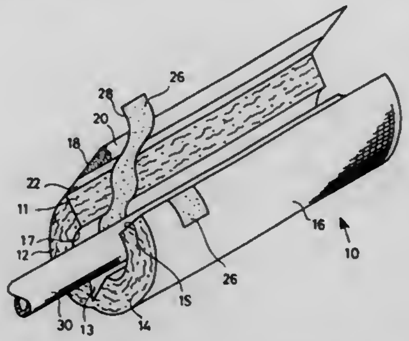
PCT No. PCT/DK95/00020, § 371 Date Aug. 26, 1996, § 102(e) Date Aug. 26, 1996, PCT Pub. No. WO95/19523, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 11, 1995, Ser. No. 666,579

Claims priority, application Denmark, Jan. 14, 1994, 71/94

Int. Cl.^{6} F16L *9/14*

U.S. Cl. 138—149 **39 Claims**



27. A heat-insulating assembly for insulating a surface of a tubular body relative to the ambient air, comprising:

a length of an annular heat-insulating body defining an inner cylindrical surface and an outer cylindrical surface, a vapour-barrier layer being applied to and covering said outer cylindrical surface of said annular heat-insulating body, and a through-going slit extending through said annular heat-insulating body in the entire length thereof so as to allow said annular heat-insulating body to be opened for positioning said annular heat-insulating body circumferentially encircling said tubular body so as to position said inner cylindrical surface juxtaposed said surface of said tubular body; and

a strip of a water transport-allowing material defining a width substantially smaller than said length of said annular heat-insulating body and a length allowing said strip to be arranged within said annular heat-insulating body circumferentially encircling said tubular body and extending through said slit of said annular heat-insulating body for presenting an exposed flap of said strip at said outer cylindrical surface of said annular heat-insulating body to be exposed to the ambient air for the evaporation of water transferred from said surface of said tubular body to said flap of said strip through said strip of said water transport-allowing material, wherein the strip of water-transport allowing material has one end fixated to the heating-insulating body at a position adjacent to the through-going slit.

5,690,148

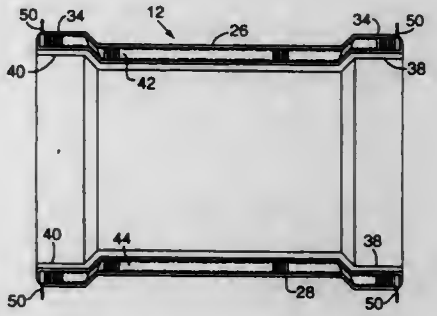
CLOSURE FITTING AND FLEXIBILITY SUPPORT ASSEMBLY FOR DOUBLE-CONTAINMENT PIPING SYSTEMS

Christopher G. Ziu, 7 Douglas St., Merrimack, N.H. 03054

Filed Jun. 21, 1996, Ser. No. 667,757

Int. Cl.^{6} H05B *13/02;3/58*

U.S. Cl. 138—171 **15 Claims**



1. A closure fitting assembly for closing a gap between containment components in a double-containment system, comprising:

a first fitting defining an axis and including a first axially-extending fusion surface located on one side of the first fitting, a second axially-extending fusion surface located on an opposite side of the first fitting relative to the first axially-extending fusion surface, a first circumferentially-extending fusion surface located on one end of the first fitting, and a second circumferentially-extending surface located on an opposite end of the first fitting relative to the first circumferentially-extending fusion surface;

a second fitting for connection to the first fitting to close the gap between containment components, the second fitting defining an axis and including a first axially-extending fusion surface located on one side of the second fitting and facing the corresponding first axially-extending fusion surface of the first fitting, a second axially-extending fusion surface located on an opposite side of the second fitting relative to the respective first axially-extending fusion surface and facing the corresponding second axially-extending fusion surface of the first fitting, a first circumferentially-extending fusion surface located on one end of the second fitting, and a second circumferentially-extending fusion surface located on an opposite end of the second fitting relative to the respective first circumferentially-extending fusion surface;

at least one first axially-extending fusion wire interposed between the two first axially-extending fusion surfaces for the passage of electric current through the first axially-extending wire to fuse the two first axially-extending fusion surfaces together;

at least one second axially-extending fusion wire interposed between the two second axially-extending fusion surfaces for the passage of electric current through the second axially-extending wire to fuse the two second axially-extending fusion surfaces together;

at least one first circumferentially-extending fusion wire seated against the first circumferentially-extending fusion surfaces

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for the passage of electric current through the first circumferentially-extending wire to fuse the first circumferentially-extending fusion surfaces to an adjacent containment component; and
at least one second circumferentially-extending fusion wire seated against the second circumferentially-extending fusion surfaces for the passage of electric current through the second circumferentially-extending wire to fuse the second circumferentially-extending fusion surfaces to an adjacent containment component.

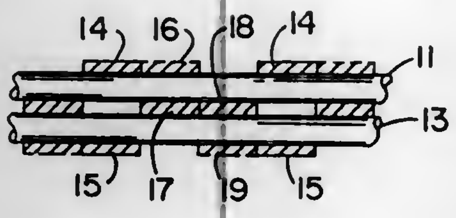
5,690,149
PAPERMAKERS FABRIC WITH STACKED MACHINE DIRECTION YARNS

Henry J. Lee, Summerville, S.C., assignor to Asten, Inc., Charleston, S.C.

Continuation of Ser. No. 524,800, Sep. 7, 1995, which is a continuation of Ser. No. 288,158, Aug. 10, 1994, Pat. No. 5,449,026, which is a continuation of Ser. No. 43,016, Apr. 5, 1993, abandoned, which is a continuation of Ser. No. 855,904, Apr. 13, 1992, Pat. No. 5,199,467, which is a continuation of Ser. No. 534,164, Jun. 6, 1990, Pat. No. 5,103,874. This application Oct. 17, 1996, Ser. No. 734,441

Int. Cl.^{6} D03D *13/00*

U.S. Cl. 139—383 A **10 Claims**



1. A papermakers fabric comprising a system of CMD (cross-machine direction) yarns interwoven with a system including flat monofilament MD (machine direction) yarns in a selected repeat pattern; said flat MD yarns comprise pairs of upper and lower flat MD yarns stacked in vertical alignment; at least said upper flat MD yarns have an aspect ratio greater than 3:1; said upper flat MD yarns weave in a repeat pattern with at least a first layer of CMD yarns with a float over a selected number of CMD yarns; and said selected number is at least two.

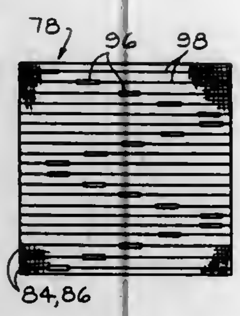
5,690,150
WOVEN FABRIC MADE WITH A YARN HAVING PERIODIC FLAT SPOTS

Larry J. Huey, North Augusta, and Thomas A. Coakley, Alken, both of S.C., assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Jul. 16, 1996, Ser. No. 683,073

Int. Cl.^{6} D03D *15/00*

U.S. Cl. 139—426 R **20 Claims**



1. A woven fabric of glass fiber warp yarn and glass fiber fill yarn, where the glass fiber fill yarn comprises a strand of individual glass filaments, the strand having a primary cross-sectional shape and periodic flat spots with a flat cross-sectional shape which is more elongated than the primary cross-sectional shape, where the effect of the flat spots is differentiated glass fiber fill yarn in the woven fabric.

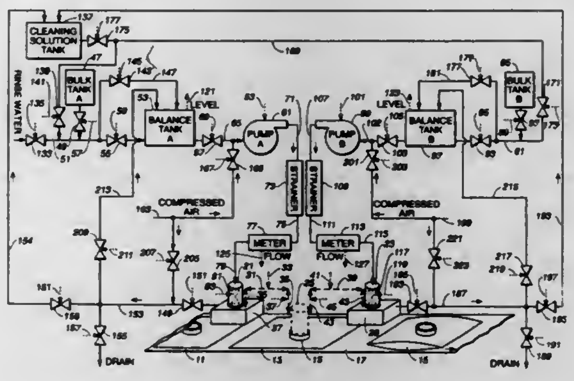
5,690,151
DUAL CHANNEL BAG FILLING MACHINE WITH A CLEAN-IN-PLACE SYSTEM THAT CLEANS ONE CHANNEL WHILE THE OTHER CONTINUES TO FILL BAGS

Christopher C. Rutter, Oakland; Robert A. Bilbrey, Orinda, and William Charron, Fremont, all of Calif., assignors to Packaging Systems, Inc., Romeoville, Ill.

Filed Apr. 2, 1996, Ser. No. 631,683

Int. Cl.^{6} B65B *1/04*

U.S. Cl. 141—92 **12 Claims**



1. Apparatus for filling containers with fluid product, comprising:

means for moving a plurality of said containers in succession through a filling station,
at least two filling nozzles provided as part of the filling station,
a source of fluid product,
an individual means associated with each of said at least two filling nozzles for delivering fluid product thereto from said fluid product source,
a source of cleaning fluid,
means including at least one receptacle provided as part of the filling station for individually receiving at least one of said filling nozzles at a time to provide fluid communication therewith,
means providing relative motion between said filling nozzles and both said at least one receptacle and a container positioned within the filling station for establishing fluid communication between individual ones of said nozzles and either said at least one receptacle or a container positioned in the filling station,
means operable when one of said nozzles establishes fluid communication with a container positioned in the filling station for delivering fluid product from said fluid product source through a respective one of said individual product delivery means to its associated nozzle, thereby to fill said container with the fluid product, and
means operable when one of said nozzles establishes fluid communication with said receptacle means for delivering cleaning fluid from said cleaning fluid source through a respective one of said individual product delivery means to its associated nozzle and into said receptacle means.

5,690,152
DEVICE FOR COUPLING CONTAINERS

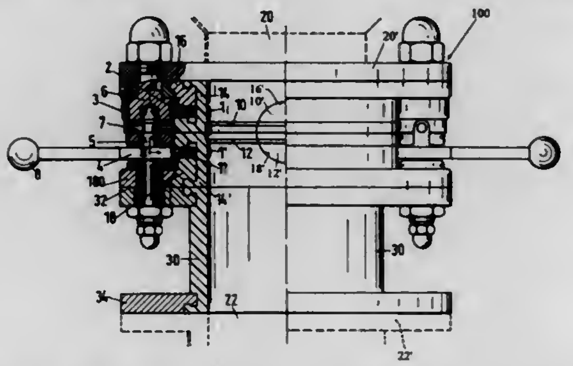
Martin Koch, Neuenburg/Baden, and Gerhard Grau, Muellheim/Baden, both of Germany, assignors to Buck Werke GmbH & Co., Bad Ueberkingen, Germany

Filed Sep. 18, 1996, Ser. No. 714,309

Claims priority, application Germany, Sep. 20, 1995, 195 34 915.6; Nov. 17, 1995, 195 42 939.7

Int. Cl.^{6} F16L *29/00*

U.S. Cl. 141—346 **15 Claims**



1. In a device for coupling two containers having terminal connecting branches having an essentially circular cross section, said device including a pair of connecting sleeves having a circular cross section with one end being connectable to the connecting branches, each of said sleeves, at an outer end, having a circular seal and a pair of half-shell bearings lying diametrically opposite each other with each half-shell bearing having a semi-circular cross section, a closing flap having a substantially flat planar outer surface with a pair of half-axles having a semi-circular cross section extending diametrically opposite thereof, said closing flap being mounted for rotation with the half-axles disposed in the half-shell bearings and movable between a closed position with the flat surface of the flap and half-axles being flush with an end surface of the connecting sleeve and the flap seated in the circular seal to an open position extending approximately 90° from the closed position, said flaps having their exposed surfaces engaging each other to form a full axle as the end surfaces of the two connecting sleeves are brought together, and a part-turn actuator engaging one of the flaps to rotate the flap between the open and closed position while the other flap is entrained to move therewith, the improvement comprising at least one radially-movable pin being provided in a wall of each of the connecting sleeves at the height of the circular seal, said pin being pushed radially inward producing a bulge in the circular seal for holding the respective closing flap in the closed position.

5,690,153
FILLING SYSTEM FOR ROBOT-CAPABLE FILLING OF A VEHICLE WITH FUEL

Reinhard Steinkaemper, Winnenden, and Adolf Kremer, Remseck, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

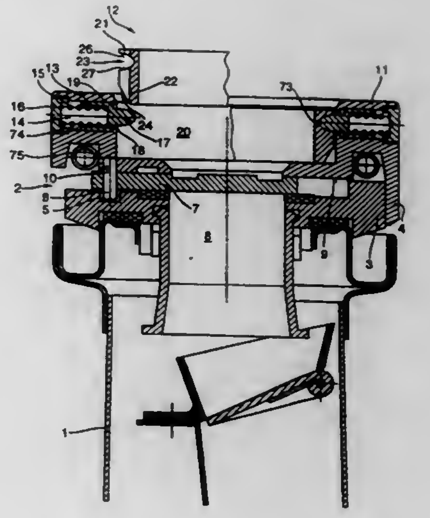
Filed Sep. 5, 1996, Ser. No. 706,558

Claims priority, application Germany, Sep. 5, 1995, 195 32 777.2

Int. Cl.^{6} B60K *15/00*

U.S. Cl. 141—348 **16 Claims**

1. A filling system for an automated filling of a vehicle with fuel, comprising:
a filler nozzle;
a filler neck for a tank of the vehicle;
a docking extension provided on a filling side of said filler neck, said docking extension having a cylindrical shape and a central passageway in an upper rotatable section thereof, said upper rotatable section being rotated around an axis of symmetry for opening and closing the tank;



wherein said filler nozzle has an outlet end which docks with said docking extension to form a positive connection between said filler nozzle and said docking extension;
positive locking elements distributed along a circumference of said filler nozzle and docking extension and running axially in a toothed manner so as to engage one another when said filler nozzle is ready to fill said tank;
wherein said filler nozzle and said docking extension are docking partners having said positive elements lockable in one another in a locked position, said positive elements acting axially to lock in a circumferential direction;
wherein positive elements of one of said docking partners are movably guided radially and tensioned flexibly in a working position against a force of a pretensioning spring; and
wherein positive elements of the other of said docking partners are rigidly mounted, said docking partners actuating said radially movable positive elements via a force directed in an axial direction with respect to said docking extension.

5,690,154
FILLING SYSTEM FOR ROBOT-CAPABLE FILLING OF A VEHICLE WITH FUEL

Adolf Kremer, Remseck; Reinhard Steinkaemper, Winnenden; Axel Fischer, Obernburg, and Tilo Schumann, Dieburg, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Sep. 5, 1996, Ser. No. 706,568

Claims priority, application Germany, Sep. 5, 1995, 195 32 774.8

Int. Cl.^{6} B60K *15/00*

U.S. Cl. 141—348 **19 Claims**

1. A filling system for an automated fueling of a motor vehicle, comprising:
a filler nozzle;
a filler neck having a docking extension provided with a central opening, said docking extension adapted for being mounted on a filling side of the vehicle and being rotatable via an upper section around an axis of symmetry for operating an opening and closing process of a tank closure of the motor vehicle;
wherein said docking extension has an outlet end which forms a positive connection between the filler nozzle and the docking extension;
locking bodies mounted on said filler nozzle, said locking bodies being radially movable but axially and circumferentially fixed;
a circumferential bead arranged on said docking extension, wherein said locking bodies positively grip beneath said circumferential bead when urged radially outward away from a longitudinal centerline of said filler nozzle, thus securing the filler nozzle in an axial direction; and

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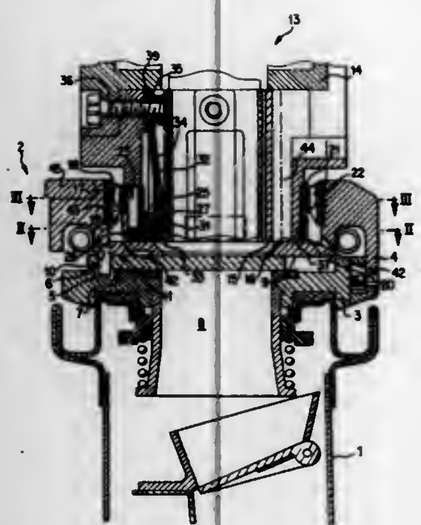


wherein said locking bodies are movable into a radially retracted position when said filler nozzle is docked and undocked.

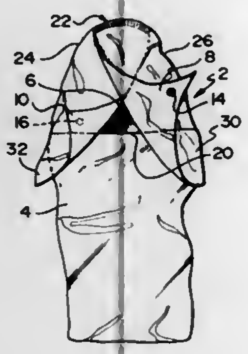
5,690,155
RAIN COVER FOR GOLF BAG AND GOLF CLUBS

Thomas D. Millar, Rothesay, Canada, assignor to Dak Manufacturing, Inc., Canada

Filed Aug. 14, 1995, Ser. No. 514,852

Int. Cl.^{6} A63B *55/00;57/00*

U.S. Cl. 150—159 **23 Claims**



1. A golf bag cover comprising first and second flexible planar sheets, each of elongated configuration; the first sheet having a top edge, side edges and a bottom portion; the second sheet having a top edge, side edges and a bottom portion, said top edge of said second sheet located beyond the top edge of the first sheet; the second sheet provided with a pair of flaps substantially continuous with said top edge and upper parts of said side edges of said second sheet and extending downwards to overlap said top edge of said first sheet and transversely overlapping each other at said top edge continuously along their length so that said flaps tend to remain in a closed overlap position; the first and second sheets fastened together substantially continuously along side edges of each of said sheets.

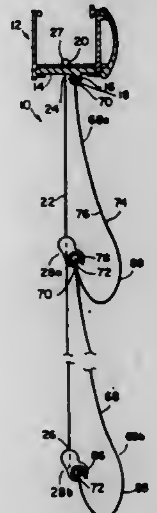
5,690,156
HORIZONTAL WINDOW SHADE

Bryan K. Ruggles, Salt Lake City, Utah, assignor to Newell Operating Company, Freeport, Ill.

Continuation-in-part of Ser. No. 263,058, Jun. 21, 1994, abandoned. This application Feb. 16, 1996, Ser. No. 602,590

Int. Cl.^{6} E06B *9/06*

U.S. Cl. 160—84.04 **20 Claims**



1. A horizontal shade including at least a pair of suspension strings attached to a headrail, the shade comprising:

a plurality of clips attached to each of the suspension strings;

a plurality of sleeves, each sleeve having an internal longitudinal cavity, wherein each sleeve is horizontally supported by at least two clips; and

a plurality of parallel horizontal fabric strips, each strip having a top edge and a bottom edge, wherein the bottom edge of one strip and the top edge of an adjacent strip are supported within the longitudinal cavity;

wherein each top edge and bottom edge includes a longitudinal bead attached thereto.

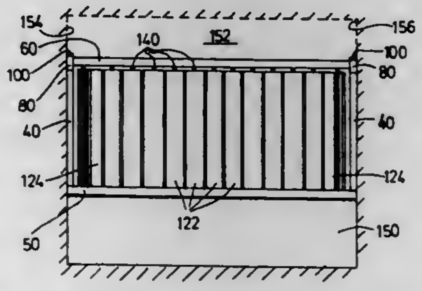
5,690,157
RIGID PANEL FOLDING SHOWER DOOR ASSEMBLY HAVING IMPROVED HORIZONTAL TRACK AND METHOD FOR MAKING THE SAME

Chang-Than Chen, 181 Po-Hai Street, Kaohsiong, Taiwan

Continuation-in-part of Ser. No. 247,365, May 23, 1994, abandoned, and a continuation-in-part of Ser. No. 380,547, Jan. 30, 1995, abandoned. This application Feb. 6, 1996, Ser. No. 595,893

Int. Cl.^{6} E05D *15/26*

U.S. Cl. 160—199 **1 Claim**



1. A shower door assembly for use with a bathtub recessed between opposing side walls at first and second ends thereof, said shower door assembly comprising:

a hollow track support member having a longitudinally extending slot located therein, said track support member including a tubular segment having a longitudinally extending slot located therein, said tubular segment being mounted with said longitudinally extending slot oriented downwardly, said track support member including a thin, horizontal rib member located inside said track support member, said horizontal rib member being located at a diameter of said track support member, said horizontal rib member functioning to reinforce said track support member,

a hollow track rail for installation inside said track support member, said track rail also having a longitudinally extending slot located therein which is aligned with said longitudinally extending slot in said track support member, said track rail including a hollow segment which is semi-circular in cross section and has a flat top side fitting immediately below said horizontal rib member in said track support member, said semi-circular segment including a longitudinally extending slot located in the bottom thereof with thin, flat segments each extending both slightly below and slightly above said semi-circular segment, said flat segments being parallel to each other and orthogonally oriented with respect to said flat top side of said semi-circular segment, said flat segments extending sufficiently below said semi-circular segment to fill said longitudinally extending slot in said track support member,

means for mounting said hollow track support member horizontally above an outer lip of the bathtub and between the opposing side walls at the first and second ends of the bathtub, said mounting means including a pair of support members each having an H-shaped segment, said H-shaped segment having a plate segment extending above the cross-bar of the H and between the portions of the legs of the H which are above the cross-bar of the H, said plate segment having a spaced-apart pair of mounting apertures located therein midway between the legs of the H, said support members adapted to be mounted on the opposing side walls at the first and second ends of the bathtub, respectively, the ends of said track support member each being supported by one of said support members, said mounting means including positioning means extending upwardly from the crossbar of said H-shaped segment for insertion into said longitudinally extending slot of said track support member to orient said track support member with said longitudinally extending slot oriented downwardly, said mounting means including a cap for placement on each support member above the legs of the H which are above the cross-bar of said H-shaped segment to retain the ends of said track support member within said support members, said mounting means including interconnecting means located on said caps and on said support members to removably affix said caps in position on said support members,

a shower door including a plurality of semi-rigid panels having a living hinge disposed intermediate each adjacent pair of semi-rigid panels, said shower door having a top edge and a bottom edge and a first side and a second side, said shower door including a first vertically disposed leader channel member attached to said first side of said shower door and a second vertically disposed leader channel member attached to said second side of said shower door,

a first closure channel for permanent mounting on the side wall at the first end of the bathtub, said first leader channel member of said shower door being adapted to be removably engaged with said first closure channel in a watertight fashion,

a second closure channel for permanent mounting on the side wall at the second end of the bathtub, said second leader channel member of said shower door being adapted to be removably engaged with said second closure channel in a watertight fashion,

mounting hardware for slideable installation within said track rail to suspend said shower door in a manner whereby said shower door is capable of unfolding to enclose an area over the outer lip of the bathtub and between the side walls at the first and second ends of the bathtub, said mounting hardware sliding freely within said track rail in a manner allowing said shower door to fold to allow access to or egress from the bathtub, said mounting hardware including a plurality of discs each mounted orthogonally and coaxially onto a short support rod, said plurality of discs being located within and slidably supported by said track rail, each of said support rods being attached to a panel of said shower door to thereby support said shower door, and

means for retaining the bottom edge of said shower door within an area bordered by the outer lip of the bathtub to prevent water from leaking between the bottom edge of said shower door and the outer lip of the bathtub, said retaining means including a bathtub trim member for installation on top of the outer lip of the bathtub, said bathtub trim member including a flat bar segment located edgewise adjacent the side of a square segment which is significantly higher than the flat bar segment, said square segment functioning to retain said bottom of said shower door within the area bordered by the outer lip of the bathtub, said flat bar segment functioning to channel water dripping from said shower door back into the bathtub.

5,690,158
DEVICE FOR MAINTAINING STRETCHED A PANEL OF SUPPLE MATERIAL, BY ITS EDGES

André Bellamy, 2, Rue De Vaugirard, 92130 Issy-les Moulineaux, France

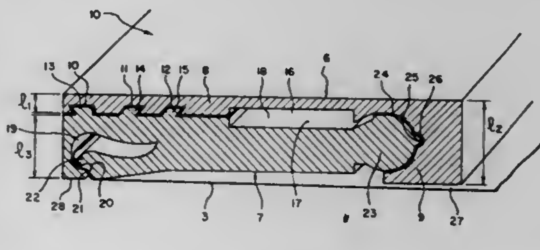
PCT No. PCT/FR93/01149, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/12741, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 22, 1993, Ser. No. 424,533

Claims priority, application France, Dec. 1, 1992, 92 14462

Int. Cl.^{6} A47H *23/00*

U.S. Cl. 160—327 **4 Claims**



1. Device for fixing on a support (**2**) such as a ceiling and stretching by its edges a panel (**3**) of supple material, of the type comprising:

an elongate section (**6**) having opposing distal and proximal lateral edges extending along the length of said section and capable of being fixed on said support (**2**);

a substantially elongated element (**7**) having opposing distal and proximal lateral edges extending along the length of said element of which said distal comprises means for blocking said panel (**3**) and of which said proximal edge (**23**) is adapted to pivotally cooperate in abutment with a first housing (**24**) of complementary dimension and shape provided on said section (**6**), the element (**7**) being independent of the section (**6**);

means for removably connecting the element (**7**) on said section **6**, in order to maintain the element (**7**) in an operative sheet holding place on the section (**6**); characterized in that said connecting means are disposed towards said distal edges of said section and said element and are adapted to immobilize the element (**7**) on the section in all directions and independently of said means for blocking of the panel on the element, and in that said means for blocking the panel (**3**) are provided in said distal edge of said element (**7**), are of the pinching type and are constituted by a deformable lip (**20**) associated with a second housing (**19**), both being capable of being spaced apart, to allow passage of the edge of the panel (**3**) in the housing (**19**), said lip (**20**) being previously moved apart and capable of returning, by its own elasticity, into its original position, where it bears, by its deformable lip, against the edge (**13**) of the second housing (**19**) and thus blocks by pinching the edge of the panel (**3**).

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5,690,159
CASTING APPARATUS AND CASTING METHOD FOR PRODUCING CYLINDER BLOCK

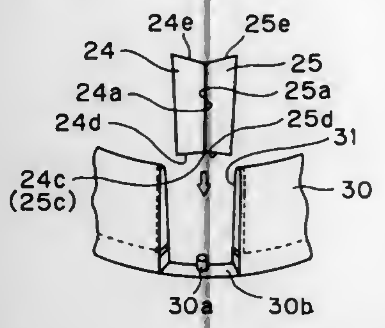
Yasuyuki Mizukusa, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima-Ken, Japan

Filed Aug. 27, 1996, Ser. No. 703,726

Claims priority, application Japan, Sep. 7, 1995, 7-255659

Int. Cl.^{6} B22D *29/00*

U.S. Cl. 164—132 **10 Claims**



1. A casting apparatus for producing a closed deck type cylinder block having a top deck portion and a plurality of juxtaposedly aligned cylinder liners, a water jacket portion being formed around the cylinder liners and having one open end open at the top deck portion, the open end being partly closed by a plurality of bridge portions provided at the top deck portion, the apparatus comprising:

a metal mold die for molding a substantial part of the cylinder block, the metal mold die having a die portion whose profile is the same as that of the water jacket portion for forming the water jacket portion, the die portion having a free end portion formed with a plurality of notched portions each, having side walls extending in an axial direction of the cylinder liner and a bottom wall; and

a plurality of pairs of loose cores, each pair being insertable into each notched portion, and each pair of loose cores having symmetrical shape and having parting faces extending in the axial direction of the cylinder liner, each pair of loose cores having a first draft facing the bottom wall of the notched portion and a second draft which defines a part of a lower end of the water jacket portion, and a distance between the first and second drafts in the axial direction of the cylinder liner being gradually increased toward opposite circumferential direction of the water jacket portion from the parting faces.

9. A method for producing a closed deck type cylinder block having a top deck portion and a plurality of juxtaposedly aligned cylinder liners, a water jacket portion being formed around the cylinder liners and having one open end open at the top deck portion, the open end being partly closed by a plurality of bridge portions provided at the top deck portion, the method comprising the steps of:

preparing a metal mold die fort molding a substantial part of the cylinder block, the metal mold die having a die portion whose profile is the same as that of the water jacket portion for forming the water jacket portion, the die portion having a free end portion formed with a plurality of notched portions each having side walls extending in an axial direction of the cylinder liner and a bottom wall provided with a projection;

preparing a plurality of pairs of loose cores, each pair being insertable into each botched portion, and each pair of loose cores having symmetrical shape and having parting faces extendible in the axial direction of the cylinder liner, each pair of loose cores having a first draft facing the bottom wall of the notched portion and a second draft which defines a part of a lower end of the water jacket portion, and a distance between the first and second drafts in the axial direction of the cylinder liner being gradually increased toward opposite circumferential direction of the water Jacket portion from the parting faces;

setting each pair of loose cores into each notched portion in such a manner that the parting faces extend in the axial direction of the cylinder liner and the end of the parting faces is placed on the projection of the bottom wall;

injecting a molten metal into the metal mold die for forming the bridge portions at positions between the bottom wall of the notched portion and said first draft, a bore corresponding to the projection being formed in each bridge portion;

inserting a jig into the bore and pressing the jig toward into the parting faces for moving the pair of loose cores away from each other from the parting faces, so that each pair of loose cores are offset from the bridge portion; and

removing the thus separated loose cores from the open end of the water jacket portion.

5,690,160
SEALING DEVICE FOR AN-INLET OF A SAND MOLD

Thomas Leonard Sutton, Preston; John Campbell; Michael Joseph Flynn, both of Worcester, and Gary McBain, Cleveleys, all of United Kingdom, assignors to Alloy Technologies Limited, England

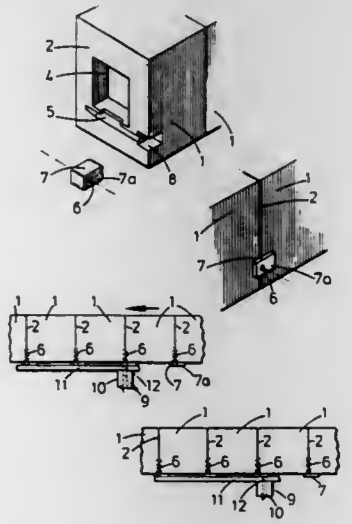
PCT No. PCT/GB94/00913, § 371 Date Jan. 16, 1996, § 102(e) Date Jan. 16, 1996, PCT Pub. No. WO94/25200, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 28, 1994, Ser. No. 535,180

Claims priority, application United Kingdom, Apr. 29, 1993, 9308833

Int. Cl.^{6} B22D *35/04*

U.S. Cl. 164—136 **11 Claims**



1. A method of sealing a sand mould having a filling inlet, comprising making the mould with an insert of thermally suitable material defining said inlet and providing a flat outer face for sealing and subsequently heat exchanging sliding contact with a sealing face of a chill plate, filling the mould through said insert, and closing the mould by means of said chill plate.

9. A casting apparatus comprising:

sand mould;

said mould having a filling inlet defined by an insert of thermally suitable material;

a chill plate having a sealing face;

said mould providing a flat outer face for sealing and subsequent heat exchanging sliding contact with the sealing face of the chill plate.

5,690,161
PROCESS FOR TREATING MOLTEN METAL DURING A CASTING OPERATION USING A FILTER AND FILTER FOR IMPLEMENTING THE PROCESS

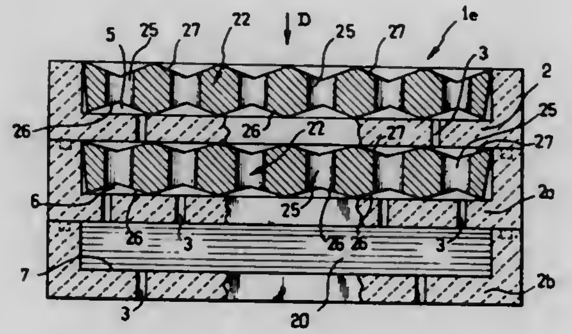
Jean-Charles Daussan, Metz; Gérard Daussan, and André Daussan, both of Longeville-les-Metz, all of France, assignors to Daussan et Compagnie, Wolppy, France

Continuation of Ser. No. 428,843, Apr. 25, 1995, Pat. No. 5,603,373, which is a continuation of Ser. No. 69,837, Jun. 1, 1993, abandoned. This application Jan. 8, 1997, Ser. No. 778,262

Claims priority, application Luxembourg, May 29, 1992, 88124; France, Oct. 30, 1992, 92 13039; Jan. 6, 1993, 93 00062

Int. Cl.^{6} B22D *27/20*

U.S. Cl. 164—358 **12 Claims**



1. Apparatus for filtering and treating molten metal adapted to implement a process for simultaneously filtering and treating a molten metal during an operation to cast said molten metal into a mold, said apparatus comprising a series of at least two refractory mineral material filtering plates in contact with each other at their periphery and defining between them at least one cavity, said filtering plates each having a series of filtering holes through which said molten metal flows and by which said molten metal is filtered, the dimensions of the filtering holes and the number of the filtering plates being selected so as to eliminate from the molten metal solid inclusions likely to affect the quality of the cast metal, said apparatus containing within said at least one cavity an inorganic treatment material for treating said molten metal flowing through the cavity, said treating material being in the form of one of solid compressed or molded or sintered treating plate positioned in said at least one cavity and extending over substantially the length and the width of said at least one cavity, said treating plate having when viewed in the direction of metal flow, a shape such that at least one passage hole is arranged around said treating plate whereby said molten metal contacts and spreads over the treating plate before passing through said at least one passage hole and through said apparatus.

5,690,162
VERTICAL-TYPE CONTINUOUS CASTING METHOD AND APPARATUS

Toshiyuki Ishikawa, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 8, 1996, Ser. No. 646,390

Claims priority, application Japan, May 12, 1995, 7-114190

Int. Cl.^{6} B22D *11/00;23/00;11/08*

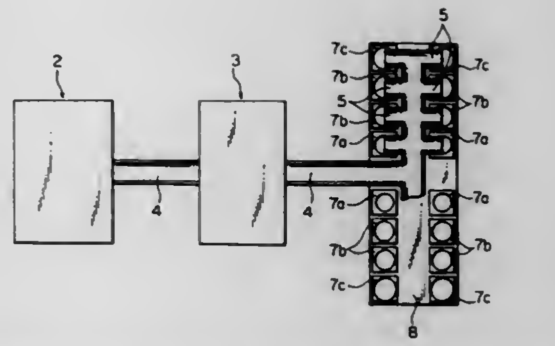
U.S. Cl. 164—459 **6 Claims**

1. A vertical-type continuous casting method for continuously casting a plurality of ingots comprising the steps of:

providing a plurality of molds each composed of upper and lower dies;

pouring molten metal into said upper dies;

lowering said lower dies in a predetermined path at a casting speed away from said upper dies,



wherein said upper dies are supported on a common table and have different casting diameters for casting the ingots of different diameters simultaneously on said common table.

5,690,163
STRIP CASTING

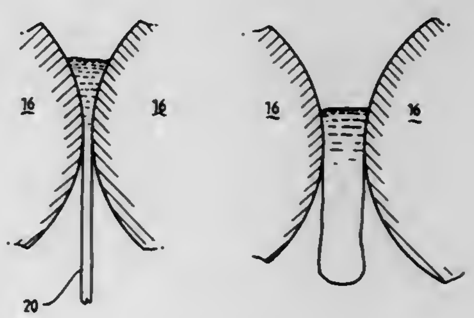
Darren John Leadbeatter, Dapto; Andrew Arthur Shook, Adamtown Heights; John Curtis, Albion Park, and Colin Robert Dean, Oak Flats, all of Australia, assignors to Ishikawajima-Harima Heavy Industries Company Limited, Tokyo, Japan, and BHP Steel (JLA) Pty Ltd, Melbourne, Australia

Filed Sep. 18, 1996, Ser. No. 715,330

Claims priority, application Australia, Sep. 19, 1995, PN 5482

Int. Cl.^{6} B22D *11/00;11/06*

U.S. Cl. 164—480 **13 Claims**



1. In a method of casting metal strip by introducing molten metal between a pair of parallel casting rolls of a twin roll caster via a metal delivery apparatus to form a casting pool of molten metal supported above the nip between the rolls and rotating the rolls so as to cast a solidified strip delivered downwardly from the nip,

the improvement comprising terminating casting of strip by stopping the flow of metal to the metal delivery apparatus and allowing the quantity of molten metal in the caster to run down to a reduced quantity at which there is still molten metal in the casting pool and continuous strip continues to be cast and then increasing the gap between the casting rolls at the nip by moving at least one of the casting rolls laterally sufficient to interrupt the formation of the strip and to allow downward discharge of said reduced quantity of molten metal through the increased gap between the rolls.

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5,690,164
METHOD AND REGENERATOR FOR HEATING A GAS

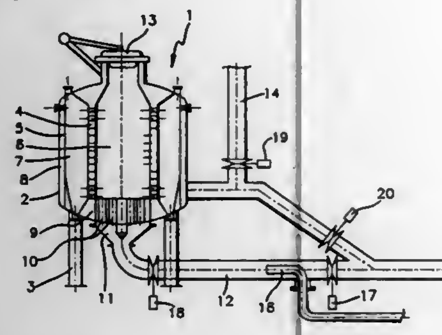
Hans-Georg Fassbinder, Sulzbach-Rosenberg, Germany, assignor to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris Cedex, France

Continuation of Ser. No. 232,064, Apr. 28, 1994, Pat. No. 5,547,016. This application Apr. 16, 1996, Ser. No. 639,005

Claims priority, application Germany, Oct. 29, 1992, 42366194

Int. Cl.⁶ F28D *17/00*

U.S. Cl. 165—10 **5 Claims**



1. Method for heating a gas and reducing stack effects in a regenerator with a heat accumulation mass consisting of a loose bulk material arranged in a ring between an inner cylindrical grid and an outer coaxial cylindrical grid, a hot collection chamber, surrounded by the inner grid, for hot gases and a cold collection chamber, enclosed between the outer grid and an external wall of the regenerator, for cold gases, comprising:

a) heating the regenerator with a premix burner;
b) during a heating phase, conveying a heating gas from the hot collection chamber to the cold collection chamber, through the heat accumulation mass; and
c) during a blowing phase, conveying said gas to be heated from the cold collection chamber to the hot collection chamber, through the heat accumulation mass; wherein ΔP hot-ΔP cold$\geqq 5\ \rho g H$ where

ΔP hot represents the pressure drop of the regenerator at the end of the heating phase,
ΔP cold represents the pressure drop of the regenerator at the start of the heating phase,
H is the height of the regenerator,
ρ is the density of said gas to be heated at 20° C.,
g is the acceleration due to gravity, wherein a flow rate of the said gas to be heated during the heating phase is at least equal to 300 $m^3N/h.m^2$ of surface area of the inner grid at standard pressure, and wherein the diameter of the outer coaxial cylindrical grid is at most double the diameter of the inner cylindrical grid.

5,690,165
VENTILATION DEVICE FOR A SPACE ZONE

Hans-Werner Roth, Tamm; Andreas Böllinger; Gerd-Eugen Schaal, both of Stuttgart, and Claus Händel, Bönnigheim, all of Germany, assignors to LTG Lufttechnische GmbH, Stuttgart, Germany

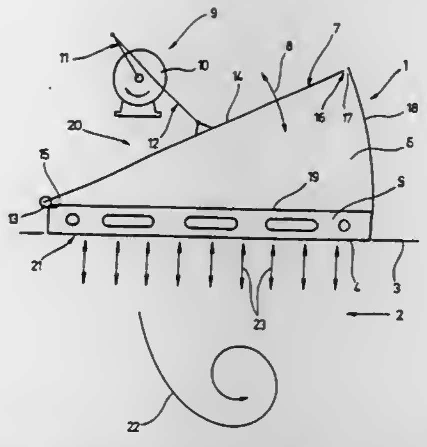
PCT No. PCT/EP94/00256, § 371 Date Jul. 27, 1995, § 102(e) Date Jul. 27, 1995, PCT Pub. No. WO94/18506, PCT Pub. Date Aug. 18, 1994

PCT Filed Jan. 29, 1994, Ser. No. 495,494

Claims priority, application Germany, Feb. 2, 1993, 43 02 855.1; Apr. 3, 1993, 43 10 959.4

Int. Cl.⁶ F24F *1/00*

U.S. Cl. 165—54 **34 Claims**



1. A ventilation device, comprising an air propulsion plant (**20**) for supplying a space zone with displacement air and including at least one variable volume chamber (**6**) for conveying at least a portion of the displacement air in an air circulating mode in a pulsating manner; and at least one air passage (**21**) for connecting the variable volume chamber with the space zone for effecting both sucking of air into the chamber from the space zone and for expulsion of substantially the same volume of air from the chamber into the space zone.

5,690,166
HEAT EXCHANGER WITH DIVIDED HEADER TANK

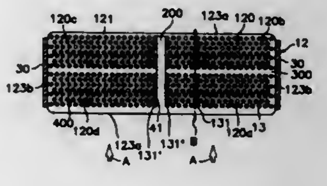
Tomohiro Yamaguchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

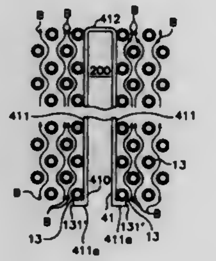
Filed May 28, 1996, Ser. No. 654,293

Claims priority, application Japan, May 30, 1995, 7-154038

Int. Cl.⁶ F28F *27/00*

U.S. Cl. 165—96 **12 Claims**





1. A heat exchanger comprising:
a pair or header tanks spaced from each other, wherein each of the pair of header tanks comprises a top end portion, a bottom end portion spaced from the top end portion, and a sidewall portion connecting the top and bottom end portions, so that a hollow space is defined within each of the pair of header tanks; and wherein the sidewall portion of each of the pair of header tanks includes a first side and a second side which is spaced from and parallel to the first side;
a plurality of pipe members placing the pair of header tanks in fluid communication;
at least one partitioning member fixedly disposed within the hollow space of at least one header tank parallel to the first and second sides of the sidewall portion of each of the pair of header tanks, so that the inner hollow space of the at least one header tank is divided into at least two chamber sections, wherein at least one gap is formed between the pair of header tanks corresponding to the at least one partitioning member; and
at least one resilient blocking element fixedly disposed within the at least one gap, wherein said blocking element is a U-shaped plate member having a pair of plane portions and a connecting portion which extends across the at least one gap and connects one end of each of the plane portions; wherein said blocking element contacts at least a pair of said pipe members.

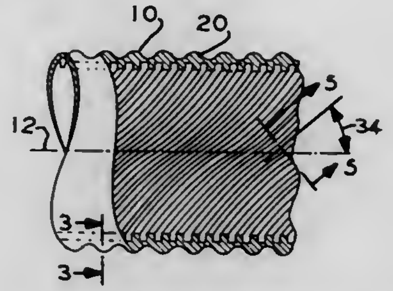
5,690,167
INNER RIBBED TUBE OF HARD METAL AND METHOD

Klaus K. Rieger, St. Simons Island, Ga., assignor to High Performance Tube, Inc., Warren, N.J.

Continuation-in-part of Ser. No. 349,613, Dec. 5, 1994, abandoned. This application Jun. 25, 1996, Ser. No. 670,010

Int. Cl.⁶ F28F *1/42*

U.S. Cl. 165—133 **4 Claims**



1. An inner spiral-ribbed tube for use in a heat exchanger or a refrigerator evaporator comprising:
an annular wall tube having an elongate axis and an inner surface and an outer surface and consisting of a hard metal material selected from the group consisting of titanium, titanium alloy, stainless steel, and an iron-nickel alloy containing more than 10% by weight of nickel;
said inner surface having a plurality of inner spiral ribs having a top and a bottom covering the entire inner surface of the tube and extending along the tube axis having a rib height of about 0.008 to about 0.016 inches, a width between the base of each rib of about 0.0125 to 0.040 inches, a width between the top of each rib of about 0.008 to 0.021 inches, and a pitch of about 0.027 to 0.070 inches, and
said inner spiral ribs each having a spiral angle formed by a tangent to a point on the rib and a longitudinal line through the point and parallel to the elongate axis of the tube of between 8 to 45 degrees, and
said outer surface having a plurality of outer spiral waves extending along the tube axis having a wave height of about 0.005 to 0.010 inches, a wave pitch of about 0.038 to 0.060 inches and a spiral angle of about 86 to 89 degrees.

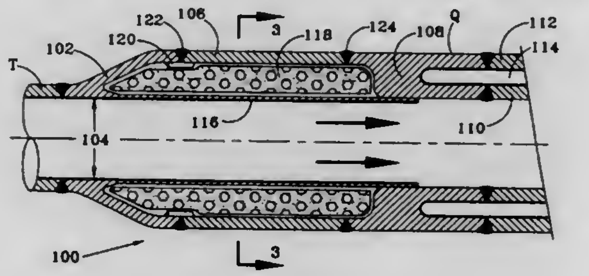
5,690,168
QUENCH EXCHANGER

Lloyd Edward Cizmar, Missouri City; Larry Gene Hackemesser, and William E. Phillips, both of Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Nov. 4, 1996, Ser. No. 743,020

Int. Cl.⁶ F28F *19/00*

U.S. Cl. 165—134.1 **14 Claims**



1. A thermal transition section for introducing a high temperature cracked process gas into a quench exchanger having an inlet end comprising inner and outer concentric pipes connected to a closure ring to define an annulus between the pipes and an interior exchanger surface having an inside diameter, comprising:
a metal outer wall extending from a downstream end connected to the closure ring to an upstream end connected to a metal transition cone, wherein the transition cone is connected at an upstream end to a line for supplying the process gas;
a metal inner sleeve extending from an upstream end connected to the transition cone to a downstream end received in the closure ring, wherein the downstream end of the inner sleeve has an outside diameter matching the inside diameter of the interior exchanger surface;
a precast, pre-fired ceramic insert substantially filling an annulus between the outer wall and inner sleeve from adjacent the transition cone to adjacent the closure ring;
wherein a ratio of length of the ceramic insert to the outside diameter of the inner sleeve is between 3 and 4.

5,690,169
HEAT TRANSMITTING APPARATUS

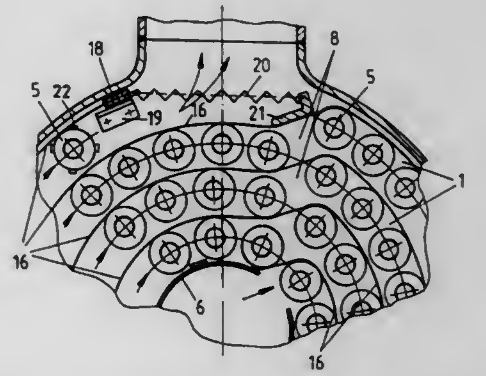
Hans Foerster, Beimstrasse 59, D-39110 Magdeburg, Germany

Filed Feb. 20, 1996, Ser. No. 603,213

Claims priority, application Germany, Feb. 20, 1995, 195 05 746.5

Int. Cl.⁶ F28F *9/22*

U.S. Cl. 165—160 **7 Claims**



1. An apparatus for exchanging heat between small liquid volume flows and large gaseous volume flows, comprising:
means for forming a circularly cylindrical pressure chamber of a predetermined length comprising a side wall defining radially directed gaseous flow output means and first and second end wall means;
pipe means coaxially aligned within said pressure chamber and extending from one of said first and second end wall means to the other of said end wall means, said pipe means having an axial gaseous flow input aperture and an elongate radially disposed gaseous flow aperture into said pressure chamber;
means forming first and second enclosed deflection chambers at said first and second end wall means and respectively provided with liquid flow input and output means;
a plurality of liquid flow tubular members extending between said first and second deflection chambers through said pressure chamber in a concentric arrangement around said pipe means and provided on their exterior with heat dissipating means;
substantially smooth thermally insulating web means extending in a convoluted path from said pipe means toward said side surface for forming a plurality of substantially annular chambers circumscribing said pipe means for receiving said tubular members and providing unidirectional gas flow thereacross between said gaseous flow aperture and said gaseous flow output means, said web means being of a width substantially equal to said predetermined length; and
means for drawing said web means into taut tangential contact with said tubular members.

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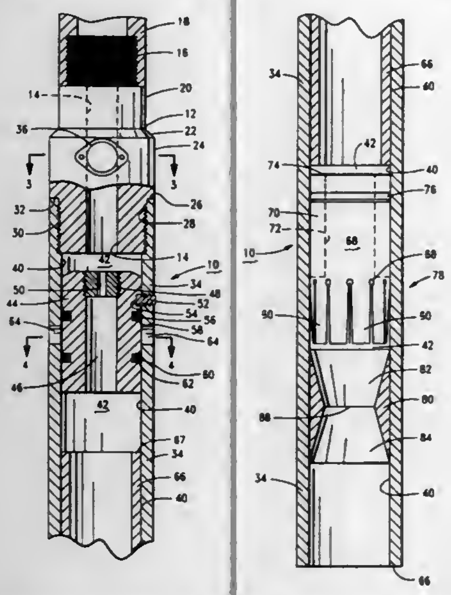
5,690,170
HYDRAULIC CUTTING OVERSHOT

Charles D. Hailey, 11628 Burning Oaks, Oklahoma City, Okla. 73150, and Wayne M. Blart, 12022 Knob Crest, Houston, Tex. 77070

Filed Feb. 22, 1996, Ser. No. 605,370

Int. Cl.^{6} E21B *31/16*

U.S. Cl. 166—55 **9 Claims**



1. An overshot cutter for removing a fish from a wellbore, comprising:
  - an elongate housing having upper and lower ends;
  - means for suspending said housing in said wellbore with the lower end enveloping said fish;
  - a drive piston retained in said housing upper end by means of a shear pin;
  - a cutter piston slidably retained in said housing adjacent said lower end, said cutter piston extending a collet cutter therebelow;
  - a restrictor block defining a reducing orifice proximate the lower end of said housing; and
  - hydraulic means for shearing said drive piston shear pin and forcing said drive piston down to force said cutter piston down around said fish while the restrictor block closes the collet cutter to separate the fish for retention within the cutter piston for subsequent removal.

5,690,171
WELLBORE STIMULATION AND COMPLETION

Peter Clive Winch, 1371 Waterworks Road, The Gap, Queensland 4061, and Ian Gray, 32 Norman Street, Coorparoo, Queensland 4151, both of Australia

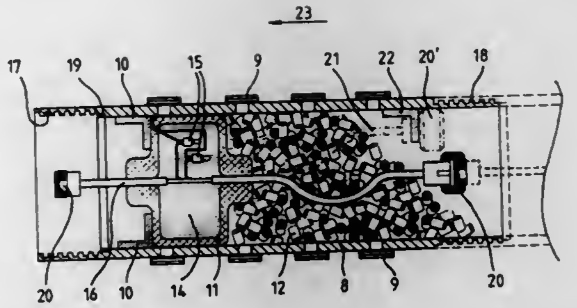
Filed Sep. 20, 1995, Ser. No. 531,092

Claims priority, application Australia, Sep. 20, 1994, PM8257

Int. Cl.^{6} E21B *43/263*

U.S. Cl. 166—63 **14 Claims**

1. A device for the stimulation and completion of a wellbore in a subterranean formation comprising:
  - a wellbore casing section having a plurality of weakened portions penetratable to leave apertures in a sidewall of said wellbore casing section, said wellbore casing being adapted for coupling to other wellbore casings;
  - a propellant material contained within said wellbore casing section so as to be run into the wellbore with said wellbore casing section, said propellant material producing expanding gaseous combustion products when ignited, for penetrating the weakened portions of said wellbore casing section and producing apertures in the sidewall thereof; and
  - one or more igniter means fixed in said wellbore casing section for igniting said propellant material; said wellbore casing section being suitable, after combustion, for remaining in said wellbore and for enabling formation fluid to be pumped into or from the wellbore via said apertures.



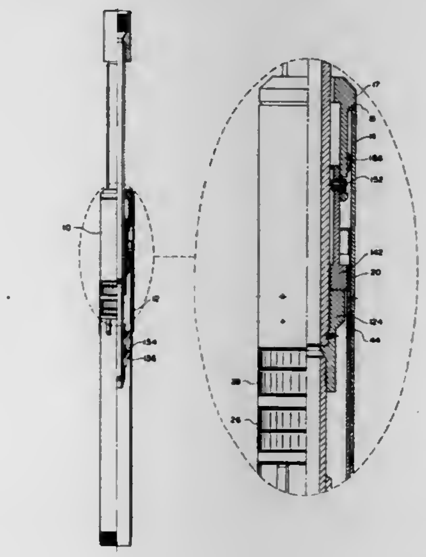
5,690,172
SEAL-SUB PACKER AND A SETTING TOOL THEREFOR

Lubbert Westra, Diepholz-St. Huelfe, Germany, assignor to Alexander Oil Tools, Inc., Metairie, La.

Filed Apr. 24, 1996, Ser. No. 639,299

Int. Cl.^{6} E21B *23/06*

U.S. Cl. 166—123 **19 Claims**



1. A seal-sub packer assembly, comprising:
  - a packer adapted for positioning inside of a casing, said packer comprising a first lower mandrel provided with interior threads and at least one compressible expandable sealing member mounted on an exterior surface of the lower mandrel, a second, upper mandrel mounted in circumferential relationship over at least a portion of said lower mandrel above said at least one sealing member and releasably secured thereto by at least one shear screw; and
  - a setting tool engageable with said interior threads of said lower mandrel for setting the packer inside the casing; said setting tool comprising an enlarged diameter ring which contacts a top edge of said upper mandrel, and whereby application of a predetermined downward force on said setting tool moves said upper mandrel downwardly shearing said at least one shear screw and causing vertical compression and horizontal expansion of said at least one sealing member in contact with an interior wall of the casing.

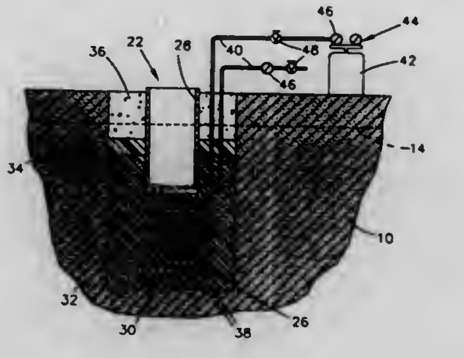
5,690,173
APPARATUS FOR ENHANCED BIOREMEDIATION OF UNDERGROUND CONTAMINANTS

Abdul Shaheed Abdul, Troy, and Thomas Loughborough Gibson, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 542,605, Oct. 13, 1995, abandoned. This application Feb. 25, 1997, Ser. No. 805,481

Int. Cl.^{6} E21B *43/01;* B09B *3/00*

U.S. Cl. 166—268 **40 Claims**



17. A method for biodegrading a contaminant in groundwater within a subsurface region of earth, the method comprising the steps of:
  - providing a first well having a lower end disposed in the subsurface region;
  - providing a second well having a lower end disposed in the subsurface region a distance from the lower end of the first well;
  - introducing groundwater from the lower end of the first well into the subsurface region;
  - introducing under pressure an oxidizing agent into the groundwater introduced by the first well, the oxidizing agent being introduced into the groundwater as a dispersion of molecules and at a rate such that the oxidizing agent is present in the groundwater within the subsurface region approximately at a maximum solubility level for the oxidizing agent in the groundwater;
  - recovering the groundwater from the subsurface region in the lower end of the second well;
  - recycling groundwater from the second well to the first well; and
  - inhibiting biofouling of the apparatus.

5,690,174
OIL AND GAS FIELD CHEMICALS

Richard George Chapman, Weybridge; Ian Ralph Collins, Hampton; Stephen Paul Goodwin, London; Andrew Richard Lucy, York, and Nevin John Stewart, Guildford, all of England, assignors to BP Chemicals Limited, London, England

Filed Jan. 17, 1996, Ser. No. 586,324

Claims priority, application United Kingdom, Jan. 19, 1995, 9501021; Jun. 7, 1995, 9511487

Int. Cl.^{6} E21B *43/16*

U.S. Cl. 166—275 **24 Claims**

1. A process for increasing the effectiveness of production chemicals by reducing the number of squeezing and shut-in operations needed to increase the production rate from an oil well by inhibiting scale formation in said well, said process comprising injecting into an oil-bearing rock formation a water-miscible formulation comprising:
  - (a) a water-miscible surfactant which is an alkyltriglycol ether, and
  - (b) at least one water-miscible oil field or gas field production chemical comprising a scale inhibitor,

under pressure and holding said formulation in said formation for a period to achieve said shut-in thereby enabling components of said formulation to be absorbed by the oil bearing formation and act as a scale inhibitor, said components of the formulation being introduced either as a pre-formed single homogeneous composition, or simultaneously in parallel or sequentially in either order into the rock formation.

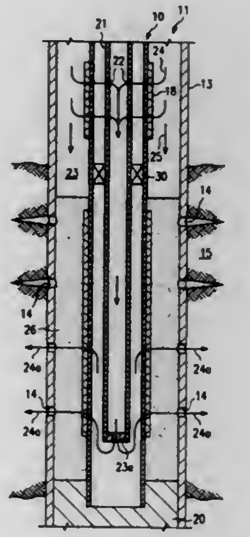
5,690,175
WELL TOOL FOR GRAVEL PACKING A WELL USING LOW VISCOSITY FLUIDS

Lloyd G. Jones, Dallas, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 4, 1996, Ser. No. 606,474

Int. Cl.^{6} E21B *43/04*

U.S. Cl. 166—278 **5 Claims**



1. A well tool for gravel packing an interval within a wellbore having a casing therein which, in turn, has perforations which lie within said interval, said well tool comprising:
  - a conduit adapted to be connected to the lower end of a work string, said conduit comprising:
    - a lower main screen adapted to lie within said interval and adjacent said casing perforations when said well tool is in an operable position within said wellbore;
    - an upper by-pass screen section lying above said main screen, said by-pass screen section positioned above said casing perforations and adapted to allow fluid to flow into said well tool but block flow of particulates therethrough; and
  - means within said conduit for by-passing fluid from said by-pass screen section to the exterior of said conduit adjacent the lower portion of said conduit 1 wherein said means for by-passing fluid comprises:
    - a washpipe positioned within said conduit and extending through said interval; said washpipe having inlet openings therein which lie substantially adjacent said upper screen section; and
    - means below said inlet openings for blocking flow between said washpipe and said conduit.

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5,690,176

COMPOSITION EFFECTIVE IN REMOVING ASPHALTENES

Alberto Delbianco, Magenta, and Fabrizio Stroppa, S. Giuliano Mil.Se, both of Italy, assignors to Agip S.p.A., Milan, Italy

Filed Mar. 12, 1996, Ser. No. 615,535

Claims priority, application Italy, Apr. 7, 1995, MI95A0711

Int. Cl.^{6} E21B *37/00;43/12*

U.S. Cl. 166—304 **8 Claims**

1. A process for the dissolution of asphaltene formations of oil wells which consists in introducing a solubilizing composition for the above asphaltenes into the oil wells, characterized in that the solubilizing composition comprises:

(a) a basically hydrocarbon fraction consisting of at least 70%, of aromatic and alkyl aromatic hydrocarbons, the alkyl group being from C_1 to C_4;

(b) a fraction basically consisting of quinoline and isoquinoline as such or alkyl substituted, the alkyl group being from C_1 to C_4;

the weight ratio between fraction (a) and (b) being from 97.5/2.5 to 75/25.

5,690,177

FILL VALVE

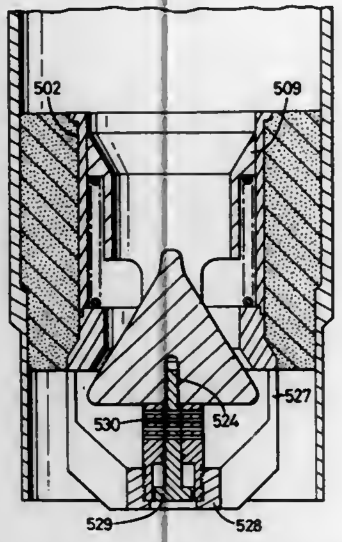
Peter Budde, Vlaardingen, Netherlands, assignor to Weatherford Lamb, Inc., Houston, Tex.

Continuation of Ser. No. 519,503, Aug. 25, 1995, Pat. No. 5,511,618, which is a continuation of Ser. No. 283,404, Aug. 1, 1994, Pat. No. 5,450,903. This application Apr. 29, 1996, Ser. No. 641,009

Claims priority, application United Kingdom, Mar. 22, 1994, 9405679

Int. Cl.^{6} E21B *34/10*

U.S. Cl. 166—321 **13 Claims**



1. A fill valve for use in cementing operations in the construction of oil and gas wells, the fill valve comprising a tubular housing having a valve seat,

a valve member slidably mounted in said tubular housing,

spring means for biasing said valve member towards a closed position,

said valve member comprising a head engageable with said valve seat of said tubular housing to close the valve,

a tubular portion and at least one window in said tubular portion so that fluid pumped through said tubular portion displaces said valve member relative to said tubular housing to open the fill valve and exit via said at least one window, and

selectively releasable apparatus for releasably maintaining the fill valve in an open position.

5,690,178

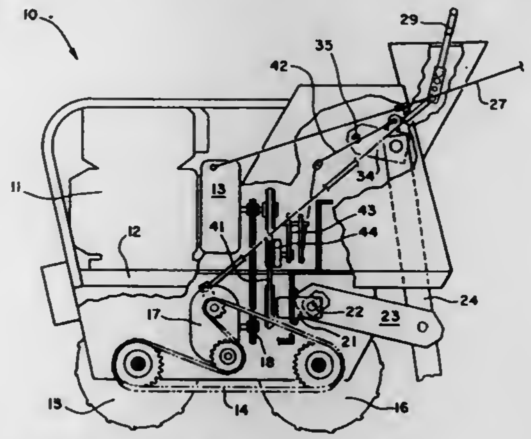
SOD CUTTER

Claude D. Zehrung, Jr., Denver, and William H. Oliver, Highlands Ranch, both of Colo., assignors to Bluebird International, Inc., Englewood, Colo.

Filed Feb. 14, 1996, Ser. No. 601,181

Int. Cl.^{6} A01B *45/04*

U.S. Cl. 172—19 **16 Claims**



1. A sod cutter comprising:

a frame;

two front wheels and two rear wheels attached to said frame;

a motor mounted to said frame for driving said front wheels and said rear wheels;

a blade adjacent to said rear wheels driven by said motor;

a handle extending rearward from said frame for guiding said sod cutter;

a blade linkage for selectively moving said blade between a raised position in which said blade is above the sod and a lowered position in which said blade cuts the sod;

a clutch driven by said motor; and

a clutch control mounted to said handle for engaging said clutch to drive said wheels, said clutch control engaging said clutch only when manually operated and automatically disengaging said clutch when released.

5,690,179

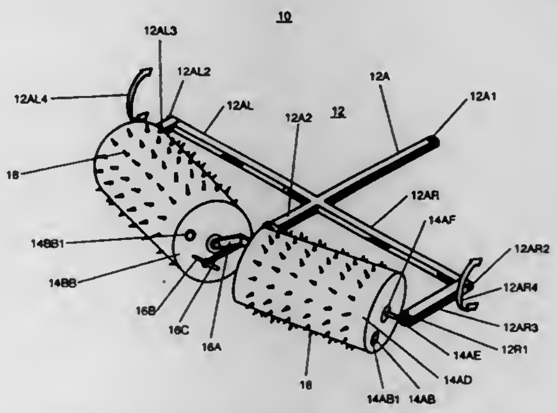
ENHANCED AGRICULTURAL AERATOR

Wayne Dickson, 145 Loretta La., Luthersville, Ga. 30251

Filed Jan. 19, 1996, Ser. No. 589,019

Int. Cl.^{6} A01B *45/02*

U.S. Cl. 172—21 **13 Claims**



1. An enhanced agricultural aerator (**10**) removably attachable to a farm tractor (**24**) by a frame hitch pin hole (**12A1**) and a frame hitch pin (**12A3**), the enhanced agricultural aerator (**10**) comprising:

(A) a frame (**12**) which comprises a frame longitudinal member (**12A**) securely fastened to a frame longitudinal member extension (**12A2**) and securely fastened to a frame left transverse member (**12AL**) and securely fastened to a frame right transverse member (**12AR**), the frame left transverse member (**12AL**) pivotally attached to a frame left rear member (**12AL3**), the frame right transverse member (**12AR**) pivotally attached to a frame right rear member (**12AR3**);

B) a right aerator (**14A**) rotatably attached to the frame right rear member (**12AR3**) by a right aerator axle (**14AE**) fastened thereto by a frame right connecting pin (**12AR1**), the frame right rear member (**12AR3**) attached to the frame right transverse member (**12AR**) by a frame right pivot joint (**12AR2**), the right aerator (**14A**) having a right aerator drum surface (**14AD**) with a plurality of aerator spikes (**18**) mounted thereon;

C) a left aerator (**14B**) rotatably attached to the frame left rear member (**12AL3**) by a left aerator axle (**14BE**) fastened thereto by a frame left connecting pin (**12AL1**), the frame left rear member (**12AL3**) rotatably attached to the frame left transverse member (**12AL**) by a frame left piviot joint (**12AL2**), the left aerator (**14B**) having a left aerator drum surface (**14BD**) with a plurality of aerator spikes (**18**) mounted thereon;

D) a rake adjusting member (**16**) which comprises a rake adjusting bracket (**16A**) having a rake adjusting screw (**16C**) threadably mounted at a midpoint of the rake adjusting bracket (**16A**), the rake adjusting screw (**16C**) further comprises a rake adjusting handle (**16B**) securely fastened thereto, the rake adjusting bracket (**16A**) rotatably fastened at a left distal end to the left aerator axle (**14BE**) and rotatably fastened at a right distal end to the right aerator axle (**14AE**).

5,690,180

HORIZONTAL-AXIS CUTTER FOR SOIL CULTIVATION

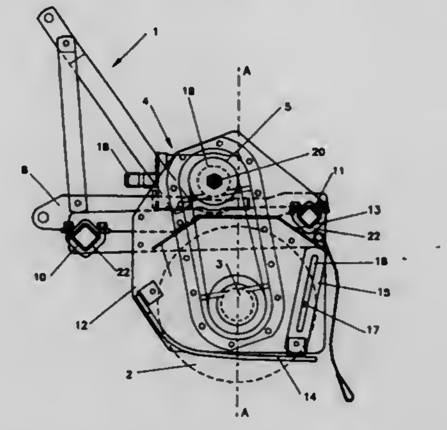
Flavio Veronesi, Nogara, Italy, assignor to Rotomec S.p.A., Nogara, Italy

Filed Mar. 15, 1996, Ser. No. 616,666

Claims priority, application Italy, Apr. 3, 1995, PC950004 U; Nov. 3, 1995, PC950018 U

Int. Cl.^{6} A01B *33/00*

U.S. Cl. 172—112 **8 Claims**



1. A horizontal-axis cutter for soil cultivation as the cutter moves in a working direction, comprising:

a front bar (**10**) extending transversely to the working direction;

a rear bar (**11**) extending transversely to the working direction and spaced rearwardly from the front bar with respect to the working direction;

a pair of spaced apart side plates (**12**), said front and rear bars being fixed between said side plates;

a horizontal-axis rotor (**2**) carrying tools for cultivating soil, mounted for rotation between said plates and between said front and rear bars;

a support (**1**) for connecting the cutter to a tractor, the support being slidably mounted for movement transverse to the working direction on said front and rear bars;

means (**22**) for locking said support at a selected transverse position between said side plates and to said front and rear bars;

a gear motor adapted to be connected to a power take-off of a tractor, mounted to said support and connected to said rotor for rotating said rotor; and

said rotor having a horizontal axis and a vertical plane (A—A) extending through said horizontal axis, said gear motor being located forward of said vertical plane with respect to the working direction.

5,690,181

TOOL HANDLE MOUNTING STRUCTURE FOR GARDEN TOOLS

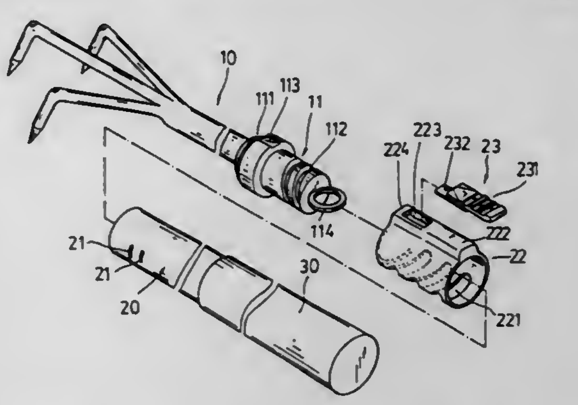
Chun-Li Shu, No. 426, Tou-Yuan E. Rd., Ho-Feng Village, Pi-Tou Hsiang, Chang-Hua Hsien, Taiwan

Filed Oct. 22, 1996, Ser. No. 735,269

Claims priority, application China, Aug. 15, 1996, 85212453

Int. Cl.^{6} A01B *1/22*

U.S. Cl. 172—378 **1 Claim**



1. A tool handle mounting structure for attaching a handle to a tool head comprising: a coupling cap having a mounting section at one end fixed to said tool head and a coupling section at an opposite end adapted for coupling to a handle, said mounting section having a stepped periphery with the steps increasing in diameter in a direction toward said coupling section, said coupling section having an external spiral groove around the periphery; a tubular front end on said handle adapted for coupling to the coupling section of said coupling cap, said tubular front end having a plurality of threads raised from an inside surface adapted for threading onto the spiral groove of the coupling section;

a longitudinal locating groove on a largest step of said mounting section;

a sleeve fixedly mounted to the tubular front end of said handle, said sleeve having a longitudinal track on an outside with a longitudinal sliding slot in said longitudinal track, said longitudinal sliding slot being longitudinally aligned with the longitudinal locating groove of said coupling cap when said handle is coupled to said coupling cap; and,

a sliding lock movably mounted in the longitudinal sliding slot, so as to be movable toward and away from the locating groove of said coupling cap, such that said sliding lock is movable into the locating groove of said coupling cap to prohibit rotary motion of said sleeve and said handle relative to said coupling cap and said tool head, and movable out of the locating groove of said coupling cap to enable said sleeve and said handle to be rotated relative to said coupling cap and said tool head.

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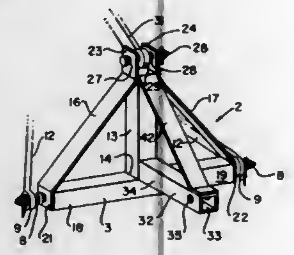
APPARATUS FACILITATING CONNECTION OF TRAILER IMPLEMENT TO TRACTOR THREE-POINT HITCH SYSTEM

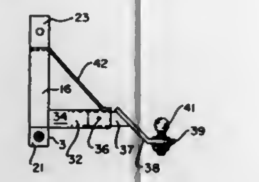
William Ward, 22000 Summit Rd., Los Gatos, Calif. 95030

Filed Apr. 5, 1996, Ser. No. 628,497

Int. Cl.^{6} B60D *1/00*

U.S. Cl. 172—439 **12 Claims**





1. Apparatus facilitating connection of a three-point hitch system adjustably mounted on a tractor to an implement adapted to trail the tractor, said apparatus comprising:

a) unitary frame means configured to present three mounting portions spacially separated from one another in generally an isosceles triangular pattern and lying in a common plane;

b) connection means mounted on each said mounting portion of said unitary frame means and lying in said common plane for selective pivotal connection to said three-point hitch system for complementary adjustment of said unitary frame means corresponding to the adjustment of said three-point hitch system in relation to said tractor; and

c) means mounted on said unitary frame means spaced rearwardly from said common plane and generally coincident with a plane perpendicular to said common plane and including two of said spacially separated mounting portions for operatively engaging said implement to be trailed behind said tractor.

5,690,183

DRILL HEAD UNIT

Phillip A. Sollami, Herrin, Ill., assignor to The Sollami Company, Herrin, Ill.

Continuation-in-part of Ser. No. 275,144, Jul. 14, 1994, Pat. No. 5,492,183, which is a continuation-in-part of Ser. No. 683,862, Apr. 11, 1991, abandoned, and a continuation-in-part of Ser. No. 947,554, Sep. 21, 1992, abandoned, and a continuation-in-part of Ser. No. 038,390, Mar. 29, 1993, Pat. No. 5,330,013. This application Feb. 16, 1996, Ser. No. 602,939

Int. Cl.^{6} E21C *7/02*

U.S. Cl. 173—216 **12 Claims**

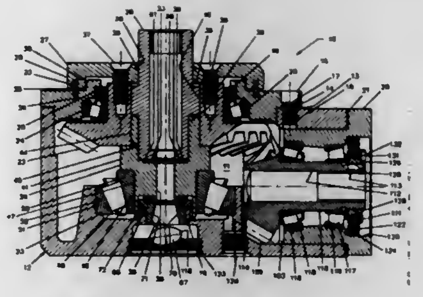
1. A drill head unit for transmitting rotational power from a motor to a vertically oriented hollow drill bit comprising:

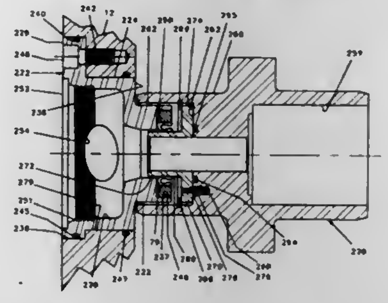
a housing having a first cavity therein for enclosing a gear assembly,

a first gear mounted in said first cavity and journaled for rotation about a vertical axis,

means for mounting a drill chuck on said first gear, said means for mounting including a axial opening for retaining a drill chuck therein,

a first shaft extending downwardly below said first gear, said first shaft having an axial hole communicating with said axial opening in said means for mounting,





means for transferring rotational power from said first gear to a drill chuck in said means for mounting,

a second cavity in said housing below said first gear, said second cavity being in communication with said axial hole in said first shaft;

said housing having a port opening into said second cavity through which a fluid may flow,

a second gear mounted in said first cavity,

attachment means for attaching said second gear to a motor shaft,

first sealing means for sealing said first gear against said housing,

second sealing means for sealing said second gear against said housing,

said housing having an opening therein,

a cartridge removably fitted into said housing opening, and removable in a direction away from said means for mounting,

a sealing surface on one of said first shaft and said cartridge, and

a seal for sealing said first cavity from said second cavity fitted on the other of said first shaft and said cartridge, said seal sealing against said sealing surface.

5,690,184

ROCK DRILLING APPARATUS

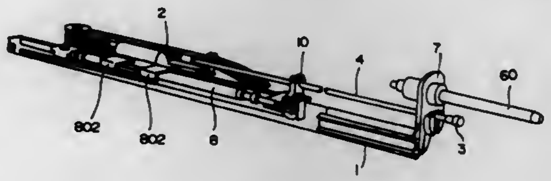
Toshiro Tsuchiya, Hiroshima-ken, Japan, assignor to Fujita Corporation, Tokyo, Japan

Filed Mar. 13, 1996, Ser. No. 615,608

Claims priority, application Japan, Apr. 20, 1995, 7-119300

Int. Cl.^{6} E21B *19/08*

U.S. Cl. 175—220 **19 Claims**



1. A rock drilling apparatus comprising:

a frame having a front end;

a guide rod supported on said front end of the frame;

a rotary rod extending parallel to said guide rod and supported on said frame for rotation about its own axis and longitudinal movement beyond said front end of the frame; and

a drill bit mounted on a front tip end of said rotary rod;

said guide rod comprising a shank fixed to said front end of the frame and a tubular member extending substantially fully over said shank and rotatably disposed around said shank.

5,690,185

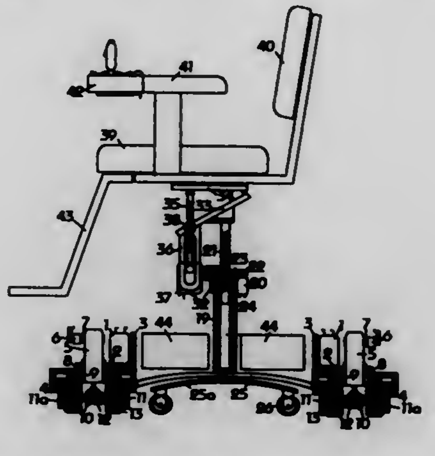
SELF POWERED VARIABLE DIRECTION WHEELED TASK CHAIR

Michael P. Sengel, 110 S. Lorraine Rd., Wheaton, Ill. 60187-5833, assignor to Michael P. Sengel, Wheaton, Ill.

Filed Mar. 27, 1995, Ser. No. 410,685

Int. Cl.^{6} B60K *1/02*

U.S. Cl. 180—65.1 **6 Claims**



1. A power driven wheel chair comprising:

a seat post frame member, having at least a lower attachment point, an upper attachment point for a driven gear retainer, and an attachment point for a vertical adjustment motor,

a longitudinal leaf spring element, having at least a forward mounting point, a rearward mounting point and a center point for attachment to the lower attachment point of the seat post frame member,

a pair of diagonal leaf spring elements, each having a first and second end, and a center point for attachment to the lower attachment point of the seat post frame member,

first and second pairs of stabilizing castors, one castor being mounted at each end of each diagonal leaf spring element,

wherein each diagonal leaf spring element is attached at its centerpoint to the seat post frame member, the diagonal springs forming an X-shape as viewed from above, each diagonal leaf spring element centerpoint coincident with the longitudinal leaf spring element centerpoint,

the chair further comprising at least single front and rear electro-mechanical directionally pivoting propulsion units, each unit having at least a single ground-engaging drive wheel, each further being attached to the respective forward and rearward mounting points of the longitudinal leaf spring element,

the chair further comprising an electro-mechanical means for adjusting a vertical height of a seating, footresting and armresting means,

the vertical height adjusting means comprising a vertical adjuster screw that has a top mounting point for attaching said seating, footresting and armresting means, the screw fitting into said seat post frame member,

the chair further comprising an electro-mechanical means for adjusting a horizontal tilt of said seating, footresting and armresting means,

the horizontal tilt adjusting means attached between the top mounting point of the vertical adjusting screw and a lower mounting point of said seating, footresting and armresting means,

said seating, footresting and armresting means having a pair of armrests, one each attached to each side of said seating, footresting and armresting means so as to provide the operator with a left and a right armrest,

said seating, footresting and armresting means further comprising a control panel, attached to the right or left armrest,

said control panel comprising:

a joy stick controlling said front and rear electro-mechanical directionally pivoting propulsion units;

a mode button controlling first, second and third steering modes;

a vertical height switch controlling at least a single vertical height adjustment motor;

a power selector switch controlling a battery operation mode or a directconnected, alternating current operation mode; and

a park and emergency stop button controlling a park and emergency stop mode,

the chair further comprising boxes attached to the chair that contain at least a single on-board battery and at least a single on-board control circuit.

5,690,186

CONTROL APPARATUS AND METHOD FOR ELECTRIC VEHICLES

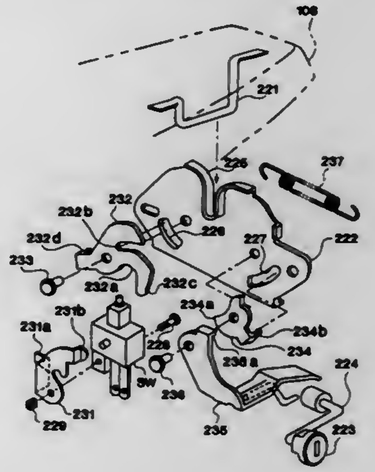
Kouichi Sugioka; Hiroyuki Sinmura; Masao Ogawa; Satoshi Honda; Yoshihiro Nakazawa, and Takaaki Fujii, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 151,172, Nov. 12, 1993, Pat. No. 5,610,814. This application Sep. 17, 1996, Ser. No. 714,267

Claims priority, application Japan, Nov. 12, 1992, 4-327368; Sep. 29, 1993, 5-243049

Int. Cl.^{6} B60K *28/00*

U.S. Cl. 180—273 **1 Claim**



1. A seat detecting apparatus for verifying that a driver of an electric vehicle has occupied a seat of the electric vehicle, the seat detecting apparatus comprising:

a seat lock engagement unit installed on the seat;

seat lock members engaged to said seat lock engagement unit for holding the seat in a closed state,

said seat lock members displaceable in a closing direction of the seat when the seat is not occupied by the driver, displacement of said seat lock members being detectable through said seat lock engagement unit when the driver occupies the seat.

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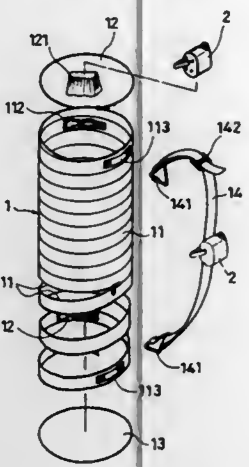
5,690,187
LIFE-SAVING TRAVEL BAG

Wen-Chung Wang, 2F., No. 36, Lane 13, Chi-Hsiang St., Hsin-tien City, Taipei County, Taiwan, and Min-Long Chuang, 4/F., No. 120, Kuang-Ming Rd., Sanchung City, Taipei County, Taiwan

Filed Aug. 12, 1996, Ser. No. 695,431
Int. Cl.^{6} A62B *1/06*
U.S. Cl. 182—70 **3 Claims**



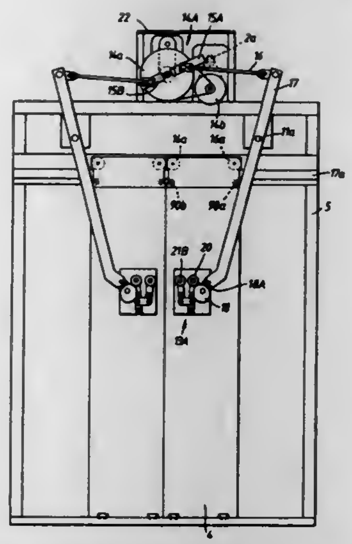
1. A life-saving travel bag, comprising a rope body of a suitable length and width and sewn with two zippers each at one side thereof, said rope body forming a substantially cylindrical bag in an upright position when said two zippers are closed, said rope body having a fastening means at an inner side thereof at a suitable position near each end thereof, two fastening straps being respectively disposed at one side of the cylindrical bag at an upper end and a lower end, said fastening straps being respectively connected to two fastening rings at two ends of a shoulder strap so that said shoulder strap may be connected to the cylindrical bag for carrying purposes, an adjusting element being provided at said shoulder strap for adjusting the length thereof, an upper cover and a lower cover being respectively connected to the upper end and lower end of the cylindrical bag by means of zippers to serve as openings of the bag, an inner pocket being provided at an inner side of said upper cover for accommodating a speed control means, said rope body being extended to its full length by opening said zippers when in use, said fastening means at one end of said rope body being adapted to be fastened to any fixed structure of a building so that said rope body may drop to a ground surface, a speed control means being adapted to be fastened to said rope body and said shoulder strap being adapted to be passed under the armpits of a user, said fastening rings of said shoulder strap being adapted to be fastened to a fastening ring portion at a bottom side of said speed control means so that the user may be suspended on said speed control means and said rope body and may drop safely downwardly to the ground surface by controlling a control lever of said speed control means.

5,690,188
ELEVATOR DOOR SYSTEM

Yasufumi Takakusaki, and Yuichiro Kimura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawaski, Japan

Filed Mar. 5, 1996, Ser. No. 610,932
Claims priority, application Japan, Mar. 10, 1995, 7-050941
Int. Cl.^{6} B66B *13/12*
U.S. Cl. 187—319 **5 Claims**

1. An elevator door system, comprising:
a landing door;
a car door provided on a car;
latch means for locking said landing door when said landing door is closed;



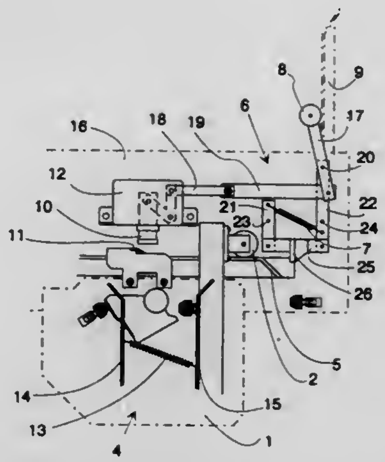
door locking means provided on said landing door composed of a coupling plate for coupling with said car door, an unlocking plate provided in parallel with said coupling plate, and a link connected between said coupling plate and said unlocking plate for moving said unlocking plate toward said coupling plate;
first linking mechanism for linking said door locking means with said latch means; and
coupling means provided on said car door composed of a pair of coupling rollers for coupling said car door with said landing door, when said car lands a landing floor and said door locking means is positioned between said coupling rollers;
one of said coupling rollers of said coupling means pushing said unlocking plate toward said coupling plate when said car lands said landing floor;
a displacement of said unlocking plate caused by being pushed toward said coupling plate by said link being applied to said latch means through said first linking mechanism;
said latch means unlocking said landing door when said displacement of said unlocking plate is applied;
said coupling means coupling said car door with said landing door by pushing said door locking means between said coupling rollers of said coupling means when said car lands said landing floor and after said landing door is unlocked; and
said car door and said landing door being moved in one unit after said coupling means couples said car door with said landing door.

5,690,189
APPARATUS AND METHOD FOR LOCKING AND UNLOCKING THE DOOR OF AN ELEVATOR CAR

Franz Josef Karner, St. Anton, Austria, assignor to Kone Oy, Helsinki, Finland

Filed Oct. 31, 1995, Ser. No. 550,656
Claims priority, application Finland, Oct. 31, 1994, 945128
Int. Cl.^{6} B66B *13/06*
U.S. Cl. 187—335 **20 Claims**

1. Apparatus for locking a door of an elevator car movable in an elevator shaft, said shaft including a guide surface at each landing, said elevator car including a door actuating mechanism on the elevator car for moving the door along a door travelling path, said apparatus comprising:
a lock for locking the door of the elevator car;
a linkage for operating the lock in cooperation with said guide surface, said linkage including an operating lever having a roller thereon which, when at a landing, presses against the guide surface, the operating lever being pivotally attached to the linkage by a movable pivot; and
a coupling element moved by the door actuating mechanism and fitted to transmit motion of the door produced by the door

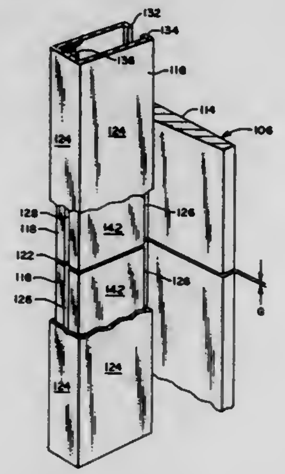


actuating mechanism to the linkage only at an ending portion of the door travelling path when the door is reaching a closed position.

5,690,190
OVERLAY FOR AN ELEVATOR GUIDE RAIL

James A. Rivera, Bristol, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Division of Ser. No. 491,003, Jun. 15, 1995. This application Jul. 5, 1996, Ser. No. 676,011
Int. Cl.^{6} B66B *7/02*
U.S. Cl. 187—406 **8 Claims**

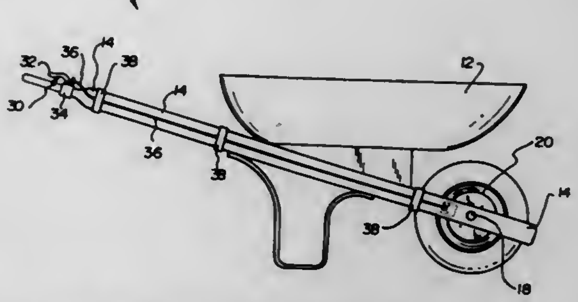


1. A method to install a guide rail for a elevator, the elevator including a platform for bearing passengers, the platform moving through a path defined by engagement between the platform and the guide rail, the guide rail including a plurality of segments adapted to be joined sequentially and an overlay, the overlay having an engagement surface for the platform, the method including the steps of:
joining the plurality of segments sequentially, such that a plurality of joints between adjacent segments are thereby formed;
attaching the overlay to the plurality of joined segments, the overlay extending over the plurality of segments and joints.

5,690,191
WHEELBARROW BRAKING SYSTEM

Daniel P. Burbank, P.O. Box 227 Ben Berry Rd., Moultonborough, N.H. 03254

Filed Aug. 12, 1996, Ser. No. 689,592
Int. Cl.^{6} B62B *1/18*
U.S. Cl. 188—2 D **6 Claims**

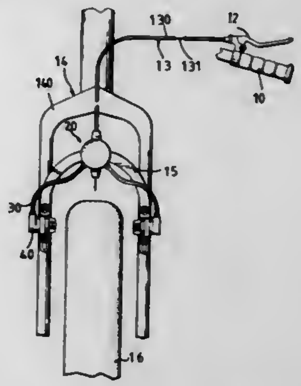


1. A wheelbarrow braking system comprising:
a braking means secured near an end of a support member near a tire rim of a wheelbarrow:
a hand brake means secured to the support member opposite of the braking means;
a brake cable secured at one end to the hand brake means projecting along the support member attached to said support member by a plurality of cable securing straps, and an opposite end secured to the braking means thereby mechanically connecting the hand brake means to the braking means allowing control thereof; and
wherein the braking means includes:
a brake disc with a smaller outside diameter than the tire rim;
four disc spacers secured radially to the brake disc; and
four fasteners projecting into the brake disc then through the corresponding disc spacers then terminating into the tire rim thereby securing the brake disc to the tire rim positioned a finite distance away.

5,690,192
BRAKE MEANS FOR A BICYCLE

Yung-Pin Kuo, No. 55, Alley 121, Lane 175, Kuo Shen Rd., Chang Hwa City, Taiwan

Filed May 28, 1996, Ser. No. 654,118
Int. Cl.^{6} B62L *3/00;* **B60T** *11/00*
U.S. Cl. 188—24.22 **4 Claims**



1. A brake means for a bicycle which comprises a front fork and a handlebar disposed above said front fork comprising two legs, at least one brake lever disposed to one of two ends of said handlebar and a brake cable connected at a first end thereof to said brake lever, a second end of said brake cable connected to said brake means which comprises:
a bridge element disposed between said two legs of said front forks a control portion disposed on said bridge element and

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being a cylindrical element with a first end and a second end which has a bottoms a tubular element extending longitudinally from said bottom and an oil hole and two first holes respectively defined in a periphery of said control portion near said second end, each of said two first holes connected with a pipe respectively and a threaded rod engaged with said oil holes a first piston slidably received in said control portion and comprising a disk and a stud which extends from one side of said disks said stud received in said tubular element and a first resilient element biasedly disposed between said bottom and said disks said disk and said bottom having hydraulic liquid filled therebetween;

an actuating means movably disposed in said control portion and located to the other side of said disks said actuating means connected to said second end of said brake cable and contacting said first pistons said first piston being pushed toward said tubular element to pressurize said hydraulic liquid received between said disk and said bottom when said brake cable is pulled, and

a brake part disposed to each of two legs of said front fork and having a first end connected to said pipe and a second end with a board received therein, a second piston slidably received in said brake part with a rod extending from a first end thereof, said rod extending through said board and having a brake pad disposed at a distal end thereof, a second resilient element biasedly disposed between said board and said second piston such that when said hydraulic liquid enters into said brake part via said pipe, said second piston together with said rod are pushed to let said brake pad extend out said second end of said brake part.

5,690,193
ARRANGEMENT FOR OPERATING A PARKING BRAKE

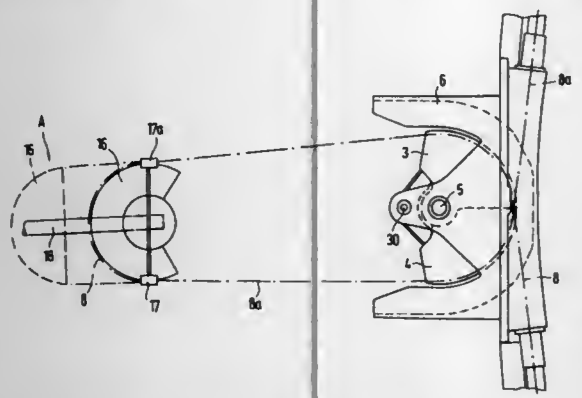
Hans-Uwe Baumann, Stuttgart, and Josef Paleczek, Weil der Stadt, both of Germany, assignors to Dr. Ing. h.c.F. Porche AG, Weissach, Germany

Filed Mar. 18, 1996, Ser. No. 617,146

Claims priority, application Germany, Mar. 16, 1995, 195 09 469.7

Int. Cl.^{6} F16D *55/08*

U.S. Cl. 188—72.9 **15 Claims**



1. An operating arrangement for a parking brake for a motor vehicle having braking mechanisms operatively arranged on wheels of the vehicle which are operable via tension members guided around a deflecting element, the tension members being coupled with a hand brake lever via a transmission element, the operating arrangement comprising:

at least two segments forming the deflecting element, said at least two segments being disposed opposite one another and arranged on a common swivel axis;

at least one return element by which said at least two segments are held in an inoperative position;

a housing in which said at least two segments are arranged, said housing having an insertion duct on each side thereof for the tension members;

wherein each of said at least two segments has a deflecting contour with a guide groove for the tension member; and

wherein said insertion ducts are located near, and open into, an area of the deflecting contour.

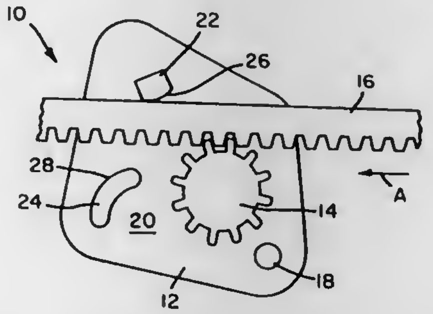
5,690,194
ONE-WAY PIVOTING GEAR DAMPER

Eric G. Parker, Elgin, and Steven L. Bivens, Kankakee, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Oct. 30, 1995, Ser. No. 550,380

Int. Cl.^{6} E05F *1/10;* **F16D** *57/00*

U.S. Cl. 188—82.1 **20 Claims**



1. A one-way pivoting gear damper for use with a rotary damper, comprising in combination:

toothed gear means movable between first and second positions and in first and second directions;

pivotable bracket means for pivoting between first and second positions and in first and second directions in accordance with the movement of said toothed gear means;

a toothed driven gear of a rotary damper rotatably disposed upon said pivotable bracket means; and

means disposed upon said pivotable bracket means for causing said toothed gear means to be moved into enmeshed engagement with said toothed driven gear so as to permit a dampening force to be produced upon said toothed gear means by the rotary damper and said toothed driven gear when said toothed gear means is moved in said first direction toward said first position, and for causing said toothed gear means to be moved out of engagement from said toothed driven gear so as to allow unrestricted movement of said toothed gear means in said second direction toward said second position.

5,690,195
ALTERNATING STATE PRESSURE REGULATION VALVED DAMPER

William Charles Kruckemeyer, Beavercreek; Patrick Neil Hopkins, Miamisburg; Richard Edward Longhouse, Dayton; Michael Anthony Dimatteo, Kettering, and Michael Leslie Oilver, Xenia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1996, Ser. No. 687,862

Int. Cl.^{6} F16F *9/46;9/34*

U.S. Cl. 188—299 **14 Claims**

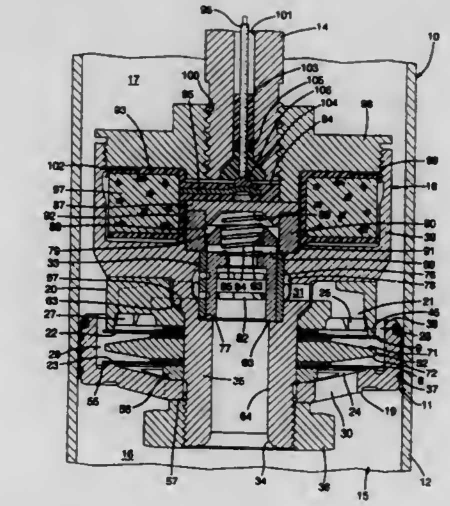
1. A suspension damper comprising:

a single cylinder defining a substantially liquid filled cavity;

a piston slidably positioned in the single cylinder separating the cavity into a compression chamber and an extension chamber;

a rod attached to the piston and extending through the extension chamber and exiting the cavity;

wherein the piston is slidable in a compression direction such that an increasing volume of the rod enters the cavity and in an extension direction such that an increasing volume of the rod exits the cavity wherein a passage is provided through the piston so that a liquid exchange is effected between the extension chamber and the compression chamber during sliding of the piston in the extension and compression directions;



wherein the passage has a first branch and second branch, the liquid exchange being selectively effected through the first branch that includes a bi-directional deflectable first single annular disc tuned to effect a relatively soft damping rate controlling damping forces at directions during both directions during extension direction and compression direction travel of the piston and the first branch also including a remotely operated control valve being selectively positioned in an open position substantially freely allowing liquid exchange through the first branch and a closed position substantially preventing liquid exchange through the first branch and the liquid exchange being selectively effected through the second branch that includes a bi-directional deflectable second single annular disc tuned to effect a relatively firm damping rate wherein when the remotely operated control valve is in the open position the monotube suspension damper develops a first damping rate wherein force is dependent upon velocity of the sliding piston and the first damping rate is substantially dependent upon the deflective characteristics of the first single annular disc and the second annular disc in parallel and when the remotely operated control valve is in the closed position the suspension damper develops a second damping rate wherein force and the second damping rate are dependent upon velocity of the sliding piston substantially as a result of the deflective characteristics solely of the second single annular disc.

5,690,196
RETRACTABLE HANDLE ASSEMBLY FOR A SUITCASE

Jin-jiao Wang, No. 18, Lane 116, Ta An Gan Rd., Tachia Chen, Taichung Hsien, Taiwan

Filed Aug. 12, 1996, Ser. No. 695,693

Int. Cl.^{6} A45C *5/14;13/26*

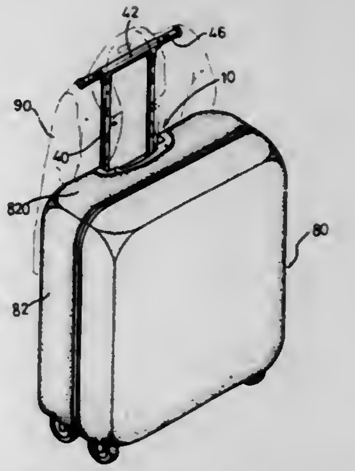
U.S. Cl. 190—115 **7 Claims**

1. A retractable handle assembly for a suitcase (**80**) having a top wall (**820**), said handle assembly comprising:

a supporting bracket (**10**) fixedly mounted on said top wall (**820**) of said suitcase (**80**) and including two end portions each having a socket (**12**) vertically defined therein and a side extension wall (**102**) extending downwardly from an underside thereof, said supporting bracket (**10**) further including a catch (**18**) formed on said side extension wall (**102**);

two receiving casings (**16**) each fixedly mounted on said side extension wall (**102**) of said supporting bracket (**10**) and each communicating with a of said two sockets (**12**);

two rotary cylinders (**30**) each rotatably received in a corresponding one of said two receiving casings (**16**) and each having a passage (**32**) radially defined therein and aligning with an associated socket (**12**);



a linking rod (**38**) mounted between said two rotary, cylinders (**30**) and having two distal end each fixedly fitted in a corresponding one of said two rotary, cylinders (**30**), at least one retaining member (**39**) fixedly mounted around said linking rod (**38**) and having a plurality of teeth (**392**) formed on a periphery thereof for meshing with said catch (**18**);

a U-shaped handle including two upright legs (**40**) each movably mounted on said supporting bracket (**10**) and each slidably extending through a corresponding one of said two sockets (**12**) and a corresponding passage (**32**) of said two rotary, cylinders (**30**); and

a handgrip (**42**) having two distal ends each having a sleeve (**43**) extending downwardly therefrom and fixedly mounted on an upper end of a corresponding one of said two upright legs (**40**).

5,690,197
POWER SUPPLY DEVICE FOR SUPPLYING A DRIVE POWER TO A MOVABLE OBJECT

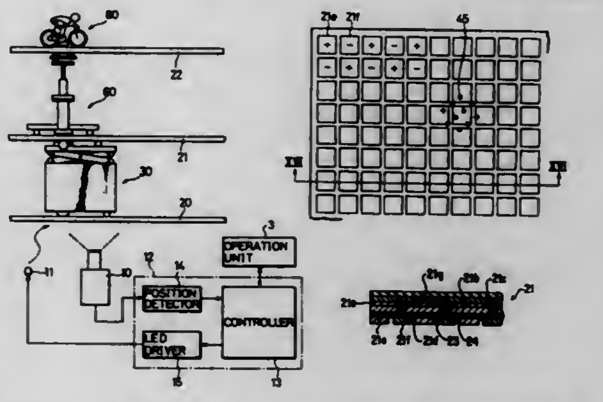
Masanori Suganuma, Kawasaki; Kazuhito Matsuura, Komae, and Kohji Okamoto, Zama, all of Japan, assignors to Konami Co., Ltd., Hyogo-ken, Japan

Filed Feb. 21, 1996, Ser. No. 604,519

Claims priority, application Japan, Feb. 21, 1995, 7-55229

Int. Cl.^{6} B60M *1/00*

U.S. Cl. 191—13 **14 Claims**



1. A power supply device for a moveable object comprising:

a power supply member which is in the form of a plate and connected with a power source; the power supply member including:

a first conductive plate electrically connected with one of positive and negative terminals of the power source;

a second conductive plate electrically connected with the other terminal of the power source;

a first insulating layer provided between the first conductive plate and the second conductive plate;

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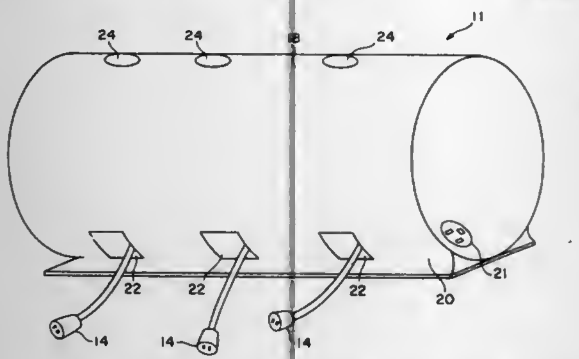
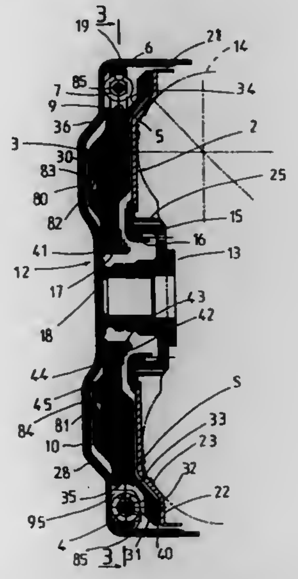
a second insulating layer provided on the other surface of the second conductive plate that does not face the first insulating layer;
a plurality of supply electrode members attached on an outside surface of the second insulating layer, the plurality of supply electrode members being spaced from one another, said first insulating layer, said second conductive plate and said second insulating layer having aligned openings, first conductors passing through said aligned openings and electrically connecting said first conductive plate to one of said supply electrode members, said first conductors not being electrically connected to said second conducting plate, said second insulating member having passages, second conductors passing through said passages and electrically connecting said second conductive plate to another one of said supply electrode members;
a plurality of current collecting electrode members provided on a movable object which is movable on a planar surface, one of said current collecting electrode members being operable to come into contact with said one of said supply electrode members connected with the first conductive plate, and another one of said current collecting electrode members being operable to come into contact with said another one of said supply electrode members connected with the second conductive plate.

5,690,198
GANGED ELECTRIC CORD REELS
Dieter Lohr, 2705 Newlands Ave., Belmont, Calif. 94002
Filed Nov. 18, 1996, Ser. No. 751,885
Int. Cl.⁶ H02R ***11/02***
U.S. Cl. 191—12.2 R **3 Claims**



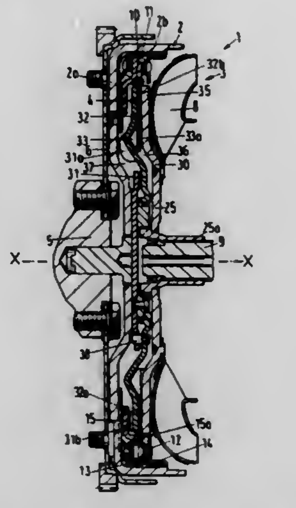
1. A holder for distributing electrical power from a single electrical power source to a plurality of outlet power cords, each power cord mounted on a respective one of a plurality of cord reel inserts, each insert being of the type having a spool carrying a respective cord inside a case and mounted on a shaft, said shaft being journalled at each end to opposing walls of the case wherein a square end of said shaft extends out of said case and wherein said spool is spring biased to turn in a rewind direction and wherein each said power cord has one end terminating through a brush connection inside said respective case to terminals on said respective case and another end extending from said respective case, said holder comprising:
a housing having an interior wall;
bracket: means (**32**) for securing each one of said inserts to said inferior wall of said housing;
a plurality of disk for controlling retraction of said, power cords of each insert, respectively, each disk having a cam surface with at least one shoulder on said cam surface;
one of said plurality of disks securely mounted on each shaft of said plurality of inserts and mounted to rotate with said respective shaft;
a plurality of catch means, each catch means mounted in said housing, one catch means for each insert for engaging said at least one shoulder of said cam surface when said respective catch means is in a first position arranged to prevent said disk from turning in a winding direction and allowing said disk to turn in an unwinding direction power cords of each insert, respectively, each respective catch means being disengaged from said shoulder of said cam surface such as to allow said disk to turn in a winding direction;
a plurality of biasing means, each one of said plurality of biasing means for biasing each respective catch means toward said first position;
a plurality of release means, each one of said plurality of release means for releasing each respective catch means to said second position and thereby permitting the respective insert to retract its cord when the cord is in an extended position;
a common electrical power cord connecting said single electrical power source to said terminals on each said case;
a plurality of openings in said housing; and
each insert having said another end of its cord extending through a respective one of said openings and away from said housing whereby a user is enabled to grasp any one of said cords of said plurality of inserts and pull on said cord such as to unwind said cord from said respective insert and then release said cord such that said cord is fixed in an extended condition then controllably rewind said cord by activating a respective one of said plurality of release means.

5,690,199
HYDROKINETIC COUPLING APPARATUS, NOTABLY FOR MOTOR VEHICLES
Pascal Annic, Dinard; Michel Ginaldi, Paris, and Gustave Chasseguet, Tarverny, all of France, assignors to Valeo, Paris, Cedex, France
PCT No. PCT/FR95/00257, § 371 Date Nov. 6, 1995, § 102(e) Date Nov. 6, 1995, PCT Pub. No. WO95/23930, PCT Pub. Date Sep. 8, 1995
PCT Filed Mar. 3, 1995, Ser. No. 545,738
Claims priority, application France, Mar. 4, 1994, 94 02543
Int. Cl.⁶ F16D ***33/00***
U.S. Cl. 192—3.29 **10 Claims**



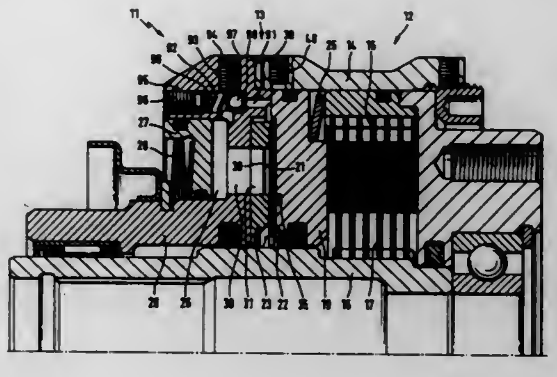
1. Hydrokinetic coupling apparatus, having a housing (**12**) capable of being rotatably locked to a driving shaft, a turbine wheel (**14**) capable of being rotatably locked to a driven shaft and a locking clutch (**10**) acting between the housing (**12**), having a wall (**28**) which is transverse overall and which carries centrally a tubular nose (**17**), and at its outer periphery an axially oriented annular (**19**), and the turbine wheel (**14**), the clutch including a piston (**2**) mounted so as to be axially mobile with respect to the turbine wheel (**14**) whilst being rotatably locked to the latter, and a counter-piston (**3**) associated with the housing (**12**), in which the piston (**2**) is interposed axially between the turbine wheel (**14**) and a mass (**3**), forming the counter-piston, rotatably mounted on the housing (**12**), and coupled elastically to the housing (**12**), and in which the mass (**3**) is pivotally mounted on the tubular nose (**17**), fixed to the housing (**12**), and forms the output element of a torsion damping device (**4**) including elastic means (**7**) with circumferential action and an input element consisting of the housing (**12**), characterized in that a bearing (**41**) is interposed radially between the inner periphery of the mass (**3**) and the outer periphery of the nose (**17**), in that the mass (**3**) has a main part (**30**) and, at the outer periphery of its main part (**30**), a transversely oriented annular projection (**31**) directed radially in the direction of the annular rim (**19**) on the housing, being offset axially with respect to the main part (**30**) of the mass (**3**) in the direction of the outer periphery of the turbine wheel (**14**), in that the projection (**31**) offers a contact surface (**32**) for the piston (**2**) and in that the circumferential-action elastic means (**7**) of the torsion damping device are mounted at the outer periphery of the main part (**30**) of the mass (**3**) between the transverse projection (**31**) on the mass (**3**) and the transverse part (**28**) of the housing (**12**).

5,690,200
HYDROKINETIC TORQUE CONVERTER
Johann Jackel, Baden-Baden, Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Bühl, Germany
Division of Ser. No. 332,549, Oct. 28, 1994, Pat. No. 5,613,582.
This application Oct. 4, 1996, Ser. No. 726,189
Claims priority, application Germany, Oct. 29, 1993, 43 37 118.3; Sep. 19, 1994, 44 33 256.4
Int. Cl.⁶ F16D ***33/00***
U.S. Cl. 192—3.29 **18 Claims**



1. A hydrokinetic torque converter comprising: a housing rotatable about a predetermined axis by an output element of an engine in a vehicle and defining a chamber for a pressurizable hydraulic fluid which circulates in response to rotation of the output element, said housing having a wall extending substantially radially of said axis between a rotary turbine of the torque converter and the output element; an engageable and disengageable lockup clutch disposed in said chamber between said wall and said turbine and including at least one friction disc rotatable with said housing and a piston disposed between said wall and said turbine, said friction disc being rotatable relative to said piston at least in the disengaged condition of said lockup clutch and said piston dividing said chamber into a first compartment adjacent said wall and a further compartment adjacent said turbine, said piston being movable in the direction of said axis in response to the establishment of pressure differentials between the fluids in said compartments, said clutch being at least partially engaged in response to a rise of fluid pressure in said first compartment and a resulting movement of the piston away from said wall and being disengaged in response to a rise of fluid pressure in said further compartment entailing a movement of said piston toward said wall; and means provided in at least one of said compartments for reducing the difference between a higher speed of circulation of fluid in said further compartment and a lower speed of circulation of fluid in said first compartment while the engine is coasting and the clutch is at least partially disengaged.

5,690,201
METHOD AND DEVICE FOR CONTROLLING A COUPLING
Theodor Gassmann, Siegburg, Germany, assignor to GKN Viscodrive GmbH, Lohmar, Germany
Filed Feb. 21, 1996, Ser. No. 604,442
Claims priority, application Germany, Feb. 21, 1995, 195 05 800.3
Int. Cl.⁶ F16D ***43/284;*** **B60K** ***23/02;23/04***
U.S. Cl. 192—35 **22 Claims**



1. A coupling for transmitting torque between two parts which are rotatable relative to one another, said coupling including;
a friction coupling having friction elements, whose friction elements are each non-rotatably connected to the one and the other of the parts which are rotatable relative to one another, with the friction coupling being loadable by at least one movable piston which, at one end, delimits a pressure chamber which is filled with a viscous fluid, which is connected to a reservoir, a rotational housing is formed by the one of the rotatable parts and by the piston sealed relative thereto and in which there rotates a rotational member connected to the other one of the rotatable parts;
wherein rotational faces of the rotational member, together with counter faces of a pumping and control member positioned in the pressure chamber, constitute at least one sealed shear channel which is formed by a groove laterally delimited by walls and extending circumferentially between two ends and by a surface which covers the groove and is rotatable relative thereto;
the pumping and control member is rotatable to a limited extent between two end positions relative to the rotational housing, that the groove, by means of control apertures, in the pumping and control member which are arranged at the groove ends, is connected to the reservoir in the rotational housing and to the pressure chamber between the piston and the rotational member is such a way that in the two end positions of the pumping and control member the control aperture arranged at the respective front end of the groove in a direction of relative rotation communicates with the reservoir and that the control aperture arranged at a respective rear end of the groove in the direction of relative rotation communicates with the pressure chamber; and
a pipeline for connecting the pressure chamber to the reservoir, in which pipeline there is arranged a valve which opens from the pressure chamber to the reservoir and which is provided to limit the pressure in the pressure chamber.

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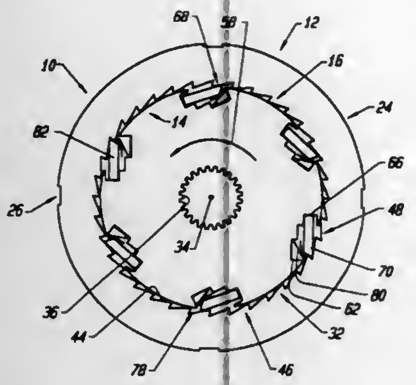
5,690,202
OVERRUNNING CLUTCH MECHANISM

John E. Myers, 14305 Mt. McClellan St., Reno, Nev. 89506

Filed Apr. 15, 1996, Ser. No. 633,959

Int. Cl.^{6} F16D *41/12*

U.S. Cl. 192—46 **10 Claims**



1. A torque converter clutch mechanism; comprising:
a. a housing having an endless inner surface;
b. a plurality of ratchet teeth located on said endless inner surface of said housing, each ratchet tooth possessing a contact surface;
c. a retainer having an endless outer surface of a predetermined size to fit within said endless inner surface of said housing, said retainer outer surface including a plurality of cavities, each retainer cavity having a wall portion and an associated edge extending from said retainer cavity, said retainer being rotatable relative to said housing;
d. a plurality of sprags located in each of said plurality of cavities of said retainer, each of said sprags including a contact surface extending from said retainer cavity, each of said sprags pivoting on said edge associated with each of said retainer cavity wall portions, each of said retainer cavities including a notch formed to contain a portion of said sprag located in said cavity; and
e. spring means for urging each of said plurality of sprags from each of said plurality of retainer cavities resulting in the bearing of each of said sprag contact surfaces with a ratchet tooth contact surface of said housing, during the rotation of said housing relative to said retainer, each of said retainer cavities further comprising an indentation being adjacent said notch, said spring means located in each said retainer cavities including a spring member being at least partially positioned within each of said indentations, said edge associated with each retainer wall portion lying between said notch and said indentation.

5,690,203
MOTOR VEHICLE FRICTION CLUTCH WITH AUTOMATIC WEAR ADJUSTMENT

Achim Link, Schweinfurt, and Reinhold Weidinger, Unterspiesheim, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

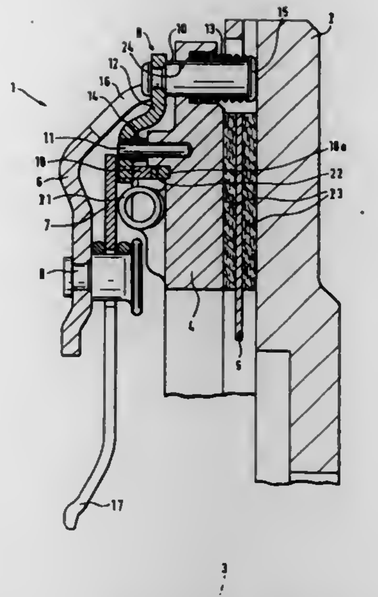
Continuation-in-part of Ser. No. 330,692, Oct. 28, 1994, Pat. No. 5,560,463. This application Feb. 23, 1996, Ser. No. 606,416

Claims priority, application Germany, Nov. 4, 1993, 43 37 613.4; Feb. 25, 1995, 195 06 698.7

Int. Cl.^{6} F16D *13/75*

U.S. Cl. 192—70.25 **20 Claims**

17. A friction clutch for a motor vehicle, said friction clutch comprising:
a clutch housing;
a clutch disc disposed within said housing, said clutch disc defining an axis of rotation and an axial direction parallel to the axis of rotation;



said clutch disc for being disposed on a transmission input shaft;
a pressure plate for engaging and disengaging said clutch disc with a flywheel of an internal combustion engine;
said clutch disc being disposed between said pressure plate and the flywheel, said clutch disc comprising friction lining means for contacting the flywheel and said pressure plate upon engagement of said friction clutch;
first means for biasing said pressure plate towards the flywheel, said first biasing means being disposed between said clutch housing and said pressure plate;
means for adjusting the axial distance between said pressure plate and said first means for biasing upon wear of said friction lining means;
at least one means for sensing wear of said friction lining means, said at least one sensing means comprising:
projection means, said projection means comprising:
a first portion extending towards said adjusting means;
said first portion being operatively connected to said adjusting means to permit said adjusting means to adjust the axial distance between said pressure plate and said first means for biasing during a disengagement process of said friction clutch, which disengagement process follows an engagement process of said friction clutch wherein wear of said friction lining means has occurred; and
a second portion disposed in said pressure plate;
means for providing friction for frictionally positioning said second portion with respect to said pressure plate, said means for providing friction comprising means for permitting sliding axial movement, against said friction, of at least one of: said pressure plate, and said at least one sensing means, one with respect to the other; and
said means for providing friction comprising second means for biasing said first portion away from said pressure plate.

5,690,204
HYDRAULIC ACTUATOR AND CLUTCH THEREWITH

Anton Schonleitner, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

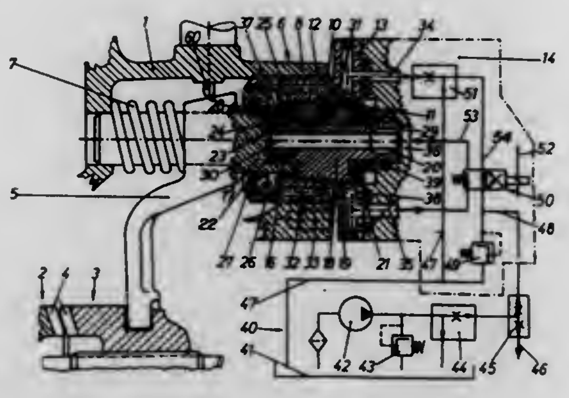
Filed Apr. 3, 1996, Ser. No. 627,026

Claims priority, application Austria, Apr. 26, 1995, 723/95

Int. Cl.^{6} B60K *23/04;* **F16D** *25/08*

U.S. Cl. 192—85 C **8 Claims**

1. A hydraulic actuator comprising a cylinder; a piston mounted for axial movement within the cylinder, said piston having a primary face and a secondary face; a piston rod projecting from said secondary face; a fluid pressure source; conduit means includ-



ing a changeover valve having a first position for selectively circulating working fluid from the fluid pressure source through said conduit means and a primary circuit to act on the primary face of the piston; and a secondary circuit for circulating working fluid from the fluid pressure source, through said conduit means and said changeover valve when in a second position to the secondary face of the piston, said secondary circuit includes a plurality of channels formed in a wall of the cylinder.

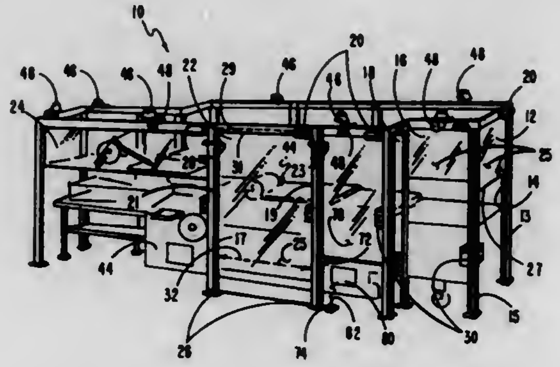
5,690,205
MACHINE SAFETY GUARD

Steven G. Doherty, 33 Winn St., Belmont, Mass. 02178

Filed Mar. 19, 1996, Ser. No. 618,664

Int. Cl.^{6} F16P *3/00;* **E06B** *9/68*

U.S. Cl. 192—133 **11 Claims**



1. A safety guard system for placement between a machine operator and the operative parts of a machine, said system having a safety guard unit, comprising:
a first side track member and a second side track member, each track member having a top, a bottom, an inner side, an outer side, a front portion and a rear portion, each of said side track members disposed generally vertical;
a rotatable reel disposed near said tops of said first and second side track members, said reel having a first end and a second end defining a length therebetween;
a flexible panel having a top, a bottom and first and second sides, said panel attached at its top to said reel;
a power source; and
a reversible motor powered by said power source, said motor in a first mode disposed to rotate said reel in one direction to drive said panel downward in front of said operative parts of said machine between said machine operator and said machine and to allow electrical power to pass to said machine; and in a second mode to reverse rotation of said reel to roll said panel up onto said reel and to deactivate electrical power to said machine while said machine operator gains access to said machine.

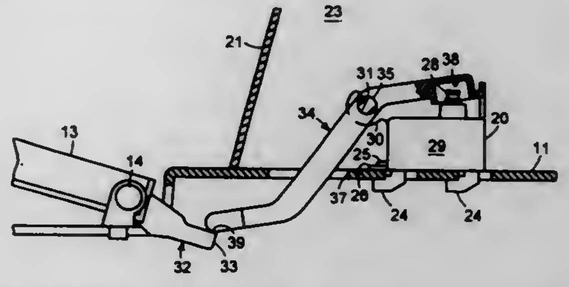
5,690,206
APPLIANCE INTERLOCKING MECHANISM

James M. Carroll, Jr., 6 Hunting St., Wellesley, Mass. 02181-3406, and Juan J. Barrena, 107 Merino St., Providence, R.I. 02909

Filed Jan. 30, 1996, Ser. No. 593,846

Int. Cl.^{6} D06F *37/42*

U.S. Cl. 192—136 **6 Claims**



6. An interlock mechanism for interrupting electrical power to electrically driven machinery in an enclosure within a wall, access to said machinery being provided by an access lid swinging on a hinge attached to said wall and giving access to said electrically driven machinery when swung to an open position away from said wall and blocking access to said electrically driven machinery when swung to a closed position toward said wall, the preponderant part of said lid extending to one side of said hinge, said lid having affixed thereto a striker having rod-like form and extending from said hinge in a direction away from the preponderant part of said lid so that a distal end of said striker swings away from said wall as the lid opens and swings toward said wall as the lid closes,
said interlock mechanism comprising a housing supporting and enclosing an electrical switch, a housing extension affixed to said housing supporting a bearing, and a rigid linking arm,
said housing including means for attaching said housing to said wall in a predetermined position,
said electrical switch having an actuating button and electrical terminals,
said rigid linking arm having a journal supported on said bearing and a first bearing portion at a first end engaging said actuating button,
said linking arm having a second bearing portion at a second end and being shaped so that when said housing is attached to said wall in said predetermined position said second bearing portion is positioned to be engaged by said striker when said lid is closed,
said interlock mechanism being effective when installed in said predetermined position and when power for operation of said electrically driven machinery is routed through said switch to permit operation of said electrical machinery when said lid is closed and to interrupt operation of said electrical machinery when said lid is opened.

5,690,207
WINDSHIELD WIPER CLUTCH ASSEMBLY

Richard P. Scherch, Johnston, Iowa, and Robert E. Neer, Urbana, Ohio, assignors to Grimes Aerospace Company, Urbana, Ohio

Filed Mar. 26, 1996, Ser. No. 621,660

Int. Cl.^{6} B60S *1/18*

U.S. Cl. 192—138 **7 Claims**

1. In a windshield wiper system having a linkage containing a park eccentric, a clutch assembly in association therewith, said clutch assembly comprising;
a sprag clutch having an inner race and an outer race, said outer race secured to said park eccentric;
a torsional return spring in association with said park eccentric; and
an eccentric stop block mounted to said system to limit the rotation of said park eccentric.

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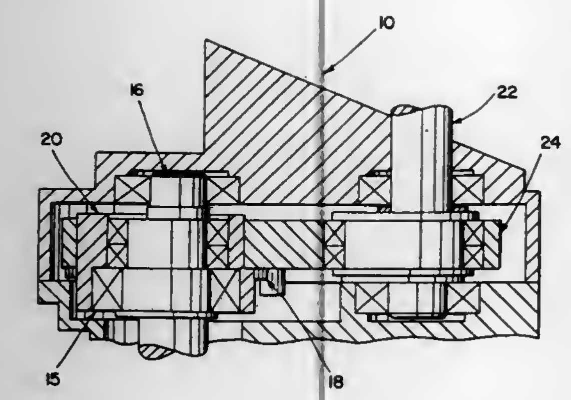


5,690,208

CLUTCH DISK VIBRATION DAMPER ASSEMBLY

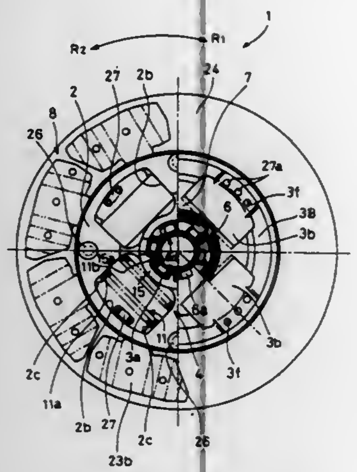
Hiroshi Uehara, Hirakata, Japan, assignor to Exedy Corporation, Osaka, Japan

Continuation of Ser. No. 530,776, Sep. 19, 1995, abandoned. This application Dec. 31, 1996, Ser. No. 777,869

Claims priority, application Japan, Sep. 29, 1994, 6-234962; Sep. 29, 1994, 6-234963

Int. Cl.^{6} F16D *13/64;3/14;3/66*

U.S. Cl. 192—214.1 **29 Claims**



1. A vibration damper mechanism, comprising:
a first disc member formed with a plurality of circumferentially spaced apart windows;
a pair of second disc members disposed on opposite sides of said first disc member, said second disc members formed with first spline teeth axially extending from an inner circumferential portion thereof;
first elastic members, each one of said first elastic members disposed within one of said windows and disposed between said second disc members, said first elastic members elastically deformable in response to relative rotary displacement between said first disc member and said second disc members;
a hub formed with second spline teeth on its outer circumference, said second spline teeth engaging said first spline teeth; and
a plurality of pins extending between said second disc members, one of each of said pins extending through a corresponding one of said windows, said pins confining said second disc members to rotate with one another.

5,690,209

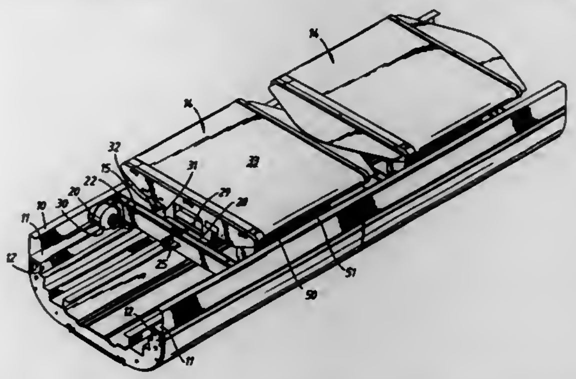
CROSS-BELT SORTER

Ralph Kofoed, Hornslet, Denmark, assignor to Crisplant A/S, Denmark

Filed Jul. 3, 1996, Ser. No. 675,551

Int. Cl.^{6} B65G *47/46*

U.S. Cl. 198—370.06 **8 Claims**



1. A conveyor comprising a plurality of wheeled chassis members linked together to form an endless loop, which chassis members have releasably attached to them carriers for discharging objects placed on the carriers in directions transverse to the direction of movement of the endless loop, wherein at least one of the wheels of each of a plurality of said linked wheeled chassis members is provided with an electric generator for providing electrical power as the wheel rotates in use, and wherein the chassis members are in the form of T-shaped members with wheels on the extremities of the cross-member of the T and the end of the T of one chassis member being connected to the cross-member of the adjacent chassis member.

5,690,210

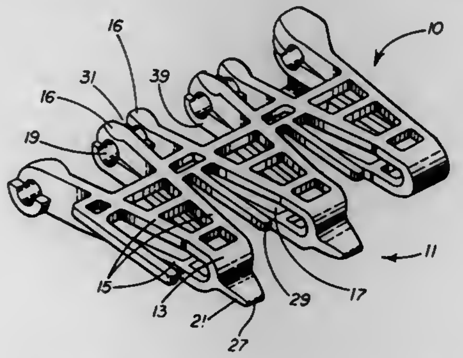
MODULAR LINK CONVEYOR WITH INTERDIGITATING GRID

James L. Layne, Scottsville, Ky., assignor to Span Tech Corporation, Glasgow, Ky.

Filed Jun. 10, 1996, Ser. No. 660,551

Int. Cl.^{6} B65G *17/06*

U.S. Cl. 198—853 **13 Claims**



1. A modular link conveyor for moving articles along a path, the improvement comprising:
a plurality of modular link assemblies forming a conveying surface including a plurality of laterally and longitudinally disposed repeating links defining an interdigitating grid, each of said links including at least one leading apex and two legs extending therefrom forming an open space in between, said leading apex further including a slot passing transversely therethrough across substantially the full width of said links, said legs further terminating in a trailing apex, each said trailing apex including a hole passing transversely therethrough;

a plurality of transverse connecting means passing through said slots and said holes to connect said longitudinally repeating modular links together; and
a forwardly extending tongue tapered in the horizontal plane and projecting from said leading apex, said tongue including a topside and a bottom side, said topside and said bottom side meeting at a terminal apex,
whereby longitudinal compression of the conveying surface results in said tongue substantially filling said open space between the trailing apexes of the next forward links in said interdigitating grid so that any foreign object present in said space is lifted free as said tongue moves forward into said space.

5,690,211

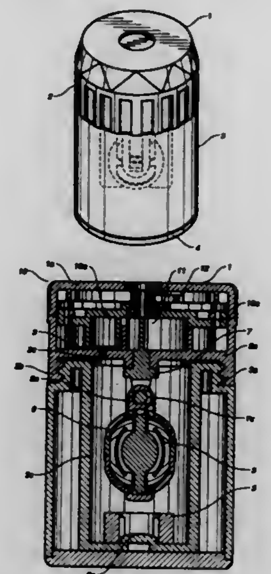
CONTACT LENS CLEANER

Shu-Wen Jao, 2nd Fl., No. 16, Sec. 3, Tin-Jiou Rd., and Lee Wei, 5th Fl., No. 9, Alley 51, Lane 269, Sec. 3, Roosevelt Rd., both of Taipei City, Taiwan

Filed Nov. 7, 1994, Ser. No. 334,963

Int. Cl.^{6} B65D *3/04*

U.S. Cl. 206—5.1 **1 Claim**



1. A contact lens cleaner comprising:
an upper rotary cover;
a middle cover;
an inner cover plate, said upper rotary cover covering said middle cover, said inner cover plate being disposed interior of said middle cover, said upper rotary cover and said middle cover and said inner cover plate defining a shell cover;
a gear linked to said upper rotary cover such that a rotation of said upper rotary cover rotates said gear;
a gear box disposed under said inner cover plate and coupled to said gear such that a rotation of said gear rotates said gear box, said inner cover plate having a recessed wall at a bottom of said inner cover plate, said recessed wall securing said gear box therein, said gear mating with an inner thread on an inner side of said upper rotary cover;
an air chamber formed by a transverse panel of said middle cover, said air chamber having an outward extending spout at one side, said transverse panel having two holes formed therein, one of said holes receiving a rotary shaft of said gear box, another of said holes begin an air-exhausting hole to said air chamber;
a cleaning container connected to said shell cover, said cleaning container receiving a lens-hanging structure therein, said lens-hanging structure connected to said gear box, said lens-hanging structure having air exhausting holes formed therein, said air exhausting holes of said lens-hanging structure having a flexible pad affixed thereover, said flexible pad for allowing air pressure above a desired level to pass therethrough, said cleaning container having a post with a convex upper surface at a bottom of said cleaning container;
a cylindrical plastic reactor having a platinum coating, said reactor having a recess therein, said recess receiving said post therein, said post having a height less than one-half a height of said reactor, said reactor being of a ring-shaped configuration, said reactor having an indentation with an inner diameter less than a diameter of said post, said pad being formed of a soft and elastic material, said pad having a tongue piece disposed over said air exhausting hole.

5,690,212

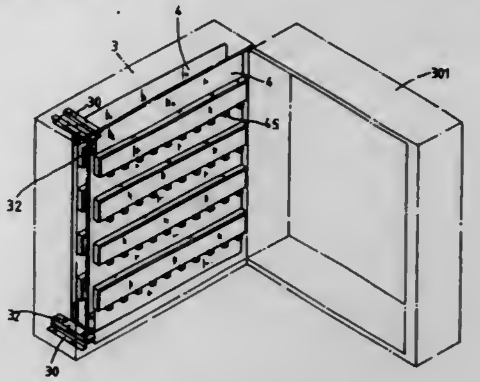
BOX FOR STORING KEYS

Chin-Lien Huang Hsu, No. 38, Lane 152, Min Sheng Road, Taichung, Taiwan

Filed Sep. 23, 1996, Ser. No. 717,682

Int. Cl.^{6} A47F *7/00*

U.S. Cl. 206—37.8 **3 Claims**



1. A box for retaining keys, said box comprising:
body including an upper portion and a lower portion,
a pair of bases secured to said upper portion and said lower portion of said box,
a pair of brackets secured to said bases respectively, said brackets each including a pair of parallel plates and each including at least one shaft secured between said plates, a first of said plates being engaged with said base and a second of said plates being spaced away from said base,
at least one panel including an upper portion and a lower portion, said panel including a plurality of hooks for supporting the keys thereon, and
a pair of fins secured to said upper portion and said lower portion of said panel respectively and secured to said shafts of said brackets respectively for allowing said panel to be rotatably secured to said body at said shafts.

5,690,213

COMBINATION SHIPPING AND DISPLAY CARTON

Yuji Matsumura, Boulder, Colo., assignor to Shoyeido Corporation, Boulder, Colo.

Filed Aug. 16, 1996, Ser. No. 696,591

Int. Cl.^{6} B65D *5/44*

U.S. Cl. 206—45.21 **9 Claims**

1. A carton for shipping and displaying items, comprising:
a lower portion comprising a lower front panel, two lower side panels each attached to said lower front panel, a lower rear panel attached to each of said lower side panels, an upper rear panel hingedly attached to said lower rear panel, and a floor attached to said lower front panel, said lower side panels and said lower rear panel;
an upper portion comprising an upper front panel and two upper side panels attached to said upper front panel, said upper

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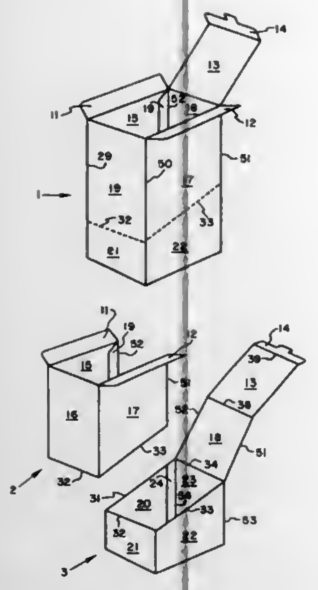


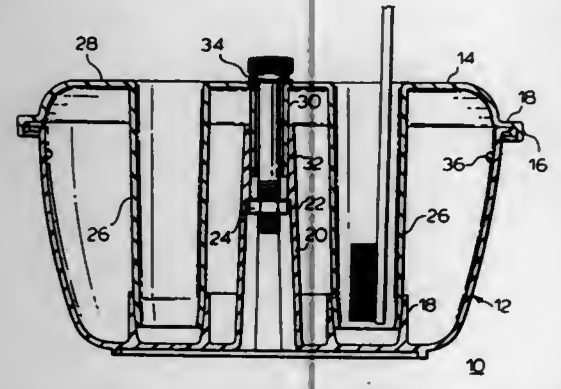
portion separably attached to said lower portion for removal when said carton is used for displaying; and

a base panel hingedly attached to said upper rear panel, said base panel and said upper rear panel adapted for folding backward and downward thereby placing said base panel under said lower portion and forming a base for tilting said lower portion.

5,690,214
TOOTHBRUSH STORAGE DEVICE

Dennis Morgan Gaines, and Brenda Lynn Bjelan, both of Brantford, Canada, assignors to Innoversions International Inc., Canada

Filed Aug. 26, 1996, Ser. No. 703,375
Int. Cl.^{6} B65D *83/10*
U.S. Cl. 206—209.1 **6 Claims**



1. A container for storing toothbrushes in pockets formed in said container,

said container having a bowl shaped receptacle containing a predetermined amount of a sanitizing solution, and a mating lid for said receptacle,

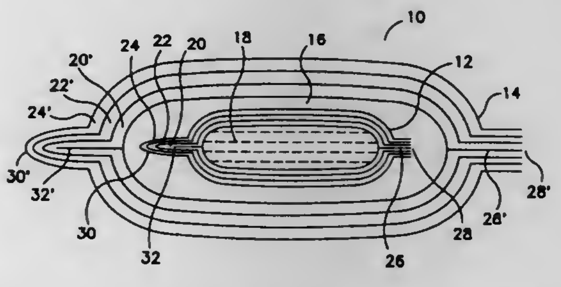
said lid having a mating surface at the periphery thereof for sealingly mating with said receptacle at the outer edge thereof, said lid having a series of toothbrush pockets formed integrally in said lid in the form of hollow open cylinders extending downwardly from said lid to contact complimentary sealing means on the lower surface of said receptacle

said lid and receptacle having biasing means for urging said lid and receptacle together to cause said lid and receptacle to seal, and simultaneously cause said open cylinders to engage said complimentary sealing means to prevent the flow of sanitizing solution from said receptacles into said pockets formed by said hollow cylinders and said complimentary sealing means.

5,690,215
DEVICE FOR MAINTAINING THE PARTIAL PRESSURE OF A DISSOLVED GAS IN A FLUID AND RELATED METHODS OF USE

Victor E. Kimball, Burnsville; Irvin T. Pierskalla, Robbinsdale, both of Minn., and Christopher H. Porter, Woodinville, Wash., assignors to Optical Sensors Incorporated, Minneapolis, Minn.

Filed Jul. 8, 1996, Ser. No. 676,945
Int. Cl.^{6} B65D *81/28*
U.S. Cl. 206—213.1 **12 Claims**

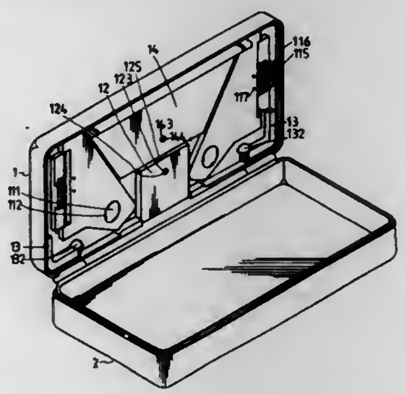


1. A device for maintaining a volume of gas dissolved in a fluid at a predetermined partial pressure, comprising a sealed, gas-impermeable first pouch containing the fluid and the gas dissolved therein, and a sealed, gas-impermeable second pouch encasing the first pouch and providing a space therebetween charged with an atmosphere containing the gas, wherein the volume of the gas in the atmosphere is greater than the volume of dissolved gas, and further wherein the partial pressure of the gas in the atmosphere is substantially the same as the partial pressure of the dissolved gas.

5,690,216
PENCIL BOX WITH A COPY HOLDER STRUCTURE

Pao-Ying Liu, Ta-Ying No. 80-2, Ta-Ying Tsun, Hsin-Shih Hsiang, Tainan Hsien, Taiwan

Filed Dec. 9, 1996, Ser. No. 762,063
Int. Cl.^{6} B65D *51/00;85/28*
U.S. Cl. 206—214 **1 Claim**



1. A pencil box comprising:

a box cover hinged to a box body, said box cover comprising a back side, a front side, a top side, a bottom side, two back recesses in said back side, two pairs of pivot holes respectively disposed in said back recesses, two locating holes respectively made through said back recesses remote from the pivot holes, a plurality of raised portions alinged in each back recess, two bottom through holes at said bottom side, two cap members respectively raised from said front side and suspended above said bottom through holes, two projections respectively raised from said front side and spaced between said cap members and said bottom through holes, two axle housings disposed at said bottom side between said bottom through holes and facing each other, a first locating rod and a second locating rod perpendicularly raised from said front side, and two lugs raised from said front side near said top side two stands respectively pivoted to the back side of said box cover and adapted for supporting said box cover in a tilted open position, each of said stands comprising a pair of pivot pins longitudinally aligned at one end and respectively coupled to the pivot holes in one back recess of said box cover, a locating block raised from one side and adapted for fitting into the locating hole of one back recess of said box cover to secure the respective stand in a collapsed position, two fixed spring bolt, a torsional spring mounted on the fixed spring bolt of the respective stand and having two opposite ends respectively stopped against the respective stand and said box cover to force the respective stand outwards from said box cover, and a locating plate raised from one side, said locating plate having a plurality of recessed portions which are forced into engagement with the raised portions in one back recess of said box cover when the respective stand is turned outwards from the back side of said box cover; a flat bottom rack pivoted to the axle housings of said box cover and adapted for holding a reading object when said box cover is opened and supported on said stands, said bottom rack comprising two pivot pins bilaterally raised from a back side thereof and respectively coupled to the axle housings of said box cover, a front recess for the holding of the hand, and a locating hole adapted for coupling to the first locating rod of said box cover to hold said bottom rack in a collapsed position closely attached to the front side of said box cover

two support arms bilaterally pivoted to the front side of said box cover and adapted for holding the reading object on said bottom rack, said support arms comprising a respective toothed eye end pivotably coupled between the cap members and bottom through holes of said box cover by a respective split-head bolt, and engaged with the projections of said box cover; and

a top rack pivoted to the lugs of said box cover and adapted for supporting the reading object on said bottom rack, said top rack comprising two pivot pins bilaterally raised from a rear side thereof and respectively pivoted to the lugs of said box cover, a plurality of recesses spaced along a front side thereof for the holding of the hand, and a locating hole disposed near the front adapted for coupling to the second locating rod of said box cover, for permitting said top rack to be retained in a collapsed position closely attached to the front side of said box cover.

5,690,217
MOVABLE COMPARTMENTALIZED LAUNDRY STORAGE UNIT

Sara A. Friday, 4350 Hillcrest Dr. Apt. No. 301, Hollywood, Fla. 33021

Filed Jun. 26, 1996, Ser. No. 672,476
Int. Cl.^{6} B65D *85/18*
U.S. Cl. 206—278 **11 Claims**

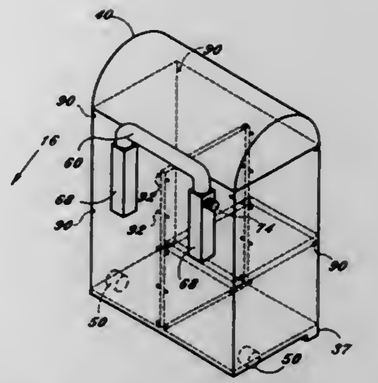
1. A movable laundry storage unit comprising:

a relatively rigid body member, having a closed bottom and an open top end, said body member defining a clothing and article storage area;

a pair of wheel members attached to a back bottom area of said body member;

a handle member attached to a back portion of said body member;

a handle housing attached to the back portion of said body member; a portion of said handle member being disposed within said handle housing;



one or more removable dividers positioned either vertical or horizontal within said storage area as desired by a user to section the storage area of said body member into two or more compartments, inner surfaces of said body member being provided with a plurality of protrusions which define pathways for the receipt and support of said dividers in their horizontal or vertical positions, said dividers creating a substantially sealed relationship between adjacent compartments;

a door member for accessing a lower storage area of said body member, said door member disposed at a lower portion of said body member and hingedly connected to the bottom end of said body member; and

cover means for preventing clothing and other articles disposed within said body member from falling out of said body member while said body member is in transit, said cover means also providing an additional storage area;

wherein said handle member is moved outward from the handle housing to an extended position when moving said body member and is in a retracted position with respect to the handle housing when said body member is in a stationery position;

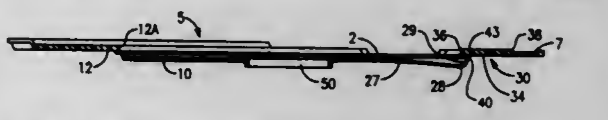
wherein said cover member also concealing said handle member, at least in its retracted position, when viewing said body member from a front area;

wherein said storage unit can be utilized as either a hamper or laundry basket.

5,690,218
COMPACT DISC STORAGE CASE

William Gary McCamy, 4353 Highborne Dr., Marietta, Ga. 30066, and Calvin Lee Payne, Jr., Jasper, Ga., assignors to William Gary McCamy, Marietta, Ga.

Continuation-in-part of Ser. No. 366,625, Dec. 30, 1994, Pat. No. 5,533,615. This application Jul. 8, 1996, Ser. No. 676,586
Int. Cl.^{6} B65D *85/57*
U.S. Cl. 206—303 **4 Claims**



1. A holder for removably storing a disc, comprising:

a container having top, bottom, left and right sides, a top planar surface and a bottom planar surface, said top planar surface having a recessed receptacle defined therein capable of receiving a disc-shaped object;

a first retention means associated within said planar surface for retaining said disc, comprising a lip projecting horizontally from said top planar surface partially over said receptacle;

a second retention means proximate to said receptacle for retaining said disc comprising,

an elongated tab extending horizontally from said bottom planar surface,

a button having generally flat top and bottom surfaces, a front edge protruding over said receptacle and a rear edge, said

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button being attached to said tab, whereby when said button is depressed, said tab flexes.

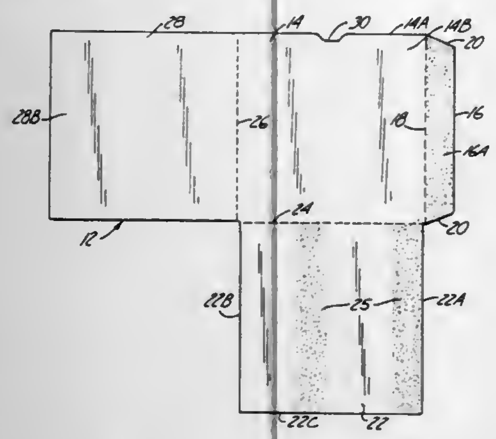
5,690,219
SEAMLESS DISC JACKET

Jill L. Harrer, Oakdale, Minn., assignor to Imation Corp., Oakdale, Minn.

Continuation of Ser. No. 261,720, Jun. 17, 1994, abandoned. This application Jul. 29, 1996, Ser. No. 681,883

Int. Cl.⁶ B65D *85/57*

U.S. Cl. 206—308.1 **2 Claims**



1. A three-panel, seamless jacket for a compact disc, consisting of three panels and one flap as follows:
- a first square-shaped panel having a peripheral size to encompass a compact disc;
- a second square-shaped panel joined to said first panel along a first edge to overlay the first panel to form a compact disc receiving packet, wherein the second panel is the same size as the first panel;
- a single flap attached to said first panel along a second edge of the first panel other than the first edge of the first panel which is joined to the second panel, the flap being folded to overlay an outer surface of the second panel;
- a third square-shaped panel attached to the first panel along a third edge of the first panel, the third panel being foldable over the outer surface of the second panel and the flap, wherein the third panel is the same size as the first panel; and
- means to retain the third panel in position overlaying the second panel and flap with the pocket formed between the first and second panels accessible from an open end opposite from one of the first, second and third edges, thereby forming a jacket having an interior for receiving a compact disc and an exterior for receiving printing thereon, wherein the single flap is positioned between the second and third panels so that the jacket has: (a) a flapless exterior, thereby minimizing difficulty of printing thereon, and (b) a flapless interior, thereby minimizing scratching of the disc.

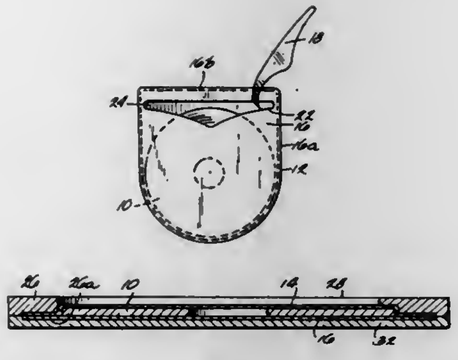
5,690,220
PACKAGING ARRANGEMENT FOR DISPLAY AND STORAGE OF COMPACT DISKS

Raleigh Swan, S 77 W23660 S. Woods La., Big Bend, Wis. 53103

Filed Oct. 16, 1996, Ser. No. 732,162

Int. Cl.⁶ B65D *85/57*

U.S. Cl. 206—308.1 **13 Claims**



1. A packaging arrangement for a compact disk comprising:
- first and second pocket pieces formed of selectively different materials joined together to form a pocket which is sized to receive said compact disk, said first pocket piece comprising a transparent material, and said second pocket piece comprising a selected non-woven fabric material;
- a panel of stiff material having first and second opposing sides and having an aperture formed therein; and
- means joined to said first side of said panel for enclosing said pocket in a compartment, and for supporting said compact disk when received into said pocket so that at least a portion of said received disk is viewable through said aperture and said transparent first pocket piece from said second side of said panel.

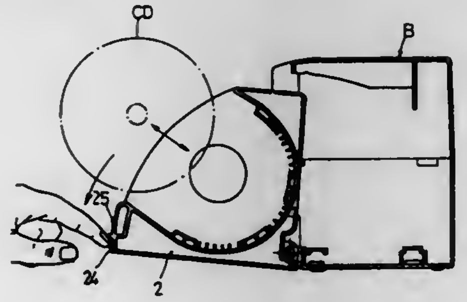
5,690,221
CD BANK

Sheng-Fu Yeh, P.O. Box 82-144, Taipei, Taiwan

Filed Dec. 3, 1996, Ser. No. 758,578

Int. Cl.⁶ B65D *85/30*

U.S. Cl. 206—308.1 **3 Claims**



1. A CD bank comprising:
- a rectangular casing including an upper portion and a lower portion engaged with said upper portion, said lower portion being formed at a lower edge with pairs of ears, each pair of said ears being provided with two opposite protuberances;
- a plurality of holders pivotally connected with a lower edge of said lower portion, each of said holders being symmetric in structure at both sides thereof and being formed with a through hole adapted to be fitted between said protuberances of a respective pair of said ears, each side of said holder being formed with a half-round recess of a diameter slightly longer than that of an compact disk, an opening at a central portion of said holder for facilitating removal of a compact disk, a plurality of retaining lugs suspending above said half-round recess and spaced around a periphery thereof and having a beveled edge facing inwards, a plurality of triangular projections spaced around said periphery and having a beveled edge facing outwards, a projection at a top of said holder adapted to engage with a cavity of said upper portion, and a protrusion below said projection.

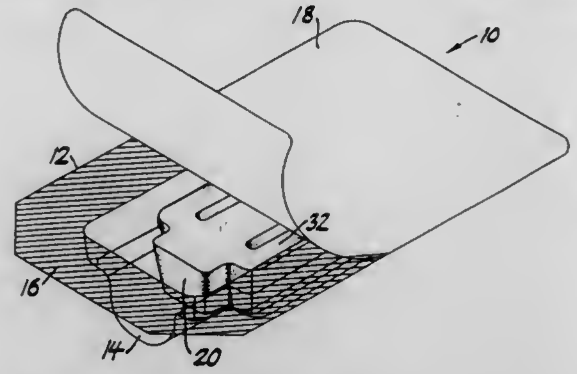
5,690,222
PACKAGE RETAINER FOR SURGICAL SCREW

Robert C. Peters, Clearwater, Fla., assignor to Linvatec Corporation, Largo, Fla.

Continuation of Ser. No. 418,699, Apr. 7, 1995, abandoned. This application Aug. 21, 1996, Ser. No. 701,183

Int. Cl.⁶ B65D *85/24*

U.S. Cl. 206—339 **10 Claims**



1. In combination, an elongated surgical screw and a retainer for holding said elongated surgical screw comprising:
- a flexible body having a top surface, a bottom surface and a pair of opposed end surfaces;
- an elongated screw-receiving recess formed in said top surface in alignment between said opposed end surfaces, said recess having a predetermined width sufficient to frictionally engage said surgical screw;
- means for enabling said recess to be manually deformed by squeezing said opposed ends together to thereby automatically decrease the frictional engagement of said screw and eject said screw from said recess.

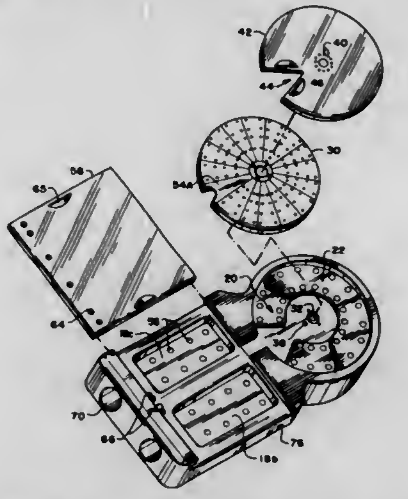
5,690,223
STERILIZATION AND STORAGE CONTAINER

Timothy E. Wood, Weare, N.H., assignor to Poly Vac Incorporated, Manchester, N.H.

Continuation of Ser. No. 388,287, Feb. 14, 1995, Pat. No. 5,595,296. This application Jul. 9, 1996, Ser. No. 677,641

Int. Cl.⁶ B65D *51/16*

U.S. Cl. 206—363 **15 Claims**



1. A sterilization container for sterilizing, transporting, and storing surgical instruments, and comprising a base having a plurality of holes for permitting ingress and egress of sterilization fluid, said base having at least one bore for accommodating the handle portion of an extraction tool stored therein, said base further having at least one well, an apertured plate covering at least part of said well, said apertured plate having apertures to accommodate selected instruments, said apertured plate comprising a plurality of apertures grouped by size, and a cover rotatably mounted over and spaced from the apertured plate, said cover having an opening for providing access to a limited area of the plate and any instruments loaded therein.

5,690,224
STORAGE CASE FOR TAPE CASSETTE

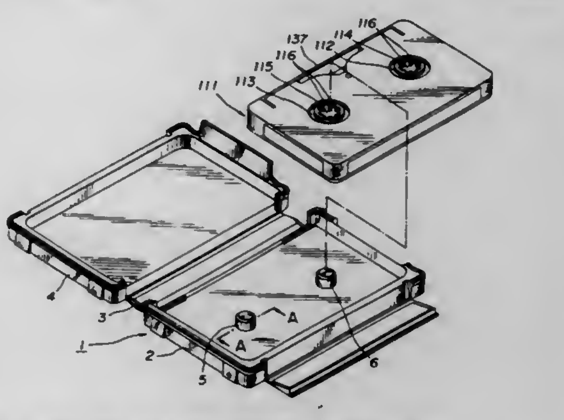
Osamu Koizumi, Miyagi, Japan, assignor to Sony Corporation, Japan

Filed Dec. 14, 1995, Ser. No. 572,616

Claims priority, application Japan, Dec. 24, 1994, 6-319883; Apr. 28, 1995, 7-105121

Int. Cl.⁶ B65D *85/672*

U.S. Cl. 206—387.1 **12 Claims**



1. A storage case for a tape cassette 2, comprising:
- a lower casing portion substantially allowing insertion of a lower shell portion of said tape cassette;
- an upper casing portion substantially allowing insertion of an upper shell portion of said tape cassette;
- a hinge member connecting said lower and upper casing portions;
- a plurality of hub base portions protected from an inner surface of one of said lower and upper casing portions; and
- a cylindrical cap member attached respectively over each of said hub base portions, each cap member including:
  - a tapered annular outer wall having a diameter at a lower side thereof which is greater than that of an upper side thereof; and
  - a flat upper surface portion formed integrally with said outer wall;
  - wherein a thermal expansion coefficient of a material of said cap member is the same or less than that of a material of which reel portions of said tape cassette are formed, and wherein a plurality of openings are provided through said flat upper surface portion.

5,690,225
SUPPORT FOR ANNULAR BODIES AND SUPPORT WITH STACKED ANNULAR BODIES

Gottfried Lutz, Seefeld; August Liepold, München; Regina Fischer, München; Hartmut Thiele, München; Ludwig Zeroni, Ottobrunn, and Dietmar Hübner, Oberkirch, all of Germany, assignors to BASF Magnetics GmbH, Ludwigshafen, Germany

Filed Dec. 4, 1995, Ser. No. 567,055

Claims priority, application Germany, Dec. 7, 1994, 94 19 393 U

Int. Cl.⁶ B65D *85/67*

U.S. Cl. 206—416 **17 Claims**

1. A support for stacked annular bodies, designed substantially as a hollow cylinder having two retaining bodies at the ends, each

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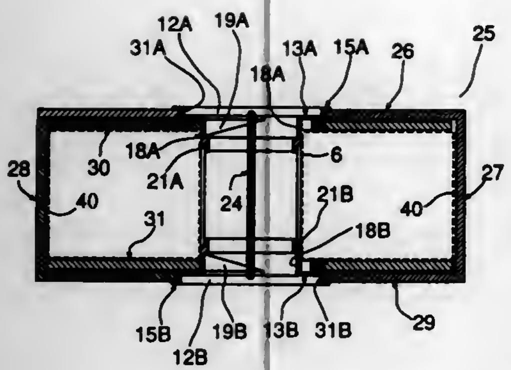
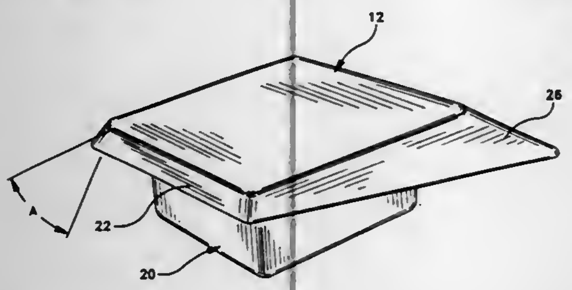


retaining body comprising a flange, a cylindrical attachment, and a hook device and at least one retaining body capable of being releasably connected to one of the ends of the hollow cylinder and at least one tensioning element being provided between the hook devices, wherein the tensioning element is a spring element which when fastened reaches straight through the hollow cylinder from one hook on one retaining body to one hook on the other retaining body and that the retaining bodies include an opening for fastening of the spring element between the hooks.

5,690,226
AIR-IMPERMEABLE PACKAGING FOR MEDICAL IMPLANTS

Hugues N'Guyen, Breville les Monts, France, assignor to Benoist Girard, Hérouville-Saint-Clair, France
Filed Apr. 19, 1996, Ser. No. 634,993
Int. Cl.⁶ B32B *31/20;* **B65D** *1/34*
U.S. Cl. 206—438 **12 Claims**

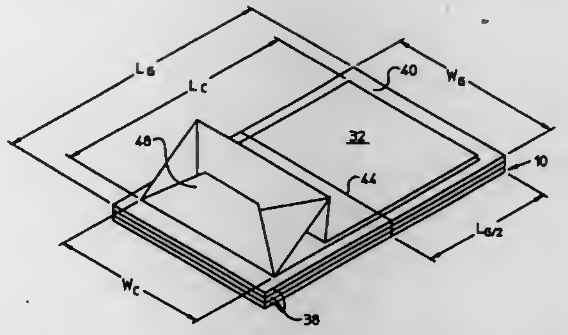


5. A container comprising:
a plastic body having a hollow interior with sidewalls, a bottom, and having a planar opening extending in a plane at a top thereof, said plank opening at said top surrounded by an outwardly extending flange and
a multi-layer peelable cover sealed to said flange surrounding said top planar opening, said cover and said flange after deformation extending permanently at an angle towards said bottom with respect to said plane of said planar opening.

5,690,227
SYSTEM FOR USE IN RECYCLING OF WASTE MATERIAL

Theodore A. Lutz, 2398 Rochester Rd., Sewickley, Pa. 15143
Division of Ser. No. 847,631, Mar. 9, 1992, Pat. No. 5,542,538, which is a continuation-in-part of Ser. No. 486,501, Feb. 28, 1990, abandoned. This application May 13, 1996, Ser. No. 645,278
Int. Cl.⁶ B65D *33/12*
U.S. Cl. 206—442 **2 Claims**

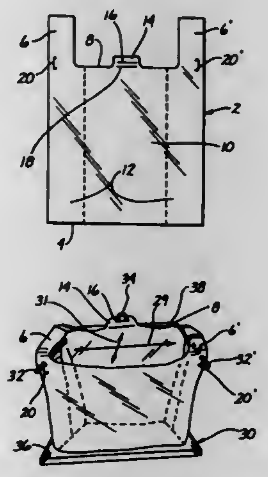
1. A method for recycling newsprint, said method comprising the steps of:



(a) obtaining an article for containing newsprint, said article consisting of bleached paper having primarily long grain soft wood fibers in quantities such that during recycling with said waste newsprint, said fibers replenish sub-standard paper fibers extracted and lost during recycling of the waste newsprint;
(b) placing an amount of newsprint in said article in order to form a unit of recyclable waste wood fiber products formed essentially entirely of materials suitable for recycling newsprint; and
(c) using said long grain wood fibers during recycling of said unit of recyclable products to replenish lost substandard wood fiber during recycling of the newsprint.

5,690,228
T-SHIRT BAG STYLE AND SYSTEM

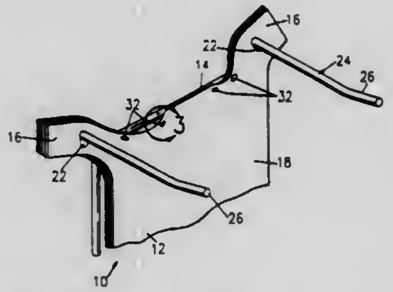
Robert DeMatteis, 1668 Mill Stream Dr., Chino Hills, Calif. 91709
Filed May 30, 1996, Ser. No. 655,470
Int. Cl.⁶ B65D *33/10;33/14*
U.S. Cl. 206—554 **10 Claims**



1. A plastic T-shirt bag having a lower openable portion for receiving and retaining articles to be carried in the bag, said portion being accessible through a centrally disposed mouth, said mouth being partially defined laterally by a pair of handles spaced from each other and extending upwardly from bases on each side of said bag mouth, said bag being formed of a front wall and a back wall secured together around their bottom and side edges and across the upper handle edges, said side edges being folded inwardly to form gussets having their folded edges disposed between the bag walls; mounting orifices extending through the bag walls and gussets, each mounting orifice being disposed adjacent, but spaced inwardly of a side edge of the bag at the approximate level of the bases of the handles; the upper central portion of the bag walls defining the bag mouth between the bases of the pair of handles, and including at least one orificed retainer means.

5,690,229
EASY DISPENSE T-SHIRT BAGS

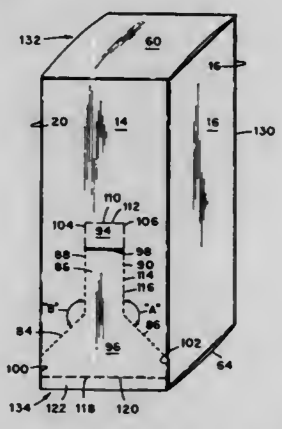
Carmelo Piraneo, Torrance; John Steven Amero, Villa Park; Gary Alden Woodruff, Torrance, and John Edward Alvey, Fullerton, all of Calif., assignors to Orange Plastics, Inc, Compton, Calif.
Division of Ser. No. 130,310, Oct. 1, 1993, Pat. No. 5,626,550. This application Nov. 12, 1996, Ser. No. 747,366
Int. Cl.⁶ B65D *33/10;30/00*
U.S. Cl. 206—554 **14 Claims**



1. A bag pack comprising a plurality of bags stacked in a pack, the bags each having a front panel with respective exterior and interior surfaces and a back panel with respective exterior and interior surfaces, the respective exterior and interior surfaces of both the front and back panels of a first individual bag having a first charge, the respective exterior and interior surfaces of both the front and back panels of a second individual bag adjacent to the first bag having a second charge, so that at least a portion of each bag is charged, the adjacent bags being at different polarities and the front and rear panels of the individual bags being at the same polarity, such that adjacent exterior surfaces of respective front and back panels of each adjacently stacked bag attract each other and the interior surfaces of respective front and back panels of each individual bag repel each other so the bags are easy to open.

5,690,230
DISPENSING CONTAINER FOR SMALL FLAT ITEMS

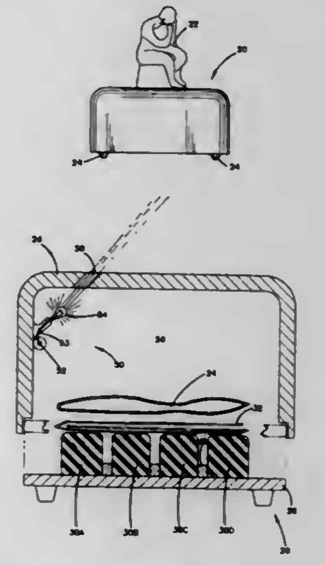
J. Martin Griffith, Knoxville, Tenn., assignor to DeRoyal Industries, Inc., Powell, Tenn.
Filed Apr. 2, 1996, Ser. No. 627,679
Int. Cl.⁶ B65D *1/34*
U.S. Cl. 206—555 **7 Claims**



1. A dispensing container suitable for use in an erect position and having top and bottom ends, for a plurality of like flat, thin products disposed in stacked relationship within the container comprising
front, side and rear panels defining the container, and including top and bottom closures for the container,
an easy opening tear-away closure tab provided on the front panel, the tear-away portion being defined by a plurality of different perforation patterns and having a profile that includes a truncated pyramidal base section including an apex and a base that extends substantially fully across the width dimension of said front panel and which is disposed above and spaced apart from the bottom end of the container and an elongated neck section, including a top side and opposite sides thereof and being divided into upper and lower portions by a fold line extending between said opposite sides, which is a continuation of the apex of said base and which is more narrow in width than said base of said base section,
said base of said pyramidal base section being removably secured to the front panel by a first line of perforations that extends fully across the width dimension of the front panel,
said neck section being removably secured to the front panel by a further pattern of perforations that extends along each of the opposite sides of the neck section from at least the apex of the base section to the intersection of the side lines of the neck section with the fold line, and further being removably secured to the front panel by a still further pattern of perforations that extends along each of the opposite sides of the neck section from the intersection of the opposite sides with the fold line to and along the top side of the neck section,
said first pattern of perforations being of less tearing strength than said further pattern of perforations, and said further pattern of perforations being of greater tearing strength than said still further pattern of perforations, whereby the application of pressure to said upper portion of the neck section inwardly of the container readily effects the tearing away of the upper portion and provides an entrance to the interior of the container for infolding of the upper portion of the neck section and providing access for grasping the neck section at the fold line for exerting a tearing away force to the closure tab.

5,690,231
CLAY SCULPTURING KIT

Steve Erickson, Minneapolis, Minn., assignor to Sculptura, Incorporated, Minneapolis, Minn.
Filed Sep. 26, 1995, Ser. No. 534,162
Int. Cl.⁶ B65D *69/00*
U.S. Cl. 206—573 **9 Claims**



1. A clay sculpturing kit, comprising:
a piece of clay;
at least one sculpturing tool for shaping the clay to form a sculpture;
a pedestal including a base, a covering, and at least one skid resistant support projected from a bottom surface of the base, the covering being receivable on the base which defines a space in which the clay and the at least one sculpturing tool are stored, the covering including a top wall having a top

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surface and side walls, the sculpture being placed to stand on the top surface of the top wall when the sculpture is displayed, so that the pedestal stores the clay and the at least one sculpturing tool, fashions and shapes the clay to form the sculpture, and supports and displays the sculpture when completed; and

wherein the space further contains a light source, the covering includes an aperture on the top wall such that when the light source is turned on, light shines through the aperture substantially illuminating the sculpture displayed on the top surface of the top wall.

5,690,232

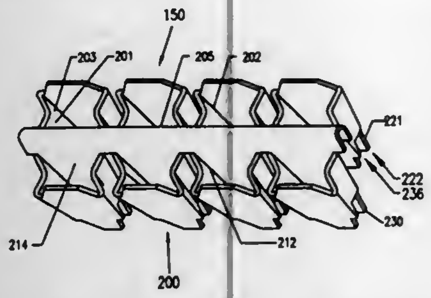
RESILIENT WRAPAROUND CUSHION PACKING

Roy William Emery, 1 Donino Court, Toronto, Ontario, Canada, M4N 2H6

Continuation of Ser. No. 466,786, Jun. 6, 1995, abandoned. This application Jan. 3, 1997, Ser. No. 778,885

Int. Cl.⁶ B65D *81/02*

U.S. Cl. 206—585 **6 Claims**



1. A group of resiliently collapsible tubular cushion packing elements integrally formed by a moulding process and connected together in at least one row of at least two of said elements by at least one connecting band, each of said at least one connecting band being comprised in part of the extension at one end of a top wall or a bottom wall of each of said cushion packing elements, each of said elements being comprised of said top wall, said bottom wall, and two accordion pleated side walls, said top wall and said bottom wall being spaced a predetermined distance apart by the integral connection of each of said top wall and bottom wall at a fold at each of two opposite edges thereof to an adjacent edge of one or the other of said two accordion pleated side walls, each of said side walls being comprised of two planar segments of similar form and equal dimensions integrally connected in a symmetrical pair at the adjacent edges of each of said pair at a fold directed inwardly of the resilient cushion packing element, all of said folds which connect together said walls and side wall segments being openly curved folds, thereby maintaining the same thickness and strength of materials in said folds as in said walls and wall segments, whereby said element may maintain cushioning pressure between the surfaces of two articles to be separated and protected from each other, and when greatly or totally collapsed by extraordinary pressure between said surfaces, said side walls will recover when said extraordinary pressure is reduced or removed.

5,690,233

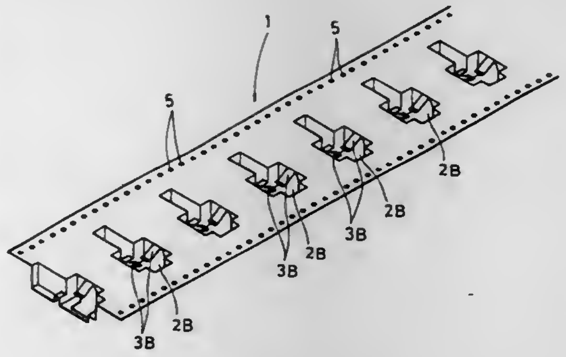
CARRIER TAPE WITH RECESSES FOR ELECTRONIC PARTS

Satoshi Kaneko, Toyoake, Japan, assignor to Kaneko Denki Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 9, 1996, Ser. No. 678,455

Int. Cl.⁶ B65D *73/02*

U.S. Cl. 206—714 **3 Claims**



1. A carrier tape comprising:

a resin tape having a plurality of part accommodating recesses arranged in series along the tape by means of a press, each recess having a bottom surface and open top, and a pair of opposing retainer arms projecting toward an inside of the recess, the retainer arms being formed integral with the resin tape and being flush with a top surface of the resin tape,

said pair of opposing retainer arms being bent downward to permit an electronic part to be inserted into the recess, and said retainer arms recovering their flush with the surface position and extending over a portion of the electronic part to prevent the inserted part from falling off the tape.

5,690,234

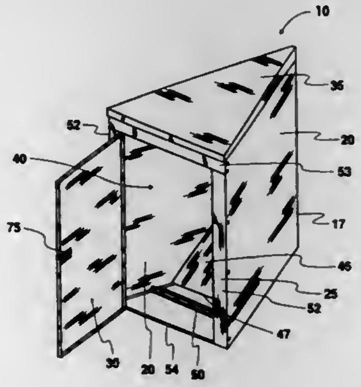
UPRIGHT MODULAR BIKE LOCKER

Ronald J. Rhead, Idaho Falls; Randall D. Rhead, Rexburg, and D. Kent Rhead, Pocatello, all of Id., assignors to Bike Gard, Inc., Rexburg, Id.

Filed Sep. 6, 1996, Ser. No. 706,661

Int. Cl.⁶ B62H *3/00*

U.S. Cl. 211—22 **19 Claims**



9. A storage unit for storing a bicycle, the storage unit comprising:

(a) an enclosed area for storing the bicycle in an upwardly inclined position, the enclosed area having an access door for selectively providing and restricting access to the enclosed area; and,

(b) an upwardly inclined ramp disposed within the enclosed area for guiding the bicycle into the upwardly inclined position as the bicycle is moved into the enclosed area through the access door.

5,690,235

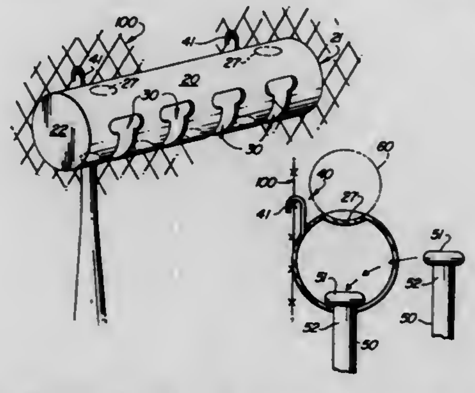
BAT SUSPENSION DEVICE

Larry H. Matzen, 24689 N. Scott Park Rd., Eldridge, Iowa 52748

Filed Jul. 10, 1996, Ser. No. 679,602

Int. Cl.⁶ A47F *7/00*

U.S. Cl. 211—60.1 **10 Claims**



1. A bat suspension device for suspending a plurality of bats and/or balls from a section of chain link fence wherein the device comprises:

an elongated hollow body member provided with a plurality of contoured apertures wherein each aperture is dimensioned to receive selected portions of a bat; and,

fastening means for releasably securing the hollow body member to spaced locations on the chain link fence.

5,690,236

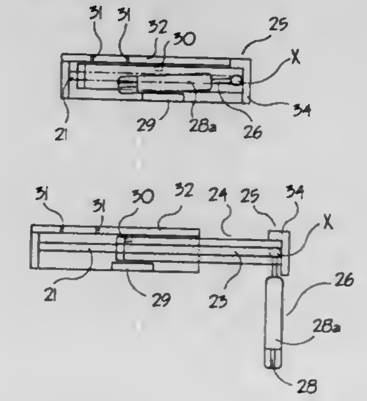
VALET

Jaime Galilea, Napoleon 3037 Dep 31, Santiago, Chile

Filed Jun. 20, 1996, Ser. No. 668,249

Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—104 **10 Claims**



1. A valet comprising:

a case having an open bottom;

a sliding drawer slidably mounted in said case and having a front face panel for said case and an open bottom;

a hanger pivotally mounted in said drawer for depending downwardly when the drawer is opened by pulling it partially outwardly of said case for hanging clothes thereon and pivotable upwardly for housing the hanger enclosed entirely within the drawer when closed,

said front panel being disposed spaced forwardly of the case when the drawer is partially opened and the hanger is depending therefrom for draping trousers or other clothes over the front panel; and

said case having a bridging element across the open bottom thereof disposed for supporting the hanger pivoted upwardly slidably resting on said bridging element housed in the drawer for storage when the drawer is closed and disposed for allowing the hanger to slide thereon and depend downwardly when the drawer is opened for hanging clothes therefrom.

5,690,237

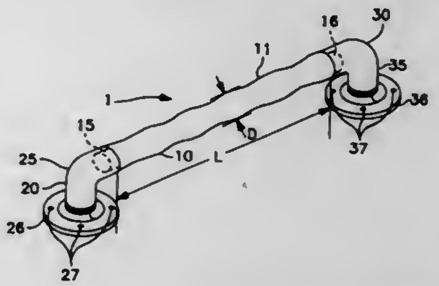
INJECTION MOLDED GRAB BAR

Richard E. Marzec, Higganum, Conn., assignor to Plumb Pak Corporation, Newington, Conn.

Filed Nov. 8, 1995, Ser. No. 555,576

Int. Cl.⁶ A47F *7/00*

U.S. Cl. 211—105.1 **11 Claims**



1. An injection molded grab bar for mounting to a surface comprising:

(a) at least one substantially rigid elongated tube, said tube having an axis and first and second end portions, said tube further having a unitary intermediate portion extending between and integral with said end portions, the outer diameter of said intermediate portion varying continuously and smoothly along its length between maximum and minimum diameters whereby said tube intermediate portion has an undulating profile; and

(b) at least one substantially rigid, integrally formed surface connector for supporting said tube in spaced relation to a substantially planar surface with the axis of said tube being substantially parallel to the surface, said surface connector having,

1. a substantially planar portion for attachment to the surface, and
2. a tubular portion integral with and extending from said planar portion, said tubular portion of said connector defining at least a first socket said first socket having an axis and an internal cross-sectional size and shape which is complementary to the external cross-sectional size and shape of said end portions of said elongated tube whereby an end portion of said tube may be coaxially engaged in said first socket and said tube will in part be rigidly supported relative to the surface by said connector.

5,690,238

POINT OF PURCHASE COMPATIBLE MERCHANDISING SYSTEM

William R. Schmehr, Wheaton, Ill., assignor to Ace Hardware Corporation, Oak Brook, Ill.

Filed Oct. 24, 1995, Ser. No. 547,590

Int. Cl.⁶ A47F *5/00*

U.S. Cl. 211—106 **18 Claims**

1. A system for displaying merchandise comprising:

a plurality of racks each having a plurality of longitudinally extending rods substantially parallel to each other wherein the rods are bent at each end forming a leg at each end of each of the plurality of rods wherein the legs at each end of each one of the plurality of racks is equal in length such that each one of the plurality of racks is capable of being flushly mounted on a surface with the legs extending perpendicular to the surface and further wherein the lengths of the legs on adjacent racks is unequal and further wherein each of the plurality of

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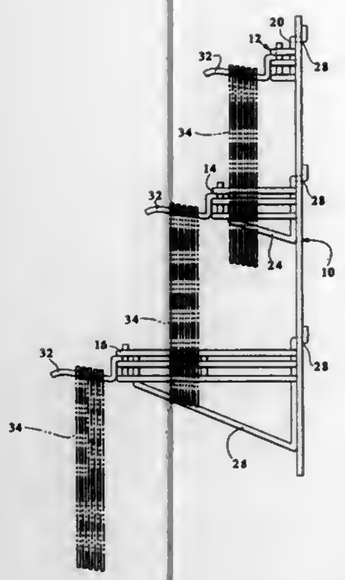
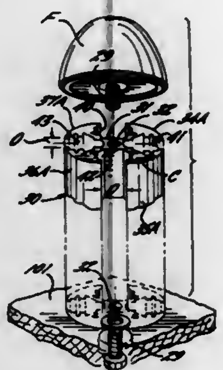


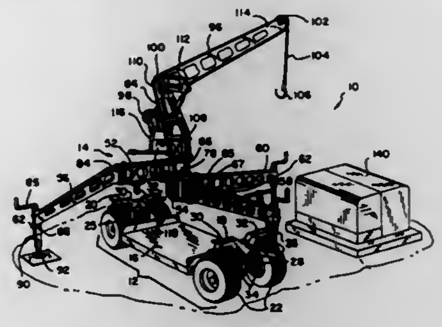
racks is distinctly formed from one another such that each of the plurality of racks forms an empty interior space between the surface on which each of the plurality of racks are mounted and the plurality of rods wherein each of the plurality of racks are mounted perpendicularly to the surface and are vertically displaced from each other.

5,690,239
MULTI-PURPOSE COLUMNAR SUPPORT
Donald M. Ballard, 16700 Tinker Pl., Huntersville, N.C. 28078
Filed May 24, 1996, Ser. No. 652,989
Int. Cl.⁶ A47F ***5/00***
U.S. Cl. 211—189 11 Claims



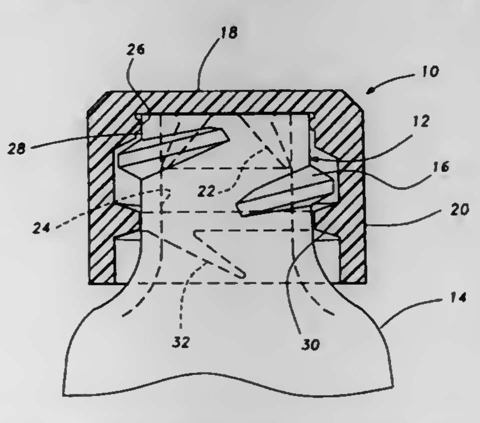
1. A columnar support for conventional items of hardware selected from a group of conventional hardware items that are normally used in the display of merchandise, the columnar support comprising a tubular column having a core and the tubular column including:
(a) a plurality of holding areas diverging outwardly from the core,
(b) a plurality of connectors, each connector including an inner portion and an outer portion,
(c) each holding area including means for frictionally retaining the inner portion of each connector, and
(d) the outer portion of each connector including means for frictionally retaining one item in said group of conventional hardware items,
whereby each item of conventional hardware in said group of conventional hardware items can be supported in any selected holding area in the tubular column.

5,690,240
DOLLY WITH DETACHABLE BOOM
William E. Thiermann, Sr., Milwaukee, Wis., assignor to Thiermann Industries, Inc., Milwaukee, Wis.
Filed Jul. 31, 1996, Ser. No. 690,717
Int. Cl.⁶ B66C ***23/36***
U.S. Cl. 212—180 10 Claims



1. A portable crane assembly, comprising:
a crane boom;
a supporter that has at least three legs and a swing arm having first and second ends, the second end coupled to and supporting the boom;
a transporter having a transport surface coupled to, and supported by, a plurality of wheels, a region directly above the transport surface defining a first area; and
a coupler including an extension member which is pivotally connected to either the transporter or the first end of the swing arm about a pivot axis and a channel formed by the transporter or the first end of the swing arm, so that when the extension member is received in the channel, the second end can be pivoted about the pivot axis from a position over the first area to a position lateral from the first area which is not directly over the transport surface;
wherein the supporter can be coupled to the transporter and positioned in a transport configuration for transporting the supporter and boom and the supporter can alternatively be decoupled from the transporter and positioned on the three legs in a self supporting lifting configuration supporting the boom independently of the transporter.

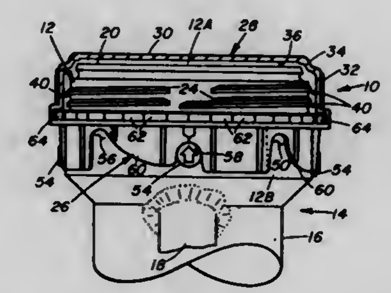
5,690,241
THREAD ON-NON-REMOVABLE CAP FOR A THREADED NECK CONTAINER
Gary V. Montgomery, Evansville, Ind., assignor to Rexam Closures, Inc., Evansville, Ind.
Filed Sep. 18, 1996, Ser. No. 710,664
Int. Cl.⁶ B65D ***41/04***
U.S. Cl. 215—28 6 Claims



1. A removal resistant cap and container assembly comprising:

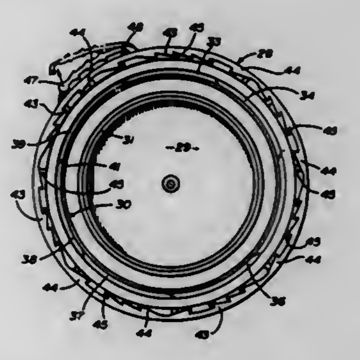
a container having a threaded neck with said thread having a helix angle; a cap having a top and a cylindrical skirt depending from the periphery of said top;
said skirt having an inwardly projecting circumferential bead with an inside diameter having a close fit with said container neck, and said bead being located below said top a distance greater than the axial extent of said container thread;
a linear projection on said skirt intersecting said bead and extending downwardly from said bead generally at the helix angle of said container thread; and
a rotary seal between said closure and said container neck;
wherein when said container neck is engaged by said cap in a threading manner, said projection will engage said container neck thread and displace said bead over said container neck thread, so said cap is axially aligned and in sealing relationship with said container neck and wherein said cap is blocked from threaded removal by said container neck thread engaging with said circumferential bead.

5,690,242
SHARPS DISPOSAL CONTAINER CAP SECUREMENT ARRANGEMENT
Vance D. Campbell, Jr., San Diego, Calif., assignor to Winfield Industries, San Diego, Calif.
Filed Mar. 25, 1996, Ser. No. 622,559
Int. Cl.⁶ B65D ***45/00***
U.S. Cl. 215—273 30 Claims



1. A sharps disposal container cap securement arrangement, comprising:
(a) a container with a neck having an opening at a top thereof through which sharps may be placed for disposal within said container and a plurality of lugs disposed in spaced relation to one another about and attached to and projecting outwardly from an exterior surface of said neck and spaced below said top thereof;
(b) a cap adapted to rotatably fit downward over and around said neck of said container above said lugs thereon so as to close said opening through said neck of said container;
(c) an annular lock collar open at opposite axially spaced upper and lower portions and rotatably mounted around said neck of said container spaced below said top thereof and below said cap, said lock collar having pairs of spaced upper and lower recesses defined therein extending upwardly from said lower portion of said collar and a tapered edge leading from said upper recess of each of said pairs to said lower recess thereof, said lugs of said neck of said container being seated in said upper recesses and supporting said collar at a lowered unlocked condition relative to said cap once said collar has been rotated to a first position, said lugs of said neck of said container being seated in said lower recesses and supporting said collar at a raised locked condition relative to said cap once said collar has been rotated to a second position, each of said lugs bearing against one of said tapered edges extending between said upper and lower recesses during rotation of said collar to move said collar from said lowered unlocked condition upwardly to said raised locked condition; and
(d) cooperative means formed on said collar and on said cap for locking said cap to said collar and thereby securing said cap on said neck of said container so as to prevent removal of said cap from said neck of said container once said cap is fitted down on said neck of said container and said collar has been rotated from said first position to said second position relative to said neck and thereby moved from said lowered unlocked condition to said raised locked condition relative to said cap.

5,690,243
SNAP ON TWIST OFF TAMPER INDICATING FLEXIBLE CAP AND NECK CONFIGURATION
Luca Molinaro, New Castle, Pa., assignor to Portola Packaging, Inc., San Jose, Calif.
Division of Ser. No. 150,356, Nov. 4, 1993, Pat. No. 5,560,504, and a continuation-in-part of Ser. No. 36,277, Mar. 24, 1993, Pat. No. 5,307,946. This application May 22, 1996, Ser. No. 654,553
Int. Cl.⁶ B65D ***41/34***
U.S. Cl. 215—329 13 Claims



1. In combination, a container and a closure therefor,
said container having a cylindrical neck surrounding an opening therein, said neck having a first neck portion of a first diameter, a plurality of external teeth on said first neck portion, a second neck portion of a second diameter less than said first diameter above said first neck portion, at least seven circumferentially and vertically spaced annular first spiral thread configurations on said second neck portion, each of said first spiral thread configurations extending in a helical path of continuous pitch around said second neck portion, each of said first spiral thread configurations having an upper end and a lower end, said lower end being circumferentially and axially spaced from said upper end, with the upper ends of each of said first spiral thread configurations forming circumferentially spaced lead-in points for the reception of said closure, each of said first spiral thread configurations having an arcuate extent around said second neck portion so that a vertical line drawn through said second neck portion at said upper ends intersects a plurality of said first spiral thread configurations,
said closure having a top, an annular depending wall depending from said top, and at least seven circumferentially and vertically spaced annular second spiral thread configurations extending in a helical path of continuous pitch on the inner surface of said annular depending wall, a tear skirt positioned radially outwardly of said annular depending wall and frangibly joined thereto, and a plurality of internal teeth on said second neck portion, said second spiral thread configurations being engageable with said first spiral thread configurations and said internal teeth being engageable with said external teeth independent of the initial orientation of said closure relative to said neck, said second spiral thread configurations engaging said first spiral thread configurations and said internal teeth engaging said external teeth when said closure is substantially applied to said neck by pushing said closure onto said neck.

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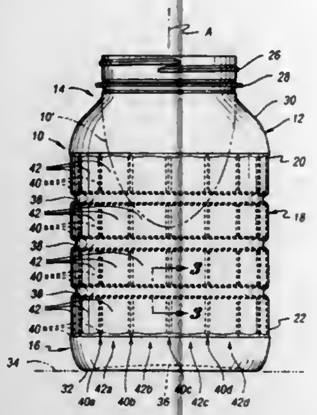
5,690,244
BLOW MOLDED CONTAINER HAVING PANELED SIDE WALL

Richard C. Darr, Seville, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.
Filed Dec. 20, 1995, Ser. No. 575,346
Int. Cl.^{6} B65D *1/02;1/42*
U.S. Cl. 215—382 **13 Claims**



1. A plastic blow molded container comprising:
a unitary plastic blow molding of polyethylene terephthalate having a central axis and including an upper dispensing end, a lower freestanding base, and a generally round side wall having upper and lower extremities respectively connected to the upper dispensing end and the lower freestanding base;
the upper dispensing end including a dispensing opening and also having a closure cap retainer;
the lower freestanding base having a lower support for supporting the container upright on a horizontal support surface;
the side wall having at least three vertically spaced horizontal ribs of an annular shape extending around the extent thereof and also having at least twelve vertical ribs spaced circumferentially and extending between the horizontal ribs thereof to cooperate therewith to define at least twelve generally rectangular panels spaced around the container between each adjacent pair of horizontal ribs, and the rectangular panels being capable of flexing inwardly to accommodate for shrinkage upon cooling after hot filling of the container; and
the container having a weight according to the equation:

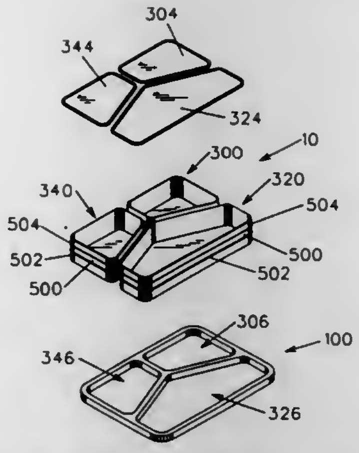
$$W_G < 12_G + 34V_G$$

wherein W_G is the weight in grams of the container, 12_G is 12 grams, and $34V_G$ is a weight in grams that is 34 times the internal volume of the container in liters.

5,690,245
FOOD TRAY

Donald E. Jenkins, 1920 Howell Mill Dr., Chattanooga, Tenn. 37421
Filed Mar. 5, 1996, Ser. No. 611,095
Int. Cl.^{6} B65D *21/024*
U.S. Cl. 220—23.4 **8 Claims**

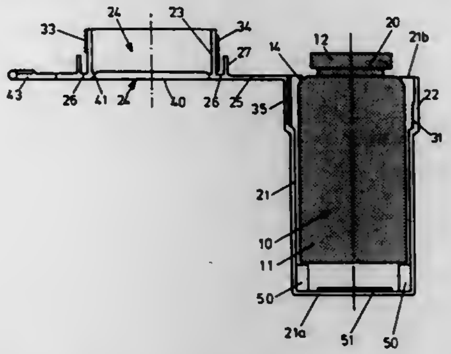
1. A food tray comprising:
a frame having a plurality of apertures therein;
a food container for placement within each aperture, each container having an opening at a top end and a base with a vertical wall extending between said opening and said base, the extent of said vertical wall between said opening and base having a configuration generally congruent to the shape of the respective aperture;
an upper ridge about said vertical wall and extending therefrom, said upper ridge vertically displaced from said opening to present a portion of said vertical wall extending between said opening and said upper ridge;



a lower ridge about said vertical wall and extending therefrom, said lower ridge vertically displaced from said upper ridge with a second portion of said vertical wall extending between said ridges and combining therewith to present a slot about said vertical wall of each container for releasably engaging a portion of said frame defining each respective aperture therein, said upper and lower ridges precluding a displacement of said engaged frame portion along said sidewall, whereby a plurality of food containers are releasably engageable with said frame.

5,690,246
SECURITY CONTAINERS FOR SAMPLES

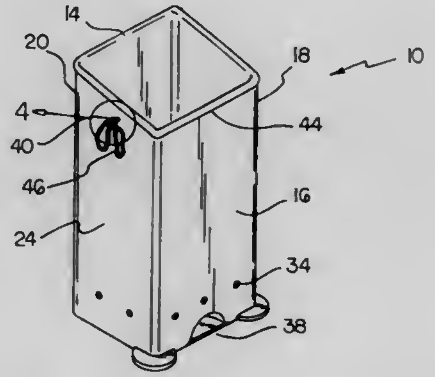
Ian Denny Anderson, and Michael Denny Anderson, both of Kent, Great Britain, assignors to Versapak (International) Ltd., Erith, Great Britain
Continuation of Ser. No. 381,933, Feb. 13, 1995, abandoned.
This application Jun. 6, 1996, Ser. No. 659,620
Claims priority, application United Kingdom, Aug. 11, 1992, 9216955
Int. Cl.^{6} B65D *47/08*
U.S. Cl. 220—254 **16 Claims**



1. A combination security container and sample bottle, comprising: a sample bottle, a container being adapted to receive the sample bottle therein, said container including a hollow body having a base, a side wall and an open end opposite said base, said open end defined by a top edge of said hollow body, a closure for said hollow body, said closure being arranged to fit said body to overlie said top edge of said hollow body and close the open end thereof, said closure forming a top for the container when said closure is fitted to overlie and close the open end of said hollow body with said sample bottle therein, and locking means for locking said closure to said hollow body, said closure including a tear-off portion defined by a line of weakness in said closure which is formed to permit the removal of said tear-off portion from the closure, said line of weakness defining an aperture through said closure of a size to permit the removal of said sample bottle therethrough only upon the effective removal of said tear-off portion from said closure along said line of weakness such that removal of said sample bottle from said container when said closure is fitted to close the opening in said hollow body without damage to said closure or said hollow body is possible only by the effective removal of said tear-off portion from said closure along said line of weakness, and the effective removal of said tear-off portion thereby being apparent on subsequent observation of said container.

5,690,247
WASTEBASKET FOR REMOVING AND RETAINING A TRASH CAN LINER

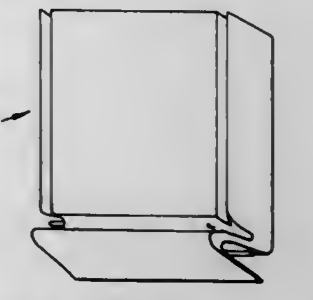
Richard C. Boover, 3869 W. Loyola Dr., Kenner, La. 70062
Filed Oct. 25, 1996, Ser. No. 738,090
Int. Cl.^{6} B65D *25/00*
U.S. Cl. 220—403 **2 Claims**



1. A new and improved wastebasket for receiving trash can liners and for facilitating the ready removal of the liner from the wastebasket comprising, in combination:
a main body portion in a generally rectilinear configuration with a rectangular rear wall having parallel upper and lower edges and parallel vertical side edges therebetween, a rectangular front wall having parallel horizontal upper and lower edges and parallel vertical side edges therebetween, the upper edge of the front wall being at an elevation lower than the upper edge of the rear wall, two side walls having parallel horizontal lower edges and parallel upper edges and parallel vertical side edges therebetween, and with the upper edges of the side walls at between about 5 and 15 degrees from the horizontal, a generally rectangular bottom wall with front, rear and side edges coupling the lower edges of the front, rear and side walls, the bottom wall being formed with generally circular extensions extending outwardly forwardly and laterally for the placing of a foot or feet of a user to hold down the wastebasket against the upward force of the trash can liner during removal of the liner;
a plurality of apertures formed in the front, side and rear walls adjacent to the bottom wall to allow for release of suction to a liner located upon and supported by the upper edges of the front, rear and side walls;
a foot-shaped recess formed centrally in the front wall adjacent the bottom wall thereof for receiving the forward portion of a foot of a user to hold the wastebasket against a recipient supporting surface during the removal of the liner;
an eyelet or hook extending outwardly from one of the side walls adjacent to the upper edge thereof;
an enlarged bead formed around the upper edges of the front, rear and side walls to assist in the proper location of the elastic band over the trash can liner during operation and use; and
an elastic band removably positioned on the eyelet or hook for storage and also positionable adjacent to the upper edges of the front, rear and side walls over the upper edge of a liner and beneath the bead to assist in retaining the liner within the wastebasket during operation and use.

5,690,248
BAG ASSEMBLY FOR RECYCLING

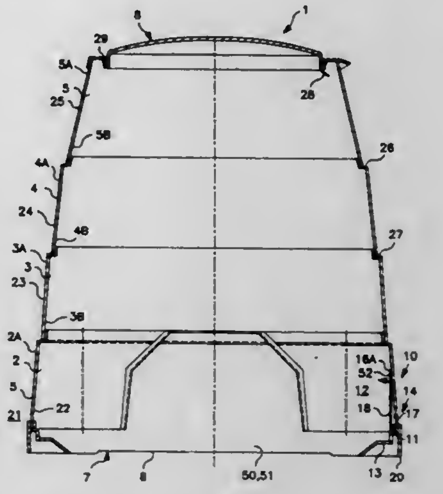
John R. Hulls, Point Reyes, Calif., assignor to Altamont, Inc., Key Biscayne, Fla.
Continuation of Ser. No. 344,817, Nov. 23, 1994, abandoned.
This application Jan. 27, 1997, Ser. No. 787,040
Int. Cl.^{6} B65D *33/01;90/04*
U.S. Cl. 220—404 **22 Claims**



1. A disposable bag assembly having a closed bottom and an open top, and a gusset, said gusset defining a pair of gusset panels joined along an edge; the disposable bag assembly further comprising retention means operatively associated with said gusset, the retention means holding the gusset in a normally closed position, said retention means having a lower yield strength than the bag material thereby allowing said bag to expand so that the gusset expands from its normally closed position without rupturing the material of said bag assembly, wherein said bag assembly comprises an inner and an outer bag, said inner bag being nested within said outer bag, and further including holes in said bags.

5,690,249
MULTI-SECTIONED IMPROVED AIR SUPPLY COMPOST CONTAINER

Stephan Karlsten, Göteborg, Sweden, assignor to Grona J AB, Gothenburg, Sweden
Filed Jul. 6, 1995, Ser. No. 499,047
Int. Cl.^{6} B65D *6/24*
U.S. Cl. 220—666 **9 Claims**



1. A compost container comprising: a plurality of ring-shaped interconnected container sections; a ventilated base-plate connected to a bottom-most ring-shaped container section, said ventilated base plate having a ventilation partition formed from an inwardly spaced outermost edge of the base plate which lies against an inside of a wall of the bottom-most container section thereby forming a ventilation column therebetween to supply air to an internal composting space of the container; a lid connected to a top-most ring-shaped container section;

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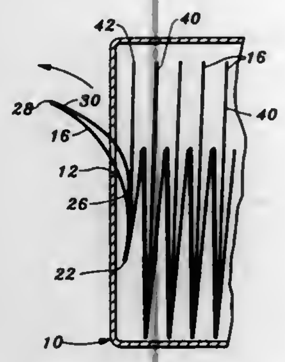
a base plate edge having a rise and a column-shaped reception channel for a bottom-most container section casing; and
a plurality of ventilation holes extending from the exterior of the compost container through the rise of the base-plate edge into the ventilation column.

5,690,250
FOLDED PAPER NAPKIN FOR DISPENSING FROM A PAPER NAPKIN DISPENSER

Chester W. Gooding, Jr., and Maurice J. Mead, both of Neenah, Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Filed Mar. 5, 1996, Ser. No. 611,212
Int. Cl.^{6} A47K *10/24*
U.S. Cl. 221—47 **3 Claims**

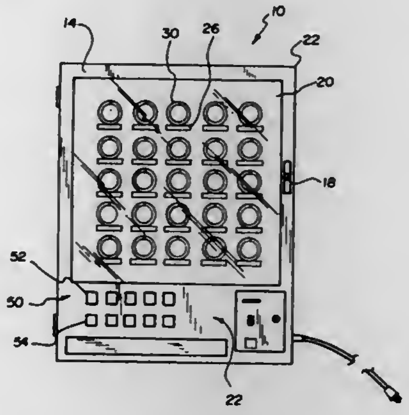


1. A folded sheet product formed from a unitary sheet of sheet material of uniform width and adapted for dispensing from a dispenser having a dispenser opening in either a frontward or backward orientation, said folded sheet product comprising, in combination:
a rectangular-shaped first sheet panel defined by a first sheet panel free edge and a first fold line spaced from said first sheet panel free edge and parallel thereto, said first sheet panel free edge located a distance from said first fold line;
a rectangular-shaped second sheet panel integral with said first sheet panel, adjoining said first sheet panel, and in registry with said first sheet panel, said second sheet panel defined by said first fold line and a second fold line parallel to said first fold line and spaced therefrom a distance substantially equal to the distance between said first fold line and said first sheet panel free edge whereby said first sheet panel free edge and said second fold line are in substantial registry;
a rectangular-shaped third sheet panel integral with said second sheet panel, adjoining said second sheet panel, extending between said first sheet panel and said second sheet panel and in face-to-face engagement with said second sheet panel, said third sheet panel defined by said second fold line and a third fold line parallel to said second fold line and spaced therefrom; and
a rectangular-shaped fourth sheet panel integral with said third sheet panel, adjoining said third sheet panel, positioned between said first sheet panel and said third sheet panel, and in face-to-face engagement with said first sheet panel and said third sheet panel, said fourth sheet panel defined by said third fold line and a fourth sheet panel free edge parallel to said third fold line, said fourth sheet panel free edge and an adjoining portion of said fourth sheet panel projecting beyond said first sheet panel free edge and beyond said second fold line.

5,690,251
PANTY HOSE VENDING MACHINE

Diane K. Wade, 12 Summit St. #102, East Orange, N.J. 07017

Filed Apr. 5, 1996, Ser. No. 630,943
Int. Cl.^{6} G07F *11/00*
U.S. Cl. 221—76 **4 Claims**

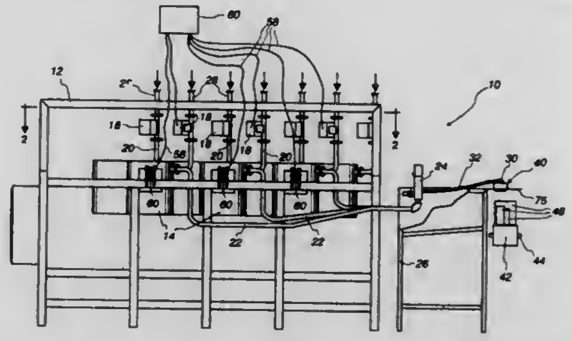


1. A new and improved panty hose vending machine comprising, in combination:
a compact housing with a generally rectangular configuration with a front panel, a rear face, a top surface, a bottom surface, and a pair of side edges formed therebetween defining an interior space, the front panel hingably coupled to the housing with a lock having a first open orientation for allowing access within the interior space and a second orientation for precluding said access, the front panel further comprising a transparent plastic plate positioned at an upper extent thereof and a control panel situated at a lower extent thereof, wherein a plurality of mounting means are formed on the rear panel for mounting the housing to a wall;
a plurality of elongated trays coupled within the interior space on the rear face and extended horizontally therefrom, wherein the trays are visible through the transparent front panel, the trays each including an elongated slit longitudinally formed therein, a helix residing lengthwise within each slit, and a motor coupled to an inboard end of each helix and adapted to rotate the helix one complete revolution upon the actuation thereof;
a plurality of labels with indicia indicative of both a panty hose size and a panty hose color situated on an outboard end of each tray;
a plurality of panty hose situated within each of the helixes of a tray with a corresponding label, wherein the panty hose are adapted to drop from the outboard end of each tray into a dispensing pan accessible to a user upon actuation of the motor, the panty hose comprising a thin square envelope with a transparent front face for viewing the panty hose therein;
a money exchanger situated on the control panel of the front panel at a right extent thereof, the money exchanger adapted to accept and account for money in the form of bills and coins and further dispense change in the form of coins; and
a selection panel situated on the control panel of the front panel at a left extent thereof, the selection panel including first row buttons each having indicia indicative of one of a plurality of sizes of panty hose and second row buttons each having indicia indicative of one of a plurality of colors of panty hose, the selection panel adapted to actuate the motor of a tray upon the acceptance and accounting for a proper amount of money and subsequent depression of a first row button and a second row button which correspond to the label of the tray.

5,690,252
VERSATILE DISPENSING SYSTEMS

Beata Maria Oleksiewicz, Downers Grove, and Michael J. Rocheleau, Prairie View, both of Ill., assignors to Fluid Management Limited Partnership, Wheeling, Ill.

Filed Oct. 20, 1995, Ser. No. 545,982
Int. Cl.^{6} B67D *5/08*
U.S. Cl. 222—56 **20 Claims**

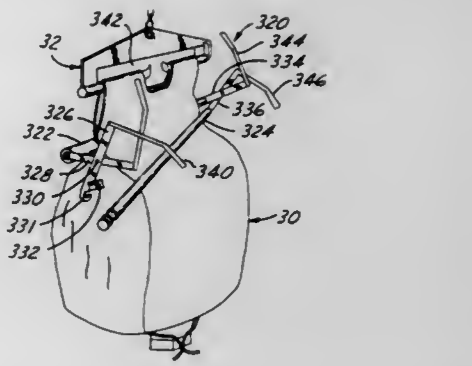


1. A dispensing system for delivering a plurality of materials, comprising:
a plurality of vessels having sidewalls with upper and lower ends;
spaced-apart pairs of mounting lugs protruding from the vessels;
a support frame for receiving the vessels and for engaging the mounting lugs so as to hangingly support the vessels;
a plurality of weight indicating means for sensing the vessel weights, located between at least one of the mounting lugs of the vessels and the support frame and the weight indicating means having output means indicative of the weights sensed;
flow control means having control input means coupled to the output means of the weight indicating means, material input means for receiving material to fill the vessels and material output means for coupling the vessels and the material source;
coupling means coupling the output means of the weight indicating means and the input means of the flow control means whereby filling of the vessels is controlled in response to signals from the weight indicating means;
a body having upper and lower spaced surfaces and defining a central aperture extending between the upper and the lower surfaces and a plurality of trough-like recesses surrounding the central aperture and extending between the upper and the lower surfaces;
a plurality of dispense nozzles coupled to the vessels and having end portions at which material is dispensed, the end portions disposed in the recesses; and
a resilient clamping member having an outer surface, the clamping member disposed in the central aperture and dimensioned so that portions of the outer surface engage the dispense nozzle end portions so as to clamp the dispense nozzle end portions in the body.

5,690,253
LARGE BULK LIQUID SQUEEZE BAG

Lee LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Inc., Manistee, Mich.

Filed Aug. 29, 1996, Ser. No. 705,419
Int. Cl.^{6} B65D *35/28*
U.S. Cl. 222—102 **13 Claims**



1. In combination with a flexible and collapsible bulk bag having an upright orientation in use with a side wall, top and bottom ends and top and bottom end openings to the exterior of the bag through which contents are respectively entered and discharged, a flexible and collapsible liner received in said bag generally complementary thereto and having a side wall, top and bottom ends and top and bottom openings through which the contents are respectively entered and discharged, said bag comprising a tubular blank of reinforced flexible woven material, the blank having a circumferentially continuous central portion and four isosceles triangular portions adjacent each end constructed and arranged such that said bag when expanded has a generally cubical configuration with a pair of generally rectangular side wall panels connected by a pair of gusseted side panels and such that when the bag is empty it can be collapsed and folded into a generally flat configuration, and wherein each of the triangular portions extend from the blank central portion toward an apex of the triangular portion, connector means connecting together adjacent triangular portions adjacent their edges along lines of connection extending from at least closely adjacent the central portion toward their associated apexes at least half of the distance therebetween, and the lines of connection associated with the triangular portions adjacent the associated end of the central portion terminating short of their apexes so as to at least in part define an access opening therethrough adjacent the center of the associated end defined by such triangular portions when such bag is expanded such that when filled such bag has a pair of spaced apart and generally conical ends interconnected by four generally rectangular side walls with the ends convergently tapering toward their associated access opening, and wherein said bag end triangular portions when the bag is empty can be collapsed into a compact configuration having a pair of overlying front and rear panels with a pair of folded gusseted side panels received therebetween with the fold line between adjacent gusseted panels extending between substantially the apexes of their associated opposed triangular portions and the fold lines lying closely adjacent each other;
the improvement in combination therewith comprising laterally spaced apart first and second U-shaped hanger straps formed at the top end of said bag and together flanking said bag and liner top openings, each said hanger strap comprising a first two-ply extension formed from a portion of said front panel triangular portion and a portion of the side panel triangular portion connected thereto and extending upwardly beyond the bag top access opening from said connector means joining said front and side panel triangular portions and terminating at a free end edge, and a second two-ply extension formed from a portion of said rear panel triangular portion and a portion of the side panel triangular portion connected thereto and likewise extending upwardly beyond the bag top access opening from said connector means joining said rear and side panel triangular portions and terminating at a free end edge, said first and second two ply extensions having mutually overlapped portions permanently interconnected to thereby form a U-shaped hanger loop configuration having a four-ply thickness where said extensions mutually overlap, and wherein the

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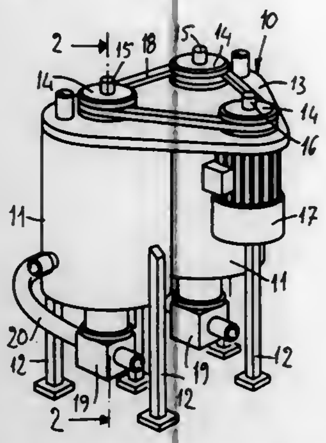
apices of said straps are coaxially aligned and spaced beyond said top bag and liner access openings when the same are closed.

5,690,254

DEVICE FOR OPERATING PUMPS IN AN INSTALLATION FOR THE FOAMING OF POLYURETHAN

Bruno Moretti, Via F. 111 Bronzetti, 4, 1 27029 Vigevano, Italy
Filed Jul. 18, 1995, Ser. No. 503,487
Claims priority, application Italy, Aug. 8, 1994, PV940006 U
Int. Cl.^{6} B67D *5/52*
U.S. Cl. 222—135 **15 Claims**

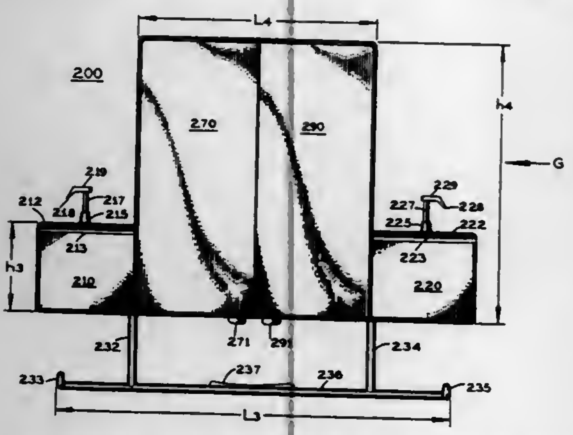


1. A device for operating pumps in an installation for the foaming of polyurethan comprising two vertical tanks each containing a component for obtaining polyurethan, a pump provided on the lower part of each tank to pump the material from said tank towards a mold for foaming, a shaft passing vertically through each tank, a pump connected to one end of each shaft, a plate for covering the tops of said tanks, the other end of each shaft passing through said plate, and means attached to said other end of each of said shaft by which said pumps are driven.

5,690,255

PORTABLE UNITARY STORAGE ORGANIZER

Horace S. White, 2101 N. Dixie Hwy., Fort Lauderdale, Fla. 33305
Continuation of Ser. No. 499,956, Jul. 10, 1995, Pat. No. 5,577,639. This application Jul. 19, 1996, Ser. No. 683,903
Int. Cl.^{6} B67D *5/52*
U.S. Cl. 222—135 **2 Claims**

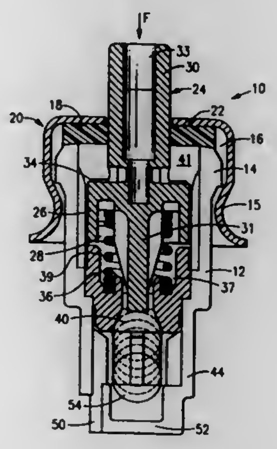


1. An integrated organizational portable storage and dispensing device for use along sinks in kitchens and bathrooms, comprising:
a first liquid pump dispensing container;
a second liquid pump dispensing container;
a storage container with two matching doors with mirrors on the inside walls connected to and aligned between the first dispensing container and the second dispensing container; and
a storage rack attached to a lower side of the storage container with two upright posts.

5,690,256

AEROSOL VALVE HAVING MECHANISM TO RESET FLOW SHUTOFF IF VALVE IS TIPPED BEYOND A CERTAIN INCLINATION FROM VERTICAL

Jeremy P. Smith, Loudon, N.H., assignor to Summit Packaging Systems, Inc., Manchester, N.H.
Filed May 6, 1996, Ser. No. 642,872
Int. Cl.^{6} B65D *83/00*
U.S. Cl. 222—402.1 **20 Claims**

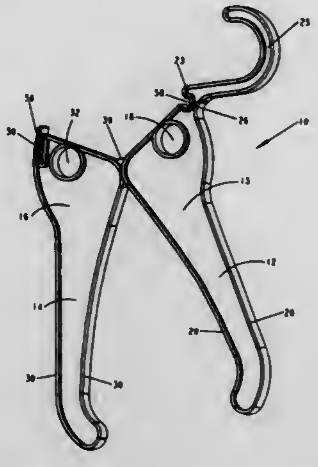


1. In an aerosol valve comprising:
a. a valve body having a product inlet;
b. a valve element being captively accommodate by said valve body and having a valve stem extending out from said valve body, and said valve element including a product outlet;
c. spring means being compressively disposed between said valve element and said valve body for urging said valve element into a normally closed position for preventing the flow of product through said valve;
d. a product flow path for product being defined through said valve and interconnecting said product inlet with said product outlet;
e. a dip tube being connected to said product inlet of said valve body; and
f. a flow shutoff mechanism being provided along the product flow path, said flow shutoff mechanism having a first position which permits the flow of product past said flow shutoff mechanism and a second position which prevents the flow of product therethrough;
the improvement wherein said valve element includes an extension which, upon further actuation of said valve element against the bias of said spring means, engages with said flow shutoff mechanism to positively move said flow shutoff mechanism from the second position towards the first position and again allow the flow of product past said flow shutoff mechanism.

5,690,257

FOLDING HANGER FOR GARMENTS AND THE LIKE

Jim Ward, P.O. Box 1702, Hayden, Id. 83835-1702
Filed Dec. 13, 1996, Ser. No. 766,485
Int. Cl.^{6} A47G *25/40*
U.S. Cl. 223—94 **15 Claims**



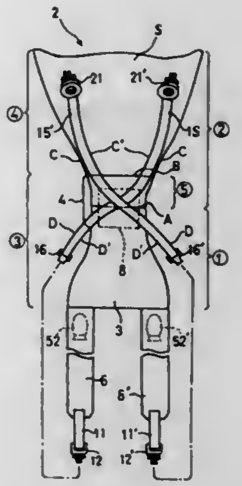
1. A folding hanger for use with garments comprising:
a first wing and a second wing, including
a pivot means, said pivot means attached to said first wing and said second wing, said pivot means permitting said first wing and said second wing to articulate between a first unfolded position and a second folded position, and
a latching means, said latching means including a spring biased tongue means which is accessible from an outer edge, said tongue means being received in a socket, said tongue means being integral with said first wing and said socket being integral with said second wing,
wherein when said hanger is in said first unfolded position, said tongue means is received in said socket, securing said hanger in said first unfolded position, and when said tongue is depressed, said tongue means is brought out of relation with said socket, permitting said hanger to pivot to said second folded position about said pivot means.

5,690,258

BABY CARRIER

Sachiyo Kataoka, Tokyo, Japan, assignor to Aprica Kassai Kabushlkikaisha, Osaka, Japan
Filed Sep. 13, 1996, Ser. No. 713,795
Claims priority, application Japan, Sep. 13, 1995, 7-262361
Int. Cl.^{6} A61G *1/00*
U.S. Cl. 224—160 **20 Claims**

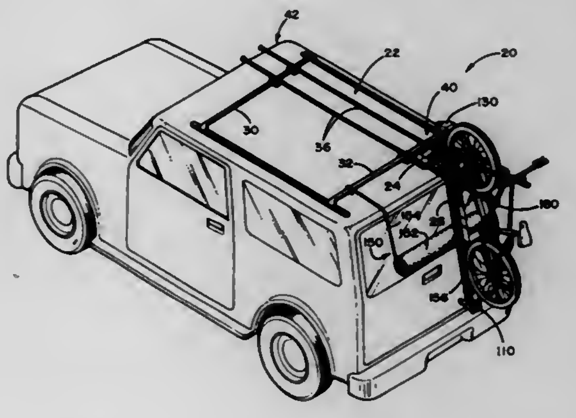
1. A baby carrier including a carrier body having a front cover portion, a crotch cover portion and a back cover portion which are arranged integrally with one another, wherein:
the carrier body comprises a first cloth material including the front cover portion, and a second cloth material including the back cover portion, which are severed from each other at a midsection of the crotch cover portion, wherein the first and second cloth materials each have a respective edge portion of concave pattern where they are severed from each other, and the edge portions of the first and second cloth materials are sewn together to form the carrier body.



5,690,259

MODULAR BICYCLE RACK SYSTEM

John J. Montani, 2560 Williams, Holland, Mich. 49424
Filed May 2, 1996, Ser. No. 640,535
Int. Cl.^{6} B60R *9/042*
U.S. Cl. 224—310 **21 Claims**



1. A modular bicycle rack system for a vehicle that has a pair of transverse load bars, the transverse load bars being spaced along a length of the vehicle, said modular bicycle rack system comprising:
a rail that is adapted to extend at least between the pair of transverse load bars, and to connect with each of the transverse load bars;
a slide connected in sliding engagement with said rail to slide along a length of said rail between a storage position and an access position, said slide having a body with two opposing body ends and a slot, said slot extending through said two body ends and defining a rail receptacle, said rail being positioned in said rail receptacle with said slide extending around said rail to capture said rail in sliding engagement;
a channel pivotally connected with said slide to pivot when said slide is in said access position, between an upper position and a lower position; and
a clamp connected with said channel, said clamp being adapted to couple with one of the transverse load bars to damp said channel in said upper position when said slide is in said storage position.

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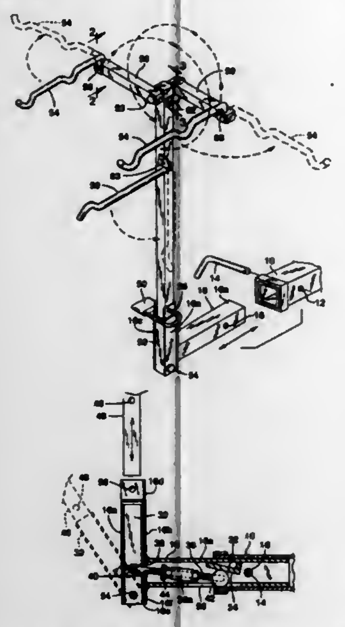
5,690,260
BICYCLE CARRIER

Warren A. Aikins, and James A. Aikins, both of P.O. Box 748, Rainier, Oreg. 97048
Filed Nov. 14, 1995, Ser. No. 557,450
Int. Cl.^{6} B60R *9/00;9/06*
U.S. Cl. 224—505 **13 Claims**



1. A carrier for bicycles for support on vehicles having a tubular hitch member, said carrier comprising:

a body member having forward and rearward end portions,

said body member being tubular in shape and size on its outer dimensions to have a telescoped connected fit in a tubular vehicle hitch member,

pivot support means at said rearward portion of said body member pivotally supporting an upright bicycle support post of said carrier for pivoted movement between an upright bicycle loaded position and a rearwardly tilted bicycle position,

and cooperating cam and cam follower means connected between said upright bicycle support post and a forward portion of said body member,

said cam and cam follower means being driven to provide a firm compressive contact between said body member and a vehicle hitch member when said upright bicycle support post is pivoted to its upright position for providing a tight rattle-free support of said upright bicycle support post on said pivot support means.

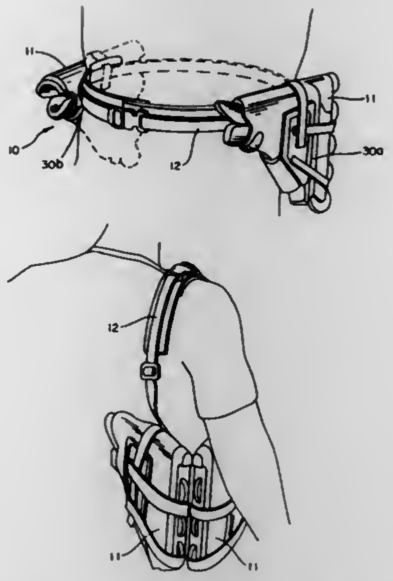
5,690,261
SKATE CARRIER

Jay Gary Moore, 720 W. Shubert Ave., Chicago, Ill. 60614
Continuation of Ser. No. 324,091, Oct. 14, 1994, abandoned.
This application Nov. 5, 1996, Ser. No. 744,062
Int. Cl.^{6} A45F *5/00*
U.S. Cl. 224—578 **19 Claims**

1. A shoe-carrying device in combination with a shoe comprising:

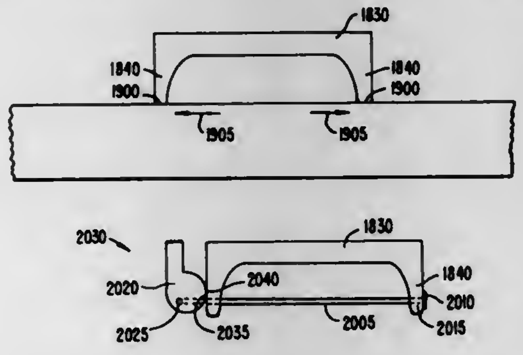
(a) a selected shoe from a range of different sizes; and

(b) a shoe-carrying device including an elongate strap with a first end and a second end, said first end having a coupling means for securement of said first end to said second end, at least one receptacle having a bearing member in engagement with said shoe at a toe of said shoe for supporting said shoe with a bottom of said shoe being substantially vertically disposed with respect to the ground in said receptacle, a first wall and a second wall for cooperatively maintaining said shoe in engagement with said bearing member, and means for adjustably coupling said first wall to said second wall to secure said shoe in said receptacle, and a retainer on said receptacle for suspending said receptacle on said strap.



5,690,262
PAGER MOUNTING SYSTEM

Robert Vardanega, 2923 Marina Dr., Alameda, Calif. 94501
Filed Jun. 11, 1996, Ser. No. 660,588
Int. Cl.^{6} A44B *21/00*
U.S. Cl. 224—667 **10 Claims**



1. A portable device securing system, comprising:

a portable device housing integral to a portable device;

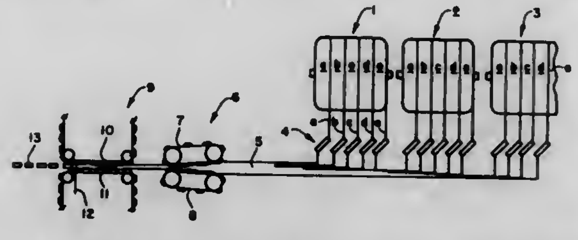
a clip member having a first portion and a second portion, said clip member pivotably coupled to said device housing, said pivotal coupling allowing a separation between said second portion of said clip member and said device housing to be varied;

a locking member attached to said clip member, said locking member having a first and a second flexible portion, said first and second flexible portions separated by a gap, wherein said first and second flexible portions are interposed between said first portion of said clip member and said device housing; and

a compression member having at least a first position and a second position, wherein said compression member in said first position places said first and second flexible portions in a first position which substantially prevents said second portion of said clip member from being separated from said device housing, and wherein said compression member in said second position places said first and second flexible portions in a second position which allows said second portion of said clip member to separate from said device housing.

5,690,263
METHOD FOR APPLYING A TRACTIVE FORCE TO A STACK OF TISSUES WITH REDUCED BULK LOSS

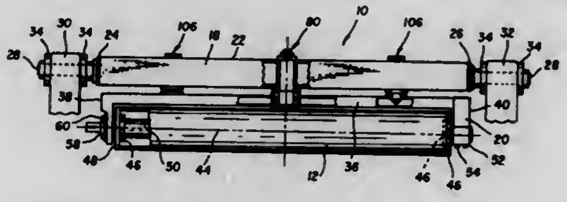
Rodney Lawrence Abba, Oshkosh, and Scott Allen Baum, Fremont, both of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.
Continuation of Ser. No. 196,608, Feb. 15, 1994, abandoned.
This application Jun. 7, 1996, Ser. No. 659,809
Int. Cl.^{6} B65H *20/06*
U.S. Cl. 226—1 **19 Claims**



1. A method for applying a tractive force to a stack of tissues comprising feeding the stack of tissues between two tissue-contacting surfaces travelling horizontally in the same direction, each of said surfaces having spaced apart protrusions positioned in a staggered relationship relative to the protrusions of the other surface such that a sinusoidal profile is imparted to the stack of tissues which provides adequate frictional engagement to move the stack of tissues without slippage and with less bulk loss compared to moving the stack of tissues between flat belts.

5,690,264
APPARATUS AND METHOD FOR SELF-ALIGNING CONTACTING SURFACES

Joseph Distefano, Hilton; Vladimir A. Garris, Rochester; Brian Douglas Hauss, Spencerport, and Michael Alexander Kubiak, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 29, 1996, Ser. No. 608,887
Int. Cl.^{6} B65H *20/00;20/02*
U.S. Cl. 226—187 **14 Claims**



1. Apparatus for self-aligning a first roller in proximate contact with a second, roller comprising:

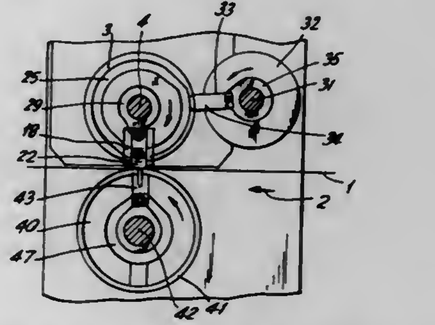
a first frame member having a main portion and first and second opposite end portions structurally mounted to said main portion, first and second elongated members structurally mounted to a respective first and second opposite end portion, said first and second elongated members defining a central axis passing through said first frame member, and said first and second opposite end portions being capable of rotation about said central axis;

a second frame member having second, opposite end portions for supporting said first roller; and

first end bearing means, central pivot bearing means, and second end bearing means for supportedly mounting the first frame member to said second frame member, said bearing means being arranged so as to enable either of said first end bearing means and second end bearing means to apply continuous pressure to said second frame member in response to movements of said second roller thereby providing continuous alignment of said first roller with said second roller; wherein a pivot shaft having a threaded and non-threaded end portion is disposed in said central pivot bearing means and passes through a boring in said second frame member, said threaded end portion extending outwardly of said first frame member, and wherein a hex nut and cap are arranged on said threaded end portion of said pivot shaft to secure the pivot shaft to said first and second frame members, and wherein said non-threaded end portion of said pivot shaft is disposed in a roller bearing arranged in said boring in said second frame member, said roller bearing being secured to said pivot shaft by a bearing cap.

5,690,265
STAPLING DEVICE

Hans-Helmut Jakob, Gottlieb-Daimler-Str. 5, 64319 Pfungstadt, Germany
Filed Apr. 24, 1996, Ser. No. 639,258
Claims priority, application Germany, May 3, 1995, 195 16 164.5
Int. Cl.^{6} B42B *4/02*
U.S. Cl. 227—81 **11 Claims**



1. A stapling device for connecting products formed from stacked and continuously conveyed webs or sheets of paper by means of a wire-like stapling material which is deformed into individual clamps, the stapling device having attached thereto a drum-shaped body mounted on one side of a travel path of the products and approximately contacting the travel path transversely of a conveying direction, the drum-shaped body comprising a supply roll and a conveying unit for the stapling material, a cutting device for severing the stapling material to a length required for forming a clamp, and a plunger for inserting the clamp into the products, further comprising a clamp forming unit comprising a pocket formed in the drum-shaped body and a clamp forming body radially displaceable in the pocket, the clamp forming body being synchronously rotatable with the drum-shaped body about an axis extending parallel to an axis of the drum-shaped body and being located on the same side of the travel path, and a rotatable body comprising a clamp closing unit located on a side of the travel path of the products opposite of the drum-shaped body and driven synchronously with the drum-shaped body.

5,690,266
STAPLING DEVICE

Bengt Klinga, Tyresö, Sweden, assignor to Tolerans Ingol Sweden AB, Tyresö, Sweden
Continuation of Ser. No. 196,484, Feb. 15, 1994, abandoned.
This application Sep. 17, 1996, Ser. No. 714,875
Claims priority, application Sweden, Feb. 18, 1993, 93 00537
Int. Cl.^{6} B27F *7/21;7/23*
U.S. Cl. 227—81 **11 Claims**

1. A device for applying staples to a material at predetermined distances along a web formed by the material, comprising:

a stapling cylinder;

a counterpressure cylinder positioned to rotate adjacent to the stapling cylinder with the web passing therebetween;

a forming drum positioned to rotate adjacent to the stapling cylinder;

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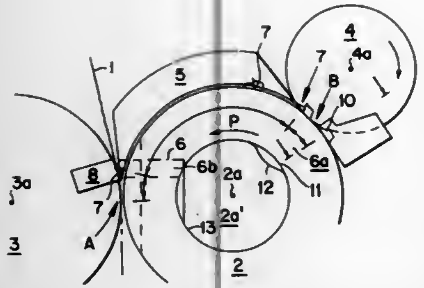
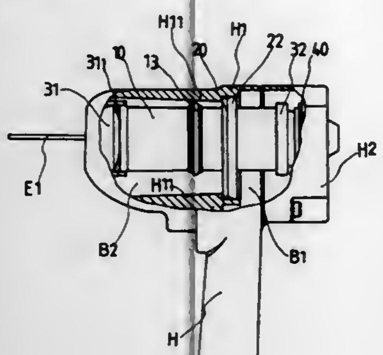


a horn which extends around a periphery of the stapling cylinder between the forming drum and the counterpressure cylinder;
a stapling fork carried by the stapling cylinder, the stapling fork coacting with the stapling cylinder to cut a staple-forming section from wire material in a region between the stapling cylinder and the forming drum and to form from said staple-forming section a U-shaped staple, wherein rotation of the stapling cylinder carries the U-shaped staple to a region between the stapling cylinder and the counterpressure cylinder for fastening the U-shaped staple to the material web passing between said stapling cylinder and said counterpressure cylinder;
means for generating an activating signal selectably responsive to a rotation of the stapling cylinder;
a guide element mounted adjacent to the stapling cylinder for guiding the stapling fork, the guide element defining a guide path including a selectable first path section and a selectable second path section; and,
means for selecting one of said first path section and second path section for the guide path in response to said activating signal,
wherein the stapling fork is movable along the first path section in the region between the stapling cylinder and the forming drum to cut and form a staple, and
wherein the stapling fork is movable along the second path section in the region between the stapling cylinder and the forming drum to prevent cutting of said wire material and the formation of a U-shaped staple.

5,690,267
MOUNTING STRUCTURE FOR STAPLE GUNS

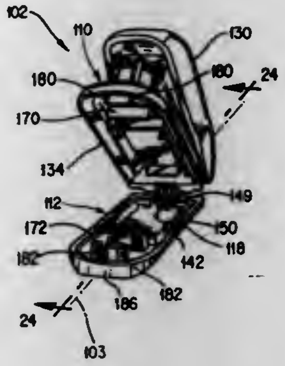
Brad Yang, Taichung-Hsien, Taiwan, assignor to Testo Industry Corporation, Taipei, Taiwan
Filed Jun. 14, 1996, Ser. No. 663,972
Int. Cl.⁶ B25C *1/04;5/13*
U.S. Cl. 227—130 **3 Claims**



1. A mounting structure for a staple gun, comprising:
a gun body having an air chamber defined therein;
a cylinder disposed in said air chamber, said cylinder being fitted with an O-ring and having two spaced flanged rings extending from an outer periphery thereof;
a buffer disposed at an end of said air chamber defined in said gun body, said cylinder accommodating a piston rod and said cylinder engaging said buffer so that a strike pin of said piston rod passes through a central hole defined in said buffer and a bottom side of said cylinder rests upon a plurality of ribs on an upper side of said buffer, said upper side of said buffer and said bottom side of said cylinder defining a clearance for passage of air inside said air chamber into said cylinder;
a sleeve engaged with said cylinder, said sleeve being disposed between said two spaced flanged rings and secured from axial movement thereby, said sleeve pressing against a plurality of ribs extending along an inner wall of said gun body such that said sleeve engages said inner wall of said gun body and firmly positions said cylinder inside said air chamber, said sleeve dividing said air chamber into an upper air chamber and a lower air chamber;
a press element being engaged with a top end of said cylinder, said press element being provided with an opening which communicates with an interior of said cylinder; and
a guide means disposed in a top cover of said gun body,
wherein said cylinder is provided with two raised rings spaced apart from each other and disposed below said flanged rings, at least one of said raised rings being provided with a plurality of air vents, said O-ring being fitted between said raised rings for covering said air vents for providing an unidirectional supply of air to said lower air chamber during return strokes of said piston rod.

5,690,268
STAPLER WITH STAPLE STORAGE

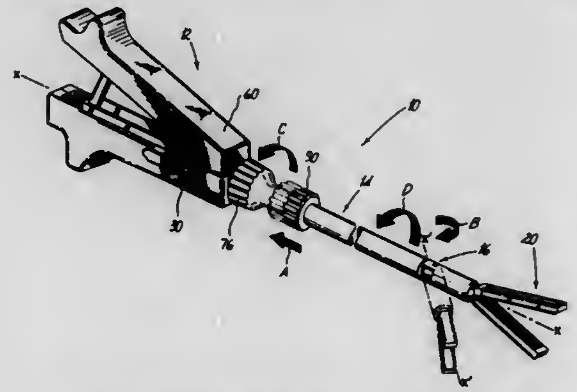
Alfred J. Evans, Lake In The Hills; David Q. Feng, Arlington Heights, and Robert J. Long, Lake In The Hills, all of Ill., assignors to Acco USA, Inc., Wheeling, Ill.
Continuation-in-part of Ser. No. 517,994, Aug. 22, 1995, abandoned. This application Jun. 3, 1996, Ser. No. 660,225
Int. Cl.⁶ B25C *5/11*
U.S. Cl. 227—156 **14 Claims**



13. A stapler, comprising:
a base including a tail portion and a bottom portion, said bottom portion defining a storage chamber adapted to store spare fasteners;
a slipper including a cover portion and a resilient loop portion extending therefrom, said loop portion defining an opening through which said tail portion is slideably positioned so that the cover portion is pivotally movable about said tail portion between i) a closed position at which the cover portion of the slipper is removably connected to said bottom portion of the base and ii) an open position at which the cover portion of the slipper is pivotally spaced from said bottom portion of the base; and
a magnet connected to the cover portion of the slipper.

5,690,269
ENDOSCOPIC STAPLER

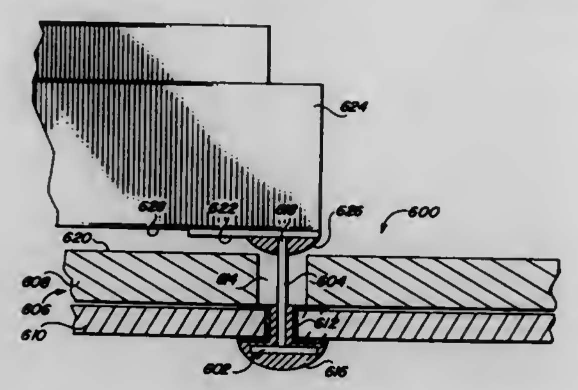
Henry Bolanos, East Norwalk; Charles R. Sherts, Southport, and Thomas A. Pelletier, Wallingford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Continuation of Ser. No. 415,776, Mar. 31, 1995, Pat. No. 5,540,375, which is a continuation of Ser. No. 49,881, Apr. 20, 1993, abandoned. This application May 1, 1996, Ser. No. 640,589
Int. Cl.⁶ A61B *17/068*
U.S. Cl. 227—176.1 **6 Claims**



1. A surgical instrument comprising:
a handle portion having proximal and distal end portions and a longitudinal axis;
a pair of jaws extending generally longitudinally from the distal end portion, at least one of the jaws being movable relative to the longitudinal axis defined by the handle portion; and
a plurality of fasteners disposed within at least one of said pair of jaws, wherein each fastener has a pair of legs joined by a backspan, the distal-most fastener backspan being oriented substantially perpendicular to the longitudinal axis of the handle portion and wherein each fastener is ejected in a direction generally towards said longitudinal axis when the instrument is fired.

5,690,270
SURFACE MOUNTING STRESS RELIEF DEVICE AND METHOD

John G. Gore, Sorrento, Fla., assignor to Sawtek Inc., Orlando, Fla.
Continuation of Ser. No. 346,131, Nov. 29, 1994, Pat. No. 5,573,172, which is a continuation-in-part of Ser. No. 148,292, Nov. 8, 1993, Pat. No. 5,369,551. This application Nov. 8, 1996, Ser. No. 745,782
Int. Cl.⁶ H05K *3/34;1/00*
U.S. Cl. 228—180.22 **24 Claims**



21. A method for mounting an electronic component onto a printed circuit board, the method comprising the steps of:
inserting a pin through a printed circuit board feedthrough for providing movement of the pin within the feedthrough;
positioning a pin proximal end in contact with a printed circuit board conductive surface;
positioning a pin distal end for supporting a component in spaced relation with a printed circuit board opposing component mounting surface;
attaching the pin proximal end to the board conductive surface; and
attaching the pin distal end to a component conductive pad for attaching the component to the printed circuit board in a spaced relation with the board mounting surface.

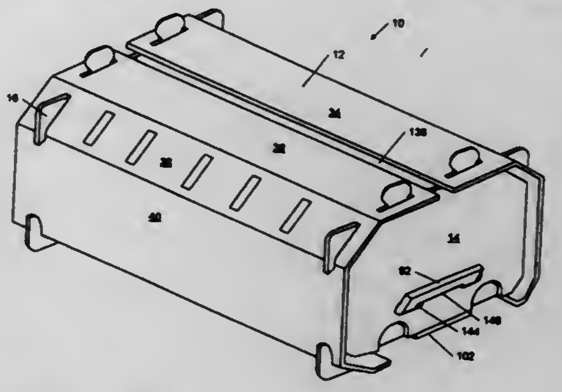
5,690,271
PROCESS AND SOLDERING PASTE FOR SOLDERING ON LARGE-AREA PLATES OF ALUMINUM OR ALUMINUM ALLOYS AND USE OF THAT PROCESS

Klaus Dudel, St. Sulpice, Switzerland, assignor to Castolin S.A., Switzerland
PCT No. PCT/EP94/02581, § 371 Date Jun. 17, 1996, § 102(e) Date Jun. 17, 1996, PCT Pub. No. WO95/13902, PCT Pub. Date May 26, 1995
PCT Filed Aug. 4, 1994, Ser. No. 648,045
Claims priority, application Germany, Nov. 19, 1993, 43 39 498.1
Int. Cl.⁶ B23K *35/363*
U.S. Cl. 228—254 **8 Claims**

1. A process for the production of large-area plates of aluminum or aluminum alloys for fixing same on a workpiece comprising an iron-base alloy, for example an aluminum plate which is a good conductor of heat on the bottom of a cooking pot of stainless high-quality steel using a powder containing aluminum and silicon, and a flux with potassium and aluminum fluoride, characterized in that the plate is provided with a soldering paste of flux with about 50% potassium fluoride and about 50% aluminum fluoride, a solder powder with about 80 to 90% aluminum and 20 to 10% silicon and a binder comprising a monopropylene glycol, 10 to 30% by weight of a solution of butyl methacrylate and glycol ethers, glycol esters, ketones, in each case individually or in the form of a mixture, wherein the proportion of the binder is between 0.2 and 2% by weight, whereafter the coated plate is dried and aged.

5,690,272
PRODUCE BOX

James England, Escondido, Calif., assignor to Universal Container, Inc., Escondido, Calif.
Filed Apr. 26, 1996, Ser. No. 638,611
Int. Cl.⁶ B65D *5/32;21/032*
U.S. Cl. 229—23 R **24 Claims**



1. A box comprising:
an elongated wrap panel having lateral edges and a plurality of flat surfaces formed by folding at a plurality of lateral creases

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wherein all said adjacent flat surfaces form angles which are greater than 90 degrees;

said flat surfaces including a bottom surface and two flat surfaces forming a top, wherein the two flat surfaces are adjacent to the lateral edges;

each of two sides of the box being formed from a plurality of said flat surfaces;

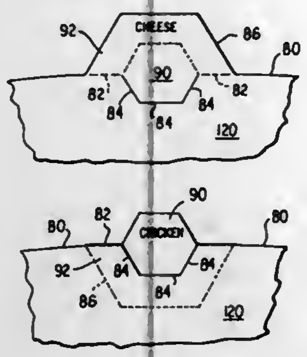
two end panels each having a plurality of tabs engaging with said box sides, the two end panels each having a horizontal slit extending therethrough;

said bottom surface having a locking tab at each end, the locking tab including a pair of hinged portions permitting said locking tab to fold upward, wherein a portion of the bottom surface between the pair of hinged portions forms a flat support tab which is formed by a slit in said locking tab, the locking tab including a first, generally U-shaped portion formed from the slit and a second generally U-shaped portion extending outward from said first U-shaped portion being hingingly attached to the first U-shaped portion, wherein said first U-shaped portion extends into the interior of said box adjacent to the end panel when folded at the hinged portions, and wherein said second U-shaped tab extends substantially outside the box through one of said horizontal slits in the end panel.

5,690,273

PAPERBOARD CONTAINER WITH INDICIA TABS

Kurt D. Jensen, Cincinnati, Ohio, assignor to International Paper Company, Purchase, N.Y.
Division of Ser. No. 620,234, Mar. 22, 1996. This application Jan. 15, 1997, Ser. No. 784,173
Int. Cl.^{6} B65D *5/42*
U.S. Cl. 229—107 **3 Claims**

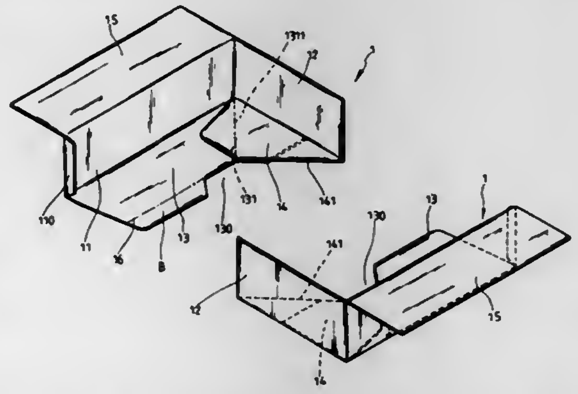


1. An indicia tab construction particularly adapted for a paperboard food container having a peripheral edge portion, a tab formed from said paperboard food container, a first segment of said tab extending outwardly relative to said peripheral edge portion, a second segment of said tab extending inwardly relative to said peripheral edge portion, an integral hinge joining said tab to said container at said periphery, said second tab segment defined by a cut entirely through said paperboard, said tab having respective first and second opposite surfaces, said tab being foldable substantially 180 degrees about said integral hinge from a first, normal position to a second position, said cut being laterally spaced from said integral hinge, means carried by said tab, or by said container, or both, for adhesively releasably securing said tab in said substantially 180 degree second position, a first indicia on said first tab surface, a second and different indicia on said second tab surface, whereby said tab can be folded substantially 180 degrees to present two different indicia to a viewer.

5,690,274

FOLDING BOX STRUCTURE

Hsi-Chin Yang, No. 33-4, HuaMei Lane, ChungCheng Road, TaYa Hsiang, TaiChung Hsien, Taiwan
Filed Oct. 22, 1996, Ser. No. 735,427
Int. Cl.^{6} B65D *5/36*
U.S. Cl. 229—117 **4 Claims**

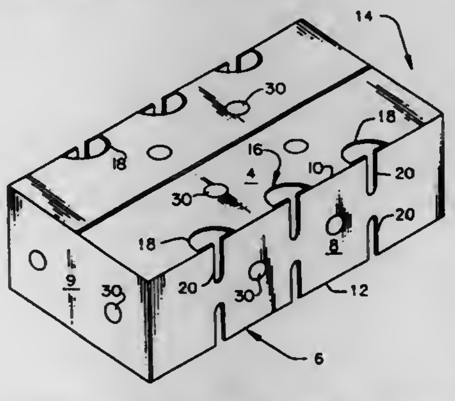


1. A folding box structure comprising two identical components, each of the components comprising a back panel which is adjacent above to a lid panel and below to a bottom panel; the back panel having two sides respectively comprising an adhesive flap and a side panel joined thereto; a bottom side panel being formed below the side panel; a recess being formed on the bottom panel located at an appropriate position along the outer edge, and gradient of the side near the bottom side panel corresponding with gradient of the outer side of the bottom side panel; a crease being formed across from the joint of the bottom panel and bottom side panel to the nearest vertex of the recess; the underside portion of the bottom panel defined by the perforations being joined with the corresponding overlapping of the bottom side panel; the two components being assembled to form a box by affixing the adhesive flap of each component to the corresponding inner surface of the other component.

5,690,275

CONTAINER WITH APERTURES FOR VENTILATION

Ajit Kumar Bose, Lawrenceville, N.J., and Fernando Tapia, Bancagua, Chile, assignors to Union Camp Corporation, Wayne, N.J.
Filed May 29, 1996, Ser. No. 644,913
Int. Cl.^{6} B65D *5/20*
U.S. Cl. 229—120 **11 Claims**

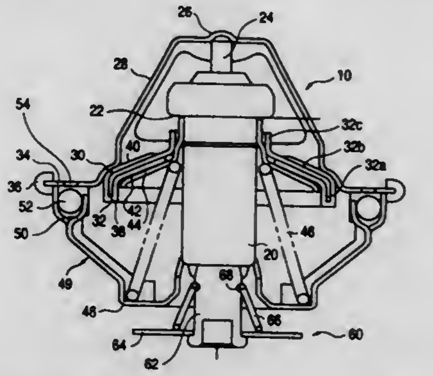


1. A container having top, bottom and side panels comprising apertures defining cut-out areas allowing the passage of vaporized materials through the container, at least some of said apertures being overlapping apertures which overlap at least one pair of panels selected from the group consisting of the top and side panels and the bottom and side panels, wherein the cut-out area of each of said overlapping apertures comprises a first cut-out area in the side panel and a second cut-out area and wherein the area of the second cut-out area exceeds the area of the first cut-out area of each of said overlapping apertures.

5,690,276

TWO STAGE THERMOSTATIC VALVE DEVICE

Peter Thiel, Bloomington; Don D. Hughes, Columbus, and John F. Grote, Columbus, all of Ind., assignors to Caltherm, Columbus, Ohio
Filed Oct. 31, 1996, Ser. No. 742,822
Int. Cl.^{6} F01P *7/16*
U.S. Cl. 236—34.5 **21 Claims**



1. A thermostatic valve device for control of the flow of coolant from an internal combustion engine to a radiator system comprising,

a temperature sensitive element contained in a body from which a piston may be axially moved with respect to said body in response to a change in temperature, and engaging means on said body,

a main valve and a main valve seat, said main valve having a leading section and a trailing section, a first side and a second side, said first side biased against said main valve seat by a compression spring to form a seal,

a second valve and a second valve seat, said second valve having a leading section, a trailing section, a first side and a second side, said second valve seat located on said second side of said main valve, said second valve biased against said second valve seat by said compression spring to form a second seal,

said compression spring seated on a spring retainer,

wherein in response to an increase in temperature said piston moves from said body thereby first causing said engaging means to engage said trailing edge of said second valve and unseat said second valve from said second valve seat and compress said compression spring, and

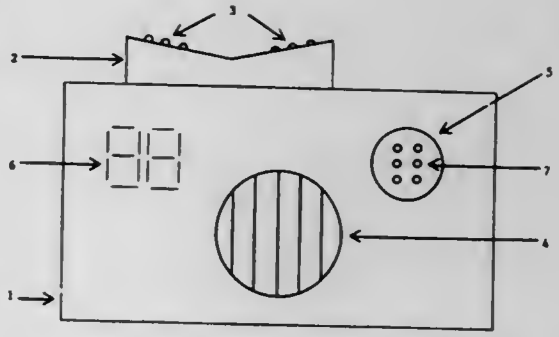
wherein in response to a further increase in temperature said engaging means engages said trailing edge of said main valve thereby unseating said main valve from its seat to open the valve and thereby further compressing said compression spring.

5,690,277

AUDIBLE THERMOSTAT

Scott W. Flood, 74 Buckingham La., Hopkinton, N.H. 03229
Filed Feb. 6, 1995, Ser. No. 386,513
Int. Cl.^{6} G05D *23/00;* G01D *13/22*
U.S. Cl. 236—94 **4 Claims**

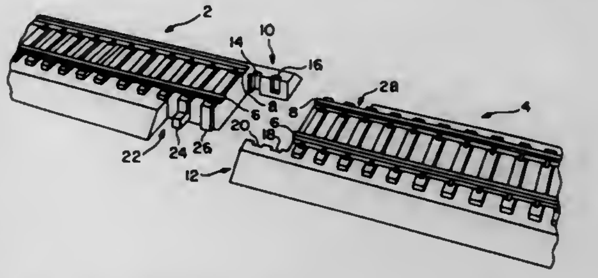
1. An audible thermostat comprising an audible output in conjunction with said thermostat whereby said audible output is a synthesized human voice indicating the setting of the thermostat or the ambient temperature in the proximity of the audible thermostat and an adjustment mechanism which allows a user to adjust the thermostat setting and obtain an audible indication as to the setting as the thermostat setting is being adjusted.



5,690,278

TRACK SYSTEMS FOR MODEL RAILROADS

Lawrence B. Grubb, Baltimore, Md., assignor to Life-Like Products, Inc., Baltimore, Md.
Filed Jan. 16, 1996, Ser. No. 586,590
Int. Cl.^{6} A63H *19/30*
U.S. Cl. 238—10 E **19 Claims**



1. In a track system for a model railroad train set of the type including a plurality of track sections removably connectable to each other to form a path of travel for a model train, the improvement comprising:

each of said plurality of track sections comprising a trackbed base section for carrying a pair of rails for guiding said model train; said trackbed base section having an extended portion defined on one side of each end thereof, and a recessed portion defined on another side of each of said ends thereof; said extended and recessed portions defined on each of said ends of said trackbed base adapted to mate with complementary portions defined on adjacent trackbed base sections for removably connecting a plurality of said trackbed base sections, wherein said extended and recessed portions on each of said plurality of trackbed base sections carry locking means thereon for removably connecting said plurality of said trackbed base sections together,

wherein said locking means carried on said extended and recessed portions of said plurality of said trackbed base sections are oriented such that adjacent ends of said trackbed base sections are removably connected to each other at at least two separate locking positions, said at least two separate locking positions being laterally offset from each other and disposed towards opposite sides of said trackbed sections connected together such that said two separate locking positions are not oriented along the same linear axis extending in a perpendicular direction relative to the longitudinal direction of said trackbed base sections connected together.

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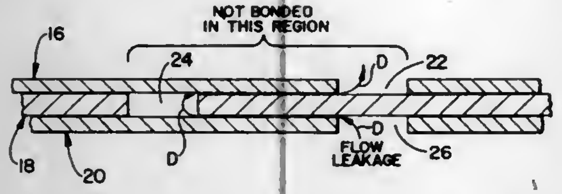
5,690,279
THERMAL RELIEF SLOT IN SHEET METAL

George J. Kramer, Jupiter; Paul A. Smith, Jr., Palm Beach Gardens, both of Fla., and Kenneth W. Froemming, Indianapolis, Ind., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 30, 1995, Ser. No. 564,997
Int. Cl.^{6} B64D *33/04*

U.S. Cl. 239—127.3 **19 Claims**



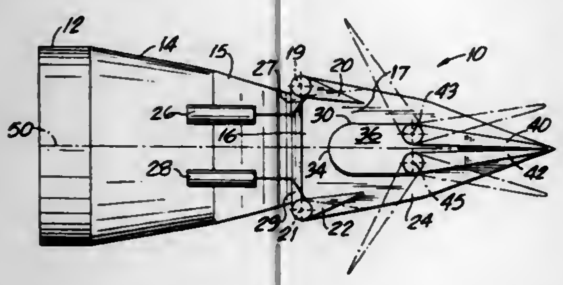
1. A sheet metal assembly being exposed to thermal stresses including a top sheet metal sheet, a bottom sheet metal sheet and a middle sheet metal sheet sandwiched between said top sheet and said bottom sheet, at lease one relief slot extending laterally into each of said top sheet, said middle sheet and said bottom sheet, the top relief slot and bottom relief slot being in vertical alignment, the relief slot in said middle sheet being axially spaced therefrom, said top sheet, said middle sheet and said bottom sheet being bonded to each other except in the area of each of the sheet metal sheets extending from the relief slot in said middle sheet and the relief slot in said top sheet and said bottom sheet whereby the portion of sheet metal adjacent each of said relief slots is capable of flexing relative to the remaining portion of the sheet metal and defining a labyrinth leakage path from said bottom sheet to said top sheet.

5,690,280
MULTIFUNCTION EXHAUST SYSTEM FOR GAS TURBINE ENGINES

Joseph Holowach, Cincinnati; William Van Sutherland, Milford, and William Harvey Wooten, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 24, 1990, Ser. No. 571,793
Int. Cl.^{6} F02K *1/62; 1/40*

U.S. Cl. 239—265.25 **19 Claims**



1. A multifunction exhaust system for use with a jet engine, said system comprising:

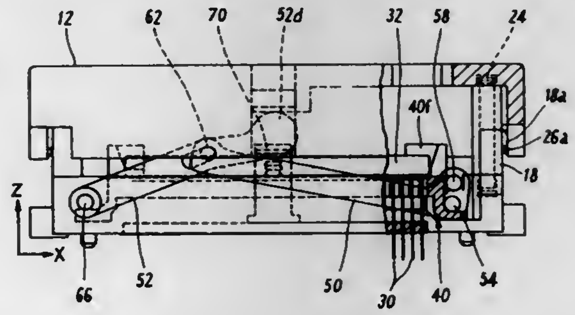
- an exhaust duct for directing the flow of exhaust gasses therethrough;
- a pair of primary flaps operatively associated with said exhaust duct for selectively controlling the direction of said exhaust gasses through said system;
- a center plug extending transversely across said exhaust duct so as to define a pair of exhaust gas flowpaths within said exhaust duct;
- a pair of divergent flaps operatively associated with said exhaust duct for directing the flow of exhaust gasses downstream from said primary flaps;
- a primary pivoting means for pivoting at least one of said primary flaps through a primary flap angle of at least about 90 degrees with respect to said exhaust duct central axis; and
- a secondary pivoting means for pivoting at least one of said secondary flaps through a secondary flap angle of at least about 90 degrees with respect to said exhaust duct central axis.

5,690,281
SOCKET APPARATUS

Kiyokazu Ikeya, Shizuoka-ken; Kiyoshi Adachi, Hiratsuka; Masao Tobyama, and Tomohiro Nakano, both of Gotemba, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 22, 1995, Ser. No. 518,123
Claims priority, application Japan, Aug. 23, 1994, 6-221083
Int. Cl.^{6} H01R *11/22*

U.S. Cl. 439—268 **13 Claims**



1. Socket apparatus for removably mounting an electric part with a plurality of ball-shaped lead terminals arranged in a selected pattern on said electrical part comprising a base, a plurality of elongated contact elements each having a longitudinal axis mounted in the base with the longitudinal axis extending generally parallel to a Z axis in a pattern extending in X-Y directions perpendicular to the Z axis and to each other corresponding to the selected pattern, each contact element having first and second flexible contact arms movable between open and closed positions, a slide plate having top and bottom generally planar surfaces mounted on the base to slide in an X direction, the slide plate having a plurality of apertures extending through the slide plate between the top and bottom surfaces and arranged in a pattern corresponding to the selected pattern, the first and second contact arms of each contact member received in a respective aperture with one of the first and second contact arms being interconnected with the slide plate to move therewith in the X direction, the socket having an electric part receiving seat with the lead terminals of an electric part disposed in the seat received in respective apertures between respective first and second contact arms and means to move the slide plate between an open contact arms position when the electric part can be inserted into and removed from the seat and a closed contact arms position when the terminal leads of the electric part are engaged by respective first and second contact arms.

5,690,282
SPRAY NOZZLE DEVICE

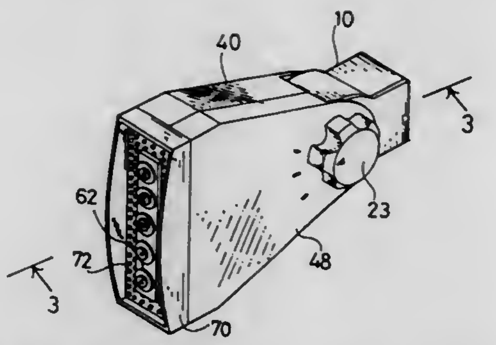
Wen-Li Guo, No. 10, Fang Dong Road,, Wen Gin Tsuen, Fang Yuan Hsiang, Chang Hua Hsien, Taiwan

Filed Apr. 10, 1996, Ser. No. 630,341
Int. Cl.^{6} B05B *1/00*

U.S. Cl. 239—395 **6 Claims**

1. A spray nozzle comprising:

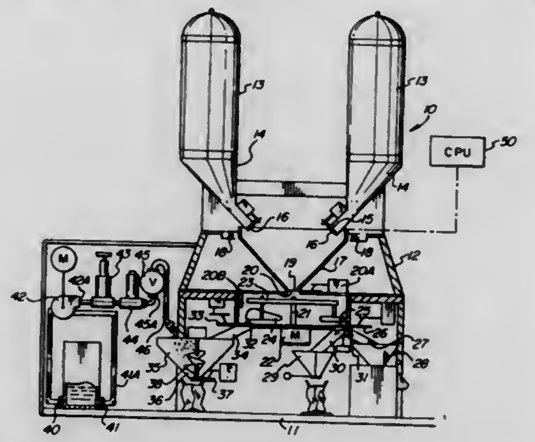
- a casing including a chamber formed therein and including an inlet for connecting said chamber to a water reservoir, said casing including a curved front portion having at least one first passage and a second passage formed therein and communicating with said chamber,
- a block rotatably supported in said casing,
- a valve secured to said block and including at least one first notch formed therein for aligning with said first passage and including a second notch for aligning with said second passage,
- a housing rotatably secured to said casing at a pivot shaft and including at least two channels formed therein for selectively aligning with said second passage and including at least one passageway formed therein for communicating with said first passage,
- a head secured to said housing and including a plurality of holes formed therein for aligning with said passageway and including at least two outlets formed therein for aligning with said channels respectively, and
- means for rotating said block so as to selectively align said first and said second notches with said first and said second passages respectively.



5,690,283
COFFEE BLENDING AND FLAVORING APPARATUS

Raffael Sandolo, 226 Thayer Pon Rd., Wilton, Conn. 06897
Continuation-in-part of Ser. No. 630,357, Apr. 10, 1996, Pat. No. 5,632,449, which is a continuation-in-part of Ser. No. 437,176, May 8, 1995, Pat. No. 5,603,458. This application Dec. 31, 1996, Ser. No. 775,291
Int. Cl.^{6} B02C *19/12*

U.S. Cl. 241—34 **14 Claims**



10. An apparatus for personalizing and custom blending of different types of coffees comprising:

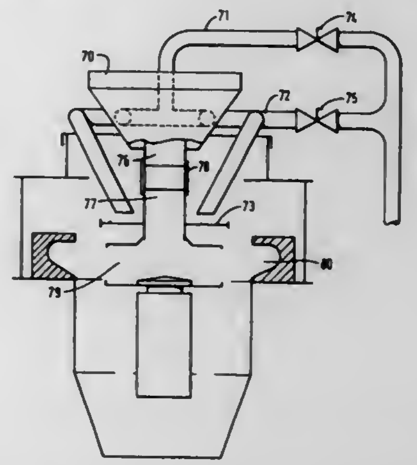
- a plurality of supply hoppers, each defining a supply source for a different coffee;
- each of said hoppers having a controlled discharge opening;
- a mixing receptacle disposed adjacent said hopper discharge opening for receiving the coffee discharged therefrom;
- said mixing receptacle including weighing means for weighing the amount of coffee disposed therein;
- means for mixing the coffee in said mixing receptacle;
- a bagging station and a mixing station operatively connected to said mixing receptacle;
- said mixing receptacle having a controlled outlet in communication with said bagging station and grinding station;
- a valve member associated with said outlet for directing the coffees to either said bagging station or grinding station;
- and said mixing means directing the mixed coffees to said outlet;
- and a central processing unit programmed to sequence the actuation of said controlled discharge openings for controlling the type and amount of coffee discharged from said respective supply hoppers and for weighing and directing the blended coffee to either said bagging station or grinding station in accordance with a predetermined program.

5,690,284
METHOD AND APPARATUS FOR GRINDING

Alastair Scott Murray, Huntly, United Kingdom, assignor to QED International Limited, United Kingdom
Continuation of Ser. No. 923,925, Sep. 1, 1992, abandoned. This application May 20, 1994, Ser. No. 246,564
Claims priority, application United Kingdom, Jan. 9, 1991, 9100456

Int. Cl.^{6} B02C *19/00*

U.S. Cl. 241—41 **10 Claims**



1. Grinding apparatus for reducing sizes of mineral particles entrained in a liquid medium, the apparatus comprising:

- a vertical shaft impactor having:
  - a rotor, said rotor being rotatable about a predetermined substantially vertical axis and having an outer peripheral edge;
  - a first material inlet aligned substantially along said predetermined axis of said rotor for supplying feed material directly to said rotor;
  - an impact bed located radially outwardly of said rotor, said impact bed being spaced from the peripheral edge of said rotor and defining a grinding region therebetween, said impact bed being disposed such that feed material supplied to said rotor from said first inlet is flung outwardly against said impact bed; and
  - a second material inlet for introducing feed material in the form of solid particles in a liquid suspension, said second material inlet being positioned above said grinding region wherein material introduced through said second material inlet is fed substantially vertically into said grinding region without entering said rotor such that said solid particles in a liquid suspension intersect said feed material flung from said rotor at generally right angles thereto.

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5,690,285
LINING ELEMENTS FOR A ROTARY MILL AND MILL EQUIPPED WITH SUCH ELEMENTS

Jean-Marie Brisbois, Dion-le-Mont, Belgium, assignor to Slegten Societe Anonyme, Louvain-La-Nueve, Belgium

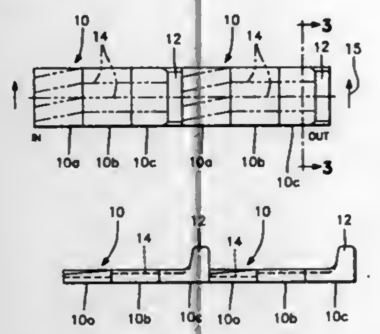
PCT No. PCT/EP94/04266, § 371 Date Oct. 4, 1996, § 102(e) Date Oct. 4, 1996, PCT Pub. No. WO95/17968, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 21, 1994, Ser. No. 666,578

Claims priority, application Belgium, Dec. 29, 1993, 9301481

Int. Cl.⁶ B02C *17/22*

U.S. Cl. 241—172 **5 Claims**



5. A rotary mill comprising:

a shell which is partially filled with grinding media, and

a lining element located on an internal wall of the shell, for protecting the internal wall of the shell from the grinding media, said lining element comprising:

a substantially cylindrical outer surface for placement against said internal wall of the rotary mill;

a substantially cylindrical internal side; and

a nose element having first and second surfaces facing toward respective longitudinal ends of said lining element, said nose element being arranged so as to project radially inwardly from said internal side in such an abrupt manner that said first and second surfaces are generally perpendicular to said internal side and, at most, are only slightly inclined with respect to a diametrical plane;

said nose element having a peak located at a distance from said internal side, said distance being smaller than 10% of a diameter defined by said cylindrical outer surface;

said substantially cylindrical internal side having longitudinal undulations arranged along at least a portion of the length of said lining element, said longitudinal undulations being at an angle with respect to a longitudinal axis of said lining element for at least a section of said portion.

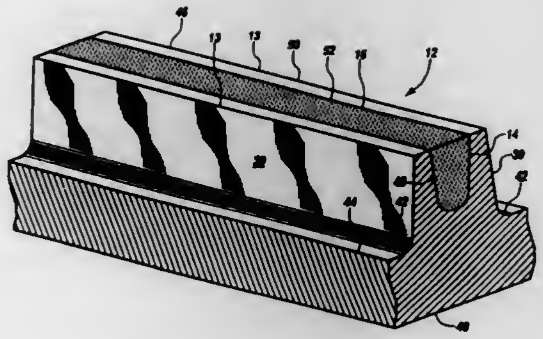
5,690,286
REFINER DISC WITH LOCALIZED SURFACE ROUGHNESS

John Dodd, Arvada, Colo., and Paul Wasikowski, Cudahy, Wis., assignors to Beloit Technologies, Inc., Wilmington, Del.

Filed Sep. 27, 1995, Ser. No. 534,522

Int. Cl.⁶ B02C *7/12*

U.S. Cl. 241—296 **13 Claims**



1. A plate for a refiner for use in refining a flow of wood fiber stock, the plate comprising:

a base member which extends radially about an axis; and

a plurality of refiner bars integrally formed with the base member and extending upwardly from the base member, wherein each bar has two upwardly extending sides and wherein flow channels are defined between spaced bars, and wherein each bar has an uppermost surface, and wherein bar edges are defined where the sides intersect the uppermost surface, and wherein each bar has portions of the bar which extend to the uppermost surface, said portions begin formed of a material having grains of abrasive imbedded therein so that surface portions of the uppermost surface of each bar wear rough, and wherein at least the majority of the two bar sides do not bave grains of abrasive imbedded therein and do not wear rough such that the refiner disk has improved refining action without substantial loss in ease of flow of the stock in the flow channels between the bars, and wherein each bar has two spaced upwardly extending members which define a groove therebetween, and wherein each groove is filled with a material different from material forming the bar members, which is bonded to the bar members such that the material in the groove forms a portion of the uppermost surface.

5,690,287
FISHING REEL WITH ROTATIONAL INDEPENDENCE OF SPOOL AND HANDLE

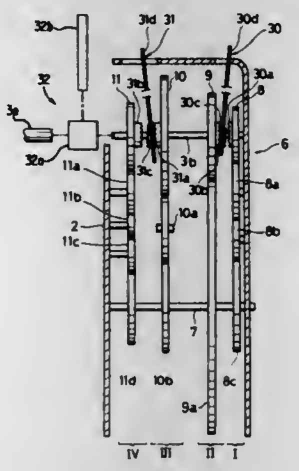
Shigehiko Ono, 1-35 Fujibayashi-cho Takagamine Kita-ku, Kyoto, Japan

Continuation of Ser. No. 298,448, Aug. 29, 1994, abandoned. This application Oct. 30, 1996, Ser. No. 741,318

Claims priority, application Japan, Aug. 31, 1993, 5-216589

Int. Cl.⁶ A01K *89/01*

U.S. Cl. 242—255 **11 Claims**



1. A fishing reel comprising:

a pair of side frames having a spool shaft rotatably supported by said side frames with one end of said spool shaft protruding sidewards from one of said side frames;

a spool carried on said spool shaft between said side frames;

a handle shaft extending from said side frame from which said spool shaft protrudes sidewards, said handle shaft having a handle coupled thereto for applying rotational force to said handle shaft;

means for rotating said spool in a predetermined direction in response to rotation of said handle regardless of a rotational direction of said handle, said means for rotating being provided between said spool shaft and said handle shaft, said means for rotating having at least two groups of gears;

a first group of gears of said at least two groups of gears having an even number of gears and a first direction dependent coupling means for unidirectionally transmitting rotational force from said handle shaft to said spool shaft via said gears of said first group when said handle shaft is rotated in a first direction and transmitting no rotational force when said handle shaft is rotated in a second direction; and

a second group of gears of said at least two groups of gears having an odd number of gears and a second direction dependent coupling means for unidirectionally transmitting rotational force from said handle shaft to said spool shaft via said gears of said second group when said handle shaft is rotated in said second direction and transmitting no rotational force when said handle shaft is rotated in said first direction.

5,690,288
DUAL BEARING TYPE FISHING REEL HAVING A ONE-WAY CLUTCH MOUNTED RADIALLY OUTWARD OF THE SPOOL

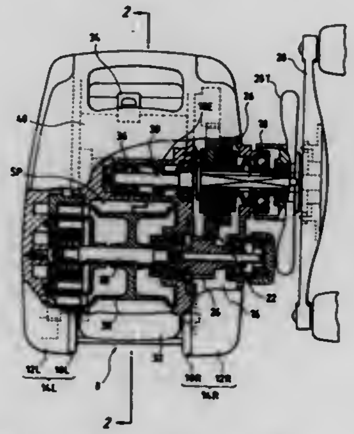
Nobuyuki Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Jul. 29, 1996, Ser. No. 687,913

Claims priority, application Japan, Aug. 8, 1995, 7-222496

Int. Cl.⁶ A01K *89/033*

U.S. Cl. 242—268 **7 Claims**



1. A dual bearing fishing reel comprising:

a spool supported for rotation by a reel body and located between first and second side plates;

a handle connected to a drive shaft for rotating said spool through a drive mechanism to wind a fishline onto said spool, said handle being located opposite from the second side plate with respect to the first side plate;

a one way clutch for preventing a reverse rotation of said handle opposite to a fishline winding direction when said spool is rotated; and

a supporting portion disposed in a space that is external to and radially outward from said spool, that is opposite from said handle with respect to the first side plate and that is between the first and the second side plate,

wherein said supporting portion defines an internal space enclosed by said supporting portion and isolated from the external space, and

wherein said one way clutch is disposed in the internal space within said supporting portion.

5,690,289
HANDLE MOUNTING STRUCTURE IN FISHING REEL

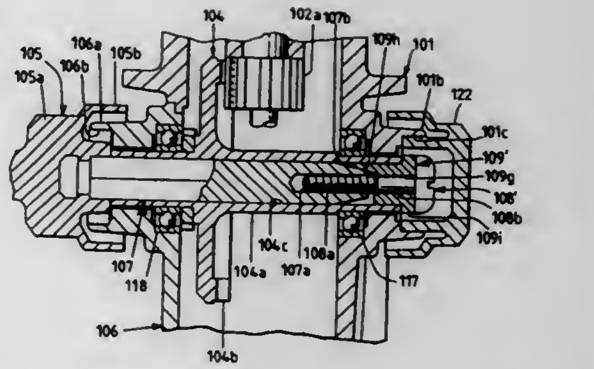
Shinji Takeuchi, and Eiji Shinohara, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 301,885, Sep. 7, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 635,215

Claims priority, application Japan, Sep. 8, 1993, 5-053615 U; Sep. 24, 1993, 5-056550 U; Sep. 24, 1993, 5-056551 U; Oct. 28, 1993, 5-062768 U

Int. Cl.⁶ A01K *89/06*

U.S. Cl. 242—282 **11 Claims**



1. A handle mounting structure in which a handle shaft is fittingly inserted into a through-hole of a cylindrical drive shaft longitudinally along a shaft axis, and a threaded member is threadingly engaged with the handle shaft so that the handle shaft is fixed to the cylindrical drive shaft, said structure comprising:

a first portion defining at least one inclined smooth surface circumscribing said shaft axis and uniformly tapered toward said shaft axis, said first portion translating longitudinally when said threaded member and said handle shaft are contractingly threaded; and

a second portion defining an engaging surface, said engaging surface being forcibly brought into pressure-contact with said at least one inclined smooth surface when said threaded member and said handle shaft are contractingly threaded, said second portion being deformed radially outwardly as a consequence of said pressure-contact, and said second portion being radially interposed between said handle shaft and said cylindrical drive shaft,

wherein said handle shaft evinces a polygonal outer surface and said through-hole of said cylindrical drive shaft evinces a polygonal inner surface, said handle shaft being rotationally interconnected with said cylindrical drive shaft through a mating of said polygonal outer surface and said polygonal inner surface, wherein said second portion extends longitudinally along only one planar surface of said polygonal inner surface.

5,690,290
FISHING REEL HANDLE FIXING STRUCTURE

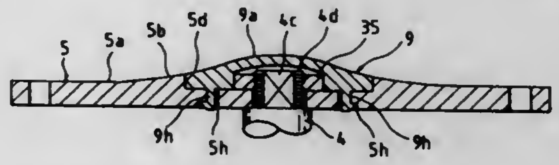
Shinichi Asano; Shigeo Mimura, and Takeo Miyazaki, all of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 344,679, Nov. 21, 1994, abandoned. This application Jan. 27, 1997, Ser. No. 789,818

Claims priority, application Japan, Nov. 24, 1993, 5-067306 U; Sep. 28, 1994, 6-233555

Int. Cl.⁶ A01K *89/01;89/015*

U.S. Cl. 242—283 **7 Claims**



1. A handle fixing structure for fixing a handle onto a drive shaft of a fishing reel, said structure comprising:

a threaded member for threadingly fixing said handle onto an end of said drive shaft;

a loosening preventive member mounted onto an upper surface of said handle for preventing said threaded member from loosening; and

at least one elastically deformable member for fixing said loosening preventive member onto said handle;

wherein said at least one elastically deformable member is homogeneously formed as a unitary body with said loosening preventive member.

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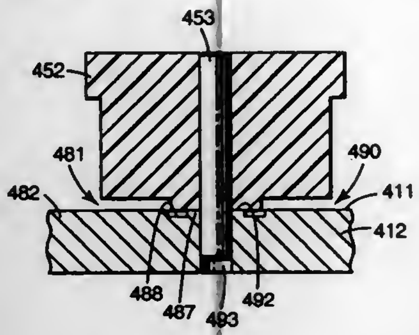
5,690,291
DATA STORAGE DEVICE WITH BASEPLATE FOR MODIFIED THRUST SURFACE DRAG

Mary R. Hable, Stillwater, Minn.; James C. Anderson, Oxnard, Calif., and Kam W. Law, Woodbury, Minn., assignors to Imation Corp., Oakdale, Minn.

Filed May 7, 1996, Ser. No. 646,413

Int. Cl.^{6} G11B *23/087*

U.S. Cl. 242—340 **14 Claims**



1. A data storage device, comprising:
a baseplate with an upper surface and a lower surface;
at least one rotating member mounted for rotation on a shaft affixed to the baseplate, wherein the rotating member has a lower surface adjacent the upper surface of the baseplate; and
at least one interface area on the upper surface of the baseplate and generally beneath the lower surface of the at least one rotating member, the interface area comprising:
a substantially annular land portion adjacent a thrust bearing surface of the at least one rotating member, wherein the land portion has a diameter sufficient to provide support for the rotating member, and a substantially annular depressed portion circumferentially arranged about the periphery of the land portion and wherein the diameter of the land portion is less than about 50% of a diameter of the rotating member.

5,690,292
TAPE CARTRIDGE AND METHOD FOR MANFACTURING SAME

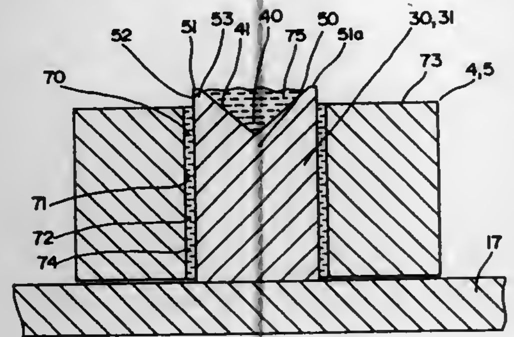
Koichi Sano, Sagamihara, Japan, assignor to Imation Corp., Oakdale, Minn.

Filed Jun. 27, 1996, Ser. No. 672,151

Claims priority, application Japan, Jun. 28, 1995, 7-161833

Int. Cl.^{6} G11B *23/087*

U.S. Cl. 242—340 **16 Claims**



1. A tape cartridge having a supply-side tape reel around which a tape is wound and a winding-side tape reel both rotatably mounted to a base, at least one pin having a first end attached to the base and a second end, at least one roller having a through-hole rotatably engaged with the pin, and grease interposed between the at least one pin and the through-hole, the at least one pin including a recess formed proximate the second end opening in an axial direction of the pin, the recess having a volume greater than a volume of excess grease accumulated on an end portion of the pin during mounting of the roller on the pin.

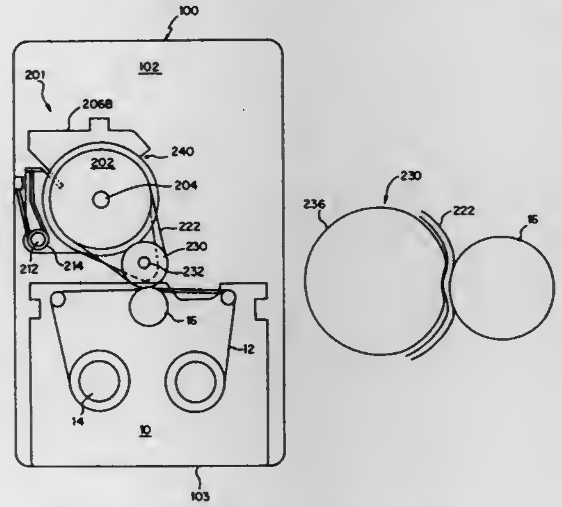
5,690,293
BELT DRIVE MECHANISM FOR A TAPE DRIVE

Robert H. Peirce, Del Mar, and Hans Graafmans, Huntington Beach, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 13, 1995, Ser. No. 555,645

Int. Cl.^{6} G11B *15/32;5/008*

U.S. Cl. 242—354 **17 Claims**



1. A drive mechanism for driving a tape comprising:
a driver assembly comprising:
a driving pulley;
an idler pulley in substantially fixed, spaced apart spacial relationship to said driving pulley; and
a driving belt around said driving pulley and said idler pulley in driven contact with said driving pulley and in driving contact with said idler pulley;
a cartridge assembly, separate from said driver assembly, comprising:
a cartridge roller; winding means adapted to carry recording tape wound thereon; and
recording tape wound on said winding means and in effective rolling contact with said cartridge roller; and
means to engage said driver assembly with said cartridge assembly, whereby juxtaposing said cartridge roller, said driving belt, and said idler pulley in mutual contact;
wherein, when engaged, said driving belt drives said cartridge roller and said idler pulley;
wherein, when engaged, said cartridge roller is substantially coplanar with said driving belt; and
wherein said recording tape is driven in juxtaposition to said cartridge roller.

5,690,294
RECORDING AND/OR REPRODUCING APPARATUS HAVING A SLIDABLE CHASSIS

Junji Kobayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

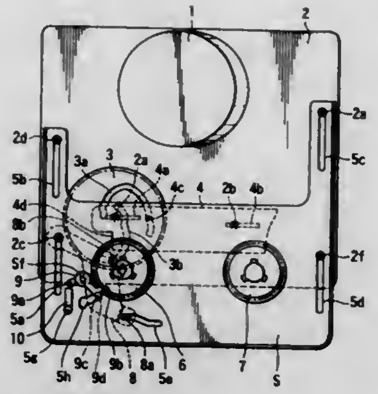
Filed Sep. 19, 1996, Ser. No. 716,031

Claims priority, application Japan, Sep. 29, 1995, 7-253540

Int. Cl.^{6} G11B *15/00*

U.S. Cl. 242—355.1 **6 Claims**

1. A recording and/or reproducing apparatus having a rotary drum, comprising:
(a) a first chassis on which said rotary drum is provided;



(b) a second chassis which is supported for sliding movement on said first chassis within a predetermined stroke;
(c) a reel mount provided on said second chassis;
(d) a brake member provided on said second chassis and capable of engaging with said reel mount, a projecting portion of said brake member projecting toward said first chassis through said second chassis;
(e) a driving member for moving said brake member by coming into abutment with said projecting portion of said brake member; and
(f) a lever turnably provided on said first chassis and having a pin at its one end, said pin being engaged with a slot, which is provided in said second chassis, so that said lever slides said second chassis, said lever being operated to overlap said projecting portion of said brake member when said second chassis projects from said first chassis.

5,690,295
MASS BODY DRIVE FOR A ROTATIONAL TENSIONING DEVICE

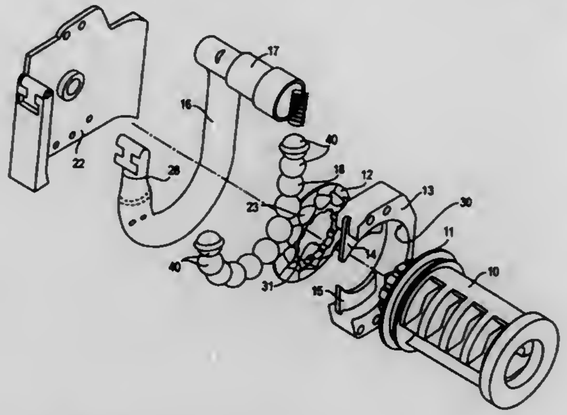
Matthias Steinberg, Elsmhorn, and Jörg Barckmann, Tornesch-Ahrenlohe, both of Germany, assignors to Autoliv Development AB, Vargarda, Sweden

Filed Aug. 2, 1996, Ser. No. 691,266

Claims priority, application Germany, Aug. 2, 1995, 195 28 385.6

Int. Cl.^{6} B60R *22/46*

U.S. Cl. 242—374 **5 Claims**



1. A rotational tensioning device for a safety belt of a motor vehicle, said tensioning device comprising:
a reeling device with reeling shaft;
a drive wheel connected to said reeling shaft, said drive wheel having a circumference with semi-spherical recesses;
a channel, having a first and a second end, positioned in a plane parallel to said drive wheel and extending at least over a portion of said circumference of said drive wheel;
spherical mass bodies contained in said channel;
a gas generator connected to said first end of said channel, wherein upon activation of said gas generator a gas is released into said channel for accelerating said spherical mass bodies in said channel and driving said spherical mass bodies through said channel into said semi-spherical recesses to thereby drive said drive wheel and said reeling shaft in a direction of winding the safety belt;
a drive piston, for driving said spherical mass bodies, comprised of two of said spherical mass bodies fixedly connected to one another to form a first twin ball and positioned within said first end of said channel.

5,690,296
MACHINE AND METHOD FOR THE FORMATION OF CORELESS LOGS OF WEB MATERIAL

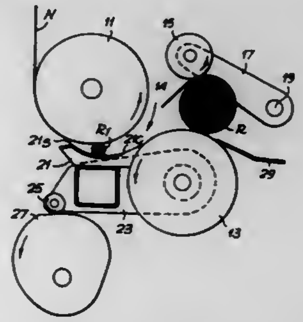
Guglielmo Biagiotti, Capannori, Italy, assignor to Fabio Perini, S.p.A., Lucca, Italy

Division of Ser. No. 90,519, Jul. 13, 1993. This application Sep. 5, 1995, Ser. No. 523,280

Claims priority, application Italy, Jul. 21, 1992, FI/92A 149; Feb. 15, 1993, FI/93A 22

Int. Cl.^{6} B65H *18/20;19/26;19/30*

U.S. Cl. 242—521 **49 Claims**



1. A surface rewinding machine for producing logs of web material without central winding cores, including a first winder roller on which the web material is carried and a second winder roller defining, along with the first winder roller, a nip through which the web material passes, said machine further comprising a member movable relative to the first winder roller, which mobile member is cyclically moved toward the surface of said first winder roller in order to retard the web material between said mobile member and said surface of the first winder roller, thereby causing the leading edge of the web material to curl and to start winding on itself.

5,690,297
TURRET ASSEMBLY

Kevin Benson McNeil, Maineville, Ohio, and James Robert Johnson, Lawrenceburg, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 2, 1995, Ser. No. 459,922

Int. Cl.^{6} B65H *19/28*

U.S. Cl. 242—533.4 **19 Claims**

1. A web winding apparatus comprising:
a turret winder having a rotatably driven turret assembly supported for rotation about a turret assembly central axis, the turret assembly supporting a plurality of rotatably driven mandrels for engaging cores upon which a paper web is wound, each mandrel extending from a first mandrel end to a second mandrel end and having a mandrel axis generally parallel to the turret assembly central axis, each mandrel supported on the turret assembly for independent rotation of the mandrel about its mandrel axis, and each mandrel driven in a closed mandrel path about the turret assembly central axis, the closed mandrel path having a predetermined core

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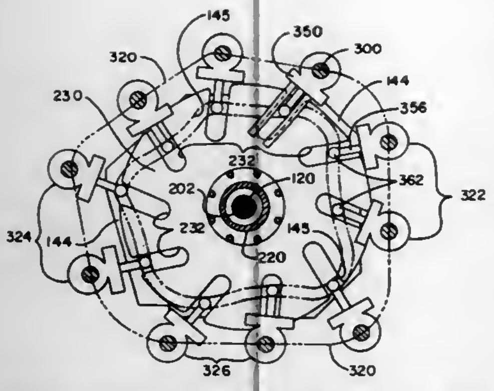


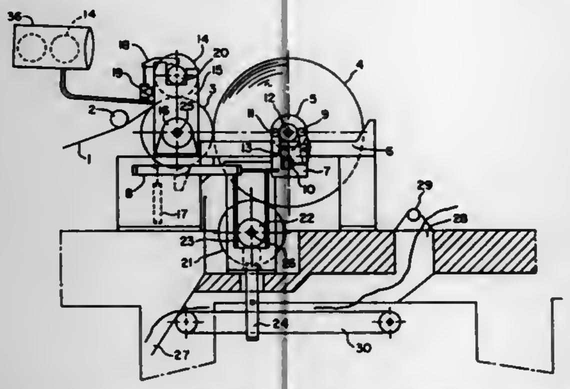
loading segment, a predetermined web winding segment, and a predetermined core stripping segment;

wherein the distance between a mandrel and the turret assembly central axis varies along the core loading segment of the closed mandrel path.

5,690,298
POPE REEL FOR A PAPER MACHINE

Kari Rück, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

Continuation of Ser. No. 295,282, Aug. 24, 1994, abandoned.
This application Jan. 30, 1996, Ser. No. 594,382
Claims priority, application Germany, Jan. 24, 1994, 44 01 959.9
Int. Cl.^{6} B65H *18/26;18/16;19/22*
U.S. Cl. 242—542.3 **5 Claims**



1. A Pope reel for winding a running paper web into a paper roll in a paper machine, said paper machine having two sides, comprising:

a magazine for holding a plurality of empty winding drums, each of said empty winding drums serving as a winding core;

a webwide first pressing roll onto which runs the web to be wound, said web being wrappable around a portion of the circumference of the pressing roll;

a pair of swivel levers for picking up an empty winding drum and transferring the drum to a winding start position on the first pressing roll for commencement of a winding of said web onto said drum;

a guideway which supports said empty winding drum during the winding operation and along which migrates the winding drum having the paper web being wound thereon, said winding drum being movable along the guideway to a delivery position for a finished paper roll;

a slide arranged on each side of the paper machine, each of said slides being engageable with the winding drum so as to force the paper roll against the first pressing roll; and

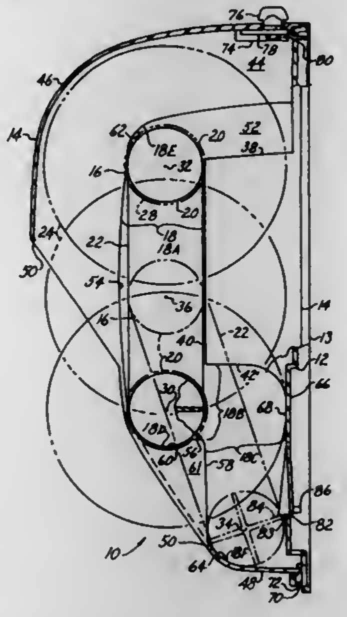
a second pressing roll, said second pressing roll being powered, and being situated generally beneath said guideway; said second pressing roll further being forceable against the paper roll;

means for forcing said second pressing roll against the paper roll; wherein said first pressing roll, second pressing roll and said paper roll are configured and juxtaposed such that each of the respective first and second pressing rolls maintains constant contact with said paper roll during substantially the entire winding of the web on the winding drum.

5,690,299
DISPENSER FOR FEEDING SHEET MATERIAL FROM SEQUENTIAL ROLLS

Patrick C. Perrin, Rancho Palos Verdes, and Jimmie L. Whittington, deceased, late of Diamond Bar, both of Calif., by Eleanor Whittington, Legal Representative, assignors to Perrin Manufacturing, City of Industry, Calif.

Filed Nov. 12, 1996, Ser. No. 746,462
Int. Cl.^{6} B65H *19/10*
U.S. Cl. 342—560 **13 Claims**



1. Apparatus for dispensing rolled sheet material, comprising:

(a) a base panel for mounting to a supporting structure and defining a parallel-spaced pair of vertically oriented coplanar panel guide surfaces;

(b) a pair of parallel-spaced base track members rigidly projecting from the base pavel, each base track member having first and second guide surface segments, each first guide surface segment extending approximately parallel to a corresponding panel guide surface, each second guide surface being inclined relative to the first guide surface and forming a continuation of the corresponding first guide surface;

(c) a cover unit openably connectable to the base panel and having latch means for holding the cover unit in a closed position relative to the base panel, the cover unit having a front wall portion and respective side wall portions;

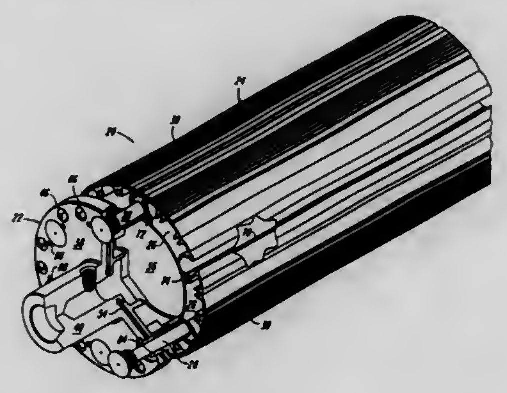
(d) a pair of parallel spaced cover track members rigidly extending in facing relation relative to corresponding ones of the side wall portions, each cover track member having a first guide surface segment, a second guide surface segment, and a transition segment wherein, when the cover unit is in the closed position, the first guide surface segments of the respective base and cover track segments extend in approximately uniformly spaced relation, the second guide surface segments of the respective base and cover track segments extend in approximately uniformly spaced relation, and the transition segments extend in concave relation between proximal ends of the first and second guide surface segments of the cover track members thereby to form respective L-shaped track passages; and

(e) a mandrel unit having a parallel-spaced pair of mandrel portions and a bridge portion rigidly connecting the mandrel portions, the mandrel unit being locatable between the base panel and the cover unit with opposite ends of each mandrel portion guidable within respective ones of the track passages in the closed position of the cover unit, one of the mandrel portions being movable between a first dispensing position to an expended position, the other of the mandrel portions being correspondingly moved from a reserve position to a second dispensing position.

5,690,300
INTERLOCKED CORE SHAFT

Don Iannucci, Jamaica Plain, Mass., assignor to Double E. Company, Inc.

Filed Aug. 9, 1996, Ser. No. 694,767
Int. Cl.^{6} B65H *75/22;75/24*
U.S. Cl. 242—571.2 **19 Claims**



1. A core comprising:

a plurality of adjoining core lengths together forming a hollow core tube having an inner diameter and an outer diameter, each core length having an inner side, an outer side, a left side, and a right side; wherein the inner side, the outer side, the left side, and the right side of each core length form a channel extending a length of each core length; and wherein a portion of the left side of each core length fits into a portion of the right side of the adjoining core length; and

a plurality of pins, each of the plurality of pins holding together two adjacent core lengths.

5,690,301
STUD MOUNTED REEL SUPPORT SYSTEM

Ron Shelton, 810 Spruce Hill La., Ortonville, Mich. 48462, and Max Van Keuren, 7972 Perry Lake Rd., Clarkston, Mich. 48348

Filed Aug. 12, 1996, Ser. No. 689,725
Int. Cl.^{6} B65H *75/18;49/00;49/18*
U.S. Cl. 242—597.8 **9 Claims**

1. A Stud Mounted Reel Support System for removably mounting a dispensing reel on a vertically-oriented wall construction stud having first edge and a second edge, said dispensing reel being of the type having a central passage therein, said support system comprising:

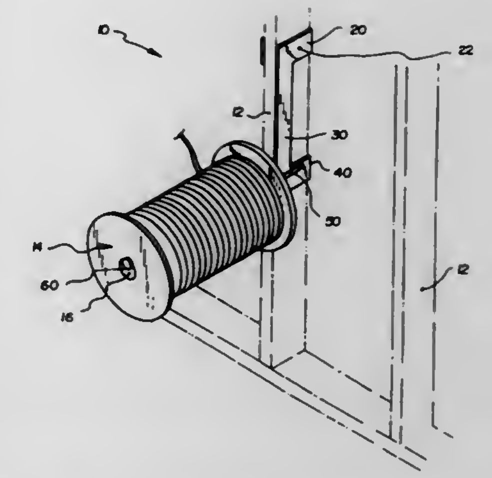
an upper cuff for removably snugly mounting about the first edge of a wall construction stud;

a connecting bar secured at one end to the upper cuff;

a lower cuff for removably snugly mounting about the second edge of the wall construction stud below the position of the upper cuff, said lower cuff being secured to the end of the connecting bar opposite of the upper cuff; and

a horizontal cantilever arm secured to the lower cuff for projecting away from the second edge of said stud such that inserting said cantilever arm through the center passage of a dispensing reel rotatably mounts said dispensing reel on said wall construction stud;

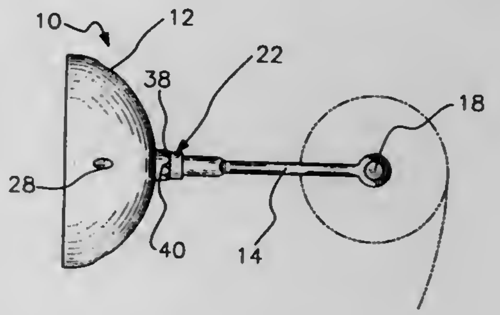
wherein the horizontal cantilever arm includes a flange at the end opposite of the lower cuff to retain the dispensing reel in position on said cantilever arm during rotation of said dispensing reel.



5,690,302
ROTATABLE PAPER ROLL HOLDER

Curtis L. Batts, 407 S. Alexander Ave., Duncanville, Tex. 75116

Continuation of Ser. No. 409,430, Mar. 24, 1995, Pat. No. 5,588,615. This application Oct. 2, 1996, Ser. No. 725,290
Int. Cl.^{6} B65H *19/10*
U.S. Cl. 242—598.3 **7 Claims**



1. A rotatable paper roll holder comprising:

a mounting means for securing to a support surface;

a yoke including spaced lateral yoke arms;

a spindle positioned between the lateral yoke arms of the yoke;

coupling means interposed between the mounting means and the yoke for supporting the yoke relative to the mounting means and permitting selective rotation of the yoke about an axis directed through the mounting means, said axis being orthogonally disposed relative to the a longitudinal axis of the spindle,

wherein the mounting means includes a hollow interior and an axle aperture directed therethrough in communication with said hollow interior, and

wherein the coupling means includes a first annular detent means positioned about said aperture, an axle projecting from the yoke and extending through said axle aperture and into the hollow interior of the mounting means, said axle terminating within said hollow interior in an end cap, second annular detent means on said axle, and a spring interposed between the end cap and an interior surface of the mounting means for biasing said second detent means into engagement with said first detent means.

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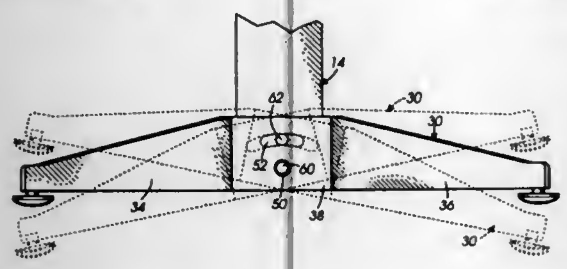
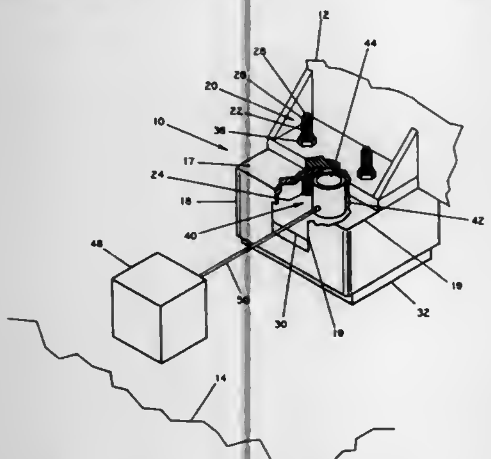
5,690,303
SELF-STABILIZING BASE FOR A TABLE
Henry Winters, Columbia, S.C., assignor to Winters-Gresham Partnership, Columbia, S.C.
Filed Jun. 24, 1996, Ser. No. 669,626
Int. Cl.^{6} F16M *11/24*
U.S. Cl. 248—188.3 **18 Claims**



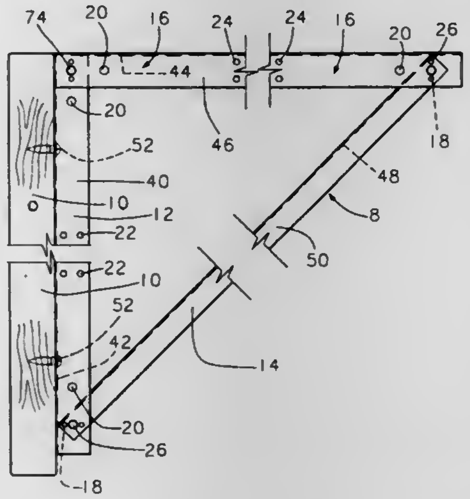
1. A base for supporting an object on an uneven floor, said base comprising:
- a central support having a first side and an opposing second side, said second side having a face;
- a first leg assembly attached to said first side;
- a second leg assembly including a first leg, a second leg and a section therebetween for connecting said first leg to said second leg, said section engaging said face of said central support;
- means for rotatably attaching said section of said second leg assembly to said face of said central support so that said second leg assembly rotates with respect to said central support; and
- means carried between said section and said face for resisting rotation of said second leg assembly with respect to said central support.

5,690,304
ADJUSTABLE MOUNTING SYSTEM
Jerry D. Folkens, DuPage County, Ill., assignor to Vibro/Dynamics Corp., Broadview, Ill.
Filed Apr. 18, 1996, Ser. No. 634,435
Int. Cl.^{6} F16M *11/24*
U.S. Cl. 248—188.4 **8 Claims**



1. In an adjustable mounting system, comprising (a) a bearing member, (b) a compressible resilient member disposed in supporting relationship with said bearing member, (c) a supporting member having a planar surface and disposed above and spaced from said bearing member, and (d) an adjustable member having a portion intermediate said bearing member and said supporting member and maintaining said bearing member in spaced relationship with said supporting member; the improvement comprising: at least one fluidic cylinder adaptable for connection and disconnection to a fluid source means, said fluidic cylinder being portable for interposition between said bearing member and said supporting member and extendable to spatially adjust said supporting member in a direction away from said bearing member and for subsequent removal after said adjustment without reducing deflection of said resilient member; and an opening between said bearing member and said supporting member of sufficient size to accommodate said fluidic cylinder.

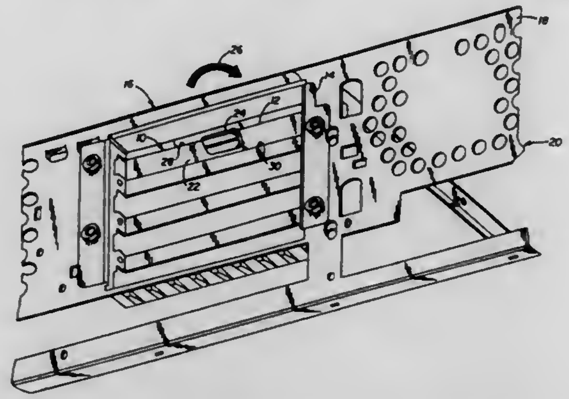
5,690,305
BRACKET FOR POSITIONING SKIRTING ON A MANUFACTURED BUILDING
Kristine M. Perkins, 4260 McConnell Blvd., Culver City, Calif. 90066
Filed Jan. 23, 1996, Ser. No. 590,115
Int. Cl.^{6} F16M *11/00*
U.S. Cl. 248—200 **13 Claims**



1. A bracket for attaching to the lower part of a building and said bracket can be assembled at a construction site and employed for attaching to said building as a first object and for receiving a second object and comprising:

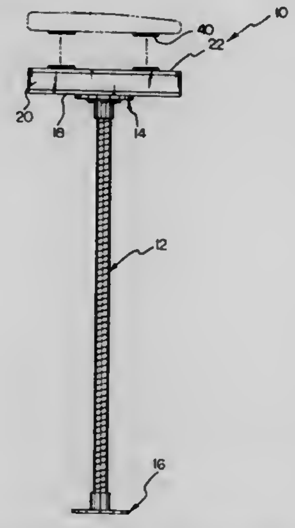
a. a vertical member;
b. a diagonal support member;
c. a first uniting means for joining together said vertical member and said diagonal support member;
d. said vertical member extending from said diagonal support to its upper end being juxtapositioned to said building;
e. a facing member for receiving an attaching means to attach said facing member to said second object;
f. said facing member being capable of receiving nails and screws;
g. said facing member being capable of being sized to a desirable length at said construction site;
h. a second uniting means for joining together said vertical member and said facing member;
i. a means to assist in attaching said vertical member to said first object;
j. a means to assist in attaching said diagonal support member to said first object;
k. horizontal upper member;
l. a third uniting means for joining together said vertical member and said horizontal upper member; and
m. a fourth means for joining together said diagonal support member and said horizontal upper member.

5,690,306
FILLER BRACKET HAVING IMPROVED ELECTROMAGNETIC SHIELDING
Arlen L. Roesner, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 14, 1996, Ser. No. 601,637
Int. Cl.^{6} H05K *5/00*
U.S. Cl. 248—222.52 **17 Claims**



1. A filler bracket for closing off an opening in a panel, the panel having an external surface and an internal surface, the opening having two opposed sides, comprising:
- a cover having a front side and a back side; and
- a clamp rotatably mounted to the cover, said clamp including a panel engaging member for engaging the opening in the panel, said clamp drawing said cover against the panel when said clamp is rotated from a disengaged position to an engaged position.

5,690,307
VEHICLE ACCESSORY HOLDER WITH A GOOSENECK SHAFT
William Edmund Joyce, 6057 Dunrobin, Lakewood, Calif. 90713
Filed Feb. 22, 1996, Ser. No. 605,720
Int. Cl.^{6} E04G *3/00*
U.S. Cl. 248—274.1 **1 Claim**



1. A new and improved vehicle accessory holder with gooseneck shaft adapted for use in association with a vehicle having a passenger cab with a floor board and at least one accessory item, the apparatus comprising, in combination:
- a gooseneck shaft formed in an elongated generally cylindrical configuration with an upper end, a lower end and a central extent therebetween, the upper and lower ends of the shaft being solid, the central extent being formed as a plurality of contiguously formed coils arranged in a loop orientation, the gooseneck shaft being semirigid and flexible to permit maneuvering of the shaft to various locations within the cab of a vehicle;
- upper and lower mounting brackets each including a cylindrical coupling member and a circular shaped base member with a plurality of bolt holes, the lower mounting bracket adapted to be coupled to the floor board of a vehicle with a plurality of bolts, the lower end of the gooseneck shaft being coupled within the lower mounting bracket, the upper bracket being coupled to the upper end of the gooseneck shaft;
- a lower semirigid shock absorbing plate formed in a planar generally rectangular configuration with three centrally positioned bolt holes, the plate having an upper surface including cylindrical bolt supports with internal bolt threads, the bolt supports being positioned around the bolt holes, three bolts coupling the lower plate to the upper mounting bracket;
- a central semirigid shock absorbing plate fabricated of elastomeric material and formed in a planar generally rectangular configuration with a greater thickness than the lower semirigid plate, the central semirigid plate having a plurality of centrally positioned bolt holes extending therethrough, the central plate being positioned upon the upper surface of the lower plate such that the bolt supports thereof extend through the central plate;
- a rigid upper mounting plate fabricated of plastic and formed in a planar generally rectangular configuration with an upper surface and a lower surface, a plurality of bolts being positioned through the lower and central semirigid plates and being coupled within the lower surface of the rigid upper mounting plate, the plates being coupled together to permit shock absorption;
- a plurality of hook and loop coupling strips, two strips being adhesively coupled to the upper surface of the rigid mounting plate, each accessory item including two strips being adhesively coupled thereto, in an operative orientation an accessory being coupled upon the upper surface of the rigid mounting plate with the hook and loop coupling strips being coupled together to retain the accessory upon the upper plate;
- a cup holder formed in a generally rectangular configuration with an upper surface and a lower surface, the upper surface including two generally cylindrical shaped recesses extending therein, in an operative orientation the cup holder having two hook and loop coupling strips affixed to the lower surface and couplable to the upper plate of the apparatus, the cup holder adapted to hold accessories such as beverage cups in an operative orientation; and
- an electronic device holder formed in a generally rectangular configuration with an upper surface and a lower surface, the upper surface including a generally rectangular shaped recess extending therein, the electronic device holder having a first side edge including a semicircular recess positioned therein to permit the passage of an electronic device electrical plug therethrough, in an operative orientation the electronic device holder including hook and loop coupling strips affixed to the lower surface and couplable to the upper rigid plate of the apparatus, the electronic device holder adapted to securely retain a plurality of different types of electronic vehicle accessories.

5,690,308
SEMI-AUTOMATIC SWING OUT CUP HOLDER
Tomislav Jankovic, Etobicoke, Canada, assignor to Manchester Plastics, Inc., Troy, Mich.
Filed Jun. 7, 1995, Ser. No. 476,230
Int. Cl.^{6} A47K *1/08*
U.S. Cl. 248—311.2 **7 Claims**

1. A cup holder apparatus for supporting a first and second containers, said apparatus comprising:
- a housing;

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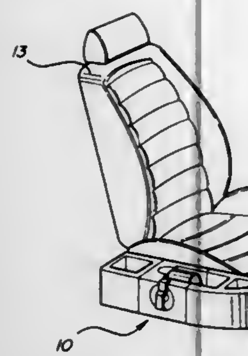
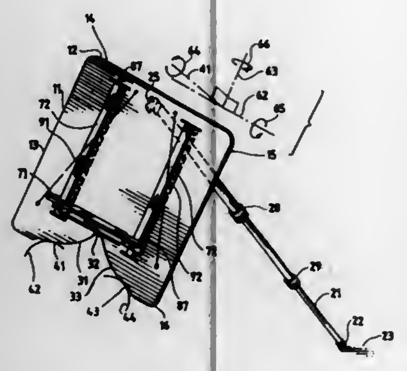


- a first cup holder non-rotatably supported by said housing for supporting the first container;
- a second cup holder pivotally connected to said housing for rotating between a stored position wherein said second cup holder is positioned within said first cup holder thereby preventing either of said first cup holder or second cup holder to receive either of the containers and a use position with the second cup holder extending outwardly from said first cup holder allowing said first and said second cup holders to each receive a beverage container, said second cup holder rotating from a first horizontally collapsed stored position to a second vertically extending use position.

5,690,309
REHABILITATION BOOK HOLDER

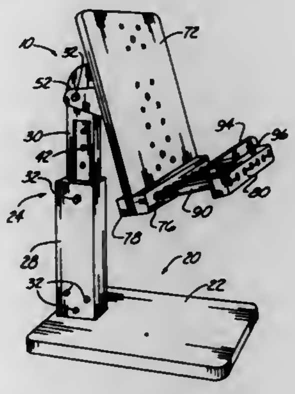
Edward I. Blum, 1713 Lincoln Rd., Champaign, Ill. 61821
Continuation-in-part of Ser. No. 490,868, Jun. 15, 1995, abandoned. This application Oct. 4, 1996, Ser. No. 726,384
Int. Cl.⁶ A47B *97/04*
U.S. Cl. 248—444 **14 Claims**



1. A book holder comprising:
- a work surface, the work surface having a back surface, the work surface and the back surface being bounded by a common periphery, the periphery having a left edge, a top edge, a right edge, and a supportable edge, the work surface having a long axis, a lateral axis, and a normal axis, the supportable edge having a midpoint and having an inflected curvature, the inflected curvature being negative curvature at the midpoint, the inflected curvature inflecting to a left positive curvature portion to the left of the midpoint, and the inflected curvature inflecting to a right positive curvature portion to the right of the midpoint; and
- a leg, the leg having a leg attachment end, a leg foot end, and a leg length, the leg length being the straight line distance between the leg attachment end and the leg foot end, the leg attachment end being attached to the back surface so that the leg can rotate independently about two orthogonal axes, the leg foot end being supportable on an external footing surface.

5,690,310
ADJUSTABLE BOOK STAND

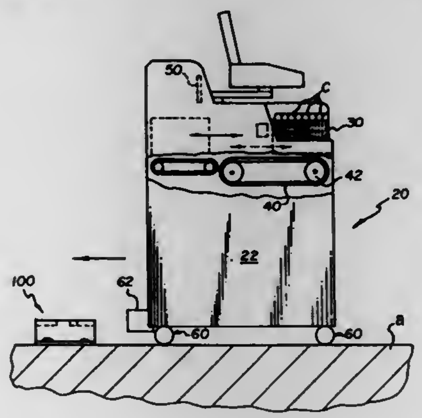
Dwayne Brown, 3408 S. 81st Ave., Omaha, Nebr. 68124
Continuation-in-part of Ser. No. 496,379, Jun. 29, 1995, abandoned. This application Oct. 28, 1996, Ser. No. 738,484
Int. Cl.⁶ A47B *97/04*
U.S. Cl. 248—448 **2 Claims**



1. An adjustable book stand, comprising:
- (a) a base having a horizontal baseplate with a vertical support tower extending therefrom;
- (b) a book holder, pivotally attached to said vertical support tower, having a backpiece and an adjustable width ledge; said adjustable width ledge including a rear ledge secured to the lower edge of said backpiece and having a plurality of apertures formed therethrough, and a front ledge having a plurality of pegs extending therefrom, said pegs slidably positioned within said apertures of said rear ledge whereby said front ledge may be positioned at variable distances from said rear ledge; said front ledge further including a transparent pagekeeper having a plurality of apertures removably secured upon said pegs for engagement with pages of a book placed upon said ledge.

5,690,311
FLOOR CLAMP FOR AN ANALYZER

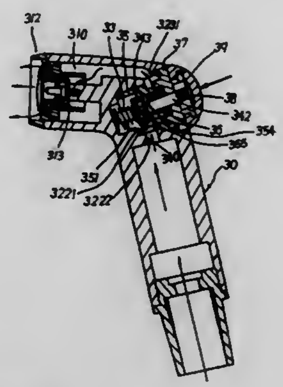
Roger Gaylord Leighton, Rochester, and Michael Erwein Bausch, Livonia, both of N.Y., assignors to Johnson & Johnson Clinical Diagnostic, Rochester, N.Y.
Filed Apr. 2, 1996, Ser. No. 626,552
Int. Cl.⁶ F16M *7/00*
U.S. Cl. 248—681 **8 Claims**



1. In combination, a mounting bracket on an analyzer, and
- a clamp for holding said analyzer in place on a horizontal surface, said claim comprising:
- a frame capable of being bolted to said surface with a portion thereof fixed a predetermined distance away from said surface to accommodate said mounting bracket so that some of said bracket is locatable in contact with said frame and between said fixed portion and said surface;
- an axle mounted on said frame;
- a locking jaw pivotally mounted on said axle;
- an actuator mounted to force said jaw to pivot from an open position effective to receive said mounting bracket, to a locking position effective to lock said bracket against said fixed portion of said frame;
- said fixed portion of said frame further comprising shoulder means defining a mouth extending from an entrance into said frame towards said portion fixed above said horizontal surface, said shoulder means being effective to guide said mounting bracket to said fixed portion of said frame, said shoulder means being angled from said fixed portion outwardly away therefrom towards said entrance at an angle such that said mouth is larger at said entrance than at said fixed portion, so that said mounting bracket can enter said mouth without being precisely aligned; and
- a tongue-and-opening interlock between said frame and said bracket, said tongue being an integral projection from one of said frame portion and said bracket, and said opening being formed in the other of said frame portion and said bracket, said opening being sized to provide sideways constraint against sideways movement of said bracket within said mouth.

5,690,312
FAUCET CONTROL MECHANISM

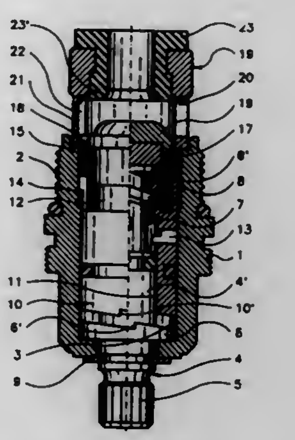
Ho Fa Yang, P.O. Box 63-99, Taichung, Taiwan
Filed Sep. 20, 1996, Ser. No. 717,440
Int. Cl.⁶ F16K *1/00*
U.S. Cl. 251—321 **2 Claims**



1. A faucet comprising:
- a body including an upper portion having a bore formed therein and having an extension provided therein, said upper portion including a rear portion, said body including a vertical portion extended from said rear portion of said upper portion, said rear portion of said body including a first chamber, a second chamber, a third chamber and a fourth chamber formed therein, said body including a projection formed therein and extended inward of said second chamber and including an inlet communicating said second chamber with said vertical portion, said body including an outlet for communicating said rear portion of said body with said bore of said upper portion and for allowing water to flow into said bore,
- a nozzle member secured to said extension and received in said bore of said upper portion of said body,
- a cap secured to said front portion of said upper portion,
- a spring engaged in said first chamber,
- a barrel engaged in said second chamber of said body and including a notch for engaging with said projection and for preventing said barrel from rotating relative to said body, said notch being communicating with said inlet and for allowing water to flow into said barrel, said barrel including a protrusion engaged in said third chamber and having an aperture formed therein, said protrusion including at least one passage formed therein, said barrel including a valve seat formed therein,
- a cover engaged in said fourth chamber and including a ring engaged in said third chamber and engaged with said protrusion of said barrel,
- a valve stem slidably engaged in said barrel and including a front portion for engaging with said spring and including a rear portion for engaging with said aperture of said barrel, said valve stem including a middle portion having a plug secured thereon for engaging with said valve seat of said barrel, and
- a knob secured to said rear portion of said valve stem for being secured to said valve stem and for moving in concert with said valve stem,
- said plug being moved against said spring by said knob for disengaging said plug from said valve seat and for allowing water from said inlet to flow through said valve seat and said passage of said protrusion and said outlet and to flow into said bore.

5,690,313
LOW NOISE WATER-CONTROL VALVE FOR HYDRAULIC AND SANITARY PIPES

Predrag Pesovic, 50 Danteova Str., 11000 Belgrade, Yugoslavia; Namanja Pesovic, 2206 Stafford Ave., Apt. C, Raleigh, N.C. 27607, and Vojin Pesovic, 1188 Bishop St., Honolulu, Hi. 96813
Filed Jun. 28, 1995, Ser. No. 496,730
Claims priority, application Yugoslavia, Jun. 29, 1994, 417/94
Int. Cl.⁶ F16D *7/02;* **F16K** *31/44*
U.S. Cl. 251—81 **20 Claims**



1. A valve (1) for water-sanitary fittings, which does not cause water hammers within an installation comprising
- a piston holder (10) of a piston (16) screwed on a spiral (8) of a spindle (4);
- at least two teeth (14) coupled with corresponding teeth (15) on the valve body (1), and provided on the piston holder (10) in the zone of the spiral (8),
- a first tooth (6') is disposed on the rim (6) of the spindle (4);
- a second tooth (10') disposed on the bottom head surface of the piston holder (10), so that the first tooth (6') and the second tooth (10') are mutually engaged together when the valve is in a fully opened position to provide the two teeth (14) to furnish a slipping motion and sound to prevent overwinding of the valve;
- wherein the spindle (4) is secured in the piston holder (10), in an axial direction, by a key (13) which passes through the piston holder (10) wall;
- two diametrically opposite teeth (18) provided on a rim portion of the piston valve (16), with a shank of the piston valve (16) positioned on the upper part (12) of the piston holder (10) and

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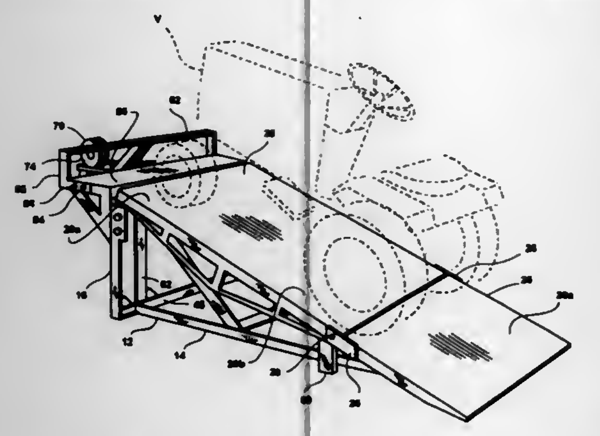
defined by slip and longitudinally guided position in at least one groove (22), provided on the posts (21) of the valve seat holder (19) of the rubber seal (23), wherein said teeth (18) are guided within the at least one groove (22) provided in the valve seat holder (19), when the valve is moved to an open position and said tooth (18) slip within the at least one groove (22) when the piston valve (16) is seated on the seat (23) to prevent overtightening of the piston valve (16) against the seat (23').

5,690,314
WORK PLATFORM

Wilson Williams, 1117 W. Carpenter, Jerseyville, Ill. 62052
Filed Feb. 20, 1996, Ser. No. 603,369
Int. Cl.⁶ E02C *3/00*
U.S. Cl. 254—88 **13 Claims**

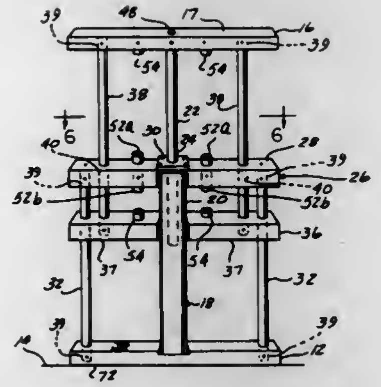


1. A work platform comprising:
(a) a base;
(b) a pair of spaced-apart support members connected to said base;
(c) a platform having first and second ends, said first end being pivotally connected to said pair of spaced-apart support members for movement of said second end thereof between a lowered position and an upraised position;
(d) a ramp pivotally connected to said platform proximate said second end thereof for movement between a first position wherein said ramp extends at an acute angle relative to said base to a second substantially vertically extending position;
(e) lifting means for moving said platform between said lowered position and said upraised position;
(f) a stop assembly connected to said support members, said stop assembly comprising:
  (i) a generally planar member connected to said support members; and
  (ii) a stop frame pivotally connected to said generally planar member for movement between an upright position and a retracted position; and
(g) an extension platform assembly adapted to be pivotally connected to said planar member of said stop assembly when said stop frame is in said retracted position.

5,690,315
COMPACT LIFTER ASSEMBLY

Timothy N. Thomas, 1242 Devonshire, Grosse Pointe Park, Mich. 48230
Filed Mar. 15, 1996, Ser. No. 617,516
Int. Cl.⁶ B66F *3/24*
U.S. Cl. 254—93 R **15 Claims**

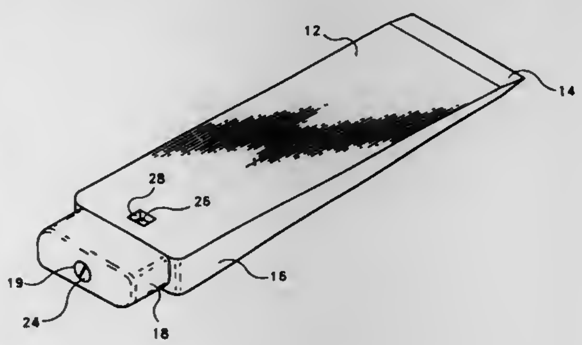
1. A compact lifter assembly comprising:
a base member supportable on a surface;
a top mounting plate spaced from said base member;



an actuator housed in the center of the compact lifter assembly and extending from the base member, said actuator having a movable rod having an opposing end secured to a center of the top mounting plate;
a movable intermediate support plate; and a stationary intermediate support plate, said movable intermediate support plate slidably disposed between said base member and said stationary intermediate support plate, wherein said movable intermediate support plate is rigidly connected to said top mounting plate, and said stationary intermediate support plate fixedly disposed between said movable intermediate support plate and said top mounting plate, wherein said stationary intermediate support plate is rigidly connected to said base member.

5,690,316
TIMBER WEDGE

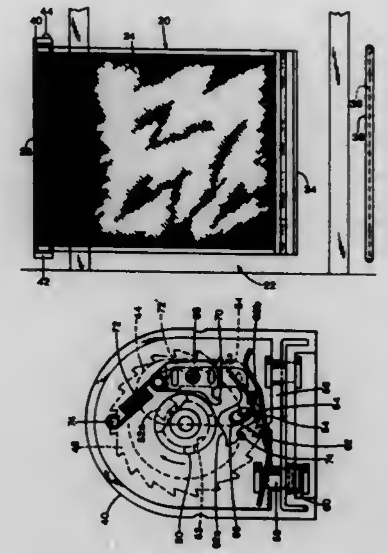
John Madjarac, 118 Chartin Rd., Blue Lake, Calif. 95525
Filed Aug. 6, 1996, Ser. No. 692,702
Int. Cl.⁶ B66F *3/00;* **B27L** *7/00*
U.S. Cl. 254—104 **20 Claims**



1. A wedge apparatus comprising:
an elongated wedge shaped body formed of a non metallic material said wedge shaped body comprising:
  a striking end;
  a second end opposite said striking end;
  an upper surface and a lower surface both of said surfaces extending from said second end to said striking end;
  a pair of opposing side walls of determined dimension diverging from said second end to said striking end defining a calculated rise of said upper surface from said lower surface;
  a strike protection means located upon said striking end of said wedge shaped body whereby said striking end of said body is protected from impact; and
an attachment means for removably mounting said strike protection means upon said striking end of said wedge shaped body.

5,690,317
CONTROL MECHANISM FOR SCREEN ROLLERS

Anders Sandsborg, Sandbackshult 4070, Blomstermale, Sweden, S-384 91
Filed Mar. 4, 1996, Ser. No. 610,283
Claims priority, application Sweden, Sep. 9, 1994, 9403001
Int. Cl.⁶ E04H *17/00*
U.S. Cl. 256—1 **14 Claims**



1. In a spring roller-mounted pull-out screen structure comprising a length of screen material wound on a roller which is journalled between opposite end caps of an elongate casing and which is spring-biased to rotate in a first direction for winding the material onto the roller, the improvement comprising a roller control mechanism including a rotary body connected to the roller for rotation therewith, an arresting body releasably engaged with the rotary body having means for locking the roller against rotation in a second direction unwinding the material from the roller while permitting rotation of the roller in the first direction, manually operable means for moving the arresting body out of engagement with the rotary body enabling the roller to be rotated in the second direction and motion responsive means for automatically re-engaging the arresting body with the rotary body responsive to rotation of the roller in the first direction.

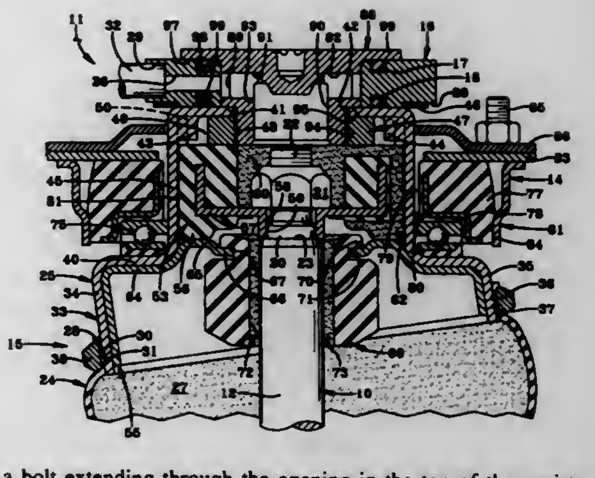
5,690,318

Patent Not Issued For This Number

5,690,319
PNEUMATIC SUSPENSION SYSTEM

Frank Robinson, Centerville; James William Zehnder, II, Huber Heights; William Charles Kruckemeyer, Beaver Creek; Herbert Stanley Summers, III, Trotwood; Jay Michael Shores, Miamisburg, and Stephen Carey Hagwood, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 15, 1996, Ser. No. 632,249
Int. Cl.⁶ F16F *9/04*
U.S. Cl. 267—64.19 **15 Claims**

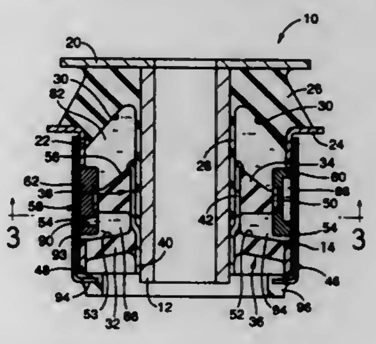
1. A pneumatic suspension system mountable to a vehicle's structure comprising:
an air spring assembly including an air canister having a top with an opening through the top;
a diaphragm forming a chamber with the canister;



a bolt extending through the opening in the top of the canister having an axial bore and a radial bore intersecting the axial bore;
a seal ring captured between the canister top and the bolt having a radial opening communicating with the radial bore of the bolt wherein the air spring, bolt and mount are rotatable in concert relative to the seal ring and wherein a continuously open charging route is maintained through the seal ring and bolt to the chamber.

5,690,320
FLUID-FILLED DAMPING DEVICE HAVING A LARGE SPRING STIFFNESS VALUES IN TWO MUTUALLY PERPENDICULAR DIAMETRIC DIRECTIONS

Ryouji Kanda, Komaki, Japan, assignor to Tokai Rubber Industries, LTD., Japan
Filed Jun. 14, 1996, Ser. No. 664,004
Claims priority, application Japan, Jun. 23, 1995, 7-158089
Int. Cl.⁶ F16M *1/00*
U.S. Cl. 267—140.12 **15 Claims**



1. A fluid-filled damping device comprising:
a center shaft member;
an outer cylindrical member disposed radially outwardly of said center shaft member;
a first and a second elastic end wall each having a generally annular shape, for elastically connecting said center shaft member and said outer cylindrical member at axially opposite end portions thereof, said first elastic end wall having a pair of recesses which are opposed to each other in a first diametric direction of said center shaft member;
a generally annular elastic intermediate wall disposed between said first and second elastic end walls and cooperating with said first elastic end wall to define an annular void between said first elastic end wall and said elastic intermediate wall;
a pair of partition blocks which are disposed between said second elastic end wall and said elastic intermediate wall such that said partition blocks are opposed to each other in a second diametric direction perpendicular to said first diametric direction, said partition blocks cooperating with said sec-

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ond elastic end wall and said elastic intermediate wall to define a first pocket and a second pocket which are opposed to each other in said first diametric direction;

said elastic intermediate wall, said second elastic end wall and said partition blocks being formed as an integral structure separate from said first elastic end wall, said integral structure being secured at an inner circumferential surface thereof to said center shaft member;

a first intermediate sleeve fitted on an outer circumferential surface of said integral structure, said first intermediate sleeve having a pair of windows through which said first and second pockets are open;

said outer cylindrical member being fitted on said first intermediate sleeve such that said outer cylindrical member closes said annular void, thereby cooperating with said first elastic end wall to define a first fluid chamber, and also closes said pair of windows, thereby cooperating with said elastic intermediate wall, said second elastic end wall and said partition blocks to define a second and a third fluid chamber which correspond to said first and second pockets, respectively, said first, second and third fluid chambers being filled with a non-compressible fluid; and

means for defining a first orifice for fluid communication between said first and second fluid chambers and a second orifice for fluid communication between said first and third fluid chambers.

5,690,321

VIBRATION DAMPING SYSTEM FOR VEHICLE

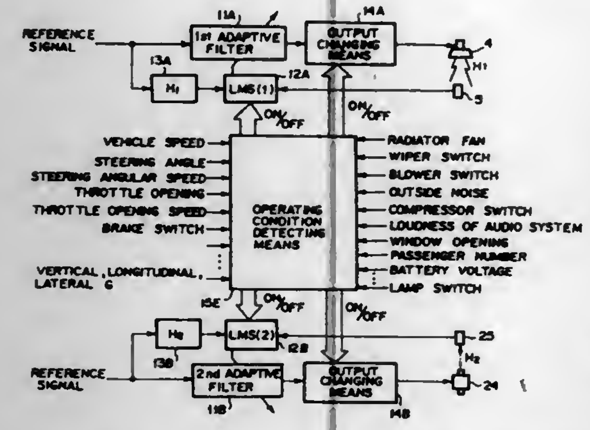
Hirofumi Seni; Norihiko Nakao; Chiaki Santo; Shin Takehara; Naoki Ikeda; Shingo Harada, and Yutaka Tukahara, all of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Continuation of Ser. No. 407,042, Mar. 17, 1995, abandoned, which is a continuation of Ser. No. 123,221, Sep. 20, 1993, abandoned. This application Jul. 1, 1996, Ser. No. 673,473

Claims priority, application Japan, Sep. 29, 1992, 4-284071; Aug. 19, 1993, 5-204850

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 267—140.14 **20 Claims**



1. A vibration damping system for a vehicle comprising a vibrating source, a vibration sensor which detects a vibration transmitted from said vibrating source to a predetermined vibrating element of the vehicle, a vibrator which vibrates the vibrating element, a drive control means for controlling the vibrator, said drive control means including receiving means for receiving a reference signal based on the vibration of the vibrating source and processing means for processing the reference signal by way of a signal from the vibration sensor and generating an output signal to the vibrator, said output signal being different than said reference signal, and a restraining means for suspending control of the vibrator during a time when the level of the vibration of another vibrating element is higher than a predetermined level.

5,690,322

SHOCK AND VIBRATION DAMPING MOUNT

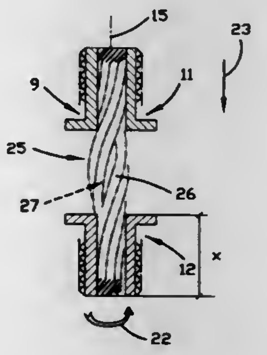
Jean-Yves Hay, Colombes, France, assignor to Socitec Societe Pour le Commerce International et les Echanges Techniques, Sartrouville, France

Continuation of Ser. No. 378,794, Jan. 26, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 767,290

Claims priority, application France, Feb. 3, 1994, 94 01233

Int. Cl.^{6} F16F *1/36*

U.S. Cl. 267—148 **17 Claims**



1. A mount for damping shock or vibration between a first and a second mass, said mount comprising:

a substantially straight cable of a plurality of multiwire strands, having a first and second end, wherein said strands are helically wound with a first pitch around a central core, said central core being extracted before the strands become permanently deformed;

said cable having an axial cavity in free state and at least one portion having a bulged middle part forming a central cavity, said portion being formed with the permanent deformation of the strands, obtained by twisting said strands in the opposite sense of that first pitch and by axial compression in the longitudinal direction, respectively, according to an angle of twist and a compressive force which are adjusted as a function of desired axial and radial stiffness; and

a fixing means, located in an axial extension of said portion of cable, to which ends of cable are fixed and which are suitable for being fastened to the masses.

5,690,323

HOLDING DEVICE FOR PERIPHERALLY HOLDING WORKPIECES OF ANY DESIRED OUTLINE

Hermann Püttmer, Kirchberg/Murr, and Peter Abraham, Ilsfeld, both of Germany, assignors to Götz GmbH, Ludwigsburg, Germany

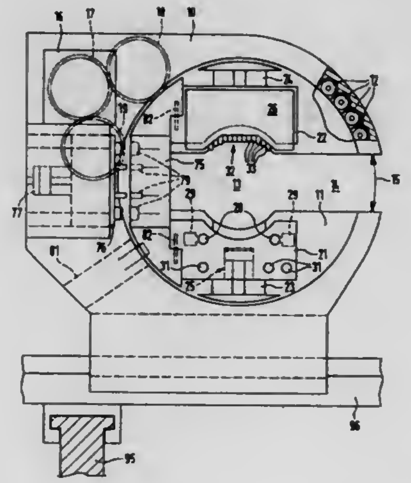
Filed Apr. 16, 1996, Ser. No. 633,187

Claims priority, application Germany, Apr. 29, 1995, 195 15 894.6; Oct. 24, 1995, 195 39 488.7

Int. Cl.^{6} B23Q *3/00*

U.S. Cl. 269—20 **25 Claims**

1. A workpiece holding device for peripherally holding a workpiece of any desired outline, comprising a base body, two shape-adjustable jaws arranged opposite one another on said base body, said jaws including a plurality of plungers able to be moved independently against said workpiece by fluid power operating means and forming gripping surfaces on said jaws and having means for arresting said plungers against said workpiece in a holding position, wherein the base body is rotatably supported in a clasping device for turning about an axis of the clasping device and possesses a connection member for the fluid power operating means of the plungers, and a counter-connection member connected with fluid power lines adapted to be thrust against the connection member and in a stationary state of the base body is able to be coupled with the base body in a certain angular setting, the base body possessing valve means for locking the holding position of the plungers in a clamping state after uncoupling the counter-connection member.



5,690,324

SORTER FOR A STENCIL PRINTER AND PAPER TRANSPORT SPEED CONTROL DEVICE FOR SORTER

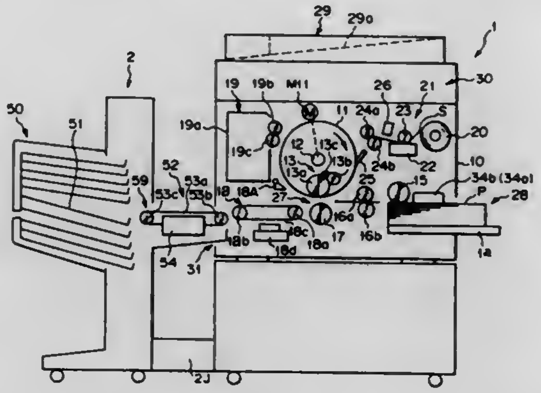
Tomoya Otomo, Sendai; Hiromi Omura, Natori, and Toshiharu Hasegawa, Shiroishi, all of Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi-ken, and Canon Aptex Inc., Mitsukaido, both of Japan

Filed Sep. 14, 1995, Ser. No. 527,921

Claims priority, application Japan, Dec. 14, 1994, 6-310989

Int. Cl.^{6} B65H *39/02*

U.S. Cl. 270—58.02 **29 Claims**



1. A sorter for sorts papers sequentially coming out of an image forming apparatus and each carrying an image thereon, comprising:

a bin unit having a plurality of bins that receives and stacks the papers;

an intermediate transport unit disposed between said bin unit and said image forming apparatus, and which transports the papers to said bin unit at a predetermined transport speed;

a paper size detector which detects a size of the papers in two dimensions;

a memory configured to hold predetermined parameters associated with respective of plural paper sizes; and

a transport speed control unit configured to retrieve from said memory one of said predetermined parameters, as a predetermined parameter, associated with the size of the papers detected by said paper size detector and configured to control said predetermined transport speed based on said predetermined parameter.

5,690,325

PAPER-REVERSING APPARATUS FOR USE IN PROVIDING TWO-SIDED COPIES

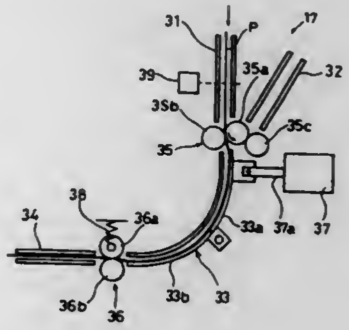
Toshihide Morimoto, Gose, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1996, Ser. No. 628,188

Claims priority, application Japan, Apr. 7, 1995, 7-082974

Int. Cl.^{6} B65H *29/66*

U.S. Cl. 271—65 **12 Claims**



1. A paper-reversing device comprising:

paper-feeding and sending roller means having a plurality of rollers that rotate while being kept in contact with one another, the plurality of rollers being provided with first and second paper-feeding-side positions through which sheets of paper are fed between the rollers and first and second paper-sending-side positions through which sheets of paper are sent out from between the rollers;

paper-feeding guide section for guiding paper to the first paper-feeding-side position;

paper-reversing guide section having a curved section on a paper-feeding and sending end side thereof, which is, an end on the side of the paper-feeding and sending roller means, and a shift section which is one part of the curved section that starts from a mid-point of the curved section and reaches the paper-feeding and sending end, the shift section being arranged so that it can move between (1) a paper-feeding position through which the paper, discharged from the first paper-sending-side position, is fed and (2) a paper-sending position through which the paper, discharged from the paper-feeding and sending end, is guided to the second paper-feeding-side position, and that corresponds to a position at which the curved section forms a straighter shape than a shape the curved section forms when it is positioned at the paper-feeding position;

paper-guide driving means for moving the shift section towards the paper-feeding position as well as towards the paper-sending position; and

paper-holding means for holding the paper that has been fed into the paper-reversing guide section.

5,690,326

PICKING-UP DEVICE FOR PHOTOGRAPHIC FILM SHEETS

Dario Ballerini, Genoa, and Marco Notini, Genova Pegli, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 16, 1996, Ser. No. 633,278

Claims priority, application Italy, May 12, 1995, MI95A0969

Int. Cl.^{6} C08K *5/41;* **B65H** *33/04*

U.S. Cl. 271—90 **12 Claims**

1. A photographic film sheet picking-up device in an apparatus for feeding such film sheets from a station containing at least one sheet to a following station where the film sheets are to be processed one at a time, wherein such film sheet picking-up device comprises suction cups made of rubber containing at least one

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antistatic compound selected within the group consisting of a) a metal salt selected within the group which consists of perfluoroalkylsulfonylmethide compounds and perfluoroalkylsulfonylimide compounds, b) a non-ionic perfluoroalkyl(ene)polyoxy-ethylene type surfactant, c) a modified polyoxyethylenepoly-siloxane type surfactant, and a mixture of such compounds.

5,690,327

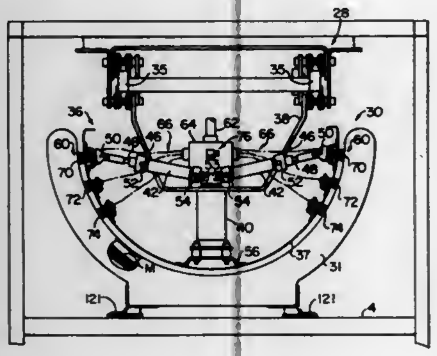
LIFTING SHOE FOR MEDIA HANDLING AND RELATED CASSETTE MEDIA HOLDER

Alan W. Menard; Larwence S. Wolfson, both of Bolton, and Joseph Conlan, Rocky Hill, all of Conn., assignors to Gerber Systems Corporation, South Windsor, Conn.

Division of Ser. No. 148,584, Nov. 8, 1993. This application Feb. 13, 1996, Ser. No. 600,889

Int. Cl.^{6} B65H *3/46*

U.S. Cl. 271—106 **13 Claims**



1. A media sheet handling device comprising:

a frame,

a supply cassette supported by said frame for holding a supply of media sheets, and

a positioning system disposed above said supply cassette for moving media sheets one at a time from said supply cassette to a remote location spaced from said supply cassette,

said positioning system including a carriage movable along a central axis from said supply cassette to said remote location,

a member carried by and depending from said carriage;

a handling shoe in the form of a flexible handling sheet connected to said depending member through lateral side actuator means and vertical actuator means;

said vertical actuator means being connected to said handling sheet to move said handling sheet between an uppermost position and a lowered position relative to said depending member;

said handling sheet having opposite lateral sides disposed laterally on either side of said central axis, said lateral side actuator means being connected to said handling sheet at said opposite lateral sides thereof;

said lateral side actuator means and said vertical actuator means when in a first state of energization causing said handling sheet to assume a first given radius and when in a second state of energization causing said handling sheet to assume a second given radius; and

holding means disposed on said handling sheet for holding a media sheet in engagement with said handling sheet.

5,690,328

DEVICE FOR DELIVERING PRINTED PRODUCTS FROM A FAN ARRANGEMENT

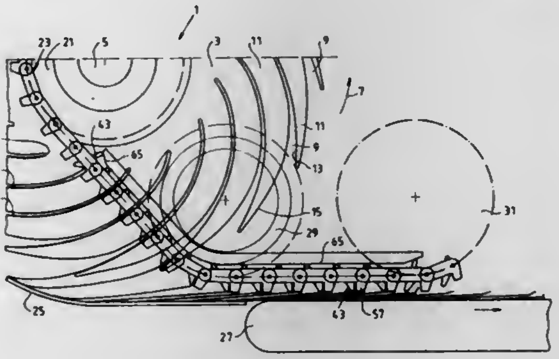
Philippe Herda, Longueil Sainte Marie, and Serge Lanvin, Cires Les Mello, both of France, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris SA, Montataire Cedex, France

Filed Apr. 26, 1996, Ser. No. 638,428

Claims priority, application France, Apr. 26, 1995, 95/04982

Int. Cl.^{6} B65H *29/04*

U.S. Cl. 271—204 **8 Claims**



1. Device for delivering printed products from a fan arrangement for forming a shingled printed-product stream, the device including an endless chain having a revolving path coordinated with the fan arrangement, so that the chain continually pushes, out of pockets of the fan arrangement, printed products received in the pockets, for forming the shingled printed-product stream, comprising:

a holding arrangement for holding the printed products in the pockets, said holding arrangement being formed of grippers disposed on the chain;

said grippers having a pair of jaws movable towards one another for gripping a respective printed product therebetween;

the endless chain having a multiplicity of interconnected chain links, one of said jaws being formed by a respective one of said chain links, and including a lever swivelably mounted in said one of said chain links, the other of said jaws being part of said lever; and

said lever is a double lever, a first arm of said lever forming said other of said jaws for clamping the printed product, and a second arm of said lever being formed with a control surface for actuating said lever.

5,690,329

STACK OF IMAGE RECEIVING SHEETS WITH DETECTION MARK

Willy Van Peteghem, Edegem; Eric Goos, Mortsel, and Jan Zwijsen, Wilrijk, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

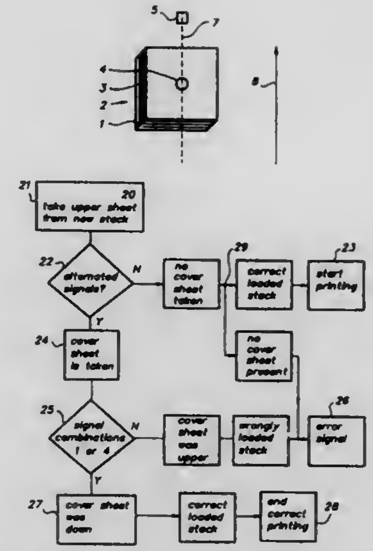
Filed Dec. 22, 1994, Ser. No. 363,280

Claims priority, application European Pat. Off., Jan. 24, 1994, 94200162

Int. Cl.^{6} B65H *7/02*

U.S. Cl. 271—227 **4 Claims**

1. A combination of a processing apparatus, having a sensing means and a control means, and a stack of image receiving sheets, wherein each image receiving sheet comprises on one side of a support an image receiving layer comprising a dye-able resin, and wherein said stack includes a cover sheet protecting the image receiving layer of an outermost image receiving sheet, said cover sheet further comprising a detection mark located at the center of said cover sheet for distinguishing it from said image receiving sheets, the presence of said detection mark being detectable by said sensing means, and converted by said control means into an indication to said processing apparatus that said stack is correctly positioned.



5,690,330

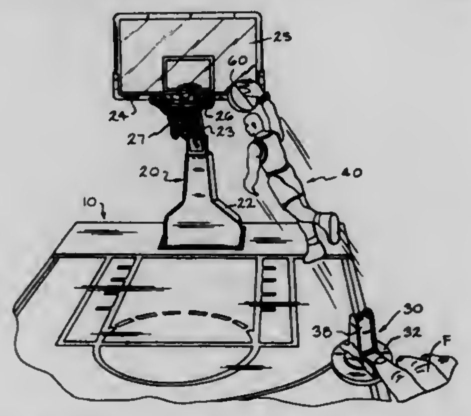
TOY BASKETBALL GAME WITH SELF-JUMPING PLAYER

Isamu Ozawa, Tokyo, Japan, assignor to The Ohio Art Company, Bryan, Ohio

Filed Sep. 9, 1996, Ser. No. 711,054

Int. Cl.^{6} A63F *7/06*

U.S. Cl. 273—108.56 **15 Claims**



1. A toy ball game with an animated figure player having a leg and a hand on an arm, a court for said player, and a goal for a ball, the improvement comprising:

A) a compressible launching spring in the leg of said player,

B) a recess in the hand of said player for releasably holding a ball, and

C) removable base for said player with a latching means for compressing and releasing said spring to launch said player and said ball in the player's hand toward said goal.

5,690,331

FOUR-FACED DIE

William A. Sides, North Charleston, S.C., assignor to TSR, Inc., Lake Geneva, Wis.

Filed Aug. 7, 1996, Ser. No. 698,033

Int. Cl.^{6} A63F *9/04*

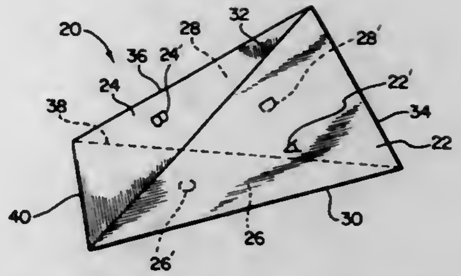
U.S. Cl. 273—146 **12 Claims**

11. A four-faced die, comprising:

only four triangular faces, each said face having a first edge and a second edge of equal length and a third edge having a different length; and

an indicium located on each said face;

wherein when said die is at rest on a flat surface, exactly one of said four faces extends upwardly from the surface and has its third edge parallel to the flat surface.



5,690,332

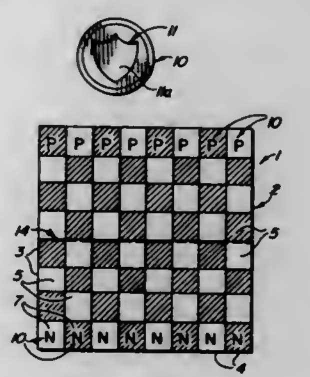
BOARD GAME AND PLAYING METHOD

Glenn M. Rechs, 913 Ridgeview, Pineville, La. 71360

Filed May 14, 1996, Ser. No. 649,949

Int. Cl.^{6} A63F *3/02*

U.S. Cl. 273—260 **20 Claims**



1. A game board comprising a grid having a selected number of rows and a selected number of columns defining a selected number of squares to identify a field of play; two sets of playing pieces disposed for movement on said grid, said playing pieces characterized by a substantially flat first surface and first indicia elevated from said first surface and a substantially flat second surface opposite said first surface and second indicia recessed in said second surface, wherein said playing pieces are placed on said grid with at least one said first surface and at least one said second surface facing said grid and said playing pieces are caused to traverse said squares on said grid.

5,690,333

BOARD GAME APPARATUS AND METHOD OF PLAYING SAME

David A. Danner, 1544 Blaine Ave., Racine, Wis. 53405; Jamie S. Verzal, 32401 Bassett Rd., Burlington, Wis. 53105, and Robert S. Zwickey, 10818 Washington Ave., Sturtevant, Wis. 53177

Filed Jul. 30, 1996, Ser. No. 688,390

Int. Cl.^{6} A63F *3/02*

U.S. Cl. 273—260 **15 Claims**

1. A method of playing a board game between two opponents involving both strategy and the consumption of beverages, the method comprising the steps of;

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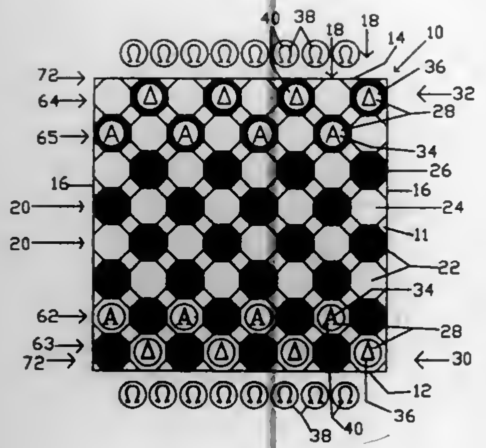
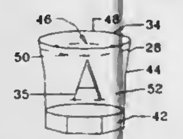




(a) providing a game board having peripheral borders defined by a first player end, a second player end, and two sides, the game board having aligned vertical and horizontal rows of playing spaces;

(b) providing a plurality of playing pieces, the playing pieces being divided into a first set of playing pieces and a second set of playing pieces, each playing piece having a bottom and sidewalls defining a cavity having an open top potion, the cavity being adapted for containing a beverage therewithin;

(c) placing the playing pieces of each first and second set in a predetermined starting configuration on playing spaces of the game board with playing pieces of the first set being placed in horizontal rows adjacent the first player end and playing pieces of the second set being placed in rows adjacent the second player end;

(d) filling the playing pieces on the game board with a beverage;

(e) determining the order of play;

(f) moving the playing pieces about the game board to unoccupied playing spaces in accordance with predetermined rules, the playing pieces being movable to jump and thereby capture the playing piece of an opponent, the first and second sets of playing pieces each include a plurality of distinguishable first, second, and third pieces, the first pieces are movable in forward and diagonally forward positions, the second pieces are movable in lateral, forward and diagonally forward positions, the first or second pieces of each first and second set being replaceable with the third piece from the respective first or second set when the first or second piece has moved forwardly across the game board to a horizontal row immediately adjacent to the corresponding player end the third piece being movable in lateral, forward, backward, diagonally forward, and diagonally backward positions; and

(g) consuming of the beverage contained within the captured playing piece by the opponent when the opponent's playing piece has been captured.

5,690,334
EXPANDED CHESS-LIKE GAME

George William Duke, P.O. Box 2204, Englewood, Colo. 80150

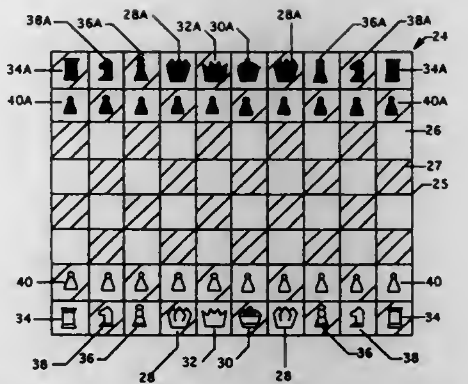
Filed Oct. 21, 1996, Ser. No. 734,722

Int. Cl.^{6} H63F *3/02*

U.S. Cl. 273—261 **18 Claims**

1. A method of playing an expanded chess-like game for use by a first player against a second player, comprising the steps of:

(a) providing a game board with alternate light-colored and dark-colored squares, arranged in adjacent vertical and horizontal rows, each of said rows including said alternate light-colored and dark-colored squares, each square offset with respect to the similarly-colored square of the adjacent row, to form a checkerboard pattern of bilaterally alternating colored squares, said game board having at least eight and fewer than eleven horizontal rows and ten vertical rows;



(b) providing a plurality of playing pieces, including one set of light-colored pieces for one player and one set of dark-colored pieces for the other player, each set of pieces comprising ten pawns, one king, one queen, two rooks, two bishops, two knights, and two of a new separate game piece, which is visually distinguishable from the others;

(c) initially positioning said set of light-colored pieces, at the start of a game, in the first row of ten squares at one end of said game board from left to· right in the sequence, rook, knight, bishop, said new separate game piece, said queen, said king, said new separate game piece, bishop, knight, and rook, with the light-colored pawns being initially positioned in the adjacent row of ten squares at said end of said game board;

(d) initially positioning said set of dark-colored pieces in the row of ten squares at the opposing end of said game board from left to right in the sequence rook, knight, bishop, said new separate game piece, said king, said queen, said new separate game piece, bishop, knight, and rook, with the corresponding pieces of the two sets being initially located in the same vertical row at its opposite ends of said game board, with the dark-colored pawns being positioned in the adjacent row of ten squares at said opposing end of said game board;

(e) formatting predetermined rules of movement for play wherein each of the kings, the queens, said rooks, said bishops, said knights, and said pawns have the same rule of movement as the corresponding piece in orthodox chess;

(f) formatting predetermined rules of movement for play wherein said new separate game piece has a rule of movement on said game board totalling three squares, by three straight-or-diagonal steps of one square each, by moving from a starting square, on which said new separate game is positioned, by a first straight-or-diagonal step of one square over a first intermediate square, different from said starting square, thence by a second straight-or-diagonal step of one square over a second intermediate square, different from said starting square and said first intermediate square, and thence by a third straight-or-diagonal step of one square to a final square, different from said starting square, said first intermediate square, and said second intermediate square, said first intermediate square and said second intermediate square being unoccupied by any other playing piece, a transition from said first straight-or-diagonal step of one square to said second straight-or-diagonal step of one square defining one angled change of direction, and a transition from said second straight-or-diagonal step of one square to said third straight-or-diagonal step of one square defining a second angled change of direction;

(g) formatting predetermined rules of movement for play wherein said rule of movement of said new separate game piece further requires:

(1) that at least one of the three straight-or-diagonal steps be straight, and that at least one of the three straight-or-diagonal steps be diagonal;

(2) that the angled change of direction from said first straight-or-diagonal step of one square to said second straight-or-diagonal step of one square be only zero degrees, or forty-five degrees to the right, or forty-five degrees to the left;

(3) that the angled change of direction from said second straight-or-diagonal step of one square to said third straight-or-diagonal step of one square be only zero degrees, or forty-five degrees to the right, or forty-five degrees to the left;

(4) that no more than one of the two angled changes of direction be forty-five degrees to the right, and that no more than one of the two angled changes of direction be forty-five degrees to the left,

whereby said new separate game piece has three, and only three, ways to move to said final square;

(h) formatting predetermined rules of movement for play wherein said set of light-colored pieces and said set of dark-colored pieces operate in said expanded chess-like game according to the rules of orthodox chess governing capture, a castling move, a pawn promotion, check, and checkmate.

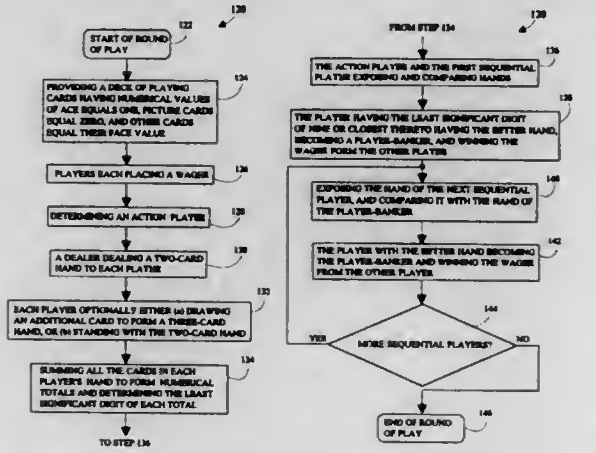
5,690,335
METHOD OF PLAYING A WAGERING GAME

John Skratulia, 11402 Howard St., Whittier, Calif. 90601

Filed Mar. 4, 1996, Ser. No. 610,419

Int. Cl.^{6} A63F *1/00;9/04*

U.S. Cl. 273—292 **29 Claims**


120
122
START OF ROUND OF PLAY
124
PROVIDING A DECK OF PLAYING CARDS HAVING NUMERICAL VALUES OF ACE EQUALS ONE, PICTURE CARDS EQUAL ZERO, AND OTHER CARDS EQUAL THEIR FACE VALUE
126
PLAYERS EACH PLACING A WAGER
128
DETERMINING AN ACTION PLAYER
130
A DEALER DEALING A TWO-CARD HAND TO EACH PLAYER
132
EACH PLAYER OPTIONALLY EITHER (a) DRAWING AN ADDITIONAL CARD TO FORM A THREE-CARD HAND, OR (b) STANDING WITH THE TWO-CARD HAND
134
SUMMING ALL THE CARDS IN EACH PLAYER'S HAND TO FORM NUMERICAL TOTALS AND DETERMINING THE LEAST SIGNIFICANT DIGIT OF EACH TOTAL
TO STEP 136
120
FROM STEP 134
136
THE ACTION PLAYER AND THE FIRST SEQUENTIAL PLAYER EXPOSING AND COMPARING HANDS
138
THE PLAYER HAVING THE LEAST SIGNIFICANT DIGIT OF NINE OR CLOSEST THERETO HAVING THE BETTER HAND, BECOMING A PLAYER-BANKER, AND WINNING THE WAGER FORM THE OTHER PLAYER
140
EXPOSING THE HAND OF THE NEXT SEQUENTIAL PLAYER, AND COMPARING IT WITH THE HAND OF THE PLAYER-BANKER
142
THE PLAYER WITH THE BETTER HAND BECOMING THE PLAYER-BANKER AND WINNING THE WAGER FROM THE OTHER PLAYER
144
YES
MORE SEQUENTIAL PLAYERS?
NO
END OF ROUND OF PLAY
146

4. A method of apportioning wagers between a plurality of game players comprising the steps of:

providing at least one deck of playing cards, said playing cards having numerical values, said values being ace equals one, picture cards equal zero, and all other cards equaling their face value;

the players each placing a wager;

a dealer dealing a two-card hand to each player;

each player optionally either (a) drawing an additional card to form a three-card hand, or (b) standing with said two-card hand;

the cards in each player's hand being summed to form numerical totals, and determining the least significant digit of said numerical totals;

the player having said least significant digit of nine or closest thereto having the best hand; and,

further including a procedure for eliminating ties wherein a ranking of cards determines a winner.

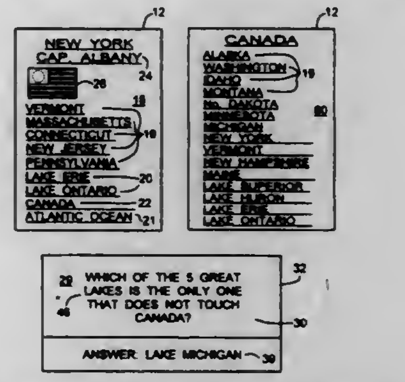
5,690,336
EDUCATIONAL CARD GAME

Matilda Joanne Oliver, 603 E. Independence Ct., Arlington Heights, Ill. 60005

Filed Nov. 26, 1996, Ser. No. 756,809

Int. Cl.^{6} A63F *1/00;3/04*

U.S. Cl. 273—302 **25 Claims**



13. An educational game relating to the identification of minor political and geographical areas within a major political and geographical area, including:

a master deck containing minor boundary cards representing minor political and geographical areas within the major political and geographical area, each minor boundary card having indicia representing a minor political and geographical area and having indicia representing information on political and geographical areas outside and adjacent to the boundary of the minor political and geographical area represented thereon, a plurality of minor and political geographical areas having a capitol, a plurality of boundary border cards representing political and geographical areas outside the major political geographical areas which engage the border of the major political and geographical area, each boundary border card having indicia representing a political and geographical area and having indicia representing minor political and geographical areas adjacent to the boundary of the political and geographical area represented thereon, a plurality of air border cards, and quiz cards each air border card containing indicia thereon to designate the same; and a plurality of

a quiz point deck, with each quiz card having indicia in the form of a question that relates to a minor boundary political and geographical area of the major political and geographical area.

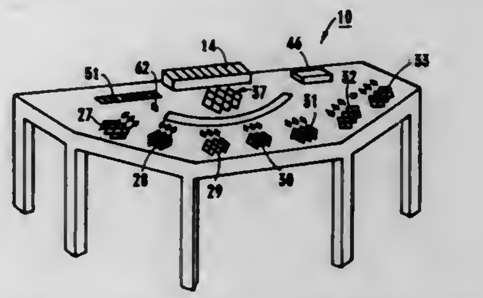
5,690,337
BETTING GAME APPARATUS AND METHOD OF PLAY

Joseph D. Somma, 3001 Lake East Dr., Bldg. 14, Apt. 2110, Las Vegas, Nev. 89117, and Philip A. Romeo, 3374 Racquet St., Las Vegas, Nev. 89121

Filed Apr. 16, 1996, Ser. No. 632,903

Int. Cl.^{6} A63F *1/00*

U.S. Cl. 273—309 **21 Claims**



1. A game apparatus used in combination with a deck of playing cards and in which one or more persons can participate as players and one person is to act as a dealer, comprising:

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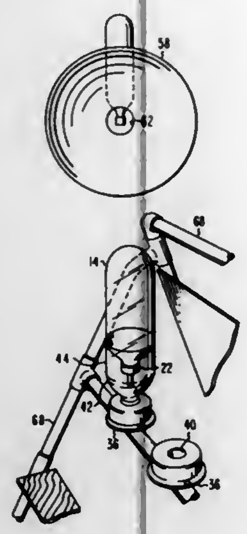
a playing surface;
a portion of the surface adjacent the periphery thereof having thereon a plurality of player betting areas at space locations where each player is to be stationed during a game;
means associated with the playing surface at each of said plurality of player betting areas for designating a numbered array, each number in each said numbered array corresponding to a numeric value defined by a separate playing card taken from said deck of playing cards, such that said numbered array includes all possible numeric values in said deck of playing cards;
means associated with the playing surface for selectively identifying a specific one of said numbers in each of said numbered arrays, said selective identification dependant upon either numeric values chosen by a player or numeric values corresponding to the numeric value of a playing card as such is revealed when turned over by the dealer.

5,690,338
EXPLOSIVE GUNNERY TARGET APPARATUS

William Thomas Cain, 1126 Mildred Ave., Bensalem, Pa. 19020, assignor to William Thomas Cain, and Elizabeth J. Cain, both of Bensalem, Pa.

Filed Oct. 15, 1996, Ser. No. 729,973
Int. Cl.⁶ F41J *5/24*

U.S. Cl. 273—393 **19 Claims**



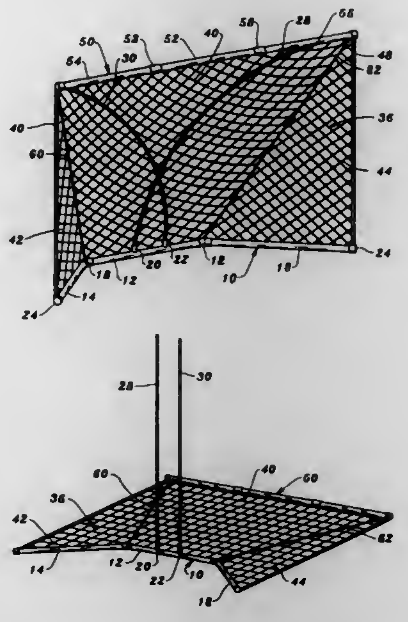
1. An explosive gunnery target apparatus having a separable rocket member responsive to being accurately struck by a gunnery projectile to explosively launch comprising:
A. a rocket apparatus comprising:
(1) a body means defining a interior chamber means therewithin and an inlet means defined therein in fluid flow communication with respect to said interior chamber means, said interior chamber means adapted to receive and retain pressurized fluid therewithin;
(2) a cap means detachably securable with respect to said body means positioned extending over said inlet means defined therein for selectively controlling fluid flow therethrough, said cap means including a nozzle means defining a nozzle bore means extending therethrough in fluid flow communication with said interior chamber means;
(3) a nozzle valve means positioned within said nozzle bore means to selectively control fluid flow through said nozzle bore means and said inlet means into said interior chamber means;
(4) a target zone defining the desired area to be struck by the gunnery projectile comprising:
(a) a first target area including a portion of said body means in an area adjacent said inlet means defined therein;
(b) a second target area defined on said cap means and said nozzle means, said first target area and said second target area being capable of being penetrated by a gunnery projectile to facilitate expulsion of pressurized fluid outwardly from said interior chamber means causing explosive propulsion of said rocket apparatus responsive to projectile penetration of said target zone;
B. a mounting means for holding at least one of said rocket apparatus therein to facilitate impacting thereof by a projectile; and
C. a deflector guide means positionable adjacent said target zone for facilitating striking thereof by a gunnery projectile.

5,690,339
COLLAPSIBLE SPORTS GOAL APPARATUS

David E. Chen, 136-42nd Ave., San Mateo, Calif. 94403

Filed May 7, 1996, Ser. No. 646,023
Int. Cl.⁶ A63B *63/00*

U.S. Cl. 273—400 **12 Claims**



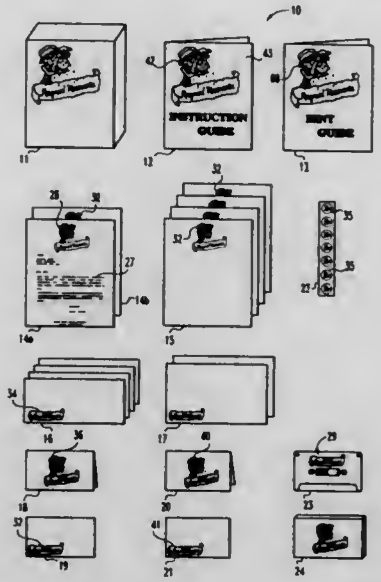
1. Collapsible sports goal apparatus comprising in combination:
a rigid, unitary goal base member having a generally U-shaped configuration for positioning on a support surface;
a goal net comprising a central panel and two spaced side net panels angularly disposed relative to said central panel and including a goal net bottom and a goal net top attached to said goal base member at said goal net bottom;
flexible, elongated reinforcement members interconnecting said goal base member to said goal net top; and
first and second flexible, resilient poles supported by the goal base member and connected to said goal base member extending upwardly and outwardly to spaced locations on said goal net top, said first and second poles being flexed and curved between said goal base member and said goal net top and exerting continuous opposed forces on said goal base member and said goal net top to continuously bias said goal net top away from said goal base member and maintain said goal net disposed upwardly from said goal base member, one of said flexible, elongated reinforcement members extending between said goal base member and said goal net top generally along a line of intersection between said central net panel and one of said side net panels and another of said flexible, elongated reinforcement members extending between said goal base member and said goal net top generally along a line of intersection between said central net panel and the other of said side net panels, said first and second flexible resilient poles maintaining said flexible, elongated reinforcement members under tension.

5,690,340
METHOD AND APPARATUS FOR A SECRET IDENTITY ADVENTURE GAME

Susan Musleh, 7551 Farm View Cir. E., Indianapolis, Ind. 46256

Filed Oct. 6, 1995, Ser. No. 540,194
Int. Cl.⁶ A63F *9/00*

U.S. Cl. 273—459 **29 Claims**



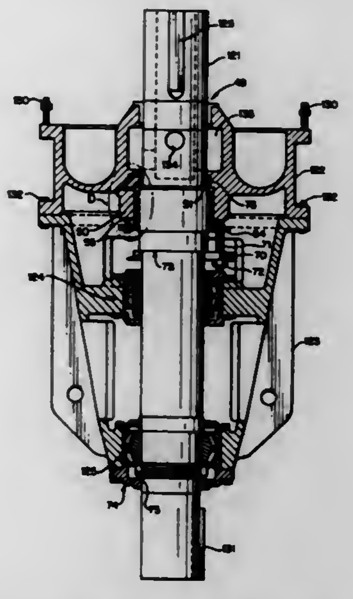
1. An adventure game, comprising:
a first themed communication element having audible or visible indicia introducing an intermediary, identifying the intermediary as an author of said first themed communication element, identifying that said first themed communication element is directed to a target, and explaining that a person is interested in the target;
a second themed communication element having audible or visible indicia identifying the intermediary as an author of said second themed communication element, identifying the target as the recipient of said second element, and expressing additional information concerning at least one of the person, the intent of the person, and what is expected of the target;
a third communication element directed to the target and including audible or visible indicia inviting the target to be at a certain place at a certain time;
an instruction guide including audible or visible indicia instructing the person to send said first themed communication element to the target first, to send said second themed communication element to the target after said first themed communication element and to send said third communication element to the target after said second themed communication element; and,
wherein each of said communication elements is a part of a pre-defined scenario having a particular theme with at least said first and second communication elements having additional audible or visible indicia consistent with said theme.

5,690,341
METHOD AND APPARATUS FOR THE FACILITATING THE SERVICING OF DRIVE-SHAFT ASSEMBLIES FOR PRESSURIZED VESSELS

J. Robert Prough, Queensbury; William A. Kerpka, Glens Falls, and John F. Bolles, Queensbury, all of N.Y., assignors to Ahlstrom Machinery Inc., Glens Falls, N.Y.

Filed Jun. 17, 1996, Ser. No. 665,284
Int. Cl.⁶ F16J *15/54*

U.S. Cl. 277—9 **21 Claims**



1. Apparatus for preventing fluid leakage from a vessel having a shaft penetrating the vessel during servicing of shaft components, comprising:
a first bearing surface that is substantially stationary with respect to said vessel;
a second bearing surface mounted to and movable with said shaft, and during normal operation of said shaft is spaced from said first bearing surface;
said first and second bearing surfaces operatively located closer to said vessel than the shaft components to be serviced; and
a shaft support structure for supporting said shaft to allow servicing of the shaft components, said shaft support structure engaging said shaft when stationary and moving at least part of said shaft with respect to said vessel so that said first and second bearing surfaces come into substantially liquid-tight sealing engagement with each other, allowing servicing of the shaft components without emptying said vessel.

5,690,342
METAL GASKET ASSEMBLY WITH FULL BEADS, HALF BEADS, AND SHIMS

Akira Tanaka, Ohmiya, and Masamichi Hoshi, Ohomiya, both of Japan, assignors to Nippon Leakless Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 312,397, Sep. 26, 1994, Pat. No. 5,601,292. This application Aug. 5, 1996, Ser. No. 691,015
Claims priority, application Japan, Mar. 14, 1994, 6-42468
Int. Cl.⁶ F16J *15/08*

U.S. Cl. 277—180 **2 Claims**

1. A metal gasket for a cylinder head, comprising a metal substrate having a predetermined shape with apertures including cylinder openings, bolt holes, coolant openings and lubricant openings, said metal substrate being provided with half-beads, in regions adjacent to the cylinder openings and full-beads in regions there around; said half-beads and full-beads all projecting in a first direction from a first side of said metal substrate, and ring shaped

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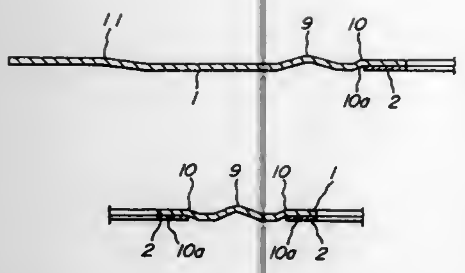
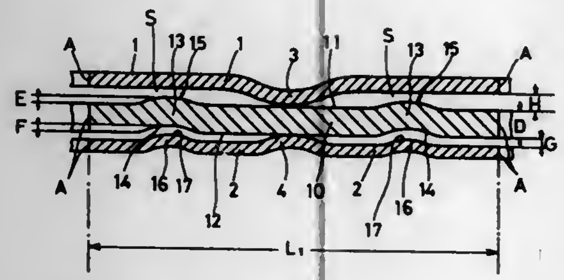


shims attached to a second side of said metal substrate and disposed within said half-beads.

5,690,343
METAL GASKET

Kazukuni Takada, Ibaragi; Hiroshi Uemura, Higashiosaka; Masahiko Miura, Kawachinagano; Yoshikazu Shinpo, Nisshin; Kazuaki Sugimura, and Kazuya Nakata, both of Toyota, all of Japan, assignors to Nippon Gasket Co., Ltd., Osaka-fu, and Toyota Jidosha Kabushiki Kaisha, Aichi-ken, both of Japan

Filed Sep. 5, 1996, Ser. No. 707,583
Claims priority, application Japan, Sep. 5, 1995, 7-250139
Int. Cl.^{6} F16J *15/00*
U.S. Cl. 277—235 B **18 Claims**

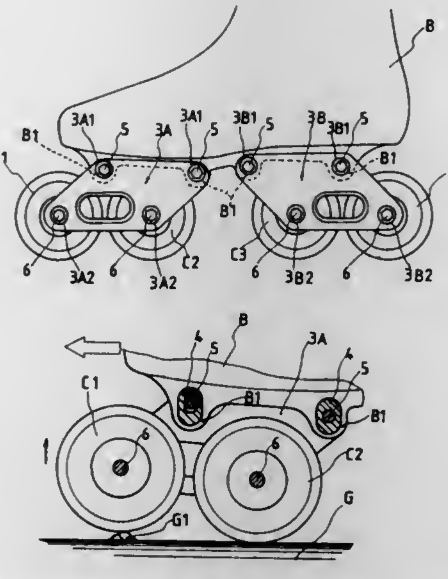


1. A metal gasket comprising
first and second bead plates formed by elastic metal plates on which main beads are formed along the circumferences of congruent holes, and
an intermediate plate interposed between said first and second bead plates on which said main beads are arranged in an opposed state, and having a thickness larger than that of said first and second bead plates,
said intermediate plate being provided in the regions thereof which are on the inner side of main beads with secondary beads extending toward said first bead plate, said secondary beads having a height smaller than that of said main beads,
said second bead plate being provided with auxiliary beads having projecting portions engageable with recessed portions of said secondary beads on said intermediate plate.

5,690,344
IN-LINE ROLLER SKATE WITH A SOLE PLATE STRUCTURE

Kim Chen, Taichung Hsien, Taiwan, assignor to Playmaker-Co., Ltd., Taipei, Taiwan

Filed Jan. 23, 1996, Ser. No. 589,079
Int. Cl.^{6} A63C *17/00*
U.S. Cl. 280—11.28 **1 Claim**

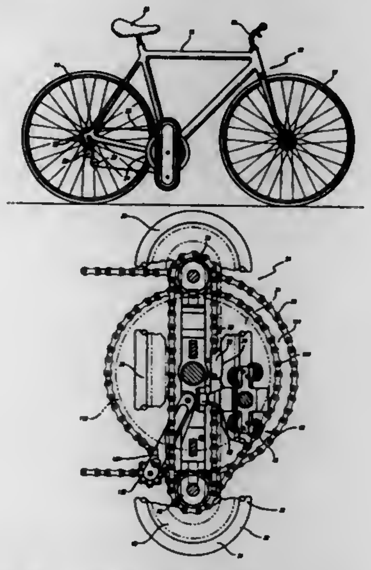


1. An in-line roller skate with improved sole plate structure, comprising:
a boot with an outer sole having a plurality of downwardly extending projections, each of said projections being provided with a vertical, elongated slot receiving a bushing made of elastic plastic material, and
multiple pairs of mounting plates having two ends at an upper and lower portion for respectively clamping a plurality of rollers between each pair of said mounting plates, each of said mounting plates having two upper holes at both ends of an upper portion thereof receiving locking means which pivotally secure each of said mounting plates to the corresponding projections through said bushing on the outer sole of said boot and two lower holes at both ends of a lower portion thereof for receiving fastening means which pivotally secure the rollers to said mounting plate.

5,690,345
BICYCLE PEDAL THAT MOVES IN A RECTILINEAR PATH

David Kerry Kiser, 513 E. Hearne Way, Gilbert, Ariz. 85234

Filed Oct. 3, 1995, Ser. No. 538,336
Int. Cl.^{6} B62M *1/00*
U.S. Cl. 280—210 **17 Claims**

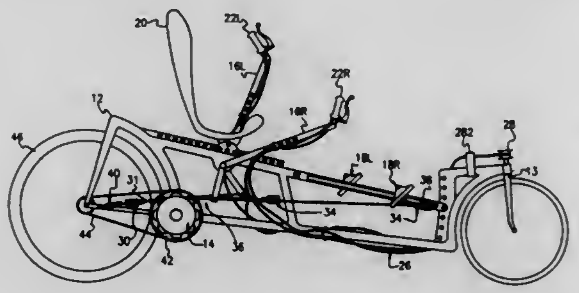


1. A bicycle drive system, comprising:
a track which has a pair of opposing linear side portions that are joined by a pair of opposing radial end portions, wherein said linear side portions and said radial end portions define a rectilinear path;
a wheel assembly that moves around said track;
a pedal connected to said wheel assembly;
a chain that is connected to said wheel assembly, said chain moves in conjunction with the movement of said wheel assembly;
a track sprocket that is rotatably mounted relative to said track and is rotated by said chain; and
a chain drive assembly adapted to drivingly couple said track sprocket to a rear wheel of a bicycle.

5,690,346
HUMAN POWERED DRIVE-MECHANISM WITH VERSATILE DRIVING MODES

Antti M. Keskitalo, 4014 Norwood Dr., Columbus, Ga. 31907

Filed Jul. 31, 1995, Ser. No. 508,386
Int. Cl.^{6} B62M *1/04*
U.S. Cl. 280—234 **9 Claims**

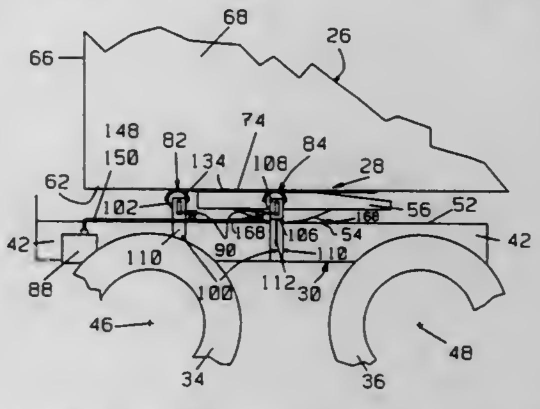


1. A human powered drive mechanism comprising:
a) a frame
b) individually movable members
c) flexible, unstrechable extensions
d) rotatable members
e) a rotatable shaft
f) redirecting means
g) additional flexible extention means
h) said individually movable members being supported said frame, each individual movable member being connected to two of said flexible, unstrechable extentions, each of said flexible, unstrechable extentions extending away from said movable members in oppposite directions and then one of said flexible, unstrechable extensions being redirected by redirecting means in the direction of said rotatable members, each of said flexible, unstrechable extentions attached to a separate rotatable member
i) said rotatable members being attached to said rotatable shaft so as to rotate the shaft when turned in one direction and freely ratchet backwards when turned in another direction
j) said rotatable members being connected in pairs and attached to said additional flexible extension means, the attachment of said additional flexible extentsion means to said rotatable members causing, during operation, one of said rotatable members to ratchet backwards while another of said rotatable members turns said rotatable shaft forward
k) a total of two of said flexible, unstrechable extentions, one of said redirecting means, two of said rotatable members, and one of said additional flexible extention means for each one of said movable members
l) said rotatable shaft and said additional flexible extention means attached to said frame
and whereby collectively providing means to cause a single-directional rotating motion of said rotatable shaft by said movable members operable individually with a complete versatility of driving modes and with a two directional power stroke.

5,690,347
TRACTOR TRAILER INTEGRATED JACKKNIFE CONTROL DEVICE

Eugene H. Juergens; Timothy A. Novesky, and Jerome Rychtik, all of Grafton, Wis., assignors to Tractor Trailer Safety Systems, Inc., Appleton, Wis.

Filed Apr. 15, 1996, Ser. No. 632,220
Int. Cl.^{6} B60T *7/12*
U.S. Cl. 280—432 **19 Claims**



1. A braking system for inhibiting a trailer of a tractor trailer assembly from jackknifing, said trailer comprising an underframe which has a front end portion supported on said tractor and a rear end portion supported on wheels, said braking system comprising:
(A) a source of pressurized fluid;
(B) a proportional control valve having an inlet port connected to said source of pressurized fluid and having an outlet port, said valve being controllable to selectively pressurize fluid in said outlet port to a variable level ranging from 0% of a maximum pressure level to 100% of said maximum pressure level;
(C) a fluid pressure cylinder fluidically coupled to said outlet of said valve;
(D) a friction brake which is mechanically coupled to said fluid pressure cylinder and which is located adjacent said underframe of said trailer;
(E) means for detecting an incipient trailer jackknife condition; and
(F) means, coupled to said means for detecting and to said proportional control valve, for automatically controlling said proportional control valve to actuate said fluid pressure cylinder in response to a detected incipient jackknife condition to cause said brake to apply a resistive force to said underframe of said trailer that increases proportionally with a detected degree of trailer jackknifing.

5,690,348
HEAVY DUTY SLIDING JACK POST STAND FOR TRAILERS

Thomas M. Williams, Jr., 2310 Old Oxford Highway, Durham, N.C. 27704

Filed Aug. 28, 1995, Ser. No. 519,875
Int. Cl.^{6} B60S *9/00*
U.S. Cl. 280—477 **9 Claims**

1. A sliding jack post stand for the alignment of a trailer with a hitch of a towing vehicle, comprising:
(a) a base assembly;
(b) a slider mounted in substantially linear sliding relation to said base assembly and adapted for supporting a jack post of a trailer on an upper surface thereof;
(c) said base assembly having a first fulcrum mounted thereon and a first series of nests formed therein;
(d) said slider having a second fulcrum mounted thereon and a second series of nests formed therein;
(e) said first fulcrum of said base assembly being located with respect to said second series of nests of said slider such that a

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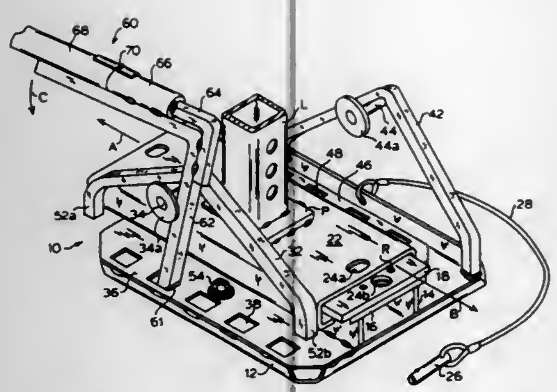


lever bearing on said first fulcrum and engaging a selected one of said second series of nests causes said slider to move in a first direction;

(f) said second fulcrum of said slider being located with respect to said first series of nests of said base assembly such that a lever bearing on said second fulcrum and engaging a selected one of said first series of nests causes said slider to move in a second direction opposite to said first direction; and

(g) a stop for preventing said slider from moving beyond a selected distance in said first and said second direction.

5,690,349
PROCESS OF MANUFACTURING A SKI WITH AN INTEGRATED TOP STRAP

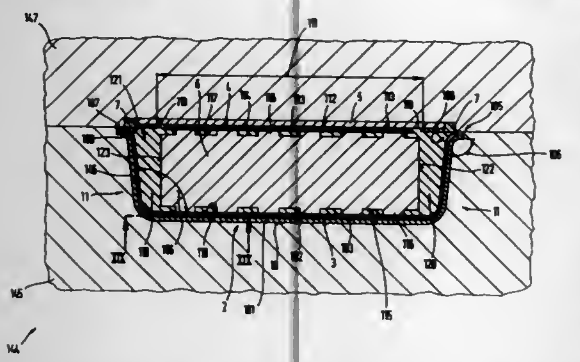
Alois Rohrmoser, Wagrain, Austria, assignor to Atomic for Sport GmbH, Wagrain, Austria

Division of Ser. No. 562,649, Nov. 27, 1995, Pat. No. 5,584,496, which is a continuation of Ser. No. 320,453, Oct. 11, 1994, abandoned, which is a continuation of Ser. No. 92,242, Jul. 14, 1993, Pat. No. 5,372,370. This application Feb. 15, 1996, Ser. No. 602,914

Claims priority, application Austria, Jul. 16, 1992, 1464/92; Feb. 25, 1993, 362/93

Int. Cl.^{6} A63C *5/14*

U.S. Cl. 280—610 **3 Claims**



1. A process for the manufacture of a ski comprising the steps of:

(a) providing a prefabricated shell of substantially U-shaped cross section with a top strap integrated in the shell, the shell having a base forming the surface of the ski and shanks extending downwardly from the base and inclined at an angle with respect thereof, the shanks forming the side faces of the ski and having outwardly projecting ends remote from the base, and the base and shanks defining a hollow space,

(b) placing a ski core in the hollow space, the ski core having
  (1) an upper side facing the base,
  (2) a lower side and
  (3) side walls spaced from the shanks to define intermediate hollow spaces between the side walls and the inner surfaces of the shell shanks, the intermediate hollow spaces each including a chamber extending in the longitudinal direction of the ski, projecting outwardly and continuously tapering towards the respective outwardly projecting shank end,

(c) arranging support elements on the upper and lower core sides, the support elements defining longitudinally and transversely extending recesses between the upper core side and the top strap and the lower core side and a bottom strap respectively, the recesses communicating with the intermediate hollow spaces and the chambers thereof,

(d) placing the bottom strap on the outwardly projecting ends of the shell shanks end over the hollow space and the intermediate hollow spaces, the bottom strap comprising a running surface layer and at least one additional reinforcement layer,

(e) filling the recesses and the intermediate hollow spaces including the continuously tapering chambers with a liquid plastic material, and

(f) bonding the core, the top strap and the bottom strap to the liquid plastic material, the inner surface of the base, shanks, and bottom strap directly contacting the liquid plastic material,

wherein the plastic material is an elastomer plastic foam material, comprising the step of expanding the material under the influence of an elevated temperature and pressure to bond the core, the top strap and the bottom strap to the expanded plastic foam material,

said process further comprising the steps of first forming the shell by laminating a flat reinforcement layer comprised of a fiber reinforced ply impregnated with a hardenable plastic to a flat plastic cover layer, the plastic being non-adhesive at room temperature and being heated to a temperature at which it becomes adhesive for laminating the reinforcement layer to the cover layer to form a laminate, deforming the laminate to form the U-shaped shell, and cooling the deformed laminate to retain the deformed U-shaped form,

wherein the hardenable plastic is first heated to a lower reaction temperature sufficient to make it adhesive and to laminate the reinforcement layer to the cover layer, cooling to a temperature below the lower reaction temperature to make the laminate form-stable, subsequently heating the laminate to a higher reaction temperature sufficient to make it adhesive to bond the laminate to the ski core, and cooling to a temperature at which the plastic is in a thermoset state.

5,690,350
SNOWBOARD BINDING

Brent H. Turner, and John E. Svensson, both of Seattle, Wash., assignors to K-2 Corporation, Vashon, Wash.

Continuation of Ser. No. 274,292, Jul. 12, 1994, Pat. No. 5,505,477, which is a continuation-in-part of Ser. No. 127,584, Sep. 27, 1993, Ser. No. 120,629, Sep. 13, 1993, Pat. No. 5,452,907, Ser. No. 100,745, Aug. 2, 1993, abandoned, and Ser. No. 94,576, Jul. 19, 1993, Pat. No. 5,437,466. This application Apr. 8, 1996, Ser. No. 628,054

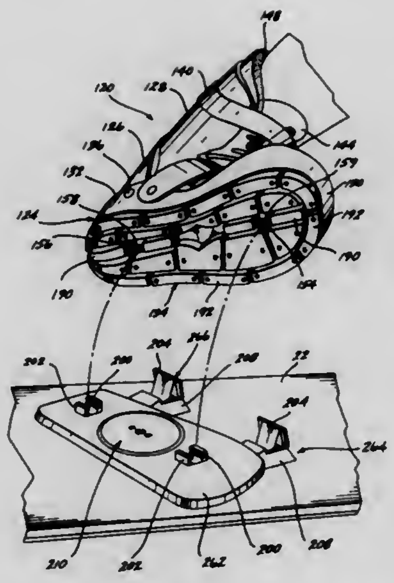
Int. Cl.^{6} A63C *9/08*

U.S. Cl. 280—613 **19 Claims**

1. A binding apparatus for securing a boot having a rearward portion and a forward portion to a snowboard having a longitudinal axis, the boot having a forward attachment member beneath the forward portion and a rearward attachment member beneath the rearward portion, the apparatus comprising:

(a) a rigid binding frame for attachment to the snowboard, said frame having a longitudinal axis generally transverse to the longitudinal axis of the snowboard when attached thereto;

(b) a first jaw secured to said frame opposite a first rigid member and substantially along said longitudinal axis of said frame for gasping at least one of the forward attachment member and the rearward attachment member between said first rigid member and said first jaw, said first jaw and said first rigid member defining a receiving portion the receives the at least one attachment member, said first jaw being movably attached to said frame for movement with respect to said frame and said boot, said first jaw disposed substantially along said longitudinal axis such that said first jaw is disposed beneath the boot when engaged with said attachment member, said first jaw extending at least partially over at least a portion of said attachment member when gasped therewith for holding said attachment member from substantial upward movement away from said binding frame;



(c) a second jaw secured to said frame in a location spaced from said first jaw opposite a second rigid member and substantially along said longitudinal axis of said frame and defining a receiving portion for receiving and grasping the other of the forward attachment member and the rearward attachment member between the second rigid member and said second jaw; and

(d) a release mechanism coupled to said first jaw for moving at least a portion of said first jaw away from at least one of the forward attachment member and the rearward attachment member to release the boot from between said first jaw and said first rigid member.

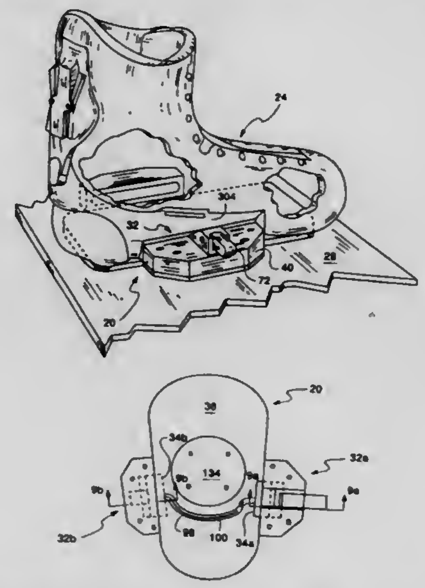
5,690,351
SNOWBOARD BINDING SYSTEM

Chris Karol, P.O. Box 6144, Vail, Colo. 81658

Filed Jul. 21, 1995, Ser. No. 505,578

Int. Cl.^{6} A63C *9/08*

U.S. Cl. 280—618 **19 Claims**



1. A snowboard binding system, comprising:

a boot engaging plate having means for attaching said plate to a snowboard, said engaging plate having at least two laterally moveable engaging members, said engaging members being engageable to engagement receptacles located along lateral sides of a boot in a manner to secure said boot from moving in a vertical or horizontal position once said engaging members are engaged, said engaging members being moveable between a first engaging position and a second disengaging position, means for biasing said engaging members to said first engaging position, whereby vertical pressure caused by downward movement of said boot towards said engaging plate is sufficient to move said engaging members from said first position to said second position and back to said first position, thereby securing said boot to said engaging plate, and a release control member operably associated with at least one of said engaging members, said release control member being moveable between first and second positions, said first position being operable to permit said engaging members to move to said first engaging position and said second position being operable to move at least one of said engaging members to said second disengaging position for permitting said boot to be removed from said engaging plate.

5,690,352
SNOWBOARD BINDING

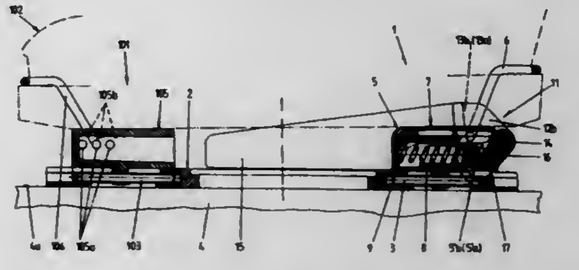
Henry Freisinger, and Johann Zotter, both of Vienna, Austria, assignors to HTM Sport- und Freizeitgeraete Aktiengesellschaft, Schwechat, Austria

Filed Feb. 2, 1996, Ser. No. 595,745

Claims priority, application Austria, Feb. 2, 1995, 181/95

Int. Cl.^{6} A63C *9/084*

U.S. Cl. 280—632 **17 Claims**



1. In a snowboard binding having a base plate adapted to be securely attached onto a snowboard, and two retaining brackets which are connected to the base plate, the two retaining brackets each being pivotal about a pin extending transversely with respect to said base plate and which, when the binding is performing a retaining function, respectively engage over front and rear sole borders of a boot located on the base plate, and a releasable locking mechanism which retains the retaining brackets in a pivoted position engaged over the sole border to secure the boot, when the binding is performing the retaining function, to the base plate, one of the retaining brackets being articulated on an actuating element pivotally mounted on the base plate about a first pivot pin extending transversely with respect to said base plate, the improvement wherein a step-on element is provided and is articulatable relative to the base plate, wherein the actuating element is acted upon by an operative engagement with the step-on element, the step-on element being pivotally supported for movement about a second pin extending transversely with respect to said base plate, the step-on element being substantially positioned beneath the boot and operatively engaging the actuating element during a boot-insertion phase, and wherein at least one locking slide is provided and arranged on the base plate and supported for longitudinal movement, the at least one locking slide being substantially positioned beneath the boot and operatively engaging the actuating element and, after overcoming a dead center position thereof, urging the actuating element and hence the one retaining bracket to secure the boot to the base plate.

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5,690,353

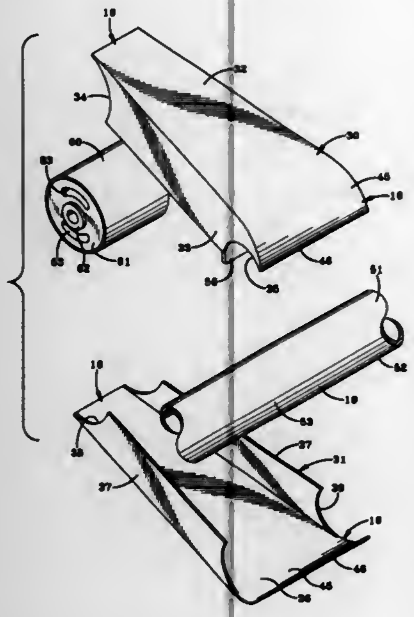
SUSPENSION SYSTEM WITH IMPROVED BEAM

Ervin K. Vandenberg, Massillon, Ohio, assignor to Suspensions Incorporated, Canal Fulton, Ohio

Filed May 9, 1996, Ser. No. 647,220

Int. Cl.^{6} **B60G** *11/28;7/00*

U.S. Cl. 280—688 **20 Claims**



1. A suspension system for use with vehicles having a frame, the suspension system comprising:
- a pair of spaced apart beams, each having a first end, a second end, a top section and a bottom section;
- each top section and bottom section having a pair of sidewalls;
- pivot means attached to the first end of each beam for pivotally mounting each beam to the frame;
- weld means extending longitudinally along each beam intermediate the first end and the second end for attaching the sidewalls of the top section to the sidewalls of the bottom section;
- an axle; and
- connection means for connecting the axle to each beam adjacent the second end of each beam.

5,690,354

AIR BAG MODULE

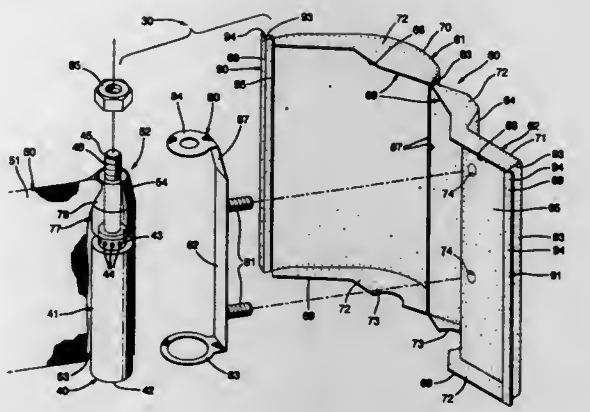
Jeffrey Allen Logan, Union; John Clifford Hattery, Jr., Dublin; John Paul Sparkman, Dayton; Graham Thornton Spencer, Tipp City, and Margaret Ann Fisher, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1996, Ser. No. 618,322

Int. Cl.^{6} **B60R** *21/20*

U.S. Cl. 280—728.2 **10 Claims**

1. An air bag module comprising:
- an inflator for generating gas;
- an air bag deployable upon generation of gas by the inflator: and
- a container housing the air bag and inflator therein, the container having walls defining a substantially enclosed volume, the container including first and second halves and a bendable closure hinge portion pivotally connecting the first and second halves and the container including an additional hinge portion located on one of the halves, the hinges enabling movement of the container between an open condition for receiving the air bag and inflator therein and a closed condition defining a substantially enclosed volume for housing the air bag and inflator.



5,690,355

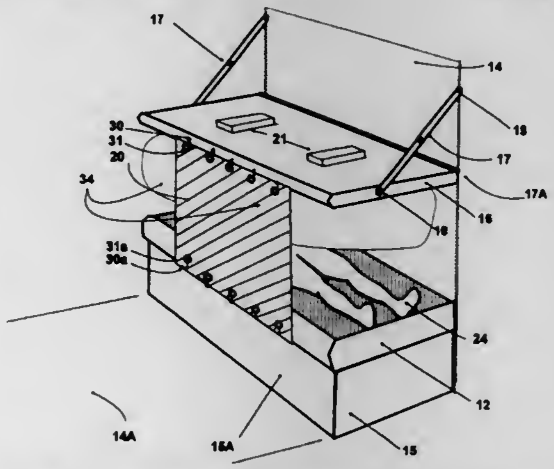
VEHICLE SLEEPER BUNK RESTRAINT SYSTEM

Raymond Kleinberg, Sterling Heights, Mich., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Dec. 10, 1996, Ser. No. 763,176

Int. Cl.^{6} **B60R** *21/22*

U.S. Cl. 280—730.1 **16 Claims**



1. A safety restraint system (**16,20,35**) for use in protecting an occupant (**24**) within a sleeping compartment of a vehicle, comprising
- reclining means for providing a bunk or bed (**12, 15**) upon which the occupant may rest;
- a shelf assembly (**16**), extendible into a position generally over the reclining means;
- inflatable restraint means including at least one airbag, installed in the shelf assembly, and which is deployable substantially downwardly towards and against the reclining occupant;
- a crash or rollover sensing means for generating an activation signal indicative of a crash or impending rollover of the vehicle for activation of the restraint airbags.

5,690,356

INTEGRATED SWITCH FOR AIR BAG DEACTIVATION

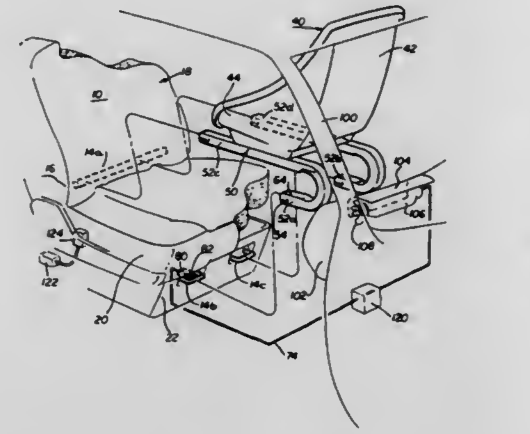
Wendell Lane, Jr., Romeo, Mich., assignor to AlliedSignal Inc., Morristown, N.J.

Continuation of Ser. No. 565,458, Nov. 30, 1995, abandoned. This application Nov. 12, 1996, Ser. No. 745,520

Int. Cl.^{6} **B60R** *21/32*

U.S. Cl. 280—735 **10 Claims**

1. A safety system comprising:



- a passenger seat (**10**) having fixed anchors (**14**) adapted to secure and retain a child seat (**40;70**);
- the child seat having clamp means (**50,52**) for lockingly engaging the anchors;
- switch means (**80,80'**) mounted in proximity to at least one of the anchors (**14**), having an active state and an inactive state, wherein with the clamp means lockingly engaging a corresponding anchor the state of the switch means is changed to provide an indication that a child seat has been installed.

5,690,357

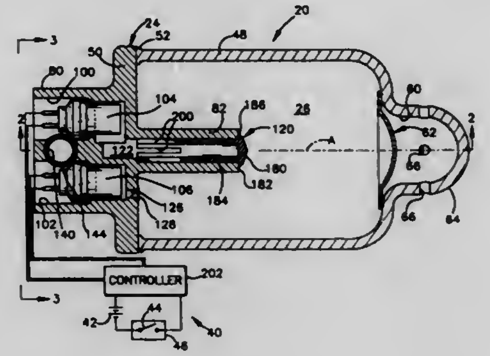
DUAL STAGE AIR BAG INFLATOR

Jess A. Cuevas, Scottsdale, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Filed Apr. 25, 1996, Ser. No. 637,856

Int. Cl.^{6} **B60R** *21/26*

U.S. Cl. 280—737 **23 Claims**



1. An apparatus for inflating an inflatable vehicle occupant protection device, said apparatus comprising:
- a container defining a chamber;
- inflation fluid and ignitable material in the chamber;
- means defining an opening in said container through which inflation fluid may flow from the chamber to inflate the protection device;
- a rupturable closure blocking flow through the opening in said container;
- a projectile supported by said container at a location spaced from said closure; and
- actuatable means supported by said container for producing combustion products which propel said projectile to rupture said closure and which are directed into the chamber to ignite said ignitable material in the chamber before said projectile ruptures said closure.

5,690,358

AIRBAG, PROCESS FOR FOLDING SAME, AND APPARATUS FOR CARRYING OUT THE FOLDING PROCESS

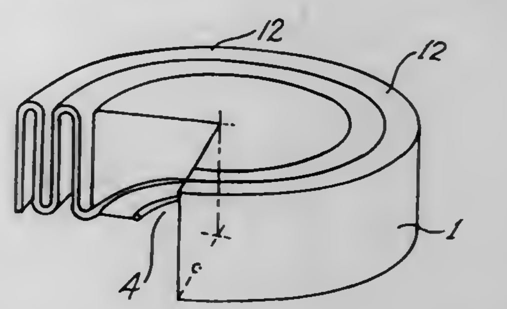
Thomas Marotzke, Berlin, Germany, assignor to Petri AG, Aschaffenburg, Germany

Filed Jun. 17, 1994, Ser. No. 261,992

Claims priority, application Germany, Jun. 17, 1993, 43 20 610.7

Int. Cl.^{6} **B60R** *21/16*

U.S. Cl. 280—743.1 **18 Claims**



1. A folded airbag of the type made from a flexible material and which can be used with an inflation device for rapidly filling the airbag with gas, the airbag comprising, when substantially empty and spread out, main fold lines and at least one of said main fold lines forming a closed track around an imaginary center of the substantially empty and spread-out airbag, the folded airbag further comprising at least one circumferential layer when folded.

5,690,359

SUPPLEMENTARY WEIGHT FOR VEHICLE BALLASTING

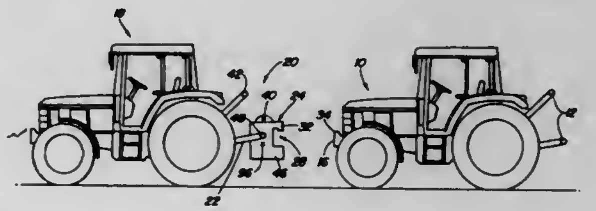
Michael Teich, D-68199 Mannheim, Germany, assignor to Deere & Company, Moline, Ill.

Filed Jun. 24, 1996, Ser. No. 669,200

Claims priority, application Germany, Aug. 3, 1995, 195 28 476.3

Int. Cl.^{6} **B60S** *9/00*

U.S. Cl. 280—759 **13 Claims**



1. A supplementary weight for ballasting a work vehicle, the weight having locating pins projecting therefrom, wherein:
- the supplementary weight has a pin bore which receives the locating pins and the locating pins are at least partially retractable into the weight, the supplementary weight is comprised of a plurality of partial weights, each having a pin bore extending laterally therethrough; and
- a central tube is received by the pin bores and couples the partial weights together, the locating pins being adjustably mounted in the central tube.

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SUPPLEMENTARY WEIGHT FOR A VEHICLE

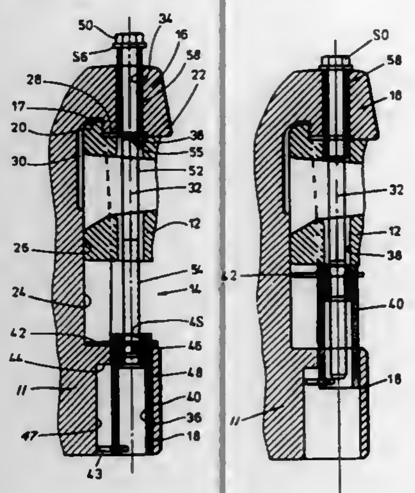
Michael Teich, Mannheim, Germany, assignor to Deere & Company, Moline, Ill.

Filed Jun. 27, 1996, Ser. No. 671,191

Claims priority, application Germany, Aug. 3, 1995, 195 28 473.9

Int. Cl.^{6} B60B *39/00;* **B62D** *49/08*

U.S. Cl. 280—759 **10 Claims**



1. A supplementary weight assembly for ballasting a vehicle, the weight assembly having at least one entry opening which is bordered by an upper leg and a lower leg and which opens on a side, the weight assembly being adapted to be hooked onto a carrier component, wherein the upper leg is supported on the carrier component which projects into the entry opening, wherein generally vertical bores extend in the upper leg and the lower leg, the leg bores being aligned with a corresponding vertical bore in the carrier component and receiving an attaching bolt when the weight assembly is mounted on the carrier component, characterized by:

the attaching bolt having a threaded section; and

the bore in the lower leg receives an axially movable tensioning device, the device having a threaded bore into which the threaded section of the attaching bolt can be screwed, the attaching bolt and the tensioning device clamping the carrier component to the upper leg.

5,690,361

STEERING SYSTEM FOR AUTOMOTIVE VEHICLES

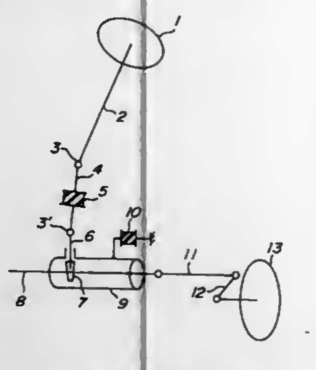
Hiroshi Mouri, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 412,160, Mar. 28, 1995, abandoned. This application Aug. 9, 1996, Ser. No. 695,364

Claims priority, application Japan, Mar. 28, 1994, 6-57177

Int. Cl.^{6} B62D *1/00;* **F16D** *3/76*

U.S. Cl. 280—771 **21 Claims**



1. A steering system for an automotive vehicle, comprising:

a steering wheel to be manually operated by a driver; and

a steering device for transmitting a steering input from the steering wheel to a tire of the vehicle, said steering device including an elastic member having a spring element with a spring constant and a damping element with a damping coefficient,

wherein an actual steering angle of said tire defines a steering output of said steering device,

wherein the elastic member has a spring constant K and a damping coefficient C such that $C/K > 1/(10\pi)$ and

wherein the elastic member comprises blended rubber.

5,690,362

LONGITUDINAL ADJUSTING ARRANGEMENT ON A CASING TUBE TELESCOPE OF A STEERING SPINDLE IN A MOTOR VEHICLE

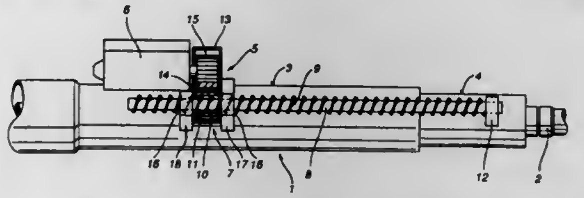
Karl Peltsmeier, Aldingen, and Helmut Patzelt, Kernen, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Jun. 19, 1996, Ser. No. 665,859

Claims priority, application Germany, Jul. 3, 1995, 195 24 196.7

Int. Cl.^{6} B62D *1/19*

U.S. Cl. 280—775 **11 Claims**



1. Longitudinal adjusting arrangement on a casing tube telescope of a steering spindle in a motor vehicle, which has a spindle drive which has a threaded spindle extending in a longitudinal direction outside on the casing tube, which threaded spindle is supported on a first telescope section and, by means of its thread, engages in a spindle nut which is supported on a second telescope section arranged coaxially with respect to the first telescope section,

wherein at least one energy absorption element is fixed on one of the telescope sections, said energy absorption element being acted upon by at least one of the threaded spindle and the spindle nut in response to axial movement of the threaded spindle with respect to the spindle nut.

5,690,363

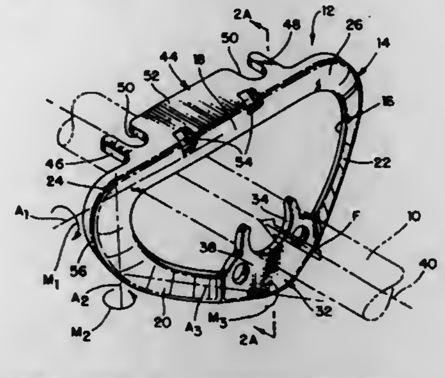
ENERGY ABSORBING MOUNTING BRACKET

Witold Peter Rybinski, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1995, Ser. No. 570,060

Int. Cl.^{6} B62D *1/16;1/19*

U.S. Cl. 280—779 **3 Claims**



1. In a motor vehicle, the combination comprising:

a body structure of the motor vehicle,

a steering column having a mast jacket, and

an energy absorbing mounting bracket for connecting the mast jacket of the motor vehicle steering column to the motor vehicle body structure comprising:

a frame having a window therein through which the mast jacket protrudes defined by a plurality of integrally connected flat walls each made of a plastically deformable material,

a support flange rigidly connecting the mast jacket to the frame with a longitudinal centerline of the mast jacket perpendicular to a first flat wall of the plurality of integrally connected flat walls of the frame and with the first flat wall extending laterally on both sides of a longitudinal centerplane of the mast jacket,

a mounting flange integral with the first flat wall of the plurality of integrally connected flat walls defining a platform whereat the frame is rigidly connected to the motor vehicle body structure in cantilever fashion and with the first flat wall extending laterally in a first direction beyond a first side edge of the mounting flange and in a second direction beyond a second side edge of the mounting flange so that the first flat wall of the frame reacts in twist against a force on the mast jacket in a collapse direction parallel to the longitudinal centerline of the mast jacket, and

a reinforcing flange around the periphery of the frame integral with and reinforcing each of the first flat wall and the remainder of the plurality of flat walls of the frame against hinge-like beam bending so that at least the first flat wall permanently deforms in twist and not in hinge-like beam bending to absorb energy when the stresses thereon attributable to the twist exceed the yield strength of the plastically deformable material from which the frame is made.

5,690,364

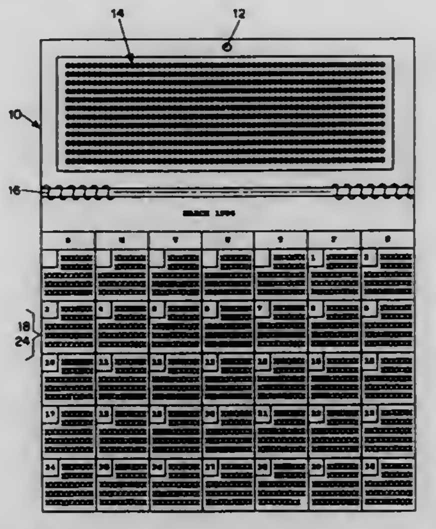
CALENDAR

Joseph A. Oleske, and Rosanne Oleske, both of 704 Woodchuck La., Toms River, N.J. 08755

Filed May 3, 1996, Ser. No. 642,416

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 283—2 **18 Claims**



1. A calendar comprising a multiplicity of base sheets, each base sheet bearing visible indicia of a plurality of day dates in a matrix of date sections, each day date indicia occupying only a day date image portion of each date section and the day date image portions of all date sections of all base sheets corresponding in size and position, and each date section of each base sheet having a blank portion, and an overlay sheet bearing graphic material in each of a matrix of image sections that correspond to and register with the date sections of the base sheets, the graphic material appearing in an image portion of each image section, and each image section of the overlay sheet having a window that corresponds to and registers with the day date image portion of the date section of the base sheet underlying the overlay sheet so that the day date indicia are visible through the overlay sheet through the windows.

5,690,365

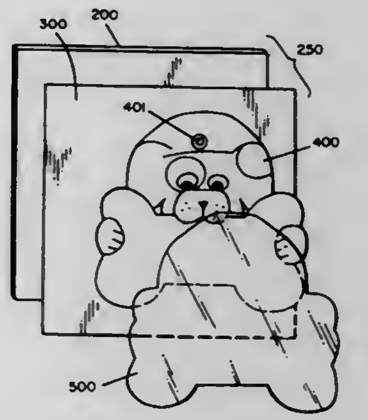
PET IDENTIFICATION TAGS

Frederick W. Fascenelli, Jr., and Cynthia F. Kirkeby, both of 696 N. Lemon Hill Trail, Orange, Calif. 92669

Filed Jun. 3, 1996, Ser. No. 657,380

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 283—67 **11 Claims**



11. A pet identification tag fabricated by the process of:

inscribing information in ink onto a plastic body which shrinks uniformly in response to the application of heat thereto,

placing said plastic body on a baking board,

pre-heating said baking board to about 300° F. for approximately 1 to 2 minutes in order to insure even heating of said plastic body during a subsequent heating step,

heating said plastic body to about 300° F. for approximately 5 minutes in order to uniformly shrink said plastic body and to bake said ink into said plastic body, and

applying a clear plastic protective layer to said plastic body after said plastic body has been shrunk to a desired size.

5,690,366

IDENTIFICATION DOCUMENT CHARACTERIZED BY AN ELECTROLUMINESCENCE EFFECT AND THE PROCEDURE FOR ITS REALIZING

Abbatemaggio Luciano, Via Don L. Milani, 4-Scandicci FI, Italy

Division of Ser. No. 230,129, Apr. 20, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 460,118

Claims priority, application Italy, Apr. 20, 1993, FI93A0078

Int. Cl.^{6} B42D *15/10*

U.S. Cl. 283—83 **16 Claims**

1. Procedure for realizing an identification document characterized by an electroluminescence effect and consisting of:

preparing the transparent support

placing a codification layer on said transparent support

placing a first electric circuit on said codification layer

placing a first insulating layer on said first electric circuit

placing one electroluminescence layer on said first insulating layer

placing a second insulating layer on said electroluminescence layer

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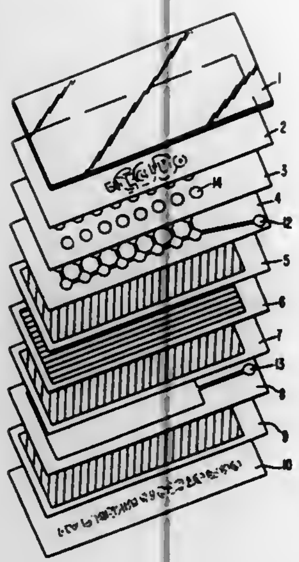
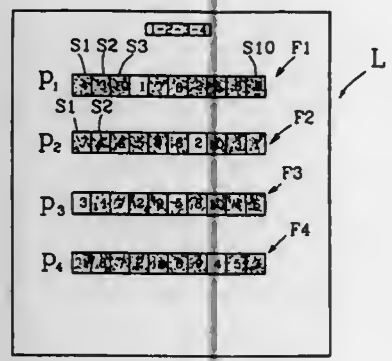


placing a second electric circuit on said second insulating layer placing one additional insulating layer.

5,690,367
LOTTERY CARD AND METHOD

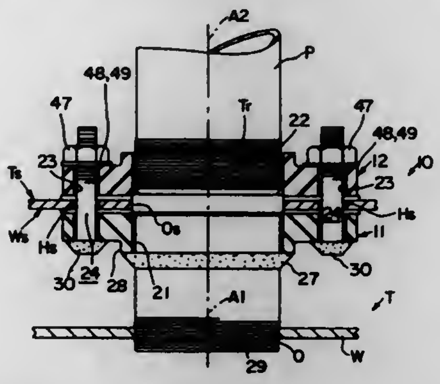
Shmuel Fromer, 10 Reiness St., Kiryat Shmuel, Haifa, Israel
Filed Mar. 22, 1996, Ser. No. 620,271
Claims priority, application Israel, Mar. 26, 1995, 113126
Int. Cl.⁶ B42D *15/00*
U.S. Cl. 283—94 **4 Claims**



1. A lottery card comprising:
a succession of marks in a given order, printed on the card;
a first plurality of fields, arranged in a successive order, each field being divided into a respective individual plurality of frames;
at least one and fewer than the entire individual plurality of the frames of the first field being imprinted with the first mark of the succession of marks;
at least one and fewer than the entire individual plurality of the frames of the second field being imprinted with the second mark of the succession of marks; and so forth through each of the first plurality of the fields;
all of the frames of all of the fields being effectively concealed by opaque coating material which can be irreversibly removed from individual frames by a user to reveal the marks imprinted under the coating at the individual frames;
an amount of a lottery prize associated with each of the marks, wherein the amount of the lottery prize increases progressively relative to the number of the marks revealed in the succession in the given order.

5,690,368
ULTRASEAL SUMP ADAPTORS MODELS 54 AND 541

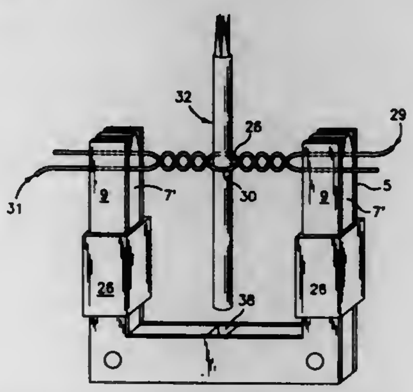
Arthur L. Johnson, P.O. Box 397, Warwick, N.Y. 10990
Filed Sep. 25, 1995, Ser. No. 453,162
Int. Cl.⁶ F16L *3/04*
U.S. Cl. 285—158 **18 Claims**



1. A sump adaptor comprising respective first and second flanges and first and second openings each having a respective first and second axis which axes are adapted to be in coaxial relationship to each other when the flanges are assembled, a plurality of apertures formed in one of said first and second flanges, a plurality of connectors carried by another of said first and second flanges, said plurality of connectors being adapted for insertion into said plurality of apertures, said plurality of apertures and said plurality of connectors being spaced substantially equal circumferential distances from each other whereby said connectors can be selectively inserted into said apertures to selectively vary the relative circumferential position of said first and second flanges, means for connecting said flanges together through said connectors, said first flange including a first tubular portion, said first tubular portion having exterior thread means for securing said first flange tubular portion to a tank, and said second flange second opening having internal thread means for releasably securing thereto a sump-associated element.

5,690,369
FISHERMAN'S KNOT TYING DEVICE

William F. Steck, III, Stamford, Conn., assignor to Outdoor Scientific, Inc., Stamford, Conn.
Filed Jan. 13, 1997, Ser. No. 782,748
Int. Cl.⁶ B65H *69/04*
U.S. Cl. 289—17 **12 Claims**

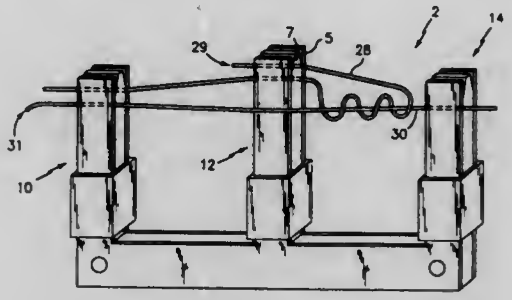


1. A device for tying together separate segments of monofilament or similarity fine line with a fisherman's knot such as a blood knot, said device comprising:
a) two like configured outer plates, each of said outer plates including a basal part and two leg parts extending from said basal part at right angles thereto;

b) an inner plate sandwiched between said outer plates, said inner plate having a basal portion interposed between the basal parts of said outer plates, and said inner plate having leg portions extending from said basal portion at right angles thereto and being sandwiched between said leg parts of said outer plates, said inner plate leg portions combining with said outer plate leg parts to form spaced-apart clamps for clamping one of the separate segments of line between the legs parts of one outer plate and the leg portions of one side of the inner plate, and for clamping the other segment of line between the leg parts of the other outer plate and the leg portions of the opposite side of the inner plate; and
c) mechanical means connected to the basal area of said device, said mechanical means being operable to clamp in place the free ends of each line segment during the formation of a knot in the device.

5,690,370
FISHERMAN'S KNOT TYING DEVICE

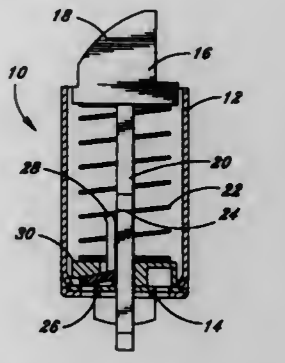
William F. Steck, III, Stamford, Conn., assignor to Outdoor Scientific, Inc., Stamford, Conn.
Filed Jan. 13, 1997, Ser. No. 782,749
Int. Cl.⁶ B65H *69/04*
U.S. Cl. 289—17 **6 Claims**



1. A device for tying together separate segments of monofilament or similarly fine line with a fisherman's knot such as a blood knot, said device comprising:
a) two like configured outer plates, each of said outer plates including a basal part, two end leg parts extending from said basal part at fight angles thereto, and one medial leg part extending from said basal part at right angles thereto; and
b) an inner plate sandwiched between said outer plates, said inner plate having a basal portion interposed between the basal parts of said outer plates, and said inner plate having two end leg portions and one medial leg portion extending from said basal portion at right angles thereto and being sandwiched between said leg parts of said outer plates, said inner plate leg portions combining with said outer plate leg parts to form spaced-apart clamps for clamping one of the separate segments of line between the end leg parts of one outer plate and the end leg portions on one side of the inner plate and for clamping the other segment of line between the end leg parts of the other outer plate and the end leg portions of the opposite side of the inner plate, and said medial leg parts of said outer plates combining with said medial leg portions of said inner plate to clamp free ends of the line segments during the formation of a knot.

5,690,371
FUSED SPRING LATCH

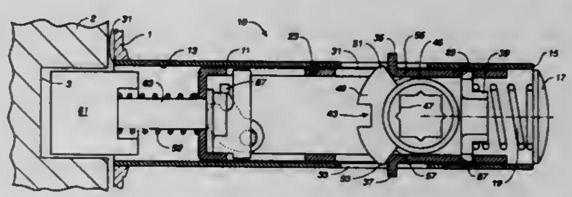
William C. Turnbull, Colorado Springs, Colo., assignor to Schlage Lock Company, San Francisco, Calif.
Continuation of Ser. No. 342,471, Nov. 21, 1994, abandoned.
This application Nov. 1, 1996, Ser. No. 742,643
Int. Cl.⁶ E05C *1/08*
U.S. Cl. 292—163 **6 Claims**



1. A spring latch assembly for fusible dead bolting by excessive temperature, comprising:
a housing having a land in an end thereof;
a latch bolt, having a bolt head and an elongated tail, slidably disposed in said housing;
means for biasing said latch bolt to maintain said bolt head projected from said housing and to resist retraction of said bolt head into said housing; and
thermally-responsive means within said housing for disabling the latch bolt by blocking said tail and preventing retraction of said bolt head into said housing after exposure of the latch assembly to excessive temperature, said thermally-responsive means comprising a platform having at least one elongated finger, and a heat-fusible means, set upon said land and providing support for said platform to maintain said finger axially oriented in said housing and out of engagement with said latch bolt tail until said heat-fusible means is fused by excessive temperature.

5,690,372
LATCH MECHANISM

Franz Werner Jans, Roedermark, Germany, assignor to JADO Bathroom and Hardware Mfg. Corp., Camarillo, Calif.
Filed Feb. 20, 1996, Ser. No. 603,432
Int. Cl.⁶ E05C *1/12*
U.S. Cl. 292—169 **12 Claims**



1. An improved latch mechanism, comprising:
a) a housing containing a force transfer mechanism biased by biasing means and said force transfer mechanism being constrained to linearly reciprocate within said housing;
b) a first cam mechanism coupled to said force transfer mechanism whereby rotation of said first cam mechanism about a first axis of rotation causes reciprocation of said force transfer mechanism against force exerted by said biasing means;
c) a second cam mechanism coupled to said force transfer mechanism whereby reciprocation of said force transfer mechanism causes rotation of said second cam mechanism about a second axis of rotation spaced from said first axis of rotation;

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d) said second cam mechanism being coupled to a latch bolt whereby rotation of said second cam mechanism causes reciprocation of said latch bolt;

e) whereby rotation of said first cam mechanism results in reciprocation of said force transfer mechanism, rotation of said second cam mechanism and reciprocation of said latch bolt.

5,690,373
ELECTROMAGNETIC LOCK

Graham James Luker, Sydney, Australia, assignor to Trimec Securities Pty. Limited, Australia

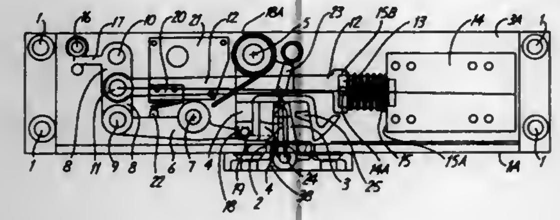
PCT No. PCT/AU94/00684, § 371 Date Jan. 22, 1996, § 102(e) Date Jan. 22, 1996, PCT Pub. No. WO95/23269, PCT Pub. Date Aug. 31, 1995

PCT Filed Nov. 8, 1994, Ser. No. 537,881

Claims priority, appilcation Australia, Feb. 25, 1994, PM4090

Int. Cl.^{6} E05C *3/06*

U.S. Cl. 292—201 **10 Claims**



1. A lock for a movable barrier such as a door, said lock comprising a tongue pivotable on a first axis between a locking position where it engages a striker and an unlocked position where it is clear of said striker, a pawl pivotable on a second axis between a first position where one end thereof abuts said tongue to hold it in said locking position and a second position where said one end is clear of the tongue and a set of toggles hingedly connected end to end between another opposite end of said pawl and a third axis, the interconnected ends of said toggles being connected to a solenoid plunger by a linkage and a stop means movable between a fail secure position where, when said solenoid is deactivated said toggles are biased by a spring means against said stop means in a substantially straight configuration to hold the pawl and tongue in said locking position, and a fail safe position where during energization of said solenoid said toggles are held to a slightly offset position against said stop means and upon deactivation of said solenoid said spring means urges said toggles to a folded configuration and said pawl and tongue means are arranged to then pivot to said unlocked position upon a withdrawal force being applied to the striker.

5,690,374
SHOCK-ABSORBING TOOL HANDLE

Paul J. Jacobs, Arlington, Mass., and Ronald J. Shaud, Reading, Pa., assignors to Nor-Easter Enterprises, Inc., Somerville, Mass.

Filed Apr. 19, 1996, Ser. No. 640,986

Int. Cl.^{6} B25G *1/04;* **E01H** *5/02*

U.S. Cl. 294—57 **12 Claims**

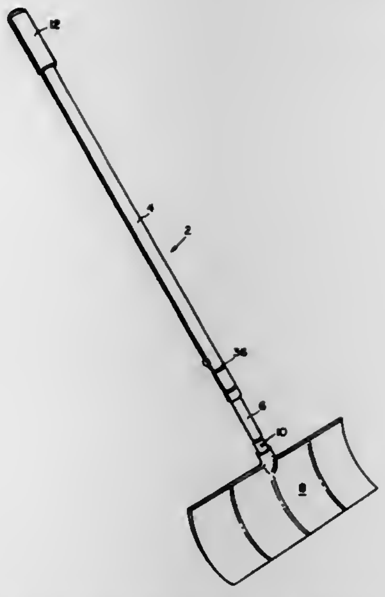
1. A shock-absorbing tool handle comprising:

a tubular proximal portion and a tubular distal portion;

the distal portion being adapted to receive a tool;

the proximal portion being larger in cross-section than the distal portion and slidable over the distal portion in telescoping relationship toward the tool;

a spring located within the handle, and compressible when the portions telescope toward each other when force is applied in an axial direction;



a first spring keeper in the distal portion and a second spring keeper in the proximal portion; and

guide mechanism in the handle portions positioned to limit the sliding motion between the portions and to permit the spring to be compressed between the keepers when shock is applied to the handle.

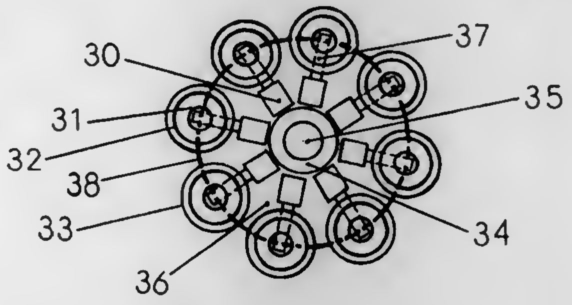
5,690,375
EZEKIEL'S WHEEL

John Robert Schneider, 4 Woodside Dr. East, Apalachin, N.Y. 13732

Continuation-in-part of Ser. No. 312,564, Sep. 26, 1994, Pat. No. 5,560,300. This application Apr. 25, 1996, Ser. No. 636,539

Int. Cl.^{6} B60B *11/00*

U.S. Cl. 295—33 **3 Claims**



1. A high speed wheel, comprising:

a) a first wheel having a first diameter and an axle for rotation thereon;

b) a brake to control the rotational velocity of said first wheel;

c) a plurality of secondary wheels each of said secondary wheels having a brake and having second diameters smaller than said first diameter, and mounted on said first wheel so that a portion of the circumference of each of said secondary wheels projects beyond the circumference of said first wheel; and

d) means operatively connected to said first wheel and to each of said plurality of secondary wheels for extending and retracting said secondary wheels relative to said axle of said first wheel.

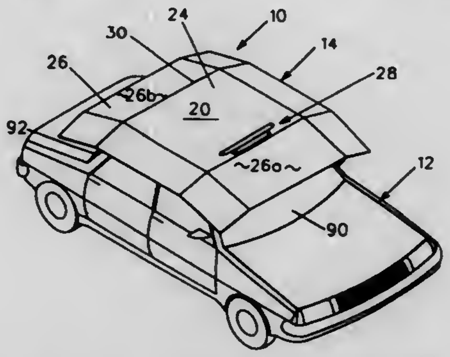
5,690,376
VEHICLE SHADE

Andrew G. Leidal, P.O. Box 455, Breckenridge, Colo. 80424

Continuation of Ser. No. 468,925, Jun. 6, 1995, abandoned. This application Sep. 5, 1996, Ser. No. 708,881

Int. Cl.^{6} B60J *1/20*

U.S. Cl. 296—99.1 **11 Claims**



10. A cover for a roof of a motor vehicle, comprising:

a rigid panel with a top surface, a bottom surface, a body portion, an edge portion and having an area greater than an area of the motor vehicle's roof;

means for securing said panel in a spaced relationship to the motor vehicle's roof; and

a reflective outer layer extending continuously across the top surface throughout said area of said panel;

said body portion having an area substantially equal to an area of the motor vehicle's roof and defining a discrete periphery;

said edge portion including front, side and rear segments depending from and extending outwardly and downwardly from said periphery for providing shade over a motor vehicle's corresponding front, side and rear windshields, said segments extending at substantially the same angle at which a motor vehicle's corresponding front and rear windshields are mounted for aerodynamic purposes;

at least a portion of said edge portion being transparent to allow a passenger of the motor vehicle to see therethrough.

5,690,377
RETRACTABLE COVER SYSTEM FOR A TRUCK TRAILER BODY

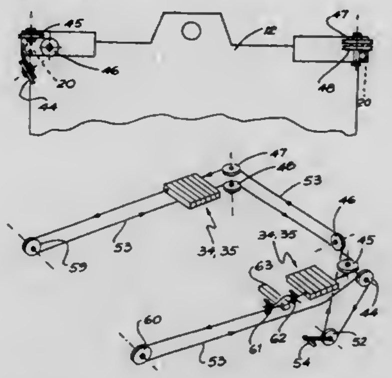
David Keith Denyer, 6 Supply Court, Albion Park New South Wales, 2527, Australia.

Filed Dec. 21, 1995, Ser. No. 579,046

Claims priority, application Australia, Jan. 30, 1995, 11446/95; Mar. 13, 1995, 14809/95; New Zealand, Apr. 28, 1995, 272008

Int. Cl.^{6} B62D *25/06*

U.S. Cl. 296—100 **2 Claims**



1. A retractable cover system for a tipper trailer body of a truck, said retractable cover system comprising:

(a) a cover for the top of the trailer body,

(b) a plurality of movable bows connected to said cover, each movable bow having a guide at each of its opposed ends,

(c) a pair of open channel tracks mounted on opposed side walls of the trailer body, each of said guides contacting an upper surface of one of said open channels,

(d) an endless linear means for moving said cover which is connected to opposed side portions of the cover,

(e) a first rotatable means for controlling the horizontal movement of said cover through Said linear means,

(f) a plurality of second rotatable means for supporting said linear means,

(g) a mounting assembly for mounting said first rotatable means to a front wall of said trailer body, and

(h) a means for adjusting tension of said linear means, said means for adjusting tension being located on said mounting assembly,

whereby the said endless linear means extends continuously between all the second rotatable means and said first rotatable means,

the arrangement of the plurality of second rotatable means and endless linear means being such that the operation of the first rotatable means causes the simultaneous movement of the opposed side portions of the cover to retractably move the cover over the top of the trailer body.

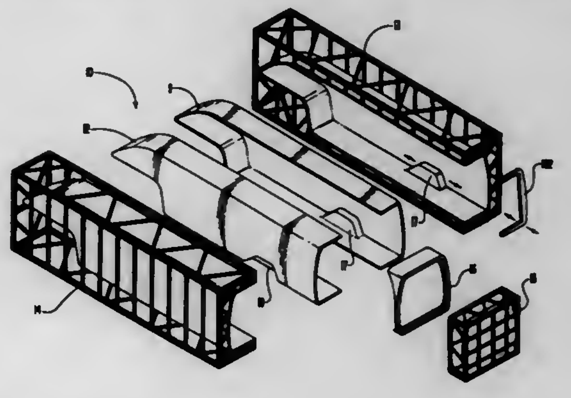
5,690,378
MONOCOQUE TRANSPORT VEHICLE

R. Bruce Romesburg, 15205 S. 1800 W., Bluffdale, Utah 84065

Filed Jan. 31, 1994, Ser. No. 188,937

Int. Cl.^{6} B62D *63/06*

U.S. Cl. 296—181 **27 Claims**



1. A chassisless trailer of monocoque design for chassislessly carrying a load comprising:

At least two molded sections joined together to form a chassisless unitary monocoque shell for supporting the weight of said load, said monocoque shell having a shell floor on an underside thereof;

At least two wheel wells in the monocoque shell for accommodating a plurality of wheels;

A rear section attachable to the monocoque shell to enclose the rear of the monocoque shell;

Axle mounting means for mounting at least one axle assembly to the underside of the shell floor corresponding to the wheel wells in the monocoque shell, and for bearing the weight of said load from the monocoque shell, said axle mounting means having a port support on the port side of the monocoque shell that is laterally separated from a starboard support on the starboard side of the monocoque shell, the starboard and port supports bearing the weight of said load without a member extending between the port and starboard supports that bears the weight of said load; and

Axle means including suspension means mounted to the underside of the monocoque shell with the axle mounting means for rotatably supporting and for transferring weight thereon to

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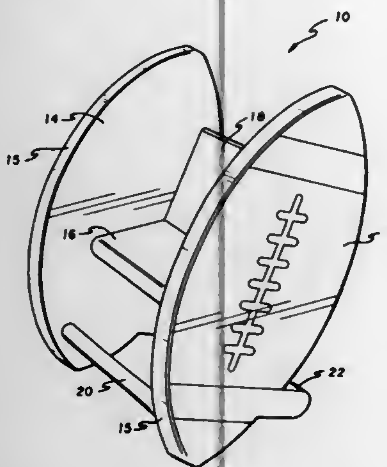
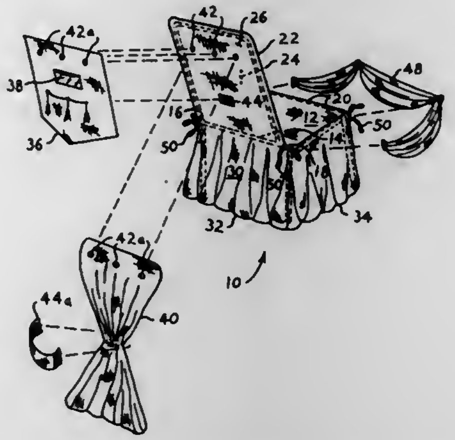
said plurality of wheels; whereby the weight of said load is transferred chassislessly from the monocoque shell to the plurality of wheels.

5,690,379
DECORATIVE FURNITURE ITEM USABLE AS CHAIR, STEP STOOL AND ROCKER
Theresa L. Cayssials, 181 Goodwin Dr., San Bruno, Calif. 94066
Filed Nov. 4, 1996, Ser. No. 743,167
Int. Cl.^{6} A47C *13/00*
U.S. Cl. 297—118 **6 Claims**



1. A decorative furniture item usable as a chair, step stool and rocker comprising:
- a first elongated body;
- a second elongated body in a spaced apart parallel relationship with said first elongated body, each of said bodies having a curved edge for use as a rocker and an opposite edge having a stem protruding therefrom;
- a first rectangular plate mounted orthogonally between said first and second elongated bodies;
- a second rectangular plate mounted orthogonally between said first and second elongated bodies, said second plate oriented generally horizontally when said furniture item rests on the curved edge of each of said elonqated bodies, said second plate forming an obtuse angle with said first plate, said first plate extending from said second plate generally toward said curved edge of each of said elonqated bodies;
- a first bar mounted orthogonally between said first and second elongated bodies; and
- a second bar mounted orthogonally between said stems; whereby
- upon resting said decorative furniture item on said stems with said first plate in a horizontal orientation, said decorative furniture item is usable as step stool and chair with said first plate serving as a step and chair seat, said second plate serving as a toe kick and chair back, and said first bar serving as a foot rest; and upon resting said decorative furniture item on said curved edge of each of said elongated bodies, said decorative furniture item is useable as a rocker with said second plate serving as a seat, said first bar serving as a foot rest and said second bar serving as a handle bar.

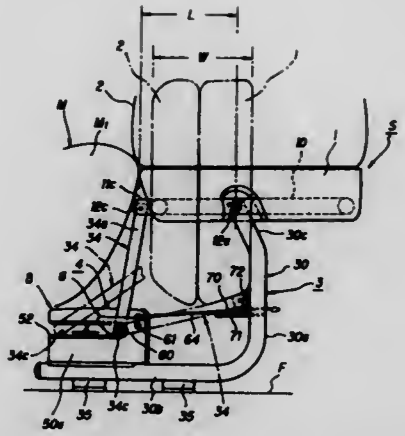
5,690,380
SLIPCOVERS WITH INTERCHANGEABLE TRIM
Abby Waters, 21346 St. Andrews Blvd. #209, Boca Raton, Fla. 33433
Filed Aug. 23, 1996, Ser. No. 700,924
Int. Cl.^{6} A47C *27/00*
U.S. Cl. 297—225 **17 Claims**



1. In combination, a removable slipcover and a chair structure having a plurality of legs, a seat, and a chair back, said removable slipcover comprising:
- a seat cover portion having a rear edge with a first end and an opposite second end, and a skirt attachment edge extending about said seat cover portion from said first end to said second end of said rear edge;
- a chair back cover portion, comprising a front and an opposite rear panel of material defining a seat back pocket therebetween, with said front panel and said rear panel each having a lower edge;
- said lower edge of said front panel of said chair back cover portion being secured to said rear edge of said seat cover portion, and said rear panel having a lowermost portion extending below said lower edge of said front panel to form a rear skin portion extending downwardly substantially the length of the chair legs;
- a skirt portion depending from said skirt attachment edge of said seat cover portion, and extending completely therearound and attaching to said rear skin portion in an unbroken length;
- said slipcover being reversible, with said seat cover portion, each said panel of said chair back portion, and said skirt portion each being formed of a first and an opposing different second sheet of material respectively providing different first and second display surfaces, with one of said different display surfaces being exposed when said slipcover is removably placed over said chair structure, and;
- at least one removably attachable trim accessory applied to said rear panel of said chair back cover portion, with said trim accessory and said rear panel each having mating fastener means thereon, providing for the removable attachment of said at least one removable trim accessory to said rear panel.

5,690,381
SPARE SEAT FOR VEHICLE
Hiroaki Hasegawa, Tochigi-ken, and Naohiro Takahashi, Saitama, both of Japan, assignors to Tokyo Seat Co., Ltd., Saitama-Ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan
Filed Dec. 20, 1995, Ser. No. 575,352
Claims priority, application Japan, Dec. 30, 1994, 6-339273
Int. Cl.^{6} A47C *15/00*
U.S. Cl. 297—234 **44 Claims**

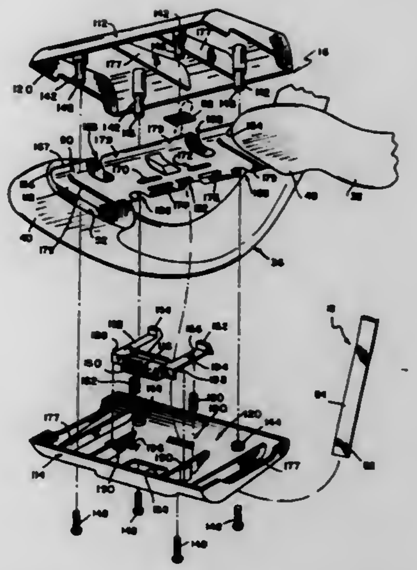
1. A spare seat for a vehicle, arranged in a space adjacent a side of a seat cushion of a main seat, said spare seat comprising:



- a seat cushion rendered horizontal relative to said seat cushion of said main seat in a position of use of said spare seat;
- a seat back foldably supported to said seat cushion of said spare seat;
- said seat back rendered vertical with respect to said seat cushion of said spare seat in said position of use of said spare seat and folded horizontally and overlapped on said seat cushion of said spare seat after use of said spare seat;
- support means pivotally supporting said seat cushion of said spare seat;
- said support means adapted to be mounted on a floor of a vehicle in the vicinity of said side of said seat cushion of said main seat;
- said seat cushion of said spare seat rendered vertical together with said seat back overlapped on said seat cushion of said spare seat after use of said spare seat, whereby said seat cushion and said seat back of said spare seat are vertically accommodated in said space adjacent the side of the seat cushion of said main seat after use of said spare seat;
- said seat cushion of said spare seat pivotally supported to said support means at points thereof which are spaced laterally from the side of said seat cushion of said main seat at an interval which is at least as long as a total width of said seat cushion and seat back of said spare seat in a vertical overlapped state; and
- locking means for releasably locking said seat cushion of said spare seat to keep said seat cushion of said spare seat horizontal or vertical;
- said locking means mounted on said support means and comprising movable means having an end section, said movable means pivotally connected to a section of said seat cushion of said spare seat which is adjacent said side of said seat cushion of said main seat, guide means mounted on said support means for guiding said end section of said movable means in the directions nearer to and away from said main seat in response to pivotal movement of said seat cushion of said spare seat, said end section of said movable means being movably engaged with said guide means in a manner to be movable along said guide means, and catching means mounted on said support means for catching said end section of said movable means to lock said seat cushion of said spare seat.

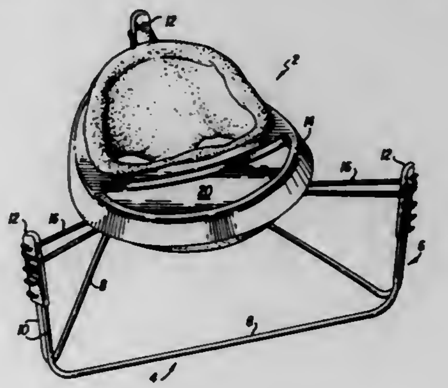
5,690,382
ADJUSTABLE CHILD-RESTRAINT SHIELD
Richard E. Cone, Athens, Ohio, assignor to Cosco, Inc., Columbus, Ind.
Filed Nov. 9, 1995, Ser. No. 556,208
Int. Cl.^{6} A47D *1/10;* **B60N** *2/28*
U.S. Cl. 297—256.15 **49 Claims**

1. A child car seat for restraining a child seated in the seat, the child car seat comprising
- a seat assembly including a seat shell and a swing arm unit and



- a restraint shield including a fixed portion having spaced-apart first and second ends connected to the swing arm unit and a movable portion configured to move relative to the fixed portion and seat assembly between a plurality of positions, the movable portion being formed to include an interior region and the fixed portion being positioned to lie entirely in the interior region of the movable portion.

5,690,383
BABY BUNGEE JUMPER
Paul K. Meeker, Hiram, Ohio, assignor to Lisco Inc., Tampa, Fla.
Filed Mar. 7, 1996, Ser. No. 612,474
Int. Cl.^{6} A47D *1/00*
U.S. Cl. 297—274 **10 Claims**



1. An infant jump seat, comprising
- (a) a base adapted for resting on a floor and including a plurality of spaced vertically extending legs, each leg having a sleeve mounted on the upper portion thereof;
- (b) a seat containing a pair of openings for receiving an infant's legs when an infant is arranged therein;
- (c) elastic means for connecting said seat with said sleeve of each of said legs, respectively, whereby said seat is elastically suspended between said legs above said base; and
- (d) adjusting means for vertically adjusting said seat relative to said base, said adjusting means being mounted on said sleeves, whereby said seat may be vertically adjusted to a position where the infant's feet extend to the floor when the infant is placed in said seat enabling the infant to jump on the floor while being suspended in said seat.

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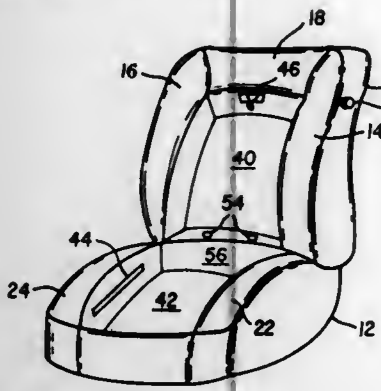
5,690,384
VEHICLE SEAT WITH REMOVABLE SEAT MEMBER
Nicole E. Rossi, 43473 Golden Meadow Cir., Ashburn, Va. 20147

Filed Aug. 20, 1996, Ser. No. 699,824
Int. Cl.^{6} A47C *27/00*
U.S. Cl. 297—283.1 **14 Claims**



1. A vehicle seat comprising:

a back support including at least one of a bed side bolster and a fixed top bolster; and a main seating support including at least one fixed side bolster,

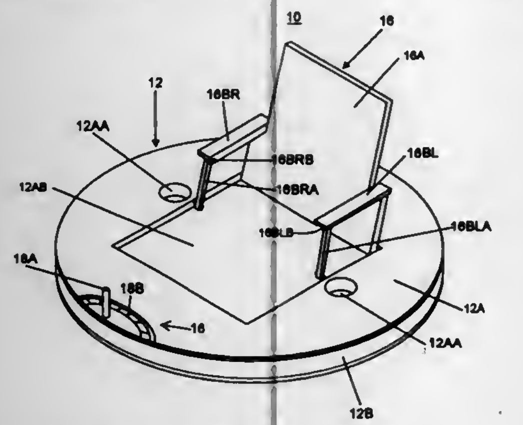
wherein at least one of the back support and the main seating support includes a removable central portion located adjacent to at least one of said bolsters;

wherein said removable central portion includes a first major side covered with a first material and a second major side covered with a second material that is different from the first material; and

wherein said removable central portion includes at least one of a flexible extended portion and a recess that engages a corresponding recess and a corresponding flexible extended portion respectively, in at least one of said side bolster of said back support, said too bolster of said back support and said side bolster of said main seating support.

5,690,385
ROTATABLE SUN CHAIR
Jerry Feldman, 1071 Lakeshore Dr., Jupiter, Fla. 33458, and Larry Brandow, 348 Honbart Ave., Absecon, N.J. 08201

Filed Aug. 7, 1996, Ser. No. 689,162
Int. Cl.^{6} A47C *1/14*
U.S. Cl. 297—344.26 **7 Claims**



1. A rotatable sun chair (**10**) comprising:

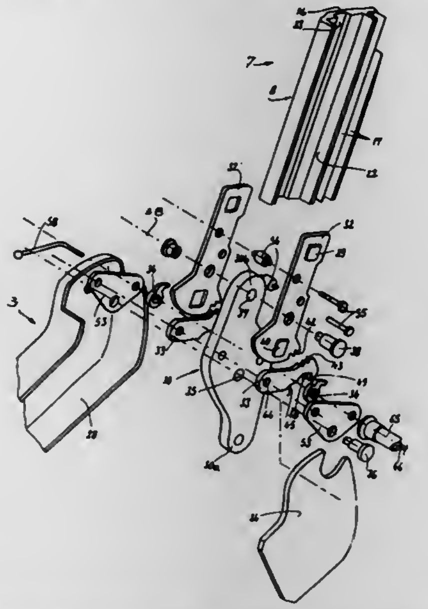
A) a circular first base member (**12**) comprises a first base member top (**12A**) and a first base member bottom (**12C**), a leading edge of the first base member (**12**) forms a first base member edge (**12B**) extending downwardly therefrom, the first base member (**12**) further comprises at least one first base member storage means (**12AA**) hollowed therein for storing objects, a middle of the first base member bottom (**12C**) forms a first base member bottom pin (**12CA**) protruding downwardly therefrom, the first base member (**12**) further comprises a sun dial (**18**) having a vertically disposed sun dial needle (**18A**) and a sun dial display (**18B**) inscribed thereon, a mid-section of the first base member (**12**) is slightly recessed to form a first base member chair housing (**12AB**) with a chair back (**16A**) mounted therein;

B) a circular second base member (**14**) disposed beneath and encased within the first base member (**12**) comprises a second base member top (**14A**) and a second base member bottom (**14C**), the leading edge of the second base member (**14B**) forms a second base member edge (**14B**) extending upwardly from the second base member (**14**), a second base member bottom aperture (**14C**) forms an opening in a mid-section of the second base member (**14**) through which the first base member bottom pin (**12CA**) is inserted, a duct (**20**) is formed from an open channel created between the first member (**12**) and the second member (**14**), the duct (**20**) includes a duct guide member (**20A**) disposed in the duct (**20**) which further includes a plurality of duct balls (**20B**) movably contained therein; and

C) a chair (**16**) having a chair left arm (**16BL**) and a chair right arm (**16BR**) pivotally connected to said chair back (**16A**) on one distal end by means of a chair left arm pin (**16BLB**) and a chair right arm pin (**16BRB**), respectively, the opposite distal ends of the chair left arm (**16BL**) and the chair right arm (**16BR**) are pivotally mounted to a chair left arm rod (**16BLA**) and a chair right arm rod (**16BRA**), respectively, by means of a chair left arm pin (**16BLB**) and a chair right arm pin (**16BRB**), and said chair right arm rod (**16BRA**) and said chair left arm rod (**16BLA**) are each mounted in said chair housing (**12AB**).

5,690,386
DEVICE FOR ARTICULATED CONNECTION BETWEEN THE BACKREST AND THE SEAT PART OF A VEHICLE SEAT
Jean-Pierre Chabanne, Champvallon, France, assignor to Irausa Ingeniera S.A., Burgos, Spain

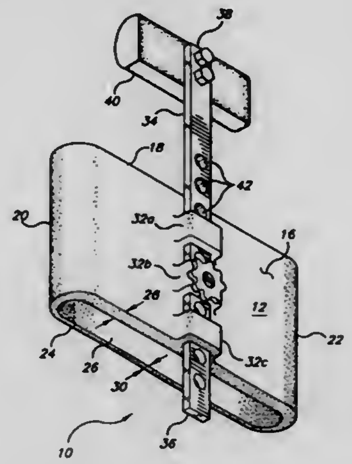
Filed Jun. 21, 1996, Ser. No. 667,657
Int. Cl.^{6} B60N *2/02*
U.S. Cl. 297—367 **7 Claims**



1. A device for articulating connection between a backrest and a seat part of a vehicle seat in which a backrest armature comprises two uprights that are articulated with respect to a seat part armature about a first transverse horizontal articulation pin in order to define various positions of comfort and about a second articulation pin, parallel to the first articulation pin, in order to allow the backrest to be folded down onto the seat part, the latter articulation being associated with unlockable immobilizing means, wherein, for each upright, a first articulation with respect to the seat part armature is provided by a lever including, above a lever part that is journal-mounted on the first articulation pin, a tenon of rectangular section that fits into a central housing formed in a section piece constituting the corresponding upright, whereas in a second articulation, the second articulation pin is borne by the aforementioned tenon and interacts with at least one mounting plate which, arranged against the lever, is set tightly into the housing of the section piece and is fixed by riveting, the mounting plate having a lower end protruding beyond the upright and locally fitted with toothing designed to interact with complementary toothing borne by a mechanism for immobilizing the upright with respect to the lever.

5,690,387
REMOVABLE HEADREST FOR CHAIRS
Ronnie A. Sarti, 1023 Bennett Ave., Glenwood Springs, Colo. 81602

Filed Oct. 28, 1996, Ser. No. 738,906
Int. Cl.^{6} A47C *1/10*
U.S. Cl. 297—397 **7 Claims**



1. A removable headrest adapted to fit over the upper portion of a chair back, comprising:

a pocket portion having a front wall, a rear wall, a closed upper edge and opposite first and second lateral edges, and an open lower edge communicating with a hollow interior;

said pocket portion including at least one headrest support arm attachment channel disposed thereon, said at least one headrest support arm attachment channel having a threaded insert therein;

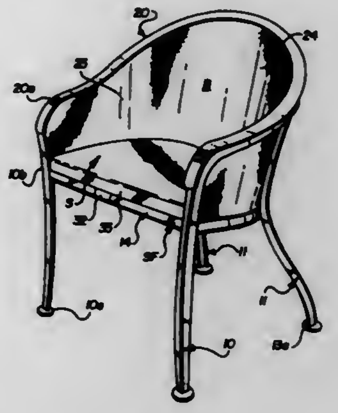
at least one elongate headrest support arm adjustably securable within said at least one headrest support arm attachment channel, with said at least one headrest support arm having a lower end and an opposite upper end, and a plurality of locking passages therethrough;

headrest means disposed upon said upper end of said at least one headrest support arm, and;

locking means disposed within said at least one headrest support arm attachment channel, said locking means providing for the selective locking of said headrest support arm within said at least one channel and comprising a threaded bolt secured through said threaded insert of said channel and one of said locking passages of said headrest support arm to affix said support arm selectively within said channel.

5,690,388
METHODS OF MAKING A FURNITURE PRODUCT AND THE PRODUCT FORMED THEREBY
Herbert C. Saiger, Troy, Ohio, assignor to Woodard, Inc., Owosso, Mich.

Filed Oct. 18, 1996, Ser. No. 733,785
Int. Cl.^{6} A47C *1/12*
U.S. Cl. 297—447.2 **17 Claims**



6. A furniture product comprising:

a) a frame with front and rear legs supporting a seat frame, the front legs having leg portions extending upwardly above the seat frame;

b) a generally U-shaped back and arm rest frame fixed to and supported by the front and rear legs;

c) the seat frame being formed with inwardly extending, generally horizontal perimetrally positioned flange surfaces and perimetrally positioned vertical flange surfaces;

d) the back and arm rest frame being formed with inwardly extending, generally horizontal, upper flange portions and downwardly extending vertical flange portions generally aligned with said perimetrally positioned vertical flange surfaces of the seat frame;

e) a laterally compressed back shell component having a curvilinear back portion with forwardly extending side portions, the back portion and side portions being configured and vertically sized to span said downwardly extending flange portions of the back and arm rest frame and the said perimetrally positioned vertical flange surfaces of the seat frame, the back shell component being formed of a resilient plastic material with a plastic memory which seeks to return to uncompressed configuration and bears against the vertical flange surfaces of the seat frame, and the downwardly extending flange portions of the arm rest and back frame, and;

f) a seat member with a rigid perimetral frame part resting on the said generally horizontal flange surfaces of the seat frame and engaging the back and side portions of the back shell component.

5,690,389
PNEUMATIC, BALL-SHAPED CHAIR
June Ekman, 47 W. 28th St., New York, N.Y. 10001, and Laurence A. Wilson, R.R. 1, Box 55, Uniondale, Pa. 18470

Filed Sep. 9, 1996, Ser. No. 709,953
Int. Cl.^{6} A47C *3/00*
U.S. Cl. 297—452.41 **16 Claims**

1. A chair for allowing the spine of an individual to vertically adjust and activate the individual's trunk muscles, as the individual shifts position upon a seat support of said chair, comprising:

an inflatable shell forming a substantially spherical seat base upon which an individual can be seated, said inflatable shell being flexible for activating the individual's trunk muscles and allowing the seated individual's spine to adjust as said seated individual shifts position upon said spherical seat base;

support means for carrying said inflatable shell; and

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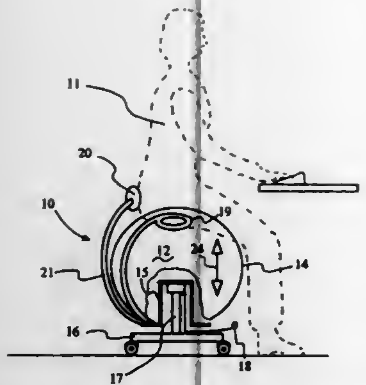


adjustment means disposed between said inflatable shell and said support means for adjusting a vertical position of said inflatable shell.

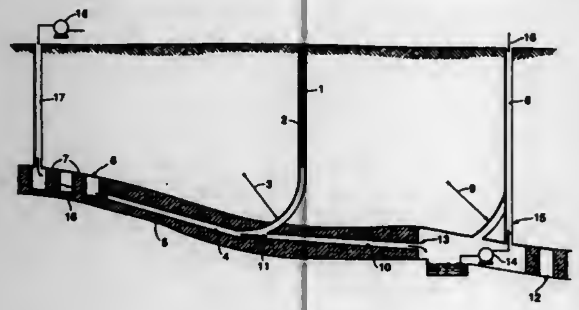
5,690,390
PROCESS FOR SOLUTION MINING UNDERGROUND EVAPORITE ORE FORMATIONS SUCH AS TRONA

Michael M. Bithell, Green River, Wyo., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 19, 1996, Ser. No. 635,135

Int. Cl.⁶ E21B *43/28*

U.S. Cl. 299—4 **5 Claims**



1. A process for solution mining isolated, mechanically mined-out areas of soluble evaporite ore to recover remaining ore reserves, wherein said mined-out areas are separated from an operational mine area by barrier pillars of said evaporite ore, comprising drilling at least one vertical well bore from the surface to a predetermined distance above the evaporite ore body, converting the drilling of said vertical well bore to a substantially horizontal well bore within the evaporite ore body at a predetermined distance below the ground level, continuing the drilling parallel to and within the evaporite ore body to form a well bore one end of which is connected to said mined-out area, developing a connection from the operating mine area to the other end of said well bore, drilling an injection well from the surface into said mined-out area, injecting an aqueous solvent into said injection well, passing the solvent into said mined-out area, removing solvent enriched in dissolved evaporite ore from said mined-out area, passing enriched solvent from said mined-out area into said well bore connecting said mined-out areas and the operational mined area, removing enriched solvent from the well bore end connected to the operational mine area and recovering the enriched solvent.

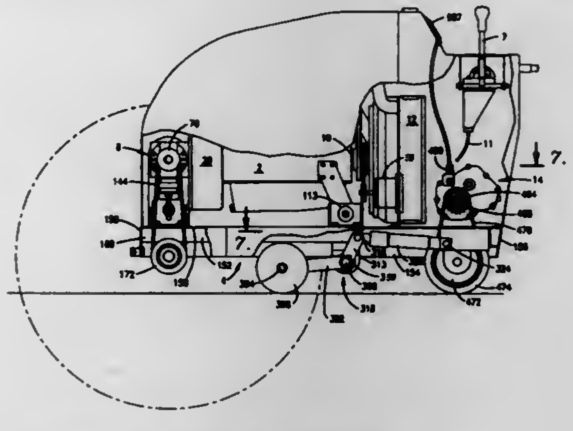
5,690,391
SELF PROPELLED SAW

Michael G. Kingsley, Independence; Kevin R. Wilson, Blue Springs, both of Mo., and Donald F. Meister, Overland Park, Kans., assignors to Diamant Boart, Inc., Kansas City, Mo.

Continuation of Ser. No. 370,374, Jan. 9, 1995, abandoned. This application May 31, 1996, Ser. No. 658,866

Int. Cl.⁶ E21C *25/16*

U.S. Cl. 299—39.3 **7 Claims**



1. A saw for cutting concrete comprising:

a frame having a longitudinal frame axis extending between front and rear ends of said frame and in a direction of a cut;

wheels connected to said frame to movably support the frame on the surface to be cut to permit the frame to be advanced in the direction of cut;

an engine mounted upon said frame and having a rotatable output shaft with a longitudinal axis extending parallel to said longitudinal frame axis;

a saw blade carried on a rotatable, horizontal blade shaft being fixedly mounted to said frame by first and second bearings connected to opposite sides of said frame to permit rotation of said blade shaft and saw blade about a blade axis perpendicular to said longitudinal frame axis whereby said blade shaft and saw blade are positioned in a fixed relation with said engine on said frame;

mechanical drive linkage means interconnecting the output shaft of said engine with said blade shaft to rotatably drive said blade shaft and saw blade, said mechanical drive linkage means including:

(a) a right angle gear box mounted to said frame and connected to said output shaft of said engine and to said blade shaft, for providing a right angle transfer of rotational driving forces from the engine output shaft to the saw blade, said right angle gear box including (i) a common rotational axle extending in a direction transverse to said longitudinal axis of said engine output shaft and having first and second ends, said common rotational axle connected intermediate said first and second ends thereof to said engine output shaft and (ii) first and second drive pulleys mounted respectively on said first and second ends of said common rotational axle, wherein at least one of said drive pulleys is driveably connected to said blade shaft,

(b) first and second blade pulleys mounted on said blade shaft outwardly from said first and second bearings on opposite sides of said frame, and

(c) first and second belts driveably linking said first and second drive pulleys of said gear box respectively to said first and second blade pulleys to provide even loading of said gear box rotational axle and said blade shaft; and

control means for controlling the rotational speed of said output shaft of said engine and the rotational speed of said blade shaft and saw blade.

5,690,392
WATER SUPPLY SYSTEM FOR A MINING MACHINE

William Stephan Clapham, Ecclesfield, England, assignor to Hydra Tools International PLC, S. Yorkshire, England

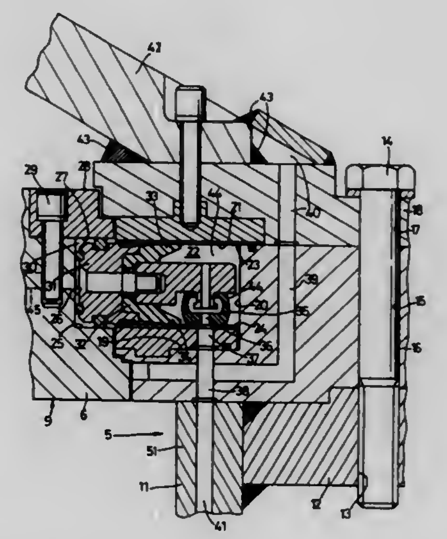
PCT No. PCT/GB94/02518, § 371 Date May 17, 1996, § 102(e) Date May 17, 1996, PCT Pub. No. WO95/14846, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 16, 1994, Ser. No. 648,172

Claims priority, application United Kingdom, Nov. 20, 1993, 9323945

Int. Cl.⁶ E21C *35/23*

U.S. Cl. 299—81.1 **28 Claims**



1. A water supply system (8) for a mining machine (1) of the continuous miner type, said system comprising:

(i) at least one rotatable mineral cutting drum (5) having a free end terminating in an end face ring (42);

(ii) at least one water supply arm (9) adapted, in use, to extend forwardly from said mining machine (1) to a portion of said cutting drum (5);

(iii) a circumferential water supply chamber (22) defined between said arm (9) and an operational portion (53,52) of said drum (5);

(iv) water sealing means (32) extending between said arm (9) and said drum (5) to minimize water leakage;

(v) a water delivery port (45) provided in said one water supply arm (9) for supplying water from a remote supply source to said drum (5); and

(vi) a water distribution network (39,40,41) of said drum (5) in water flow communication with said drum (5), characterized in that said water supply arm (9) is interposed between said free end of the drum (5) and said end face ring (42).

5,690,393
CUTTING TOOL RETENTION SYSTEM

Ted R. Massa, Latrobe, and Robert H. Montgomery, Jr., Everett, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

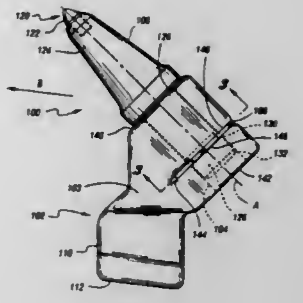
Filed May 1, 1996, Ser. No. 641,608

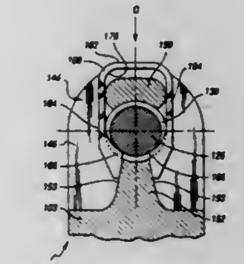
Int. Cl.⁶ E21C *35/197*

U.S. Cl. 299—107 **27 Claims**

20. A method for retaining a cutting tool having a tool recess in a support block having a block bore and a block recess intersecting the block bore, the method comprising:

movably situating a clip having a spring structure in the block recess such that the clip will be urged by the spring structure to protrude into the block bore and engage the tool recess of the cutting tool inserted into the block bore unless a force is applied directly to the clip so as to overcome the urging of the spring structure.





5,690,394
METHOD AND DEVICE FOR PROCESSING BRUSHES

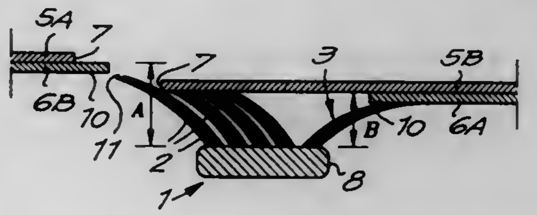
Bart G. Boucherie, Izegem., Belgium, assignor to Firma G.B. Boucherie, Izegem, Belgium

Filed Apr. 3, 1996, Ser. No. 627,034

Claims priority, application Belgium, Apr. 5, 1995, 09500313

Int. Cl.⁶ A46D *1/04*

U.S. Cl. 300—2 **23 Claims**



1. A method for processing fibre brushes wherein the fibres of the brushes extend lengthwise away from a brush body and are divided into at least two separated fibre fields and then separately treated within such fields, comprising the steps of:

bending the free ends of the fibres of at least one fibre field away from the free ends of the fibres of another fibre field using at least one movable displacement element that is advanced toward the one fibre field into engagement with the free ends of the fibres of said at least one fibre field;

retaining the bent fibre ends in bent condition by at least one auxiliary element;

withdrawing the at least one displacement element from engagement with the ends of the fibres of said at least one fibre field.

5,690,395
SHOPPING CART WHEEL ASSEMBLY WITH ANTI-FRICTION BEARING AND FRICTION BEARING

Jimmy L. Hicks, 3315 Hollow Creek Rd., Arlington, Tex. 76017

Filed May 24, 1996, Ser. No. 653,251

Int. Cl.⁶ B60B *27/00*

U.S. Cl. 301—105.1 **3 Claims**

1. A shopping cart wheel assembly having a hub supporting a tire portion, said hub having an axial opening surrounding an axle assembly and having a pair of outwardly facing outer bearing

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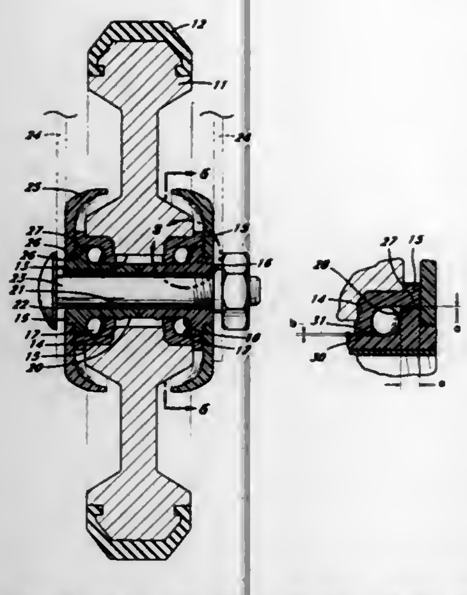
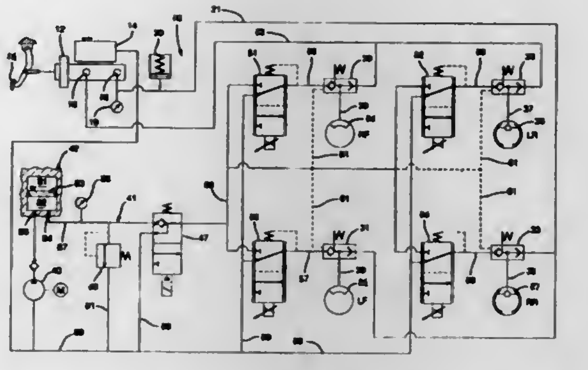


support cavities, each of said pair of outwardly facing outer bearing support cavities supporting a bearing assembly comprising:
- an outer bearing race member (15), said outer bearing race member (15) being held by said outer bearing support cavity (14), and having a curved ball bearing outer race surface (16) extending inwardly radially from said outer race surface to form an inner sleeve (30) and extending outwardly axially to form an outer sleeve (28);
- an inner bearing race member (19), said inner bearing race member (19) being held by said axle assembly (22,23), and having a curved ball bearing inner race surface (18) extending outwardly radially and outwardly axially from said inner race surface (18) to form an outer journal bearing surface (27) spaced an outer gap (a) distance from said outer sleeve and extending inwardly from said inner race surface (18) to form an inner journal (31) spaced an inner gap distance (b) from said inner sleeve (30) and as said race surfaces (16,18) wear, said outer sleeve (28) will contact said outer journal bearing surface (27) to form a journal bearing and upon further wear, said inner sleeve (30) will contact said inner journal bearing surface (31) to form an additional journal bearing; and
- a plurality of ball bearings positioned between said inner and outer race surfaces.

5,690,396
PROPORTIONAL FLUID PRESSURE REGULATION SYSTEM

Gary Lee Johnston, Pleasant Hill, Ohio; James William Zehnder, II, Huber Heights, Ohio; William Charles Kruckemeyer, Beaver Creek, Ohio; Richard Edward Longhouse, Dayton, Ohio, and Michael Leslie Oliver, Xenia, Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 20, 1996, Ser. No. 602,524
Int. Cl.^{6} B60T *13/74*
U.S. Cl. 303—3 **11 Claims**

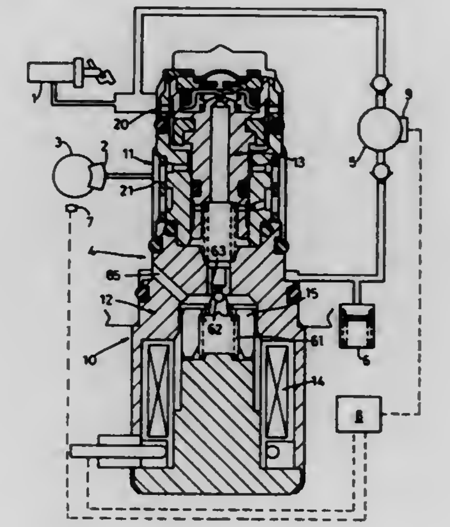
1. A fluid pressure regulation system comprising:
- a first pressure input line;
- a second pressure input line;
- a pressure output line alternately communicating with one of the first pressure input line and the second pressure input line;
- a shuttle valve having a first inlet port communicating with the first pressure input line, a second inlet port communicating with the second pressure input line and an outlet port communicating with the pressure output line;
- a proportional valve disposed in the second pressure input line having a modulated side port connected to the shuttle valve by a modulated segment of the second pressure input line, the proportional valve operable to effect a modulated fluid pressure level in the modulated segment of the second pressure input line between the proportional valve and the shuttle valve by increasing or decreasing the modulated fluid pressure level proportionally, in response to selected control factors;



- wherein the pressure output line is normally in communication with the first pressure input line through the shuttle valve and is simultaneously selectively isolated from the first pressure input line by the shuttle valve and placed in communication with the second pressure input line by the shuttle valve;
- a wheel brake wherein the wheel brake is directly connected through the pressure output line to the outlet port of the shuttle valve;
- a brake master cylinder disposed in the first pressure input line operable to pressurize the first pressure input line with a manually actuated pressure and further comprising a pressure transducer disposed in the first pressure input line wherein the brake master cylinder is normally in open fluid communication with the pressure output line through the shuttle valve;
- wherein the shuttle valve includes a moving shuttle and a spring biasing the moving shuttle to a normal position so that the master cylinder is normally in open fluid communication with the pressure output line through the shuttle valve and wherein the shuttle valve includes a pilot chamber in continuous open fluid communication with the second pressure input line, wherein when the pressure charge effected by the pump is communicated through the second pressure input line to the pilot chamber the moving shuttle of the shuttle valve is moved compressing the spring and closing off fluid communication between the brake master cylinder and the pressure output line through the shuttle valve and simultaneously, open fluid communication is effected between the second pressure input line and the pressure output line through the shuttle valve so that the pressure charge effected by the pump is transmitted to the pressure output line and therethrough to the wheel brake;
- and including a discharge valve disposed in the second pressure input line between the accumulator and the proportional valve delimiting the charged side of the second pressure input line to that portion between the pump and the discharge valve and separating a pressure rail side of the second pressure input line from the charged side of the second pressure input line the pressure rail side providing continuously open fluid communication between the discharge valve and the proportional valve and between the discharge valve and the pilot chamber of the shuttle valve, the discharge valve having a charged side port connected to the charged side of the second pressure input line, a pressure rail side port connected to the pressure rail side of the second pressure input line and a return system port, the discharge valve normally separating the charged side of the second pressure input line from the pressure rail side of the second pressure input line and normally providing open fluid communication between the pressure rail side of the second pressure input line and the return system port wherein the pressure rail side is discharged therethrough so that the pilot chamber of the shuttle valve is normally discharged ensuring that the brake master cylinder is normally in open fluid communication with the pressure output line through the shuttle valve.

5,690,397
SOLENOID-OPERATED FLUID FLOW CONTROL VALVES

John Patrick Bayliss, Worcestershire, and Ivan Mortimer, West Midlands, both of England, assignors to Lucas Industries Public Limited Company, England
Continuation of Ser. No. 343,328, Nov. 21, 1994, abandoned. This application Oct. 9, 1996, Ser. No. 727,286
Claims priority, application United Kingdom, Nov. 27, 1993, 9324408
Int. Cl.^{6} G60T *8/36*
U.S. Cl. 303—119.2 **17 Claims**

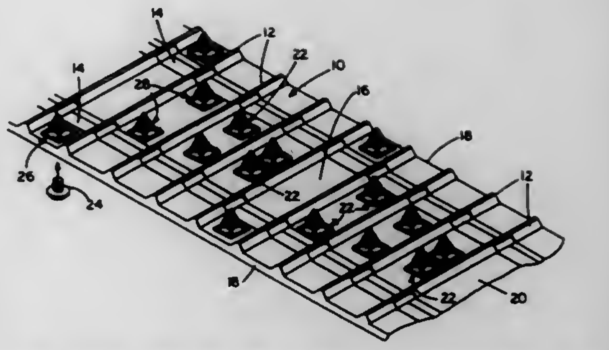


1. A solenoid-operated flow control valve comprising a housing having a bore, a solenoid coil, an armature, an inlet and an outlet, means defining a permanent communication between said inlet and said outlet, said means comprising a first and a second flow path connected in parallel between said inlet and said outlet, said first flow path being closable and said second flow path providing a variable permanent communication between said inlet and said outlet, an exhaust, a seating and a valve assembly including a hollow valve body working in said bore, said armature being responsive to said coil to open said exhaust to create a pressure differential across said valve body, said pressure differential in turn causing said valve body to move in said bore so as to co-operate with said seating, whereby said valve body provides selective communication between said inlet, outlet and exhaust, and whereby upon deenergisation of said coil said flow control valve controls the rate of reapplication of pressure to said outlet.

5,690,398
SNOWMOBILE TRACTION POINT

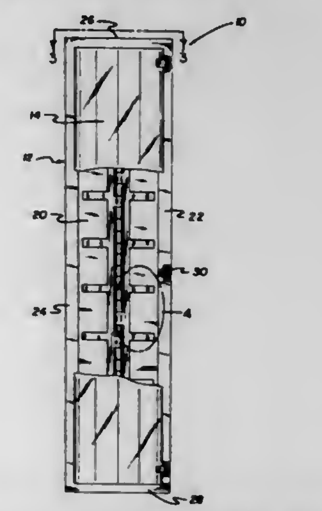
Ralph G. Pribyl, Maple Lake, Minn., assignor to Bottom Line Traction Products, Inc., Maple Lake, Minn.
Filed Jul. 30, 1996, Ser. No. 688,330
Int. Cl.^{6} B62D *55/28*
U.S. Cl. 305—162 **19 Claims**

1. An apparatus for increasing the traction capability of a track driven vehicle comprising:
- a traction point having a base, a central hub extending from the base and a portion forming an outer end point;
- a fastener comprising a threaded shank and a head having a countersunk tapered portion between an outer surface of the head and the threaded shank;
- the central hub having a threaded bore for receiving the threaded shank of the fastener for tightening and clamping a resilient member between the head and the base, said base having a recess for permitting the member to be clamped to deflect into said recess when the traction point is tightened onto said threaded shank.



5,690,399
COMPACT DISK STROAGE CABINET

Randal H. Davis, 121 Bortondale Rd., Media, Pa. 19063
Filed Apr. 5, 1996, Ser. No. 630,924
Int. Cl.^{6} A47B *81/06*
U.S. Cl. 312—9.58 **1 Claim**



1. A new and improved compact disk storage cabinet apparatus adapted for use in association with single and double compact disk cases, the apparatus comprising, in combination:
- an outer shell formed in the configuration of a hollow box with a rear wall, a first side wall, a second side wall, a roof and a floor, the roof and floor of the outer shell each including at least two cylindrical peg bores extending therein, at least two cylindrical shaped elastomeric pegs being included with the apparatus and positionable within the peg bores to permit stacking of one cabinet on top of another, each side wall having a front edge, a transparent door formed in a curved configuration, the door having a first vertical side edge coupled to the front edge of the first side wall of the outer shell by a plurality of pivotable hinges, the door being curved outwardly with respect to the rear wall of the outer shell;
- a central shaft formed in an elongated generally cylindrical configuration with an upper end and a lower end, the upper end of the shaft being releasably coupled to the approximate center point of the roof of the outer shell, the lower end of the central shaft being releasably coupled to the approximate center point of the floor of the outer shell; and
- twelve compact disk carrier racks each comprising a vertical member and a plurality of perpendicularly extending horizontal arms, each vertical member including side walls, each vertical member having an outer surface including a centrally positioned guide slot, each horizontally extending arm having an upper surface and a lower surface, the upper and lower surfaces each including a centrally positioned guide slot, each

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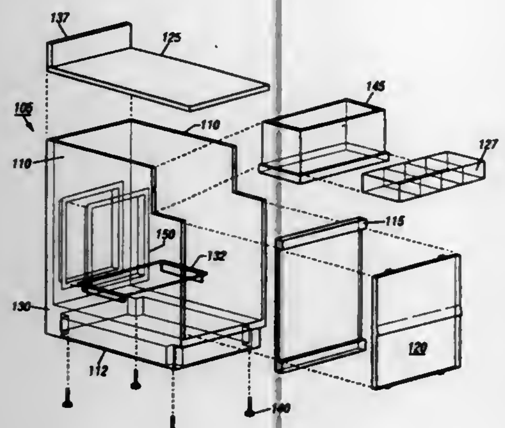
arm including side walls extending above and below the upper and lower surfaces, the lower surface, upper surface and vertical member between adjacent arms defining individual compact disk carrier units, a plurality of removable center dividers being formed in a generally C-shaped configuration, the center dividers being slidably positionable within the guide slots of individual compact disk carrier units, with one of the center dividers positioned within one of the units two separate compact disk cases being positionable within the unit, absent the center divider a double compact disk case being positionable within the unit, each vertical member having an inner surface including at least one generally circular shaped hinge extending therefrom, the hinges adapted to be coupled to the central shaft of the apparatus, the twelve racks being positioned in a circumferential orientation around the central shaft rotatably mounted to the hinges of each rack, the hinges being positioned in different locations to permit stacked positioning of the hinges one above another.

5,690,400

CABINET ASSEMBLY COMPRISING MULTIPLE IDENTICAL MOLDED CABINET UNITS

John Frederick Tryon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 473,686, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 435,052, May 8, 1995.
This application Sep. 25, 1995, Ser. No. 533,418
Int. Cl.^{6} A47B *81/00*
U.S. Cl. 312—107 **1 Claim**



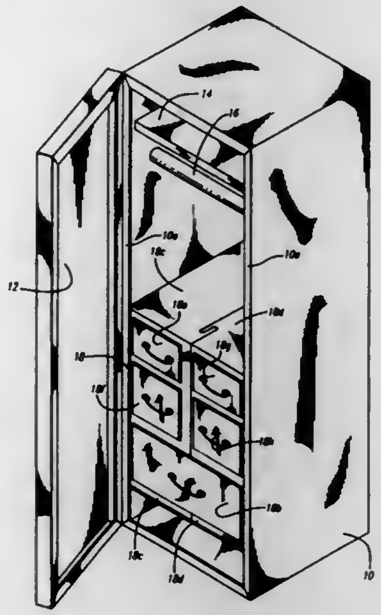
1. A cabinet assembly comprising:
a plurality of molded cabinet units joined side by side, and wherein each of said cabinet units comprises
  a plurality of polymeric surfaces molded in a unitary construction, said plurality of said surfaces consisting of one bottom surface, one back wall and two side walls; and
  a top panel fixedly attached to the top edges of said back and side walls of at least one of said cabinet units to thereby define a hollow bounded by said top panel and said bottom surface, said back wall, and said two side walls of said cabinet unit;
  wherein said two side walls of said at least one of said cabinet units includes matching L-shaped notches in the top front edges of said two side walls and wherein said matching L-shaped notches are adapted to engage with a removable plug-in unit; and
  wherein said removable plug-in unit comprises L-shaped flat surfaces which are adapted to engage with said matching L-shaped notches and thereby close the opening formed between said notches.

5,690,401

LOCKER DRESSER

Randolph C. Franklin, 4117 Woodlawn Ave., Los Angeles, Calif. 90011

Filed Sep. 24, 1996, Ser. No. 719,125
Int. Cl.^{6} A47B *87/00*
U.S. Cl. 312—107 **4 Claims**



1. In combination, a dresser and a clothing locker, said clothing locker having a particular internal width and a particular internal height, said dresser comprising a pair of separate units, a single sliding lower drawer mounted said units, and each of said units having a front, a bottom, a top, first and second sides, and a rectangular shape, and said units being dimensioned to be fitted together to form an assembly having an overall width corresponding to the internal width of the locker and an overall height substantially less than the internal height of the locker, said units being supported in side-by-side relationship to have facing sides and also to have an overall width corresponding to the internal width of said locker, and the facing sides of said units being shaped to form mating latches to cause said units to be interlocked to one another as one of the units is moved down into side-by-side relationship with the other of the units.

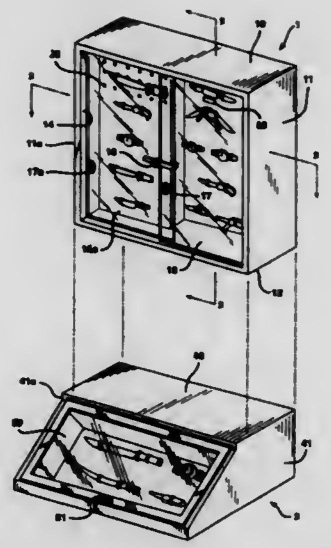
5,690,402

PRODUCT DISPLAY CASE

Rudolf Koppe, 1251 Britannia Rd., Campbellville, Ontario L0P 1B0, Canada

Filed Mar. 22, 1996, Ser. No. 622,452
Int. Cl.^{6} A47F *3/06*
U.S. Cl. 312—128 **18 Claims**

1. A rectilinear display case having a generally vertically arranged rear wall, opposing side walls, top wall, bottom wall and front opening opposite said rear wall, said case having a plurality of horizontally arranged stacked shelves, spaced upwardly adjacent said rear wall and mounted at opposite ends to said opposing side walls;
  said case having at about said front opening, spaced apart generally parallel, generally transparent door panels, arranged slidably mounted in said case in an arrangement which enables selective access through left and right sides of said front opening to an interior of said case, and a plurality of spaced apart, generally parallel display panels, arranged in the interior of said case positioned in front of said stacked shelves so as to conceal said shelves, each panel being roller mounted for slidable movement from a first position at one side of the interior of said case to a second position at another side of said interior of said case, said panels comprising means for mounting a display item thereto.

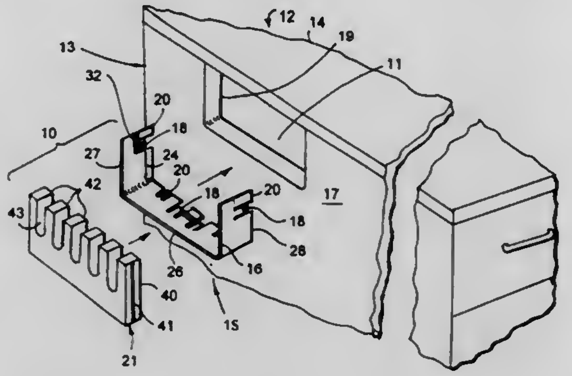


5,690,403

INSERT FOR FILLING UTILITY ACCESS OPENING IN FURNITURE PANEL

Samuel J. Ellison, Grand Rapids, and Daniel N. Siegrist, Grand Blanc, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Oct. 23, 1995, Ser. No. 553,813
Int. Cl.^{6} A47B *77/08*
U.S. Cl. 312—223.6 **16 Claims**



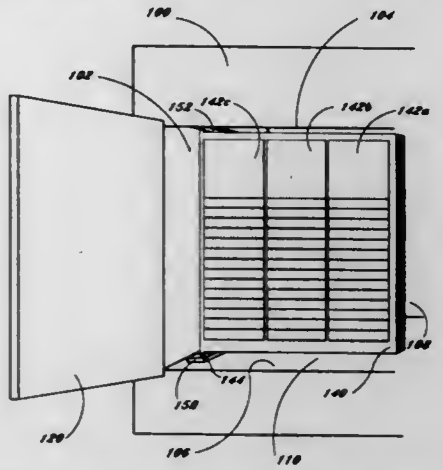
1. An insert that can be used to selectively fill a utility access opening in furniture where the access opening is formed in a panel in the furniture, the panel having a first surface and an opposing surface, the surfaces defining a predetermined thickness that is one of a first thickness dimension and a second thickness dimension greater than the first thickness dimension, comprising:
  a sleeve having a stop for engaging the first surface on the panel and further having first retainers configured to frictionally interlockingly engage the opposing surface in opposition to the stop when the panel defines the first thickness dimension and still further having second retainers configured to frictionally interlockingly engage the opposing surface in opposition to the stop when the panel defines the second thickness dimension, whereby the sleeve can be selectively interlockingly engaged with a panel having either the first or second thickness dimension, said sleeve being U-shaped and including end wall sections defining the U-shape that are non-parallel and slightly outwardly deformed when in an unstressed condition.

5,690,404

HIDDEN PHOTOGRAPH STORAGE DEVICE

William Keller, 10194 Dover Carriage La., Lake Worth, Fla. 33467

Filed Nov. 7, 1995, Ser. No. 554,762
Int. Cl.^{6} A47B *88/00*
U.S. Cl. 312—310 **14 Claims**



1. A hidden photographic storage and display device comprising:
a plurality of photographic storage sheets, each of said sheets having a plurality of photographic insert sleeve members disposed thereon, each of said photographic sleeve members capable of storing at least one photograph;
means for housing said photographic storage sheets, said means for housing including a cover member, said means for housing concealing said plurality of photographic storage sheets and any photographs disposed within an associated photographic insert sleeve member when said cover member is in a closed position;
said cover member having an outer appearance of a decorative element, said device providing an outer appearance of a decorative element as well as providing a hidden storage area for the plurality of photographs when said cover member is in a closed position;
means for pivoting said plurality of photographic sheets out of said means for housing;
means for preventing said means for pivoting from moving;
wherein said means for preventing comprises a recess disposed within said means for housing and a peg member, a portion of said peg member disposed within said recess to prevent said means for pivoting from moving, said peg member being removed when it is desired to move said means for pivoting.

5,690,405

CONNECTING BRACE FOR FIXING THE RAIL OF A DRAWER TO A REAR WALL OR A SIDE WALL OF THE DRAWER

Edgar Huber, Hard, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Continuation of Ser. No. 587,987, Jan. 17, 1996, abandoned.
This application Jan. 17, 1997, Ser. No. 786,100
Claims priority, application Austria, Jan. 24, 1995, GM36/95 UM
Int. Cl.^{6} A47B *88/00*
U.S. Cl. 312—348.2 **11 Claims**

1. A connecting fitting for fastening a rear end of a rail of a drawer to a rear wall or side wall of the drawer, said fitting comprising:
  a supporting component in the form of a plate extending in a plane and having a leading edge, an open slot formed in said plate and extending from said leading edge in said plane, said slot opening through said plate in opposite directions transverse to said plane, and said supporting component having a support edge spaced from said slot; and

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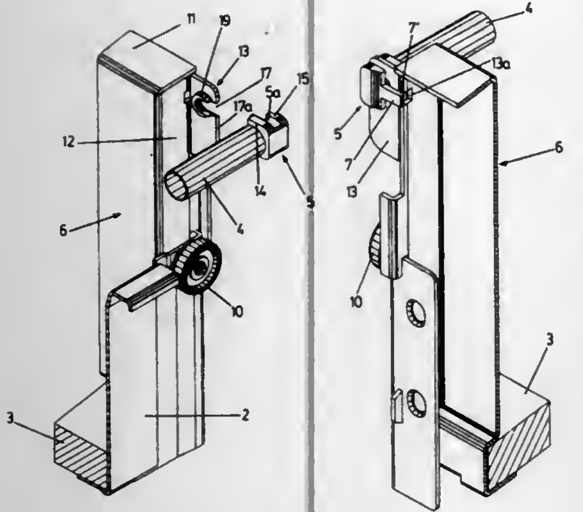


a fixing component including a first portion extending in an axial direction transverse to said plane and to be attached to the rear end of the rail, a second portion integral with said first portion and spaced axially thereof, said second portion being configured to be pushed into said slot to a position whereat said fixing component is hung on said supporting component, and a hook portion integral with said first and second portions and spaced axially therefrom, said hook portion extending transversely of said axial direction and parallel to said plane, said resilient hook portion having a free end having a hook extending transverse to said plane and operable to snap behind said support edge of said supporting component to thus retain said fixing component in said position.

5,690,406
CONTROL METHOD FOR MICROFILM IMAGE READER

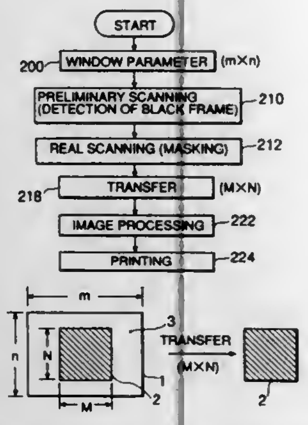
Takao Furukawa, Tokyo, and Michinori Hashimoto, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1996, Ser. No. 668,824

Claims priority, application Japan, Jun. 23, 1995, 7-179652

Int. Cl.^{6} G03B ***21/14***

U.S. Cl. 353—25 **4 Claims**



1. A control method for a microfilm image reader, in which a scanner with a line sensor reads an image in a retrieved frame specified by a command fed from a host computer and transfers image data of the read image to the host computer, comprising the steps of:

outputting a window parameter containing a range of reading area from said host computer to said scanner;

detecting by said scanner only an image area from all the reading area specified by the window parameter; and

transferring image data of the detected image area from said scanner to said host computer together with attribute information containing the size of the image area.

5,690,407
SHUTTER FOR DISPLAY DEVICE OF PROJECTION TYPE

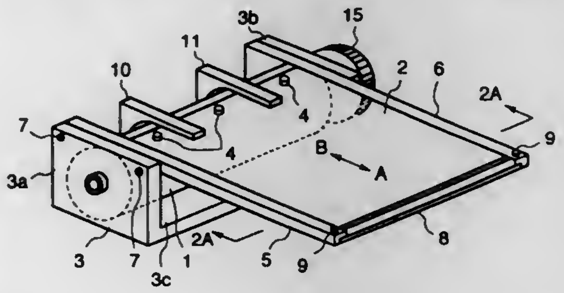
Nobuyuki Kikuchi, Tochigi-ken; Yoshiro Oikawa, Toyko, and Tetsuo Hattori, Yokohama, all of Japan, assignors to Nikon Corporation, Toyko, Japan

Filed May 29, 1996, Ser. No. 654,555

Claims priority, application Japan, Dec. 13, 1995, 7-346825

Int. Cl.^{6} G03B ***21/14***

U.S. Cl. 353—88 **10 Claims**



1. A shutter for a display device of the projection type comprising:

a cylindrical take-up member rotatable about the central shaft thereof; and

a thin board member having one end portion thereof fixed to the outer surface of said take-up member and deformable into a state rolled on the outer peripheral surface of said take-up member and having a spring force for returning to a flat state;

said thin board member being capable of operating between a liberating position in which in conformity with the rotated position of said take-up member, it is rolled onto said take-up member and retracts from a predetermined optical path to thereby permit the passage of light in said optical path and an intercepting position in which it is unrolled from said take-up member and assumes a flat shape and protrudes into said predetermined optical path to thereby intercept the light.

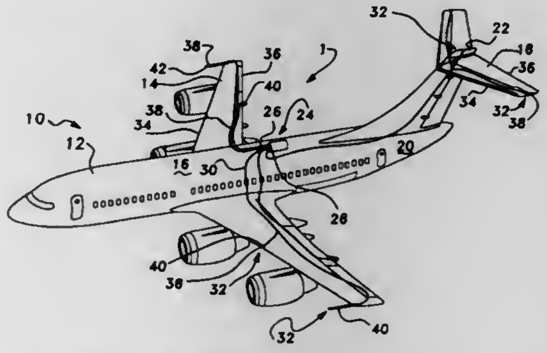
5,690,408
FIBER OPTIC BASED LIGHTING FOR AIRCRAFT

Alex T. de la Peña, San Diego, and Carl A. Mentzer, Poway, both of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Sep. 23, 1996, Ser. No. 717,564

Int. Cl.^{6} B60Q ***1/24***

U.S. Cl. 362—32 **23 Claims**



1. A lighting system comprising:

a light source within an aircraft having a plurality of wings;

a concentrator operably coupled to said light source for directing light generated therefrom towards an exit end of said concentrator;

a fiber optic bundle having a proximal end secured to said exit end for receiving said light therein;

a plurality of sub-bundles diverging from said fiber optic bundle for transporting said light to a plurality of locations; and

a plurality of emitters operably coupled to said plurality of sub-bundles to receive said light, said emitters being disposed about a periphery of said aircraft.

5,690,409
HEADLIGHT FOR VEHICLES

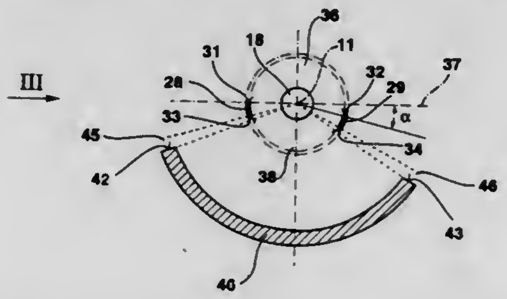
Doris Boebel, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 16, 1996, Ser. No. 586,068

Claims priority, application Germany, Mar. 10, 1995, 195 08 639.2

Int. Cl.^{6} B60Q ***1/04***

U.S. Cl. 362—61 **6 Claims**



1. A headlight for vehicles, comprising a light source; a reflector; a screening device associated with said light source for screening a part of light emitted by said light source and producing a bright-dark limit of a light beam exiting the headlight, said screening device having at least one light impermeable web arranged at each side of an optical axis and extending along the optical axis of said reflector and also extending over a part of a periphery of said light source, said webs having upper edges and lower edges, said upper edges of said webs being arranged so that an opening is provided between said upper edges of said webs so that the light emitted by said light source and reflected by an upper region of said reflector forms a light beam having said bright-dark limit, said screening device also having a light-impermeable cap which is arranged additionally to said webs underneath said light source and extends over part of the periphery of said light source, said cap having upper edges arranged so that an additional opening is provided between each of said upper edges of said cap and said lower edges of said webs so that the light is formed by said light source can pass through said additional opening and is reflected by a lower region of said reflector so as to form an additional light beam extending at a distance above said bright-dark limit.

5,690,410
LIGHT DEVICE FOR A BICYCLE

Tzu-Lung Lin, P.O. Box 53-8, Taichung, Taiwan

Filed Oct. 23, 1995, Ser. No. 553,774

Int. Cl.^{6} F21V ***33/00***

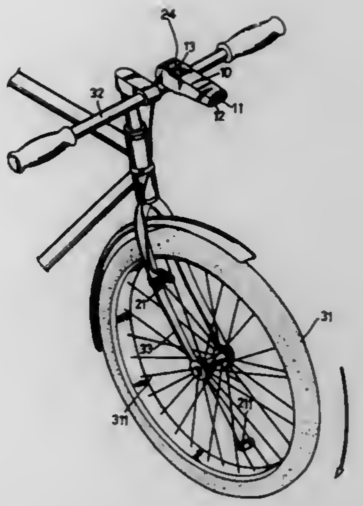
U.S. Cl. 362—72 **2 Claims**

1. A light device for a bicycle, the bicycle including a fork having a wheel rotatably secured thereto, said light device comprising:

a sensor for securing to the fork of the bicycle,

an inducing block for securing to the wheel of the bicycle and for moving past said sensor so as to actuate said sensor,

a housing for securing to the bicycle,



a microprocessor secured in said housing and coupled to said sensor,

a displayer coupled to said microprocessor for displaying a speed of the bicycle, and

a light bulb means coupled to said microprocessor so as to be energized when said inducing block moves past said sensor, said light bulb means including two light bulbs of different wattages, and said light device further including two transistors coupled between said light bulbs and said microprocessor respectively for controlling said light bulbs.

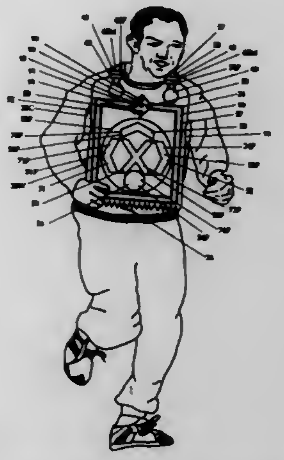
5,690,411
WEARABLE VEHICULAR SIGNALING SYSTEM ADAPTED AND AUGMENTED FOR WEARING ON OR ABOUT THE BODY OF A PERSON

Vernon L. Jackman, 30 Center St., Little Ferry, N.J. 07643-1803

Filed Apr. 25, 1996, Ser. No. 637,542

Int. Cl.^{6} F21L ***15/08***

U.S. Cl. 362—103 **24 Claims**



1. A wearable vehicular signaling system adapted and augmented for wearing on or about the body of a person comprising, in part, direction signaling means wherein:

(a) said direction signaling means can be shaped, powered, actuated, and controlled to communicate and signal an intention to commence, continue, or resume forward motion; to turn or bear to the right; to turn or bear to the left; to cross the roadway or highway; or to stop; and

(b) said direction signaling means is securable to a garment or other means for wearing on or about the body of a person.

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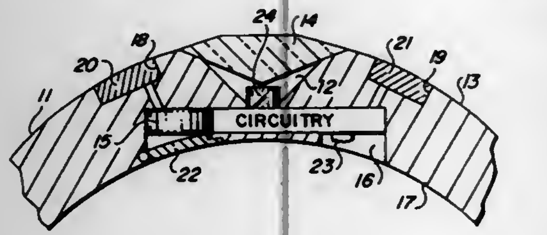
5,690,412
SOLAR ILLUMINATED JEWELRY

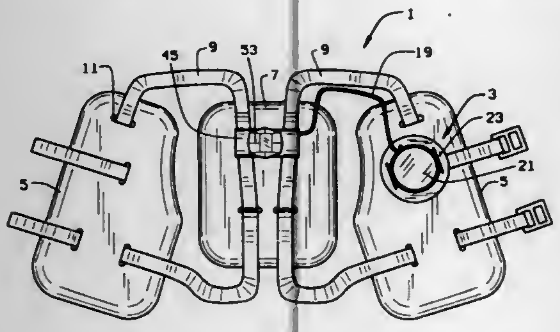
Joseph M. Sheldon, Sedona, Ariz., assignor to Said M. Sekandari, Sedona, Ariz., a part interest
Filed Jul. 1, 1996, Ser. No. 673,537
Int. Cl.^{6} F21L *15/08*
U.S. Cl. 362—104 **4 Claims**



1. An ornamental article utilizing a miniature battery as a source of electrical power for illumination of a gem stone mounted therein comprising:
- a casing providing a first opening in one side thereof,
- a gem stone mounted in said first opening,
- said casing defining a second opening in another side thereof for receiving a battery means,
- said battery means comprising an electric bulb energized by said battery means for illuminating said gem stone by passing light therethrough,
- solar means comprising at least one solar cell mounted in the outer periphery of said casing for receiving solar rays from the sun, and
- switch means mounted in said second opening for selectively connecting said solar cell to said battery means for charging thereof and to said bulb for illumination thereof.

5,690,413
SAFETY LIGHT FOR MARINE VEST

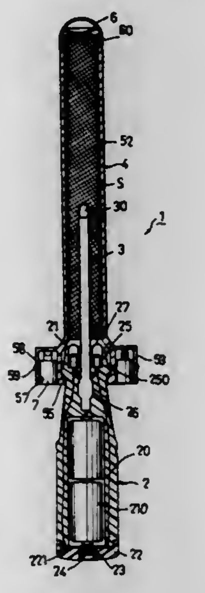
James Coughlin, R.R. 1-Box 84, Hardin, Ill. 62047
Filed Feb. 27, 1996, Ser. No. 607,717
Int. Cl.^{6} F21L *15/08;* **B63C** *9/08;9/20*
U.S. Cl. 362—108 **20 Claims**



1. In combination, a marine safety vest and a safety light which is removably mounted to the safety vest; the safety vest including a back panel and two front panels, each of said panels having a first side and a second side and at least one slot formed therein, said panels being connected by straps which are threaded through said slots; said safety light including:
- a first plate positioned against said first side of a selected one of said front panels; said first plate including a front surface, a back surface, and a first post extending from said back surface of said first plate, said first post extending through a slot of said selected front panel;
- a lamp mounted on said front surface of said first plate;
- a securing member including a second plate having a front surface, a back surface, and a second post extending from said back surface of said second plate through said slot of said selected front panel, said first and second posts mating with each other to mount said safety light to said vest; and
- a battery pack assembly electrically connected to said lamp.

5,690,414
SCREW DRIVER ADAPTED FOR USE AS A SIGNALING DEVICE

Jong-Pyng Jeng, No. 9-1, Ting-Nan, Ying-Chuan Li, Huwei Chen, Yunlin Hsien, Taiwan
Filed Dec. 3, 1996, Ser. No. 781,937
Int. Cl.^{6} B25B *23/18*
U.S. Cl. 362—120 **6 Claims**

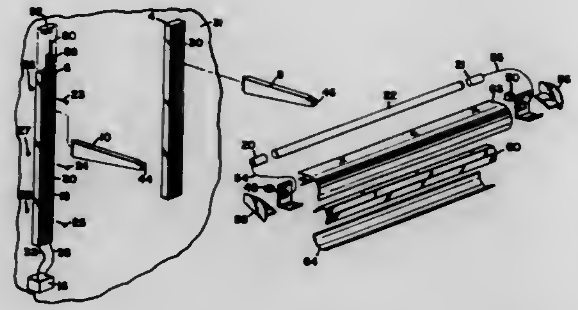


1. A screw driver comprising:
- a handle body having a front end portion with an end surface, and an illuminating unit mounted on said front end portion at said end surface, said handle body confining a compartment for receiving a cell unit therein, said handle body being provided with a switch unit that is adapted to connect electrically said cell unit to said illuminating unit;
- a shank mounted on said handle body and extending from said end surface of said front end portion of said handle body; and
- a light transmittable tubular member having a rear end mounted detachably on said front end portion of said handle body around said end surface of said front end portion, said tubular member being capable of transmitting light generated from said illuminating unit to an exterior of said tubular member so as to achieve a signaling effect.

5,690,415
DISPLAY LIGHT

Edward F. Krehl, Eagan, Minn., assignor to Stylmark, Inc., Minneapolis, Minn.
Filed Nov. 29, 1995, Ser. No. 564,436
Int. Cl.^{6} A47F *11/10*
U.S. Cl. 362—125 **26 Claims**

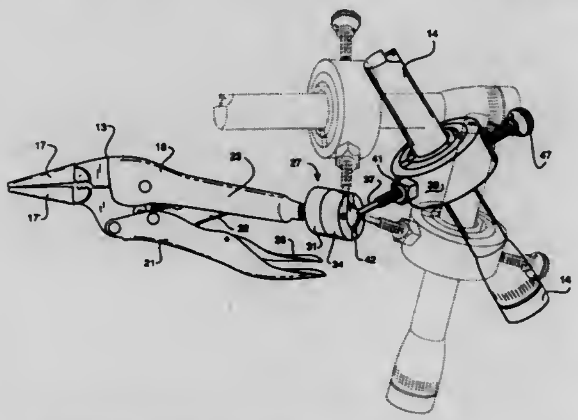
1. A modular lighted shelf apparatus for displaying merchandise and the like, said modular lamped shelf apparatus comprising:
- a) a first vertical track,
- b) a second vertical track,
- c) an electrical bus carried by said second vertical track,
- d) a first bracket having a first and second end,
- e) a second bracket having a first and second end,
- f) a means for operatively connecting said first end of said first bracket to said first vertical track,



- g) a means for operatively connecting said first end of said second bracket to said second vertical track,
- h) an electrical path having a first end at said first end of said second bracket and second end at said second end of said second bracket, whereby said electrical path transfers electrical energy from said first end to said second end of said electrical path,
- i) a means for operatively connecting said first end of said electrical path to said electrical bus,
- j) a lamp housing having a first and second end, and a lamp socket,
- k) a means for operatively connecting said first end of said lamp housing to said second end of said first bracket,
- l) a means for operatively connecting said second end of said lamp housing to said second end of said second bracket,
- m) a means for electrically connecting said lamp socket to said second end of said electrical path.

5,690,416
HOLDER ADJUSTABLE TO HOLD A FLASHLIGHT SELECTED FROM A GROUP OF DIFFERENTLY SIZED FLASHLIGHTS

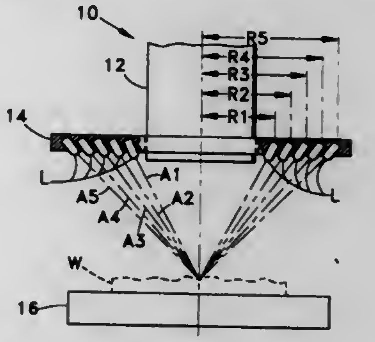
Jan Van Gennep, 715 Laural Ave., Menlo Park, Calif. 94025
Filed Jan. 11, 1996, Ser. No. 585,377
Int. Cl.^{6} F21L *7/00*
U.S. Cl. 362—191 **10 Claims**



1. An interface unit for securing a connector for an instrumentality to a gripping device of the type providing a parality of locked, set positions for locking to differing structures, comprising:
- A. A first housing portion for encompassing a projection for said gripping device;
- B. An orientation change mechanism for said instrumentality secured rigidly to said housing to facilitate changing the orientation relative to said gripping device of an instrumentality held by said connector, said mechanism comprising a second housing portion, and
- C. A fastener for varying the resistance to orientation change provided by said orientation change mechanism, said fastener connecting said first and second housing portions together.

5,690,417
SURFACE ILLUMINATOR WITH MEANS FOR ADJUSTING ORIENTATION AND INCLINATION OF INCIDENT ILLUMINATION

Edward T. Polidor, Webster; Albert G. Choate, Rush, and Terry L. Herbeck, Rochester, all of N.Y., assignors to Optical Gaging Products, Inc., Rochester, N.Y.
Filed May 13, 1996, Ser. No. 645,382
Int. Cl.^{6} F21V *5/00*
U.S. Cl. 362—244 **9 Claims**

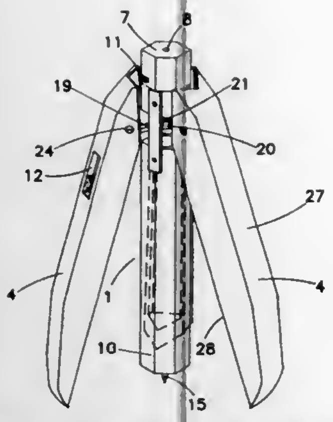


1. A surface illuminator, comprising
- a first housing having therein an axial bore containing means for projecting through said bore the image of an object located in a predetermined position beyond one end of said first housing,
- a second housing surrounding said first housing and having an open end disposed coaxially of and adjacent to said one end of said first housing
- a plurality of collimated light sources each having a light emitting end,
- said light sources being mounted in said second housing in spaced relation to each other, and with said light emitting ends thereof disposed in radially spaced circular arrays surrounding said first housing coaxially of said bore, and lying in a common plane extending normal to the axis of said bore, each of said sources being operative, when energized, to direct a beam of light substantially parallel to said axis and toward the open end of said second housing,
- a Fresnel lens mounted in said open end of said second housing in confronting relation to the light emitting ends of said light sources whereby the light beams from said sources pass through said Fresnel lens and are thereby redirected toward and focused onto said object in said predetermined position, and
- control means for selectively energizing said light sources, thereby to control the amount and orientation of the illumination directed by said Fresnal lens onto said object.

5,690,418
MULTIPURPOSE LASER POINTER

Bear Hsiung, 5F, No. 30, Lane 179, Sec. 2, Nei-Hu Rd., Taipei, Taiwan
Filed Aug. 16, 1996, Ser. No. 689,720
Int. Cl.^{6} F21L *15/08*
U.S. Cl. 362—259 **1 Claim**

1. A laser pointer comprising:
- a laser module case shaped as a hexagonal prism, having a top side, a bottom side, and a laser beam outlet at the center of the top side;
- an on/off switch mounted on said laser module case on the outside;
- a laser module mounted inside said laser module case, having a laser firing hole disposed in alignment with the laser beam outlet of said laser module case, and controlled by said on/off switch to project a laser beam out of said laser firing hole and said laser beam outlet;
- a battery case shaped as a hexagonal prism longitudinally spaced from and connected to said laser module case by connecting



plates, said battery case comprising a battery set on the inside electrically connected to said laser module through said switch, a closed top side, a threaded bottom opening, a screw cap threaded into said threaded bottom opening, and a point downwardly vertically raised from said screw cap;

a rack having a center supported between the bottom side of said laser module case and the top side of said battery case, said rack having a center block supported on the top side of said battery case at the center, a conical tip raised from said center block on which the bottom side of said laser module case is supported, and three equiangularly spaced supporting rods radially raised from said center block and projecting over the periphery of said laser module case and said battery case;

three legs respectively pivoted to the supporting rods of said rack outside said laser module case and said battery case, each of said legs having a longitudinal outer plane and a longitudinal inner plane, the longitudinal outer planes of said legs being disposed in parallel to the laser beam of said laser module when the longitudinal planes thereof are closely attached to the periphery of said battery case; and

a level mounted on one of said legs in parallel to the corresponding longitudinal outer plane for determining, or adjusting a surface to, an even horizontal plane.

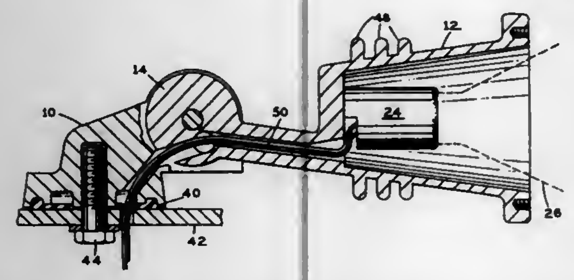
5,690,419
OPTICAL REFLECTOR MOUNTING ASSEMBLY

Steven L. Siems, 1491 SW. 21st Ave., Fort Lauderdale, Fla. 33314

Filed Mar. 26, 1996, Ser. No. 621,907

Int. Cl.^{6} F21V *21/26*

U.S. Cl. 362—269 **10 Claims**



1. An optical reflector mounting assembly for mounting a reflector and a flood lamp on a crossarm, comprising:

a base;

means for sealingly mounting said base on said cross-arm;

a light socket for receiving a flood lamp;

a mounting socket for holding said light socket;

means on the outside of said mounting socket for dissipating heat;

and means for pivotally mounting said mounting socket on said base for pivotal movement of said mounting socket and said light socket relative to said base, said mounting socket having means for mounting reflectors of different types, and said means for mounting reflectors comprising bolts.

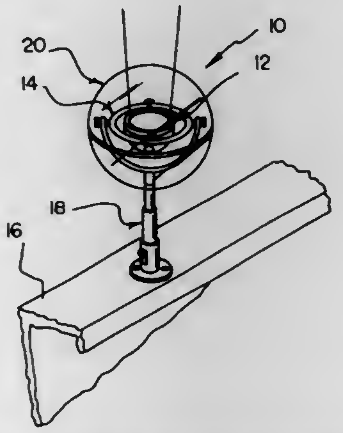
5,690,420
UPWARDLY PROJECTING INDICATOR LIGHT

Andres B. Saldana, Sr., P.O. Box 201, Ontario, Calif. 91762

Filed Jan. 19, 1996, Ser. No. 591,423

Int. Cl.^{6} F21V *21/28*

U.S. Cl. 362—275 **15 Claims**



1. An upwardly projecting indicator light comprising: a spotlight for creating a directed beam of illumination;

a gimbal securable to a support surface, the spotlight being supported within the gimbal such that the spotlight projects the directed beam of illumination vertically upwardly regardless of an orientation of the support surface;

a mounting means for mounting the gimbal relative to the support surface;

a transparent enclosure secured to the mounting means and enclosing both the gimbal and the supported spotlight; and

the spotlight having a parabolic reflector housing having a light bulb mounted centrally therewithin; and a spotlight lens extending across an open upper end of the parabolic reflector housing so as to enclose the light hulb therewithin.

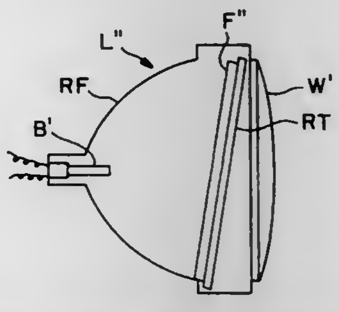
5,690,421
DISPLAY LIGHTING WITH MATCHED NARROW BAND FILTER AND LIGHT SOURCE

Michael Joseph Shea, Salem; Jakob Maya, Brookline, and John Francis Waymouth, Marblehead, all of Mass., assignors to Matsushita Electric Works R&D Lab, Woburn, Mass.

Filed Sep. 25, 1995, Ser. No. 533,163

Int. Cl.^{6} F21V *9/00*

U.S. Cl. 362—293 **13 Claims**



9. Light display system comprising (1) light source means, and (2) color filter means for selective display of a color corresponding to the filter, for use in an environment exposed to strong glare generating wide band ambient light, the improvement wherein the light source and filter are selected for a common narrow band range, substantially narrower than the said ambient source and with essentially common peaks.

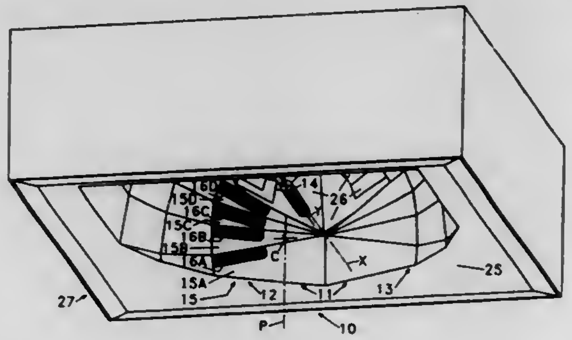
5,690,422
SHARP-CUTOFF LUMINAIRE HAVING SPECULAR REFLECTING FACETS WITH FAN-LINE GEOMETRY

John R. Brass, San Anselmo, Calif., assignor to Lighting Research & Development, Inc., San Anselmo, Calif.

Filed Sep. 25, 1995, Ser. No. 533,200

Int. Cl.^{6} F21V *7/12*

U.S. Cl. 362—297 **11 Claims**



1. A luminaire comprising:

a reflector including specular or semi-specular reflecting facets, said reflector further including a photometric axis and an opening for emitting light from a light source to an area to be illuminated;

a primary light source mounted within said reflector, said primary light source having a diameter and a longitudinal axis which is substantially perpendicular to said photometric axis;

a fan-like vertex axis located substantially in parallel with the longitudinal axis of the light source, at a distance approximately equal to one-half of the light source diameter, and between said light source and said reflector;

a plurality of fan-lines, each fan-line originating from a point on or near the fan-line vertex axis;

a plurality of said reflecting facets being fan-line facets, each of said fan-line facets having a cutoff edge lying substantially on one of said fan-lines, said cutoff edge being the facet edge which lies furthest from the opening;

whereby an image of said light source is displayed by each of said fan-line facets in a given direction, each said image being parallel and adjacent to said cutoff edge for each of said fan-line facets.

5,690,423
WIRE FRAME PAN ASSEMBLY FOR MOUNTING RECESSED LIGHTING IN CEILINGS AND THE LIKE

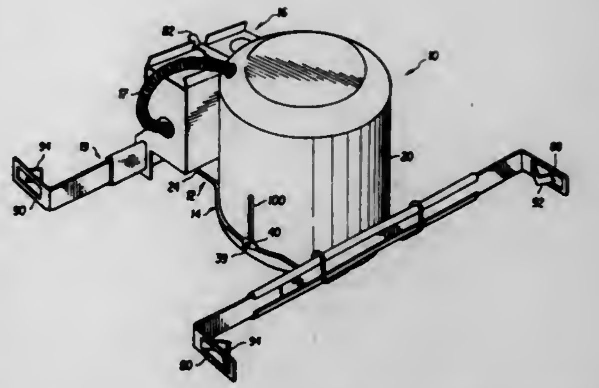
Joseph A. Hentz, Crawfordsville, and Richard F. Ashcraft, Greenwood, both of Ind., assignors to NSI Enterprises, Inc., Atlanta, Ga.

Filed Mar. 4, 1996, Ser. No. 610,431

Int. Cl.^{6} F21S *1/02*

U.S. Cl. 362—365 **47 Claims**

1. In a recessed lighting fixture assembly having a pan supporting a lamp housing, a junction box, electrical connections between the junction box and the housing and bar hanger assemblies for mounting of the fixture assembly to portions of a building structure, the improvement comprising a pan frame formed of a length of wire bent to a configuration capable of supporting the housing.



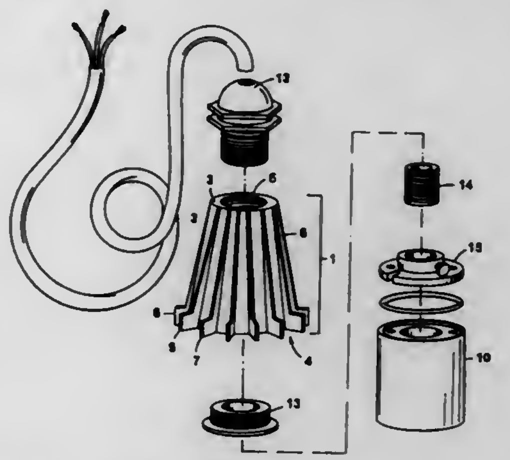
5,690,424
MOUNTING APPARATUS FOR LIGHTING FIXTURES

Mark Warshauer, Venice; James Schwartzman, and William Schiffman, both of Los Angeles, all of Calif., assignors to Justice Design Group, Inc., Culver City, Calif.

Filed May 8, 1995, Ser. No. 437,179

Int. Cl.^{6} F24V *29/00*

U.S. Cl. 362—373 **12 Claims**



1. An apparatus for mounting a lamp shade to a suspended lighting fixture, comprising:

a. a body of said lighting fixture configured to fasten to a bulb socket, which body is defined by a wall having an outer surface and having a bore extending vertically; through the body;

b. at least three fins extending outwardly from the outer surface of the wall, wherein each fin has a horizontal length from its point of attachment to the outer surface of the wall, said horizontal lengths of said fins sufficiently supporting a free-resting lamp shade; and

c. means for securing the body to a suspended wiring cord.

5,690,425
PROTECTIVE GUARD ASSEMBLY

D. Robert Knoll, Jr., 112 Fugate Dr., Cumberland, Ky. 40823

Filed Apr. 24, 1995, Ser. No. 427,946

Int. Cl.^{6} F21V *15/00*

U.S. Cl. 362—376 **10 Claims**

1. A protective guard assembly for a light fixture, said light fixture receiving and being powered by at least one cable, said protective guard assembly comprising:

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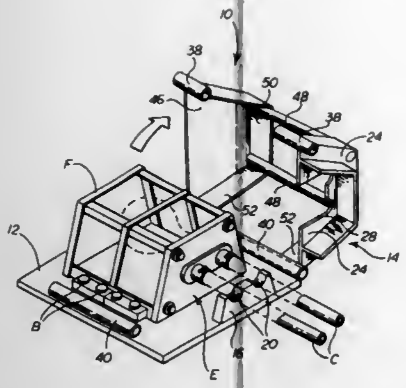
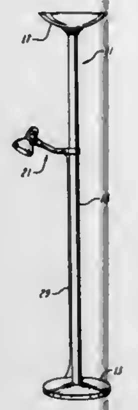


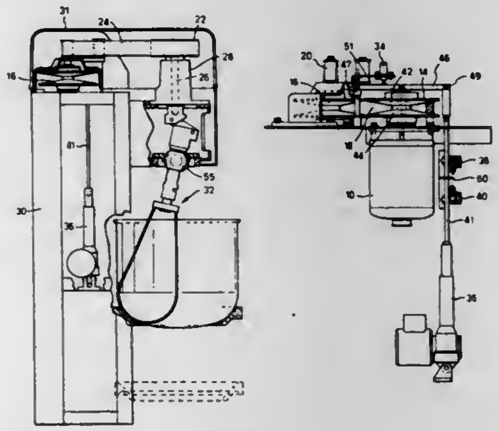
a base mounting said light fixture;
a reinforced cap substantially surrounding said fixture and including at least one aperture to allow illumination from said light fixture to propagate from said cap;
cable protection means adjacent one end of said base and including a cable support flange extending substantially perpendicularly from said one end of said base; and
fastener means fastening said cap to said base;
wherein said cap includes a rear end plate having a cut-out substantially conforming to the shape of said cable support flange, whereby said cable support flange cooperates with said rear end plate to support said cable substantially around its entire periphery when said cap is fastened to said base.

5,690,426
READING LAMP ASSEMBLY REMOVABLY AND ADJUSTABLY ATTACHABLE TO A TORCHIERE-TYPE LAMP
Roger N. Sherman, Jamaica Plain, Mass., assignor to Tensor Corporation, Chelsea, Mass.
Filed Dec. 23, 1996, Ser. No. 772,489
Int. Cl.⁶ F21S *1/12;* **F21V** *21/22*
U.S. Cl. 362—410 **3 Claims**



1. A reading lamp assembly for selective attachment to a vertical support pole of a torchiere-type lamp, said assembly comprising:
an arm;
a reading lamp mounted at one end of said arm;
a resilient clip having an annular portion configured to surround said vertical pole and, a pair of tabs projecting outwardly and extending from said annular portion, said annular portion being interrupted between said tabs to allow said clip to be expanded for applying to the pole from one side of said pole; and
a fitting mounted at another end of said arm which interengages with said tabs supporting said arm and lamp and allows limited pivotal movement of said arm around a horizontal axis, said fitting including a portion which projects inwardly with respect to said annular portion below said axis, the weight of said lamp causing said projecting portion to engage said pole and restrain said assembly from sliding down said pole.

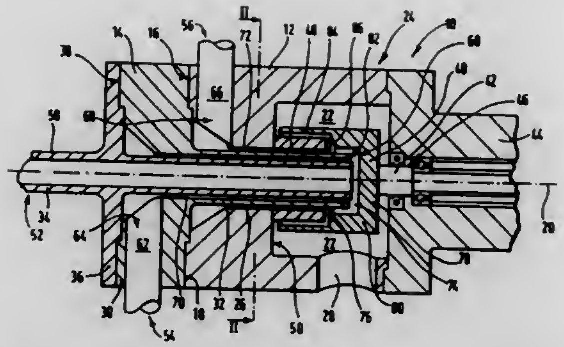
5,690,427
VARIABLE SPEED FOOD MIXER INCORPORATING A VARIABLE TRANSMISSION RATIO BELT DRIVE
Garry Stuart Jennings, Bideford, United Kingdom, assignor to Premark FEG L.L.C., Wilmington, Del.
Filed Nov. 2, 1995, Ser. No. 552,097
Claims priority, application United Kingdom, Apr. 11, 1994, 9422270
Int. Cl.⁶ B29B *7/22*
U.S. Cl. 366—100 **10 Claims**



2. A food mixer comprising:
a frame,
a mixing tool,
means supporting said mixing tool for rotation relative to said frame, a first pulley and a second pulley mounted for rotation relative to said frame,
a driving belt extending around the first and second pulleys and forming a driving connection between said pulleys, driving means for driving said first pulley and
a drive train providing a driving connection between said driving means, said first pulley, said second pulley and said mixing tool, at least one of said first and second pulleys being a pulley of which the effective diameter is variable, and
control means for varying said effective diameter to vary the transmission ratio between said first and second pulleys and thus between said driving means and said mixing tool,
wherein said control means includes a sensor for sensing the effective diameter of said variable pulley; means to compare said effective diameter to a desired transmission ratio; and means to adjust said effective diameter to provide said desired transmission ratio.

5,690,428
MIXING DEVICE COMPRISING CONCENTRIC TUBES FOR SUPPLYING SOLUTIONS ONTO AND MIXING ON A ROTOR
Michael Bryan, Watford; Michael Tadeusz Gorecki, Harrow, and Terry Douglas Haynes, Croxley Green, all of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 22, 1996, Ser. No. 620,520
Claims priority, application United Kingdom, Mar. 29, 1995, 9506400
Int. Cl.⁶ B01F *5/04*
U.S. Cl. 366—172.1 **2 Claims**

1. A device for mixing photographic solutions, the device comprising:
a body having an interior;

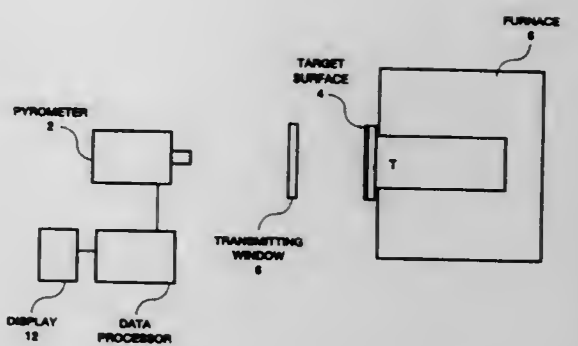


a plurality of solutions for introducing into the interior of the body; mixing means in the interior of the body for mixing the solutions comprising at least one mixing surface which is arranged substantially perpendicular to the direction of flow of the solutions orifices wherein each mixing surface is formed on a rotor which is rotated;
a rotor on which each of the at least one mixing surfaces is formed, the rotor being rotated about an axis by a motor;
a disc element included on the rotor;
a first mixing zone provided on the disc element, said mixing zone being substantially annular and being centered about the axis of the rotor, at which mixing zone at least two of the solutions impinge for mixing;
at least one further mixing zone provided on the disc element, the at least one further mixing zone being substantially annular and being located radially outwardly of the first mixing zone and substantially concentric therewith;
at least one annular element having steps, said at least one annular element being included on the rotor and arranged to be substantially perpendicular to the disc element;
a further mixing zone corresponding to the step of the at least one annular element for mixing the solutions;
a plurality of inlets connected to the interior of the body and through which solutions to be mixed are introduced;
a plurality of concentric orifices connected to respective ones of said inlets, the concentric orifices directing the solutions to be mixed onto the mixing means providing a plurality of mixing zones;
an outlet connecting the interior of the body to the exterior thereof and through which the mixed solutions can be removed from the device; characterized in that each of the concentric orifices terminates at a respective one of the mixing zones.

5,690,429
METHOD AND APPARATUS FOR EMISSIVITY INDEPENDENT SELF-CALIBRATING OF A MULTIWAVELENGTH PYROMETER
Daniel Ng, 3622 Lynnfield Rd., Shaker Heights, Ohio 44122
Continuation-in-part of Ser. No. 353,521, Dec. 7, 1994, abandoned. This application Jan. 14, 1997, Ser. No. 783,640
Int. Cl.⁶ G01K *15/00;* **G01J** *5/00*
U.S. Cl. 374—1 **10 Claims**

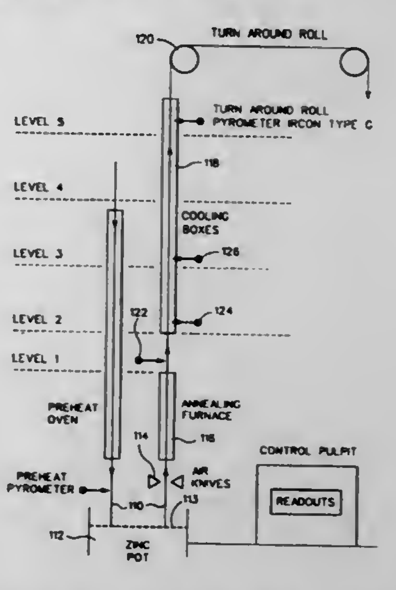
1. A method of self-calibrating a pyrometer, comprising:
measuring two voltage spectra at two unknown and different temperatures; and calibrating said pyrometer independent of emissivity in accordance with said two voltage spectra.

6. A self-calibrating pyrometer, comprising:
means for measuring two voltage spectra at two unknown different temperatures; and



means for calibrating the pyrometer independent of emissivity in accordance with said two voltage spectra.

5,690,430
APPARATUS AND METHOD FOR MEASURING TEMPERATURE AND/OR EMISSIVITY OF STEEL STRIP DURING A COATING PROCESS
Ralph G. Rudolph, Center Valley, Pa., assignor to Bethlehem Steel Corporation, Del.
Filed Mar. 15, 1996, Ser. No. 616,894
Int. Cl.⁶ G01J *5/00*
U.S. Cl. 374—126 **23 Claims**



1. An apparatus for measuring the surface temperature and emissivity of coated steel strip during a coating process comprising:
a first radiation sensor for receiving radiation from an area on the surface of the coated steel strip and for providing a first signal indicative of the radiation received;
a second radiation sensor, separate from said first radiation sensor, for receiving radiation from the same area on the surface of the coated steel strip and for providing a second signal indicative of the radiation received, said radiation received by said second radiation sensor is from the exact same area on the surface of the coated steel strip and simultaneous with the radiation received by said first radiation sensor;
means for passing differing wavelengths of the received radiation to the first and second sensors such that the first sensor is responsive to shorter wavelengths than the second sensor; and
processing means for processing the two signals indicative of radiation to determine at least one of temperature and emissivity.

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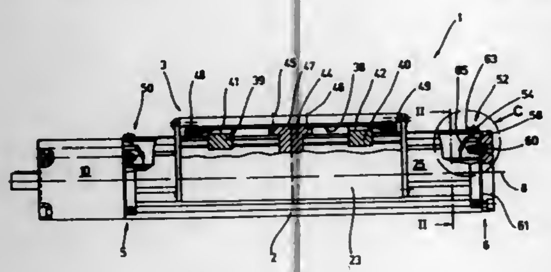
5,690,431
GUIDE SYSTEM FOR GUIDING A MOVABLE ELEMENT ALONG A PREDETERMINED ELONGATED PATH

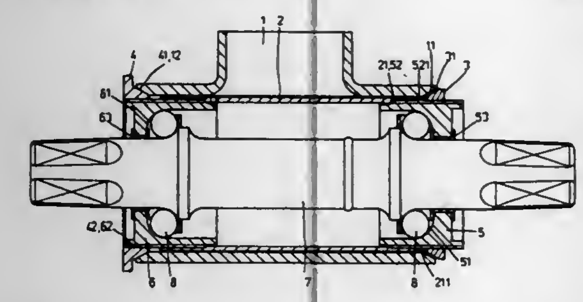
Uwe Schön, Schönaich, Germany, assignor to Neff Antriebstechnik Automation GmbH, Waldenbuch, Germany
Filed Dec. 4, 1995, Ser. No. 566,793
Claims priority, application Germany, Dec. 17, 1994, 44 45 132.6
Int. Cl.⁶ F16C *33/74;29/12*
U.S. Cl. 384—15 **20 Claims**



1. Guide system (1) for guiding a movable element (3) along a predetermined elongated path between a first end (5) and a second end (6) thereof, said system having
- a hollow base body (2) formed with an elongated opening (34) extending essentially along the length of said path;
- a connecting element (39,40,44) extending through said opening (34) and into the interior (36) of the base body, coupled to said movable element (3); and
- an elongated tape or ribbon (25) extending over and covering said opening (34), and
- comprising
  - a reverse-motion lock (50,52) located at least at one of said ends (5,6) of said path, coupled to the base body (2), holding and engaging said tape or ribbon (25),
  - said reverse-motion lock being operative to permit shifting of said tape or ribbon (25) with respect to said lock (50,52) in a first direction, in which said tape or ribbon is free to project beyond said path, but inhibiting shifting of said tape or ribbon in a second direction, opposite to said first direction, and blocking movement of said tape in said second direction.

5,690,432
MEAN AXIS OF BICYCLE

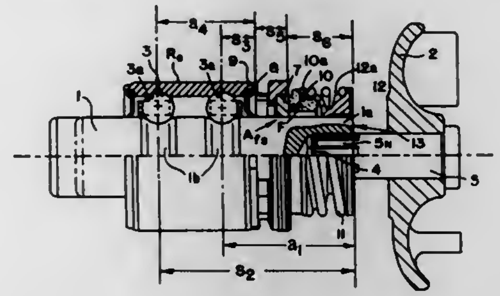
Jing-Chen Lin, No. 173, Kuei Suel St., and Ming-Chang Lin, No. 66, Hual An St., both of Kaohsiung City, Taiwan
Filed Jan. 30, 1997, Ser. No. 791,361
Int. Cl.⁶ F16C *19/08*
U.S. Cl. 384—545 **1 Claim**



1. A mean axis of bicycle comprising a five-way pipe, an internal pipe, two setting rings, two ball housings, an axle and two ball bearing, and cooperating with a master chain wheel set in practising; and the improvements comprising:
- said five-way pipe comprising two conic surfaces at respective inner ends thereof;
- said internal pipe comprising two threads at respective inner ends thereof;
- said setting rings comprising a conic surface formed at an outer end as a spigot corresponding to said conic surfaces of said five-way pipe, and an inner threaded hole from the other end;
- said ball housings comprising a ball track at an inner end, thread surrounding over the outside surface, and a ring seal embedded into said ball housings; wherein by threading said ball track end of said ball housing into one end of said internal pipe, one of said ball bearing, said axle and the other said ball bearing are inserted respectively from other side, then the last ball housing is threaded into the internal pipe from the other side so that the ball bearings seat in the ball tracks respectively to form a mean axis assembly; then inserting the combined mean axis assembly into the five-way pipe, and turning two setting rings from both sides of the five-way pipe so that the conic surfaces of the setting rings press against the conic surfaces of the five-way pipe tightly fix the mean axis assembly in the five-way pipe; making use of the gaps between the inner ends of the setting rings and both ends of the internal pipe, turning the setting rings out and in separately adjust the axle shift left-right to adjust the allowable range.

5,690,433
SYSTEM FOR PRELOADING THE BEARING OF A PUMP ASSEMBLY

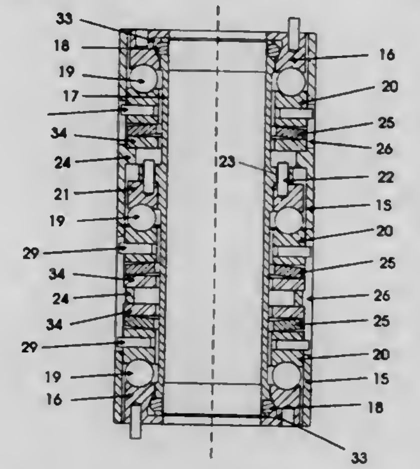
Rüdiger Hans, Niederwerrn, and Elmar Mause, Schweinfurt, both of Germany, assignors to SKF GmbH, Germany
Filed Mar. 1, 1996, Ser. No. 609,717
Claims priority, application Germany, Mar. 9, 1995, 195 08 404.7
Int. Cl.⁶ F16C *19/02;35/06;* **F04D** *29/04;29/12*
U.S. Cl. 384—482 **5 Claims**



1. Bearing assembly for a cooling water pump for motor vehicles, comprising a shaft and an impeller mounted on one end of the shaft, an outer bearing ring surrounding the shaft, an axial face seal mounted on one projecting end of the shaft having a rotating part attached to the shaft operable to tension spring-loaded sliding rings with a predetermined contact pressure against each other, characterized in that the axial face seal is pressed on said one end of the shaft so that the outer axial end face of said seal is coplanar with the axial end face of the shaft whereby the projection of the shaft (1) on the pump impeller side has the length of the axial face seal under its operating pretension and also has an axial bore (4) within which the shaft journal (5) carrying the pump impeller (6) is pressed.

5,690,434
DOWNHOLE TOOL BEARING ASSEMBLY

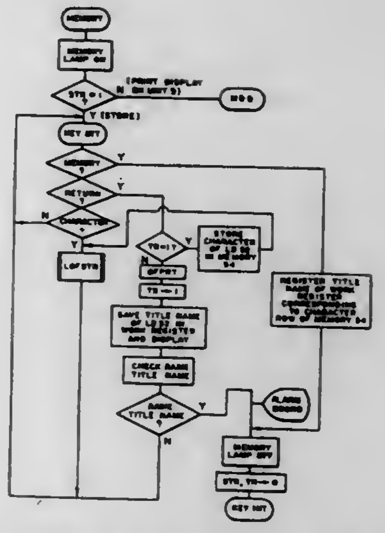
Edward Joseph Beshoory, and William David Murray, both of Houston, Tex., assignors to Bafco International Incorporated, Houston, Tex.
Continuation of Ser. No. 285,336, Aug. 2, 1994, abandoned.
This application Apr. 26, 1996, Ser. No. 638,379
Int. Cl.⁶ F16C *19/10;* **E21B** *4/02*
U.S. Cl. 384—613 **8 Claims**



1. A bearing housing assembly to support a drive shaft of a drive train of a downhole tool comprising:
- a housing;
- a bearing assembly including stationary and rotating bearing components located within said housing;
- a compression sleeve in threaded engagement with said housing, such that rotation of said compression sleeve in a first direction causes said stationary bearing components of said bearing assembly to be compressed tightly together, thereby creating a compressive preload to ensure that said bearing components remain in contact throughout their operations; and
- a locknut in threaded engagement with said compression sleeve and which, in cooperation with said compression sleeve, maintains a preload through said stationary bearing components by providing an additional frictional interface capable of accepting a large torque input, thereby allowing the generation of a large mount of frictional resistance to loosening at the locknut interface.

5,690,435
SERIAL PRINTING APPARATUS WITH SENTENCE MEMORY AND DISPLAY

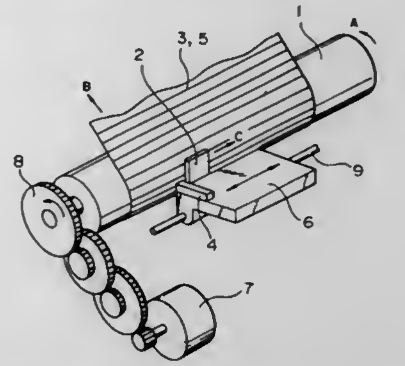
Hiroyuki Ueda, Kawasaki; Yasuaki Yamada, Matsudo; Toshiaki Ozawa, Chiba-ken; Hiroharu Nakajima, Kodaira, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 906,672, Jun. 30, 1992, abandoned, which is a division of Ser. No. 627,919, Dec. 17, 1990, Pat. No. 5,322,376, which is a continuation of Ser. No. 230,677, Aug. 8, 1988, abandoned, which is a continuation of Ser. No. 63,781, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 883,447, Jul. 10, 1986, abandoned, which is a continuation of Ser. No. 664,945, Oct. 26, 1984, abandoned, which is a continuation of Ser. No. 314,441, Oct. 23, 1981, abandoned. This application Feb. 8, 1994, Ser. No. 193,671
Claims priority, application Japan, Oct. 31, 1980, 55-152103; Oct. 31, 1980, 55-152104; Oct. 31, 1980, 55-152105; Oct. 31, 1980, 55-152106; Nov. 17, 1980, 55-160692; Nov. 17, 1980, 55-160693; Nov. 25, 1980, 55-160694; Nov. 25, 1980, 55-164527; Nov. 28, 1980, 55-166630; Nov. 28, 1980, 55-166635
Int. Cl.⁶ B41J *3/00*
U.S. Cl. 400—74 **9 Claims**



1. A method of processing documents comprising the steps of:
- inputting a title for a document to be stored in memory means;
- determining whether the inputted title has already been store in the memory means;
- storing the document, format information, and the inputted title, when the inputted title has not been stored in the memory means;
- issuing an appropriate message when the inputted title has already been stored in the memory means; and
- reading out the document corresponding to the inputted title when the inputted title has already been stored in the memory means.

5,690,436
THERMAL PRINTER

Katsutoshi Suzuki; Mitsuo Yoshida; Yuko Sonoda; Hiroo Sonoda, all of Fukushima-ken; Yasuhiko Iwane, and Masahiko Mori, both of 1wate-ken, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Jun. 11, 1996, Ser. No. 664,275
Claims priority, application Japan, Jun. 14, 1995, 7-171555
Int. Cl.⁶ B41J *2/315*
U.S. Cl. 400—120.01 **5 Claims**



1. A thermal printer of the type using a thermo-sensitive recording sheet prepared by applying a recording material onto a front side of a carrier sheet, with or without an opaque protective sheet bonded thereon, said thermal printer comprising:
- a rotatable platen for feeding said thermo-sensitive recording sheet in a first direction; and
- a carriage mounted adjacent said platen and movable along said platen;
- a thermal head pivotally mounted on the carriage;
- means for pivoting said thermal head such that said thermal head is pressed against a back side of said carrier sheet; and
- means for controlling the thermal head to perform thermal recording on said thermo-sensitive recording sheet by induc-

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ing a color change in said recording material on the front side of said thermo-sensitive recording sheet,
wherein said back side of said carrier sheet is opposite to the front side of said carrier sheet coated with said recording material.

5,690,437

METHOD AND APPARATUS FOR CONTROLLING THE THERMAL HEAD DRIVE

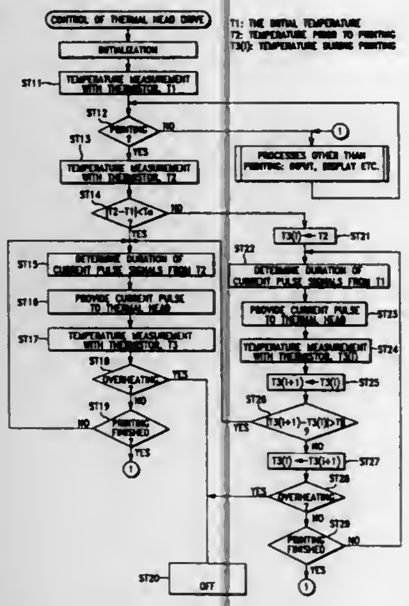
Shigekazu Yanagisawa; Susumu Takatsu, both of Suwa; Kenji Watanabe, Tokyo; Takanobu Kameda, Tokyo; Chieko Aida, Tokyo, and Tomoyuki Shimmura, Tokyo, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 1, 1995, Ser. No. 566,209

Claims priority, application Japan, Dec. 2, 1994, 6-299599; Nov. 10, 1995, 7-292817

Int. Cl.⁶ B41J *2/365*

U.S. Cl. 400—120.14 **27 Claims**


CONTROL OF THERMAL HEAD DRIVE
T1: THE INITIAL TEMPERATURE
T2: TEMPERATURE PRIOR TO PRINTING
T3(i): TEMPERATURE DURING PRINTING
INITIALIZATION
ST11
TEMPERATURE MEASUREMENT WITH THERMISTOR, T1
ST12
PRINTING
NO
YES
1
ST13
TEMPERATURE MEASUREMENT WITH THERMISTOR, T2
PROCESSES OTHER THAN PRINTING: INPUT, DISPLAY ETC.
ST14
T2-T1<Ta
ST21
ST22
ST15
DETERMINE DURATION OF CURRENT PULSE SIGNALS FROM T2
DETERMINE DURATION OF CURRENT PULSE SIGNALS FROM T1
ST16
PROVIDE CURRENT PULSE TO THERMAL HEAD
ST23
ST17
TEMPERATURE MEASUREMENT WITH THERMISTOR, T2
TEMPERATURE MEASUREMENT WITH THERMISTOR, T3(i)
ST24
ST18
OVERHEATING
ST25
ST26
ST19
PRINTING FINISHED
ST27
ST28
OVERHEATING
ST29
PRINTING FINISHED
ST20
OFF

1. A method for driving and controlling a thermal head of a printing device, said thermal head including a plurality of heat elements to which current signals are supplied, the method comprising the steps of:

(a) measuring an ambient temperature of said thermal head to obtain an initial temperature T1 immediately after the power to the printing device is switched on;
(b) measuring an ambient temperature of said thermal head to obtain a temperature prior to printing T2 just before said thermal head starts printing on a recording medium;
(c) calculating a temperature difference between the initial temperature T1 and the temperature prior to printing T2; and
(d) if the temperature difference is less than a predetermined first threshold value Ta, controlling the duration of the current signals provided to the heat elements of said thermal head in accordance with the temperature prior to printing T2.

5,690,438

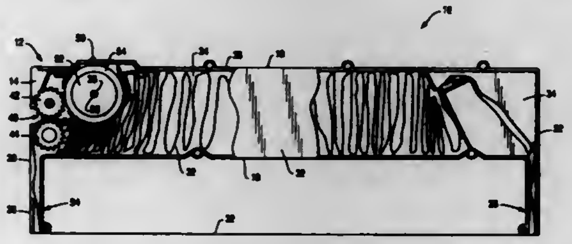
CONTINUOUS OR ENDLESS LOOP PRINTING RIBBON CASSETTES AND REINKING DEVICES THEREFOR

Yaoping Tan, Miamisburg, and Bernard P. Sheehan, Cincinnati, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 541,762, Oct. 10, 1995, abandoned, which is a continuation of Ser. No. 173,582, Dec. 2, 1993, abandoned. This application Feb. 24, 1997, Ser. No. 804,597

Int. Cl.⁶ B41J *31/14*

U.S. Cl. 400—197 **5 Claims**



1. A printing ribbon cassette for printing equipment, comprising:
a printing ribbon cassette base of generally rectangular configuration having a bottom portion, a front portion, a rear portion, an inlet side portion, an outlet side portion, a continuous or endless loop printing ribbon storage cavity and an upstanding pin;
a wall extending upwardly from said bottom portion of said printing ribbon cassette base along said front portion, said rear portion, said inlet portion and said outlet portion;
an inlet guide extending outwardly from said front portion along said inlet side portion of said printing ribbon cassette;
an outlet guide extending outwardly from said front portion along said outlet side portion of said printing ribbon cassette;
a continuous or endless printing ribbon exiting from said printing ribbon cassette through said outlet guide, extending between said outlet guide and said inlet guide, and entering into said printing ribbon cassette through said inlet guide;
a printing ribbon drive gear mechanism for moving said continuous or endless printing ribbon from said inlet guide into said continuous or endless loop printing ribbon storage cavity in said printing ribbon cassette base;
a reinking device rotatably mounted on said upstanding pin on said printing ribbon cassette base, said reinking device including an inner cylindrical ink roll and an outer cylindrical ink roll concentrically positioned in relation to each other, said inner cylindrical ink roll having a first ink and said outer cylindrical roll having a second ink, wherein said first ink is not the same ink as said second ink; and
said inner cylindrical ink roll and said outer cylindrical ink roll being rotatable in response to rotational movement of said printing ribbon drive mechanism so that ink is transferred from said outer cylindrical ink roll to said continuous or endless loop printing ribbon through said printing ribbon drive mechanism.

5,690,439

THERMAL TRANSFER PRINTING APPARATUS

Naotaka Sasaki; Shunichi Kawamata, and Kenji Sugaya, all of Gunma, Japan, assignors to Japan Servo Co., Ltd., Tokyo, Japan

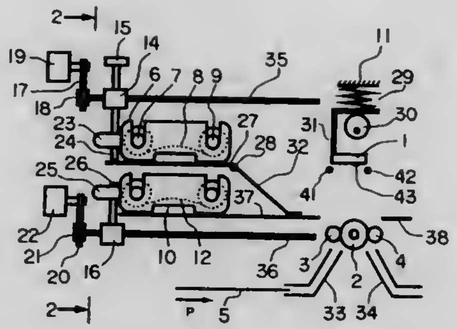
Filed Dec. 13, 1995, Ser. No. 571,438

Claims priority, application Japan, Dec. 15, 1994, 6-332898; Dec. 15, 1994, 6-332899

Int. Cl.⁶ B41J *35/22*

U.S. Cl. 400—206.2 **6 Claims**

1. A thermal transfer printing apparatus comprising: a thermal head including a plurality of heating elements, a platen roller to which said thermal head is urged selectively, a printing portion at which an ink on art ink sheet is printed on a recording paper by a thermal energy produced when said heating elements are energized, said recording paper being inserted between said thermal head and said platen roller, a first stock portion for storing therein a first ink sheet cassette including a first ink sheet, a second stock portion for storing therein a second ink sheet cassette including a second ink sheet, and means for transferring to said printing portion selectively one of said first ink sheet cassette and said second ink sheet cassette to carry out the thermal transfer printing, wherein said means for transferring causes the entire selected cassette to move as a unit into the priming portion, wherein both said first and second stock portions are arranged at one of art up-stream side and a down-stream side of art ink sheet cassette forwarding direction with respect to said printing portion and stacked one above the other such that said first stock portion is permanently located above said second stock portion.



5,690,440

CONTROLLER FOR SERIAL PRINTER CARRIAGE

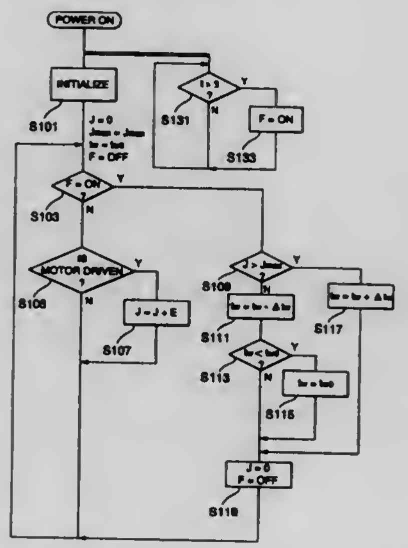
Shinji Konishi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 14, 1995, Ser. No. 502,462

Claims priority, application Japan, Jul. 15, 1994, HEI 6-164238

Int. Cl.⁶ B41J *19/30*

U.S. Cl. 400—279 **1 Claim**



1. In a serial printer, a method for controlling a temperature of a motor that drives a print carriage, said method comprising the steps of:

setting an delay time interval, an extending time value, a shortening time value, and a consumed energy limitation value;
measuring an amount of energy consumed by said motor over a unit of time to provide a measured energy value;
making a comparison between said measured energy value and said consumed energy limitation value;
increasing said delay time interval by said extending time when said comparison indicates that said measured energy value is greater than said consumed energy limitation value; and
decreasing said delay time interval by said shortening time when said comparison indicates said measured energy value is less than said consumed energy limitation value.

5,690,441

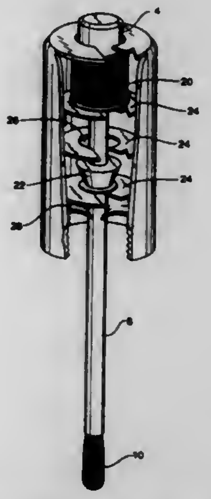
EXTENDABLE, RETRACTABLE APPLICATOR BRUSH

Jenny L. McManus, 5506 368 Ave., Burlington, Wis. 53105

Filed May 31, 1996, Ser. No. 646,830

Int. Cl.⁶ A46B *11/00;* **A45D** *34/00*

U.S. Cl. 401—127 **3 Claims**



1. In a nail polish container having a nail polish bottle, a threadingly retained cap, and an elongated applicator brush shaft terminating in an applicator brush and affixed to said cap, the improvement comprising:
said applicator brush shaft being slidingly retained within said cap such that said applicator brush shaft can be slidingly extended downward into the nail polish bottle;
said cap having a top and internal threads for engaging with external threads around a throat of said bottle;
said cap further comprising a push button extending from an opening at the top of said cap, said push button having a bottom portion and wherein said applicator brush shaft is fixed to said bottom portion of said push button;
said cap further comprising a spring affixed between said push button and said cap for urging the push button toward an extended position;
a stop affixed in a rigid manner, circumscribing the applicator brush shaft between the applicator brush and the spring;
a plurality of internal click stops affixed within said cap that circumscribe the interior of the cap and form an annular orifice through which said stop passes.

5,690,442

METAL TIP FOR BALL-POINT PEN

Shinsuke Sato, Yonezawa; Toshiaki Takayanagi, Yokohama; Toru Kitao, Sagamihara, and Masao Hashi, Yokohama, all of Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1995, Ser. No. 573,002

Claims priority, application Japan, Feb. 7, 1995, 7-019235

Int. Cl.⁶ B43K *7/10*

U.S. Cl. 401—216 **4 Claims**

1. A tip for a ball-point pen with a ball having a diameter set therein, said tip comprising:
a ball holding portion within which the ball is positioned;

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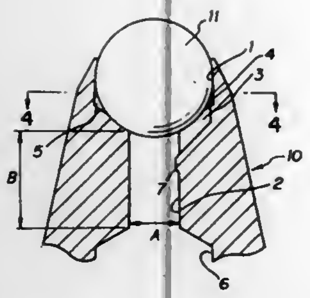
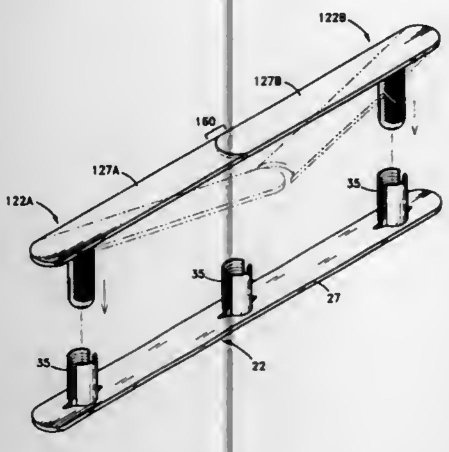


an ink guide hole, said ink guide hole having a diameter and being formed at a center of a bottom surface of said ball holding portion, a portion of the ball extending into said ink guide hole;
radial grooves arranged around said ink guide hole, each said groove angularly oriented with respect to said ink guide hole;
a flash oriented into said ink guide hole and projecting along 1.5% to 15% of said diameter of said ink guide hole; and
a back hole formed behind said ink guide hole;
wherein said ink guide hole diameter is 30% to 55% of the diameter of the ball and said guide hole has an axial length of 1.2 to 2 times said ink guide hole diameter.

5,690,443
ADJUSTABLE, RELEASABLE BINDING FASTENER

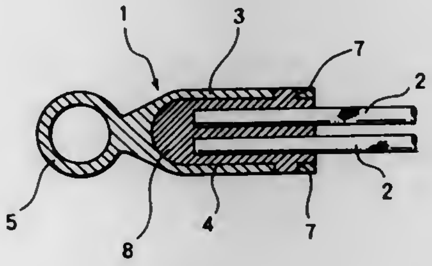
Thomas V. Sullivan, 121 Marine Ave., Balboa Island, Calif. 92662
Continuation-in-part of Ser. No. 461,061, Jun. 5, 1995, abandoned. This application Jun. 3, 1996, Ser. No. 657,317
Int. Cl.^{6} B42F *3/00*
U.S. Cl. 402—63 **25 Claims**



1. A releasable fastener for binding a stack of paper, comprising:
a female fastener portion having a first planar base including an aperture therethrough, and further having an arcuate shaped collar extending perpendicularly from said first planar base, said collar comprised of a pair of opposing, parallel collar halves positioned on opposing sides of the aperture, each of the collar halves including a vertical, first series of ratchet teeth facing the aperture; and
a male fastener portion having a second planar base, and a rod-like post extending perpendicularly from said second planar base, said post having an exterior surface having two vertical oppositely disposed second series of ratchet teeth oriented to engage said first series of ratchet teeth when said post is inserted between said arcuate shaped collar and towards said aperture, in a ratchet manner when the first and the second series of ratchet teeth are mutually engaged.

5,690,444
CORD EQUIPPED WITH CONNECTOR

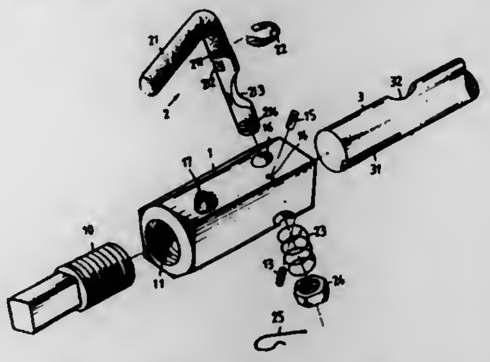
Kenji Yuuki; Akiyoshi Kando; Masato Yokota, and Hitomi Kawamura, all of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan
Filed May 29, 1996, Ser. No. 657,050
Claims priority, application Japan, Sep. 29, 1995, 7-253112
Int. Cl.^{6} A44B *21/00;19/26;* **A45C** *13/30*
U.S. Cl. 403—268 **22 Claims**



1. A cord equipped with a connector, wherein said connector has at one end a connecting ring and at the other end an opening, said connector having a hollow into which two free end portions of said cord are inserted from said opening, said free end portions of said cord being fixed by a molded core which is insertion-molded of synthetic resin in said hollow, said hollow having a mechanism for preventing said molded core from accidental removal from said hollow.

5,690,445
HIGH-SPEED ASSEMBLY CONNECTOR STRUCTURE

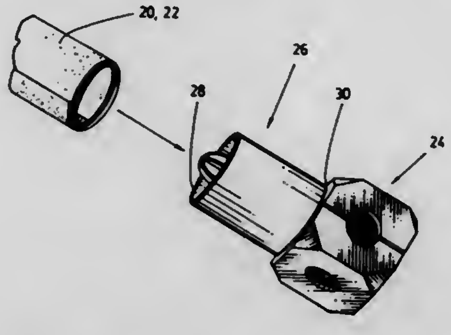
Ta-Chin Wu, No.1,Lane 3,Section 2,Hwanher West Road, Yeng Her,Taipei, Taiwan
Filed May 13, 1996, Ser. No. 644,299
Int. Cl.^{6} B25G *3/00;* **B23B** *31/00*
U.S. Cl. 403—306 **2 Claims**



1. A high speed assembly connector comprising:
a) a generally tublar connector head having a connector hole therethrough, a direction screw extending into the connector hole and a set screw;
b) a tool element having a mounting notch and a direction slot of predetermined length whereby when the tool element is inserted into the connector hole the direction screw engages the direction slot to limit the length of the insertion of the tool element into the connector head;
c) a handle pivotally connected to the connector head, the handle having an entry position notch and a cambered groove into which the set screw extends to limit the pivoting movement of the handle between an entry position wherein the entry position notch is aligned with the connector hole so as to allow the insertion of the tool element into the connector hole, and an anchoring position wherein a portion of the handle engages the mounting notch of the tool element so as to anchor the tool element in the connector head; and,
d) a handle set hole in the connector head engaged by a portion of the handle when in the anchoring position so as to releasably retain the handle in the anchoring position.

5,690,446
CONNECTION SYSTEM FOR CONNECTING STRUTS TO CONSTRUCT THREE-DIMENSIONAL STRUCTURES

Philip Laurier Poissant, and Jane Elizabeth Somerville, both of Toronto, Canada, assignors to Somerville House Books Limited, Toronto, Canada
Filed Jun. 18, 1996, Ser. No. 664,916
Int. Cl.^{6} A63H *33/08*
U.S. Cl. 403—361 **13 Claims**

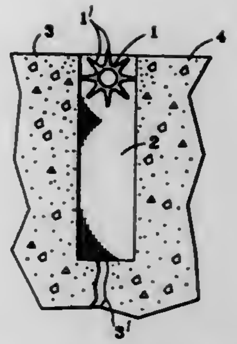


1. A connection system for connecting struts formed from paper or paper-like sheets rolled into a tube comprising
(i) a plurality of cylindrical receptors, each receptor having
  (a) an inside diameter approximately equal to or slightly smaller than the predetermined outside diameter of the tubes for friction-fit engagement onto the ends of each tube;
  (b) a finger centrally disposed within the receptor and about the longitudinal axis of the cylinder and in which at least a part of such finger is substantially the same size as the inside diameter of the tube, wherein such finger is made of a plurality of longitudinal ribs extending radially from the longitudinal axis of the finger; and
  (c) connecting means for press-fit detachable engagement of each receptor with a complementary connecting means on a connector; and
(ii) a plurality of connectors wherein each connector has at least two such complementary connecting means for connecting at least two receptors to the connector and by this to each other.

5,690,447
METHOD OF AND DEVICES FOR SEALING AND SUPPORTING CONCRETE FLOOR JOINTS AND THE LIKE

Steven N. Metzger, P.O. Box 2391, Concord, N.H. 03302-2391
Continuation of Ser. No. 293,795, Aug. 22, 1994, abandoned. This application Aug. 13, 1996, Ser. No. 695,966
Int. Cl.^{6} E01C *11/10*
U.S. Cl. 404—64 **3 Claims**

1. A method of sealing and supporting fillings in concrete floor joints and the like each having a joint opening and a bottom, that comprises, during floor construction and preparation, inserting a resiliently compressible cylindrical support member into a joint opening of a longitudinally extending concrete floor joint of lesser cross-dimension to lodge the member at and along the opening in order to retain moisture in the curing of the concrete at the joint, while sealing the opening from the entry of debris into the joint; following the concrete hardening, pushing the compressed support member to the bottom of the joint to seal the bottom; and filling the joint above the support member with semi-rigid epoxy filler flush with the concrete surface on each side of the joint; the hardness of the compressed support member being substantially matched to the hardness of the epoxy filler to prevent any substantial depression of the filler as vehicle wheels ride over the filled joint.



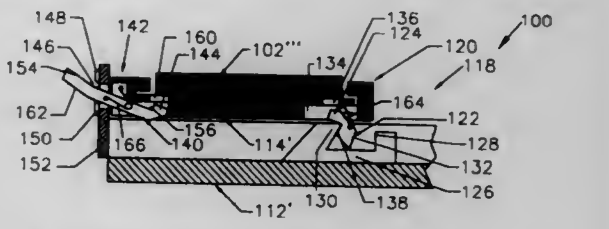
5,690,448
LANDFILL CLOSURE SYSTEM

Leonard Joseph Fasullo, Wilmington; Brian Joseph Strusowski, Bear; Michael U. Destefano, Wilmington; David Giacomini, and Michael Joseph Lukas, both of Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 327,257, Oct. 21, 1994, abandoned. This application Jan. 24, 1997, Ser. No. 787,999
Int. Cl.^{6} B09B *1/00*
U.S. Cl. 405—129 **7 Claims**

1. A landfill closure system, comprising:
(a) a vegetated top layer comprising an iron containing solids component, wherein the iron containing solids component is produced from the neutralization of a metal chloride by-product stream;
(b) a drainage layer; and
(c) a low-permeability layer comprising a geomembrane liner.

5,690,449
TOOL BASE SECURING SYSTEM

Ward D. Morrison, and Perry L. Coombs, both of Claremont, N.H., assignors to Cannon Industries, Inc., Claremont, N.H.
Filed Jan. 4, 1996, Ser. No. 582,867
Int. Cl.^{6} E02D *5/74*
U.S. Cl. 405—303 **20 Claims**



1. An improved rock bolter, the rock bolter having:
tool bases on which bolt setting tools are mounted;
a transfer platform with tool base transfer tracks for slidably engaging and guiding the tool bases;
a cradle having tool base embracing tracks, a cradle front section, and a cradle rear section;
a transfer slider for positioning the tool bases on the transfer platform and the cradle such that one of the tool bases becomes an on-cradle tool base and is positioned on the cradle with the remaining tool bases being defined as off-cradle tool bases; and
a feed shell on which the cradle rides providing for advancement of the on-cradle tool base from a park position wherein the

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tool base embracing tracks are aligned with the tool base transfer tracks to a forward region of the feed shell near a surface where a rock bolt is to be installed;

the improvement comprising a tool base securing system having:

a front latch pivotably mounted on the front section of the cradle, said front latch having a front tool base engaging lug for engaging the on-cradle tool base;

means for engaging said front tool base engaging lug with the on-cradle tool base as the cradle is advanced along the feed shell from the park position toward the forward region of the feed shell, said means for engaging said front tool base engaging lug being a mechanical linkage designed to block advancement of the cradle unless said front tool base engaging lug is engaged with the on-cradle tool base;

means for disengaging said front tool base engaging lug from the on-cradle tool base as the cradle is returned to the park position, said means for disengaging said front tool base engaging lug being a mechanical linkage designed to prevent return of the cradle to the park position unless said front tool base engaging lug is disengaged from the on-cradle tool base; and

means for maintaining said front tool base engaging lug engaged with the on-cradle tool base when the cradle traverses the feed shell.

5,690,450

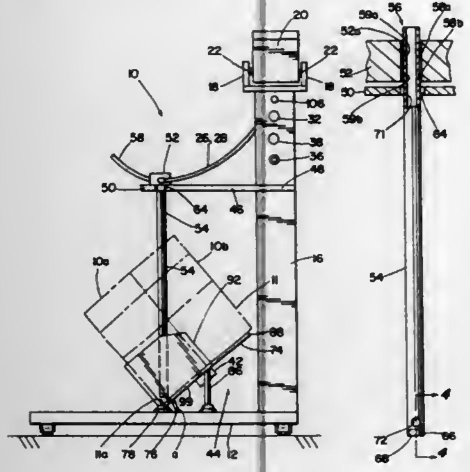
APPARATUS FOR TRANSPORTING POWDER COATING MATERIAL FROM A BOX-SHAPED CONTAINER

William S. Miller, Wakeman; Kenneth Holley, South Amherst, and John C. A. Traylor, Elyria, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 554,545, Nov. 7, 1995, abandoned, which is a continuation of Ser. No. 126,391, Sep. 23, 1993, Pat. No. 5,518,344, which is a continuation-in-part of Ser. No. 876,610, Apr. 30, 1992, abandoned. This application Oct. 18, 1996, Ser. No. 730,886

Int. Cl.^{6} B65G *53/26*

U.S. Cl. 406—39 **4 Claims**



1. A manual powder coating system comprising:

a support structure having wheels for moving said support structure;

a cradle mounted to said support structure for supporting a boxed-shaped container containing powder in a tilted position at an angle with respect to horizontal, said boxed-shaped container having a lowermost interior portion in said tilted position;

a vibrator attached to said cradle for vibrating and loosening said powder thereby causing said powder to move by gravity towards said lowermost interior portion of said boxed-shaped container;

vibration isolation mounts between said cradle and said support structure to dampen vibration transferred from said cradle to said support structure;

a pick-up tube having a lower inlet end with at least one inlet opening adapted to being positioned within said box-shaped container in said lowermost interior portion and an upper outlet end for discharging the powder;

a powder pump associated with said upper outlet end of said pick-up tube for drawing the powder from said box-shaped container into said lower inlet end of said pick-up tube and discharging said powder from said upper outlet end of said pick-up tube;

a spray gun connected to said powder pump for applying the powder drawn from said box-shaped container;

a control housing mounted to said support structure for operating said powder pump and said vibrator; and

a support arm extending outward from said control housing to project over said box-shaped container.

5,690,451

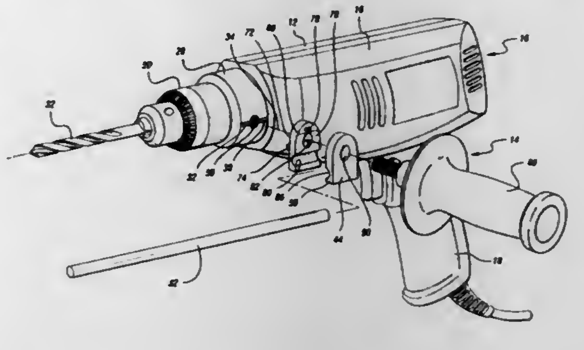
DEPTH STOP ASSEMBLY FOR A PORTABLE ELECTRIC DRILL

James E. Thurler, Pickens, and Michael E. Sheriff, Easley, both of S.C., assignors to Ryobi North America Corp., Easley, S.C.

Filed Jul. 31, 1995, Ser. No. 509,463

Int. Cl.^{6} B23B *49/00;45/14*

U.S. Cl. 408—113 **15 Claims**



1. A portable electric drill assembly comprising:

a drill including a housing, an electric motor and a chuck operatively driven by the electric motor about a drill axis;

a depth stop rod;

a mounting block having a mounting surface adapted to cooperate with the housing, a first aperture spaced from the housing between the mounting surface and an outboard surface for supporting the depth stop rod generally parallel to the drill axis, and a second aperture extending about a fastener axis passing through the mounting surface and the outboard surface;

a rotatable handle; and

a fastener extending through the second aperture along the fastener axis and having two ends respectively cooperative with the housing and the handle to releasably entrap the mounting block therebetween to enable a user to adjustably position the depth stop rod relative to the housing, wherein the housing has an aperture therein for receiving an end of the fastener.

5,690,452

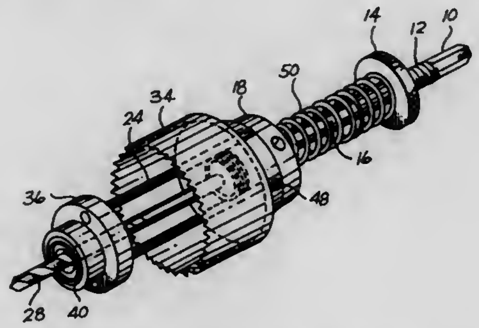
SPRING LOADED AUTOMATIC PLUG EJECTOR OR HOLE SAWS

David G. Baublits, 15306 33rd Ave. East, Tacoma, Wash. 98446

Filed Jun. 27, 1996, Ser. No. 671,182

Int. Cl.^{6} B23B *51/04*

U.S. Cl. 408—204 **26 Claims**



1. An automatic plug ejector tool for a hole saw which comprises:

a mandrel having a proximal end for mounting the tool in a drive means, said mandrel having a distal end for mounting a standard hole saw;

a bearing means adapted to press against a workpiece when the tool is in use;

a spring compressible by movement of the bearing means as a hole saw mounted on the mandrel is advanced into a cut; and

retaining means for holding the spring and bearing means generally in an axial relationship on the mandrel, said retaining means further comprising a slide ring moveable along the mandrel and elongated drive pins to engage a hole saw the pins extending between the bearing means and slide ring parallel to the axis of the mandrel,

whereby when a hole saw mounted on the mandrel is advanced into a cut into a workpiece the bearing means acts against the workpiece surface to compress the spring so that when the saw cuts through the workpiece and removes a cylindrical plug which is contained within the saw the spring relaxes to eject the removed plug from the hole saw.

5,690,453

METHOD AND APPARATUS FOR TRANSPORTING CARS

William R. Claps, Glen Ridge, N.J., assignor to Global Transport Systems, Inc., Glen Ridge, N.J.

Continuation-in-part of Ser. No. 228,091, Apr. 15, 1994, Pat. No. 5,489,171. This application Feb. 17, 1995, Ser. No. 390,743

Int. Cl.^{6} E04H *06/06*

U.S. Cl. 410—24 **17 Claims**

1. A method of transporting cars from an assembly plant to dealers comprising the following steps:

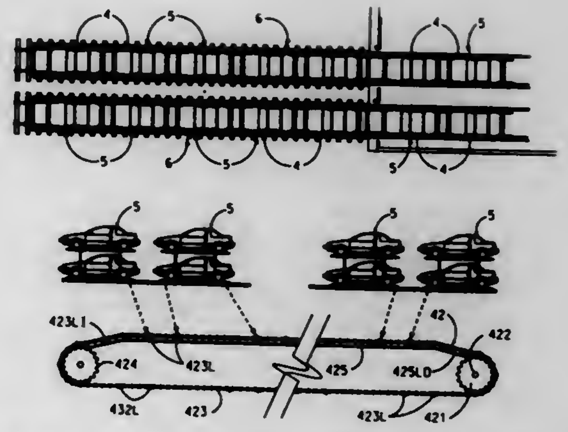
at the assembly plant loading each car individually onto a pallet on which the car is supported on its wheels and securing the car to the pallet to form a palleted car unit;

at the assembly plant loading multiplicities of palleted car units into first closed housings to form first transportable units;

moving a multiplicity of the first transportable units to a first distribution center remote from the assembly plant;

at the first distribution center removing the palleted car units from the first closed housings of the first transportable units and allocating at least some of the palleted car units individually to selected dealers, the palleted car units being removed from the first closed housings and allocated without removing any of the cars from any of the pallets;

at the first distribution center loading the allocated palleted car units into second closed housings to form second transportable units; and



moving the second transportable units from the distribution center to the selected dealers.

5,690,454

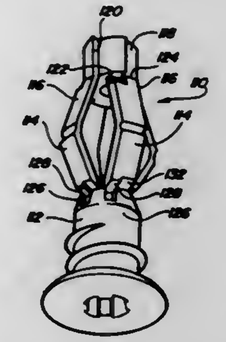
ANCHORING RETAINER FOR THREADED FASTENERS

Jon D. Smith, Fenton, Mich., assignor to Dry Dock Industries, Inc., Fenton, Mich.

Continuation-in-part of Ser. No. 357,078, May 17, 1995, which is a continuation of Ser. No. 153,152, Nov. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 980,555, Nov. 23, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 475,556

Int. Cl.^{6} F16B *13/04;21/00*

U.S. Cl. 411—30 **25 Claims**



1. A retainer for receiving a threaded fastener comprising:

a retainer body formed having a generally cylindrical outer periphery centered about a central axis of said retainer, said outer periphery being generally cylindrical and constant;

a head having a threaded inner bore for receiving a threaded fastener, said head defining an inner end of said retainer body;

an inner subsection hingedly attached to said head;

an outer subsection hingedly attached to said inner subsection;

an outer portion hingedly attached to said outer subsection, said cylindrical body having an outer periphery that is generally cylindrical except for said hinge locations, said hinges being formed by having radially thinner portions on the outer periphery of said body at said hinge locations; and

said body being designed such that said outer portion extends axially for sufficient distance such that it will extend entirely through the thickness of a wall that is to receive said retainer, said inner and outer subsections, said head and said outer portion being designed such that when a threaded fastener is threaded into said retainer and into said head, said head is drawn axially towards said outer portions, said outer subsection rotating about said hinged connection to said outer portion, and into contact with a wall which receives said retainer at a radially outer end, said outer subsection extending away from said wall radially inwardly of said radially outer end and

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extending to said outer portion, said inner subsection rotating about the hinged connection to said head, and said inner and outer subsections being in abutting contact adjacent to the hinge between said inner and outer subsections when said retainer is fully received within a wall such that a truss-like configuration is defined.

5,690,455
METAL EXPANSIBLE ANCHOR

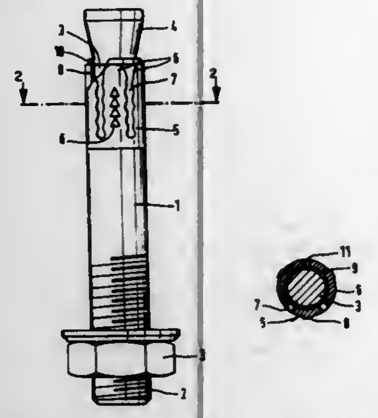
Artur Fischer, Waldachtal, and Dirk Elger, Alpirsbach, both of Germany, assignors to fischerwerke Artur Fischer GmbH & Co. KG, Weinhalde, Germany

Filed Nov. 8, 1996, Ser. No. 745,260

Claims priority, application Germany, Nov. 8, 1995, 195 41 564.7

Int. Cl.^{6} F16B *13/06*

U.S. Cl. 411—55 **6 Claims**



1. An expansible anchor for anchoring in a hole drilled in a concrete part, comprising a shaft having a rear end for fastening an article and a front end with a portion of reduced cross-section and an adjoining expander cone; a slide-enhancing sleeve arranged on said shank; an expansible sleeve arranged on said shank and on said slide-enhancing sleeve, said slide-enhancing sleeve being formed as a thin-walled plastic sleeve having a continuous longitudinal slit and arranged on said reduced portion of said shank, said plastic sleeve having a stop edge that abuts said expansible sleeve and formed so that said slide-enhancing sleeve is pushable with said stop edge onto said expander cone when said expander cone is drawn into said expansible sleeve.

5,690,456
APPARATUS FOR SECURING STRUCTURAL MEMBERS TOGETHER

Bendt W. Wedellsborg, 552 Maureen La., Pleasant Hill, Calif. 94523

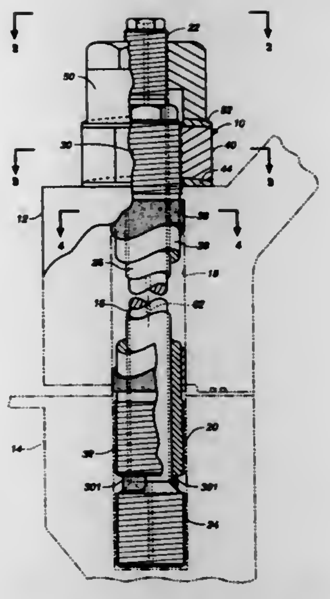
Filed Nov. 14, 1996, Ser. No. 749,000

Int. Cl.^{6} F16B *25/00*

U.S. Cl. 411—383 **25 Claims**

1. Apparatus for securing together first and second structural members, said apparatus comprising, in combination:

- a stud having a first threaded stud end and a second threaded stud end spaced from said first threaded stud end;
- a stud sleeve extending about said stud, said stud sleeve having a first externally threaded sleeve end and a second externally threaded sleeve end spaced from said first threaded sleeve end;
- first stud connector means for being located at said first structural member for threaded engagement with said first threaded stud end to connect said stud to said first structural member;
- second stud connector means for being located at said second structural member for threaded engagement with said second threaded stud end to connect said stud to said second structural member;



- first sleeve connector means for being located at said first structural member for threaded engagement with said first threaded sleeve end to connect said stud sleeve to said first structural member; and
- second sleeve connector means for being located at said second structural member for threaded engagement with said second threaded sleeve end to connect said stud sleeve to said second structural member.

5,690,457
EYEBOLT

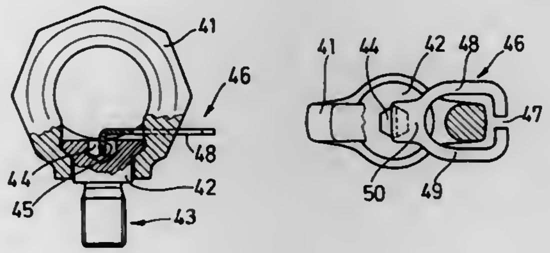
Reinhard Gerog Erich Smetz, Baldingen, Germany, assignor to RUD-Kettenfabrik Rieger & Dietz GmbH. u. Co., Aalen-Unterkochen, Germany

Filed Oct. 20, 1994, Ser. No. 326,550

Claims priority, application Germany, Oct. 25, 1993, 43 36 780.1; Feb. 3, 1994, 44 03 785.6

Int. Cl.^{6} F16B *23/00;* **B25B** *13/48*

U.S. Cl. 411—400 **20 Claims**



1. An eyebolt for lifting or lashing purposes, said eyebolt having a connecting eyelet with an integral base (21) defining an insertion opening (1) for an anchor bolt (3); an anchor bolt comprising a head (6) forming an annular flange (62), a cylindrical segment (61) adjoined to said annular flange (62) and having a smaller diameter than said annular flange (62), and a threaded journal (31) adjoined to said cylindrical segment (61), which threaded journal serves to fasten the eyebolt to an object, the insertion opening forming a circumferential supporting surface (4) at the periphery thereof for a counter-face (5) formed by said annular flange of said head (6);

wherein the cylindrical segment (61) of the anchor bolt (3) has a larger diameter than its threaded journal (31), and wherein the end of the cylindrical segment (61) of the anchor bolt facing away from the annular flange (62), in a fitted state of the eyebolt, forms a bearing surface (10) extending beyond an underside (11) of the base (21) of the connecting eyelet (2) to allow free rotational movement of said connecting eyelet (2) on said cylindrical segment (61) of the anchor bolt (3).

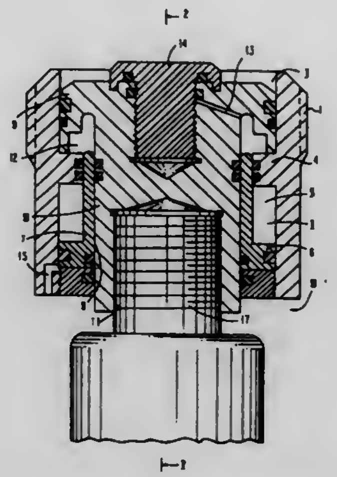
5,690,458
HYDRAULIC BOLT TENSIONER

John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07540, assignor to John K. Junkers, Saddle River, N.J.

Continuation-in-part of Ser. No. 489,896, Jun. 13, 1995, abandoned. This application May 3, 1996, Ser. No. 642,623

Int. Cl.^{6} F16B *37/08*

U.S. Cl. 411—432 **6 Claims**



1. A hydraulic bolt tensioner, comprising means forming a first chamber and a second chamber; first hollow piston means movable in said first chamber and partially extending into said second chamber; second piston means displaceable inside said first piston means and movable in said second chamber, said second piston means having connecting means for connecting with an end of a bolt; and means for supplying hydraulic fluid into said first chamber so that when hydraulic fluid pressure is applied to said first chamber, said first piston means moves so that said first piston means displaces the hydraulic fluid in said second chamber and moves said second piston to pull the end of the bolt.

5,690,459
PLATE AND RIVETED STUD ASSEMBLY

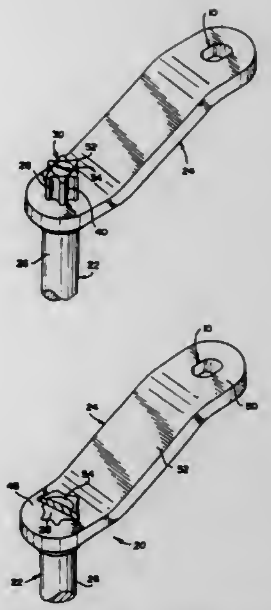
Steve Donovan, Roscoe, and Frank Buchmann, Rockford, both of Ill., assignors to Textron Inc., Providence, R.I.

Filed May 29, 1996, Ser. No. 654,629

Int. Cl.^{6} F16B *7/00; 19/06*

U.S. Cl. 411—504 **18 Claims**

1. An assembly comprising: a stud having a shank portion and a stem portion extending from one end of said shank portion, said stem portion having a multi-lobular configuration thereon comprising a plurality of arcuate lobes, wherein pair of said lobes are interconnected to each other by an arcuate flute; and a plate having an aperture therethrough, said aperture having a multi-lobular configuration thereon which corresponds in shape to the multi-lobular configuration of said stem portion, wherein said stem portion is inserted through said aperture in said plate such that said stem portion having said multi-lobular configuration thereon extends beyond said plate and a portion of said stem portion having said multi-lobular configuration thereon remains within said aperture, said extending portion of said stem portion being riveted to said plate to cause said extending portion to uniformly expand and secure said stud to said plate.



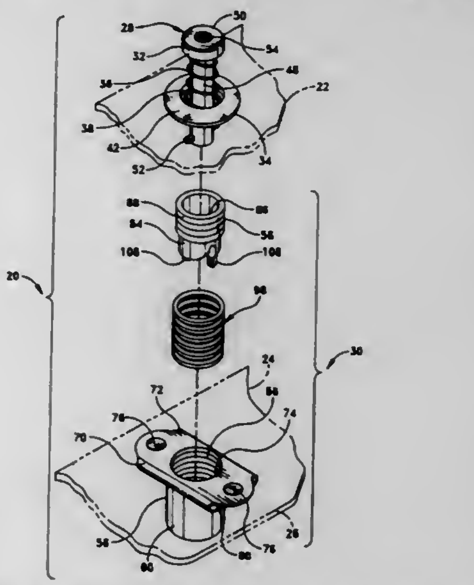
5,690,460
FASTENER ASSEMBLY FOR ATTACHING A COVER TO A PANEL

Jerry E. Attanasio, Middlebury, Conn., assignor to Pilgrim Screw Corporation, Providence, R.I.

Filed Dec. 11, 1996, Ser. No. 763,609

Int. Cl.^{6} F16B *21/00*

U.S. Cl. 411—551 **19 Claims**



1. A fastener assembly for attaching a cover to a panel, said fastener assembly comprising:

- a stud assembly mounted on the cover, said stud assembly including a stud extending through an opening formed in the cover, said stud having a shank portion which extends through the opening in the cover and means for securing the stud to the cover in a position where the stud is biased upwardly from the cover;
- a receptacle assembly including a receptacle barrel having a cylindrical wall defining an opening of the barrel, said barrel being mounted on an inner surface of the panel, said cylindrical wall having an interior surface with female threads formed

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thereon, an insert having a cylindrical body defining a bore of the insert, said insert having an exterior surface with male threads formed thereon, and a helix fabricated from wire-like material, said helix having alternating large and small diameter coils extending along the length of the helix, said helix being disposed between the insert and the barrel for threadably engaging the female threads of the receptacle barrel and the male threads of the insert for preventing the axial movement of the insert with respect to the barrel; and

means for releasably attaching the stud to the insert when releasably attaching the stud assembly to the receptacle assembly.

5,690,461

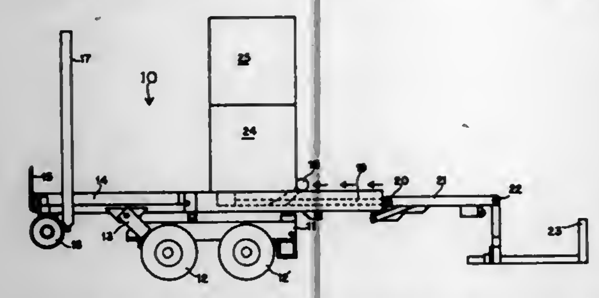
BIG HAY BALE STACKER AND METHOD

Martin C. Tilley, 3003 N. 4025 E., Hansen, Id. 83334

Continuation of Ser. No. 441,839, May 16, 1995, abandoned. This application Dec. 23, 1996, Ser. No. 772,308

Int. Cl.⁶ B65G *57/32*

U.S. Cl. 414—111 **1 Claim**



1. A hay bale stacker for hay bales having a height, a length and a width, said length being the hay bales' longest dimension, said hay bale stacker having a direction of travel, and comprising:

a pick-up mechanism which lifts a hay bale across the length of the hay bale and rotates the bale 90° about a horizontal axis parallel to said bale length and perpendicular to the stacker direction of travel;

a load table with a front end and a back end, said load table being pivotally connected at its front end to said pick-up mechanism, said load table being rotatable 90° only at its back end about a horizontal axis parallel to said bale length and perpendicular to the stacker direction of travel, and said load table being adapted to receive said hay bale from said pick-up mechanism;

a load bed with a front end and a back end, said load bed being pivotally connected at its front end to said load table, said load bed having a bale-set moving mechanism which moves from near the front end of said load bed towards the back end, and said load bed being adapted to receive a vertically stacked set of two hay bales from said load table and from said pick-up mechanism; and

a frame pivotally connected to said load bed, so that said load bed may be tipped backwards relative to the said frame to discharge a said vertically stacked set of two hay bales,

wherein the load table rotates about a horizontal axis in the plane of said load bed from coplanar with to perpendicular to and above the load bed.

5,690,462

PARKING DEVICE FOR MOTOR VEHICLES

James Fan, and Che Kao Chang, both of P.O. Box 82-144, Taipei, Taiwan

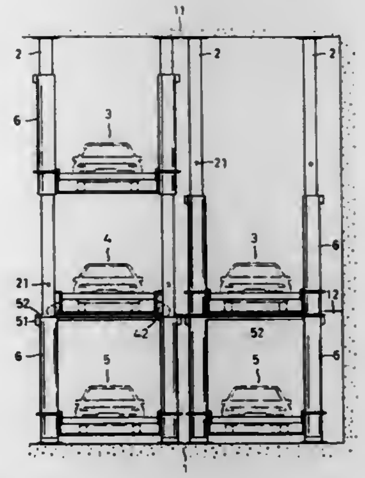
Filed Sep. 16, 1996, Ser. No. 714,202

Int. Cl.⁶ B65G *1/10*

U.S. Cl. 414—228 **2 Claims**

1. A parking device comprising:

a base frame;



a top frame;

four cylindrical poles mounted between four corners of said base frame and said top frame, each of said cylindrical poles having two tubular members slidably mounted thereon;

an upper platform fixedly mounted on said tubular members at an upper position;

a lower platform fixedly mounted on said tubular members at a lower position;

a plurality of first hydraulic cylinders mounted on a bottom of said top frame and drivingly connected with said upper platform;

a plurality of second hydraulic cylinders mounted on said base frame and drivingly connected with said lower platform; and

positioning means having a casing mounted on each of said tubular members, a solenoid fitted within said casing, a plunger fitted within said casing and a spring arranged between said solenoid and said plunger, said plunger being forced by said spring to go partly into a tube radially arranged within each of said poles through said tubular members.

5,690,463

BOOK STORAGE/RETRIEVAL APPARATUS

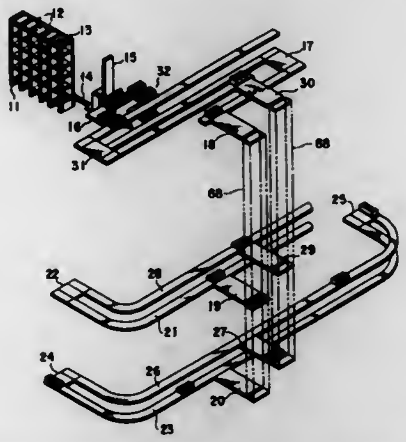
Jinichi Yoshie, Matsudo, Japan, assignor to Nippon Filing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 328,602, Oct. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 094,432, Jul. 21, 1993, abandoned. This application Apr. 30, 1996, Ser. No. 640,075

Claims priority, application Japan, Jul. 31, 1992, 4-205313

Int. Cl.⁶ B65G *1/00;37/00*

U.S. Cl. 414—266 **13 Claims**



1. An automated storage/retrieval apparatus for removing and filing books, comprising:

a plurality of containers, each having an inner space;

a plurality of subcontainers located within each of said containers, each subcontainer including a plurality of books such that spines of the books face in one direction;

a rack means for housing the plurality of containers;

a working station for receiving and holding a designated container with a selected subcontainer storing a requested book;

means for transferring the designated container from said rack means to the working station, and for returning the designated container from the working station to said rack means;

lift plate means, located at said working station, for raising/lowering the selected subcontainer from the designated container at the working station to allow viewing of the spines of the plurality of books stored in the selected subcontainer so that the requested book can be removed therefrom; and

wherein each of the plurality of containers has a bottom grid with openings formed therein at positions underneath aligned bottoms of the plurality of subcontainers so that said lift plate means is raised/lowered through a selected one of the openings in the bottom of the designated container to raise/lower the selected subcontainer with the requested book.

5,690,464

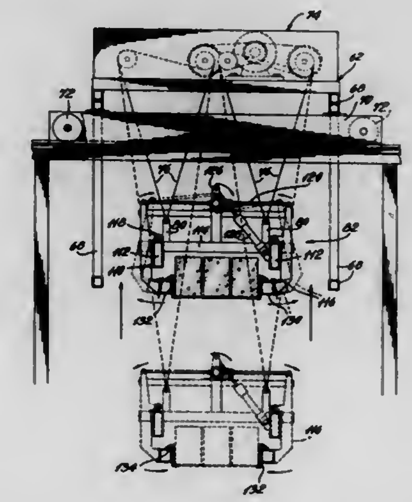
HOLDERS FOR ARTICLE-CARRYING PALLETS AND SYSTEM FOR LOADING AND UNLOADING A STORAGE RACK WITH SUCH PALLETS

Pierre Gagnon, Outremont, and Pierre Laforest, Montreal, both of Canada, assignors to Gestion Laforest Inc., St-Hubert, Canada

Division of Ser. No. 354,258, Dec. 12, 1994, abandoned. This application Jun. 27, 1996, Ser. No. 673,780

Int. Cl.⁶ B65G *1/04*

U.S. Cl. 414—286 **18 Claims**



1. The combination of an assembly of several article-carrying pallets of uniform width and in end-to-end relation, with pallet holders for holding said assembly and with a storage rack having storage compartments arranged in a grid of rows and tiers, each compartment having a pair of spaced, parallel supports disposed along its length and on each side thereof, said pallet holders suspending said assembly from said supports in any selected compartment, said pallet holders comprising a pair of separate, pallet carrying beams disposable along opposite sides of said assembly, the length of each beam being substantially equal to the length of said assembly, each beam defining a web of uniform width and bordered by a lower, inturned, longitudinal flange extending under the side edges of the pallets of said assembly and by an upper, outturned, longitudinal flange hooking onto said supports.

5,690,465

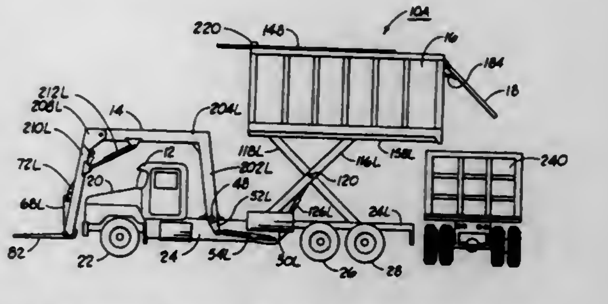
CARCASS PICK UP AND DELIVERY MOTOR VEHICLE

Steven H. Ledwell, Texarkana, Tex., assignor to Ledwell & Son Enterprises, Inc., Texarkana, Tex.

Filed Oct. 11, 1995, Ser. No. 541,117

Int. Cl.⁶ B65F *3/00*

U.S. Cl. 414—408 **15 Claims**



1. A specialized vehicle having a combination of operative elements for receiving and transporting animal carcasses, comprising:

a truck vehicle including an operating cab and engine mounted on the front end of an elongated wheeled frame having front and rear ends;

a forklift assembly which includes:

first and second U-shaped arms each having front and rear ends with the U-shaped arms' rear end pivotally mounted on opposite sides of the wheeled frame behind an adjacent said operating cab, and with said U-shaped arms' front end extending to a point in front of the operating cab;

a fork frame pivotally mounted between said U-shaped arms' front end and pivotal about a transverse axis; and

at least two forks pivotally supported on said fork frame;

first means for controlling the position of said first and second U-shaped arms which include:

first hydraulic means connected between said wheeled frame and each of said first and second U-shaped arms and actuatable to rotate said U-shaped arms in unison;

second hydraulic means actuatable to rotate said fork frame about said transverse axis; and third hydraulic means actuatable to rotate said forks relative to said fork frame;

a scissor beam support frame secured on said elongated wheeled frame rear end, said scissor beam support frame being controllable between a lower horizontal position and an upwardly extended, elevated position;

a truck bed having front and side walls and a tailgate, said truck bed being affixed on said support frame and movable between said lower horizontal position and said elevated position;

second means for controlling said truck bed elevation; fourth hydraulic means for releasing and raising the truck bed tailgate; and

a moving floor disposed in said truck bed actuatable to incrementally off-load rearwardly through said tailgate.

5,690,466

SLOPE PLATES FOR PARTICULATE MATERIAL TRUCK BOX

Donald L. Gaddis, Solon, and Myland D. Hepker, Urbana, both of Iowa, assignors to Courtesy Enterprises, Incorporated, Cedar Rapids, Iowa

Continuation of Ser. No. 381,757, Feb. 1, 1995, Pat. No. 5,505,583. This application Nov. 28, 1995, Ser. No. 563,669

Int. Cl.⁶ B60P *1/40*

U.S. Cl. 414—526 **22 Claims**

1. An improved truck box for transporting particulate material, comprising:

a floor having opposite forward and rearward ends, opposite sides, and an elongated opening extending longitudinally along the length of the floor;

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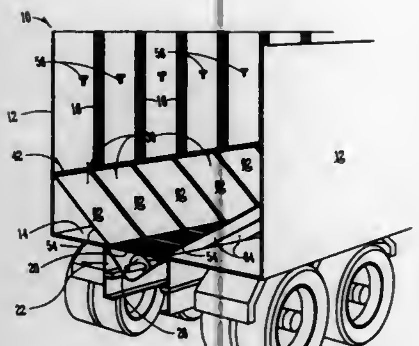


- opposite first and second side walls extending upwardly from each side of the floor;
- a first slope plate assembly pivotally connected to the first side wall for pivotal movement between a raised position adjacent the first side wall and a lowered position extending angularly between the first side wall and the floor;
- a second slope plate assembly pivotally connected to the second side wall for pivotal movement between a raised position adjacent the second side wall and a lowered position extending angularly between the second side wall and the floor;
- each slope plate assembly including a plurality of slope plate sections which are individually pivotal between the raised and lowered positions, each section having forward and rearward edges;
- the side walls including a plurality of vertically disposed stakes; and
- the edges of the slope plate sections being offset rearwardly with respect to the stakes.

5,690,467

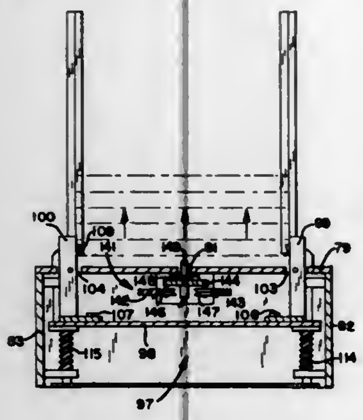
1C TRAY HANDLING APPARATUS

Nathan R. Smith, Stillwater, Minn., assignor to Advantek, Inc., Minnetonka, Minn.

Division of Ser. No. 276,336, Jul. 18, 1994, Pat. No. 5,588,797. This application Sep. 30, 1996, Ser. No. 723,983

Int. Cl.^{6} B65G *57/30*

U.S. Cl. 414—795.2 **8 Claims**



7. An apparatus for handling trays accommodating microchips comprising: first means operable to move one tray from a first position to a second position, second means for placing microchips on said one tray located in the second position, said first means operable to move the one tray located in the second position after the second means has placed microchips on said one tray to a third position, tray holding means for lifting a stack of trays located in the third position whereby said one tray is moved by the first means under said stack of trays, said tray holding means being operable to lower the stack of trays on said one tray and subsequently raise the stack of trays including the one tray whereby another tray can be moved under the stack of trays by the operation of the first means, said tray holding means including upright members adjacent opposite sides of the one tray located in the third position, said upright members having means engageable with the trays operable to lift the stack of trays except to one tray when the upright members are moved in an upright direction, and means connected to the upright members operable to selectively move the upright members in up and down directions, said means connected to the upright members comprise a plate, and power means operatively connected to the plate for moving the plate in up and down directions, said power means includes lead screws, sleeves mounted on the plate accommodating the lead screws and drive means for rotating the lead screws thereby moving the plate selectively in up and down directions.

5,690,468

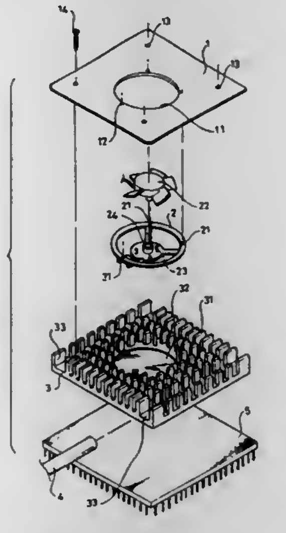
FAN ASSEMBLY FOR AN INTEGRATED CIRCUIT

Chen Fu-In Hong, No. 3, Lane 45, Yi-Yung Road, Kaohsiung, Taiwan

Filed Jun. 19, 1996, Ser. No. 668,629

Int. Cl.^{6} F01D *29/58*

U.S. Cl. 415—177 **4 Claims**



1. A fan assembly for an integrated circuit comprising:
- a finned plate (3) including a plurality of rows and columns of fins (31) extending upwardly from an upper side thereof and a space (32) defined in a center of the upper side, each two said adjacent fins (31) having a gap (33) defined therebetween;
- a board member (1) securely mounted to the finned plate (3) and including a hole (11) defined in a mediate portion thereof;
- a fan device (2) mounted to the board member (1) and having a fan (22) rotatably received in the space (32) of the finned plate (3) the fan device (2) further including a plurality of spacers (23) extending downwardly from a bottom side thereof in contact with the upper side of the finned plate (3) defining the space (32); and
- a heat conducting member (4) securely connected to one of the finned plate (3) and an integrated circuit (5).

5,690,469

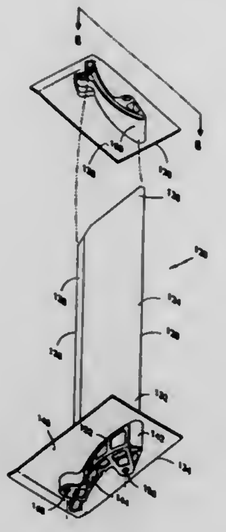
METHOD AND APPARATUS FOR REPLACING A VANE ASSEMBLY IN A TURBINE ENGINE

James L. Deal, Amston; Foster P. Lamm, South Windsor, and Gustavo Moreno, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 6, 1996, Ser. No. 660,050

Int. Cl.^{6} F01O *9/04*

U.S. Cl. 415—189 **13 Claims**



1. A repair kit for replacing an unserviceable stator vane assembly in a gas turbine engine having an array of vane assemblies extending across an annular flowpath defined by coaxial inner and outer cases, the unserviceable vane assembly having an airfoil with inner and outer ends, an inner base attached to the inner end of the airfoil and secured to the inner case, an outer base attached to the outer end of the airfoil and secured to the outer case, the repair kit characterized by:
   - a serviceable vane subassembly comprising a serviceable airfoil having a leading edge, a trailing edge, a tip end, a root end and a base attached to the root end; and
   - an opposing base which is slidingly engageable with the serviceable airfoil but unattached thereto so that the opposing base can be slipped over the tip end of the serviceable airfoil and slid toward the attached base until the serviceable airfoil projects through and is embraced by the opposing base.

4. A method of replacing an unserviceable stator vane assembly in a gas turbine engine having an array of vane assemblies extending across an annular flowpath defined by coaxial inner and outer cases, the method characterized by:
   - providing a serviceable vane subassembly comprising a serviceable airfoil having a leading edge, a trailing edge, a tip end, a root end and a base attached to the root end;
   - providing an opposing base;
   - sliding the opposing base over the tip end of the serviceable airfoil and spanwisely toward the attached base so that the serviceable airfoil projects through and is embraced by the opposing base;
   - positioning the serviceable vane subassembly and opposing base in place of the unserviceable vane assembly so that the attached base is proximate to one of the cases;
   - translating the opposing base to its installed position proximate to the other case and proximate to the tip end of the airfoil; and
   - attaching the opposing base to the serviceable airfoil and securing the opposing base to the other case.

5,690,470

BLOWER HOUSING AND APPARATUS FOR ASSEMBLY THEREOF

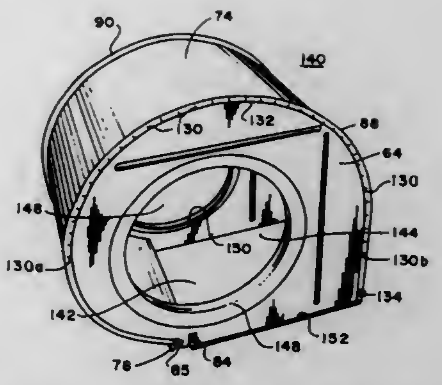
Donald N. Zimmer, Marshalltown, Iowa, assignor to Lennox Industries Inc., Richardson, Tex.

Filed Oct. 30, 1996, Ser. No. 739,178

Int. Cl.^{6} F01D *25/24*

U.S. Cl. 415—214.1 **13 Claims**

1. Apparatus for assembling first, second and third panels into a housing for an air blower, the first and second panels having respective first and second curved edges and the third panel having opposed first and second flanges, the first flange defining a first channel on one side of the third panel and the second flange defining a second channel on an opposite side of the third panel, said apparatus comprising:



- retaining means for retaining the first and second panels in spaced parallel relationship with the third panel below the first and second panels;
- wrapping means for wrapping the third panel around the first and second panels such that the first and second curved edges are received within the first and second channels, respectively, the first flange is in overlapping relationship with the first curved edge, the second flange is in overlapping relationship with the second curved edge and the third panel spans between the first and second panels; and
- securing means mounted with said wrapper means for securing said third panel to said first panel generally along said second paved edge and to said second panel generally along said second curved edge concurrently with the third panel being wrapped around the first and second panels.

5,690,471

WATER PUMP

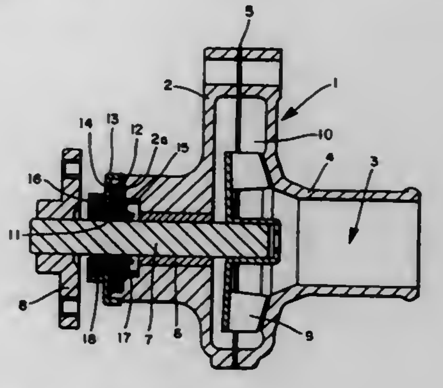
Norio Sasaki, Aichi-ken, Japan, assignor to Aisin Seiki K.K., and Toyota Jidosha K.K., both of Aichi-ken, Japan

Filed Sep. 25, 1996, Ser. No. 720,148

Claims priority, application Japan, Sep. 29, 1995, 7-253848

Int. Cl.^{6} F01D *25/00*

U.S. Cl. 415—229 **5 Claims**



1. A water pump comprising:
- a water pump housing defining a pump chamber;
- a shaft having one end provided with rotating force transmitting means and another end on which an impeller is fitted, said shaft being freely rotatably supported in said water pump housing via a plain bearing;
- an annular mandrel attached on the outer periphery of said shaft between a portion of said shaft supported by said plain bearing and said rotating force transmitting means, said mandrel having a distal end that is inserted into an annular groove formed in said water pump housing at a position opposite to the side surface of said water pump housing;
- a first annular lip seal attached to the distal end of said annular mandrel, said first annular lip seal having portions which make contact with walls forming said annular groove; and

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second annular lip seals for providing a seal between said shaft and said water pump housing disposed on both sides of said annular mandrel axially of said shaft, and grease is filled in a space between said second annular lip seals.

5,690,472

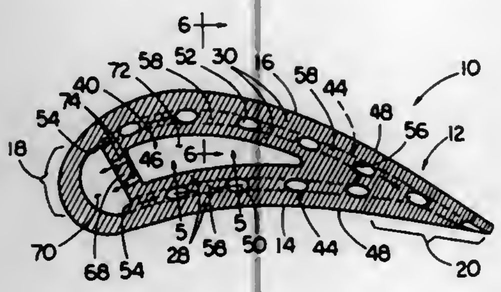
INTERNAL COOLING OF TURBINE AIRFOIL WALL USING MESH COOLING HOLE ARRANGEMENT

Ching-Pang Lee, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 3, 1992, Ser. No. 830,145

Int. Cl.^{6} F01D *5/18*

U.S. Cl. 416—97 R **10 Claims**



1. In a turbine blade airfoil having leading and trailing edge portions and opposite side walls defining pressure and suction sides and extending between and merging together with said leading and trailing edge portions, said side walls having internal surfaces defining a hollow interior chamber for communication of cooling air flow to said side walls, said side walls having external surfaces spaced from said internal surfaces and extending generally in the direction of gas flow past said airfoil from said leading edge portion to said trailing edge portion of said airfoil, each of said side walls having an interior structure defined between said internal and external surfaces thereof, a mesh cooling hole arrangement comprising:

(a) first and second pluralities of cooling holes formed within said interior structure of said side wall at least at said pressure side of said airfoil so as to extend between and along but not intersect with said spaced internal and external surfaces of said side wall extending between said leading and trailing edge portions of said airfoil;

(b) said cooling holes of said first plurality and said cooling holes of said second plurality having inlets and outlets disposed such that the cooling flow direction within said cooling holes is in a generally axial direction from said leading edge portion to said trailing edge portion of said airfoil; and

(c) said cooling holes of said first plurality intersecting said cooling holes of said second plurality so as to define a plurality of spaced apart internal solid nodes in said side wall having pairs of opposite sides interconnected by pairs of opposite corners, a multiplicity of hole portions extending between and along opposite sides of adjacent nodes and a plurality of flow intersections interconnecting said hole portions and disposed between said corners of adjacent nodes.

5,690,473

TURBINE BLADE HAVING TRANSPIRATION STRIP COOLING AND METHOD OF MANUFACTURE

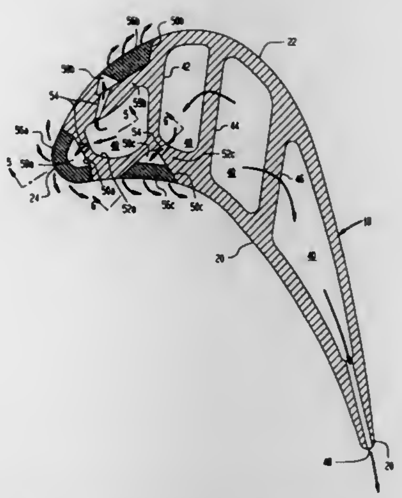
David Max Kercher, Ipswich, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Aug. 25, 1992, Ser. No. 935,066

Int. Cl.^{6} F01D *5/18*

U.S. Cl. 416—97 A **11 Claims**

11. A method of manufacturing a gas turbine engine blade comprising:



providing a hollow airfoil including pressure and suction sides joined together at leading and trailing edges and having an internal supply channel for receiving compressed air;

forming an elongate recess in said airfoil and separated from said supply channel by an imperforate partition;

forming a plurality of spaced apart metering holes through said partition in flow communication with said supply channel; and

fixedly joining a transpiration strip to said airfoil in said recess and spaced from said partition to define a plenum therebetween for receiving said compressed air, and said transpiration strip being complementary in configuration with said recess and having perimeter sides fixedly joined to said airfoil, and an outer profile disposed coextensively with an outer surface of said airfoil.

5,690,474

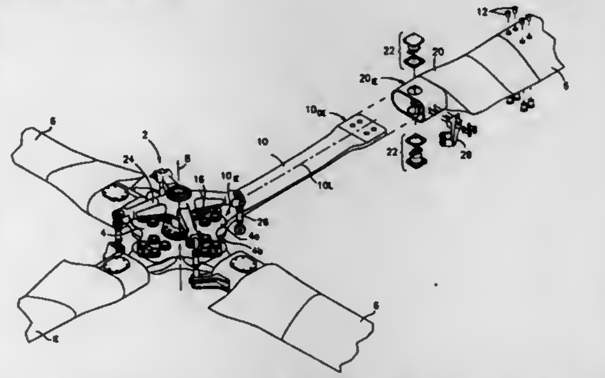
OPTIMIZED COMPOSITE FLEXBEAM FOR HELICOPTER TAIL ROTORS

Francis E. Byrnes, White Plains, N.Y.; Francis D. Federici, Bridgeport, and David N. Schmaling, Oxford, both of Conn., assignors to Sikorsky Aircraft Corporation, Stratford, Conn.

Filed Jul. 18, 1996, Ser. No. 683,490

Int. Cl.^{6} B64C *27/38*

U.S. Cl. 416—134 A **20 Claims**



1. An optimized composite flexbeam (**10**) for a helicopter tail rotor assembly (**2**), the optimized composite flexbeam (**10**) having a plurality of adjoining regions including a hub attachment region (HAR), a blade attachment region (BAR), an inboard transition region (ITR) adjoining the hub attachment region (HAR), and an outboard transition region (OTR) adjoining the blade attachment region (BAR), the optimized composite flexbeam (**10**) further comprising:

a pitch region (PR) adjoining the inboard and outboard transition regions (ITR, OTR) and defining a flapwise bending neutral axis (X_A), said pitch region (PR) including:

a core laminate (**50**) of unidirectional fiberglass material (U_F), said core laminate (**50**) defining lateral surfaces (**50_L**) and mating surfaces (**50_M**), said lateral surfaces (**50_L**) defining a pitch region width dimension (W_{PR}) therebetween;

face laminates (**52**) of unidirectional graphite material (U_G), said face laminates (**52**) being bonded to said mating surfaces (**50_M**) of said core laminate(**50**), said face laminates(**52**), furthermore, defining face surfaces (**52_F**), said face surfaces (**52_F**) defining a pitch region thickness (T_{PR}) dimension therebetween;

said pitch region width and thickness dimensions (W_{PR}, T_{PR}) defining an aspect ratio, said aspect ratio being greater than or equal to 10;

said core and face laminates (**50**, **52**), furthermore, defining a chamfered edge configuration (CH_E) having chamfered edge surfaces (**54_S**), each said chamfered edge surface (**54_S**) defining a critical acute angle α with respect to said flapwise bending neutral axis (X_A), and, furthermore, defining a lateral edge (**54_E**) disposed a vertical distance X from said flapwise bending neutral axis (X_A);

said critical acute angle α being between about 14 degrees to about 22 degrees;

said vertical distance X being about 12.5% to about 37.5% of said pitch region thickness dimension T_{PR}.

5,690,475

SCROLL COMPRESSOR WITH OVERLOAD PROTECTION

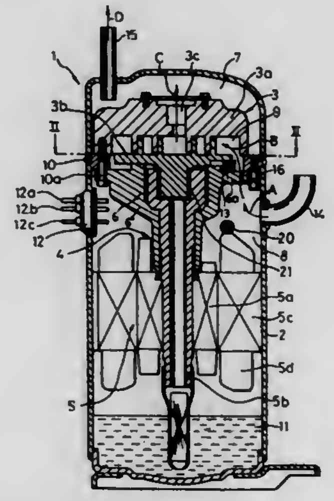
Sadayuki Yamada, Otsu; Nobuyuki Shiratake, Kusatsu; Hiroyuki Fukuhara, Otsu, and Shigeru Muramatsu, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 364,631, Dec. 27, 1994. This application Sep. 4, 1996, Ser. No. 707,356

Claims priority, application Japan, Dec. 28, 1993, 5-336364

Int. Cl.^{6} F04B *49/10*

U.S. Cl. 417—32 **5 Claims**



1. A scroll compressor comprising:

a sealed container;

a partition wall provided in said sealed container which partitions an internal space of said sealed container into a delivery chamber which contains compressed coolant and a suction chamber in which a motor is located;

a pressure relief valve for relieving said compressed coolant from said delivery chamber when pressure of said compressed coolant exceeds a predetermined pressure, said pressure relief valve being pressure actuated by said compressed coolant and being located in said partition wall, said pressure relief valve having an inlet and an outlet, said inlet leading to said delivery chamber, and said outlet being located in said suction chamber; and

a thermal switch located in said suction chamber in an aligned position with the outlet such that compressed coolant being relieved from said pressure relief valve flows onto said thermal switch to control the operation of said motor.

5,690,476

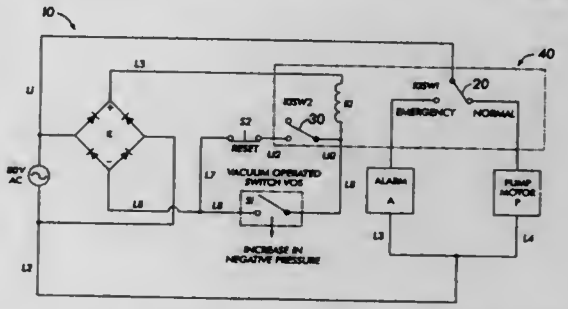
SAFETY DEVICE FOR AVOIDING ENTRAPMENT AT A WATER RESERVOIR DRAIN

Bernard J. Miller, 882 Andorra Rd., Lafayette Hills, Pa. 19444

Filed Oct. 25, 1996, Ser. No. 738,222

Int. Cl.^{6} F04B *49/06*

U.S. Cl. 417—44.2 **9 Claims**



1. An electrical circuit adapted to shut-off power to a water reservoir pump having an intake coupled in fluid communication to a water reservoir drain whenever the drain becomes obstructed, the power being provided to the pump via first and second leads coupled between a power source and the pump, said electrical circuit comprising:

a relay comprising a drive coil for driving a first associated switch and a second associated switch, said drive coil having a first end coupled to the first lead of the power source and a second end coupled through said first associated switch to the second lead of the power source, thereby defining a first return path;

a parallel return path coupling said second end of said drive coil to the second lead of the power source through a vacuum-operated switch that is disposed at the intake of the pump, said vacuum-operated switch permitting a flow of current through said drive coil and through said vacuum-operated switch whenever said vacuum-operated switch experiences a partial vacuum draw of a predetermined pressure or greater partial vacuum;

said first associated switch being closed whenever said flow of current exists;

and said second associated switch being coupled in series between the power source and the pump and whenever said flow of current exists said second associated switch opens, thereby shutting-off power to the pump.

5,690,477

INVISIBLE SETTING METHOD FOR JEWELRY

Manny Haimoff, Lawrence, N.Y., assignor to Nili Jewelry, Corp., New York, N.Y.

Continuation-in-part of Ser. No. 676,846, Jul. 8, 1996, abandoned. This application Mar. 21, 1997, Ser. No. 828,209

Int. Cl.^{6} B22C *7/02;* **B22D** *19/00*

U.S. Cl. 164—9 **10 Claims**

1. A method of manufacturing jewelry having a plurality of stones supported in an invisible stone mount, said method comprising the steps of:

providing a mold for producing a wax-like pattern of the jewelry;

placing a rigid segment into a stone mount region of the mold corresponding to a stone-mount region of the jewelry;

injecting a wax-like substance to form a wax-like pattern of said jewelry, including the rigid segment;

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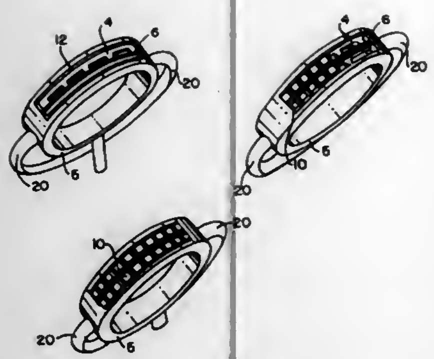


inserting the stones into set positions thereof in the wax-like pattern on opposite sides of the rigid segment which forms an invisible preset stone mount;
embedding said wax-like pattern, containing said rigid segment with the positioned stones in an "investment" material;
melting the wax-like pattern to provide a mold cavity with said rigid segment and the supported stones being suspended therein;
injecting molten material into the mold cavity to form a casting of the jewelry with the invisibly supported stones; and
separating the investment material to remove the jewelry with the invisibly preset stones.

5,690,478
SOLID MATERIAL PUMP

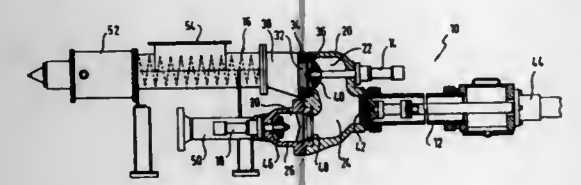
Peter Zöliner, Glinde, Germany, assignor to Abel GmbH & Co., Buchen, Germany

Filed Dec. 19, 1995, Ser. No. 574,941

Claims priority, application Germany, Dec. 30, 1994, 44 47 209.9

Int. Cl.⁶ F04B *15/02;53/10*

U.S. Cl. 417—533 **10 Claims**



1. A solid material pump comprising
a pump housing,
a pair of parallel pump cylinders driven by hydraulic cylinders and each connected to a pump chamber,
a slurry feed device which communicates via inlet valves with inlet valve chambers each of which are adjacently positioned to and communicates with the pump chambers, wherein the valve chambers and the pump chambers merge into each other to form a junction zone, inlet valve cylinders for actuating the inlet valves,
a plurality of inlet openings being provided in the pump housing opposite, yet offset, to the pump cylinders, wherein
the pump housing, which forms the inlet valve chambers and the pump chambers, is shaped and configured such that when the material is sucked by the pump cylinder, the material enters the inlet valve chambers via the inlet openings as it flows into the pump cylinder, the solid material pump further comprising outlet valves,
outlet valve chambers, each having an outlet opening adapted to communicate via an outlet valve with the pump chambers and connected to a common outlet valve conduit,
outlet valve cylinders for actuating the outlet valves, being connected to the pump housing on the side opposite to the inlet valve cylinders, and the axes of the outlet valve cylinders extending in parallel to each other,
wherein
the axes of the inlet cylinders (**14**,**14***a*) and the pump cylinders (**12**,**12***a*) are arranged and
the pump chambers (**24**,**24***a*) and the inlet valve chambers (**22**,**22***a*), are positioned within the pump housing
such that the flow of material is sucked in through the inlet openings by the pump cylinder and is diverted within the pump housing at an angle of 45° or less with respect to the axes of one of the valve cylinders (**14**) and of the pump cylinders (**12**,**12***a*), respectively.

5,690,479
MULTI-STAGE REGULATOR FOR VARIABLE DISPLACEMENT PUMPS

Uwe Lehmann, Worrstandt; Bodo Stich, Wiesbaden, and Maik Wilhelm, Trebur, all of Germany, assignors to Mercedes-Benz Aktiengesellschaft, Stuttgart, Germany

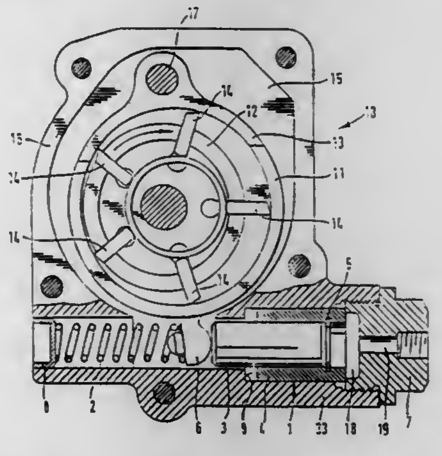
PCT No. PCT/DE94/00642, § 371 Date Apr. 23, 1996, § 102(e) Date Apr. 23, 1996, PCT Pub. No. WO94/29595, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 7, 1994, Ser. No. 564,346

Claims priority, application Germany, Jun. 9, 1993, 43 19 200.9

Int. Cl.⁶ F04C *2/344;15/04*

U.S. Cl. 418—26 **17 Claims**



1. Multi-stage regulator for a variable displacement volume pump with a pressure regulating piston to which a pressure (P) derived from the output side of a said variable displacement volume pump can be applied, and which upon increasing pressure can be displaced counter to the force of a flexible restoring element, said regulator comprising a regulating piston having a plurality of part pistons, including at least a first part piston and a second part piston, to which pressure can be simultaneously supplied, said part pistons being engagable with each other such that they can be moved simultaneously over a limited regulating distance in a parallel manner, wherein for at least said second part piston of said plurality of part pistons a stop is provided which limits the regulating distance of said second part piston in opposition to the direction of force of said restoring element as the pressure increases, wherein said first part piston of said plurality of part pistons still remains movable counter to the force of the restoring element, wherein said first and second part pistons have transferring means therebetween such that the force acting on said second part piston when being in engagement with said first part piston is transferred to said first piston via said second part piston.

5,690,480
SCROLL COMPRESSOR WITH COOLING HOLES IN ORBITING SCROLL

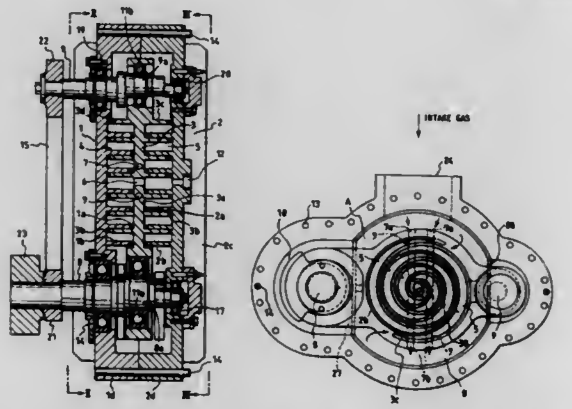
Akira Suzuki; Kazuaki Shiinoki; Isamu Kawano, all of Shimizu, and Shigeru Machida, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1996, Ser. No. 602,275

Claims priority, application Japan, Feb. 20, 1995, 7-030395; Mar. 20, 1995, 7-060469

Int. Cl.⁶ F01C *1/04*

U.S. Cl. 418—55.2 **20 Claims**



1. A scroll compressor comprising an orbiting scroll having a spiral-shaped lap formed on an end plate and a fixed scroll having a spiral-shaped lap meshing with the lap formed on the end plate, wherein the end plate has a cooling hole passing therethrough from one peripheral side of the end plate to another and at least some intake gas of the scroll compressor passes through the cooling hole before being sucked into a compression chamber through an intake end of the spiral-shaped laps.

5,690,481
INTERNAL-GEAR MACHINE HAVING A DIVIDED FILLING PORTION

Otto Eckerle, Malsch, Germany, assignor to Eckerle Industrie-Elektronik GmbH, Malsch, Germany

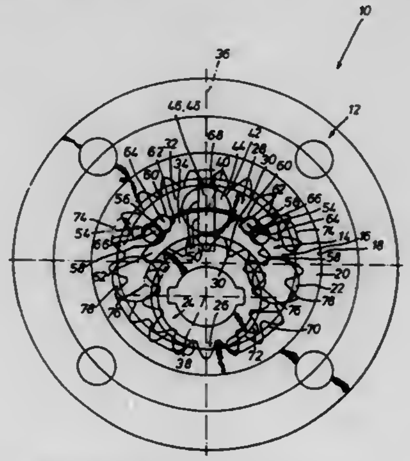
PCT No. PCT/DE94/01249, § 371 Date Apr. 18, 1996, § 102(e) Date Apr. 18, 1996, PCT Pub. No. WO95/12070, PCT Pub. Date May 4, 1995

PCT Filed Oct. 21, 1994, Ser. No. 633,782

Claims priority, application Germany, Oct. 29, 1993, 43 36 966.9

Int. Cl.⁶ F01C *1/10*

U.S. Cl. 418—126 **33 Claims**



1. An internal-gear machine enclosed in a two part casing comprising:
an internally toothed annular gear;
an externally toothed pinion engaged with said internally toothed annular gear and defining a sickle shaped filling portion in the remaining space between said internally toothed annular gear and said externally toothed pinion;
first and second symmetrical sickle shaped filling portion parts situated within the filling portion and forming a separation surface which extends substantially in a peripheral direction, each filling portion part having mutually disposed openings at their respective ends, said openings beginning at the separation surface and extending angularly outward forming respective wedge surfaces;
first and second sealing rollers provided in the mutually disposed openings defined by the respective wedge surfaces, said first and second sealing rollers bearing against said first and second wedge surfaces respectively; and
first and second spring elements comprising a fixing portion and a spring portion and fixed to one of the two casing parts, said first and second spring elements urging said first and second sealing rollers against said first and second wedge surfaces respectively.

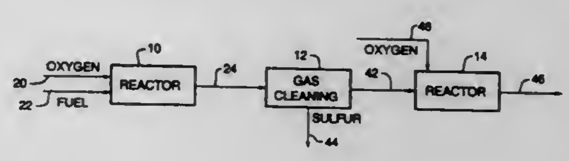
5,690,482
PROCESS FOR THE COMBUSTION OF SULPHUR CONTAINING FUELS

Gerry Shessel, North York, and Norman James MacGregor, Kingcardine, both of Canada, assignors to Integrated Energy Development Corp., Kingcardine, Canada

Filed Nov. 4, 1994, Ser. No. 336,113

Int. Cl.⁶ F23B *1/00*

U.S. Cl. 431—2 **24 Claims**



1. A process for producing energy from sulphur containing carbonaceous fuels comprising the steps of:
(a) partially oxidizing the carbonaceous fuel at a pressure from about 10 to about 40 bars and a temperature from about 1,200° C. to about 1,700° C. to produce off gasses including carbon monoxide, hydrogen and hydrogen sulphide;
(b) removing hydrogen sulphide from said off gasses; and,
(c) combusting the off gasses from step (b) to produce energy.

5,690,483
GASEOUS FUEL BURNER

Kenneth J. Oda, Elk Grove Village; Donald M. Krueger, Westchester; Stefan J. Szewczyk, Lansing; George R. Kell, Geneva, and Norman K. Peck, Bloomingdale, all of Ill., assignors to Eaton Coporation, Cleveland, Ohio

Filed Jul. 17, 1996, Ser. No. 682,464

Int. Cl.⁶ F23Q *3/00*

U.S. Cl. 431—266 **14 Claims**

1. A burner assembly for gaseous fuel comprising:
(a) a body formed of a metallic material having a melting point less than the ignition temperature of said fuel and having an annular configuration with an inlet adapted for connection to a source of gaseous fuel and air and communicating with a cavity defined by a portion distal said inlet;
(b) a wafer disposed over said cavity and closing same to form a fuel-air plenum chamber and cooperating with said base to define a plurality of peripheral flame generating ports each communicating with said fuel-air plenum chamber; and,

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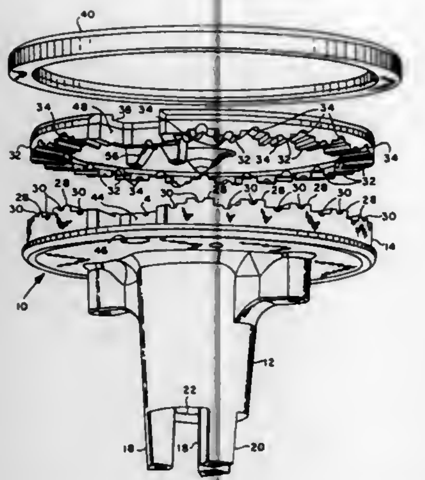


(c) a cap formed substantially of metallic material and disposed over said wafer, said cap and wafer defining therebetween an air plenum for limiting the temperature rise of said cap.

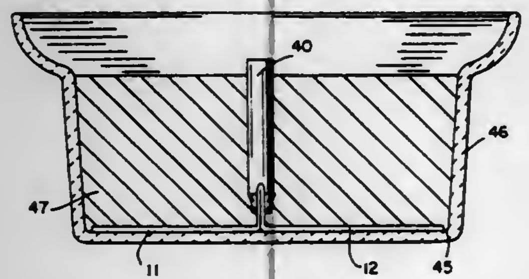
5,690,484
CANDLE WICK HOLDER

Stephen B. Leonard, Franksville, and D. James Musiel, Wind Point, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 592,165, Jan. 26, 1996, abandoned. This application Apr. 5, 1996, Ser. No. 628,431

Int. Cl.^{6} F23D *3/24*

U.S. Cl. 431—291 **17 Claims**



1. A foldable blank for use in forming a candle wick holder, comprising an elongated sheet of foldable material, the sheet having an upper surface and a downward surface, with:

a first leg panel;

a first wick support panel connected to the first leg panel and having a downwardly bendable platform panel and an upwardly bendable wick guide panel;

a second wick support panel connected to the first wick support panel at an opposite end of the first wick support panel from the first leg panel, the second support panel also having an upwardly bendable wick guide panel; and

a second leg panel connected to the second wick support panel at an opposite end of the second wick support panel from the first wick support panel.

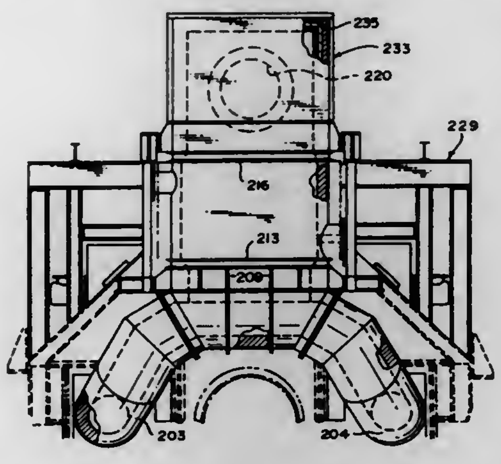
5,690,485
COMBUSTION SYSTEM FOR A STECKEL MILL

William J. Mangham, Brookwood; Charles D. McPherson, Mulga, and Donald N. Mohr, Northport, all of Ala., assignors to Tuscaloosa Steel Corporation, Tuscaloosa, Ala.

Division of Ser. No. 331,099, Oct. 28, 1994. This application Feb. 22, 1996, Ser. No. 603,876

Int. Cl.^{6} F26B *13/00;* **F27B** *9/28*

U.S. Cl. 432—8 **5 Claims**



1. A method of pre-heating a combustible intake gas delivered to multiple burners of an open bottom coiling furnace unit in a steckel mill comprising:

providing a recuperator in-line with an exhaust duct used to direct a flow of combustion products from the multiple burners to an exhaust outlet:

directing a flow of combustion products from the multiple burners through said recuperator to an exhaust outlet; and

directing a flow of the combustible intake gas through said recuperator in heat exchange relationship with the flow of combustion products in said recuperator in order to pre-heat the combustible intake gas prior to delivery of the combustible intake gas to the multiple burners.

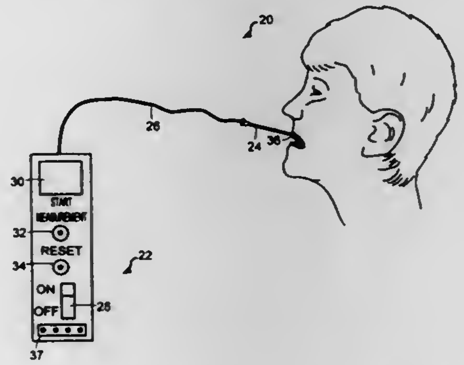
5,690,486
DENTAL TOOTH COLOR DETECTOR APPARATUS AND METHOD

Sheldon D. Zigelbaum, Boston, Mass., assignor to Dentalase Corporation, Newton, Mass.

Filed Jul. 28, 1995, Ser. No. 508,868

Int. Cl.^{6} A61C *1/00*

U.S. Cl. 433—29 **14 Claims**



1. A dental tooth color detector which detects the color of a tooth and determines the proper restorative dental material to be used to repair the tooth, said detector comprising:

A. means for illuminating the tooth with light including

a plurality of light emitting diodes each illuminated in a controlled manner;

a bifurcated fiber optic bundle having an output path which receives illuminating light from said light emitting diodes, and an input path disposed to provide detected light;

a light wand which receives the illuminating light from said output path and diffuses the light to provide a diffuse light beam which illuminates the tooth, and which receives reflected light from the tooth and routes said reflected light to said input path;

a disposable, protective sheath placed over said light wand and comprising a surface which is placed against said tooth, wherein said surface is formed of light absorbing, compressive material;

B. means for detecting a plurality of color components from said detected light which are reflected off the tooth, and for providing a plurality of light color component signal values indicative thereof;

C. means for processing said plurality of color component signal values to determine a desired restorative material which best matches the color of the tooth, wherein said means for processing includes a non-volatile electronic memory device comprising a database of a plurality of reference color signal values indicative of the color characteristics for a plurality of restorative materials, and means for comparing a detected color signal value indicative of said plurality of light color component signal values against said plurality of reference color signal values to determine said desired restorative material; and

D. a display for displaying a message indicative of said desired restorative material.

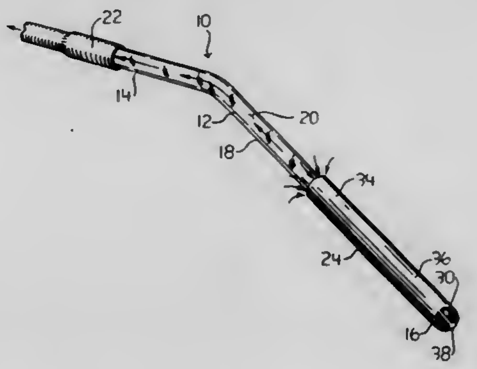
5,690,487
DISPOSABLE ORAL SUCTION TIP

Ronald L. S. Whitehouse, and Connie Watson, both of Edmonton, Canada, assignors to White Shield Inc., Edmonton, Canada

Continuation of Ser. No. 418,404, Apr. 7, 1995, abandoned. This application Nov. 8, 1996, Ser. No. 745,675

Int. Cl.^{6} A61C *17/06*

U.S. Cl. 433—91 **4 Claims**



1. A disposable oral suction tip, comprising:

a bendable tubular body having a consistent cross-sectional profile having a suction line attachment and attachable to a suction source, a mouthpiece end, an exterior surface and at least one central passage that extends between the suction line attachment end and the mouthpiece end;

a mouthpiece secured to the mouthpiece end of the tubular body where the mouthpiece is directly open to a plurality of vacuum release channels and the mouthpiece is directly open to the at least one central passage so that the plurality of vacuum release channels and the at least one central passage can communicate; and

a tubular barrel having an internal surface with a plurality of internal vanes overlies the tubular body, the internal vanes dividing a space between the internal surface of the tubular barrel and the exterior surface of the tubular body into the plurality of vacuum release channels each of the plurality of vacuum release channels having a first end and a second end, each of the plurality of vacuum release channels extending along the exterior surface of the tubular body, the first end being positioned for placement in a patient's mouth along with the mouthpiece and the second end being spaced from the mouthpiece such that there is communication between the suction source and each of the plurality of vacuum release channels, so that when the patient's mouth is closed over the mouthpiece the plurality of vacuum release channels provide direct unobstructed venting of the oral cavity to prevent backflow from the at least one central passage into the patient's mouth and there is no effect on the force of suction up the at least one central passage.

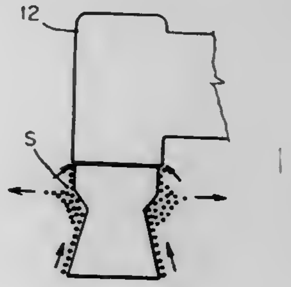
5,690,488
ANTI-SPLATTERING ROTARY DENTAL INSTRUMENT FOR CLEANING TEETH

Ronald P. Spinello, York, Pa., assignor to Spintech, Inc., York, Pa.

Continuation-in-part of Ser. No. 432,768, May 2, 1995, abandoned. This application Apr. 25, 1996, Ser. No. 637,551

Int. Cl.^{6} A61C *1/08;3/06*

U.S. Cl. 433—116 **11 Claims**



1. A splatter resistant prophylactic dental apparatus comprising:

a rotatable tooth-cleaning element comprising a resilient, radially-flarable tooth-engaging head portion and a base portion to carry said head portion;

a housing to carry said tooth-cleaning element; and

means for diverting splatterable migrating slurries on the rotatable element before they detach therefrom by centrifugal force as splatter, said diverting means closely surrounding at least a portion of said base portion of said tooth-cleaning element to define a narrow gap therebetween;

said base portion is sufficiently rigid to preclude contact with the diverting means during rotation;

the forward end of said diverting means terminating at a point which affords an open view of the radially flarable head portion but precludes engagement therewith both in its flared working configuration and in its unflared non-working configuration;

whereby the diverting means is positioned to engage slurries which migrate on the outer surface during rotation of the tooth-cleaning element without touching the element to damp the rotational momentum of the slurry before accumulations thereof are hurled into the surrounding environment as contaminated splatter.

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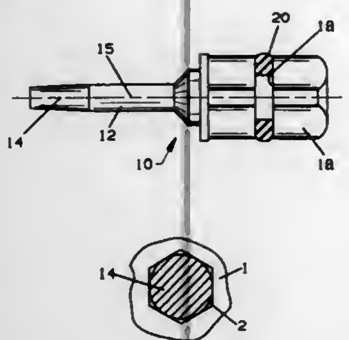
5,690,489
DELIVERY AND DRIVE TOOL FOR THREADED MEMBERS AND METHOD FOR USE

Joseph Edward Carchidi, 132 Samuel Ave., West Bridgewater, Mass. 02379

Filed Jul. 26, 1995, Ser. No. 507,086

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—141 **6 Claims**



1. A drive and delivery tool for use with a dental prosthetic component having a threaded portion and a recess formed with hexagonal flat side surfaces comprising a generally elongated member having a longitudinal axis and having opposite end portions, one end portion having a circular cross section at any given point along the longitudinal axis, the said one end portion having a cylindrical tapered surface adapted to be received in the recess of the component for frictional engagement with essentially only a point on respective flat side surfaces defining the recess.

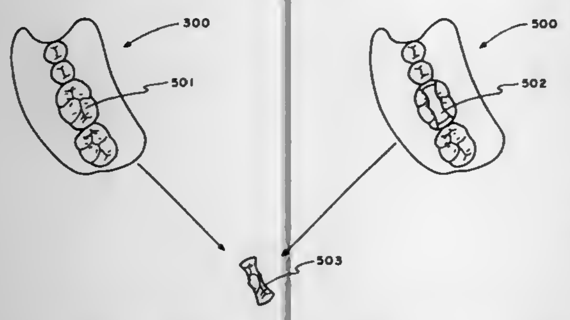
5,690,490
METHOD AND APPARATUS FOR FABRICATION OF DENTAL RESTORATION BY PINHEAD MOLDING

Mark L. Cannon, 548 Wayland Ave., Kenilworth, Ill. 60043, and George H. Boyd, 1351 W. Touhy, Apt. 1N, Chicago, Ill. 60626

Filed Nov. 25, 1996, Ser. No. 756,276

Int. Cl.^{6} A61C *5/04*

U.S. Cl. 433—226 **18 Claims**



1. A method for fabrication of a restoration for a patient's dentition by pinhead molding, the method comprising the steps of:
(a) examining the patient's dentition, restoring gross areas of tooth loss, and restoring proper anatomy and contour of the dentition;
(b) forming a first optically correct impression of the dentition and scanning the first impression to provide a first data set;
(c) appropriately isolating and preparing the patient's dentition for a dental restoration;
(d) forming a second optically correct impression of the dentition and scanning the second impression to form a second data set;
(e) comparing the first and second data sets and deriving a third data set based upon the comparison, the third data set being descriptive of a restoration to be prepared; and
(f) forming the restoration by pinhead molding of a flowable composite material in accordance with the third data set.

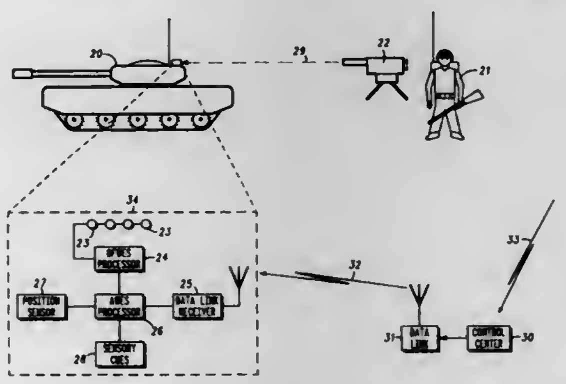
5,690,491
METHOD AND APPARATUS FOR SIMULATING THE EFFECTS OF PRECISION-GUIDED MUNITIONS

Mark Richard FitzGerald, Phoenix; Joseph Richard Miller, Paradise Valley, and Clyde Jack McLennan, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 13, 1996, Ser. No. 696,079

Int. Cl.^{6} F41A *33/00*

U.S. Cl. 434—16 **20 Claims**



1. An apparatus for simulating effects of precision guided munitions comprising:
a target;
a designator device for indicating to fire upon said target with said simulated precision guided munitions, said designator device transmitting a signal from said designator device to said target;
a detector for determining that said target has been indicated by said designator device, said detector including a receiver for receiving a mission message indicating that said target is selected for a simulated round of said precision guided munitions; and
said detector including a means for determining effects of said simulated round of said precision guided munitions on said target.

12. A method for simulating effects of precision guided munitions upon a target comprising the steps of:
transmitting a mission message to a target, said mission message including a location of an impact area of said simulated precision guided munitions and a designator code;
transmitting by a designator simulator a coded signal to the target;
decoding the coded signal by a processor associated with the target to produce a decoded signal;
independently determining a location of the target;
comparing a code of the decoded signal with the code transmitted in the mission message;
comparing a firing location of the simulated precision guided munitions transmitted with the mission message with the location of the target; and
displaying sensory cues if the firing location of the simulated precision guided munitions and the location of the target compare and if the decoded signal compares with the code transmitted in the mission message.

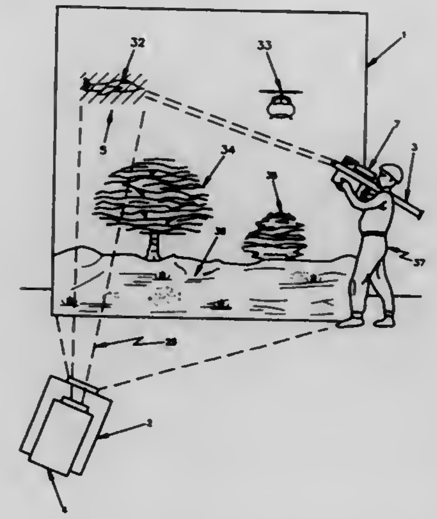
5,690,492
DETECTING TARGET IMAGED ON A LARGE SCREEN VIA NON-VISIBLE LIGHT

Gordon L. Herald, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 18, 1996, Ser. No. 683,272

Int. Cl.^{6} F41G *3/26;* **F41J** *5/10*

U.S. Cl. 434—20 **4 Claims**



1. A method for determining when a selected visible image among many visible images located on a surface is being aimed at by a pointing device comprising the steps of:
creating a pulsed light beam of high intensity;
transmitting said pulsed light beam through a dynamic light positioning aperture;
focusing said pulsed light beam emitted by said aperture;
filtering said focused light beam to create a focused, non-visible, pulsed light beam;
projecting said focused, non-visible, pulsed light beam upon said selected visible image;
sensing the reflection of said focused, non-visible, pulsed light beam from said surface by a sensing means located on said pointing device;
converting said sensed reflection to a signal;
processing said signal to indicate when said selected visible image is being aimed at by said pointing device;
wherein said step of creating a pulsed light beam of high intensity further comprises the step of generating a series of unique pulsed light beams of high intensity, each said unique pulsed light beam corresponding to a selected set of visible images located on said surface.

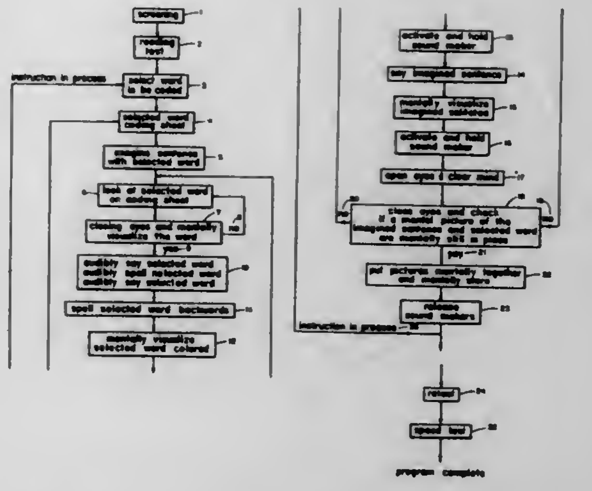
5,690,493
THOUGHT FORM METHOD OF READING FOR THE READING IMPAIRED

Anthony M. McAlear, Jr., 87 Old Forge Rd., Scituate, Mass. 02066

Filed Nov. 12, 1996, Ser. No. 745,701

Int. Cl.^{6} G09B *17/00*

U.S. Cl. 434—178 **6 Claims**



1. A method of reading instruction whereby words without pictures, as well as other words which a particular reading impaired person finds especially difficult to read and understand, are coded into thought forms through the use of sensing anchors and triggers thereby resulting in the establishment of a mental picture for each such word, comprising the steps of:
screening a student to determine if the student is reading impaired;
providing a standard reading test to establish a reading skills benchmark;
providing a coding sheet for a selected word wherein said sheet has the selected word printed in large letters in a shadowed lower case and in a standard type face;
providing on the coding sheet a definition of the selected word, a plurality of sample sentences with containing the selected word, and a picture scene enacting one of the sentences or suggesting an application of the word;
instructing the student to create a thought form for the selected word according to the following steps:
imagining a sentence that best represents the idea of the selected word;
looking at the selected word on the sheet and then closing his or her eyes, repeating this step as many times as necessary, to mentally see the word clearly;
audibly saying the selected word, spelling the word, and then saying the word again;
spelling the selected word backwards;
mentally visualizing the selected word colored;
saying the imagined sentence to himself or herself;
mentally visualizing the imagined sentence;
opening his or her eyes and clearing his or her mind;
closing his or her eyes and checking whether a picture of the selected word and imagined sentence are mentally still in place;
if either or both pictures of the selected word and imagined sentence are not in place, then the sentence and/or word steps above are repeated;
if the two pictures are in place, the pictures are mentally put together and mentally stored.

5,690,494
GOLF TEACHING AID

John E. Luker, P.O. Box 5203, Destin, Fla. 32540

Filed Nov. 25, 1996, Ser. No. 756,251

Int. Cl.^{6} A63B *23/02;69/36*

U.S. Cl. 434—252 **8 Claims**

1. A golf teaching aid comprising:
an upper body yoke structured to snugly fit the shoulders and upper arms of a user; at least one handle attached to a forward portion of said upper body yoke and extending downwardly therefrom; and a resilient cord having a first end attachable to a rearward portion of said upper body yoke and a second end attachable to a fixed object; whereby rotational movement of said upper body yoke against resistance of said resilient cord

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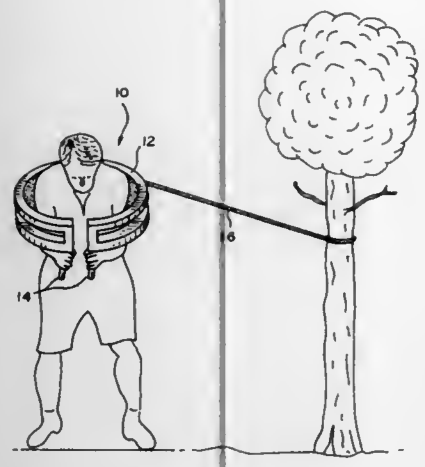
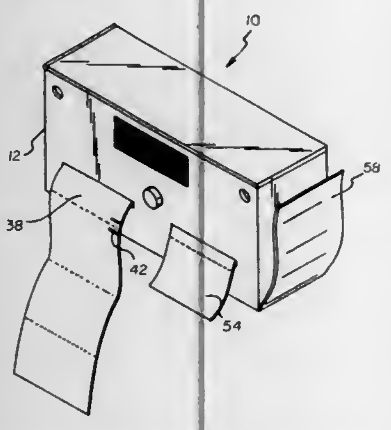


teaches the user proper golf swing positions and strengthens golf muscles of the user.

5,690,495
INCENTIVE DEVICE FOR TOILET TRAINING CHILDREN

Tammy Mae Collier, 10280 Oak La., Grandbay, Ala. 36541
Filed Nov. 7, 1996, Ser. No. 746,171
Int. Cl.^{6} G09B *19/00*
U.S. Cl. 434—258 **5 Claims**



2. An incentive device for toilet training children comprising:

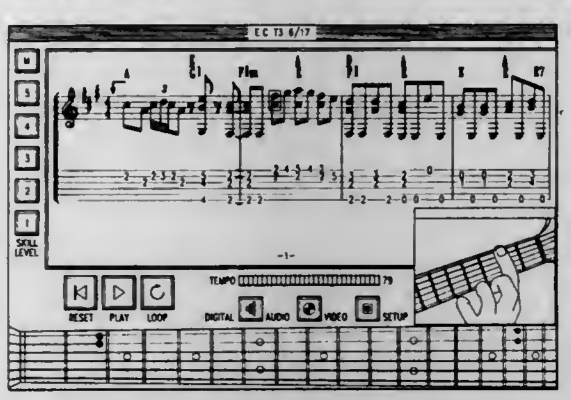
a housing having a lid hingedly secured to an open upper end thereof, a pair of horizontally disposed slots through a front wall of the housing, each of a pair of side walls having a rod extending inwardly from an inner surface thereof within the housing;

a roll of toilet paper rotatably disposed on a rod of one of the opposed side walls of the housing and extending outwardly through one of the horizontally disposed slots in the front wall of the housing; and

a roll of decorative stickers rotatably disposed on the rod opposing the roll of toilet paper, the roll of decorative stickers extends outwardly through one of the horizontally disposed slots in the front wall of the housing.

5,690,496
MULTIMEDIA PRODUCT FOR USE IN A COMPUTER FOR MUSIC INSTRUCTION AND USE

Stephen E. Kennedy, Dallas, Tex., assignor to Red Ant, Inc.
Continuation-in-part of Ser. No. 677,639, Jul. 8, 1996, which is a continuation of Ser. No. 254,403, Jun. 6, 1994, Pat. No. 5,533,903. This application Aug. 8, 1996, Ser. No. 689,527
Int. Cl.^{6} G09B *5/00*
U.S. Cl. 434—307 R **15 Claims**



1. An article of manufacture for use in a computer having a processor, a display and an associated audio device to assist a student to learn to play a given musical work previously recorded on a master recording, comprising:

a computer-readable storage medium having a substrate; and

program data encoded in the substrate of the computer-readable storage medium, wherein the program data comprises:

the master recording;

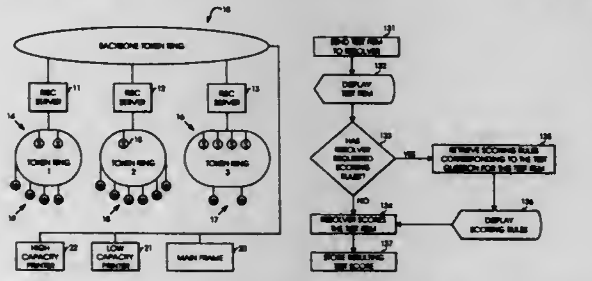
a music score representing a version of the musical work as previously recorded on the master recording the music score having notational information useful in assisting the student to learn to play the musical work:

control data for controlling output on the display of a set of one or more visual indicators that highlight the notational information in the music score as the music score is displayed on the display and the master recording is played on the audio device; and

timing data for synchronizing the highlight of the notational information in the music score to playback of the master recording.

5,690,497
DYNAMIC ON-LINE SCORING METHOD

Jay V. Clark, West Liberty; William L. Bramlett, Jr., Swisher, and Judith Moyer, Iowa City, all of Iowa, assignors to National Computer Systems, Inc., Eden Prairie, Minn.
Continuation of Ser. No. 290,014, Aug. 12, 1994, Pat. No. 5,558,521, which is a division of Ser. No. 14,176, Feb. 5, 1993, Pat. No. 5,437,554. This application Nov. 20, 1995, Ser. No. 561,084
Int. Cl.^{6} G09B *7/00*
U.S. Cl. 434—322 **2 Claims**



1. A method for electronically and dynamically providing scoring rules to test resolvers to assist the test resolvers in scoring test items to which the scoring rules apply, the method comprising the steps of:

a) receiving a plurality of answers for test questions, the answers each comprising an electronic representation of at least a portion of a test answer sheet;

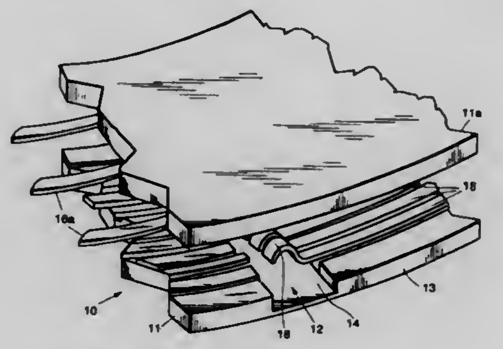
b) storing a plurality of scoring rules, each of the scoring rules relating to a procedure for scoring at least a particular one of the test questions;

c) selectively presenting the test answers to a test resolver; and

d) automatically selectively presenting to the test resolver the scoring rules related to the test question corresponding to the answer presented to the test resolver.

5,690,498
SPRING LOADED ROTARY CONNECTOR

Mohi Sobhani, Encino, Calif., assignor to He Holdings, Inc, Los Angeles, Calif.
Filed Sep. 23, 1996, Ser. No. 717,377
Int. Cl.^{6} H01R *39/10*
U.S. Cl. 439—22 **15 Claims**



1. A spring loaded rotary connector comprising:

a first wiring board comprising:

a first dielectric substrate having a plurality of cavities formed therein; and

a first plurality of conductive circuits concentrically disposed on a first surface of the dielectric substrate that are cut into a plurality of sections and that are bent to form loop-shaped dimples extending across the cavities;

a second wiring board disposed adjacent to the first surface of the first printed wiring board that comprises:

a second dielectric substrate; and

a second plurality of conductive circuits concentrically disposed on a surface of the second dielectric substrate;

and wherein the first and second wiring boards are disposed such that the dimples formed on the first wiring board contact the conductive circuits on the second wiring board; and

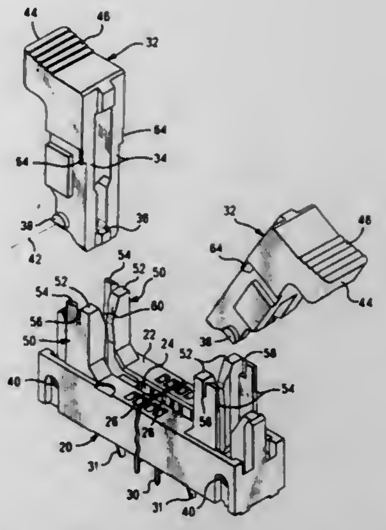
a plurality of electrical conductors coupled to the respective pluralities of conductive circuits of the first and second wiring boards.

5,690,499
CARD EDGE SOCKET HAVING EXTRACTOR WITH CLOSED POSITION LOCK

David Gregory Howell, Madison, and Ronald Louis Marion, Winston-Salem, both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.
Filed Sep. 23, 1996, Ser. No. 717,637
Int. Cl.^{6} H01R *13/62*
U.S. Cl. 439—157 **3 Claims**

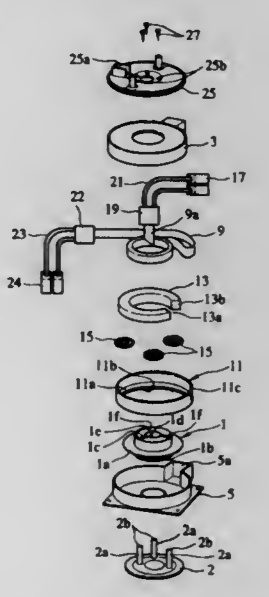
1. An electrical socket comprising:

a dielectric housing having a top surface and an elongated slot which is open through the top surface and dimensioned to receive an edge of a circuit card, a plurality of contacts disposed along the slot for electrically connecting with the circuit card, a pair of towers extending upwardly from the top surface at an end of the slot, an extractor coupled to the housing proximate to the towers, the extractor being movable from a closed position to an open position to dislodge the circuit card from the slot, the extractor and the towers having cooperable detent means comprising projections which are engageable in respective notches for retaining the extractor in the closed position, wherein urging the extractor to the open position resiliently deflects the towers and overcomes the detent means, and each of the projections has a rearward beveled surface which is opposed by a complementary ramp of its respective said notch during movement of the extractor from the closed position to the open position.



5,690,500
ELECTRICAL CONNECTING DEVICE FOR CONNECTING ROTOR WITH STATOR THROUGH CABLE

Satoshi Ishikawa, and Nobuhiko Suzuki, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 30, 1996, Ser. No. 681,991
Claims priority, application Japan, Aug. 11, 1995, 7-206043
Int. Cl.^{6} H01R *3/00*
U.S. Cl. 439—164 **6 Claims**



1. An electrical connecting device comprising:

a stator provided by a substantially cylindrical housing;

a rotor rotatable within said stator;

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a flexible flat cable accommodated in an annular space defined between said rotor and said stator so that one end of said flat cable is fixed on said stator while the other end of said flat cable is fixed on said rotor thereby electrically connecting elements on said rotor to other elements on said stator, said flat cable being wound along the outer periphery of said rotor in one winding direction and wound along the inner periphery of said stator in the opposite winding direction through a bend in said flat cable, the bend forming a boundary between the winding directions; and

a C-shaped movable member in said annular space and defining spaces for accommodating said flat cable between said movable member and the outer periphery of said rotor and between said movable member and the inner periphery of said stator, said C-shaped movable member having a pair of spaced circumferential ends to provide a gap through which said bend in said flat cable passes, whereby said C-shaped movable member rotates relative to said rotcr while rotating and to said stator with circumferential movement of said bend caused by winding said flat cable on the outer periphery of said rotor or along the inner periphery of said stator;

said movable member having a pusher part for pushing said flat cable, said pusher part projecting from an inner edge of one of said pair of circumferential ends of said C-shaped movable member as a relatively thin extension toward the other of said pair of circumferential ends around which said bend in said flat cable is looped

whereby an opening for passing said flat cable through said gap is defined in part between said other of said pair of circumferential ends and said pusher part, and in part by both said pair of circumferential ends.

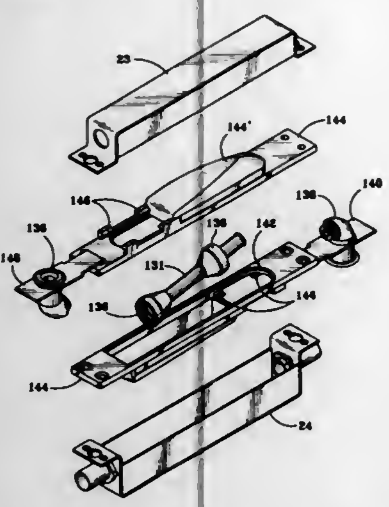
5,690,501
ELECTRICAL POWER TRANSFER FOR ¾" OFFSET PIVOTS

Gerald E. Mader, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed Dec. 26, 1995, Ser. No. 578,298

Int. Cl.^{6} H01R *3/00*

U.S. Cl. 439—165 **3 Claims**



1. An apparatus for providing an electrical connection from a power source, through a stationary door frame, into a door to connect to door-mounted electrically-operated hardware, comprising:

an electrical junction box installed in a mortise cavity in said door frame adjacent to a similar electrical junction box installed in a mortise cavity in an edge of said door, said junction boxes being adjacent each other when the door is in a closed position;

a housing installed in each junction box, each housing having a longitudinal slot in a face plate thereof of a length substantially equal to the length of the junction box, and a cover plate longitudinally slidably engaged in grooved fingers on a rear surface of said face plate, said cover plate having a substantially circular hole;

a hollow tube having an elbow swivelably mounted on each end, one said elbow floatably engaged in the substantially circular hole of the cover plate of the housing mounted in the door frame and the other said elbow floatably engaged in the substantially circular cover plate of the housing mounted in the door; and

a conductor cable connected to a power source, in the junction box mounted in the door frame, extending through said elbows and said hollow tube into the junction box mounted in the door, and connected to leads to door hardware mounted in or on the door.

5,690,502
EDGE CONNECTOR

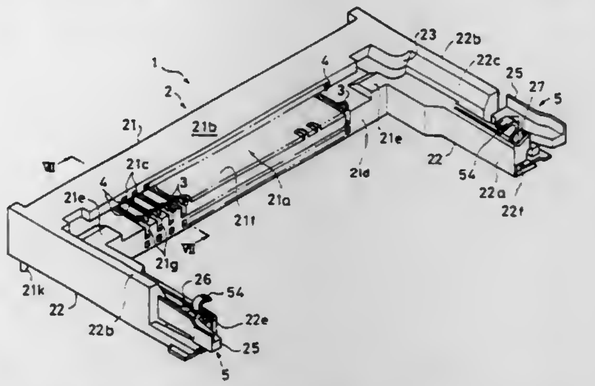
Shoichi Mochizuki, Tokyo, Japan, assignor to Kel Corporation, Tokyo, Japan

Filed Mar. 5, 1996, Ser. No. 611,204

Claims priority, application Japan, Mar. 10, 1996, 7-079610

Int. Cl.^{6} H01R *13/62*

U.S. Cl. 439—328 **12 Claims**



1. An edge connector comprising:

a housing formed of resin, having a main body including a receptive space capable of receiving a front end portion of a circuit board, and a pair of arms extending rearward from both lateral ends of said main body,

a plurality of contacts provided in alignment in said receptive space; said contacts being for coming into pressing contact with electrically conductive pads provided on the front end portion of said circuit board when said circuit board is lowered from a jumped-up position to an installation position, the jumped-up position being where the front end portion of said circuit board is positioned in said receptive space and the rear portion of said circuit board is kept above said arms, and the installation position being where the front end portion of said circuit board is kept in said receptive space and the rear portion of said circuit board is placed along said arms; and

locking means incorporated in said arms for fixedly retaining said circuit board in the installation position,

wherein:

said locking means has an engaging lock and a releasing lever;

said engaging lock is formed of metal, is incorporated in said housing and is capable of being moved between an engaging position and a releasing position: the engaging position being where said engaging lock engages with said circuit board to retain said circuit board in the installation position and the releasing position being where said engaging lock is released from the engagement, said engaging lock further including an engaging leaf-spring portion which enables said engaging lock to swing between the engaging position and the releasing position, and through which said engaging lock is positioned at the engaging position when no outside force is applied to said engaging leaf-spring portion; and

said releasing lever and said housing are integrally formed together in one piece from resin and said releasing lever is capable of engaging with said engaging lock, said engaging lock being moved from the engaging position to the releasing position when said releasing lever is manually operated outward.

5,690,503
CONNECTOR LOCK STRUCTURE

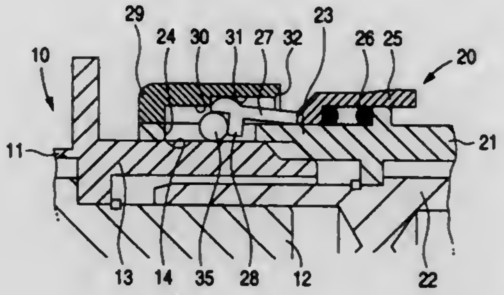
Kazumoto Konda; Kunihiko Watanabe; Sho Miyazaki, all of Yokkaichi, and Shigehiro Tsuda, Itami, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, and Asahi Metal Industries, Ltd., Hyogo, both of Japan

Filed Sep. 13, 1996, Ser. No. 710,142

Claims priority, application Japan, Sep. 20, 1995, 7-267728

Int. Cl.^{6} H01R *4/50*

U.S. Cl. 439—348 **7 Claims**



1. A connector lock structure comprising:

a tubular fitting portion formed on a connector housing for fitting relative to a mating connector;

at least one ball support hole formed through said tubular fitting portion, which are open to outer and inner peripheral surfaces of said tubular fitting portion;

at least one lock ball received in said ball support hole in a manner that said lock ball is displaceable in a radial direction of the tubular fitting portion, and is prevented from passing radially past that peripheral surface of said tubular fitting portion facing said mating connector, a projecting portion of said lock ball, projecting from the peripheral surface of said tubular fitting portion, being engageable with said mating connector, thereby locking the two connectors in a mutually fitted condition;

elastic engagement members each elastically displaceable radially between an engagement position where said elastic engagement member engages that side of the associated lock ball facing away from said mating connector and a retracted position where the associated lock ball is allowed to be disengaged from said mating connector; and

a flexure restriction member for preventing said elastic engagement members from being elastically flexed into their retracted position.

5,690,504
PLASTIC GUIDE PIN WITH STEEL CORE

John F. Scanlan, Nashua, and Gerald P. Grassett, Amherst, both of N.H., assignors to Teradyne, Inc., Boston, Mass.

Filed May 13, 1996, Ser. No. 645,304

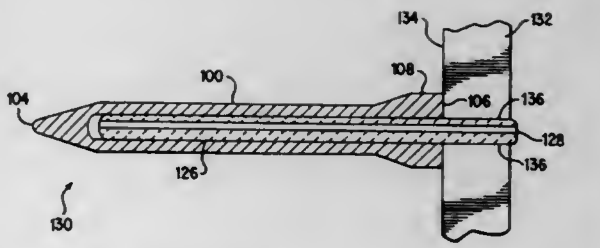
Int. Cl.^{6} H01R *13/629*

U.S. Cl. 439—378 **19 Claims**

1. A back plane assembly comprising:

(a) a back plane including at least one hole;

(b) a daughter board connected to the back plane; and



(c) at least one guide pin mounted to the back plane, the guide pin comprising

(i) an elongated body,

(ii) a chamber within said body, and

(iii) a rigid, elongated rod including a first section and a second section, said rod having the first section thereof inserted into and substantially filling said chamber, and said rod having the second section thereof passing through and engaging the hole in said back plane, thereby securing the guide pin to the back plane.

5,690,505
PRESSURE JOINT CONNECTOR AND METHOD OF ASSEMBLING WIRE HARNESS USING THE SAME

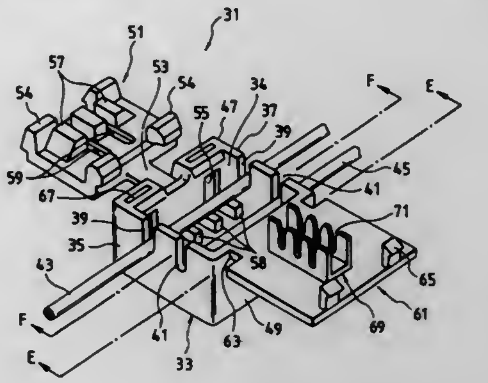
Noboru Hirata, Hiroshima, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jul. 3, 1996, Ser. No. 675,045

Claims priority, application Japan, Jul. 4, 1995, HEI.7-168801

Int. Cl.^{6} H01R *4/24*

U.S. Cl. 439—402 **5 Claims**



1. A pressure joint connector for jointing a trunk line to a branch line, comprising:

a housing for allowing the trunk line and the branch line to be inserted thereinto, said housing having an opening formed thereon for exposing the trunk line and the branch line;

a primary cover, arranged on said housing so as to be freely opened and closed through a hinge portion, for fixing only the branch line and leaving the trunk line unfixed when closed over the opening;

a secondary cover, arranged on said housing so as to be freely opened and closed through a hinge portion, for closing so as to be superimposed on said primary cover already closed over the opening; and

a pressure blade, arranged so as to project from said secondary cover, for coming in pressure contact with the trunk line and the branch line simultaneously by passing through said primary cover when said secondary cover is closed so as to be superimposed on said primary cover.

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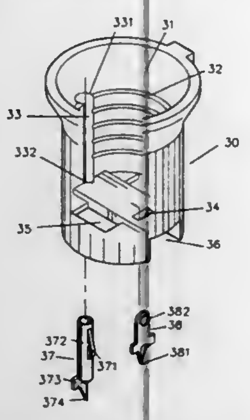
5,690,506
DECORATIVE LAMP HOLDER

Mei Lu Lin, 56, Min Sheng Street, Fengyuan, Taichung, Taiwan

Filed Mar. 11, 1996, Ser. No. 615,541
Int. Cl.⁶ H01R *4/24*
U.S. Cl. 439—419 **1 Claim**

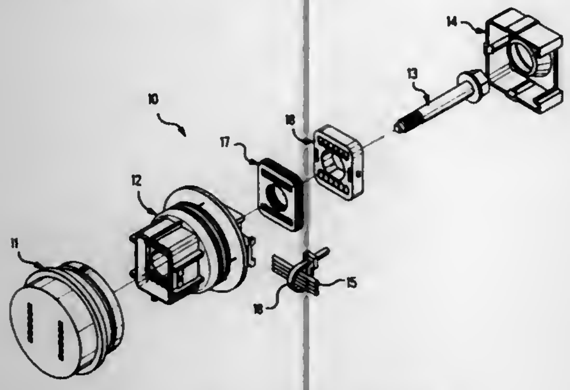


1. A decorative lamp holder comprising:
a socket shell comprising an interior, an inserted groove formed on an inner periphery of said socket shell longitudinally, an outer recess at a bottom of said socket shell, an inserted hole and a positioning slot formed at said bottom of said socket shell;
an upper portion of said inserted groove having a C-shaped groove;
a bottom of said inserted groove having a rectangular groove and an outcurved groove adjacent to said rectangular groove;
a solid shortened copper plate with a tip and an upper round protrusion inserted in said inserted hole, and an upper portion of said shortened copper plate bent flatly;
a rigid, hollow-round, elongated copper plate inserted in said inserted groove;
said elongated copper plate having an elastic plate at an outer periphery of said elongated copper plate, two laternal protrusions at a lower portion of said elongated copper plate, and a sharp end; and
a socket cap inserted beneath a bottom of said socket shell.

5,690,507
RECEPTACLE HOUSING FOR CONNECTOR ASSEMBLY

Richard Wayne Grzybowski, Lebanon, and John Mark Myer, Millersville, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 331,257, Oct. 28, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 729,895
Int. Cl.⁶ H01R *13/58;13/627*
U.S. Cl. 439—464 **14 Claims**

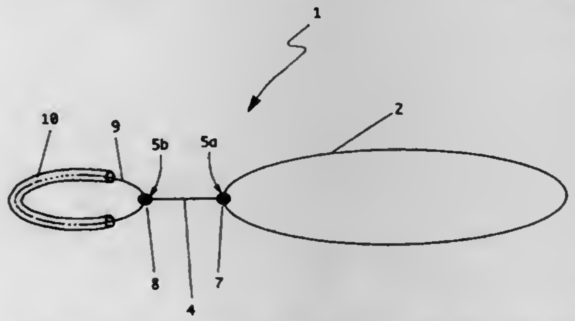


1. An electrical receptacle housing comprising:
a module side and a wire side axially connected by a main body, the wire side including first walls axially extending from the main body, the first walls having respective upper edges,
at least one of the first walls having a recess,
a chute being integrally molded to said at least one first wall at said recess at substantially a right angle to said at least one of the first walls, the chute receiving a plurality of wires bundled by a wire tie, and
said chute having a pair of side flanges, said side flanges preventing the wire tie from slipping off the chute.

5,690,508
ELECTRICAL CORD PLUG PULLER

Stuart Lloyd Atkinson, 2910 6 Ave. North, Saint Petersburg, Fla. 33713

Filed Mar. 21, 1996, Ser. No. 619,982
Int. Cl.⁶ H01R *13/00*
U.S. Cl. 439—484 **2 Claims**

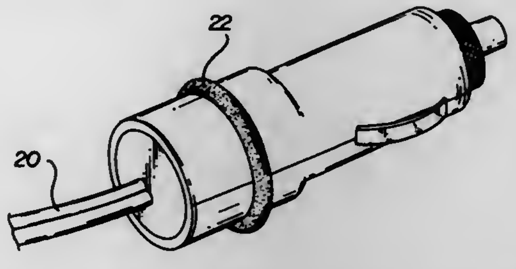


1. An electrical cord plug puller suitable for use with most standard electrical cord plugs, said electrical cord plug puller comprising:
a cord affixment loop formed of flat cord:
an elongated extension member having a first end and a second end said first end affixed to said cord affixment loop at a first attachment point:
a gasping loop formed of a flat cord, said grasping loop affixed to said second end of said extension member at a second attachment point; and
cushioning means for surrounding said grasping loop wherein said cushioning means comprises of a pliable, tubular section of plastic material;
and wherein:
said cord affixment loop, said extension member, said grasp loop, and the combined combination of all three elements together have a minimum of 15 pounds of pull strength.

5,690,509
LIGHTED ACCESSORY POWER SUPPLY CORD

Kenneth D. Eisenbraun, Birmingham, Mich., assignor to United Industrial Trading Corp., Troy, Mich.

Filed Feb. 26, 1996, Ser. No. 607,291
Int. Cl.⁶ H01R *3/00*
U.S. Cl. 439—490 **7 Claims**

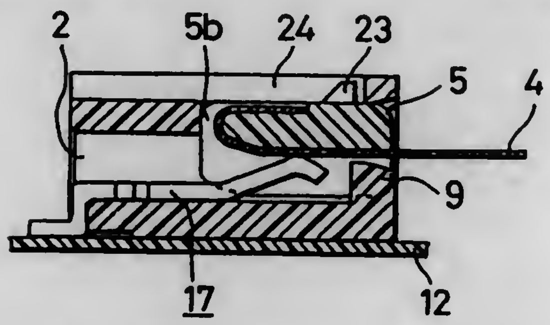


1. An electrical power connector for use with a vehicle having an electrical distribution system including a cigarette lighter receptacle, the connector comprising an opaque elongated body, cylindrical about a longitudinal axis, having an exterior surface and a first end formed with electrically conductive terminals adapted to be inserted into the receptacle to make electrical connection with the electrical distribution system, and wherein the receptacle is of the type which will accept the connector independently of rotational orientation about the longitudinal axis the improvement comprising:
an electrical light source disposed within the body;
circuitry within the body to electrically connect the light source to the electrical distribution system via the receptacle to energize the light source when the first end of the connector is in electrical communication with the receptacle; and
a light-transmissive lens encircling a portion of the exterior surface of the body to conduct light from the source exteriorly of the body so as to be visible to an observer regardless of the rotational orientation of the connector within the receptacle.

5,690,510
FLAT CABLE CONNECTOR AND METHOD FOR ASSEMBLING FLAT CABLE AND A CONNECTOR HOUSING

Masamitsu Chishima, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Inc., Mie, Japan

Continuation of Ser. No. 390,786, Feb. 17, 1995, abandoned. This application Nov. 29, 1996, Ser. No. 758,447
Claims priority, application Japan, Apr. 7, 1994, 6-095805
Int. Cl.⁶ H01R *9/07*
U.S. Cl. 439—496 **10 Claims**

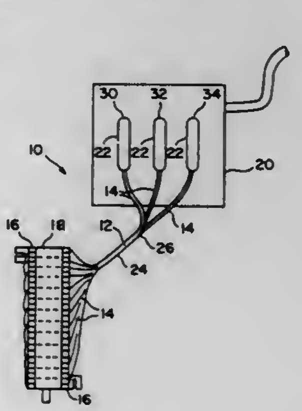


1. A flat cable connector, comprising:
a cable insertion chamber formed in a rear portion of a chamber extending through a connector housing so that a forward end of a flat cable is insertable into said cable insertion chamber;
terminal receptacles formed in a front portion of said chamber so that each one of a plurality of terminals integrally connected together by a connection portion is insertable into a respective one of said terminal receptacles for attachment therein, each of said terminals projecting into said cable insertion chamber to be connectable with said flat cable, said connection portion removably connected to respective base portions of said terminals to be disassociated from said terminals when said terminals are attached to said connector housing to render individual ones of said terminals secured in a respective one of said terminal receptacles, each of said terminals having an anchor portion, a spring portion and a distal end portion, said anchor portion extending longitudinally in a respective one of said receptacles, said spring portion pivotally and flexibly connected to said anchor portion and extending from said anchor portion at an obtuse angle in a direction to project away from the front portion of said chamber and into said cable insertion chamber and said distal end portion extending rewardly of said spring portion to project away from the front portion of said chamber, said distal end portion forming a surface for contacting the forward end of the flat cable when inserted into said cable insertion chamber thereby causing said spring portion to pivot and flex; and
a lock member fixed to said forward end of said flat cable whereby said flat cable passes around at least a portion of said lock member and a portion of said flat cable facing said terminals is exposed, said lock member being insertable into said cable insertion chamber and including at least one stationary lock projection element formed on and extending outwardly from an upper surface of said lock member and sized to be received by said cable insertion chamber and engageable with a groove formed in said connector housing so that said lock member can be retained within said cable insertion chamber.

5,690,511
RECONFIGURED CABLE AND PLUG ASSEMBLY AND METHOD FOR INTERCONNECTION OF TELEPHONE CONTROL BOX AND WIRE TERMINAL BLOCK

Chris John Melito, 3016 S. Oakland Forest Dr., Apt. No. 2906, Fort Lauderdale, Fla. 33309

Filed Mar. 25, 1996, Ser. No. 619,142
Int. Cl.⁶ H01R *11/00*
U.S. Cl. 439—502 **6 Claims**



1. A reconfigured standard telephone cable assembly for connecting cable plug receptacles on a generic control box to a telephone terminal block, comprising:
a standard telephone cable containing a plurality of lead wires within a cable casing, each said lead wire having a plug end and a block end and a distinctive color code corresponding to an established color code sequence;
a first cable plug and a second cable plug, each said cable plug having connection means for connecting a plurality of lead wires, wherein the first eight of said lead wire plug ends in said cable code sequence are connected to said connection means of said first cable plug, and wherein the second eight of said lead wire plug ends in said cable code sequence are connected to said connection means of said second cable plug.

5,690,512
ELECTROTECHNICAL ARTICLE

Eduard Zumstein, Giswil, and Heinz Amrein, Kriens, both of Switzerland, assignors to Schurter AG, Luzern, Switzerland

Filed Jun. 21, 1996, Ser. No. 670,228
Claims priority, application Switzerland, Jun. 28, 1995, 01890/95
Int. Cl.⁶ H01R *13/73*
U.S. Cl. 439—545 **6 Claims**

1. An electrical receptacle module for carrying electrical components adapted to be mounted into an opening of predetermined dimensions in a panel defined in a wall of an electrical apparatus, comprising in combination:
a rigid module casing defining two mounting grooves of predetermined depth located on opposite sides of the module at a distance from each other corresponding to fit within the predetermined dimensions of the opening with groove bottoms substantially abutting panel edges defining the opening

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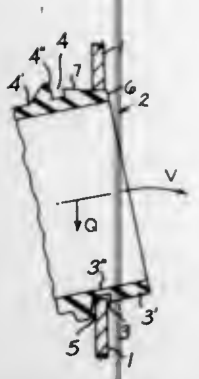


and further defining rigid groove walls for abutting opposite sides of the panel about the opening;

said groove walls further defining a first groove wall surface for contacting one wall side of the panel, said groove wall surface being provided with mounting structure adapted to pass through the opening to register the grooves upon the panel edge about the opening on said one side of the panel;

a second groove wall adapted to abut an opposite wall side of the panel without passing through the opening for retaining the module in place in the opening in a stable mounted state with the first groove walls abutting the panel; and "one of said groove bottoms that substantially abuts the panel edge being an elastically yielding structure that yields enough to allow movement of the module", a distance corresponding to the groove depth, thereby permitting the first groove wall to pass through the opening when the module is moved laterally toward a panel edge to seat the module in said opening in a stable mounted state with the grooves abutting the edges of the opening thus to retain the module in place in said panel opening.

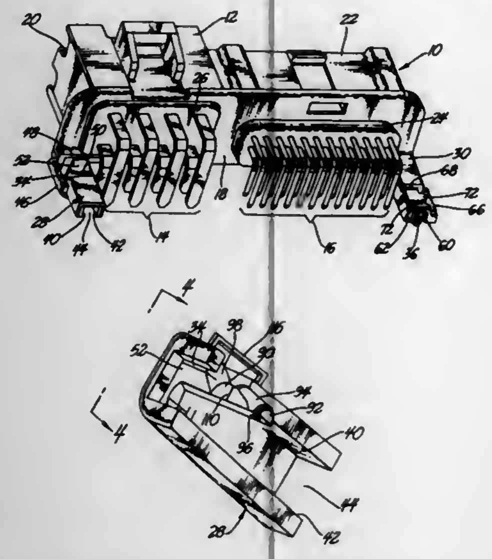
5,690,513
HEADER CONNECTOR SNAP LOCK

Randy Lynn Fink, Warren, and Michael Patrick Cummings, Canfield, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1995, Ser. No. 560,179

Int. Cl.^{6} H01R *13/60*

U.S. Cl. 439—567 **15 Claims**



1. A header connector snap lock apparatus for securing a header connector to a printed circuit board having a plurality of spaced openings, the apparatus comprising:

a plurality of spaced cantilever beams attached to the header connector and extending outward from the header connector, each of the plurality of spaced cantilever beams having a peg with a semi-circular cross-section defining a semi-circular outer peg surface, each peg projecting in a downward direction from its corresponding cantilever beam and terminating in a tapered head;

wherein each peg is positioned to be received in a corresponding one of the plurality of spaced printed circuit board openings when the header connector is secured to the printed circuit board, wherein a deflection force acts between the outer peg surface and an outer surface of the corresponding printed circuit board opening to deflect the peg in an inward direction when received into the opening, the deflection resisted by a peg force retaining the outer peg surface against the outer surface of the corresponding opening to secure the header connector to the printed circuit board, and wherein a spacing between an inner surface of each peg opposing the outer surface of the peg and an inner surface of the corresponding printed circuit board opening opposing the outer surface thereof is present when the peg is received into the corresponding one of the printed circuit board openings, which spacing is reduced by an increase in the spacing between the printed circuit board openings.

5,690,514

Patent Not Issued For This Number

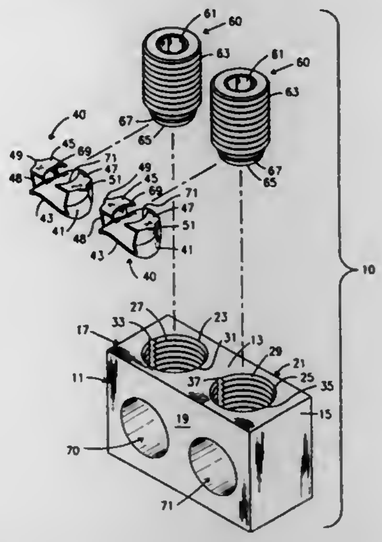
5,690,515
SPLICING BLOCK FOR MULTI-STRAND ELECTRIC CABLE

Frank G. Cipolla, 8927 95th St., N., Seminole, Fla. 34647

Filed Jul. 16, 1996, Ser. No. 682,940

Int. Cl.^{6} H01R *4/66*

U.S. Cl. 439—797 **11 Claims**



1. A splicing block for an electric cable, comprising:

a) a housing having a passageway sized to receive an end of an electric cable;

b) said housing having a threaded recess extending from an outer face of said housing and intersecting with said passageway;

c) a vertical keyway formed through threads of said threaded recess;

d) a saddle receivable within said threaded recess and having a laterally extending protrusion receivable within said keyway;

e) a pressure screw threadably receivable within said threaded recess and capturing said saddle within said threaded recess;

f) whereby an end of an electric cable may be inserted into said passageway, said saddle may be received within said threaded recess and may be guided in linear non-rotative movement by interaction of said protrusion and keyway, said pressure screw being reciprocated to cause said saddle to clamp an electric cable within said passageway.

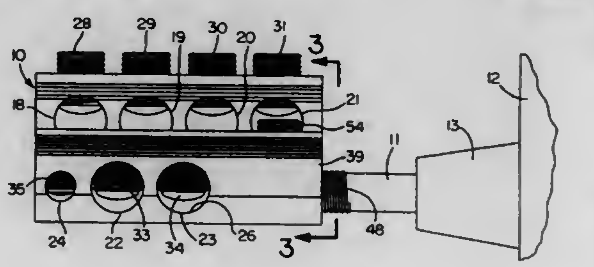
5,690,516
TRANSFORMER STUD ELECTRICAL CONNECTER

David R. Fillinger, Cincinnati, Ohio, assignor to Erico International Corporation, Solon, Ohio

Filed Jul. 14, 1995, Ser. No. 502,830

Int. Cl.^{6} H01R *11/09*

U.S. Cl. 439—798 **9 Claims**



1. A slip-fit transformer stud connector comprising an elongated body of conductive material, a plurality of conductor wire pads extending transversely of said body, means operative to clamp conductors to said pads, a stud hole in the end of said body operative to receive said transformer stud in a slip-fit, said hole being formed with two vertically spaced centers forming two-hole portions, the hole portion on the top center being a larger diameter than the hole portion on the bottom center with the hole portion on the bottom center intersecting the hole portion on the top center, the bottom hole portion being the same diameter as said stud, jam screw means above said stud hole operative to force the transformer stud against the hole portion on the bottom center locking the connector against rotation on the stud and providing a low resistance electrical connection between the stud and body, said transformer stud being threaded, and said somewhat smaller bottom portion including matching threads.

5,690,517
RECEPTACLE CONTACT

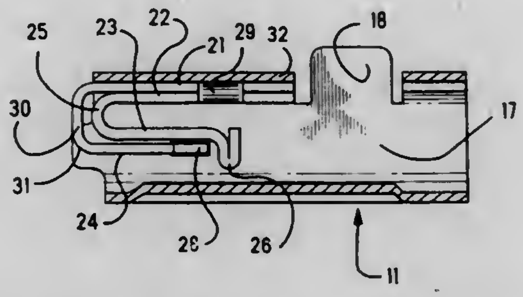
Kazuhisa Betsui, Yokohama, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 378,854, Jan. 25, 1995, abandoned. This application Nov. 21, 1996, Ser. No. 754,115

Claims priority, application Japan, Mar. 31, 1994, 6-085609

Int. Cl.^{6} H01R *4/48*

U.S. Cl. 439—839 **11 Claims**



1. A receptacle contact having a conductor connection section and a tab receiving cavity section formed by a bottom wall, opposed first and second side walls extending upwardly therefrom, a first base wall extending from said first side wall toward said second side wall to a free edge and being opposed to said bottom wall, and a spring-loaded contact arm having a contacting section for contacting a mating tab contact inserted into the tab receiving cavity section, the spring loaded contact arm having a U-shaped spring section proximate a tab receiving end of the receptacle contact, the spring section providing resiliency to the contact arm, protective wall extending from a leading end of said first base wall initially toward said bottom wall and then around the spring section of the spring-loaded contact arm to an end which is proximate the contacting section of the spring-loaded contact arm, to protect the contact arm from abutment or contact with the mating tab except at the contact section, said spring-loaded contact arm being joined to said free side edge of said first base wall by a folded-over connecting piece adjacent said second side wall, and a cover wall extending from said second side wall overlapping said first base wall, and an opening is provided in the cover wall to receive said connecting piece therein to increase the rigidity of the contact.

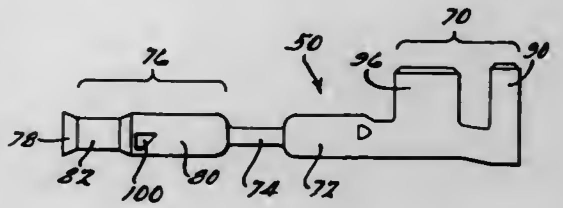
5,690,518
FEMALE AND MALE ELECTRICAL CONNECTORS REQUIRING LOW INSERTION FORCES

Dhirendra C. Roy, Canton; Zenon Hotra, Troy, both of Mich., and Steven K. Heckman, Fort Wayne, Ind., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Continuation of Ser. No. 166,214, Dec. 13, 1993, abandoned. This application Mar. 7, 1996, Ser. No. 610,801

Int. Cl.^{6} H01R *13/05;13/62*

U.S. Cl. 439—851 **21 Claims**



2. An electrical connection comprising:

a female electrical connector comprising:

a wire attachment segment securely affixed to a predetermined portion of said wire;

a receptacle segment electrically coupled with said wire attachment segment, said receptacle segment being substantially hollow; and

a pair of apertures each being defined by an inner edge longitudinally juxtapositioned within said receptacle segment, said pair of apertures each being circumferentially separated from one another on all edges by solid portions of said receptacle segment;

a male electrical connector comprising:

a wire attachment segment securely affixed to a predetermined portion of said wire;

a bulged segment electrically coupled to said wire attachment segment, said bulged segment having a peripheral wall; and

a shaft segment electrically coupled to and projecting coaxially from said bulged segment, said shaft segment having a cylindrical wall of smaller diameter than a transverse measurement of said peripheral wall of said bulged segment, said shaft segment further having a longitudinal channel with a radially extending wall inwardly turned from said cylindrical wall, said longitudinal channel having an internal bottom trough substantially parallel with said longitudinal axis; and

a portion of said shaft segment of said male electrical connector being insertable within said receptacle segment and past said pair of apertures of said female electrical connector such that said male and female electrical connectors are electrically connectable to each other, said pair of apertures within said female electrical connector and said longitudi-

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nal channel of said male electrical connector allowing said male electrical connector to be easily insertable within said receptacle segment of said female electrical connector.

5,690,519

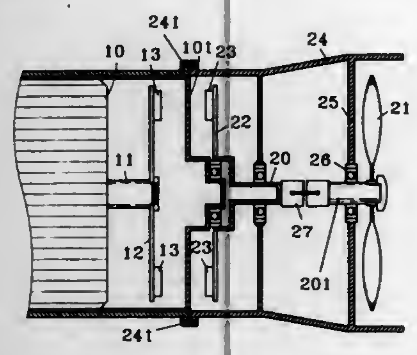
UNDERWATER PROPULSIVE DEVICE

Johnson Chen, No. 7 Lane 42, Jen-Shing Road, Tai-Ping Shiang, Taichung Hsien, Taiwan

Filed Sep. 17, 1996, Ser. No. 710,436

Int. Cl.^{6} B60L *11/02*

U.S. Cl. 440—6 **1 Claim**



1. A propulsive device comprising;

an enclosed housing, said housing including at least two chambers having at least one gap formed therebetween,

a motor disposed in said housing and including a spindle extending therefrom, said spindle and said motor being received in said housing, said spindle including at least two first magnets secured thereto and rotated in concert with said spindle and arranged in said chambers of said housing,

a casing secured to said housing,

a shaft rotatably supported in said casing, said shaft including a first end extending outwardly from said casing and having a blade member secured thereto and rotated in concert with said shaft, said shaft including a second end located adjacent to said spindle, and

a barrel secured to said second end of said shaft and rotated in concert with said shaft, said barrel including at least one second magnet secured to said barrel and rotated in concert with said barrel and engaged in said gap of said housing,

said first magnets acting on said second magnet for driving said barrel and said shaft to rotate said blade member when said first magnet is rotated by said motor.

5,690,520

WEED REMOVAL APPARATUS FOR A JET PUMP PROPELLED WATERCRAFT

Alain Rheault, St-Nicolas, Canada, assignor to Bombardier Inc., Montreal, Canada

Filed Oct. 19, 1995, Ser. No. 545,550

Int. Cl.^{6} B63H *11/01*

U.S. Cl. 440—46 **5 Claims**

1. A blocking means for removing weeds and debris from an impeller in a jet pump propelled watercraft;

said blocking means being mounted downstream said impeller;

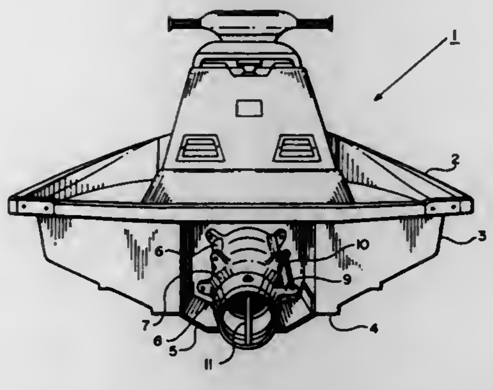
said blocking means comprising a butterfly valve;

said butterfly valve being mounted on a shaft for pivotal movement between an open position and a closed position,

said butterfly valve being mounted on said shaft in common with a steering nozzle;

said steering nozzle being pivotally mounted on said shaft at a rear end of a venturi;

said steering nozzle being activated, at said operating position, by an independent linkage,



wherein, in operation, when said blocking means is in said open position, propelled water passes freely from an intake opening through said impeller through said venturi, and exits at the rear of said watercraft, and when said blocking means is in said closed position water is prevented from exiting at the rear of said watercraft, thereby producing back pressure and turbulence which dislodges weeds and debris from said impeller.

5,690,521

TRANSMISSION DEVICE, ESPECIALLY A REVERSING GEAR FOR BOATS

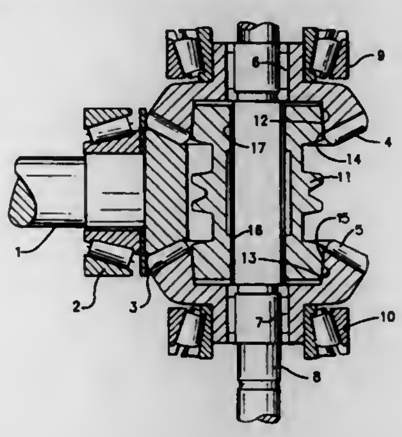
Oddbjörn Hallenstvedt, Köping, and Bo Kristiansson, Kungsör, both of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden

Filed Jun. 26, 1996, Ser. No. 670,633

Claims priority, application Sweden, Jun. 26, 1995, 9502302

Int. Cl.^{6} B63H *20/14*

U.S. Cl. 440—75 **2 Claims**



1. Transmission device, especially a reversing gear for a marine engine, comprising a first shaft with a first gear non-rotatably fixed to said shaft, a second shaft mounted perpendicular to the first shaft with two second gears freely rotatably mounted on said second shaft, said second gears engaging the first gear and each having an individual interior conical frictional surface, and, between said second gears, a clutch sleeve axially displaceably mounted on the second shaft and having two exterior conical frictional surfaces which face away from each other and which each cooperate with an individual one of said interior frictional surfaces to alternately lock the second gears to the second shaft, characterized in that the clutch sleeve (11) has exterior conical frictional surfaces (12,13) of aluminum, which are oxidized and impregnated with a fluoroplastic and are heat-treated.

5,690,522

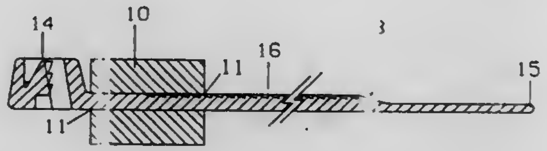
CABLE TIE FLOTATION DEVICE WITH CABLE TIE

Reginald J. Moreau, 70 William Gannon Rd., Manchester, N.H. 03104

Filed Jul. 9, 1996, Ser. No. 678,519

Int. Cl.^{6} B63B *22/00*

U.S. Cl. 441—1 **20 Claims**



1. A cable tie flotation device for making a cable tie buoyant, said device comprising:

a volume of resilient, deformable material having an opening therethrough, said material having a specific gravity less than one; and

fastening means comprising an opposed resilient force created by the deformation of said opening by a cable tie passing therethrough such that said deformable material is maintained in connective relationship about said cable tie by said opposed resilient force of said material.

5,690,523

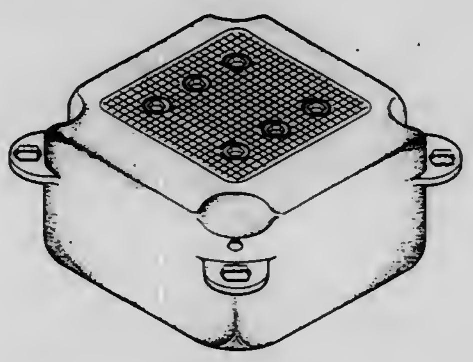
FLOATS

Meng-Hua Yu, No. 536-1, Ta Chin Street, Taichung, Taiwan

Filed Sep. 20, 1996, Ser. No. 717,010

Int. Cl.^{6} B63B *35/58*

U.S. Cl. 441—35 **1 Claim**



1. A float comprising:

a hollow main body having four upper corners, each said upper corner having a first recess defined therein, a cavity defined below each said first recess, and a lug extending outwardly therefrom at a position below each said cavity, said lug having a hole defined therein, said hollow float main body further comprising a second recess defined in an upper side thereof, a bottom surface defining said second recess including two intersecting grooves defined therein, four corners at an intersection of the intersecting grooves being beveled; and

an anti-slip cover removably received in said second recess, said anti-slip cover including protuberant patterns on an upper side thereof, said anti-slip cover having a plurality of through holes defined therein, and fasteners being extended through the through holes, thereby removably mounting said anti-slip cover in said second recess.

5,690,524

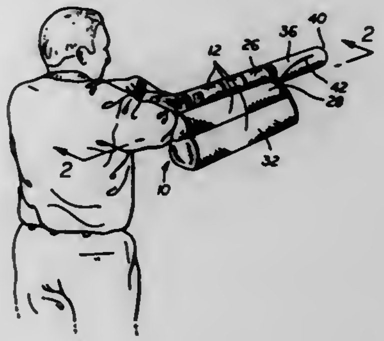
LIFE SUPPORT APPARATUS

Marcus Salvemini, 5203 La Jolla Blvd., La Jolla, Calif. 92037

Continuation of Ser. No. 523,949, Sep. 6, 1995, Pat. No. 5,584,736. This application Aug. 15, 1996, Ser. No. 698,019

Int. Cl.^{6} B63C *9/26*

U.S. Cl. 441—85 **13 Claims**



1. A life-support apparatus for rescuing a victim from water, comprising:

a harness container;

a storage container;

an inflatable harness, said harness in a first deflated state being removably folded into said harness container, said harness container in a first state being placed within said storage container;

a life-line of cord material, said life-line in a first state being coiled inside said storage container and attached at its distal end to said harness and secured at its proximal end to said storage container;

said harness further having a second inflated state upon contact with water wherein said harness automatically emits from said harness container upon inflation and wherein said harness forms a triangular-like shape, with an opening at one end having at least one adjustable strap for securing said harness assembly to the body of said victim;

said triangular-shaped harness further being constructed of three individual sections, each said section forming one side of said triangular-shape and being in fluid communication with a next adjacent section; and

said life-line further having a second deployed state for pulling a victim wearing said harness back to safety and out of the water.

5,690,525

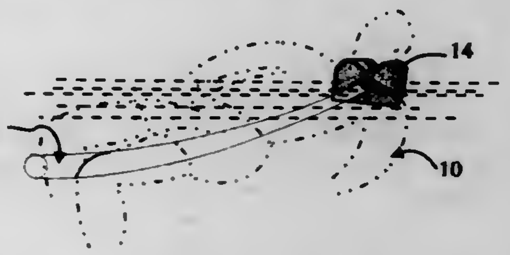
FLOATING HEADREST

Stephen W. Bing, 7714 Creek Glen, Houston, Tex. 77095

Filed Jan. 30, 1997, Ser. No. 791,356

Int. Cl.^{6} B63C *9/08*

U.S. Cl. 441—129 **2 Claims**



1. A floating headrest for the use in the water by a rider, said headrest comprising a unitary member of polyethylene or polystyrene, top surface of said headrest having two raised ends, each said raised end extending in a continuous smooth curved convex surface from a top center line, forward and rear surfaces of said

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headrest being flat with a cylindrical hole bored from the forward surface to the rear surface, with said hole having the capacity to receive a tubular flotation device, a bottom surface of said headrest being flat, said headrest being substantially symmetrical on either side of said top center line.

5,690,526
HIGH STRENGTH, BALLISTIC RESISTANT COMPOSITES

Chi-Tsun Leroy Lin, 10921 Pintail Pl., Chesterfield, Va. 23832, and Laura G. Wilson, 11717 Elmwood La., Chester, Va. 23831

Continuation of Ser. No. 406,255, Mar. 16, 1995, abandoned, which is a continuation of Ser. No. 121,851, Sep. 17, 1993, abandoned. This application Jul. 3, 1996, Ser. No. 674,930

Int. Cl.^{6} D03D *3/00*

U.S. Cl. 442—59 **10 Claims**

1. A ballistic resistant article comprising at least one consolidated network of high strength fibers in a thermoplastic matrix material comprising a thermoplastic polyurethane, the high strength fibers having a tenacity of at least about 7 g/d, a tensile modulus of at least about 150 g/d and an energy-to-break of at least about 8 J/g, wherein prior to consolidation the matrix material consists essentially of an aqueous solution of monomers, said monomers comprising an aliphatic diisocyanate and a polyol, said aliphatic diisocyanate comprising a combination of a hexamethylene diisocyanate and an isophorone diisocyanate, and said polyol comprising a polyester polyol.

5,690,527
COATED FIBROUS SUBSTRATE WITH ENHANCED PRINTABILITY

Jerry Dean Rutledge, Macon, Ga.; Ronald Steven Fletcher, Vancouver, Canada, and James Lynwood Jonakin, Camden, Ala., assignors to MacMillan Bloedel Packaging Inc., Montgomery, Ala.

Filed Mar. 22, 1995, Ser. No. 408,249

Int. Cl.^{6} B32B *3/26*

U.S. Cl. 442—76 **16 Claims**

1. A coated fibrous substrate comprising a fibrous substrate, a coating on at least one surface of said fibrous substrate, said coating being porous and having voids formed therein, said coating forming an exposed coating surface on a side of said coating remote from said one surface, a number of said voids open through said exposed coating surface to enhance printability of said exposed coating surface, a majority of said voids having a size of at least 5 microns and less than 100 microns.

5,690,528
RELEASE LINER AND METHOD OF USING SAME

T. Doyle Kelley, Greenville, S.C., assignor to JPS Automotive Products Corporation, Greenville, S.C.

Filed May 31, 1996, Ser. No. 656,661

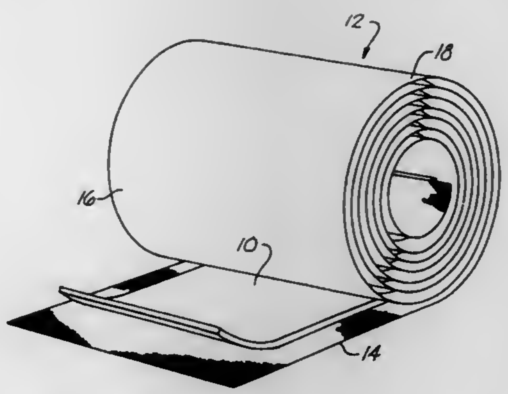
Int. Cl.^{6} B32B *7/00*

U.S. Cl. 442—260 **23 Claims**

1. A layered elastomeric article comprising:

a plurality of layers of a sheet-like elastomeric material; and

a release liner placed between adjacent layers of said elastomeric material for preventing said layers of said elastomeric material from sticking together, said release liner comprising a fabric made from at least one type of yarn, said at least one type of yarn comprising a fibrillated yarn.



5,690,529
ADSORBER MATERIAL, APPARATUS AND PROCESS FOR CONCENTRATING AND RECOVERING TRACE MATERIALS FROM THE GASEOUS PHASE

Helmut Oberpriller, Feldkirchen; Reinhold Hilpert, Moorenweis; Florian Binder, Traunstein; Josef Ritter, Munich; Harald Ertl, Gelting; Rolf Lerch, Ilvesheim; Reiner Schlipfenbacher, Bad Durkheim; Ludwig Angermaier, Bichl, and Christian Klein, Weilheim, all of Germany, assignors to Securetec GmbH, Vagen, and Boehringer Mannheim GmbH, Mannheim, both of Germany

Continuation of Ser. No. 380,423, Jan. 27, 1995, abandoned. This application Nov. 13, 1996, Ser. No. 748,618

Claims priority, application Germany, Jan. 27, 1994, 44 02 377.4

Int. Cl.^{6} G01N *13/00;* **D04H** *3/00;3/12*

U.S. Cl. 442—414 **13 Claims**

1. An apparatus capable of detecting trace materials in a gas, the improvement comprising an adsorber material for concentrating and recovering trace materials from a gas stream, wherein said adsorber material is a planar, nonwoven web of natural or synthetic textile fibers, said web having a thickness of from 100 μm to 2 mm and having a weight per unit area of from 20 to 200 g/m^2.

5,690,530
MULTILAYER PILLAR STRUCTURE FOR IMPROVED FIELD EMISSION DEVICES

Sungho Jin, Millington; Gregory Peter Kochanski, Dunellen, and Wei Zhu, North Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 380,774, Jan. 31, 1995, Pat. No. 5,598,056. This application Oct. 8, 1996, Ser. No. 728,254

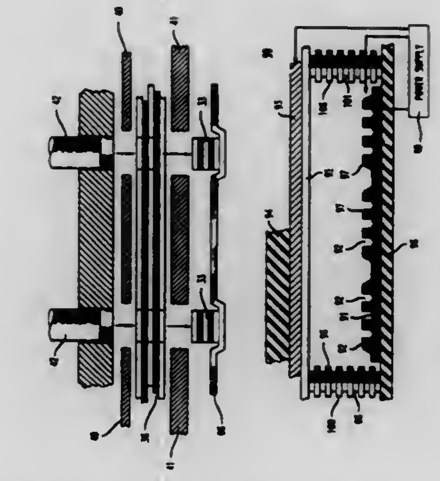
Int. Cl.^{6} H01J *9/24*

U.S. Cl. 445—24 **3 Claims**

1. A method for making a field emission device comprising an emitter cathode electrode, an anode electrode and a plurality of insulating pillars separating said electrodes, comprising the steps of:

providing a multilayer pillar precursor comprising alternating layers of conducting and insulating material;

cutting or etching pillar preforms from said precursor;



forming grooves in said pillar preforms; and

adhering said pillars on one of said electrodes.

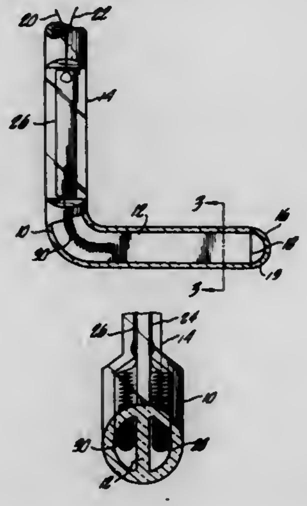
5,690,531
METHOD FOR THE MANUFACTURE OF BENT TUBE LAMPS

Robert A. Foss, Hesperia; Patrick M. Lewis, Diamond Bar, and Michael P. Duffey, Hesperia, all of Calif., assignors to UVP, Inc., Upland, Calif.

Division of Ser. No. 378,683, Jan. 26, 1995, Pat. No. 5,600,205. This application Oct. 22, 1996, Ser. No. 735,005

Int. Cl.^{6} H01J *9/24*

U.S. Cl. 445—26 **3 Claims**



1. A method of making a lamp, comprising the steps of

placing electrodes having leads extending therefrom in an elongate tube with a distal end, a terminal end and a septum extending longitudinally of the tube with the electrodes to either side of the septum;

sealing the tube;

bending the tube with the electrodes extending to the distal end side of the bend and the leads extending to the terminal end side of the bend.

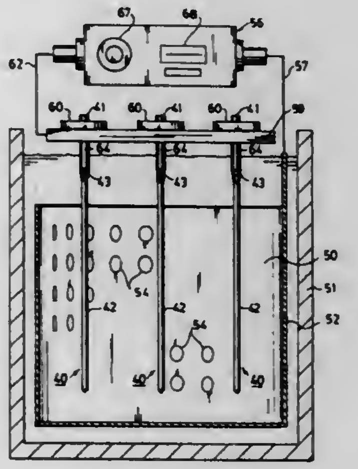
5,690,532
METHOD FOR FORMING TUNGSTEN ELECTRODE

John W. Sims, Weedsport, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Division of Ser. No. 268,255, Jun. 29, 1994, Pat. No. 5,539,273. This application Jun. 19, 1996, Ser. No. 667,987

Int. Cl.^{6} H01J *9/14*

U.S. Cl. 445—49 **1 Claim**



1. A method of forming a tungsten electrode which includes a post section of a first diameter and a lead-in section of a second smaller diameter, and a smooth, uniformly tapered transition section connecting the lead-in section and the post section, said method comprising:

- (a) providing a single segment of tungsten wire;
- (b) selectively masking one end of said segment of tungsten wire with a suitable masking material to protect the masked area from an electro-chemical etching solution; and
- (c) immersing said masked segment of tungsten wire into an electro-chemical etching solution and selectively etching said wire in the unmasked area to form an electrode having a first diameter in the masked unetched areas which constitutes a post section, and a lead-in section of a smaller diameter which has been selectively etched to the desire diameter, and an etched smooth uniformly tapered transition section between said post and lead-in sections.

5,690,533
AIRFOIL

Robert Dean Harris, 2014 Bennett Ave., Chattanooga, Tenn. 37404, and David Edward Barry, 9222 Hopi Trail, Ooltewah, Tenn. 37363

Filed Sep. 3, 1996, Ser. No. 707,001

Int. Cl.^{6} A63H *27/00*

U.S. Cl. 446—34 **16 Claims**

1. An aerial toy that is adapted to be launched into the air using an elastomeric band, said toy including:

- (a) a nose portion that is generally in the shape of an elongate ellipsoid, said nose portion having a front end and a rear end;
- (b) an elongate rib depending from the rear end of the nose portion in a direction generally along the long axis of said nose portion;
- (c) a first generally planar wing portion and a second generally planar wing portion, wherein each of said wing portions:
  - (i) depends from the rear end of the nose portion;
  - (ii) depends from the rib;
  - (iii) has a tapered outer edge; and

wherein the plane of the first wing portion is generally parallel to and spaced apart from the plane of the second wing portion, and

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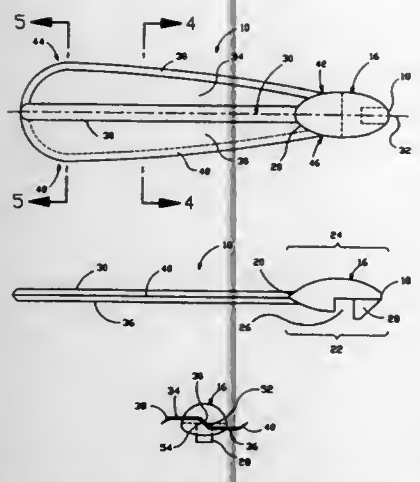
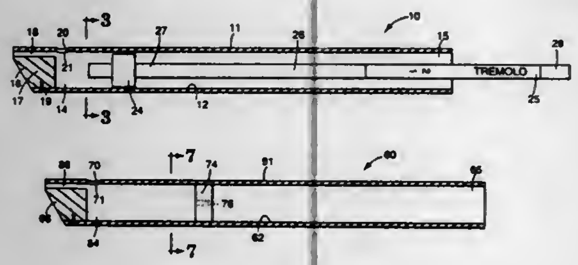


the taper of the outer edge of the first wing portion is oppositely disposed to that of the second wing portion.

5,690,534
BIRD AND ANIMAL CALL

William M. Shea, 13131 Keystone Ave. North, Hugo, Minn. 55038

Filed Dec. 21, 1995, Ser. No. 576,501
Int. Cl.^{6} A63H 5/00
U.S. Cl. 446—205 **15 Claims**



1. A wind instrument for replicating the calls of birds or animals, said instrument comprising:

an elongate body having an outer surface, an inner surface defining a bore having an axis and opposite axially spaced inlet and outlet ends;

a mouthpiece at the inlet end of the body, said mouthpiece having a through windway smaller than said bore and having an inlet at the end of the mouthpiece opposite the bore and an outlet communicating with the bore at the inlet end of the bore adjacent the inner surface of the body;

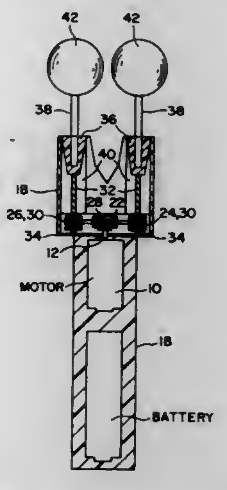
said body having at least one window surface defining a window through said body between said outer and inner surfaces and aligned with the outlet of said windway, said window surface intersecting said inner surface to define a sharp edge at the side of the window opposite the mouthpiece so that air blown through the windway into the bore and the window will produce sound; and

a baffle within said bore closing between 87 to 97 percent of the cross sectional area of said bore and being up to 0.83 inch or 2.11 centimeters long axially along said body, said baffle being movable axially along said bore between inner and outer positions relative to said mouthpiece, and said instrument including an elongate rod smaller in cross sectional area than said baffle having an attached end attached to said baffle and an opposite outer end, said elongate rod projecting from said baffle through the outlet end of said bore, so that with said baffle moved through at least one location in the bore, significant changes can be made in the pitch of the sound being made by blowing into the instrument with a generally steady air pressure to replicate the call.

5,690,535
TWIN SPINS SPIN POP

Thomas J. Coleman, 19170 Paddock Pl.; William K. Schlotter, IV, 20308 Alvarado Rd.; Princess Ann Coleman, 19170 Paddock Pl., and Ann M. Schlotter, 20308 Alvarado Rd., all of Abingdon, Va. 24211

Filed Jul. 10, 1996, Ser. No. 676,680
Int. Cl.^{6} A23G *03/00;* **A63H** *33/00*
U.S. Cl. 446—236 **3 Claims**

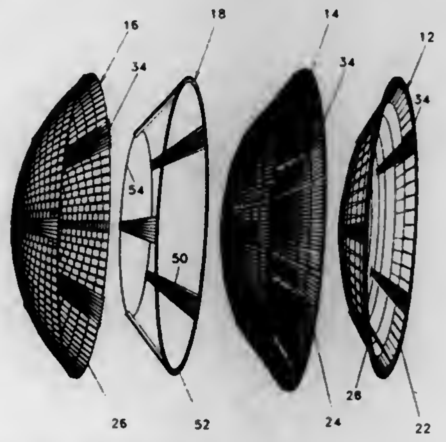


1. An improved candy holding device which comprises a housing, said housing including a bottom portion (**16**) and an upper portion (**18**), said bottom portion of said housing including a power supply, a motor, a gearing system driven by said motor and a switch (**14**) for controlling the power supply, said gearing system including a first spindle shaft (**12**), and a first drive gear (**28**) on an end of said first spindle shaft, the upper portion of said housing including an improvement that includes a gearing means which is driven by said first drive gear (**28**), said gearing means drives parallel second and third spindle shafts (**32**), each of said second and third spindle shafts rotate a candy pop which is secured to each of said second and third spindle shafts by a candy holding stick (**38**).

5,690,536
BRASSIERE LINER

Kathleen A. D. Madden, and Michael P. Madden, both of 10765 Cedarwood Drive, Waldorf, Md. 20601

Filed Dec. 20, 1995, Ser. No. 575,481
Int. Cl.^{6} A41D *27/12*
U.S. Cl. 450—37 **18 Claims**



1. A bra cup liner comprising:

an absorbent material layer shaped for placement in a bra cup presenting a periphery;

a correspondingly shaped moisture resistant material layer presenting a periphery and being attached to said absorbent layer;

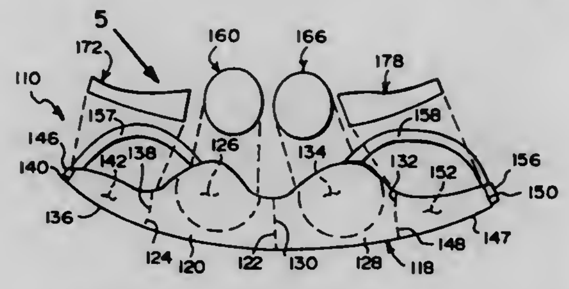
a structural member attached to said peripheries of said layers for maintaining the shape of the liner, said structural member including a first band extending about said layers;

a substantially V-shaped fold portion extending from said first band and tapering therefrom.

5,690,537
PROTECTIVE BRASSIERE WITH REMOVABLE MOUNTED INSERTS OF ELECTRICALLY CONDUCTIVE MATERIAL

Phyllis Kalmus, 3592 Carrollton Ave., Wantagh, N.Y. 11793

Filed Dec. 18, 1995, Ser. No. 574,327
Int. Cl.^{6} A41C *3/10;3/12;3/14*
U.S. Cl. 450—57 **16 Claims**



1. A protective brassiere, comprising:

a) a generally concave-shaped right cup having a proximal side, a distal side, and an inner surface; said generally concave-shaped right cup being constructed to overlie the right breast of a user;

b) a generally concave-shaped left cup having a proximal side, a distal side, and an inner surface; said proximal side of said generally concave-shaped left cup being disposed at said proximal side of said generally concave-shaped right cup; said generally concave-shaped left cup being constructed to overlie the left breast of the user;

c) a generally elongated right side panel having a proximal side, a distal side, and an inner surface; said proximal side of said generally elongated right side panel being disposed at said distal side of said generally concave-shaped right cup; said generally elongated right side panel being constructed to underlie the right arm pit of the user;

d) a generally elongated left side panel having a proximal side, a distal side, and an inner surface; said proximal side of said generally elongated left side panel being disposed at said distal side of said generally concave-shaped left cup; said generally elongated left side panel being constructed to underlie the left arm pit of the user;

e) a removably mounted generally convex-shaped right cup protective insert of electrically conductive material having an outer surface and being removably mounted to said generally concave-shaped right cup, so that the right breast of the user is protected from radiation regardless of how minimal since radiation exposure is cumulative; said removably mounted generally convex-shaped right cup protective insert of electrically conductive material being pliable and containing carbon;

f) right cup protective insert mounting means for removably mounting said removably mounted generally convex-shaped right cup protective insert of electrically conductive material to said generally concave-shaped right cup;

g) a removably mounted generally convex-shaped left cup protective insert of electrically conductive material having an outer surface and being removably mounted to said generally concave-shaped left cup, so that the left breast of the user is protected from radiation regardless of how minimal since radiation exposure is cumulative; said removably mounted generally convex-shaped left cup protective insert of electrically conductive material being pliable and containing carbon;

h) left cup protective insert mounting means for removably mounting said removably mounted generally convex-shaped left cup protective insert of electrically conductive material to said generally concave-shaped left cup;

I) a removably mounted generally elongated right side panel protective insert of electrically conductive material having an outer surface and being removably mounted to said generally elongated right side panel, so that the right underarm area of the user is protected from radiation regardless of how minimal since radiation exposure is cumulative; said removably mounted generally elongated right side panel protective insert of electrically conductive material being pliable and containing carbon;

j) right side panel protective insert mounting means for removably mounting said removably mounted generally elongated right side panel protective insert of electrically conductive material to said generally elongated right side panel;

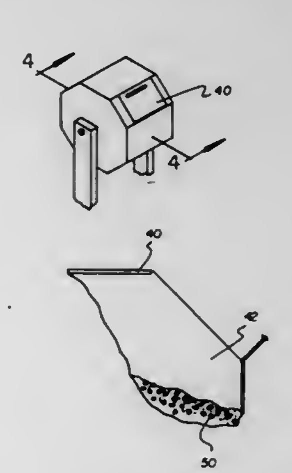
k) a removably mounted generally elongated left side panel protective insert of electrically conductive material having an outer surface and being removably mounted to said generally elongated left side panel, so that the left underarm area of the user is protected from radiation regardless of how minimal since radiation exposure is cumulative; said removably mounted generally elongated left side panel protective insert of electrically conductive material being pliable land containing carbon; and

l) left side panel protective insert mounting means for removably mounting said removably mounted generally elongated left side panel protective insert of electrically conductive material to said generally elongated left side panel.

5,690,538
METHOD OF SHAPING AND POLISHING JEWELRY FROM SHELLS

Eugene A. Haas, Box 210 Gehris Rd. R.D.#4, Boyertown, Pa. 19512

Filed Dec. 16, 1996, Ser. No. 767,143
Int. Cl.^{6} B24B *1/00*
U.S. Cl. 451—32 **14 Claims**



1. A method of shaping and polishing jewelry from shells comprising:

(a) providing a whole shell;

(b) breaking said whole shell into a plurality of shell pieces;

(c) grinding at least one shell piece approximately into a desired shape; and

(d) tumbling at least one shell piece until a fine polish is developed upon said shell piece.

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5,690,539
METHOD OF ABARDING USING SURFACE ABRASION COMPOSITIONS

Ronald Swidler, Palo Alto, and Edward W. Woodhall, Los Altos, both of Calif., assignors to Cal-West Equipment Company Inc., Sunnyvale, Calif.

Filed Aug. 7, 1995, Ser. No. 512,055
Int. Cl.^{6} B24C *1/08;1/00;* **C09C** *1/68*
U.S. Cl. 451—38 **21 Claims**

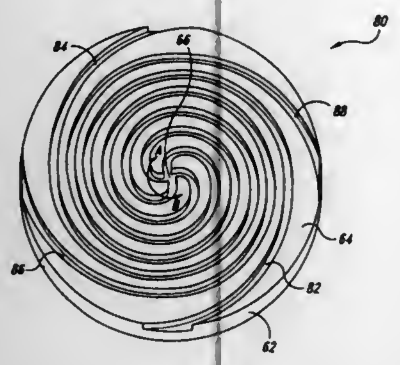
1. A method of preparing a surface for application of a finish, said method comprising the steps of

(i) abrading said surface with an abrasive composition that is a foam or a gel comprising:
  (a) about 1.0% to about 80% by weight of a particulate abrasive;
  (b) about 0.1% to about 10% by weight of a suspension agent;
  (c) a surfactant; and
  (d) a cleaning agent comprising an aliphatic hydrocarbon; and
(ii) removing said abrasive composition from said surface.

5,690,540
SPIRAL GROOVED POLISHING PAD FOR CHEMICAL-MECHANICAL PLANARIZATION OF SEMICONDUCTOR WAFERS

Richard L. Elliott, Meridian, and Michael A. Walker, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 23, 1996, Ser. No. 606,418
Int. Cl.^{6} B24B *7/22*
U.S. Cl. 451—41 **8 Claims**



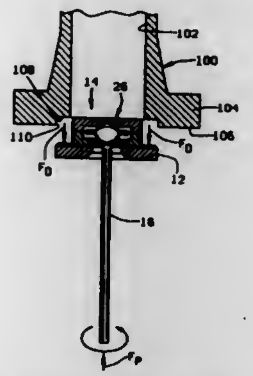
5. A method of planarizing a semiconductor wafer, comprising:

providing a polishing pad having a polishing surface with at least one groove formed therein, each groove formed in the polishing surface of said polishing pad extending inwardly in a spiral from a location adjacent the periphery of said polishing pad toward the center of said polishing pad;
placing said wafer in contact with the polishing surface of said polishing pad;
placing slurry on said polishing pad; and
rotating said polishing pad about its center in a direction opposite the circumferential direction of said groove as it extends inwardly toward the center of said pad so that said wafer slides along said polishing pad during chemical-mechanical planarization of said wafer and said groove pumps said slurry through said groove inwardly toward the center of said polishing pad.

5,690,541
METHODS AND APPARATUS FOR POLISHING SEAL SURFACES IN A NUCLEAR REACTOR

Charles Arthnr Dalke, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1995, Ser. No. 541,613
Int. Cl.^{6} B24B *15/03*
U.S. Cl. 451—63 **20 Claims**



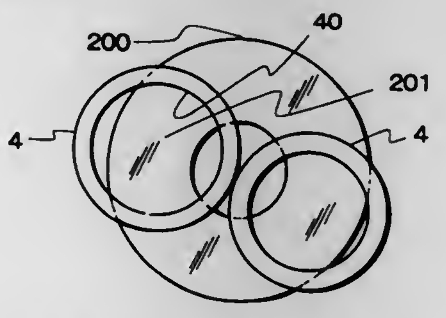
11. A method for polishing a seal surface in a nuclear reactor using a polishing tool, the seal surface being substantially ring shaped and having an opening extending therethrough, said seal surface located adjacent an end of a bore, the polishing tool including a polishing plate with a working surface and a universal joint comprising a drive shaft and universal joint housing secured to the polishing plate adjacent the working surface, the housing having a substantially cylindrical shape, the polishing plate having a polishing material secured thereto, said method comprising the steps of:

aligning the tool with the seal surface so that a center axis of the universal joint housing is substantially coaxial with a center axis of the seal surface, aligning the tool with the seal surface comprising the step of inserting substantially the entire universal joint housing through the seal surface opening so that substantially the entire outer surface of the housing cooperates with the surface of the bore to substantially align the polishing plate working surface with the seal surface; and
rotating the polishing plate while the working surface of the plate is in contact with the seal surface.

5,690,542
DISC STREAK PATTERN FORMING METHOD AND APPARATUS

Kiyoshi Ikemoto, Ayase, Japan, assignor to Speedfam Co., Ltd., Ayase, Japan

Filed Aug. 26, 1996, Ser. No. 703,104
Claims priority, application Japan, Apr. 15, 1996, 8-115294
Int. Cl.^{6} B24B *1/00*
U.S. Cl. 451—63 **8 Claims**



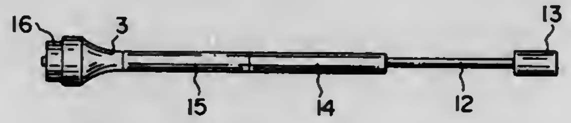
8. A disc streak pattern forming method for use in polishing an annular disc having a storage surface, a radially outer periphery and a radially inner periphery, and a center, the method comprising the steps of:

providing a ring-shaped polishing means having a central axis and defining a central bore therein, said ring-shaped polishing means comprising a plurality of ring-shaped polishing pads;
placing the ring-shaped polishing means in contact with the surface of said disc, with at least one portion of the surface disposed inside the central bore of said ring-shaped polishing means;
driving said ring-shaped polishing means to revolve about the center of said disc;
driving said ring-shaped polishing means to rotate around its central axis;
disposing said plurality of ring-shaped polishing pads about the center of said disc in such a manner that the radially outer periphery and the radially inner periphery of said at least one portion of the surface of said disc are both disposed inside the central bore of each of said ring-shaped polishing pads; and
subjecting said respective ring-shaped polishing pads to said contacting revolving and self-rotating steps,
whereby the surface of said disc is polished and provided with streak patterns by said ring-shaped polishing means.

5,690,543
INTERNAL PIPE BLASTING NOZZLE

Ed Curran, 830 S. Northlake Dr., Hollywood, Fla. 33019

Filed Oct. 8, 1996, Ser. No. 727,180
Int. Cl.^{6} B24C *5/04*
U.S. Cl. 451—76 **6 Claims**



1. A blasting nozzle assembly for blast cleaning internal pipe surfaces, comprising:

a cylindrical sleeve having a given length and a central axis, said sleeve defining a flow channel through which blasting abrasive and a carrier fluid can flow in a given flow direction;
a web member integrally formed with said sleeve and extending diametrically across said flow channel, said web member having a length inside said flow channel being at least 60% of the given length of said sleeve, and said web member having an opening formed therein extending coaxially with said axis of said sleeve;
a stem inserted in said opening of said web member, said stem extending coaxially with said sleeve and having a free end protruding from said sleeve; and
a deflection tip mounted on said free end of said stem for radially deflecting the blasting abrasive and the carrier fluid flowing in the given flow direction.

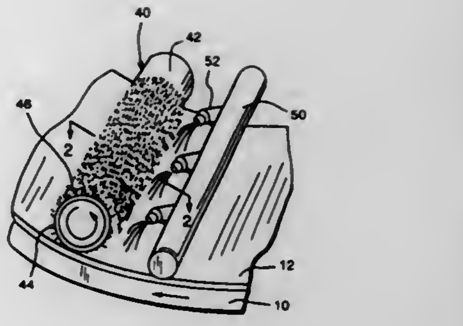
5,690,544
WAFER POLISHING APPARATUS HAVING PHYSICAL CLEANING MEANS TO REMOVE PARTICLES FROM POLISHING PAD

Michio Sakurai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 28, 1996, Ser. No. 623,936
Claims priority, application Japan, Mar. 31, 1995, 7-075719
Int. Cl.^{6} B24B *21/18;33/00;47/26;55/00*
U.S. Cl. 451—444 **8 Claims**

1. An apparatus for polishing wafers used as substrates of semiconductor integrated circuits, comprising:

a turntable;
a polishing pad which is held on the turntable and has a multiplicity of tiny cavities in the polishing surface;
a wafer holding means for holding each wafer parallel to the polishing pad and brining the wafer into rubbing contact with the polishing surface of the polishing pad; and

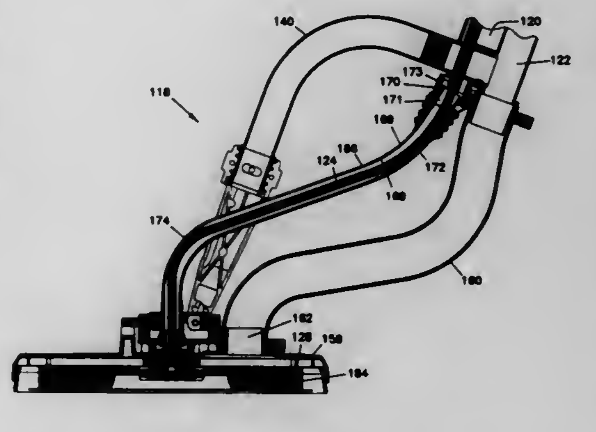


a cleaning device which comprises a physical cleaning means for driving particles of foreign matter out of the cavities in the polishing pad surface and a washing means for washing said particles out of the polishing pad surface by water, wherein said physical cleaning means comprises a cylindrical rotary cleaner comprising a cylindrical cleaning element which is formed of a synthetic resin and has a multiplicity of needle-like parts standing on the cylindrical outer surface, said needle-like parts being thin relative to the cavities in the polishing pad surface, the rotary cleaner being rotated with its longitudinal center axis above and parallel to the polishing pad such that said needle-like parts are pressed against the polishing pad surface and forced into the cavities in the polishing pad surface.

5,690,545
MOTORIZED ROTARY TOOL HAVING A HEAD MOUNTED BY A PIVOTAL JOINT

Earl Roger Clowers, Jackson; Steve Harry Plume, Humboldt, and John Charles Smith, Jackson, all of Tenn., assignors to Porter-Cable Corporation, Jackson, Tenn.

Continuation of Ser. No. 389,800, Feb. 16, 1995, Pat. No. 5,545,080. This application Aug. 12, 1996, Ser. No. 695,644
Int. Cl.^{6} B24B *27/027*
U.S. Cl. 451—359 **16 Claims**



1. A motorized rotary tool comprising:

(a) a drive motor mounted on a distal end of a tubular wand;
(b) a drive shaft operatively coupled to the drive motor and extending along the length of the tubular wand; and
(c) a head mounted by a pivotal joint to a proximal end of the tubular wand, the head including a rotary pad operatively coupled to the flexible drive shaft such that the rotary pad can be driven rotably by the drive shaft, the pivotal joint comprising a first and a second flexible joint, the first joint being configured to pivot about a first axis which is different from a second axis about which the second joint pivots.

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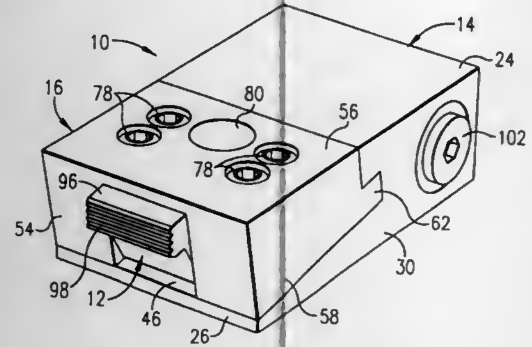
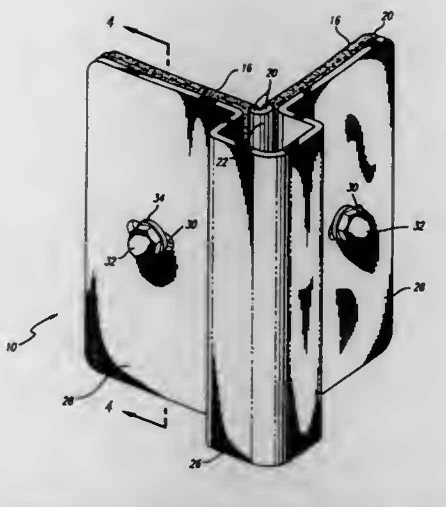
5,690,546
EDGE CLAMP APPARATUS
James V. Mascola, Emporia, Kans., assignor to Vektek, Inc., Emporia, Kans.
Filed Aug. 30, 1996, Ser. No. 711,182
Int. Cl.^{6} B24B *41/06*
U.S. Cl. 451—365 **9 Claims**



1. An edge clamp apparatus comprising:
an elongated body including a mounting surface and opposed front and rear body portions, the rear portion including a cylindrical bore extending longitudinally through the body in a direction parallel to the mounting surface, the front portion including a support surface that intersects the cylindrical bore of the rear portion and is inclined relative to the mounting surface, the body defining at least one port in fluid communication with the cylindrical bore of the body;
a piston received in the cylindrical bore for longitudinal shifting movement between a retracted position and an extended position;
a cap secured to the front portion of the body for closing off the cylindrical bore of the body and limiting movement of the piston, the cap including an inner surface engaging the support surface of the body, opposed front and rear ends, and a recess formed in the inner surface and extending between the front and rear ends;
a clamp blade received within the recess of the cap and supported on the support surface of the body for movement between a retracted, releasing position and an extended, engaging position, the clamp blade including a rear portion defining a central longitudinal axis and extending into the cylindrical bore for engagement with the piston, and an opposed front portion that is offset from the longitudinal axis of the rear portion of the clamp blade such that the front portion is spaced from the support surface of the body; and
a biasing means for biasing the clamp blade and piston toward the retracted position; wherein the recess in the cap includes a support surface that is stepped to present outer and inner end sections that are parallel to the support surface of the body and an intermediate section that is angled relative to the end sections such that the outer section of the support surface of the recess is spaced further from the support surface of the body than the inner section.

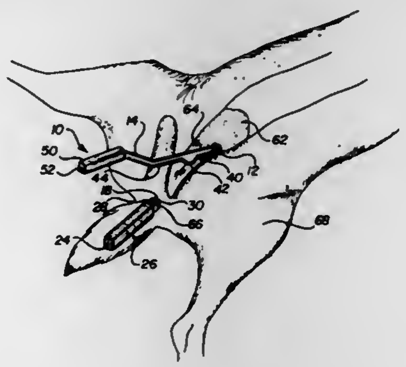
5,690,547
CORNER SANDER FOR MANUALLY SANDING AN OUTSIDE CORNER OF A WALL STRUCTURE
Wayne H. Holland, Jr., 13215 Leadwell St., and Patrick L. Ilejay, 7256 Hinds Ave., both of North Hollywood, Calif. 91605
Filed Aug. 26, 1996, Ser. No. 703,194
Int. Cl.^{6} B24D *15/00*
U.S. Cl. 451—524 **10 Claims**

1. A non-mechanized corner sander for manually sanding an outside corner of a wall structure, comprising:
a pair of support plates for receiving and supporting a pair of sandpaper sheets;



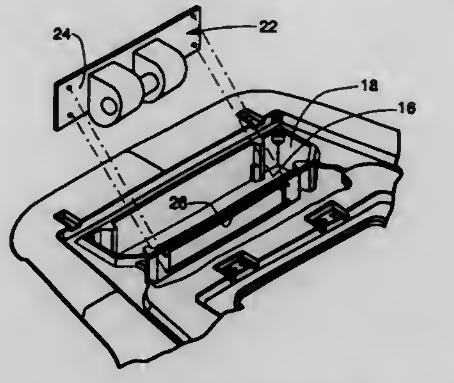
a base formed of a rigid plate bent to define a handgrip and a pair of backstop plates extending outwardly from said handgrip at a selected angle relative to each other so as to receive the outside corner of the wall structure therebetween; and
means for removably connecting said pair of support plates respectively to said backstop plates.

5,690,548
PELVIC GIRDLE SPLITTER TOOL AND METHOD
Kevin L. Jones, 5841 W. Barden Rd., Coleman, Mich. 48618, and Jeffery M. Simon, 10799 N. Shepherd Rd., Clare, Mich. 48617
Filed Aug. 6, 1996, Ser. No. 692,601
Int. Cl.^{6} A22C *17/06*
U.S. Cl. 452—160 **12 Claims**



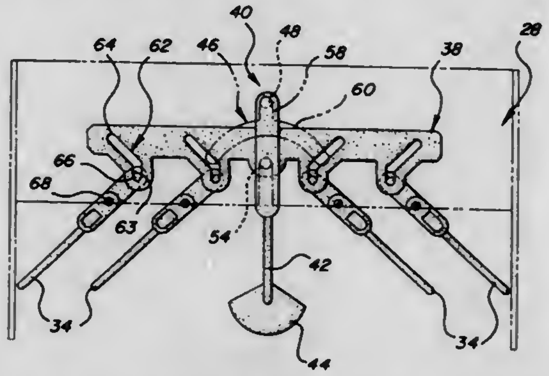
1. A pelvic bone splitter comprising a shaft with an elongated slot, an anvil surface on each side of the slot and a gripping surface on a free end of the shaft; and a blade member with a first end pivotally attached to the shaft, a hand grip on a second end and a cutting edge between the hand grip and the first end and wherein the cutting edge is received in the slot in the shaft upon pivotal movement of the blade member in a close direction relative to the shaft, the cutting edge cooperates with the anvil surfaces to split a traversing bone upon pivotal movement of the cutting edge in the close direction towards the slot, and the cutting edge is removed from the slot in the shaft upon pivotal movement of the blade member in an open direction relative to the shaft.

5,690,549
ROOF FOR A VEHICLE CAB
Stephen M. Webb, Shenfield, and Robert Samuel David Whybro, Butnham on Crouch, both of Great Britain, assignors to New Holland North America, Inc., New Holland, Pa.
Filed Mar. 11, 1996, Ser. No. 613,829
Claims priority, application United Kingdom, Mar. 18, 1995, 9505539
Int. Cl.^{6} B60H *1/32*
U.S. Cl. 454—137 **11 Claims**



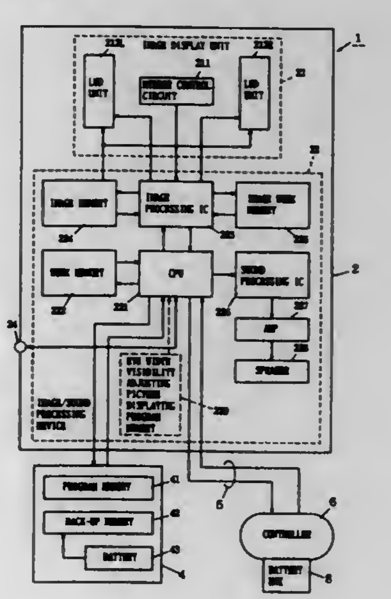
1. A roof for the cab of a vehicle, comprising:
a hollow plastic body that is molded in one piece and defining a cavity therein, said plastic body including an inner partition wall extending between an upper roof surface and a lower roof surface, the cavity being formed as a toroid surrounding the partition wall; and
a blower and heat exchanger fitted to the hollow body, the cavity within the hollow body forming an air duct through which air for ventilating the cab is ducted.

5,690,550
DIFFUSER OUTLET ASSEMBLY
Michael Stephen Mikowski, Lake Leelanau, Mich., assignor to Manchester Plastics, Inc., Troy, Mich.
Filed Apr. 24, 1996, Ser. No. 637,051
Int. Cl.^{6} B60H *1/34*
U.S. Cl. 454—155 **19 Claims**



11. An air outlet assembly for directing air in a plurality of directions, said assembly comprising;
a housing;
a plurality of directional louvers and a control louver each having first and second ends and pivotally connected to said housing;
a unitary link control plate of fixed shape slidably connected to each of said plurality of directional louvers for sliding movement along a control axis and slidable with respect to said housing; and
a guide operatively connected between said housing and said link control plate establishing a first position to allow said louvers to pivot in parallel with one another in a parallel mode of operation and a second position spaced from said first position along said control axis to spread said louvers outwardly in a diffused mode of operation.

5,690,551
IMAGE DISPLAY DEVICE, IMAGE DISPLAY SYSTEM, AND PROGRAM CARTRIDGE USED THEREWITH
Yoshihiro Taki; Masafumi Sakashita, and Satoshi Matsumura, all of Kyoto, Japan, assignors to Nintendo Co., Ltd., Kyoto, Japan
Filed Nov. 9, 1995, Ser. No. 555,748
Claims priority, application Japan, Nov. 11, 1994, 6-278181
Int. Cl.^{6} G09G *3/02*
U.S. Cl. 463—32 **7 Claims**



1. An image display device for independently displaying images to both eyes of a user, comprising;
a pair of display units being disposed in use on the left and the right respectively adjacent to the left and right eyes of the user;
a width adjusting mechanism adjustably holding a space between said pair of display units;
eye width adjusting picture displaying program storage locations for storing a program for displaying an eye width adjusting picture;
eye width adjusting picture displaying image data storage locations for storing image data for displaying the eye width adjusting picture; and
a processor for executing the program stored in said eye width adjusting picture displaying program storage locations and for accessing image data stored in said eye width adjusting picture displaying image data storage locations to cause said left and right display units to display said eye width adjusting picture,
wherein the space between said left and right display units may be adjusted by operating said width adjusting mechanism on the basis of a visually recognized state of the eye width adjusting picture displayed in said left and right display units.

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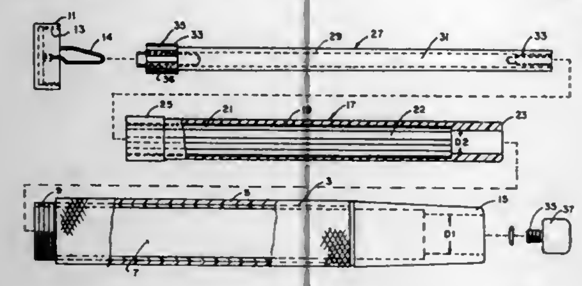
5,690,552
INJECTION MOLDED TELESCOPING BATON

Bruce K. Siddle, St. Clair County, Ill., assignor to PPCT Products, Inc., Millstadt, Ill.

Continuation-in-part of Ser. No. 249,279, May 25, 1994, Pat. No. 5,568,922, which is a continuation-in-part of Ser. No. 141,068, Oct. 26, 1993, Pat. No. 5,372,363. This application Sep. 9, 1996, Ser. No. 709,718

Int. Cl.^{6} F41B *15/02*

U.S. Cl. 463—47.7 **4 Claims**



1. A telescoping baton for use in self-defense or training, comprising:

a cylindrical handle section having an end and axial bore formed therein, said handle section formed from an injection molded material;

a cylindrical second section disposed within said axial bore of said handle section and being capable of being extended out of said handle section or retracted into said handle section, said second section having an axial bore formed therein, said second section being formed from said injection molded material simultaneously with said handle section;

an end section disposed within said second section and capable of being extended out of said second section and retracted into said second section, said end section having an axial bore formed therein, said end section being formed of said injection molded material simultaneously with said handle and said second sections;

an internally threaded first metal tube within a first end of said axial bore of said end section and a metal knob threadedly engaged within said first metal tube, a second metal tube within a second end of said axial bore of said end section;

an end cap on said handle end, said end cap having a fastening means provided to releasably engage said second metal tube within said axial bore of said end section to provide a holding means for retaining the telescoping baton in its retracted position, said end cap being removable to allow assembly of said sections;

said axial bore of said second section being defined by a wall which has a plurality of grooves formed therein and said end section includes a raised collar, said collar having a plurality of ribs formed thereon, said ribs disposed to slidingly engage said grooves to allow said end section to extend out of and retract into said second section while preventing rotation of said end section within said second section axial bore, whereby telescoping sections of said baton may be extended, during usage, and retracted, during storage.

5,690,553
RESILENT ELEMENT HAVING AN ELASTIC PORTION AND SEAT PORTIONS FOR USE IN A VIBRATION DAMPING DEVICE

Hideyuki Imanaka, Moriguchi; Yasuyuki Hashimoto, Neyagawa, and Hiroshi Teramae, Nara, all of Japan, assignors to Exedy Corporation, Osaka, Japan

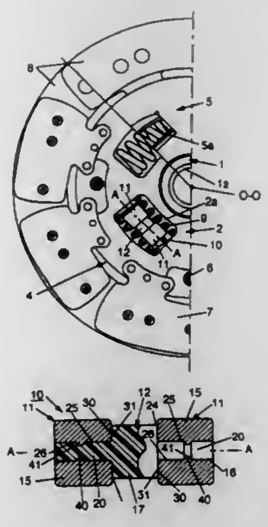
Division of Ser. No. 424,012, Apr. 18, 1995. This application Jun. 12, 1996, Ser. No. 660,950

Claims priority, application Japan, Apr. 25, 1994, 6-86847

Int. Cl.^{6} F16D *3/64*

U.S. Cl. 464—68 **9 Claims**

1. A torsion damper for a clutch disc comprising:



a pair of seat elements, each of said seat elements having a generally cylindrical shape having a first length measured along a central axis thereof;

an elastic non-metallic element disposed between said seat elements, said elastic non-metallic element in engagement with said seat elements in the absence of an adhesive, limiting relative movement between said seat elements and said elastic non-metallic element, and said elastic non-metallic element having a generally cylindrical shaped central body having a second length measured along a central axis thereof, said first length being greater than said second length; wherein

each of said seat elements is provided with an aperture and said elastic non-metallic element is provided with opposing extending portions which extend into a corresponding one of said apertures fixing said seat elements to said elastic non-metallic element by friction engagement, and each of said apertures is provided with an annular protrusion and each of said extending portions are provided with an annular groove which engage said protrusions respectively.

5,690,554
TORSION DAMPER FOR A CLUTCH DISK

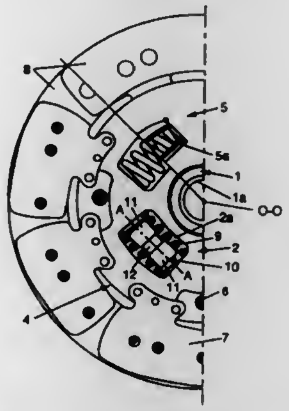
Hideyuki Imanaka, Moriguchi; Yasuyuki Hashimoto, Neyagawa, and Hiroshi Teramae, Nara, all of Japan, assignors to Exedy Corporation, Osaka, Japan

Continuation of Ser. No. 424,012, Apr. 18, 1995, abandoned. This application Feb. 13, 1997, Ser. No. 800,150

Claims priority, application Japan, Apr. 25, 1994, 6-086847

Int. Cl.^{6} F16D *3/14;3/52*

U.S. Cl. 464—68 **5 Claims**



1. A torsion damper for a damper mechanism comprising:

a pair of seat elements;

an elastic non-metallic element disposed between said seat elements; and

mechanical engagement means for engagement between said elastic non-metallic element and said seat elements in the absence of an adhesive, limiting relative movement between said seat elements and said elastic non-metallic element;

wherein the mechanical engagement means between said seat elements and said elastic non-metallic element comprises at least one aperture formed in one of said seat elements and said elastic non-metallic element and an extending portion formed on the other of said seat elements and said elastic non-metallic element extending into the aperture fixed therein by friction engagement; and

wherein said at least one aperture is provided with an annular groove and said extending portion is provided with an annular protrusion which engages said groove.

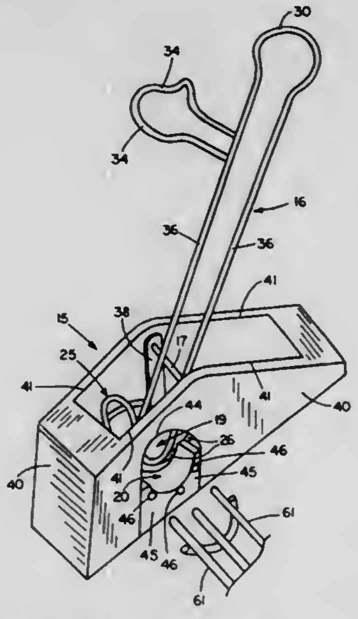
5,690,555
AUTOMATIC TEEING DEVICE AND CAGE FOR CATCHING GOLF BALLS HIT TOWARD THE CAGE

William C. Lay, 95 W. 650 South, St. George, Utah 84770

Filed Aug. 30, 1996, Ser. No. 707,961

Int. Cl.^{6} A63B *57/00*

U.S. Cl. 473—137 **25 Claims**



1. A golf ball teeing device comprising

an elongate trough having respective proximal and distal ends, said trough being capable of supporting a golf ball for rolling motion of the golf ball along said trough when the trough slopes downwardly from its proximal end to its distal end;

a substantially horizontal pivot axis extending transversely of said trough adjacent to said proximal end of said trough so that said trough can pivot about said horizontal pivot axis to rotate back and forth between a first position in which the trough extends generally upwardly from said horizontal pivot axis and a second position in which said trough slants downwardly from said horizontal pivot axis so that the distal end of said trough is slightly lower than the proximal end thereof so that said golf ball will roll down said trough from the proximal end of said trough to the distal end of said trough when said trough is in its said second position;

a ball receiving chamber located below said horizontal pivot axis, said ball receiving chamber being offset to the side of a vertical plane passing through said horizontal pivot axis, said ball receiving chamber further having an opening in a sidewall thereof, whereby said opening forms a ball receiving entrance through which said golf ball is introduced into said ball receiving chamber;

a ball-cradle member extending downwardly from said horizontal pivot axis into said ball receiving chamber when said trough is in its said first position, said ball-cradle member receives and cradles said golf ball when said golf ball enters said ball receiving chamber through the ball receiving entrance formed by the opening in the sidewall of said ball receiving chamber;

said ball-cradle member being associated with said trough such that the ball-cradle member rotates upwardly about said horizontal pivot axis when said trough rotates downwardly from its said first position to its said second position, whereby when said trough rotates to its said second position, the ball-cradle member rotates sufficiently upward so that said golf ball cradled therein will roll from the ball-cradle member to the proximal end of the trough, with said golf ball then rolling down said trough to the distal end thereof;

gate means associated with said ball receiving entrance, said gate means being adapted to block said ball receiving entrance when said ball-cradle member rotates upwardly, whereby a subsequent golf ball cannot enter said ball receiving chamber through said ball receiving entrance until said ball-cradle member rotates back downwardly into said ball receiving chamber;

a circular guide loop formed at the distal end of said trough, said guide loop having a diameter that will allow said golf ball to pass through the loop, whereby when said golf ball rolls down said trough and is set on a suitable support member by said guide loop, said guide loop can move upwardly around said golf ball so that said trough can move back to its said first position while leaving said golf ball setting on said support; and

means for rotating said trough back and forth between its said first and second positions.

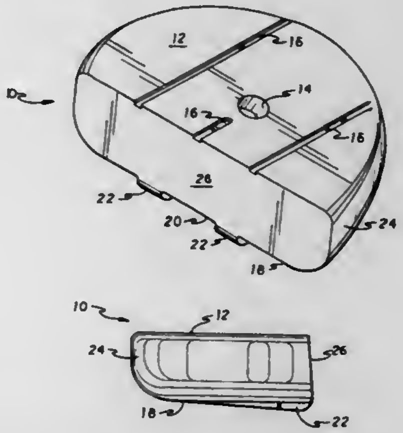
5,690,556
PUTTER/CHIPPER GOLF CLUB

Dennis Paul Condon, 144 Carlyle Dr., Palm Harbor, Fla. 36483

Filed Nov. 8, 1996, Ser. No. 745,774

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—252 **10 Claims**



1. A golf club head, comprising:

a top surface, having a shaft receiving hole;

a flat bottom surface,

an angled striking surface extending between the top surface and the bottom surface, said angled surface being flat and at an acute angle with the bottom surface;

a back surface; and

at least two rails extending from the flat bottom surface, with the rails being integral with the golf club head, and decreasing in height from the angled striking surface to the back surface;

whereby when said golf club head is provided with a shaft, a shaft ferrule, and a gripping device, the golf club head can be used for both chipping and putting a golf ball, with the angled

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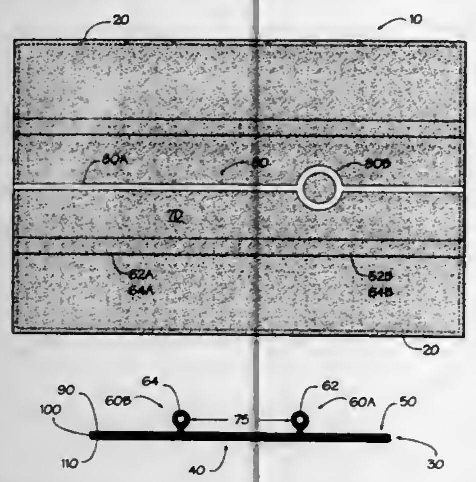
striking surface allowing a more positive roll of the golf ball while putting, and said rails allowing putting in areas not normally conducive to putting.

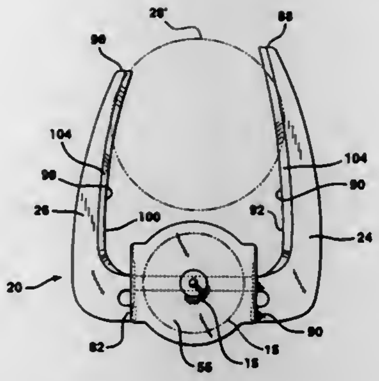
5,690,557
PUTTING PRACTICE DEVICE
Roy C. Casillas, and Judith L. Casillas, both of 1197 Hogan Ave., Banning, Calif. 92220
Filed Sep. 11, 1996, Ser. No. 712,138
Int. Cl.^{6} A63B *69/36*
U.S. Cl. 473—265 **2 Claims**



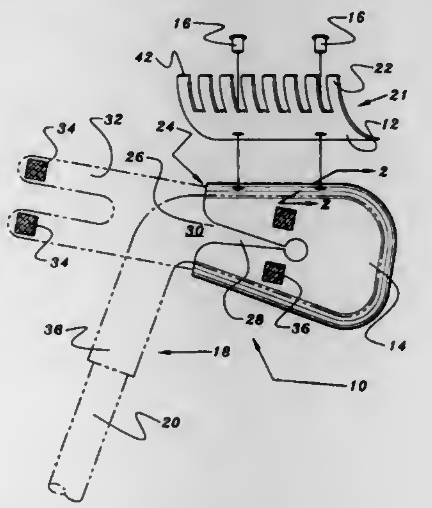
1. A golf ball putting guide device comprising:
a mat having a bottom surface for placement on a generally flat support surface, and a top surface for hitting a golf ball; the top surface being characteristic of a golf green;
first and second mutually parallel raised guide portions extending uniformly upwardly from the top surface and substantially along the top surface to define an elongate, uniform width, area of the top surface within which to strike the golf bail with a golf club;
a marking on the top surface, the marking providing; first, a line laying parallel to the raised portions and bisecting the elongate top surface area, and, second, an indicator for guiding the repeated consistent common placement of the golf ball onto the top surface;
each of the raised portions comprise a tubular outer shell formed as an extension of the top surface and protruding therefrom, each of the outer shells comprising two joined and colinear shell portions, each of the shell portions enclosing a rod fitted snugly within the each of the shell portions, the rods being removable from the shell portions for enabling the mat to lie folded for compact storage.

5,690,558
GOLF BALL RETRIEVER
Jack A. Huber, Canoga Park, Calif., assignor to Larry K. Goodman, Cerritos, Calif.
Filed Aug. 22, 1996, Ser. No. 701,642
Int. Cl.^{6} A63B *57/00*
U.S. Cl. 473—285 **20 Claims**

1. Apparatus for retrieving a golf ball from a playing surface comprising a fork and attachment means for securing said fork to an elongated shaft that has a handle end and an opposite end, wherein said attachment means secures said fork to the extremity of said handle end, and wherein said fork has first and second arms separated from each other and lying substantially in a common plane and arcuately curved toward each other so as to receive and cradle a golf ball therebetween and said first arm is longer than said second arm, and means for holding said arms in at least one lifting position in which said arms extend outwardly from said elongated shaft at a predetermined lifting angle between perpendicular alignment relative to said elongated shaft and a thirty degree inclination from perpendicularity in a direction away from said opposite end of said elongated shaft.

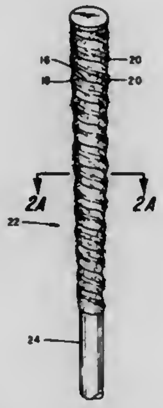


5,690,559
COMBINATION GOLF CLUB COVER AND RAKE
Gloria R. Julius, 6382 18th St. NE., Saint Petersburg, Fla. 33702
Filed Jun. 24, 1996, Ser. No. 669,044
Int. Cl.^{6} A63B *57/00*
U.S. Cl. 473—286 **2 Claims**



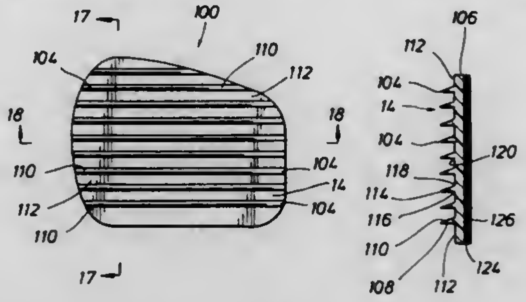
2. A golfer's sand rake comprising:
a golf club comprising a shaft and a head comprising a face having a groove formed therein;
a head cover portion made of a semi-rigid, flexible material, the head cover portion comprising an aperture, the head cover portion receiving the head therein; and
a toothed rake head portion comprising a plurality of teeth arranged in a row, each of the teeth having a predetermined width substantially greater than a width of the groove, each of the teeth spaced apart from an adjacent one of the teeth by a distance substantially equal to the predetermined width, the toothed take head portion attached to the head cover portion, the rake-head portion not extending laterally outward beyond the head of the club.

5,690,560
GRIP FOR GOLF CLUBS AND SPORTS RACKETS
Joseph F. Ruiz, 201 N. Concord Exchange, South St. Paul, Minn. 55075
Continuation of Ser. No. 569,731, Dec. 8, 1995, abandoned. This application Nov. 14, 1996, Ser. No. 748,353
Int. Cl.^{6} A63B *49/08;53/14*
U.S. Cl. 473—301 **3 Claims**



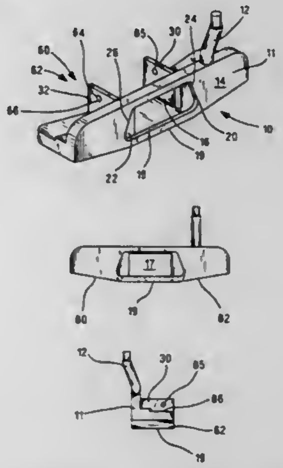
1. A moisture absorbing grip for a handle of a golf club or sports racket consisting of an elongated strip of leather of a predetermined width dimension, the strip having a smooth grain side and a rough napped side, the strip including first and second lateral edges on either side of a central portion, the central portion of said strip on the napped side being of a thickness greater than at the first and second lateral edges and arcuately tapering down to the first and second edges, the strip adapted to be spirally wound about the handle with the grain side contacting and adhered over its entire width dimension to the handle, the napped side exposed for absorbing moisture, and the first edge of one spiral convolution abutting the second edge of an adjacent spiral convolution, the predetermined width of the strip forming an arcuate spiral recess between the central portions of the one spiral convolution and the adjacent convolution for receiving and conforming to the rounded contour of the fingers of a player therein.

5,690,561
REMOVABLE ADHESIVE BACKED PADS FOR GOLF CLUB STRIKING SURFACES
Michael L. Rowland, and David L. Ballard, both of Kingwood, Tex., assignors to The Spin Doctor, Ltd., Kingwood, Tex.
Continuation-in-part of Ser. No. 597,974, Feb. 7, 1996. This application Jul. 8, 1996, Ser. No. 676,434
Int. Cl.^{6} A63B *53/04*
U.S. Cl. 473—330 **15 Claims**



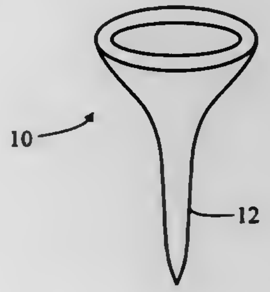
1. A device for use on a golf club having a generally planar club head striking face comprising a two-sided removable pad having dimensions corresponding generally to those of the striking face of a golf club head, said pad having a first side including a plurality of continuous ridges extending generally horizontally and spaced vertically from each other, the continuous horizontal extent of said ridges corresponding generally to the width of said pad, and an adhesive coating on a second side of said pad for temporary application to a club head striking face, said ridges being firm enough to impart spin to a golf ball yet not significantly mar the surface of the golf ball.

5,690,562
SOFT IMPACT PUTTER
Ernst F. Sturm, 9612 Magnolia Dr., Hillsboro, Mo. 63050
Filed Sep. 3, 1996, Ser. No. 707,003
Int. Cl.^{6} A63B *53/04*
U.S. Cl. 473—340 **15 Claims**



1. A golf putter comprising: a putter body portion with a width and a bottom having a handle extending upwardly therefrom to be grasped by a user, said body portion containing a first opening on the putter face extending along the width of the body portion; said first opening being filled with an elastomeric material having a resiliency of at least a Durometer value of at least about 60 D scale, and having sufficient strength to withstand repeated impacts with a golf ball during putting; and means for maintaining said elastomeric material within said putter body portion; said means for maintaining the elastomeric material in place within said body portion including a second opening in communication with said first opening and extending inwardly behind the face of said body portion through the bottom of the putter; said means for maintaining the elastomeric material within the putter body portion further comprising laterally spaced slots extending outwardly from said first opening and extending less than the width of the body portion on either side of the first opening.

5,690,563
BIODEGRADABLE GOLF TEE
Albert L. Gammon, 418 Mountain Creek Rd., Albermarle, N.C. 28001
Filed Jan. 9, 1997, Ser. No. 781,186
Int. Cl.^{6} A63B *57/00*
U.S. Cl. 473—399 **7 Claims**



1. A biodegradable golf tee formed from a moldable composition compressible at room temperature and decomposable upon contact

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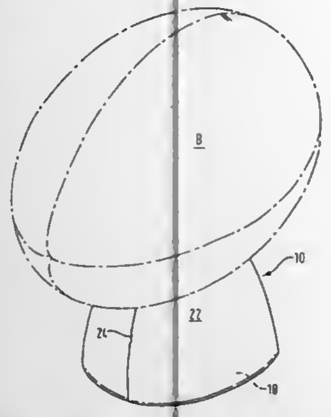
with water, said biodegradable golf tee comprising a rendered animal meal made from pulverized animal parts selected from the group of scientific animal classifications consisting of Bovidae, Suidae, Superclass Agnathia, Superclass Gnathostomdta and Phasianidae.

5,690,564
FOOTBALL SUPPORT

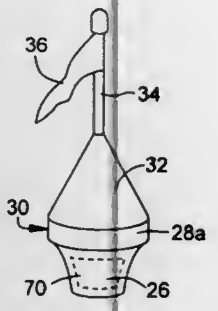
Jamie Carmichael Hassard, and Lawrence Edward Webb, both of Rugby, England, assignors to James Gilbert (Rugby Footballs) Ltd., Rugby, United Kingdom
PCT No. PCT/GB96/00276, § 371 Date Sep. 27, 1996, § 102(e) Date Sep. 27, 1996, PCT Pub. No. WO96/24408, PCT Pub. Date Aug. 15, 1996
PCT Filed Feb. 8, 1996, Ser. No. 722,006
Claims priority, application United Kingdom, Feb. 11, 1995, 9502696
Int. Cl.⁶ A63B *71/00*
U.S. Cl. 473—420 15 Claims



1. A football support comprising a filler material contained within an outer skin forming a deformable closed bag including a flat base portion having a periphery connected with an upstanding wall portion tapering in a direction away from said flat base portion.

5,690,565
RECREATIONAL GAME APPARATUS WITH INDICATOR

Leonard A. Swanson, 410 Mors, Wheeling, Ill. 60090
Filed Feb. 16, 1996, Ser. No. 602,587
Int. Cl.⁶ A63B *67/00*
U.S. Cl. 473—417 7 Claims



1. A game apparatus comprising having a flat bottom and upper body;

said upper body including a vertical internal passage extending substantially from said flat bottom and having an upper opening for receiving the lower end of a game piece,

said lower end having an inserted length extending into a substantial portion vertically of said internal passage for support in an upright orientation

said internal passage having a gradually increasing width from adjacent said bottom plate to said upper opening,

said lower end having a configuration substantially corresponding to the configuration of the internal passage, and

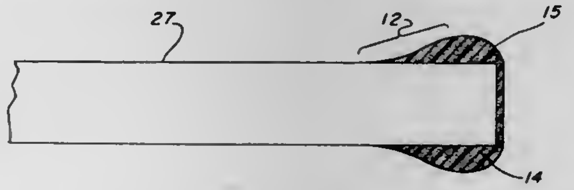
said configuration being shaped to permit said game piece to be dislodged from said passage

said passage is formed by a circumferentially extending wall having a curved configuration,

said lower end of said game piece includes a circumferentially extending curved wall generally corresponding to said circumferentially extending wall of said base for creating substantial circumferential contact along the inserted length of said lower end between said circumferentially extending curved wall and said circumferentially extending curved lower end of said game piece.

5,690,566
END CAP FOR RACKET HANDLE

Juan Bracho, 5327 Patrick Henry, Bellaire, Tex. 77401
Continuation of Ser. No. 439,453, May 11, 1995, abandoned, which is a continuation of Ser. No. 294,776, Aug. 23, 1994, abandoned, which is a continuation of Ser. No. 121,842, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 37,509, Mar. 24, 1993, Pat. No. 5,295,684, which is a continuation of Ser. No. 835,613, Feb. 13, 1992, abandoned. This application Mar. 15, 1996, Ser. No. 736,198
Int. Cl.⁶ A63B *49/08*
U.S. Cl. 473—549 2 Claims



1. An end cap in combination with a racket handle, said racket handle having a first end portion, a second end portion, and a length extending therebetween, the first end portion of said racket handle having a racket head secured thereto, the second end portion of said racket handle being free, said end cap being disposed at the second end portion of the racket handle, said end cap comprising:

a. a cushioned butt cap member formed of a spongy, shock absorbent material and being positionable over the second end portion of said racket handle;

b. an overwrap member formed of an elongated strip of thin material, said overwrap member being wrapped over said butt cap member and wrapped over a portion of said length of said racket handle;

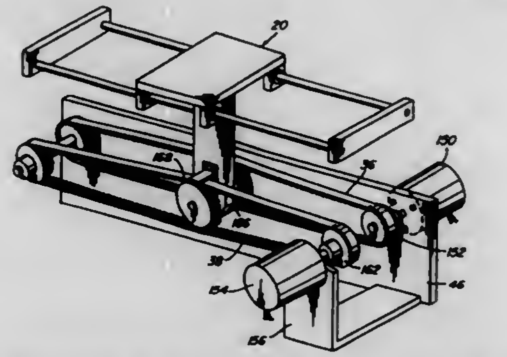
c. said end cap further having a first thickness located at said second end portion of said racket handle, a second thickness spaced from said first thickness along said length of said racket handle, said second thickness being greater in thickness than said first thickness;

d. a bridge section extending from said second thickness towards said racket head, said bridge section tapering gradually and nonlinearly along said length of said racket handle as said bridge section extends from said second thickness towards said racket head; and,

e. the length of said end cap, measured from said first thickness to the end of said bridge section closest to said racket head, being greater in length than said second thickness.

5,690,567
TRANSMISSION FOR CONVERTING ROTARY MOTION INTO LINEAR MOTION

Jan F.C. DeNijs, Wakefield, Mass., and Matthias Lindner, Bad Nauheim, Germany, assignors to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.
Division of Ser. No. 552,552, Nov. 3, 1995. This application Jan. 3, 1997, Ser. No. 778,698
Int. Cl.⁶ F16H *9/00;27/02;29/02*
U.S. Cl. 474—73 6 Claims



1. A transmission for converting rotary motion of a rotary drive mechanism to linear motion of a carriage, comprising:

a belt assembly for connection to the rotary drive mechanism, including,
  a drive shaft for coupling to the rotary drive mechanism,
  a follower shaft spaced from said drive shaft, and
  first and second belts mounted for rotation around said drive shaft and said follower shaft;

a first pulley driven by said first belt of said belt assembly at a first belt velocity and coupled to the carriage for rotation at a first angular velocity, said first pulley having a first pulley size;

a second pulley driven by said second belt of said belt assembly at a second belt velocity different from said first belt velocity and coupled to the carriage for rotation at a second angular velocity, said second pulley having a second pulley size; and

a mechanical coupling between said first and second pulleys for establishing a predetermined ratio of said first angular velocity to said second angular velocity;

wherein the carriage, in response to rotary motion of the rotary drive mechanism, moves linearly with respect to said belt assembly at a carriage velocity determined by said first and second belt velocities, said first and second pulley sizes and the predetermined ratio of said first and second angular velocities, wherein the predetermined ratio of said first and second angular velocities is equal to one.

5,690,568
IDLER SPROCKET ASSEMBLY FOR A PHASED CHAIN SYSTEM

Stephen P. Watson, Freeville, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Filed Jan. 31, 1996, Ser. No. 595,038
Int. Cl.⁶ F16H *7/00*
U.S. Cl. 474—85 8 Claims

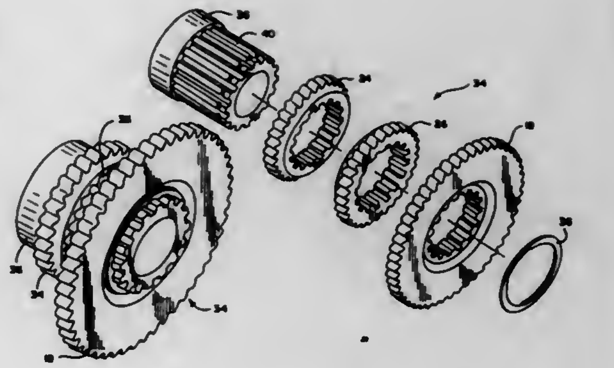
1. A phased chain and sprocket system, comprising:

a pair of chains,

a pair of sprockets located on a common shaft, each of said sprockets having a first number of outer sprocket teeth and a second number of internal spline teeth,

said internal spline teeth of a first sprocket being rotated with respect to said internal spline teeth of said second sprocket by a third number of spline teeth before location of said sprockets on a common shaft,

said pair of sprockets being circumferentially offset by said rotation of said internal spline teeth such that said first number of outer sprocket teeth of said first sprocket are rotated with

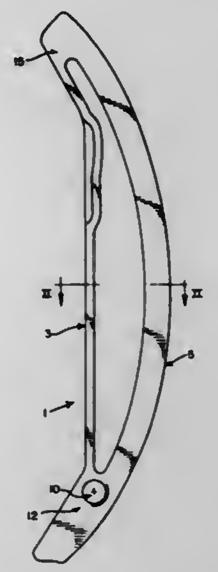


respect to said first number of outer sprocket teeth of said second sprocket by a fourth number of outer sprocket teeth, said fourth number of outer sprocket teeth being a calculated value of equal to said first number of outer sprocket teeth divided by the product of said second number of internal spline teeth multiplied by said third number of spline teeth, said fourth number of outer sprocket teeth being the combination of a whole number of teeth and a fractional number of teeth, and

said second sprocket outer teeth being circumferentially offset from said first sprocket outer teeth by said fractional number portion of said fourth number of outer sprocket teeth.

5,690,569
SINGLE PIECE REINFORCED CHAIN GUIDE

Timothy J. Ledvina, Groton, and Stanley K. Dembosky, Ithaca, both of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Filed Mar. 13, 1996, Ser. No. 643,936
Int. Cl.⁶ F16H *7/08*
U.S. Cl. 474—111 5 Claims



1. A guide for a power transmission chain, comprising:

a single rail component which integrally forms a carrier portion and a slide portion,

said component being formed of polymer material containing fibers from the group of graphite and aramid, and being manufactured by an injection molding process.

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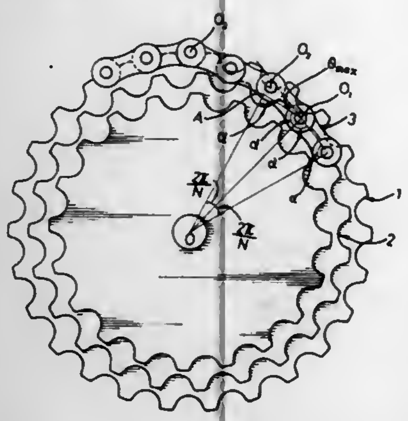
5,690,570
MULTISTAGE SPROCKET ASSEMBLY FOR A BICYCLE

Mickey Wen-pin Chang, Fengyuan, and Ti-li Ueng, Taichung, both of Taiwan, assignors to Industrial Development Bureau, Taipei, Taiwan

Filed Sep. 26, 1995, Ser. No. 533,848
Int. Cl.^{6} B62M ***11/02***
U.S. Cl. 474—158 2 Claims



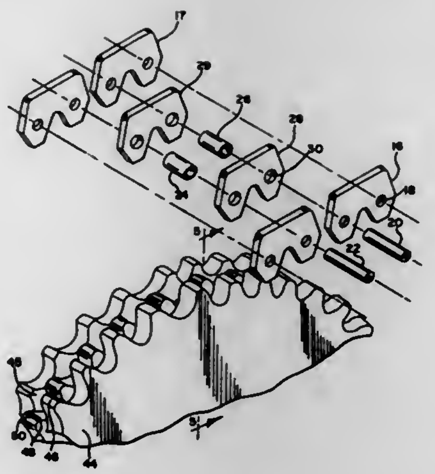
1. A sprocket assembly for a bicycle comprising at least one larger diameter sprocket having a plurality of teeth of an equal distance formed on an outer periphery thereof, at least one smaller diameter sprocket rotated in concert with said larger diameter sprocket and having a plurality of teeth of an equal distance formed on an outer periphery thereof, a driving chain meshing with said plurality of teeth of said smaller diameter sprocket and being able to shift from a first center of a space defined between the teeth of one pair of adjacent teeth located at the smaller diameter sprocket to a second center of a space defined between the teeth of one pair of adjacent teeth located at the larger diameter sprocket, a distance between said first and second centers being not equal to an integer multiple of the pitch of said driving chain such that said driving chain is bent between said first and second centers and is deflected from a moving direction thereof which is along a tangent line drawn from said first center of said smaller diameter sprocket, and such that a deflection point is provided on said driving chain between said first and second centers so that a first line passing through said first center and said deflection point, and a second line passing through said first center and said second center will intersect with an included angle formed therebetween.

5,690,571
HYBRID ROLLER AND SILENT CHAIN

Philip J. Mott, Dryden, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Sep. 11, 1996, Ser. No. 710,018
Int. Cl.^{6} F16G ***13/04***
U.S. Cl. 474—212 11 Claims

1. A chain assembly, comprising:
- a series of interleaved inner and outer links, said outer links having a pair of outer link plates fixedly mounted to spaced pin members, each outer link plate having a pair of apertures for receiving said pin members;
- said inner links having a pair of bushings mounted to turn on said pin members of said outer links, said inner links having a pair of inner link plates fixedly mounted to said bushings, each inner link plate having a pair of apertures for receiving said bushings;



- said outer link plates having a pair of outer depending members adapted to contact a first set of teeth of the sprocket assembly;
- said inner links and said outer links being adapted to receive a second set of teeth of a sprocket assembly between said inner link plates.

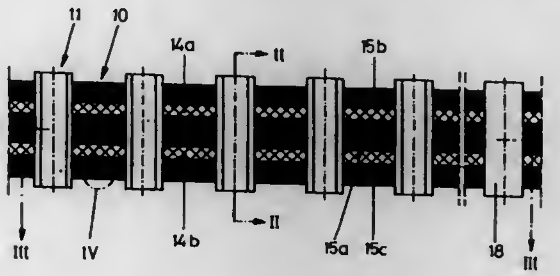
5,690,572
DRIVING BELT

Karl-Heinz Belz, Arnsberg, and Hans-Jürgen Kelsch, Wickede, both of Germany, assignors to PLASTO Textil-GmbH, Ense-Höingen, Germany

Filed Jan. 16, 1996, Ser. No. 585,093

Claims priority, application Germany, Jan. 13, 1995, 195 00 897.9

Int. Cl.^{6} F16G ***1/04;1/28;*** **B32B** ***7/00***
U.S. Cl. 474—266 8 Claims

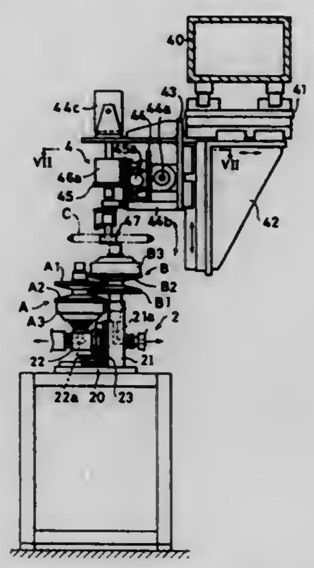


1. A driving belt extending in a longitudinal direction with a top side and an opposed bottom side comprising:
- a textile belt having a first non-reinforced strip extending in the longitudinal direction, a second non-reinforced strip extending in the longitudinal direction and a reinforced strip extending in the longitudinal direction adjacent said non-reinforced strips; and
- a plurality of plastic catch elements injection molded onto said textile belt with equal longitudinal spacing from each other, said plurality of catch elements projecting outwardly from at least one side of said belt with each catch element extending in a direction transverse to the longitudinal direction whereby the plastic penetrates said textile belt across said first non-reinforced strip.

5,690,573
APPARATUS FOR ASSEMBLING BELT OF VARIATOR

Yutaka Sato, and Wataru Takada, both of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1996, Ser. No. 595,190
Claims priority, application Japan, Feb. 15, 1995, 7-026713
Int. Cl.^{6} B23P ***19/00***
U.S. Cl. 474—273 9 Claims



1. An apparatus for assembling an endless belt of a variator, wherein the belt is automatically assembled into a pair of pulleys containing sheave halves forming a groove, said pulleys being held by a pulley holding unit having a pair of holding members for holding the pulleys such that axial lines thereof are parallel to each other, and means for relatively moving said holding members such that a sheave half of each of the pulleys is brought into a groove of the other of the pulleys, said apparatus comprising:
- a belt feeding unit for feeding the belt to an operative position with respect to said pulleys; and
- a belt assembly head operative to pinch intermediate portions of the endless belt to be fed from said belt feeding unit and to extend the belt across the pair of pulleys, said belt assembly head comprising belt pinching means effective to engage the endless belt at opposed intermediate portions thereof, and means for moving said belt pinching means such that one end and the other end of the endless belt are sequentially expanded for assembly into one and then the other of the pair of pulleys which are held in a condition in which the sheave half of each of the pulleys is brought into the groove of the other of the pulleys.

5,690,574
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

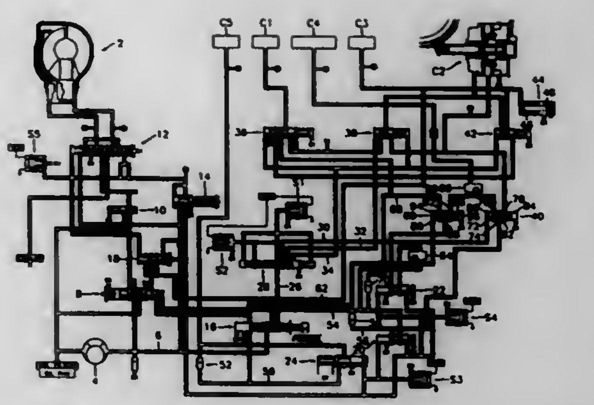
Jaeduk Jang, Kyungki-do, Rep. of Korea, assignor to Hyundai Motor Company, Rep. of Korea

Filed Jun. 6, 1996, Ser. No. 658,806

Claims priority, application Rep. of Korea, Aug. 30, 1995, 95-27632

Int. Cl.^{6} F16H ***61/06***
U.S. Cl. 475—128 8 Claims

1. A hydraulic control system for an automatic transmission, comprising:
- a pressure regulating means, having a pressure regulating valve, for regulating hydraulic pressure fed from a hydraulic pump;
- a shift control means, having a manual valve and a shift control valve, for feeding hydraulic pressure fed from the pressure regulating means in response to each shift mode;



- a pressure control means for controlling hydraulic pressure for each shift mode, the pressure control means including first and second pressure control solenoid valves which are duty controlled by a transmission control unit, and first and second pressure control valves and an N-R control valve which are controlled in accordance with the operation of the solenoid valves;
- a pressure dispensing means for dispensing hydraulic pressure from the shift control means and the pressure control means to first, second, third, fourth and fifth friction members, the pressure dispensing means including a second-to-fourth/third-to-fourth speed shift valve, a second-to-third/fourth-to-third speed shift valve and a first-to-second speed shift valve, and the fifth friction member being applied by hydraulic pressure which is controlled by the N-R control valve;
- a first pressure line changing means for selectively feeding a reverse pressure and a drive pressure each fed from the manual valve, to the second pressure control valve;
- a switch valve for selectively feeding hydraulic pressure from the second pressure control valve to the first and fourth friction members, the switch valve being controlled by reverse pressure fed from the manual valve;
- a second pressure line changing means for selectively feeding hydraulic pressure from both the first-to-second speed shift valve and the switch valve to the fourth friction member;
- a pressure damping means disposed in a line connected to the third friction member which is applied in third and fourth speeds of a drive "D" range;
- a first release pressure retarding means disposed on a release pressure line of the fifth friction member; and
- a second release pressure retarding means disposed on a line connecting the first pressure control valve to the first-to-second speed shift valve.

5,690,575
DIFFERENTIAL TRANSMISSION WITH INTEGRATED RANGE GEAR

Klaus Lippitsch, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Jul. 1, 1996, Ser. No. 673,077

Claims priority, application Germany, Jul. 6, 1995, 195 24 682.9

Int. Cl.^{6} B60K ***17/346***
U.S. Cl. 475—204 7 Claims

1. A differential transmission with a range gear box, comprising:
- housing means;
- input shaft means;
- first and second output shaft means;
- planetary gear train means comprising first ring gear means drivingly connected to the input shaft means, planet carrier means drivingly connected to one of the first and second output shaft means, sun gear means selectively connectible with at least one of the planet carrier and the other of the first and second output shaft means, and a plurality of pairs of

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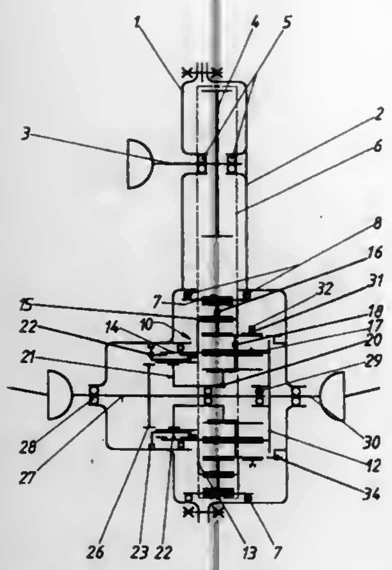


meshing planet gears, one gear of each pair meshing with the first ring gear means, the other gear of each pair meshing with the sun gear means;

second ring gear means meshing with the other planet gear of each pair; and

means for selectively connecting the second ring gear means with the housing means.

5,690,576
CONTINUOUSLY VARIABLE TRANSMISSION WITH CONTROL OF SWITCHING BETWEEN FORWARD AND REVERSE

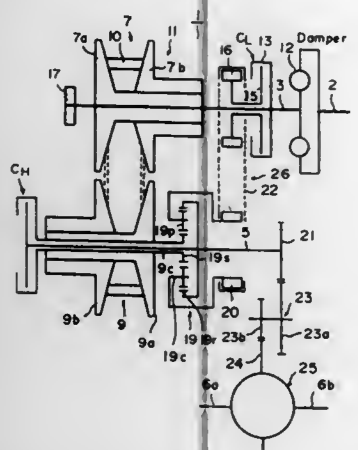
Shuzo Moroto, Nagoya; Takao Taniguchi; Shoichi Miyagawa, both of Okazaki; Shiro Sakakibara, Anjo; Kazumasa Tsukamoto, Toyota; Takeshi Inuzuka, and Masashi Hattori, both of Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Mar. 22, 1996, Ser. No. 620,226

Claims priority, application Japan, Mar. 24, 1995, 7-066234; May 26, 1995, 7-128701; May 26, 1995, 7-128702

Int. Cl.^{6} F16H *9/26*

U.S. Cl. 475—211 **10 Claims**



1. A continuously variable transmission system for speed change of rotation received from an engine output shaft and for transmitting that rotation, at the changed speed, to vehicle wheels, said system comprising:

an input shaft for receiving engine torque from the engine output shaft;

an output shaft for outputting torque to the vehicle wheels;

a belt type continuously variable transmission unit having a first pulley for receiving engine torque from said input shaft, a second pulley, a belt trained around both of said first and second pulleys and axial force actuating means for changing the pulley ratio of said first and second pulleys by applying axial forces to said first and second pulleys;

a planetary gear unit having a first rotary element rotatable with said input shaft, a second rotary element rotatable with said second pulley and a third rotary element rotatable with said output shaft;

selection means for selecting between forward travel wherein torque is transmitted from said second pulley to said first pulley with forward rotation output at said output shaft and reverse travel wherein torque is transmitted from said first pulley to said second pulley with reverse rotation output at said output shaft;

control means for controlling said axial force actuating means so that axial forces acting on said first and second pulleys produce a difference corresponding to the pulley ratio of said first and second pulleys; and

switching means, responsive to operation of said selection means selecting between said forward travel and said reverse travel, for reversing relative magnitudes of the axial forces acting on said first and second pulleys, under control of said control means, thereby switching between said forward travel and said reverse travel.

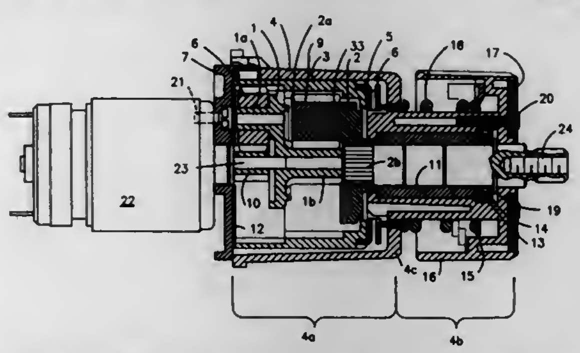
5,690,577
GEAR MECHANISM

Bernd Enzmann, Villingen-Schwenningen, and Hansjörg Maus, Donaueschingen, both of Germany, assignors to IMS Morat Sohne GmbH, Germany

Continuation-in-part of Ser. No. 280,237, Jul. 25, 1994, Pat. No. 5,551,927. This application Feb. 20, 1996, Ser. No. 603,410

Int. Cl.^{6} F16H *57/00*

U.S. Cl. 475—265 **13 Claims**



1. Gear mechanism comprising a gear housing (4), an annular gear (3) provided inside said gear housing, a planetary gearing (1, 2, 8, 9) provided internal of said annular gear (3) for reduction of rotations between a drive shaft (23) and an output shaft (24), said annular gear (3) provided with internal teeth which are in engagement with said planetary gearing, and an overload clutch provided between said annular gear and said output shaft, said overload clutch comprised of a cam surface (5) formed on the face of said annular gear and pressure ring (6) urged against said cam surface,

wherein said annular ring (3) is formed of a plastic material, said annular gear (3) and cam surface (5) are formed as a single component of an injection moldable plastic material, and the face side of said annular disk, which forms the cam surface (5), is covered with a wear resistant material, and

wherein said pressure ring (6) is secured against rotation with respect to said gear housing (4), said cam surface (5) and said pressure ring (6) facing each other and having engaging means provided on facing surfaces, a spring element (18) pressing against said pressure ring (6) from a side of said pressure ring opposite the side facing said cam surface (5), said pressure ring (6) pressing against said cam surface (5), said cam surface (5) formed intimately with said annular gear (3), and said annular gear (3) pressing against a detente wall (12), such that said annular gear (3) is frictionally prevented from rotation with respect to said detente wall (12) and said pressure ring (6) until a predetermined torque loading is exceeded, and wherein upon exceeding said predetermined torque load said annular gear (3) is able to rotate with respect to said pressure ring (6) and said detente wall (12).

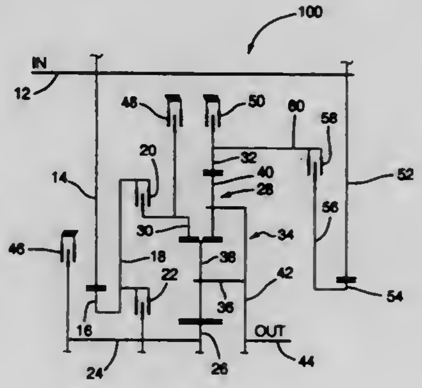
5,690,578
RAVIGNEAUX PLANETARY GEAR TRANSMISSION

Arthur Hall, III, Cicero, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1996, Ser. No. 638,665

Int. Cl.^{6} F16H *3/66;1/36*

U.S. Cl. 475—269 **6 Claims**



1. A power transmission comprising:

a sun gear;

a first ring gear;

a second ring gear;

a carrier assembly having a first pinion meshing with said sun gear and said first ring gear, and a second pinion meshing with said first pinion and said second ring gear;

an input shaft;

an output shaft continuously drivingly connected with said carrier assembly;

a selectively engageable first clutch selectively connecting said input shaft with said first ring gear;

a selectively engageable second clutch selectively connecting said input shaft with said sun gear;

a first selectively engageable brake for selectively connecting said sun gear to a housing of the transmission;

a second selectively engageable brake for selectively connecting one of said first and second ring gears to the housing; and

a third selectively engageable brake for selectively connecting the other of said first ring gear and second ring gear to said housing, said second clutch and said second brake being engaged to establish a reverse ratio between said input and output shafts, said first clutch and said first brake being engaged to establish a first forward ratio, said first clutch and said second brake being engaged to establish a second forward ratio, said third brake and said first clutch being engaged to establish a third forward ratio, and said first clutch and said second clutch being selectively engaged to establish a fourth forward ratio between said input and output shafts.

5,690,579
PLANETARY GEAR TRANSMISSION

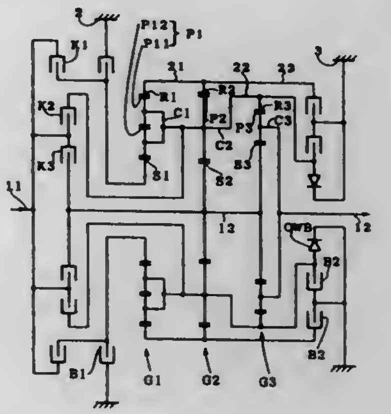
Tomokazu Takeda, Shiki, and Takashi Hotta, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1996, Ser. No. 597,013

Claims priority, application Japan, Feb. 6, 1995, 7-041377

Int. Cl.^{6} F16H *3/44*

U.S. Cl. 475—281 **10 Claims**



1. A planetary gear transmission comprising:

a first planetary gear train of double pinion type with a first sun gear element, a first carrier element, and a first ring gear element; a second planetary gear train of single pinion type with a second sun gear element, a second carrier element, and a second ring gear element; and a third planetary gear train of single pinion type with a third sun gear element, a third carrier element, and a third ring gear element; said first to third planetary gear trains being disposed coaxially and in parallel with one another; and

characterized by:

that said first sun gear element is engageably and disengageably coupled to an input member through a first clutch, and a first brake is provided capable of holding said first sun gear element against rotation;

that said first and second carrier elements and said third ring gear element are coupled to one another, and these three elements are engageably and disengageably coupled to said input member through a second clutch, and a second brake is provided capable of holding said three elements against rotation;

that said first ring gear element and said second ring gear element are coupled with each other, and a third brake is provided capable of holding these two elements against rotation;

that said second and third sun gear elements are coupled with each other, and these two elements are engageably and disengageably coupled to said input member through a third clutch; and

that said third carrier element is directly coupled to an output member.

5,690,580
NEUTRAL APPARATUS FOR ELECTRIC VEHICLE

Shoji Tokushima; Kiyoshi Kimura; Hisahiro Ito; Tomoyuki Itoh; Kiyotaka Hayashi, and Naofumi Hoshi, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo, Kabushiki Kaisha Tokyo, Japan

Filed Apr. 19, 1996, Ser. No. 634,855

Claims priority, application Japan, Apr. 19, 1995, 7-093729

Int. Cl.^{6} B60K *41/48*

U.S. Cl. 477—8 **6 Claims**

1. A neutral control apparatus for use on an electric vehicle having a power train for transmitting rotating force to drive wheels, said neutral control apparatus comprising:

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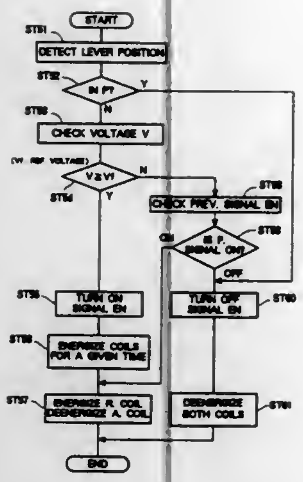
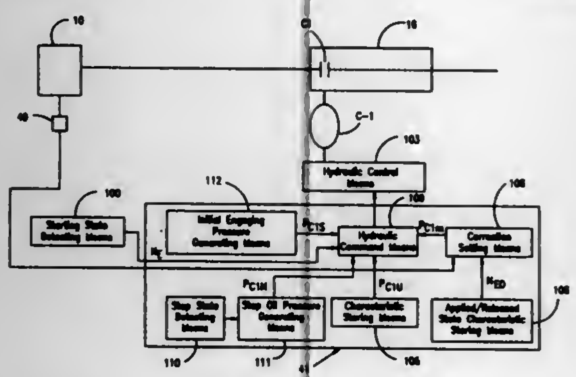


a battery;
an electric motor for producing the rotating force;
a neutral mechanism for selectively interrupting said rotating force of said powertrain;
a control state detector for detecting whether a motor control unit for controlling said motor is in a predetermined control state; and
a neutral control mechanism controller for actuating an actuator according to a signal output from said control state detector to cause said neutral mechanism to interrupt said power train.

5,690,581
CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kaoru Nadayoshi, Anjo; Hiroshi Tsutsui; Yoshihisa Yamamoto, both of Nishio, and Masahiro Hayabuchi, Anjo, all of Japan, assignors to Aisin Aw Co., Ltd., Japan

Filed May 10, 1996, Ser. No. 645,959
Claims priority, application Japan, May 12, 1995, 7-115010
Int. Cl.⁶ B60K *41/02*
U.S. Cl. 477—176 **5 Claims**

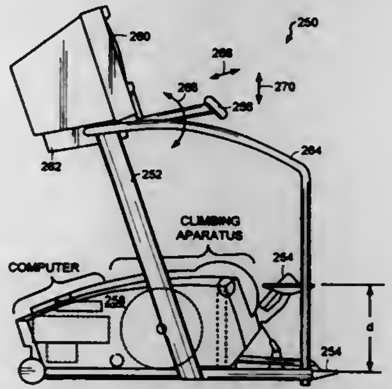

10
16
C1
C-1
103
Hydraulic Control Means
100
Starting State Detecting Means
112
Initial Engaging Pressure Generating Means
PC1S
109
Hydraulic Command Means
PC1m
108
Correction Setting Means
PC1M
PC1U
KED
Stop State Detecting Means
Stop Oil Pressure Generating Means
Characteristic Storing Means
Applied/Released State Characteristic Storing Means
106
110
111
41
105

1. A control system for an automatic transmission which receives rotation from an engine mounted in a vehicle, comprising:
a clutch for transmitting the rotation of the engine to the transmission;
a hydraulic servo for applying/releasing said clutch;
starting state detecting means for detecting, as a vehicle starting condition, at least one of the following conditions: that a throttle is at least partially open; that a brake pedal is released; and that the vehicle is in motion;
throttle opening detecting means for detecting the throttle opening of the engine;
applied/released state detecting means for detecting the applied/released state of said clutch;
hydraulic control means for controlling the oil pressure fed to said hydraulic servo; and
a control unit, said control unit including:
a timer for measuring an elapsed time from the initiation of a control of engagement of said clutch;
characteristic storing means containing engagement characteristic data in the form of oil pressures for achieving ideal engaging characteristics for said clutch, correlated with data for elapsed time and the throttle opening;
applied/released state characteristic storing means containing data for applied/released parameters of said clutch corresponding to the ideal engaging characteristics, correlated with elapsed time and the throttle opening;
correction setting means for setting an oil pressure correction according to a difference between the actual applied/released state of said clutch, as detected by said applied/released state detecting means, and the ideal applied/released state, as read out from said applied/released state characteristic storing means; and
hydraulic command means for reading out the oil pressure from said characteristic storing means, responsive to detection of said vehicle starting condition, and for adding said oil pressure correction to said read oil pressure.

5,690,582
INTERACTIVE EXERCISE APPARATUS

W. Thatcher Ulrich, Boston; Harvey A. Koselka; Aaron F. Bobick, both of Newton, and Michael H. Benjamin, Quincy, all of Mass., assignors to Tectrix Fitness Equipment, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 189,896, Feb. 1, 1994, Pat. No. 5,466,200, which is a continuation-in-part of Ser. No. 12,305, Feb. 2, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,242
Int. Cl.⁶ A63B *23/04*
U.S. Cl. 482—4 **7 Claims**



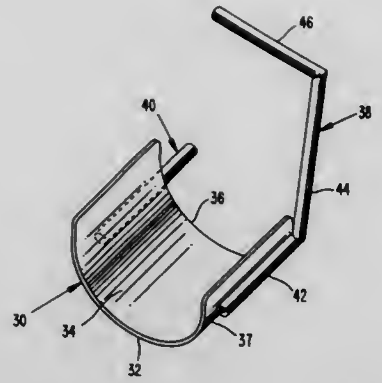
7. A stair climbing simulator exercise apparatus, comprising:
a pair of steps which a user manipulates to achieve exercise; and
means for automatically adjusting the steps to maintain the user at substantially a particular distance above the ground regardless of the speed at which the user manipulates the steps.

5,690,583
JUMP CUP ADAPTED TO BE MANIPULATED BY ONE HAND

Joseph J. Keusch, 23317 Potts Mill Rd., Middleburg, Va. 20117

Filed Sep. 6, 1996, Ser. No. 708,972
Int. Cl.⁶ A63K *3/04;* **A63B** *5/02*
U.S. Cl. 482—16 **5 Claims**

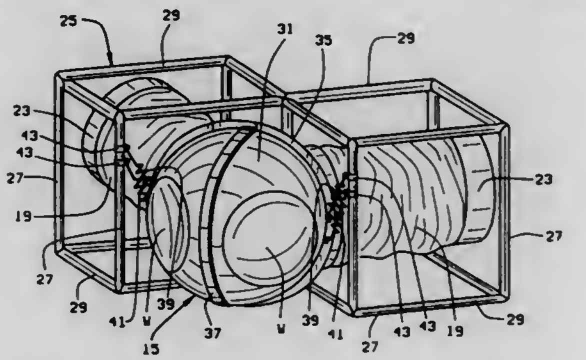
1. A jump cup adapted to be selectively mounted in one of a plurality of horizontal holes spaced vertically apart in a jump standard, the jump cup comprising:
a curved member, forming an upwardly facing concave surface adapted to support an end of a jump pole; and
a lateral support member and a mounting member both being rigidly connected directly to the curved member and both projecting rearwardly beyond a rear side of the curved member, the mounting member including both a lateral support portion spaced horizontally from the lateral support member, and a horizontal mounting axle portion integral with and extending transversely from an end of the lateral support portion, the mounting axle portion being adapted for insertion into a hole of a jump standard to define a rotary axis permitting the curved member to be tilted to a first position enabling the lateral support member to pass across a front surface of the standard during insertion of the mounting axle into the hole, and then to be swung to a downward position such that the rear side of the curved member engages the front surface of the standard, with the front surface being straddled by the lateral support member and lateral support portion.



5,690,584
MULTI-DIRECTIONAL MOVABLE RECREATIONAL EQUIPMENT DEVICE

Grant M. Strawcutter; James O. Dunn, Jr., both of Charlotte, and Todd A. Coble, Stanfield, all of N.C., assignors to Soft Play, L.L.C., Charlotte, N.C.

Filed Apr. 17, 1996, Ser. No. 633,462
Int. Cl.⁶ A63B *9/00;17/00*
U.S. Cl. 482—35 **15 Claims**

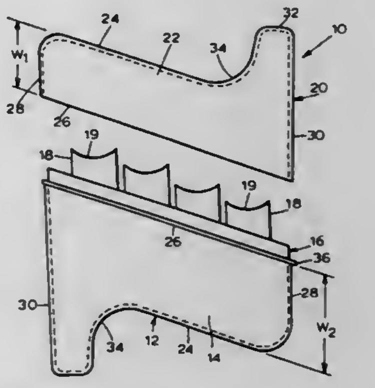


1. A movable recreational equipment device, including:
an enclosure having at least one opening for entry of an occupant;
proximate support structure immediately adjacent to generally opposed areas of the enclosure for suspending the enclosure above a floor surface;
spring means extending between the proximate support structure and generally opposed areas of the enclosure for controlled multi-directional movement of the enclosure relative to the support in order to provide controlled multi-directional movement of the enclosure relative to the support when an occupant enters the enclosure:
means generally intermediate the spring means and extending between the proximate support structure and enclosure for limiting multi-directional movement of the enclosure relative to the support within a predetermined confined path.

5,690,585
HAND DEVELOPMENT APPARATUS

John R. Ditsch, Bolingbrook, Ill., assignor to HDS, Inc., Bolingbrook, Ill.

Filed Jan. 23, 1996, Ser. No. 590,164
Int. Cl.⁶ A63B *23/16*
U.S. Cl. 482—47 **20 Claims**



1. A hand development apparatus comprising:
a first housing having an interior cavity formed therein, said first housing comprising:
a first housing portion having a first pair of sides substantially parallel to each other and a second pair of sides substantially parallel to each other, one of said sides of said first pair being disposed at an acute angle relative to one of said sides of said second pair, said first housing portion having a first width measured between two of said substantially parallel sides;
a second housing portion which extends from said first housing portion;
a first gripping surface coincident with one of said sides of said first housing portion; and
a second gripping surface disposed on said second housing portion, said first and second gripping surfaces being adapted to fit the palm of a person's hand;
a second housing having an interior cavity formed therein, said second housing wherein a person can selectively use one of said first and second bousings that best fits the person's hand comprising:
- a first housing portion having a first pair of sides substantially parallel to each other and a second pair of sides substantially parallel to each other, one of said sides of said first pair being disposed at an acute angle relative to one of said sides of said second pair, said first housing portion of said second housing having a second width measured between two of said substantially parallel sides of said second housing, said second width being substantially different than said first width;
- a second housing portion which extends from said first housing portion of said second housing;
- a first gripping surface coincident with one of said sides of said first housing portion of said second housing; and
- a second gripping surface disposed on said second housing portion of said second housing, said first and second gripping surfaces of said second housing being adapted to fit the palm of a person's hand;

a carrier alternately removably disposed within said interior cavity of one or the other of said first and second housings;
a plurality of movable elements carried by said carrier, said movable elements being adapted to accommodate the fingers of a person's hand and being movable along a movement direction, said movable elements being carried by said carrier in a staggered relationship wherein each of said movable elements lies at a different position with respect to a plane perpendicular to said movement direction; and
a spring mechanism for resisting movement of each of said movable elements along said movement direction, said spring mechanisms being disposed in said carrier and each of said spring mechanisms including a spring and means for adjusting the compression of said spring.

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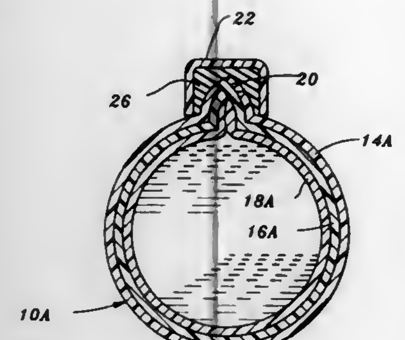
5,690,586
THERMAL HOT OR COLD HAND EXERCISER

Raymond P. Wilhelm, San Francisco, Calif., assignor to Cold Ice Corporation, Oakland, Calif.
Filed Jul. 1, 1996, Ser. No. 674,139
Int. Cl.^{6} A63B *23/16*
U.S. Cl. 482—49 **9 Claims**



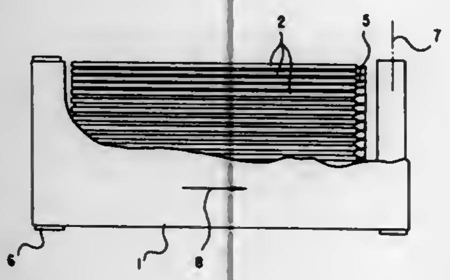
1. Exercise apparatus for holding in the hand of an individual and for imparting heat or cold to the hand during manipulation of the exercise apparatus by an individual, said apparatus comprising, in combination:

a flexible outer container defining an interior; and

a gel mixture located in the interior of the flexible outer container for retaining heat or cold applied to the exercise apparatus prior to placement of the exercise apparatus in the hand, said gel mixture including water, a gelling agent, propylene glycol; and a scent producing agent.

5,690,587
TREADMILL WITH CUSHIONED SURFACE, AUTOMATIC SPEED CONTROL AND INTERFACE TO EXTERNAL DEVICES

Johann Gruenangerl, A-5421 Adnet, Austria
Filed Feb. 27, 1996, Ser. No. 607,761
Claims priority, application Austria, Apr. 21, 1993, 780/93
Int. Cl.^{6} A63B *22/02*
U.S. Cl. 482—54 **6 Claims**



1. A treadmill, comprising:

a running deck defining a running area;

rollers;

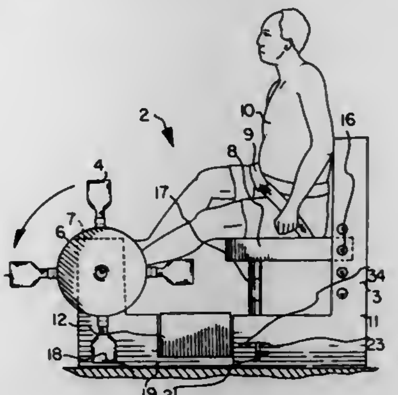
an endless transportation belt being stretched over and guided around said rollers for movement in a given direction in said running area;

a cushioning layer disposed on said running deck; and

a glide layer disposed between said cushioning layer and said transportation belt, said glide layer being formed of a plurality of individual, mutually parallel strips glued to said cushioning layer.

5,690,588
UNDERWATER AQUACYCLE

Joseph S. Lavore, 6492 Sugar Tree Dr., Spring Hill, Fla. 34607
Filed Feb. 28, 1997, Ser. No. 808,876
Int. Cl.^{6} A63B *21/008*
U.S. Cl. 482—58 **12 Claims**

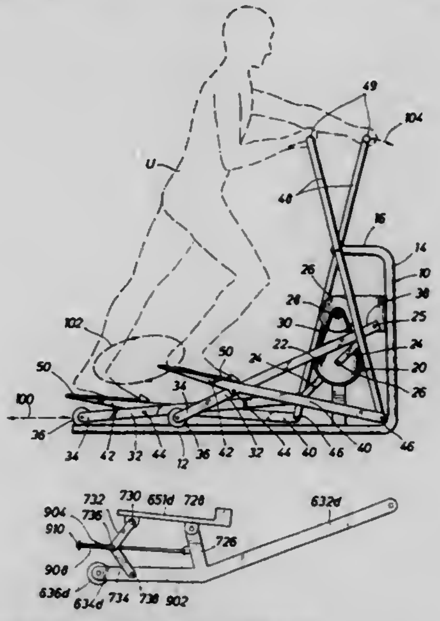


8. An underwater exercise device for exercising muscles associated with both the lower extremities and the upper extremities of an operator, said device comprising an essentially U-shaped frame having two L-shaped components movable lengthwise relative to one another, one of said L-shaped components being a seat supporting member and the other of said L-shaped components being a wheel supporting portion, each of said L-shaped components having an upwardly depending end; a first fixing means connected between said L-shaped components to allow said L-shaped components to move relative to one another for lengthwise adjustment and to securely connect said L-shaped components to one another after said lengthwise adjustment; a pair of wheels each having a central axis and a perimeter; said central axis of each of said wheels being connected to said upwardly depending end of said wheel supporting portion so that said wheel can move in both clockwise and counterclockwise directions; a plurality of paddles, each of said paddles being removably connected to said perimeter of one of said wheels in a position to radially extend beyond said perimeter; a first connection means to position each of said paddles into a variety of fixed orientations between a first position of maximum resistance and a second position rotated ninety degrees therefrom and creating minimum resistance during movement through water, said first connection means comprising a plurality of casings attached to each of said wheels, a plurality of openings through each of said casings, and a plurality of locking buttons, each of said paddles having at least one of said locking buttons attached thereto for engagement with one of said openings and orientation of said paddles into fixed positions relative to said casings during exercise use; a pair of handles, one of said handles being connected for rotation to each of said wheels in a position between said wheels; a pair of pedals, each of said pedals being connected to one of said handles and positioned centrally between said handles; a second connection means to connect one of said pedals and one of said handles to each of said wheels, said second connection means comprising a pair of cranks and a pair of pillow blocks, each of said cranks and one of said pillow blocks being used to connect one of said pedals and one of said handles to one of said wheels, said pillow blocks each positioned and configured to journal one of said wheels for rotation upon movement of said pedals and handles by an operator's feet and hands, respectively; a seat removably connected said upwardly depending end of said seat supporting member, said seat being configured to comfortably support an adult human operator; restraining means for use with said seat to maintain an operator against said seat during movement of said wheels; a third connection means to adjustably connect said seat to said frame so that said seat may be adjusted vertically, said third connection means comprising a plurality of holes through said seat supporting member, a plurality of holes through said seat configured to correspond to said holes through said seat supporting member, a plurality of legs downwardly depending from said seat, and a second fixing means attached

between said seat and said seat supporting member for securing said seat into one of several pre-selected fixed positions relative to said seat supporting member during exercise so that said seat can be vertically adjusted; and weighted means positioned against said frame to anchor said flame in place under water so that at least part of said wheels and said paddles remain underwater during exercise, and so that said underwater exercise device provides water resistance to muscles associated with the lower extremities of an operator when said device is oriented in water so that said upwardly depending ends of said U-shaped frame is positioned perpendicular to the bottom surface of a body of water, said seat is connected to said frame, the operator is positioned upon said seat, and the operator's feet are used against said pedals to cause rotation of said wheels, and so that said device also provides water resistance to muscles associated with the upper extremities of an operator when said device is oriented in water so that said upwardly depending ends of said U-shaped frame are positioned parallel to the bottom surface of the water, said seat is removed from said frame, the operator is standing upon said one of said upwardly depending ends so as to face said wheels, and the operator's hands are used to grip said handles to cause rotation of said wheels.

5,690,589
STATIONARY EXERCISE APPARATUS

Robert E. Rodgers, Jr., 8011 Meadowcroft, Houston, Tex. 77063
Continuation-in-part of Ser. No. 602,952, Feb. 16, 1996, which is a continuation of Ser. No. 377,846, Jan. 25, 1995, Pat. No. 5,573,480. This application Mar. 14, 1996, Ser. No. 615,103
Int. Cl.^{6} A63B *69/16;22/04*
U.S. Cl. 482—57 **22 Claims**



1. An apparatus for exercising comprising:

a frame having a base portion adapted to be supported by a floor;

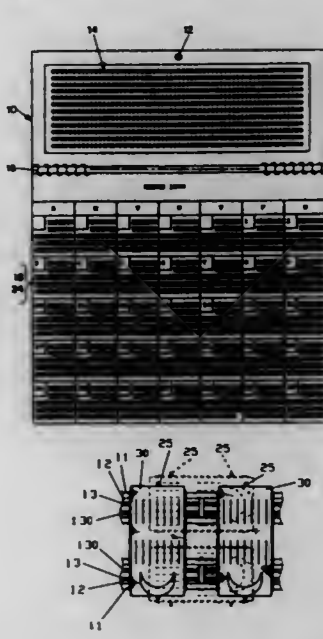
first and second reciprocating members, each reciprocating member having a first end and a second end;

a coupling member having (i) a pulley supported by said frame defining a pivot axis, and (ii) means for attaching the second ends of said first and second reciprocating members to said pulley so that rotation of said pulley results in the rotation of the second ends of said first and second reciprocating members in a substantially circular path about said pivot axis while the first ends of each of said first and second reciprocating members move in a reciprocating manner; and

means for orienting the bottom of the feet of the user of the apparatus so that each foot of the user follows a substantially elliptical path during operation of the apparatus, said orienting means includes a pivotable platform for each foot of the user positioned substantially between the first and second ends of a corresponding reciprocating member and adapted to pivot within an acute angle relative to an axis extending from the first end of the corresponding reciprocating member to the second end of the same corresponding reciprocating member.

5,690,590
MULTI-FUNCTIONAL EXERCISER

Chiu-Hsiang Lo, No. 20 Lane 305, Sec. 3, Chung-Shan Road, Tan-Tz Hsiang, Taichung Hsien, Taiwan
Filed Jan. 6, 1997, Ser. No. 779,326
Int. Cl.^{6} A63B *69/18*
U.S. Cl. 482—70 **10 Claims**



1. An exerciser, comprising a pair of horizontal beams and a pair of parallel guiding rails mounted between the horizontal beams, each guiding rail including a longitudinal guiding groove defined therein, a pedal means being slidably mounted in each said guiding groove, each said pedal means including a pedal and two roller seats mounted to an underside of the pedal, a plurality of rollers being rotatably mounted to each said roller seat and slidable along the associated guiding rail, a plurality of strings being mounted in each said guiding groove and roved around a number of support rollers on the roller seats to allow sliding motions of the pedal means along the guiding rails, a vertical beam being mounted on one of the horizontal beams and a pair of handles being respectively pivotally mounted to two opposite sides of the vertical beam, the improvements comprising:

the pedals and the associated roller seats being disengagable, each said pedal including two recesses defined in the underside thereof, two longitudinal holes each extending along a longitudinal direction of the pedal and in communication with the associated recess, and two lateral holes each extending along a lateral direction of the pedal and in communication with the associated recess, each said roller seat including a cylinder formed on a top side thereof, the cylinder having a longitudinal bore defined therein, and a pin releasably extending through the longitudinal bore of the cylinder and either one of the longitudinal hole and the lateral hole, wherein when each said pedal is in a first position, each said pedal is mounted to two of said roller seats, the rollers of which are in the same guiding rail and the longitudinal bores of the cylinders of the associated roller seats are in alignment with the associated lateral holes, and when each said pedal is in a second position, each said pedal is mounted to two of said roller seats, the rollers of which are in different guiding rails

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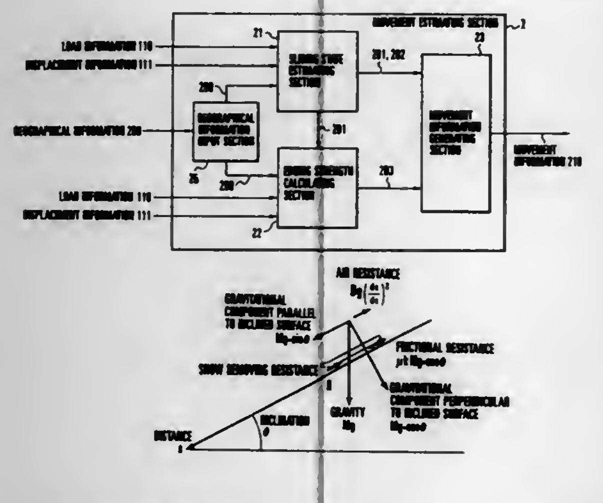
and the longitudinal bores of the cylinders of the associated roller seats are in alignment with the associated longitudinal holes.

5,690,591
SKI TRAINING APPARATUS

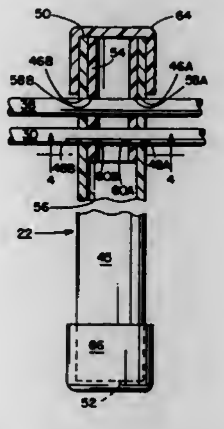
Akihisa Kenmochi, and Shin'ichi Fukuzumi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Sep. 12, 1995, Ser. No. 527,203
Claims priority, application Japan, Sep. 12, 1994, 6-217472
Int. Cl.^{6} A63B *22/00;71/00*
U.S. Cl. 482—71 **8 Claims**


MOVEMENT ESTIMATING SECTION
1
21
23
201, 202
LOAD INFORMATION 110
DISPLACEMENT INFORMATION 111
SLIDING STATE ESTIMATING SECTION
GEOGRAPHICAL INFORMATION INPUT SECTION
MOVEMENT INFORMATION GENERATING SECTION
MOVEMENT INFORMATION 210
EDGING STRENGTH CALCULATING SECTION
203
22
AIR RESISTANCE
GRAVITATIONAL COMPONENT PARALLEL TO INCLINED SURFACE
FRICTIONAL RESISTANCE
SNOW REMOVING RESISTANCE
GRAVITATIONAL COMPONENT PERPENDICULAR TO INCLINED SURFACE
GRAVITY
Mg
INCLINATION
θ
DISTANCE

1. A ski training apparatus comprising:
a pair of left and right footboards on which a trainee stands instead of skis;
a movable portion which supports said footboards to allow said footboards to rotate clockwise and counterclockwise, and swings to displace said footboards along an arcuated locus in accordance with ski-sliding movement of the trainee;
an apparatus body which supports said movable portion to allow said movable portion to swing in a horizontal direction;
measuring means for measuring loads of the left and right feet of the trainee standing on said footboards, and outputting the measured loads as load information, while measuring a displacement amount of said movable portion and rotational angles of said footboards, and outputting the measured amount and angles as displacement information;
movement estimating means for estimating a sliding velocity, a position of the trainee on a slope, and an edging strength representing a magnitude of a reactive force received from a snowy surface and corresponding to a load of the trainee on the snowy surface on the basis of the load information and the displacement information, which are supplied from said measuring means, and geographical information input in advance and indicating a state of the inclined surface on which the trainee slides, and outputting the estimated sliding velocity, position, and edging strength as movement information; and
braking control means for calculating a braking amount by using the load information and the displacement information which are supplied from said measuring means and the movement information which is supplied from said movement estimating means, and outputting the braking amount as braking information; and
braking means for applying a braking force to said movable portion in accordance with the braking information from said braking control means.

5,690,592
EXERCISING SYSTEM

Carl C. Heinrich, 5 Elaine St., Bozrah, Conn. 06334
Filed Sep. 27, 1996, Ser. No. 722,627
Int. Cl.^{6} A63B *5/20;5/22*
U.S. Cl. 482—82 **11 Claims**

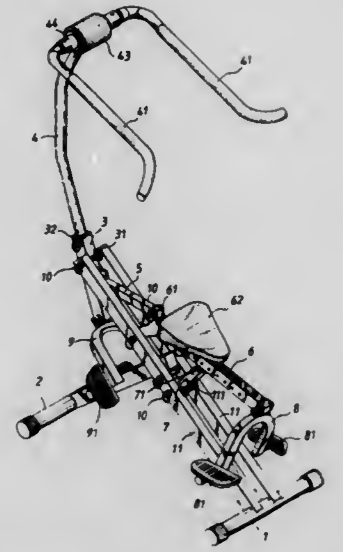


1. An exercising system comprising:
hoop means including first and second opposed leg members and a first elongated integral transverse member attached at opposite ends to said first and second leg members and over which a user can jump;
first and second opposed mutually independent elongated tubular handles, each having an inner channel;
means inflexibly mounting said first and second handles to said first and second leg members, respectively, each of said first and second handles having a first and second pair of aligned diametrically opposed mounting bores therethrough, the first pair of mounting bores being longitudinally spaced from the second pair of mounting bores, said first leg members extending through the first pairs of bores in said first and second handles, respectively, said second leg members extending through the second pairs of bores in said first and second handles, respectively; and
gripper means on said first and second handles for frictionally engaging said first and second leg members, said first and second leg members being selectively adjustably movable longitudinally of said handles, wherein said gripper means includes a friction member within each of said inner channels of said first and second handles adjacent the first and second pairs of mounting bores for frictionally engaging said first and second leg members and preventing unintended movement of said leg members relative to said handles.

5,690,593
PUSH/PULL EXERCISING APPARATUS

Andrew Huang, 6F-1, No. 2, Lane 41, Tein Mou W. Rd., Taipei, Taiwan
Filed Oct. 28, 1996, Ser. No. 738,554
Int. Cl.^{6} A63B *69/06*
U.S. Cl. 482—96 **5 Claims**

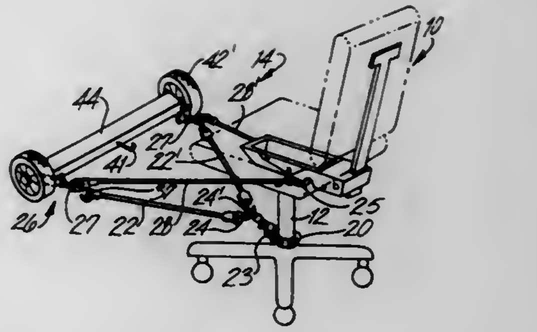
1. A push/pull exercising apparatus comprising:
a frame support comprising a long Tee bar and a short Tee bar, a vertical section of said long Tee bar being formed by two parallel rods, a vertical section of said short Tee bar being disposed in between said two parallel bars to form an arching fixed frame support on the ground;
a mounting support, said mounting support being a hollow bar and having an upper end pivotally connected to an extreme end of the vertical section of said long Tee bar;
a handle bar having a circular cross section that may be bent to have suitable angles if necessary, a pair of hand grips being disposed at an upper end of said handle bar;
a pull bar pivotally disposed between said mounting support and a seat stay by means of a positioning pin; said seat stay, said seat stay having a slightly bent tail portion, an end of said tail portion being pivotally positioned between said two parallel bars, an extreme end of said pull bar being pivotally positioned near said tail portion, said seat stay further having an extended section an upper side thereof supporting a seat;
a support bar, said support bar being a relatively short bar structure with an extreme end disposed at a middle portion of said parallel bars of said long Tee bar, a baffle post being provided between said parallel bars for laterally urging said support bar such that said support bar may work in cooperation with said extended section of said seat stay to constitute an urging support, an upper end of said support bar being provided with a resilient block disposed between said support bar and said seat stay to achieve an upwardly baffling effect;
said rear pedal mount and a front pedal mount both of which are substantially U-shaped having a pedal movably provided at either side thereof, said rear pedal mount being provided at a lower end of said handle bar, and said front pedal mount being provided at a front end of said extended section of said seat stay; whereby
when the user sits on said seat and faces the direction of said front pedal mount with both hands gripping said hand grips behind and pushing forwardly, said mounting support and said handle bar will be driven forwardly such that said seat stay elevates to achieve a forwardly push exercising effect, and when the user sits on said seat and faces the direction of said rear pedal mount with both hands gripping said hand grips in front and pulling said hand grips rearwardly, said seat stay will also elevate to achieve a rearwardly pull exercising effect.



5,690,594
EXERCISE APPARATUS FOR USE WITH CONVENTIONAL CHAIRS

Roy J. Mankovitz, 18057 Medley Dr., Encino, Calif. 91316
Filed May 16, 1995, Ser. No. 441,940
Int. Cl.^{6} A63B *21/02*
U.S. Cl. 482—121 **23 Claims**

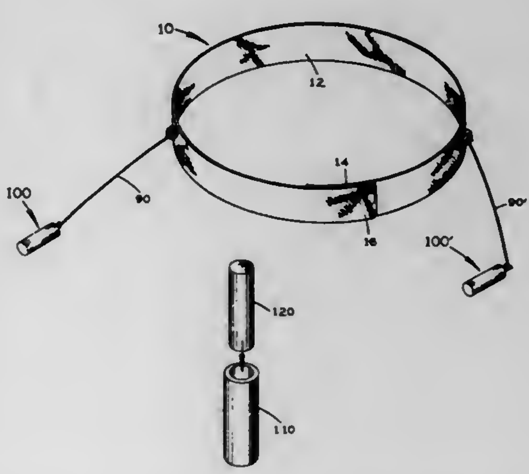
1. Exercise apparatus for attachment to conventional chairs having a central support post or multiple leg support comprising:
a foot support consisting of a bar having a length, first and second ends and at least one edge extending substantially along the length of the bar, against which the heel of a shoe can lock;
a resilient member for operatively connecting the chair and the foot support;
at least one wheel mounted on each of the respective ends of the foot support for rolling directly on a floor;
at least one attachment means rotatably mounted on the foot support;



the resilient member being attached to the attachment means; and
the at least one attachment means, the foot support, and the wheels rotate independently about a common longitudinal axis.

5,690,595
BELT WITH PROTRUDING ELASTIC BANDS CONNECTED TO HAND WEIGHTS

Juan A. Quinones, 511 NW. 108th Ter., Pembroke Pines, Fla. 33026
Filed Dec. 9, 1996, Ser. No. 762,326
Int. Cl.^{6} A63B *21/02*
U.S. Cl. 482—124 **17 Claims**



1. A walking exercise apparatus for effectively exercising back, abdominal, chest, shoulders, arms, buttocks and leg muscles, the apparatus comprising:
a belt for attaching about the waist of a user;
a first elastic cord having a first end attached to a side of the belt, and a second end;
a second elastic cord having a first end attached to another side of the belt, and a second end; and
a first weight sized for a user's left hand attached to the second end of the first elastic cord;
a second weight sized for a user's right hand attached to the second end of the second elastic cord,
wherein user alternates swinging the first weight and second weight forward and backward while walking; and
first and second weight covers receiving said first and second weights and attached respectively to said second ends of said first and second elastic cords, said weight covers having hollow interiors for inserting said weights.

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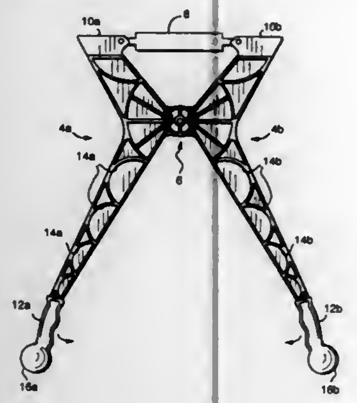
5,690,596
UPPER BODY EXERCISE APPARATUS

David G. Parker, 10 Meeting House Sq., Middleton, Mass. 10949

Filed Mar. 15, 1996, Ser. No. 616,701

Int. Cl.^{6} A63B *21/02*

U.S. Cl. 482—126 **26 Claims**



1. Apparatus for exercising a user's upper body, said apparatus comprising:

first and second members pivotally connected at a central joint, each of said members having a hand grip at one end and a head at the opposite end;

said central joint comprising a pair of overlapping dish each of which is secured to a respective one of said members, a pair of bearing surfaces each of which is located on a respective one of said members and abuts the disk which is secured to the opposite member, and a fastener; and

said heads for removably connecting one more force-resisting elements therebetween, said elements being selectable by said user to generate a first resisting force which said user may overcome by urging said hand grips together, or to generate a second resisting force which said user may overcome by urging said hand grips apart, or to generate both said first and second resisting forces.

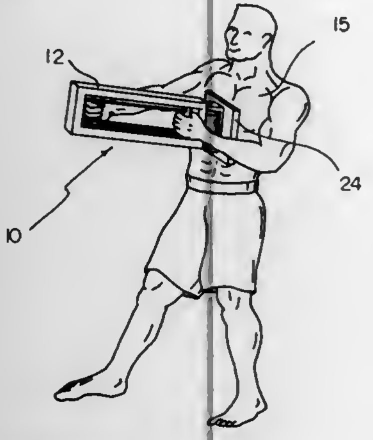
5,690,597
MARTIAL ARTS EXERCISE APPARATUS

Abbas Enfaradi, P.O. Box 18927, Atlanta, Ga. 31126

Filed Jun. 13, 1996, Ser. No. 663,513

Int. Cl.^{6} A63B *21/00*

U.S. Cl. 482—126 **14 Claims**



1. An exercise apparatus, comprising:

a frame which includes a first pair of tracks and a second pair of tracks,

a first handle received in said first pair of tracks,

a second handle received in said second pair of tracks,

a pulley positioned between said first pair of tracks and said second pair of tracks at a first end of said frame, and

a flexible line extended around a portion of said pulley and connected between said first handle and said second handle,

a base member, and

a frame-to-base pivot assembly connected between said frame and said base member.

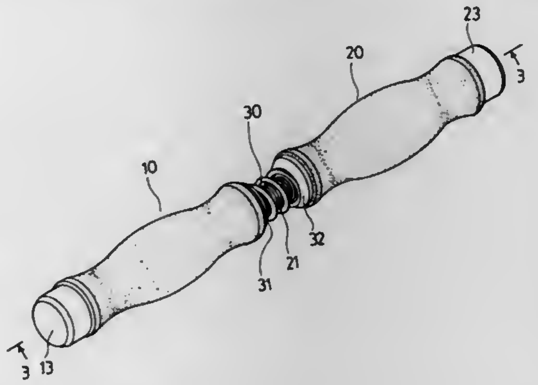
5,690,598
WRIST EXERCISER

Yung Jen Liang, No. 76, An Ler Street, An Dong Tsuen, Hsue Hsai Hsiang, Chang Hua Hsien, Taiwan

Filed Sep. 27, 1996, Ser. No. 720,095

Int. Cl.^{6} A63B *21/02;21/045*

U.S. Cl. 482—127 **3 Claims**



1. An exerciser comprising:

a first handle including a first end having an inner thread formed therein and including a second end,

a second handle including a first end having a bolt extended therefrom for engaging with said inner thread of said first handle and for allowing said second handle to be rotated relative to said first handle, said second handle including a second end,

two cones rotatably engaged on said bolt, and

means biasing between said first handle and said second handle for applying a biasing force against said first handle and said second handle and for resisting the rotation of said second handle relative to said first handle, said biasing means including a spring engaged on said bolt and biased between said first handle and said second handle for applying the biasing force against said first handle and said second handle, said spring including two ends engaged with said cones.

5,690,599

Patent Not Issued For This Number

5,690,600
RETRACTABLE WEB SEPARATOR

Sungwook Yang, Deerfield; Dale R. Severs, Gurnee, both of Ill.; David Frankenberger, and Michael Kemp, both of Mountain Home, Ark., assignors to Baxter International Inc., Deerfield, Ill.

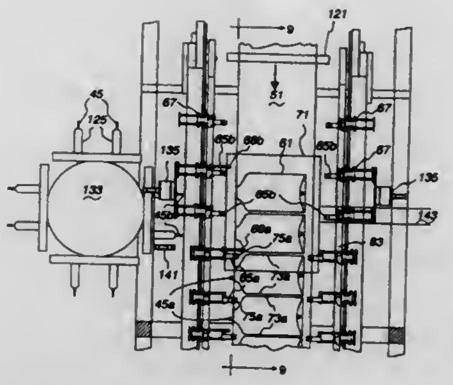
Filed Aug. 19, 1994, Ser. No. 293,441

Int. Cl.^{6} B31B *1/84*

U.S. Cl. 493—212 **22 Claims**

1. An apparatus for manufacturing an article formed from multiple webs with a seal formed between the webs, the apparatus comprising:

a guide for guiding the webs and for spacing the webs;



a conveyor for conveying the webs along a predetermined path of travel to a sealing station;

a sealer for sealing the webs together to form a seal at the sealing station;

a retractable web separator for temporary insertion between the spaced webs to provide a gap between the webs adjacent the sealing station;

means for transporting the retractable web separator in the direction of web travel and for travel to a location adjacent the sealer station;

means for inserting the retractable web separator between the spaced webs to provide the gap between the webs for performance of an operation in the gap between the webs and for withdrawing the retractable web separator from the gap between the webs at a location adjacent the sealer; and

means for performing the operation in the gap between the webs.

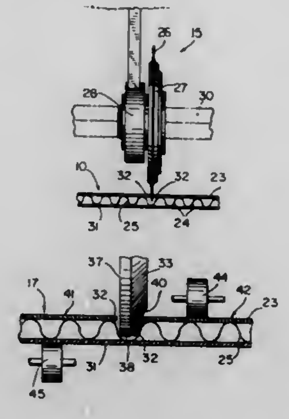
5,690,601
METHOD AND APPARATUS FOR SLITTING AND SCORING CORRUGATED PAPERBOARD SHEETS FOR FOLDING

James A. Cummings, and Arthur P. Burkart, both of Phillips, Wis., assignors to Marquip, Inc., Phillips, Wis.

Filed Jun. 10, 1996, Ser. No. 660,858

Int. Cl.^{6} B31D *5/04;* B31F *1/10*

U.S. Cl. 493—340 **3 Claims**



1. A method for providing a fold line in a corrugated paperboard sheet for making a folded box blank which sheet includes a fluted medium and enclosing liners, said method comprising the steps of:

(1) aligning a slitting tool and a scoring tool on a line generally parallel to the flutes of the paperboard sheet;

(2) orienting the sheet for movement on said line relative to said tools; and,

(3) positioning the tools to sequentially provide a colinear and coextensive slit and score in one liner to define the fold line by slitting the liner prior to scoring;

(4) positioning said scoring tool to engage one slit edge of the liner; and,

(5) scoring only said one slit edge to displace the same toward the unslit liner.

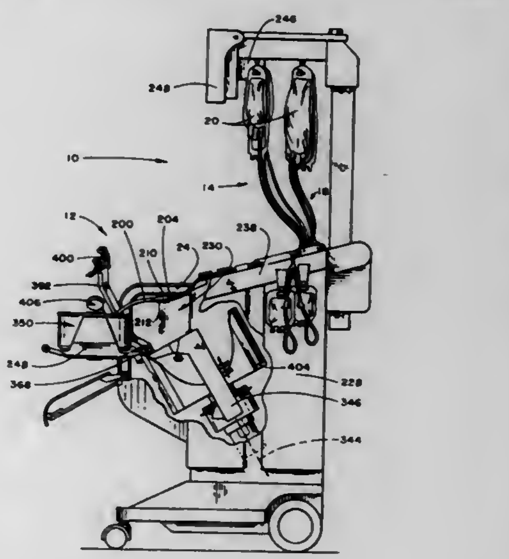
5,690,602
CENTRIFUGE WITH PIVOT-OUT, EASY-LOAD PROCESSING CHAMBER

Richard I. Brown, Northbrook, Ill.; Warren P. Williamson, Loveland, Ohio, and Paul M. Di Perna, Long Grove, Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 176,425, Dec. 22, 1993, Pat. No. 5,551,942. This application Aug. 30, 1996, Ser. No. 705,699

Int. Cl.^{6} B04B *7/08*

U.S. Cl. 494—43 **7 Claims**



1. A centrifuge comprising

a rotating element,

a drive mechanism coupled to the rotating element to rotate the rotating element about a rotational axis,

a processing element having an axis, and

a hinge coupling the processing element to the rotating element for rotation with the rotating element about the rotational axis, the hinge also permitting pivotal movement of the processing element between an operating position, in which the axis of the processing element lies in coaxial orientation with the rotational axis, and an access position, in which the processing element is cantilevered from the hinge and the axis of the processing element lies outside coaxial orientation with the rotational axis.

5,690,603
EROGENIC STIMULATOR

Melissa Mia Kain, P.O. Box 737, Mulberry, Fla. 33860-0737

Continuation-in-part of Ser. No. 44,464, Sep. 25, 1995, Ser. No. 44,405, Sep. 25, 1995, and Ser. No. 46,493, Nov. 16, 1995, Pat. No. Des. 376,650. This application Jan. 22, 1996, Ser. No. 589,191

Int. Cl.^{6} A61H *21/00*

U.S. Cl. 600—38 **15 Claims**

1. An erogenic stimulator for use by two partners comprising:

(a) a first elongated, resilient and generally cylindrical end region tapering to a reduced diameter portion, said reduced diameter portion enabling said first end region to flex thereabout;

(b) a second resilient and generally cylindrical end region sized for receipt in an anal or vaginal cavity having a neck-down

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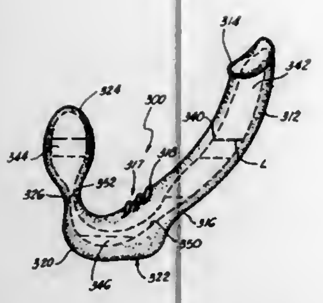
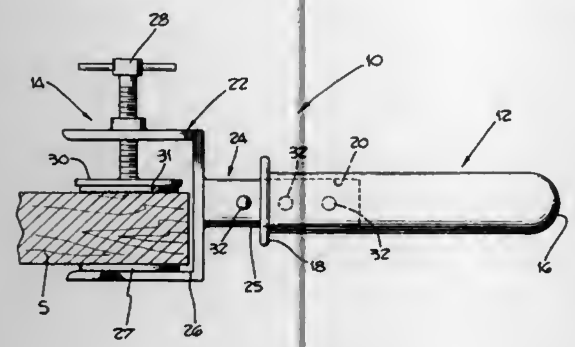


portion, said neck-down portion enabling said second end region to flex thereabout, said second end region being shorter than said first end region, said neck-down portion adapted for permitting the muscle groups of one of said partners to hold said second end region in place during use; and,

(c) means for flexibly connecting said first end region to said second end region, said connecting means comprising a common saddle area larger in cross-section than the cross-section of either said first or second end regions, said first and second end regions being connected to opposing sides of said common saddle area, said reduced diameter portion of said first end region being connected to a first or one of said opposing sides of said common saddle area and wherein said neck-down portion of said second end region is connected to a second or the other of said opposing sides of said common saddle area, whereby said first and second end regions are separately and independently flexible about, respectively, said reduced diameter portion and said neck-down portion.

5,690,604
SEXUAL APPLIANCE HAVING A PHALLIC DEVICE AND A DEVICE FOR MOUNTING THE SAME ONTO A SUPPORT STRUCTURE

Doyle Barnett, Montecito, Calif., assignor to Topco Sales, San Fernando, Calif.
Filed Mar. 22, 1996, Ser. No. 621,105
Int. Cl.^{6} A61F *5/00*
U.S. Cl. 600—38 **24 Claims**



1. A sexual appliance, comprising:

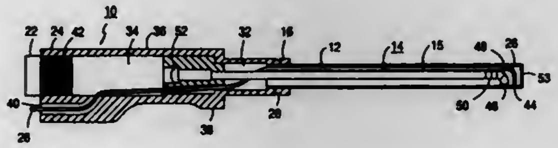
a resilient phallic device defining a forward end, a rearward end and a longitudinally extending aperture extending from the rearward end to a point between the rearward end and the forward end; and

a support device including a clamp having a substantially C-shaped member and a threaded tightening bolt, an arm operably connected to the C-shaped member and extending longitudinally therefrom, and a plurality of detents associated with the arm and adapted to engage a surface of the longitudinally extending aperture of the resilient phallic device;

wherein the resilient phallic device is positioned over at least a portion of the longitudinally extending arm and at least one of the detents when the appliance is in an assembled state.

5,690,605
ENDOSCOPIC DEVICE

David Hamlin, 109 Rugby Dr., Langhorne, Pa. 19047; Arthur C. McKinley, 11 Academy Ave., Bradford, Mass. 01835, and William Habermann, 22 Slabtown Creek Rd., Blairstown, N.J. 07825
Continuation-in-part of Ser. No. 148,097, Nov. 5, 1993, Pat. No. 5,408,992. This application Apr. 19, 1995, Ser. No. 426,608
Int. Cl.^{6} A61B *1/04*
U.S. Cl. 600—109 **14 Claims**



1. An endoscopic device for viewing a field within a cavity comprising:

a handle;

a solid state video detector within said handle;

a rigid optics tube extending distally from said handle and closed at its distal end;

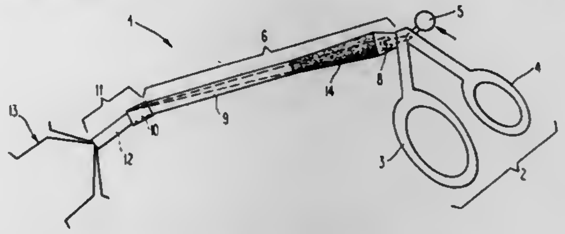
illuminating means for illuminating the field to be viewed;

optical means within said optics tube for conveying light from the illuminated field to the video detector in a manner so as to provide a non-reversed image at the detector; and

a rigid, removable, sterilizable or discardable sheath encasing said rigid tube and said illuminating means so as to completely isolate them from contact with the field or wall of the cavity.

5,690,606
TISSSUE SPREADING SURGICAL INSTRUMENT

Gus J. Slotman, 705 Mill St., Moorestown, N.J. 08057
Continuation of Ser. No. 262,625, Jun. 20, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 608,043
Int. Cl.^{6} A61B *11/02*
U.S. Cl. 600—206 **18 Claims**



1. A tissue spreading surgical instrument comprising:

a handle assembly capable of movement;

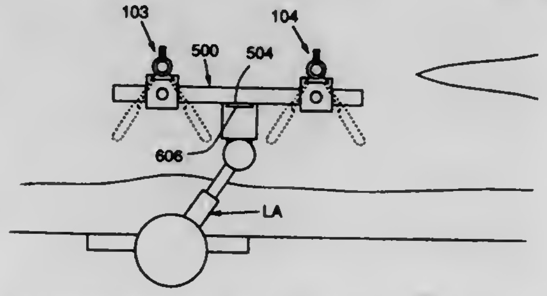
an elongated shaft extending distally from said handle assembly, said shaft having a proximal and distal end, said proximal end for housing an actuating mechanism;

an actuating mechanism housed in said proximal end of said shaft and at least partially extending through said shaft to said distal end, said actuating mechanism moveable in response to movement of said handle assembly;

a tissue spreading assembly operatively associated with said distal end of said shaft and deployable between a closed and open position by said actuation mechanism in response to movement of said handle assembly, said tissue spreading assembly including a plurality of fingers, wherein in the closed position said fingers maintain a longitudinal axis with said instrument and in the open position said fingers are spread in opposing directions to one another and transversely with respect to said shaft so that tissues can be spread apart without placing pressure on the elongated shaft of the tissue spreading surgical instrument or on a body cavity wall.

5,690,607
METHOD FOR MECHANICAL ABDOMINAL WALL RETRACTION

Albert K. Chin, Palo Alto, and Edmund K. M. Isoi, San Francisco, both of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.
Division of Ser. No. 366,367, Dec. 29, 1994, Pat. No. 5,569,165, which is a continuation of Ser. No. 959,717, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 890,033, May 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Jul. 3, 1996, Ser. No. 675,694
Int. Cl.^{6} A61B *17/02*
U.S. Cl. 600—228 **6 Claims**



1. An improved method for connecting a pair of mechanical retractors to a mechanical lifting arm to lift a tissue plane of the body, said method comprising:

providing an elongated rigid bar;

inserting each of the pair of mechanical retractors through a small laparoscopic opening in the body;

slidably connecting one of the retractors in load and torque transmitting relationship to the bar for movement relative to the bar to different positions along the length of the bar;

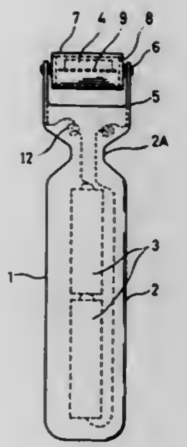
slidably connecting the other of the retractors in load and torque transmitting relationship to the bar for movement relative to the bar to different positions along the length of the bar;

locking the retractors to the bar in adjusted spaced relationship;

securing the lifting arm to the bar between the retractors in load and torsion transmitting relationship; and transmitting lifting force and torque from the arm to the bar and the pair of retractors to lift a tissue plane of the body.

5,690,608
ULTRASONIC APPARATUS FOR HEALTH AND BEAUTY

Tsutomu Watanabe; Takashi Hamaura, and Masao Utsumi, all of Tokyo, Japan, assignors to Asec Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 101,906, Aug. 4, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 360,177
Claims priority, application Japan, Apr. 8, 1992, 4-114239
Int. Cl.^{6} A61H *1/00*
U.S. Cl. 601—19 **18 Claims**



1. In an ultrasonic apparatus for health and beauty treatments which includes a main body having a grip portion, a power source contained in an inner space of said main body, and a hollow roller supported rotatably at one end of said main body by bearings;

the improvement comprising an ultrasonic generating unit disposed in said hollow roller,

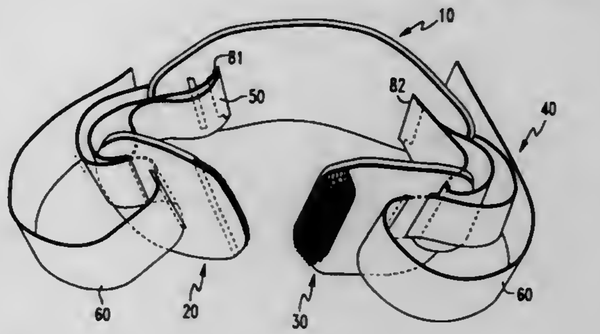
a high-frequency generating unit electrically connected to said power source and to said ultrasonic generating unit, said ultrasonic generating unit generating ultrasonic vibrations when energized by said high-frequency generating unit,

said bearings being conductive and coupling energy from said power source within said inner space to said ultrasonic generating unit within said hollow roller,

said ultrasonic generating unit directly engaging said hollow roller so as to efficiently transfer when energized vibrations therefrom to said hollow roller so that said hollow roller itself constitutes an ultrasonic vibrator which is excited by said ultrasonic generating unit, said hollow roller while being rolled on human skin producing a massage effect on the skin from rolling and from ultrasonic vibrations transferred from said ultrasonic generating unit to said hollow roller.

5,690,609
COMPOUND ABDOMINAL AND BACK SUPPORT BELT SYSTEM

Frank D. Heinze, III, 3090 N. Rio Baya, Indialantic, Fla. 32903
Filed May 13, 1996, Ser. No. 645,180
Int. Cl.^{6} A61F *5/00*
U.S. Cl. 602—19 **23 Claims**



1. A torso support apparatus comprising:

a back support pad that is contoured to generally conform with a wearer's lower back region;

a plurality of abdominal muscle support pads configured to engage one another to form an abdominal muscle support structure for a wearer's abdominal muscle region, and contoured to generally conform with said wearer's abdominal muscle region;

an inner, elastic belt structure, which is arranged to extend around the sides of the torso of said wearer, and elastically positions said plurality of abdominal muscle support pads in spaced apart relationship to said back support pad, so as to form therewith a compound torso support structure that includes said abdominal muscle support structure, said inner, elastic belt and said back support pad; and

an outer belt structure, which engages said plurality of abdominal muscle support pads and said back support pad of said compound torso support structure, is arranged outside of said inner, elastic belt structure, and is operative to tighten said abdominal muscle support structure and said back support pad about the torso of the wearer, causing a reduction in tension of said inner, elastic belt structure, and maintaining said abdominal muscle support structure supporting said wearer's abdominal muscle region and said back support pad supporting said wearer's lower back region.

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5,690,610
ADHESIVE MATERIAL FOR HEMOSTASIS AND A METHOD FOR HEMOSTASIS

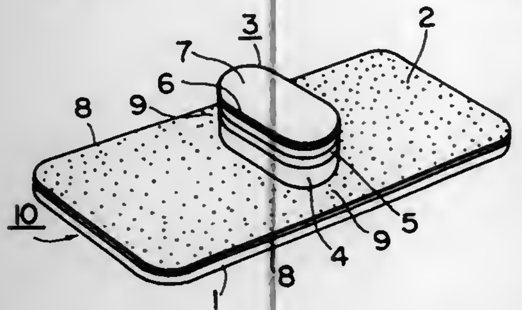
Toshio Ito, Tokyo; Takayuki Akutsu; Tsugio Saito, both of Iruma; Takayoshi Numata, Kawagoe; Fumio Tokumura; Katsumi Kusumi, both of Iruma, and Kunihiro Ohyama, Tsurugashima, all of Japan, assignors to Nichiban Co., Ltd., Japan

Filed Mar. 10, 1994, Ser. No. 209,537

Claims priority, application Japan, Mar. 4, 1991, 6-060144; Mar. 10, 1993, 5-075028; May 20, 1993, 5-139833

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 602—53 **24 Claims**



1. An adhesive material for hemostasis, comprising: a flexible strip-shaped base member having a high recovery property, a main surface, and side edges extending in a first longitudinal direction; an adhesive layer disposed on the main surface of the base member; and a pad having opposite ends and being disposed on the adhesive layer and extending in a second longitudinal direction substantially transverse to the first longitudinal direction such that a space is defined between each end of the pad and a respective one of the side edges of the base member, the pad comprising a layer composed of a material for preventing the deposition of coagulated blood when the pad is applied against a puncture area, the pad being of a size sufficient to directly contact and exert pressure at the puncture area including punctures of both a blood vessel and a skin surface, the pad having a slight elasticity and a hardness capable of securely exerting pressure on the punctures by a shrinking action of the base member when the base member is adhered to the skin surface while being stretched to secure the pad over the punctures.

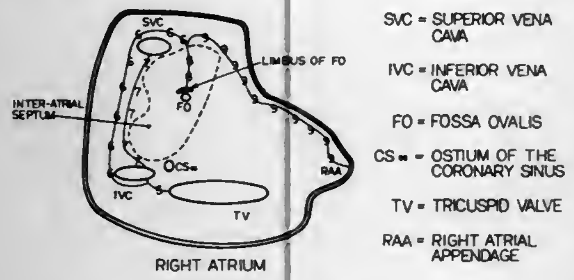
5,690,611
PROCESS FOR THE TREATMENT OF ATRIAL ARRHYTHIMA USING A CATHETER GUIDED BY SHAPED GIDING INTRODUCERS

John F. Swartz, Tulsa, Okla., and John D. Ockuly, Minnetonka, Minn., assignors to Daig Corporation, Minnetonka, Minn.

Continuation-in-part of Ser. No. 272,014, Jul. 8, 1994, Pat. No. 5,575,766. This application Nov. 14, 1994, Ser. No. 337,722

Int. Cl.^{6} A61M *31/00*

U.S. Cl. 604—53 **35 Claims**



1. A process for the treatment of atrial arrhythmia within the atria of a human heart by use of ablation and mapping procedures whereby said procedures comprise

(a) introducing into the atria a guiding introducer system comprised of an inner and an outer guiding introducer, each containing a lumen running therethrough and a proximal and a distal end, wherein the inner guiding introducer passes through the lumen of the outer guiding introducer,

(b) introducing into the lumen of the inner guiding introducer an ablation and mapping catheter,

(c) guiding the catheter to a selected location within the atria by use of the inner and outer guiding introducers, and

(d) mapping and ablating the selected location within the atria by use of the catheter.

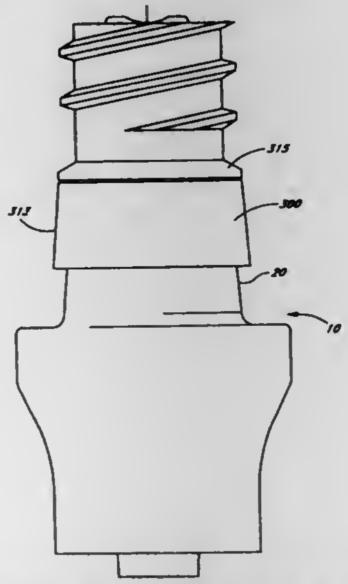
5,690,612
MEDICAL CONNECTION INDICATOR

George A. Lopez, Corona del Mar, Calif., and Kathaleen K. Prince, Tampa, Fla., assignors to ICU Medical, Inc., San Clemente, Calif.

Continuation of Ser. No. 96,659, Jul. 23, 1993. This application Jun. 7, 1995, Ser. No. 477,382

Int. Cl.^{6} A61M *11/00*

U.S. Cl. 604—93 **6 Claims**



1. A medical flow apparatus that provides an indication of it location in a dark environment comprising:

a medical implement that facilitates the passage of fluids either to or from a patient, said implement having an outer housing having a first end and a second end, said ends adapted for mating engagement with another medical implement and said housing defining a fluid passage therethrough; and

a visible light emitting device affixed to said medical implement, said device comprising an annular ring encircling a portion of said housing of said implement.

5,690,613
RAPID EXCHANGE HIGH PRESSURE TRANSITION FOR HIGH PRESSURE CATHETER WITH NON-COMPLIANT BALLOON

Maurice T.Y. Verbeek, Geleen, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 6, 1996, Ser. No. 759,696

Int. Cl.^{6} A61M *29/00*

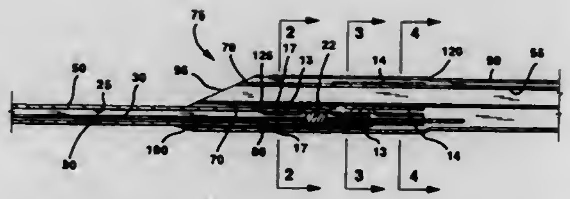
U.S. Cl. 604—103 **22 Claims**

14. A medical catheter comprising:

a proximal section having a proximal end and a distal end;

a transition section having the proximal end and a distal end;

a balloon section having a proximal end and a distal end, the distal end of the proximal section being affixed to the proximal end of the transition section, the distal end of the transition section being affixed to the proximal end of the balloon section, the balloon section having a balloon mounted at the distal end, the transition section further comprising:



an inflation tube, the inflation tube defining an inflation lumen, the inflation tube having an inner diameter, an outer diameter, a proximal end and a distal end, the balloon being in fluid communication with the inflation tube;

a first reinforcement band having a distal end and a proximal end, the distal end of the inflation tube extending longitudinally through a first reinforcement band, the distal end of the first reinforcement band terminating distal to the distal end of the inflation tube, the first reinforcement band being necked down over the distal end of the inflation tube, the inflation tube being necked down proximal to the proximal end of the first reinforcement band, the necked down portion of the inflation tube abutting the proximal end of the first reinforcement band;

an inner lumen tube defining a guidewire lumen, the inner lumen tube being biaxial with the inflation tubing and running longitudinally along the outer diameter of the inflation tubing;

a shim tube, the inner lumen tube extending longitudinally through the shim tube, the shim tube having a proximal end and a distal end, the distal end of the shim tube being aligned with the distal end of the first reinforcement band, the shim tube having a longitudinal slit running along a top portion of the shim tube;

a shaft tube defining a shaft lumen; and

the inner lumen tube having the shim tube coaxially bonded thereon extending longitudinally through the shaft tube, the inflation tube with the first reinforcement band coaxially bonded thereon also extending longitudinally through the shaft tube, the shaft tube being bonded to the inner lumen tube and to the inflation tube, the shaft being necked down distal to and abutting the distal end of the shim tube.

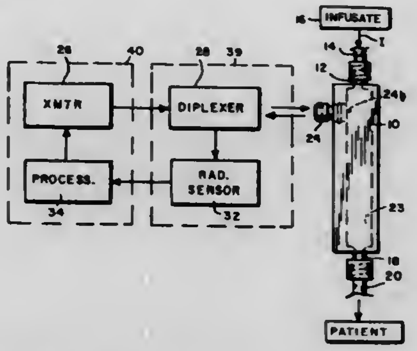
5,690,614
MICROWAVE APPARATUS FOR WARMING LOW FLOW RATE INFUSATES

Kenneth L. Carr, Harvard, and James Regan, Waltham, both of Mass., assignors to Microwave Medical Systems, Inc., Acton, Mass.

Filed Sep. 6, 1995, Ser. No. 524,392

Int. Cl.^{6} A61F *7/12*

U.S. Cl. 604—114 **17 Claims**



1. Infusate warming apparatus comprising

a housing defining an elongated microwave heating cavity having electrically conductive walls;

a printed circuit board separating said cavity lengthwise into first and second cavity sections, said printed circuit board including a fluid impervious, electrically insulating substrate and an elongated conductor run having opposite ends, said conductor run extending along said substrate and facing one of said cavity sections;

a fluid inlet into, and a fluid outlet from, said first cavity section so that infusate can flow through said first cavity section and

connector means extending into said housing for coupling an external microwave signal of a selected frequency to, and a temperature sensing signal from, one end of said conductor run.

5,690,615

Patent Not Issued For This Number

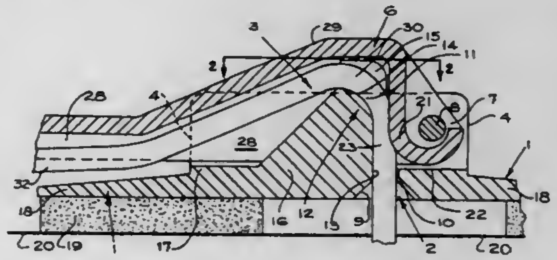
5,690,616
CATHETER CLAMP

Alan David Mogg, 44 Albert Road, Ferndown, Dorset, BH22 9HE, England

Filed Jan. 16, 1996, Ser. No. 588,011

Int. Cl.^{6} A61M *25/02*

U.S. Cl. 604—174 **20 Claims**



1. A catheter clamp comprising a base adapted to be secured to the skin, an aperture in the base through which a catheter tube can be inserted, curved tube support means for supporting in use a curved portion of the tube with said tube support means having a passageway whose longitudinal center extends through an arc, manually operable clamping means which is manually displaceable relative to the base from an inoperative position, in which movement of the tube passing through said aperture is substantially unrestricted by the clamping means, to an operative clamping position in which the tube is gripped between first and second clamping surfaces and with at least one of the surfaces curved along a longitudinal direction of the passageway, one of said clamping surfaces being provided on the clamping means, and the other of said clamping surfaces being provided on an abutment which is fixed relative to the base.

5,690,617
ADJUSTING CATHETER HOLDING DEVICE

Charles R. Wright, 3613 Singapore Cr., NE., Albuquerque, N. Mex. 87111

Filed Nov. 8, 1996, Ser. No. 745,658

Int. Cl.^{6} A61M *5/32*

U.S. Cl. 604—179 **10 Claims**

1. A catheter tube holding device, said device comprising:

a. a base;

b. a disk, said disk including means for holding a length of catheter tubing,

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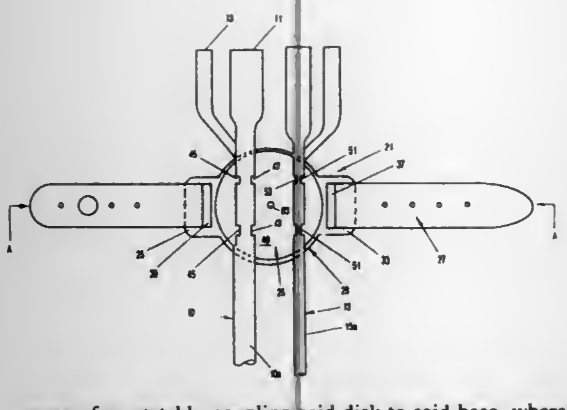


c. means for rotatably coupling said disk to said base, whereby said disk, when holding said length of tubing, can rotate through, at least, a 90° arc; and

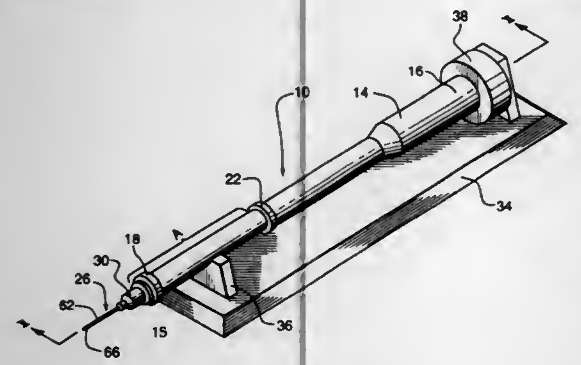
d. means for removably attaching said base to a human.

5,690,618
ELECTRONIC SYRINGE

Mark Timothy Smith, 375 St. James Street, London, Ontario, Canada, N6A 1X7; James William Ellis, and Gerald Peter Keogh, both of London, Canada, assignors to Mark Timothy Smith, London, Canada

Filed Feb. 22, 1995, Ser. No. 392,225
Int. Cl.⁶ A61M *5/00*

U.S. Cl. 604—232 **31 Claims**



1. An electronic syringe comprising:
- a pen-style elongate housing comprising a needle and electronic control means at opposite ends thereof;
- an ampoule receiving first portion disposed in the housing adjacent the needle;
- drive means in electrical communication with the electronic control means;
- a plunger disposed between the first portion and the drive means, the drive means actuating the plunger through the first portion; and
- switch means located on the pen-style elongate housing between said opposite ends for actuating the drive means.

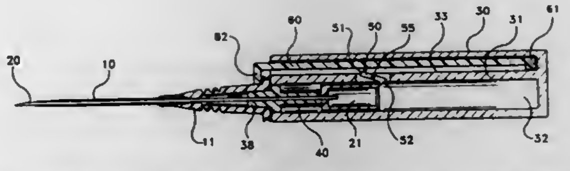
5,690,619
CATHETER-ADVANCEMENT ACTUATED NEEDLE RETRACTION SYSTEM

Timothy J. Erskine, Sandy, Utah, assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 581,390, Dec. 29, 1995, abandoned, which is a continuation of Ser. No. 400,150, Mar. 7, 1995, abandoned. This application Oct. 24, 1996, Ser. No. 736,616
Int. Cl.⁶ A61M *5/00*

U.S. Cl. 604—263 **4 Claims**

1. A catheter and needle introducer assembly, comprising:
- a barrel defining a barrel lumen and having a proximal end and a distal end, the distal end defining a distal wall with an opening extending therethrough;
- a catheter having a proximal end and a distal end;
- a catheter hub, having an inner wall, affixed to the proximal end of the catheter;
- a needle having a sharp distal tip and a proximal end;
- a needle hub having a proximal end and a distal end affixed to the proximal end of the needle, the needle hub being disposed in the barrel lumen such that the sharp distal tip of the needle initially extends distally of the distal wall of the barrel through the opening coaxially within the catheter and the catheter hub with the catheter hub adjacent to the distal wall of the barrel;
- a spring disposed in the barrel lumen and operatively engaged with the needle hub to urge the needle hub toward the proximal end of the barrel;
- a means for retaining the needle hub adjacent to the distal end of the barrel wherein the means for retaining engages the needle hub to retain the needle hub adjacent to the distal end of the barrel; and
- a means removably engaged with the catheter hub and movable distally with respect to the proximal end of the barrel in order to move the means for retaining the needle hub adjacent to the distal end of the barrel out of engagement with the needle hub to allow the spring to force the needle hub toward the proximal end of the barrel when the catheter hub is moved distally from the distal wall of the barrel.

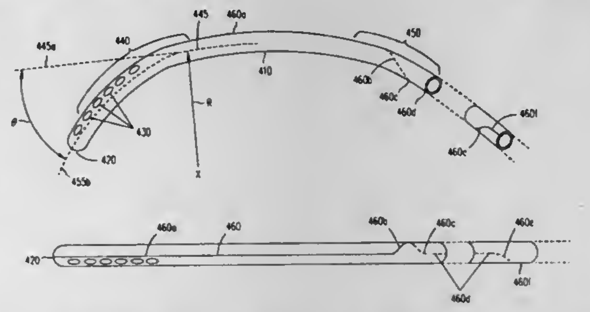


5,690,620
ANATOMICALLY CONFORMING NASOGASTRIC TUBE WITH NORMALLY-CURVED TIP AND METHOD FOR USING SAME

Michael McFarland Knott, P.O. Box 5577, Tahoe City, Calif. 96145

Filed Aug. 19, 1996, Ser. No. 697,104
Int. Cl.⁶ A61M *25/00*

U.S. Cl. 604—280 **15 Claims**



1. A nasogastric tube for insertion through a patient's nasal passage and esophagus, the nasogastric tube comprising a flexible tubing having a closed end, the flexible tubing including a normally-bent portion which is located between a leading portion of the flexible tubing, which is located adjacent the closed end, a subsequent portion of the flexible tubing attacked to the normally-bent portion, and a normally-curved portion located 2 to 3 inches from the normally-bent portion;
- wherein the normally-bent portion forms an angle which is in the range of 10° to 65° with respect to a longitudinal axis of the subsequent portion of the flexible tubing;
- wherein the leading portion of the tube is 0.5 to 2 inches in length; and

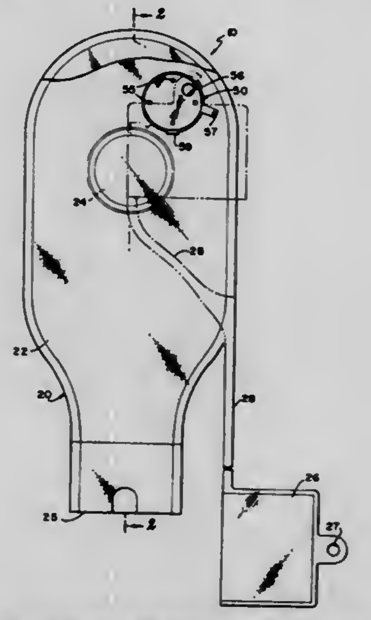
- wherein the normally-curved portion is 4 to 6 inches in length and has an arc radius of 2 to 4 inches.

5,690,621
DRAINABLE POUCH FOR COLOSTOMY PATIENTS

Heriberto Canela, 8027 W. 14th Ave., Hialeah, Fla. 33014

Filed Mar. 26, 1996, Ser. No. 622,723
Int. Cl.⁶ A61F *5/44*

U.S. Cl. 604—333 **2 Claims**



1. A pouch for colostomy patients with a stoma, and said pouch has an elongated shape with first and second ends, said first end including an outlet spout and further including an opening adjacent to said second end, and further including a disk with a central opening that is coaxially aligned with said opening and said disk being mounted to said pouch and removably attached to the periphery of said stoma, and said pouch comprising:
- A) valve means mounted to said pouch to permit a user to selectively release any gases trapped within said pouch wherein said valve means is removably mounted thereby permitting a user to rinse said pouch by flushing it with water passing from the opening of said removed valve means and out through said outlet spout and wherein said valve means includes filter means for treating said escaping gas, said filter means is impregnated with a fragrance;
- B) a cap member for selectively covering said outlet spout;
- C) an opaque sheet member attached to said second end and having cooperative dimensions to conseal said pouch;
- D) a clamp assembly for removably holding and sealing said folded first end and cap member in place.

5,690,622
OSTOMY BAG FILTERS

Rory James Maxwell Smith, Skipton, and Paul Stephen Bird, Copthorne, both of United Kingdom, assignors to Welland Medical Limited, Crawley, United Kingdom

PCT No. PCT/GB95/01429, § 371 Date Dec. 31, 1996, § 102(e) Date Dec. 31, 1996, PCT Pub. No. WO96/01091, PCT Pub. Date Jan. 18, 1996

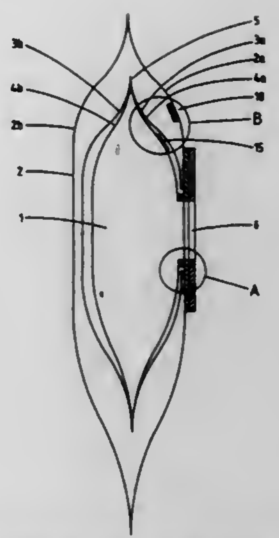
PCT Filed Jun. 19, 1995, Ser. No. 765,603

Claims priority, application United Kingdom, Jul. 1, 1994, 9413227

Int. Cl.⁶ A61F *5/44;* **A61M** *1/00*

U.S. Cl. 604—333 **4 Claims**

1. A drainage bag for receiving bodily waste, the drainage bag including a water-impermeable outer bag, a water-impermeable inner bag enclosed therein, means defining an orifice to enable bodily waste to be received by the inner bag, the outer and inner bags being detachably secured together in the region of the orifice, said bag comprising means defining a first opening in a wall of the water-impermeable inner bag, said first opening being covered by a portion of a gas-permeable hydrophobic foam material; and means defining a second opening in a wall of the water-impermeable outer bag, the second opening being covered by a flatus filter; wherein the disposition of the first and second openings allow flatus gases within the inner bag to pass through the first opening and hence through the second opening to atmosphere.

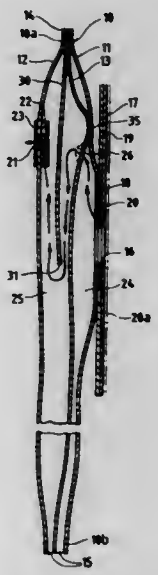


5,690,623
VENTED OSTOMY POUCH WITH PROTECTED GAS FILTER

Morten Lenz, Rungsted, and Steen Holmberg, Helsingor, both of Denmark, assignors to Dansac A/S, Fredensborg, Denmark

Filed Jan. 13, 1997, Ser. No. 782,216
Int. Cl.⁶ A61F *5/44*

U.S. Cl. 604—333 **18 Claims**



1. An ostomy pouch having upper and lower ends and comprising first and second walls of thermoplastic film sealed to each other along their outer edges; said first wall having a stoma-receiving opening and being externally provided with attachment means

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extending about said opening for securing said pouch to a wearer; said second wall being provided with a gas outlet opening and having a deodorizing gas filter secured thereto over said outlet opening for deodorizing gases passing therethrough; a third wall of thermoplastic film interposed between said first and second walls and having outer edges heat sealed to said outer edges of said first and second walls for dividing said pouch into adjacent first and second chambers; said third wall having at least one gas vent located above said stoma-receiving opening for the flow of gases from one chamber to the other; wherein the improvement comprises

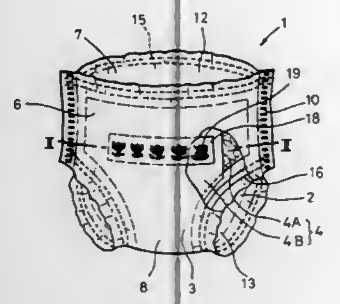
connecting means joining said first and third walls together at a point of connection spaced below the upper end of said pouch and above said gas vent.

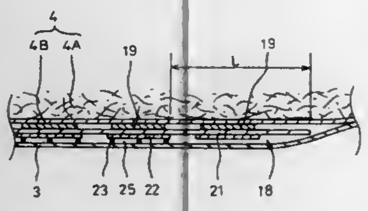
5,690,624

DISPOSABLE DIAPER

Toru Sasaki; Makoto Suekane, and Kenichi Hisada, all of Ehime-ken, Japan, assignors to Uni-Charm Corporation, Ehime-ken, Japan

Flied Nov. 27, 1996, Ser. No. 757,863
Claims priority, application Japan, Nov. 29, 1995, 7-310874
Int. Cl.⁶ A61F *13/15;13/20*
U.S. Cl. 604—361 **10 Claims**





1. A disposable diaper comprising a liquid-permeable topsheet, a liquid-impermeable backsheet, a liquid-absorbent core disposed therebetween, and indicator means provided on a front or rear region of the diaper so as to be revealed as the indicator means is wetted with urine and thereby to allow occurrence of body fluid excretion to be visually recognized externally of the diaper, the disposable diaper being characterized by that:

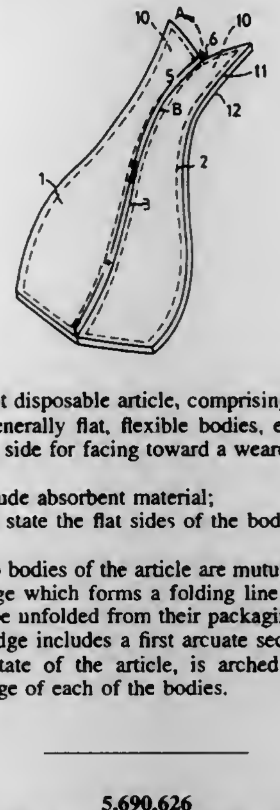
a. the backsheet is light-transmissive;
b. the indicator means comprises a hydrophilic base sheet, a first coating layer formed on one side of the base sheet and having a color different from that of the base sheet, and a second coating layer formed on the other side of the base sheet or an upper surface of the first coating layer so as to substantially cover up the color of the first coating layer when the indicator means is dry but to become transparent and thereby to reveal the color as the indicator means is wetted with urine;
c. the first coating layer comprises at least one of silica and alumina particles, and water-absorptive binder and colorant;
d. the second coating layer comprises at least one of silica and alumina particles, and hydrophilic binder; and
e. the indicator means is attached to the diaper by intermittently bonding said second coating layer to inner surface of said backsheet.

5,690,625

ABSORBENT DISPOSABLE ARTICLE CONSTRUCTED FROM AT LEAST TWO PLAT FLEXIBLE BODIES CONTAINING ABSORBENT MATERIAL, AND A PACKAGE OF ARTICLES HAVING S-SHAPED EDGES

Urban Widlund, Mölnlycke, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden

Continuation of Ser. No. 284,405, Sep. 1, 1994, abandoned.
This application Dec. 16, 1996, Ser. No. 766,935
Claims priority, application Sweden, Feb. 18, 1992, 9200482
Int. Cl.⁶ A61F *13/15;* **A61B** *17/06*
U.S. Cl. 604—385.1 **12 Claims**



1. An absorbent disposable article, comprising:

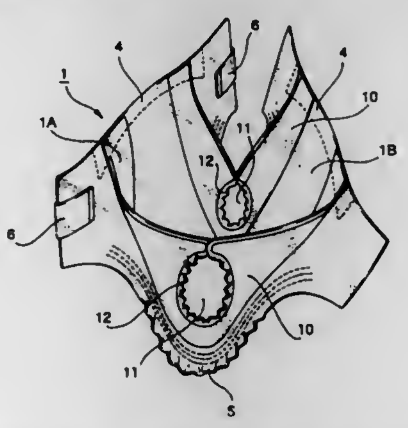
at least two generally flat, flexible bodies, each of the bodies having a flat side for facing toward a wearer when the article is in use;
the bodies include absorbent material;
in a packaging state the flat sides of the bodies lie against one another;
the at least two bodies of the article are mutually joined along a common edge which forms a folding line around which the bodies can be unfolded from their packaging state; and
the common edge includes a first arcuate section which, in the packaging state of the article, is arched toward a second opposing edge of each of the bodies.

5,690,626

SANITARY ARTICLE WITH IMPROVED FITNESS

Migaku Suzuki, Kanagawa, and Hiroaki Fukui, Saitama, both of Japan, assignors to Japan Absorbent Technology Institute, Tokyo, Japan

Division of Ser. No. 298,131, Aug. 30, 1994, abandoned. This application Aug. 5, 1996, Ser. No. 692,371
Claims priority, application Japan, Sep. 30, 1993, 5-265449
Int. Cl.⁶ A61F *13/15*
U.S. Cl. 604—385.2 **3 Claims**



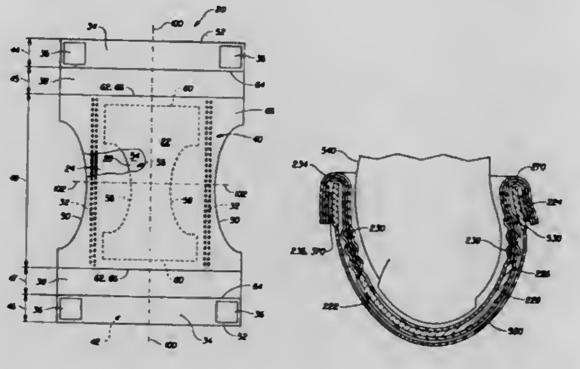
1. A sanitary article comprising a main body having a liquid-impermeable back sheet, a liquid-permeable front sheet and an absorbent material, and leg holes provided at both opposed edge portions of the main body, said main body divided into a front portion and a rear portion along the lines running from said waist hole up to each leg hole, and both side edge portions of said front portion and both side edge portions of said rear portion which are opposed thereto are coupled by tapes; comprising a pair of side members each extending along the peripheral edge of said leg hole at the inner side of said main body, and having an opening formed at the portion corresponding to the leg hole of the main body so as to pass the wearer's leg through, thereby to form fixation means surrounding closely over the entire circumference of the proximal portion of each of the wearer's legs.

5,690,627

ABSORBENT ARTICLE WITH FIT ENHANCEMENT SYSTEM

Sandra Hintz Clear, Longwood, Fla.; Kenneth Barclay Buell, Cincinnati; Denise Marie Stelljes, West Chester, both of Ohio, and Merlene Adams Cummins, Lakeside Park, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 357,484, Dec. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 668,073, Jun. 19, 1996, which is a division of Ser. No. 466,952, Jun. 6, 1995, which is a division of Ser. No. 78,538, Jun. 17, 1993, Pat. No. 5,499,978, which is a continuation of Ser. No. 914,958, Jul. 16, 1992, Pat. No. 5,221,274, which is a continuation of Ser. No. 750,775, Aug. 22, 1991, Pat. No. 5,151,092. This application Oct. 15, 1996, Ser. No. 730,169
Int. Cl.⁶ A61F *13/15*
U.S. Cl. 604—385.2 **23 Claims**



1. An absorbent article for fitting about a wearer's body, the absorbent article having longitudinal and lateral centerlines, which respectively define a longitudinal and a lateral direction, the absorbent article comprising:

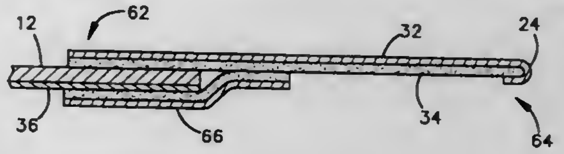
a containment assembly having first and second end edges, said containment assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined with said topsheet, and an absorbent core positioned intermediate said topsheet and said backsheet;
a first fit panel having a first waist edge and a first chassis edge longitudinally opposite said first waist edge, said first chassis edge being joined to said containment assembly adjacent said first end edge of said containment assembly, said first fit panel being elastically extensible with a vector component in the longitudinal direction, said elastic extensibility providing a body contact force;
a first waist feature being joined to said first fit panel adjacent said first waist edge, said first waist feature being elastically extensible with a vector component in the lateral direction; and
a fastening system disposed on said first waist feature for maintaining lateral tension through at least a portion of said first waist feature.

5,690,628

REFASTENABLE ADHESIVE TAPING SYSTEM

Richard A. Huskey, Mentor, Ohio; Eng-Pi Chang, Arcadia, Calif.; Carol A. Caldwell, Kirtland Hills; Gary A. Avalon, Painesville, both of Ohio; Yung-Hsiang Huang, Appleton, Wis.; Dave A. Soerens, Neenah, Wis., and Ruth A. Lachapell, Menasha, Wis., assignors to Avery Dennison Corporation, Pasadena, Calif.

Continuation of Ser. No. 57,004, May 3, 1993, abandoned.
This application Jan. 20, 1995, Ser. No. 376,284
Int. Cl.⁶ A61F *13/15;* **B32B** *7/12*
U.S. Cl. 604—390 **51 Claims**



1. A refastenable, adhesive taping system, comprising:

a substrate which defines a securing zone having a peak strength of less than about 2750 grams/inch, and
an adhesive fastening tape having a flexible backing, and a layer of pressure-sensitive adhesive which is attached to said backing and is adapted to be adhered to and releasably peeled from said securing zone, said adhesive providing for a 180 degree peel adhesion of said fastening tape to said securing zone, measured at a peel speed of 2000 to 25000 mm/minute, which is less than said peak strength of said securing zone, and said adhesive having a maximum tan delta which is within the range of about 1.5 to 2.5 at 20 degrees C., reached at a frequency greater than about 500 rad/sec.

4. In a refastenable diaper, a diaper outer cover, a securing zone on the diaper outer cover of a peak strength of less than 2750 grams/inch, a refastenable adhesive taping system including an adhesive fastening tape having a factory bond section and a user bond section, said tape being fixed to said diaper at said factory bond section, said tape comprising a flexible backing and a layer of pressure-sensitive adhesive permanently combined to said flexible backing and adapted to be applied to and released from said securing zone to fasten and open the diaper at said user bond section of the tape, said adhesive exhibiting a 180° peel adhesion of the tape to the securing zone, measured at a peel speed of 2000 to 25000 mm/minute, that is less than said peak strength of the securing zone, said adhesive being selected to have a maximum tan delta of from 1.5 to 2.5 at 20° C., reached at a frequency greater than 500 rad/sec.

5,690,629

APPARATUS FOR MAINTAINING VERTEBRAE OF A SPINAL COLUMN IN A DESIRED SPATIAL RELATIONSHIP

Marc A. Asher, Leawood, Kans.; Charles F. Heinig, Wareneck, Va.; William L. Carson, Columbia, Mo.; Walter E. Stripggen, Golden, Colo., and Terrence M. Stahurski, Seven Hills, Ohio, assignors to AcroMed Corporation, Cleveland, Ohio

Filed Apr. 24, 1996, Ser. No. 637,153
Int. Cl.⁶ A61B *17/70*
U.S. Cl. 606—61 **18 Claims**

1. An apparatus for use in retaining vertebrae of a spinal column in a desired spatial relationship, said apparatus comprising:

a longitudinal member extendable along the spinal column;
a fastener for connecting said longitudinal member to a vertebra including a first end portion for engaging the vertebra and a second end portion connectable with said longitudinal member; and
a staple including a plurality of mounting projections for attachment to the vertebra, said mounting projections extending from a first side surface of said staple, said staple further including surface means for defining an opening through

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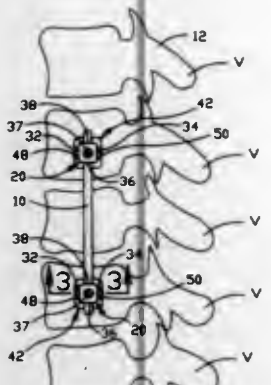


which said second end portion of said fastener extends, said staple including means for engaging said second end portion of said fastener to prevent relative rotation between said fastener and said staple, wherein said means for engaging said second end potion of said fastener includes said surface means for defining said opening in said staple.

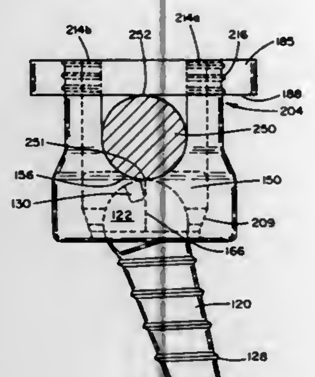
5,690,630
POLYAXIAL PEDICLE SCREW

Joseph P. Errico, Far Hills; Thomas J. Errico, Summit, and James D. Ralph, Oakland, all of N.J., assignors to Fastenetix, LLC, Summit, N.J.

Continuation-in-part of Ser. No. 559,196, Nov. 13, 1995, abandoned, which is a continuation-in-part of Ser. No. 421,087, Apr. 13, 1995, Pat. No. 5,520,690. This application Dec. 23, 1996, Ser. No. 772,403

Int. Cl.⁶ A61B *17/70*

U.S. Cl. 606—61 **12 Claims**



9. A polyaxial locking mechanism for use with orthopaedic implantation apparatus, comprising:

a first element having a rod receiving channel formed therein, and an axial bore, a portion of said axial bore having a tapered interior surface;

a tapered locking collar positionable within said axial bore such that said tapers of each are nested, said locking collar further including a curvate interior volume;

a second element having a curvate head, said curvate head being insertable into said axial bore and into said tapered locking collar whereby subsequent selected translation of said tapered locking collar relative to said axial bore causes said curvate interior volume to crush lock to said curvate head: and

means for locking a rod in said rod receiving channel.

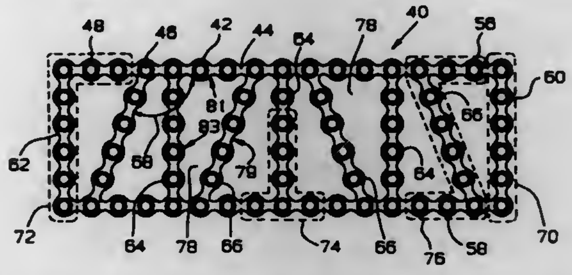
5,690,631
MULTI-CONFIGURABLE PLATING SYSTEM

Jeffrey Duncan, and Kevin Stone, both of Jacksonville, Fla., assignors to Walter Lorenz Surgical, Inc., Jacksonville, Fla.

Filed Sep. 11, 1996, Ser. No. 712,431

Int. Cl.⁶ A61B *17/58*

U.S. Cl. 606—69 **27 Claims**



1. A single multi-configurable plate for use in osteosynthesis, said single multi-configurable plate comprising:

a plurality of tabs connected together by a plurality of linking members;

an integral straight plate defined by at least three of said tabs and at least two of said linking members, said integral straight plate separable from said single multi-configurable plate by cutting along less than three of said linking members;

an integral L-shaped plate defined by at least three of said tabs and at least two of said linking members, said integral L-shaped plate separable from said single multi-configurable plate by cutting along less than three of said linking members; and

an integral T-shaped plate defined by at least four of said tabs and at least three of said linking members, said Integral T-shaped plate separable from said single multi-configurable plate by cutting along less than four of said linking members, wherein a user may easily separate each of said integral straight plate, said integral L-shaped plate, and said integral T-shaped plate from said single multi-configurable plate by cutting along appropriate linking members.

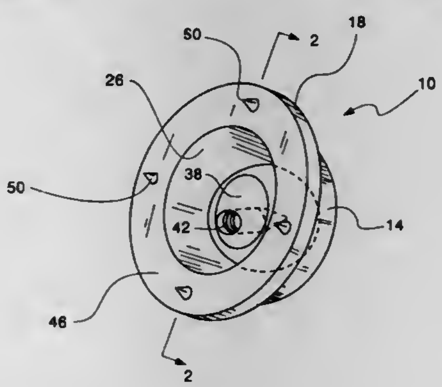
5,690,632
OSTEOSYNTHESIS SCREW FASTENER HAVING ANGULARLY ADJUSTABLE THREADS AND METHODS OF USE THEREFOR

Paul Steven Schwartz, 19 El Rincon, Orinda, Calif. 94563, and Jerry K. Erben, 132 Fountainhead Ct., Martinez, Calif. 94553

Filed Nov. 30, 1995, Ser. No. 568,313

Int. Cl.⁶ A61B *17/84*

U.S. Cl. 606—73 **16 Claims**



1. A screw fastener, comprising:

a housing having: (a) an interior chamber and; (b) an exterior surface, said exterior surface provided for contacting a fastener attachment surface;

a threaded means provided within said interior chamber, said threaded means having a threaded bore which is closed at one end and which is configured to receive a threaded portion of a screw to threadably secure said screw fastener on said screw, wherein said threaded means has a high coefficient of friction with respect to said interior chamber to prevent undesired rotational movement of said threaded means; and

means for resisting a separation of said housing and said threaded means;

wherein said threaded means is adjustable, relative to said housing, for receiving said threaded screw portion at a plurality of angles.

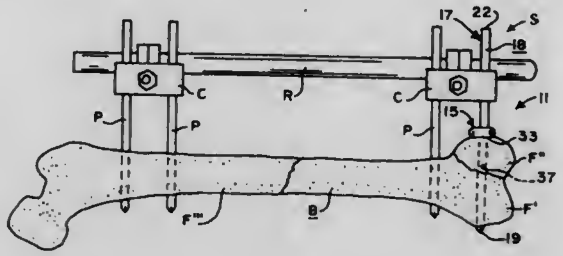
5,690,633
ORTHOPEDIC FRACTURE FIXATION DEVICE

Harold S. Taylor, and J. Charles Taylor, both of Memphis, Tenn., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.

Continuation of Ser. No. 311,316, Sep. 23, 1994, abandoned. This application Apr. 3, 1996, Ser. No. 626,913

Int. Cl.⁶ A61B *17/60*

U.S. Cl. 606—73 **11 Claims**



1. An improved fracture fixation device for securing an external fixator system to a multiple fractured bone structure having a first bone fragment, a second bone fragment and a third bone fragment and for compressing said first bone fragment against said second bone fragment said fracture fixation device comprising:

(a) a screw portion for screwing through said second bone fragment and into the first bone fragment;

(b) a shank portion attached to said screw portion said shank portion having a smaller cross sectional area than said screw portion

(c) engagement means attached to said shank portion for engaging the second bone fragment and for coacting with said screw portion to compress the first bone fragment against the second bone fragment when said screw portion is screwed into the first bone fragment and said engagement means engage the second bone fragment, said engagement means having a face surface with a portion for abuting the second bone fragment, said engagement means having a cross sectional area larger than the cross sectional area of said screw portion and

(d) attachment means for attaching said fracture fixation device to the external fixator system, whereby said external fixator system secures said first and second bone fragments to said third bone fragment.

5,690,634
MEDULLARY DRILL HEAD

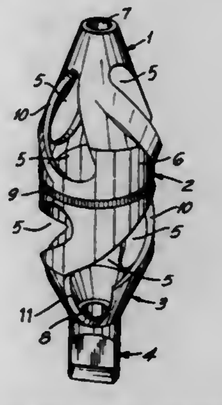
Christof Muller, Berlin, Germany, and Peter Christen, Selzach, Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.

Continuation of Ser. No. 299,965, Sep. 2, 1994, abandoned. This application Jan. 25, 1996, Ser. No. 599,505

Claims priority, application Switzerland, Sep. 15, 1993, 02774/93

Int. Cl.⁶ A61B *17/16*

U.S. Cl. 606—80 **17 Claims**



1. A drill head for drilling out the medulla of a tubular bone comprising a hollow body of revolution having a front part, a middle part and a rear part, each of the front and rear parts having spiral slots with cutting edges, the middle part providing an area free from slots separating the slots of the front and rear parts from one another and the rear part having coupling means for attachment to a drill.

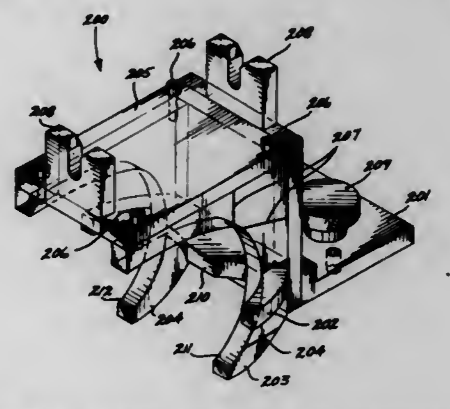
5,690,635
PROSTHESIS TEMPLATE FOR USE IN A ROBOT-AIDED SYSTEM FOR SURGERY

Frederick A. Matsen, III; Joseph L. Garbini; John A. Sidles, all of Seattle; Donald C. Baumgarten, Lynnwood, and Brian S. Pratt, Seattle, all of Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Division of Ser. No. 72,466, Jun. 4, 1993, Pat. No. 5,403,319, which is a division of Ser. No. 934,713, Aug. 24, 1992, Pat. No. 5,236,432, which is a division of Ser. No. 606,521, Oct. 31, 1990, Pat. No. 5,154,717, which is a division of Ser. No. 186,345, Apr. 26, 1988, Pat. No. 4,979,949. This application Nov. 14, 1994, Ser. No. 338,422

Int. Cl.⁶ A61B *17/56*

U.S. Cl. 606—88 **5 Claims**



1. A prosthesis template for aiding in the determination of a desired position of a prosthesis relative to a bone and for additionally aiding in determining the proper positions of bone cuts necessary to prepare the bone to receive the prosthesis, the prosthesis having an exterior surface that simulates the exterior surface of the bone and an interior surface comprised of one or more contact

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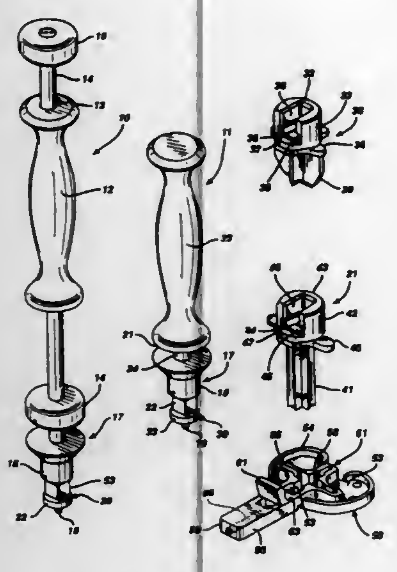
surfaces to which the prepared bone must conform to provide an adequate fit of the prosthesis, said template comprising a template member having an interior surface, said interiot surface corresponding to an exterior surface of the prosthesis, whereby said template can be positioned adjacent the bone and thereby provide means for evaluating a desired position of the prosthesis exterior surface, said template further including a cut-guide mark lying in a cut plane, the relationship between the cut plane and said interior surface representing the relationship between the prosthesis exterior surface and one contact surface of the prosthesis, whereby said template can be positioned adjacent the bone and thereby provide a visual means for evaluating the proper position of the prosthesis interior and exterior surfaces.

5,690,636
PUNCH SYSTEM FOR TIBIAL PROSTHESIS

Sarah Anne Wildgoose, Smithfield, R.I.; Ernest Quintanilha, Norton, and Diana F. McCue, Pocasset, both of Mass., assignors to Johnson & Johnson Professional, Inc., Raynham, Mass.

Filed Dec. 21, 1995, Ser. No. 576,746
Int. Cl.⁶ A61B *17/56*
U.S. Cl. 606—88 **20 Claims**

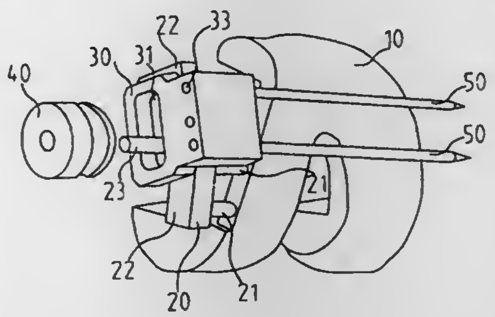


19. A punch system for preparing a tibial bone for a prosthetic implant, said punch system comprising:
- a revision tibial tray trial comprising:
  - a stem;
  - a punch opening for receiving a punch;
  - a mating portion for receiving an alignment handle; and
- an alignment handle comprising:
  - a body having a connecting end portion, said connecting end portion comprising a locking member having at least one tab portion extending from said body and arranged to engage into an opening in said tray trail to prevent tray trail movement away from said body;
  - a connecting member located at said connecting end portion, said connecting member having a first position whereby said connecting member may be coupled with said mating portion of said tray trial; and a second position, whereby said connecting member is released from the mating portion of said tibial tray trial, wherein said connecting member is biased towards said first position; and
  - a hand actuable quick-release button located on said body and coupled to said connecting member, said button actuable to move said connecting member from said first position to said second position.

5,690,637
GUIDE FOR PATELLAR CUTS

Ning Wen, Chantilly; Rémy Charpenet, Epinal; Henri Coudane, Nancy Cedex; Jean-Luc Roure, Paris; Christian Dongar, Viarmes, and Jean-Claude Junger, Vandoeuvre Les Nancy, all of France, assignors to France Bloc, Viarmes, France

Filed Apr. 12, 1996, Ser. No. 631,340
Claims priority, application France, Apr. 13, 1995, 95 04465
Int. Cl.⁶ A61B *17/15*
U.S. Cl. 606—88 **8 Claims**

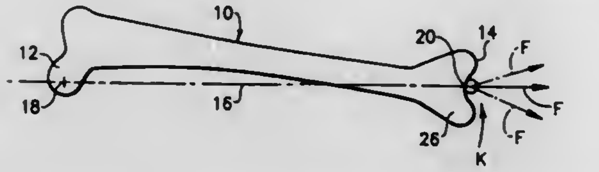


1. A guide which allows a precise patellar cut to be made for fitting a prosthetic patella of a knee prosthesis using a trial femoral component, the trial femoral component including an articular surface (**14**) and having a sagittal plane of the condyle;
- (i) a sliding plate (**20**), the plate including, on a side opposite to the trial femoral component,
- a flat sliding surface (**22**) parallel to the sagittal plane of the condyle of the trial femoral component, and
- a shaft (**23**) installed perpendicularly to the sliding surface (**22**), and including, on a side adjacent the trial femoral component, at least one protuberance (**21**) of a complementary shape to a recess (**11***a*) provided in the trial femoral component comprising means to be fixed thereto;
- (ii) a pin guide (**30**) comprising at least two channels (**33**) for guiding pins (**50**), installed perpendicularly to the sagittal plane of the condyle, and an L-shaped piece comprising two panels including a first panel and a second panel having two respective flat surfaces (**32, 34**) forming a right angle therebetween;
- the first panel, parallel to the sagittal plane, having the first flat surface (**32**) parallel to the sagittal plane comprising means to slide in contact with the sliding surface (**22**) of the plate (**20**);
- a central aperture (**31**) comprising means for passage of the shaft (**23**) through the first panel, the aperture being of dimensions sufficient to allow translation movements of the pin guide (**30**) in all directions parallel to the sagittal plane;
- the second panel, perpendicular to the first panel, situated on the side of the trial femoral component, naving, towards the inside of the guide, having the second flat surface (**34**) of dimensions sufficient to come into contact with the articular surface (**14**) of the trial femoral component during the translation movements of the pin guide (**30**), and also comprising channels (**33**) for guiding pins (**50**);
- (iii) a securing element (**40**) comprising means to cooperate with the shaft (**23**) to lock the pin guide (**30**) with respect to the sliding plate (**20**) and thus to avoid the translation movements.

5,690,638
METHOD AND APPARATUS FOR THE ALIGNMENT OF A FEMORAL KNEE POSTHESIS

Mark N. Dance, Ladner; Mark Ward, Surrey, both of Canada, and David T. Pollock, Glen Rock, N.J., assignors to Osteonics Corp., Allendale, N.J.

Division of Ser. No. 199,069, Feb. 22, 1994, Pat. No. 5,601,566. This application Dec. 27, 1996, Ser. No. 773,193
Int. Cl.⁶ A61B *17/56*
U.S. Cl. 606—88 **7 Claims**

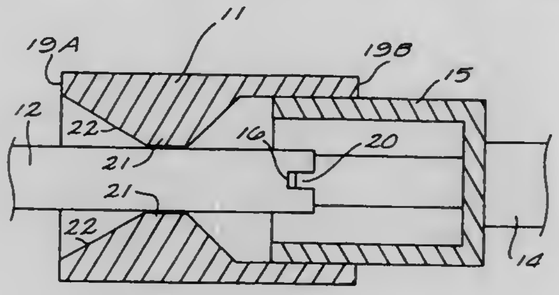


1. The method for determining the direction of the mechanical axis of a femur of a patient in relation to the corresponding knee of the patient, the method comprising:
- placing the knee of the patient in an equilibrium position wherein external forces on the knee are balanced so that the knee remains essentially stationary at the equilibrium position and is freely deflectable from the equilibrium position in response to a further external force applied to the femur;
- applying a force to the femur at a predetermined location relative to the mechanical axis of the femur;
- directing the applied force in a direction such that the knee is undeflected from the equilibrium position while the force is applied to the femur in said direction; and
- employing said direction of the applied force to indicate the direction of the mechanical axis of the femur.

5,690,639
MEDICAL WRENCH

Louis Murray Lederer, and Gustavo F. Nunez, both of Tucson, Ariz., assignors to Very Inventive Physicians, Inc., Tucson, Ariz.

Filed Oct. 11, 1996, Ser. No. 730,734
Int. Cl.⁶ A61B *17/04*
U.S. Cl. 606—104 **18 Claims**

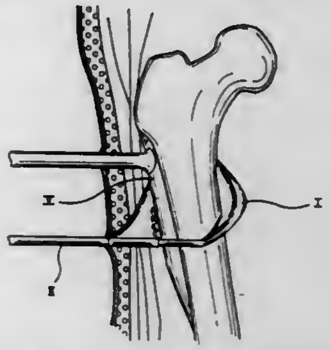


1. A combination comprising:
- a) a fixation pin having a substantially circular cross section, a first end of said fixation pin having a slot therein and a second end of said fixation pin being adapted to be screwed into a bone of a patient; and,
- b) a tool having,
  - 1) a grip member on a first end thereof, a second end of said tool adapted to engage the slot of said fixation pin, and,
  - 2) a sleeve member secured to said second end of said tool, a first end of said sleeve member adapted to fit over the first end of the fixation pin such that said second end of said tool is engagable with said slot of said fixation pin and said first end of said sleeve slideably engages a mid-section of said fixation pin.

5,690,640
SURGICAL INSTRUMENT FOR USE DURING CONNECTION OF FRACTURED BONES

Yehiel Gotfried, 10, Ben Gurion Avenue, Kiryat Bialik 27000, Israel

Filed Jan. 11, 1995, Ser. No. 371,300
Claims priority, application Israel, Jun. 8, 1994, 109929
Int. Cl.⁶ A61B *17/56*
U.S. Cl. 6066—105 **8 Claims**



1. A surgical instrument adapted to cooperate with a part of a human body so as to be used for percutaneous insertion into a limb through a small incision and for holding a connector plate in a correct position on a fractured bone while pressing the connector plate onto a surface of the bone, the instrument having a proximal end and a distal end, and the instrument comprising:
- a first member including:
  - a distal end,
  - a first hook at the distal end of the first member, the first hook having a concave surface pointing towards the proximal end of said instrument, and said first hook having a distal side which is shaped to form a chisel/knife blade for cutting through tissue and muscle, and
  - a straight bar extending from one end of said first hook and extending in a proximal direction toward the proximal end of the instrument, and said bar having a proximal end,
- a second member including:
  - a distal end,
  - a second hook at the distal end of the second member, the second hook having a concave surface pointing towards the distal end of said instrument, and
  - a tube extending from one end of said second hook and extending in said proximal direction, said tube slidably arranged on said straight bar of said first member, and said tube having a proximal end and a distal end,
- a first handle provided at the proximal end of said straight bar of said first member for turning said straight bar,
- a device for moving said tube of said second member along said bar of said first member and for urging said second hook of said second member towards said bone and onto said connector plate in order to hold said connector plate in its correct position on the fractured bone.

5,690,641
ROTARY DEVICE FOR REMOVING OPHTHALMIC LENS

John T. Sorensen, Costa Mesa; Michael Mittelstein, and Soheila Mirhashemi, both of Laguna Niguel, all of Calif., assignors to Optex Ophthalmologics, Inc., San Juan Capistrano, Calif.

Continuation-in-part of Ser. No. 984,229, Nov. 30, 1992, Pat. No. 5,437,678. This application Apr. 11, 1995, Ser. No. 421,421
Int. Cl.⁶ A61F *9/00*
U.S. Cl. 606—107 **68 Claims**

1. A device which is insertable through the cornea of a mammalian eye and into the lens capsule thereof, for reducing an ophthalmic lens within the lens capsule, said device comprising:
- an elongate probe which is insertable into the lens capsule, said probe comprising:

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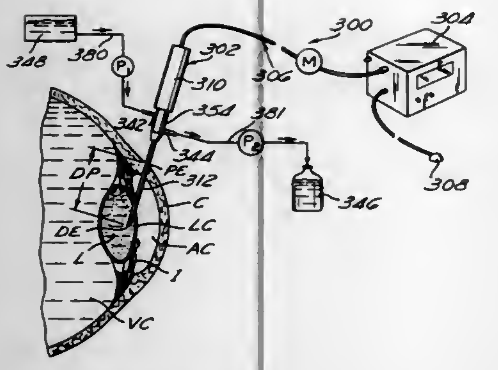


i) an elongate tubular sheath;

ii) a rotatable drive shaft extending longitudinally through said elongate tubular sheath, said drive shaft having a distal end;

iii) a rotatable lens-reducing head on the distal end of said drive shaft;

iv) said tubular sheath having a distal portion, said distal portion being insertable through the cornea and into the lens capsule, said distal portion having a distal end and a proximal end, the distal end of said distal portion being at least as large in cross-dimension as the proximal end of said distal portion; and,

v) said tubular sheath being further configured and positioned, during operation of the device, such that at least one side of the rotating lens-reducing head is shielded by said tubular sheath while the remainder of the rotating lens-reducing head is allowed to contact and reduce lens matter.

5,690,642

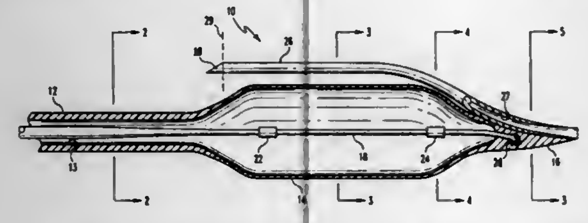
RAPID EXCHANGE STENT DELIVERY BALLOON CATHETER

Thomas A. Osborne, and Scott E. Eells, both of Bloomington, Ind., assignors to Cook Incorporated, Bloomington, Ind.

Filed Jan. 18, 1996, Ser. No. 582,338

Int. Cl.^{6} A61F *11/00*

U.S. Cl. 606—108 **14 Claims**



1. A rapid exchange stent delivery balloon catheter, comprising:
a catheter shaft defining an inflation lumen, the inflation lumen having a proximal end and a distal end;
an inflatable balloon having a proximal end and a distal end;
a wire guide shaft defining a wire guide lumen, the wire guide shaft having a proximal end and a distal end, wherein the proximal end of the wire guide shaft is proximal to the proximal end of the inflatable balloon; and
a catheter tip having a proximal end and a distal end;
wherein the distal end of the inflation lumen opens into and is in fluid communication with an interior of the inflatable balloon, the distal end of the inflatable balloon is sealed by the proximal end of the catheter tip, and the wire guide shaft is coupled only to the catheter tip completely distally of the distal end of the inflatable balloon.

5,690,643

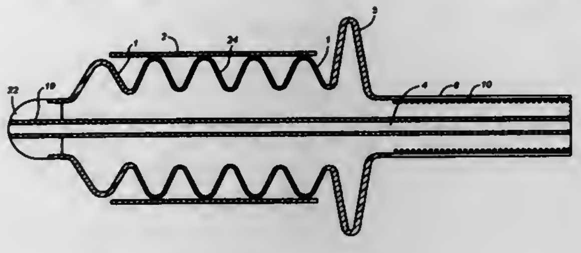
STENT DELIVERY SYSTEM

Bandula Wijay, Friendswood, Tex., assignor to Leocor, Incorporated, Houston, Tex.

Filed Feb. 20, 1996, Ser. No. 603,267

Int. Cl.^{6} A61F *11/00*

U.S. Cl. 606—108 **23 Claims**



1. A stent delivery system, comprising:
an inner elongated member;
an outer elongated member mounted over and movable with respect to said inner elongated member;
a flexible member connected to said inner elongated member and said outer elongated member;
a stent overlying said flexible member;
said flexible member movable from a first contracted position, where said flexible member longitudinally retains said stent with respect to said elongated members for insertion, to a second expanded position, where said stent is expanded for fixation, by virtue of relative movement between said inner and outer elongated members.

5,690,644

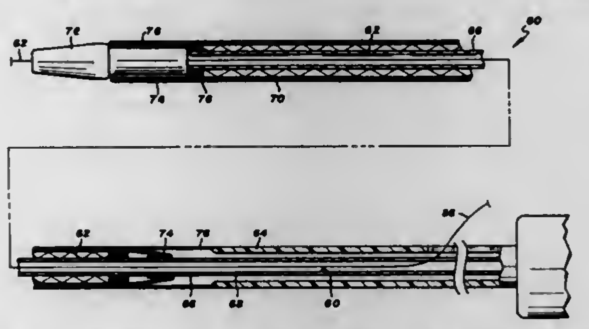
APPARATUS FOR DEPLOYING BODY IMPLANTABLE STENT

Matthew T. Yurek, Bloomington, and Steven J. Healy, Vadnais Heights, both of Minn., assignors to Schneider (USA) Inc., Plymouth, Minn.

Continuation of Ser. No. 311,912, Sep. 26, 1994, abandoned, which is a continuation of Ser. No. 998,343, Dec. 30, 1992, abandoned. This application Feb. 20, 1996, Ser. No. 603,683

Int. Cl.^{6} A61F *11/00;* **A61M** *29/00*

U.S. Cl. 606—108 **31 Claims**



22. An apparatus for deploying a prosthesis at a treatment site within a body lumen, in combination with the prosthesis, including:
an elongate prosthesis carrier having a proximal end region, a distal end region having a distal end region axial length, a carrier wall defining a guidewire lumen running axially of the carrier at least along the distal end region, a first opening disposed at a distal end of the distal end region for admitting a guidewire into the guidewire lumen, a second opening through the carrier wall at a proximal end of the distal end region, for providing egress of the guidewire out of the guidewire lumen, and a means for channeling the guidewire out of the guidewire lumen through the second opening whereby the carrier contains the guidewire within the guidewire lumen only along the distal end region;
a prosthesis disposed along the distal end region;

a flexible, elongate outer catheter having a catheter wall defining a catheter lumen running axially for substantially the entire length of the outer catheter, said carrier being disposed within the catheter lumen and extending substantially the entire length of the outer catheter, the carrier and the outer catheter being movable with respect to one another toward and away from a delivery configuration;
a rolling membrane folded over on itself and including an outer fold attached to the outer catheter and an inner fold attached to the carrier, wherein the rolling membrane is adapted to surround the prosthesis when the carrier and the outer catheter are in the delivery configuration, thus to releasably support the prosthesis in a delivery state along the distal end region;
an outer catheter opening through the catheter wall and disposed near the proximal end of the distal end region when the outer catheter and the carrier are in the delivery configuration, to allow passage of the guidewire from within the catheter lumen to the exterior of the outer catheter, said outer catheter opening comprising an axial slit extended proximally to a proximal region of the outer catheter;
said prosthesis when so supported in the delivery state having a reduced radius along its axial length to facilitate delivery of the prosthesis to a treatment site in a body lumen; and
a control means coupled with respect to the outer catheter, for moving the outer catheter proximally relative to the carrier away from the delivery configuration to remove the rolling membrane proximally from its surrounding relation to the prosthesis, thereby releasing the prosthesis when the distal end region is positioned near the treatment site, thus to facilitate deployment of the prosthesis in a radially expanded state at the treatment site.

5,690,645

DEVICE FOR MOVING A CATHETER IN A CONTROLLED MANNER

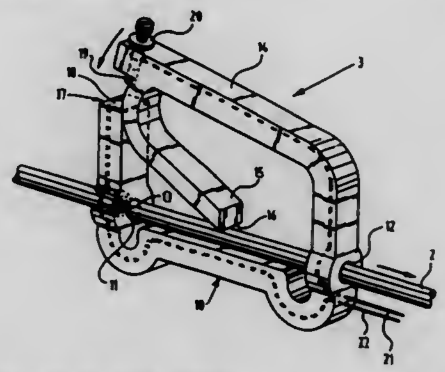
Wilhelmus Petrus Martinus Maria Van Erp, Leek, Netherlands, assignor to Cordis Corporation, Miami, Fla.

Filed Jun. 19, 1996, Ser. No. 671,126

Claims priority, application Netherlands, Jun. 28, 1995, 1000685

Int. Cl.^{6} A61F *11/00*

U.S. Cl. 606—108 **9 Claims**



1. Device for moving a catheter in a controlled manner, comprising:
a frame;
a guiding means arranged to the frame for the purpose of guiding a catheter;
first engaging means in order to manually engage the guiding means;
second engaging means for the purpose of engaging the catheter guided by said guiding means;
wherein the first and second engaging means are connected in such a manner that, on moving the first engaging means, the catheter is moved in relation to the frame; and
electronic signalling means engaged in said first engaging means for the purpose of giving off a signal corresponding to the displacement of the catheter.

5,690,646

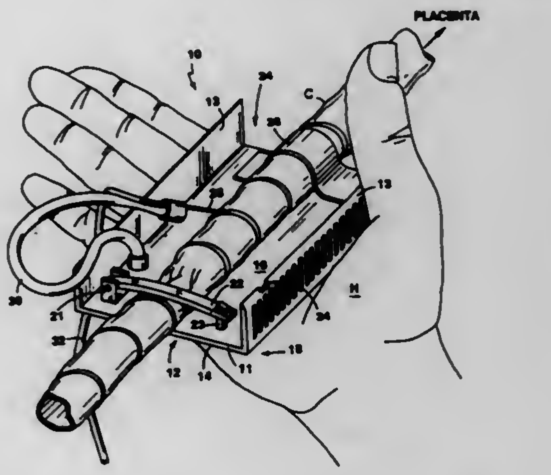
UMBILICAL CORD BLOOD COLLECTION DEVICE AND METHOD

Lisa J. Gruenberg, 74 Claypit Hill Rd., Wayland, Mass. 01778

Filed Aug. 30, 1996, Ser. No. 705,784

Int. Cl.^{6} A61B *17/42;* **A61M** *1/00*

U.S. Cl. 606—120 **17 Claims**



1. An umbilical cord blood collection device comprising:
a base defining a collection surface for receiving and supporting a segment of an umbilical cord, in communication with a placenta, from which blood is to be collected, said base, in at least a region including said collection surface, being resistant to penetration by a blood collection needle;
a clamp mounted at a first end region of said collection surface for clamping engagement across the umbilical cord supported upon said collection surface;
a securement strap disposed in a second end region of said collection surface, opposite said first end region, for securing engagement with the umbilical cord; and
a malleable arm having a first end mounted to said base and a second, free end supporting a blood collection needle.

5,690,647

Patent Not Issued For This Number

5,690,648

METHODS AND APPARATUS FOR ROLLING A DEFIBRILLATOR ELECTRODE

Thomas J. Fogarty, 5660 Alpine Rd., Portola Valley, Calif. 94028, and Thomas A. Howell, Palo Alto, Calif., assignors to Thomas J. Fogarty, Portola Valley, Calif.

Division of Ser. No. 406,372, Mar. 17, 1995, abandoned, which is a division of Ser. No. 188,573, Jan. 28, 1994, Pat. No. 5,464,447. This application Mar. 22, 1996, Ser. No. 620,986

Int. Cl.^{6} A61N *1/04*

U.S. Cl. 606—129 **6 Claims**

1. A method of rolling a defibrillator electrode comprising the steps of:
inserting one side of a defibrillator electrode within a recess of a first handle, the first handle having an axis substantially parallel to its length, the recess of the first handle located at one end of the first handle;
inserting an opposite side of the defibrillator electrode within a recess of a second handle, the second handle having an axis substantially parallel to its length, the recess of the second handle located at one end of the second handle;

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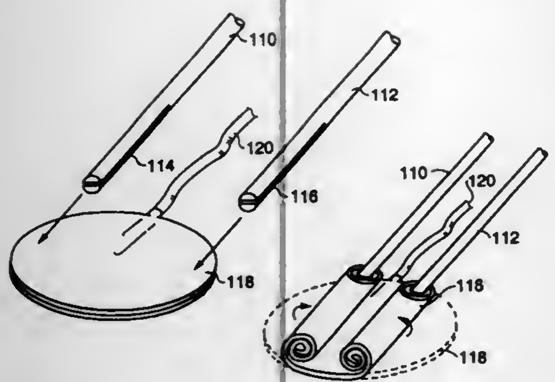


rotating each of the first and second handles about its respective axis.

5,690,649

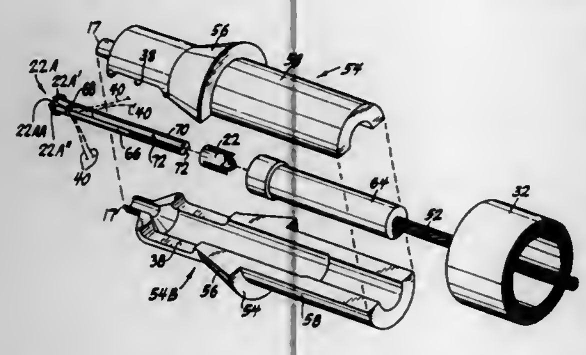
ANCHOR AND ANCHOR INSTALLATION TOOL AND METHOD

Lehmann K. Li, Milford, Conn., assignor to Li Medical Technologies, Inc., Shelton, Conn.

Filed Dec. 5, 1995, Ser. No. 567,490

Int. Cl.^{6} A61B *17/10*

U.S. Cl. 606—139 **65 Claims**



29. A method of securing an anchor into a bore in a medium, the anchor being adapted to engage the walls of the bore for securing the anchor into the medium, the method comprising:

inserting an anchor, connected to a coupling member held to a distal end of an insertion tool, into the bore;

applying a force to a lever extending from the insertion tool to cause a force to be exerted on the anchor by a coupling member to deform the anchor into engagement with the walls of the bore in the medium and separating the anchor from the coupling member; and

pulling the insertion tool away from the anchor leaving the anchor secured in the bore in the medium;

wherein said anchor comprises a biocompatible anchor adapted to be implanted in organic tissue and further comprising the step of coupling a suture to said anchor prior to said step of inserting.

5,690,650

Patent Not Issued For This Number

5,690,651

Patent Not Issued For This Number

5,690,652

SURGICAL SUTURING DEVICE

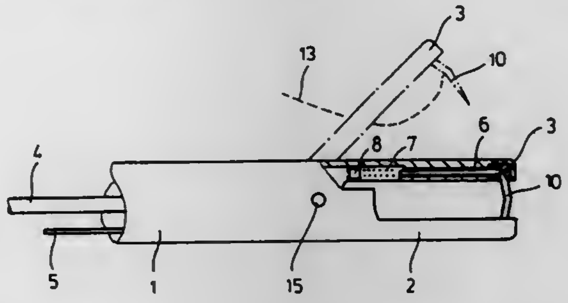
Helmut Wurster, Oberderdingen, and Rainer Trapp, Graben-Neudorf, both of Germany, assignors to Forschungezentrum Karlsruhe GmbH, Karlsruhe, Germany

Filed Jan. 6, 1997, Ser. No. 778,972

Claims priority, application Germany, Jul. 7, 1994, 44 23 881.9

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—144 **17 Claims**



1. A surgical suturing device particularly for endoscopic surgery, comprising a handle mechanism and a drive and locking mechanism, a shaft connected to the drive and locking mechanism and including coupling means, a suturing head mounted at an end of said shaft and having jaws supported so as to be movable relative to each other, a needle guide disposed at the free end of each jaw, and a needle having ends with needle tips and an eye in its center and being adapted to be received and retained at its opposite ends in said needle guides by operation of said drive and locking mechanism, said drive and locking mechanism comprising a base plate, a slide member slideably supported on said base plate, a drive rod having one end rigidly connected to said slide member for operating said jaws and the opposite end connected to said handle mechanism for moving said rod and said slide member along said base plate, a pull and push rod extending between said jaws and said slide member and being engaged thereby by a spring member for pulling said rod, said rod being slideably supported on a stop projecting from said base plate and by said slide member, a toothed rack mounted on said slide member for movement therewith, a pawl pivotally supported on said base plate and extending through a cutout in said slide member into engagement with said toothed rack for holding said slide member in a particular position, means for disengaging said pawl from said toothed rack where said slide member with said toothed rack has been moved to one end position, means for holding said pawl disengaged until said slide member has moved to its opposite end position, means for returning said pawl into engagement with said toothed rack when said slide member reaches said opposite end position, a transfer structure for controlling the engagement of said needle with said jaws, including a cylindrical partially circular transfer member rotatably supported by a shaft mounted on said base plate and having a W-shaped recess formed in its circumferential surface, and cam areas for actuating a locking mechanism for locking said needle alternately in engagement with said jaw, said locking mechanism including a control plate disposed in parallel spaced relationship above said base plate and coupled, by a bolt, with said slide member for movement therewith, said bolt extending through an elongated hole in said base member to allow the movement of said bolt with said slide member, said control plate having an elongated hole receiving said shaft mounted on said base plate so as to permit movement of said control plate with said slide member, a shift lever pivotally mounted on said control plate and having a free end with a shift pin extending therefrom through a cutout in said control plate into engagement with said W-shaped recess on said transfer member, a return spring engaging said shift lever so as to bias said shift lever into a center position in longitudinal alignment with said control plate, at least one control rod having a proximal end biased into engagement with said cam on said transfer member and a distal end for reception in a recess formed in said needle adjacent the opposite ends thereof for locking said needle in said jaw, said needle being curved so as to have a shape corresponding to the path of relative movement of said jaws.

5,690,653

SUTURING APPARATUS

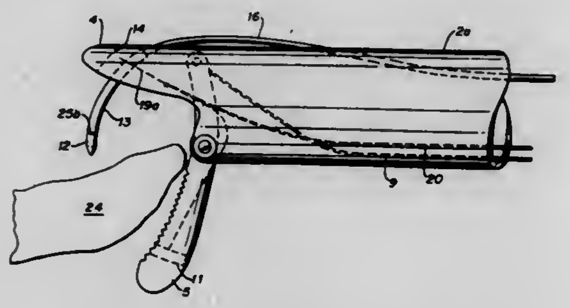
Philip Richardson, and Margaret Pamela Richardson, both of Lluest, Cynwyl Elfed, Carmarthen Dyfed, SA33 6TL, United Kingdom

Continuation of Ser. No. 192,936, Feb. 7, 1994, Pat. No. 5,454,823, which is a continuation of Ser. No. 954,013, Sep. 30, 1992, abandoned. This application Jul. 24, 1995, Ser. No. 492,271

Claims priority, application United Kingdom, Sep. 30, 1991, 9120871.0

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—148 **25 Claims**



17. A surgical suturing apparatus comprising:

an elongated tubular body portion;

a handle mechanism positioned at a proximal end portion of the elongated portion;

first and second jaws positioned at a distal end portion of the elongated body portion and relatively movable between an open and closed position, each of the jaws having a needle receiving recess formed therein;

a securing mechanism movable with respect to the first and second jaws to alternately retain and allow release of a surgical needle in the respective needle receiving recess;

wherein actuation of the handle mechanism effects relative movement of the jaws and effects movement of the securing mechanism.

5,690,654

SURGICAL IMPLEMENT PARTICULARLY USEFUL FOR IMPLANTING PROSTHETIC HEART VALVES AND SURGICAL METHOD INCLUDING SUCH IMPLEMENT

Joel Ovil, Ramat Hasharon, Israel, assignor to S.M.T. (Medical Technologies) Ltd., Tel-Aviv, Israel

Filed Apr. 30, 1996, Ser. No. 640,149

Claims priority, application Israel, Jan. 24, 1996, 116891

Int. Cl.^{6} A61B *17/00*

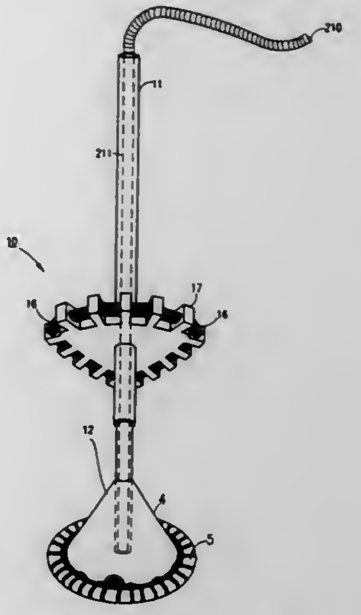
U.S. Cl. 606—148 **24 Claims**

1. A surgical implement particularly useful for implanting a prosthetic device in an excised annulus by means of a plurality of sutures, comprising:

a manually grippable handle for manually supporting the implement during use;

and a suture retainer carried by said handle constructed for receiving and releasably retaining a plurality of sutures;

said suture retainer including an outer annular face divided by dividers into a plurality of divisions, each division including a space on said annular face between two adjacent dividers having retainers for receiving and releasably retaining the two opposite ends of at least one suture to be applied, said dividers being visually discernible from said retainers for facilitating the application and uniform spacing of the sutures.



5,690,655

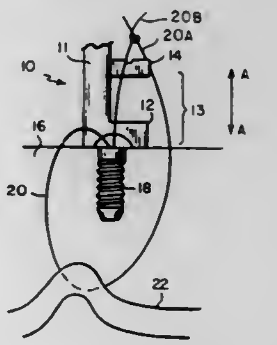
SUTURE TENSIONING DEVICE

Rickey D. Hart, Plainville, and John Rice, Lincoln, both of Mass., assignors to Innovasive Devices, Inc., Marlborough, Mass.

Continuation of Ser. No. 643,267, May 3, 1996, which is a continuation of Ser. No. 314,244, Sep. 28, 1994, abandoned. This application Jan. 9, 1997, Ser. No. 781,181

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—148 **20 Claims**



1. A suture tensioning device, comprising:

a support arm;

a first jaw attached to said support arm;

a second jaw slidably attached to said support arm in facing relationship with and oriented in parallel to said first jaw, so that said second jaw is adapted for slidable and parallel movement towards and away from said first jaw, said jaws defining a variable gap therebetween; and

a suture retainer on said first or second jaw.

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5,690,656

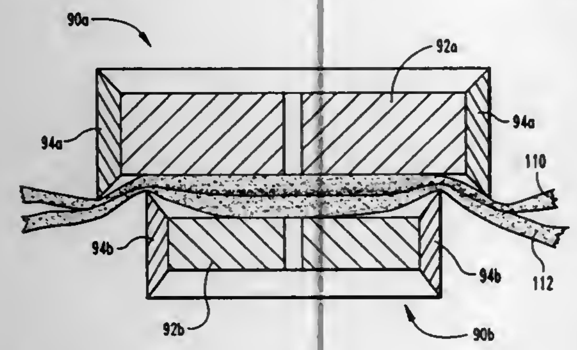
METHOD AND APPARATUS FOR CREATING ABDOMINAL VISCERAL ANASTOMOSES

Constantin Cope, Elkins Park, Pa., and Hans A. Timmermans, Portland, Oreg., assignors to Cook Incorporated, Bloomington, Ind.

Filed Jun. 27, 1995, Ser. No. 496,125

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—153 **23 Claims**



18. A device for forming an anastomoses between adjacent viscera, comprising:
- a first magnet having opposing first and second faces;
- a first jacket having opposing first and second rims, said first jacket formed around a first periphery of the first magnet on a first surface connecting the first and second faces, wherein the first and second jacket rims are spaced farther apart than the first and second magnet faces wherein said first and second rims include means for promoting tissue necrosis;
- a second magnet having opposing third and fourth faces; and
- a second jacket having opposing third and fourth rims, said second jacket formed around a second periphery of the second magnet on a second surface connecting the third and fourth faces, wherein the third and fourth jacket rims are spaced farther apart than the third and fourth magnet faces;
- wherein the second periphery is smaller than the first periphery, such that the first and second magnets are self-centering when they are magnetically coupled through walls of the adjacent viscera.

5,690,657

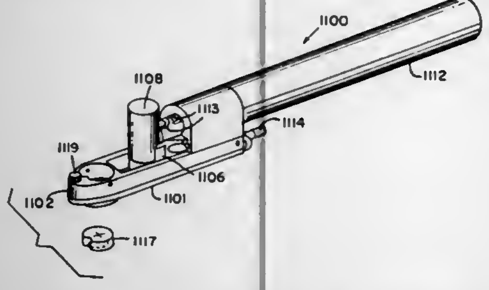
UNIVERSAL AUTOMATED KERATECTOMY APPARATUS AND METHOD

Russell G. Koepnick, 4435 N. 78th St. #113A, Scottsdale, Ariz. 85251

Continuation-in-part of Ser. No. 245,228, May 17, 1994, Pat. No. 5,496,339. This application May 16, 1995, Ser. No. 441,789

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—166 **38 Claims**



1. A surgical device for making a surgical cut to the cornea of an eye, said device comprising:
- a base;
- a single vacuum chamber adapted to engage the sclera of an eye, said vacuum chamber being connectable to a vacuum source;
- an insert, said insert being carried on said base, said insert having a face disposed toward said eye, said face having a surface portion shaped according to a predetermined prescriptive correction, said insert being positioned such that said vacuum chamber is disposed adjacent said insert, and whereby application of vacuum to said vacuum chamber causes the cornea of said eye to engage said surface portion;
- a knife provided on said base and movable in a plane transverse to said face and adjacent to said face, said knife having a cutting edge;
- said base, said vacuum chamber and said insert being cooperatively shaped such that when said knife is moved in said plane, said knife will cut only corneal tissue of said eye in said plane;
- a first drive apparatus drivingly connected to said knife for causing the cutting edge of said knife to swing from side to side in an arc in said plane;
- a drive device coupled to said knife for moving said knife in reciprocal fashion in said plane to advance said knife to cut said cornea; and
- said drive device and said first knife apparatus positioned and operable such that only said knife is movable across said insert.

5,690,658

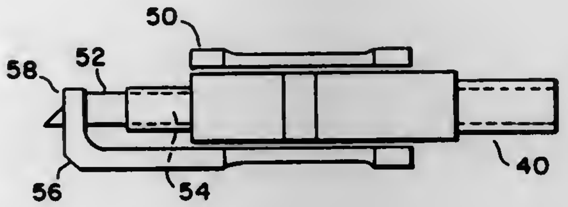
KERATOREFRACTIVE SYSTEM AND METHOD

John B. McAdams, 22107 Boca Place Dr., Boca Daton, Fla. 33433

Continuation of Ser. No. 132,374, Oct. 6, 1993, abandoned. This application May 30, 1995, Ser. No. 453,906

Int. Cl.^{6} A61F *9/00*

U.S. Cl. 606—166 **27 Claims**



1. A set of surgical instruments for performing Keratorefractive eye surgery, said Keratorefractive eye surgery for changing refraction of a cornea by making a plurality of incisions in said cornea, and said set of surgical instruments for providing precise depth of each of said plurality of incisions, said set of surgical instruments comprising:
- at least two knife blades for making said plurality of incisions, each of said two or more knife blades having a cutting portion of a precise fixed length, said precise fixed length of each of said at least two knife blades differing by a predetermined increment from said precise fixed length any other of said two or more knife blades; and
- two or more footplate assemblies, each of said two or more footplate assemblies for attachably holding one of said two or more knife blades such that said cutting portion of said one of said two or more knife blades extends from said footplate assembly by said precise fixed length, said precise fixed length for providing said precise depth of each of said plurality of incisions.

5,690,659

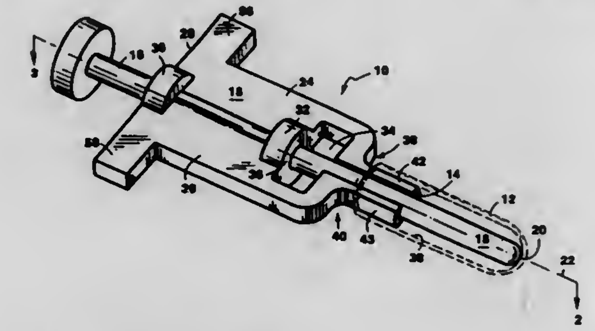
SURGICAL CUTTING IMPLEMENT DISPENSER

Graham Smith, Plaistow, N.H., assignor to Smith & Nephew, Inc., Andover, Mass.

Filed Jun. 2, 1995, Ser. No. 456,648

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—170 **16 Claims**



1. A dispenser comprising:
- a surgical instrument cutting implement disposed along an axis;
- a support structure releasably engaged with the cutting implement; and
- a release mechanism carried by to said support structure for disengaging the cutting implement from said support structure, said release mechanism being movable along said axis and including a surface configured to engage the cutting implement as said release mechanism is moved along said axis.

5,690,660

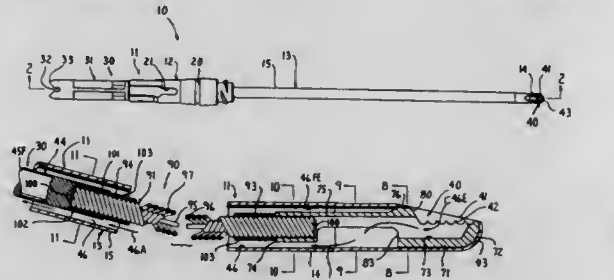
ARTHROSCOPIC CUTTER HAVING CURVED ROTATABLE DRIVE

Barry J. Kauker, Soquel, and Alex L. Lim, San Francisco, both of Calif., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 433,695, May 3, 1995, abandoned, which is a continuation-in-part of Ser. No. 313,407, Sep. 27, 1991, Pat. No. 5,437,630, which is a continuation of Ser. No. 144,195, Oct. 27, 1993, abandoned. This application Apr. 2, 1996, Ser. No. 626,688

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—180 **24 Claims**



1. A powered rotatable surgical tissue working tool for chucking in a powered rotating surgical handpiece, comprising:
- a tubular outer member having a proximal end portion fixable in a handpiece and having a hollow distal tip portion with an opening thereinto;
- a rotatable inner shaft extending coaxially within and rotatable inside said outer member and having at least a tubular proximal portion having an inner surface defining an interior suction passage and at least a distal portion radially spaced from the inside surface of said tubular outer member by an annular suction passage, said distal portion including flow blocking means for blocking tissue flow through the central portion of said distal portion, said proximal portion having a cross-section reducing transition portion at a distal end thereof connecting said distal portion and said proximal portion, said transition portion having a transition opening in communication with said interior suction passage and said annular suction passage;
- a tissue working head rotatably drivable by and fixed with respect to a distal end of said inner shaft, said head being rotatable inside said hollow distal tip portion of said tubular outer member, said head comprising surgical tissue working means at the distal end thereof cooperable with said opening in said distal tip portion of said outer member for engaging and removing tissue from a surgical site during surgery, said head further comprising a lateral port opening between said tissue working means and said annular suction passage in said outer tubular member, said head having a reduced radius tail disposed proximally of said port for continuing said annular suction passage forward along said tail to said port.

5,690,661

Patent Not Issued For This Number

5,690,662

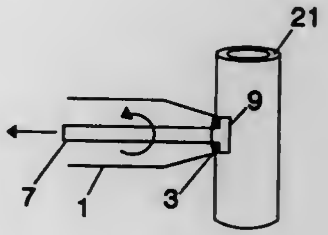
DEVICE AND METHOD TO CREATE A SMOOTH OPENING ON A TUBULAR STRUCTURE SUCH AS AN ARTERY OR A VEIN

David Tak Wai Chiu, Bronxville, N.Y., and Heinz Rosskothen, Tea Neck, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Oct. 12, 1995, Ser. No. 541,220

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—184 **17 Claims**



1. An apparatus for creating a substantially circular hole in a wall of a vessel of a patient, comprising:
- an elongated circular knife with a proximal end, a distal end with a circular knife edge, and an inner channel;
- an elongated probe with a proximal end and a distal end, said elongated probe being disposed within said inner channel of said elongated circular knife and being adapted to be moveable axially and rotatably with respect to said elongated circular knife; and
- a linear bar member formed on the distal end of the elongated probe, said linear bar member being substantially perpendicular to said elongated probe, whereby when said linear bar member is inserted in the vessel through a slit in the wall of the vessel, the elongated probe and the linear bar member may be rotated with respect to the circular knife edge of said elongated cylindrical knife to form a substantially circular hole in the wall of the vessel.

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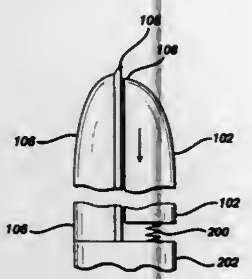
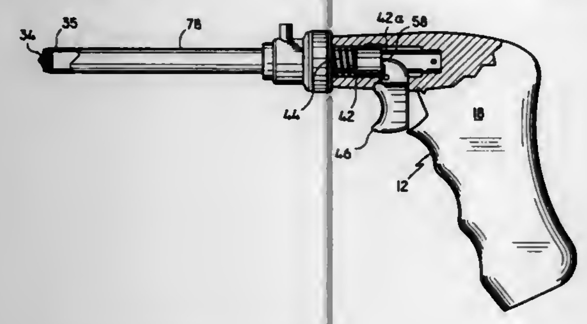
5,690,663
SAFETY TROCAR
Randy R. Stephens, Fairfield, Ohio, assignor to Ethicon Endo-Surgery Inc., Cincinnati, Ohio
Continuation of Ser. No. 296,217, Aug. 25, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 657,532
Int. Cl.⁶ A61B *17/34*
U.S. Cl. 606—185 **4 Claims**



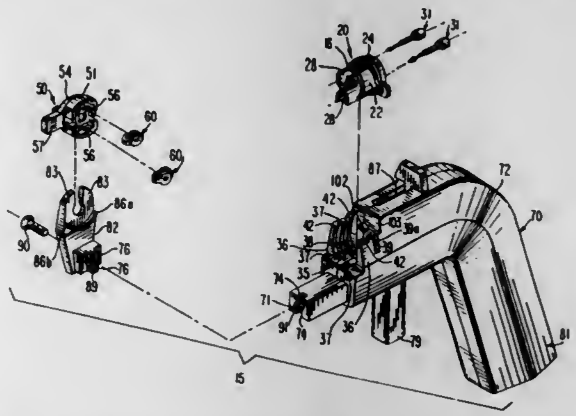
1. A trocar obturator comprising:
an elongated shaft having a distal end and a proximal end;
a blade with a distal cutting end and a proximal end, said blade proximal end attached to the distal end of said shaft;
a stationary shield portion affixed to said blade, said stationary shield portion having a distal end and a proximal end;
a movable shield portion attached by a spring to the distal end of said shaft, said movable shield portion slidable with respect to said stationary shield portion and said blade, such that said movable shield portion may be retracted proximally from the distal cutting end of said blade to allow cutting by said blade;
wherein said blade distal cutting end extends distally from said stationary shield distal end, and said blade distal cutting end is generally semicircular in shape.

5,690,664
TROCAR HAVING MOVABLE BLADE
Jude S. Sauer; Alexander I. Kobilansky, both of Pittsford, N.Y.; Marc J. Theroux, Bethel, Conn., and Carl T. Urban, Lake Oswego, Oreg., assignors to United States Surgical Corporation, Norwalk, Conn.
Continuation of Ser. No. 322,884, Oct. 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 249,707, May 26, 1994, which is a continuation-in-part of Ser. No. 132,403, Oct. 6, 1993, Pat. No. 5,467,762, which is a continuation-in-part of Ser. No. 120,489, Sep. 13, 1993, Pat. No. 5,441,041. This application Sep. 18, 1996, Ser. No. 715,305
Int. Cl.⁶ A61B *17/34*
U.S. Cl. 606—185 **22 Claims**



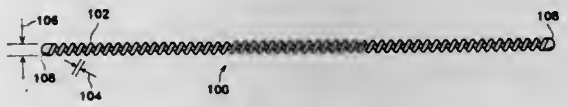
1. A surgical apparatus comprising:
a cannula;
an obturator configured for insertion into the cannula, the obturator having a proximal portion and a distal portion;
a tissue cutting member mounted to the distal portion of the obturator and movable between deployed and non-deployed positions; and
an actuating mechanism operatively associated with the tissue cutting member, the actuating mechanism being selectively controllable for moving the tissue cutting member between the deployed and non-deployed positions independent of the position of the obturator;
wherein movement of the actuating mechanism to a cutting member deployment position causes the cutting member to move to the deployed position, the actuating mechanism at the cutting member deployment position also automatically retracts the cutting member to the non-deployed position, wherein the actuating mechanism cannot maintain the cutting member in the deployed position as each deployment of the cutting member causes automatic retraction of the cutting member.

5,690,665
ROTATABLE EAR PIERCING CARTRIDGE ASSEMBLY
Samuel J. Mann, Englewood, N.J., assignor to Inverness Corporation, Fair Lawn, N.J.
Filed Feb. 13, 1996, Ser. No. 600,427
Int. Cl.⁶ A61B *17/34*
U.S. Cl. 606—188 **40 Claims**



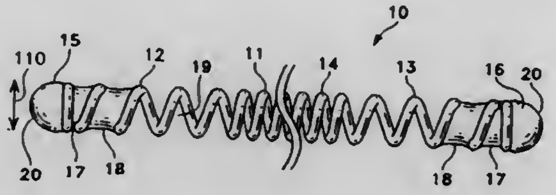
1. An ear piercing gun for piercing an ear, said gun comprising;
a housing;
a stud cartridge receiving chamber coupled to said housing and adapted to receive a stud cartridge therein, said stud cartridge adapted to releasably secure therein at least a first stud, said receiving chamber permitting said stud cartridge to rotate between a first position and a second position relative to said receiving chamber while being disposed therein; and
a push rod slidably contained in said housing so that when said stud cartridge is disposed at said first position, a stud is coaxially aligned with said push rod.

5,690,666
ULTRASOFT EMBOLISM COILS AND PROCESS FOR USING THEM
Alejandro Berenstein, New York, N.Y., and Ivan Sepetka, Redwood City, Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.
Filed Nov. 18, 1992, Ser. No. 978,320
Int. Cl.⁶ A61M *29/00*
U.S. Cl. 606—191 **27 Claims**



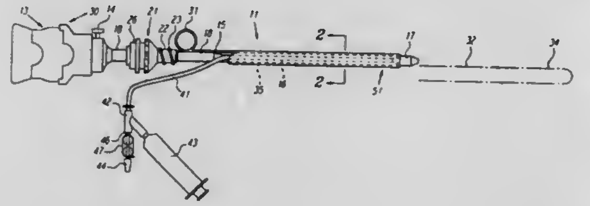
1. A flexible, vaso-occlusive device comprising a radiopaque coil having an outside diameter less than about 0.010 inches which is sufficiently flexible that a 1 cm length of coil supported horizontally at one end will deflect more than 20° under its own weight.

5,690,667
VASOOCCLUSION COIL HAVING A POLYMER TIP
Son M. Gia, San Jose, Calif., assignor to Target Therapeutics, Fremont, Calif.
Filed Sep. 26, 1996, Ser. No. 721,351
Int. Cl.⁶ A61B *17/00*
U.S. Cl. 606—191 **11 Claims**



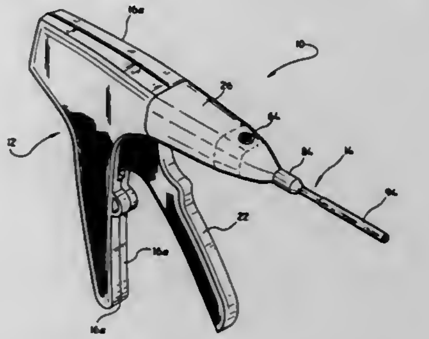
1. A vasoocclusion coil comprising a helical coil having a multiplicity of windings that define a lumen, a first end and a second end, and a plug of thermoplastic biocompatible polymer comprised of a first portion that extends into the lumen at said first end and is molded into the windings defining said first end and a second rounded portion that extends axially outwardly from said lumen at said first end.

5,690,668
EXTRALUMINAL BALLOON DISSECTION
Thomas J. Fogarty; George D. Hermann, both of Portola Valley; Jan M. Echeverry, San Jose, and Kenneth H. Mollenauer, Los Gatos, all of Calif., assignors to General Surgical Innovations, Inc., Palo Alto, Calif.
Continuation-in-part of Ser. No. 267,484, Jun. 29, 1994, Pat. No. 5,601,589. This application Apr. 11, 1996, Ser. No. 631,221
Int. Cl.⁶ A61M *29/00*
U.S. Cl. 606—192 **12 Claims**



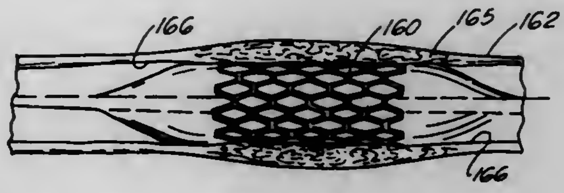
1. A method of dissecting tissue from an elongate structure in a body, said method comprising the steps of:
(a) providing an elongate tunneling member having a distal end and an elongate balloon having a fully inflated length of greater than said tunneling member, said elongate balloon being folded inwardly to reduce its length;
(b) making an incision in the body adjacent the elongate structure;
(c) introducing said tunneling member and elongate balloon through said incision;
(d) advancing said tunneling member and said elongate balloon bluntly alongside the elongate structure in the body until a desired location is reached; and
(e) inflating said elongate balloon to cause said elongate balloon to expand outwardly and evert distally beyond said tunneling member to dissect tissue from the elongate structure along and beyond said distal end of said tunneling member.

5,690,669
APPARATUS FOR EXPANDING BODY TISSUE
Jude S. Sauer; James W. Kaufer, both of Pittsford; Daniel E. McGarry, North Chili, and John F. Hammond, Canandaigua, all of N.Y., assignors to Laser Surge, Inc., Rochester, N.Y.
Filed Jan. 26, 1996, Ser. No. 592,056
Int. Cl.⁶ A61M *29/00*
U.S. Cl. 606—196 **18 Claims**



1. A surgical apparatus for manipulating body tissue, which comprises:
a handle member, including:
  a frame having a guide wire channel;
  a self contained fluid dispenser disposed within the frame, the fluid dispenser including a chamber for storing a supply of inflation fluid;
  a curved flexible drive member directly connected to the dispenser; and,
  a trigger moveable relative to the frame and operatively connected to the drive member;
a generally elongated member connected to the handle member and extending distally therefrom, the elongated member having proximal and distal portions, the elongated member including a longitudinal guide wire passageway in communication with the guide wire channel;
an inflatable member supported at the distal portion of the elongated member in fluid communication with the fluid dispenser; and,
an inflation lumen in fluid communication with the chamber and the inflatable member.

5,690,670
STENTS OF ENHANCED BIOCOMPATIBILITY AND HEMOCOMPATIBILITY
James A. Davidson, 2573 Windy Oaks Dr., Germantown, Tenn. 38139
Division of Ser. No. 112,599, Aug. 26, 1993, Pat. No. 5,477,864, which is a continuation-in-part of Ser. No. 36,414, Mar. 24, 1993, Pat. No. 5,509,933, which is a continuation-in-part of Ser. No. 986,280, Dec. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,453, Jan. 28, 1991, Pat. No. 5,169,597, which is a continuation of Ser. No. 454,181, Dec. 21, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 468,258
Int. Cl.⁶ A61M *29/00*
U.S. Cl. 606—198 **17 Claims**



1. An expandable stent for supporting a blood, urinary, or gastrointestinal vessel from collapsing inward, the stent having enhanced hemocompatibility, comprising:

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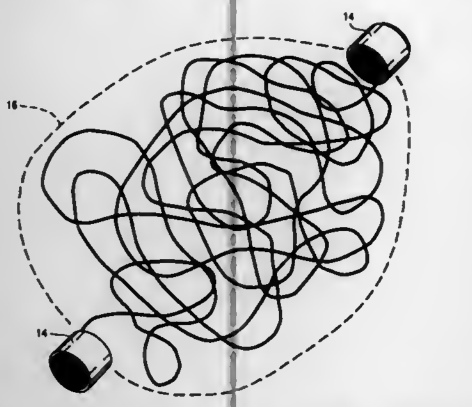
(a) a radially outwardlly expandable stent body for insertion in a tubular conduit of a living body, said stent body having outer surfaces and a longitudinal bore therethrough for receiving a means for expanding said stent body radially outwardly; and
(b) anchoring means on said outer surfaces for engaging said tubular conduit and anchoring said stent body in a radially outward expanded position thereby supporting said tubular conduit from collapsing inward;
the stent at least partially fabricated from a biocompatible and hemocompatible low elastic modulus metal alloy comprising:
(i) titanium; and
(ii) from about 10 wt. % to about 20 wt. % niobium or from about 35 wt. % to about 50 wt. % niobium;
wherein the alloy is free of toxic elements, except such amounts of said toxic elements as may occur as impurities in the alloy and as contaminants as a result of an alloying process.

5,690,671
EMBOLIC ELEMENTS AND METHODS AND APPARATUS FOR THEIR DELIVERY

Erin McGurk; Ronald Dieck, both of Palo Alto, and William S. Tremulis, Redwood City, all of Calif., assignors to Micro Interventional Systems, Inc., Sunnyvale, Calif.

Filed Dec. 13, 1994, Ser. No. 355,142
Int. Cl.^{6} A61M *29/00;* A61B *17/00*
U.S. Cl. 606—200 **23 Claims**

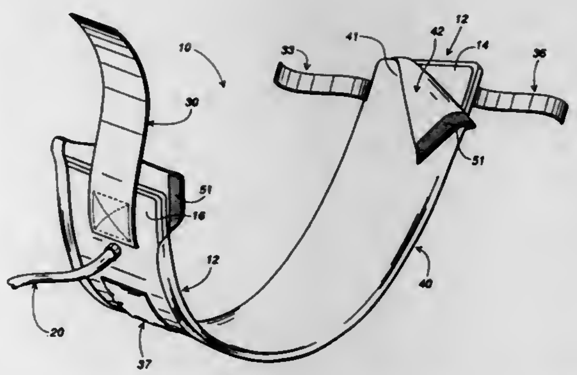


1. An embolic element comprising a filament composed of a shape memory material having a transition temperature, wherein the filament is in an unexpanded coil configuration at a first temperature at or below the transition temperature and assumes an expanded configuration when the temperature is raised to or above the transition temperature, wherein the expanded configuration is a random matrix which defines a peripheral envelope which is larger in all dimensions than that of the unexpanded coil configuration.

5,690,672
TOURNIQUET APPARATUS WITH REPLACEABLE COVER

Robert A. Cohen, Atlanta, Ga., assignor to Dignity Wear, Ltd., Boca Raton, Fla.

Filed Jun. 12, 1996, Ser. No. 662,038
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—203 **5 Claims**

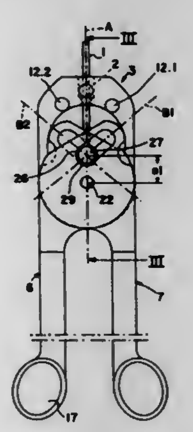


1. A tourniquet apparatus comprising:
a reusable, elongated, distensible member adapted to be wrapped about and secured about a body member for applying pressure to the body member, said elongated, distensible member having side edges;
a replaceable cover for preventing body fluids and topical dressings from contacting and contaminating said elongated, distensible member, said cover having a liquid-impermeable layer, a liquid-permeable layer, and an inner absorbent pad between said liquid-permeable layer and said liquid-impermeable layer, and wherein said liquid-impermeable layer is sized to be wrapped about said side edges of said elongated, distensible member; and
a means for releasably securing said cover to said elongated, distensible member,
whereby fluids that otherwise would normally come into contact with the elongated, distensible member pass through the liquid-permeable layer to the inner absorbent pad where they are prevented from contacting the elongated, distensible member by the liquid-impermeable layer.

5,690,673
SURGICAL INSTRUMENT

Stephan Koscher, Lachstrasse 53, and Johann Wurtz, Semmelweiss-Strasse 32, both of D-78549 Spaichingen, Germany

Filed Feb. 23, 1996, Ser. No. 604,825
Claims priority, application Germany, Mar. 9, 1995, 195 08 186.2
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—205 **14 Claims**

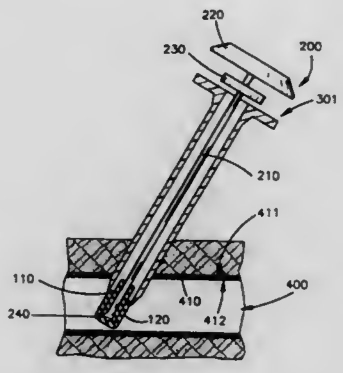


1. A surgical instrument which comprises: at least one jaw part; at least one handle part connected with said jaw part; a recess connected to said handle part, wherein said recess has an axis thereof; a pulling or pushing element connecting said jaw and handle parts and having a lengthwise axis and being movable along said lengthwise axis; pin means engaging into said recess, wherein the axis of the recess extends at an angle to the lengthwise axis of the pulling or pushing element; and a disk element extending from said handle part and having a tongue thereof, wherein said recess is formed in said tongue.

5,690,674
WOUND CLOSURE WITH PLUG

Roberto Diaz, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jul. 2, 1996, Ser. No. 674,442
Int. Cl.^{6} A61B *17/08*
U.S. Cl. 606—213 **9 Claims**



1. A method for closing a wound in a wall of a vessel, comprising the steps of:
a) mating a positioning tool with a plug comprising an elastic material;
b) inserting the plug into a passageway of a sleeve such that a distal retainer of the plug is compressed in the passageway of the sleeve, the sleeve having a distal end extending through the vessel wall in the vessel;
c) pushing the plug through the passageway of the sleeve with the positioning tool such that the distal retainer exits the distal end of the sleeve and expands in the vessel; and
d) positioning the plug in the wound of the vessel wall, wherein the positioning step (d) comprises the step of pulling the expanded distal retainer against the distal end of the sleeve with the positioning tool to disengage the positioning tool from the plug.

5,690,675
METHODS FOR SEALING OF STAPLES AND OTHER FASTENERS IN TISSUE

Philip N. Sawyer, Brooklyn, N.Y.; Philip M. Sawyer, Menlo Park, and Cary J. Reich, Laguna Hills, both of Calif., assignors to Fusion Medical Technologies, Inc., Mountain View, Calif.

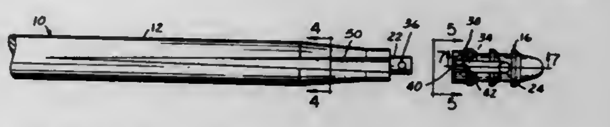
Continuation-in-part of Ser. No. 303,336, Sep. 6, 1994, which is a continuation-in-part of Ser. No. 7,691, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 832,171, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 654,860, Feb. 13, 1991, Pat. No. 5,156,613. This application Jun. 7, 1995, Ser. No. 481,712
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—229 **14 Claims**

1. A method for closing a wound in tissue, said method consisting essentially of the following two steps performed sequentially:
applying fasteners selected from the group consisting of staples, clips, pins, hooks, and suture to a region adjacent to the wound to close the wound, wherein the fasteners cause penetrations in the tissue and the fasteners are present in a preformed layer of a material selected from the group consisting of collagen, fibrin, fibrinogen, elastin, albumin, and combinations, thereof, which fuses to the tissue upon the application of energy; and
applying energy selected from the heat, radiofrequency, laser, ultrasonic, and electrical energy to the region to fuse the material to the tissue and seal perforations in the tissue.

5,690,676
SUTURE ANCHOR AND DRIVE ASSEMBLY

Gene Philip DiPoto, Cumberland, R.I.; Jeffrey C. Cerier, Franklin, Mass.; Russell F. Warren, Greenwich, Conn.; Gerard S. Cariozzi, Weymouth; Paul DiCarlo, E. Falmouth, both of Mass.; James W. Dwyer, Brookfield, Conn., and Alan Attridge Small, Needham, Mass., assignors to Smith & Nephew, Inc., Andover, Mass.

Continuation of Ser. No. 91,092, Jul. 12, 1993, abandoned, which is a division of Ser. No. 836,679, Feb. 14, 1992, Pat. No. 5,258,016, which is a continuation-in-part of Ser. No. 681,042, Apr. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 552,440, Jul. 13, 1990, Pat. No. 5,100,417. This appilcation Aug. 1, 1995, Ser. No. 509,966
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—232 **18 Claims**

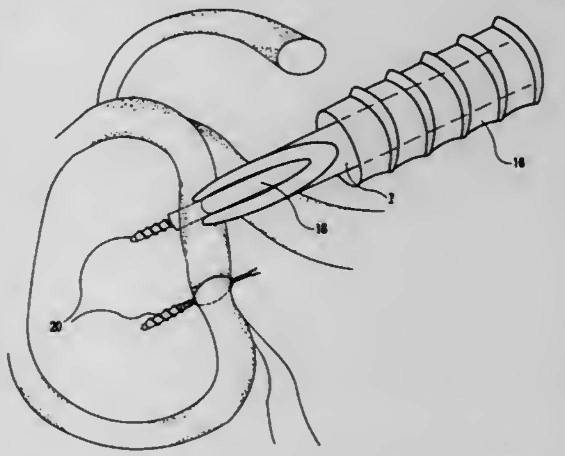


1. An anchor for securing a suture to bone, comprising:
an elongated body having a proximal region terminating in a proximal end, and a distal region terminating in a distal end configured for insertion into a hole in the bone;
said proximal region including an element configured for positive axial interengagement with a corresponding element of a driver for insertion of said anchor into the hole, said element of said proximal region including one of a protrusion or a recess which axially interlocks with a corresponding recess or protrusion, respectively, of the corresponding driver element;
at least one ridge, disposed on an exterior surface of said body, for engaging the bone after insertion to resist withdrawal of said anchor; and
a suture mount carried by said elongated body.

5,690,677
METHOD FOR INSTALLING A SUTURE ANCHOR THROUGH A CANNULATED TISSUE-SHIFTING GUIDE

Reinhold Schmieding, Naples, Fla., and Stefan Krupp, Munich, Germany, assignors to Arthrex, Inc., Naples, Fla.

Continuation-in-part of Ser. No. 552,694, Nov. 3, 1995, which is a continuation of Ser. No. 197,829, Feb. 17, 1994, Pat. No. 5,466,243. This application Feb. 21, 1996, Ser. No. 604,611
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—232 **11 Claims**



1. A method for installing a suture anchor for securing tissue to bone using a cannulated tissue-shifting guide having a tip, the method comprising the steps of:
(a) contacting the tissue with the tip of the cannulated tissue-shifting guide;

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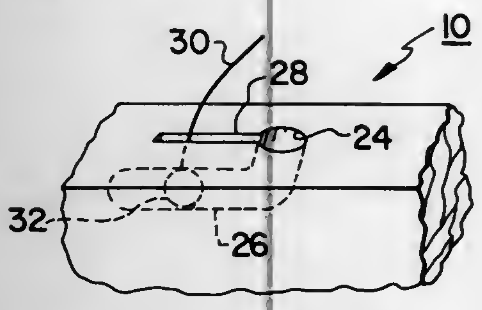
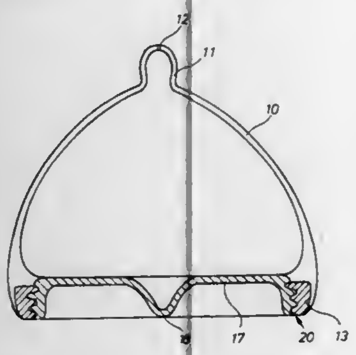
(b) introducing the suture anchor to the tissue through the cannulated tissue-shifting guide;
(c) installing the suture anchor through the tissue and into the bone by rotating and advancing the suture anchor; and
(d) removing the cannulated tissue-shifting guide from the repair site, leaving the suture anchor installed in the bone.

5,690,678
ARRANGEMENT FOR ANCHORING SUTURE TO BONE
Lanny L. Johnson, 2950 E. Mount Hope Rd., Okemos, Mich. 48864
Filed Apr. 30, 1996, Ser. No. 640,232
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—232 13 Claims



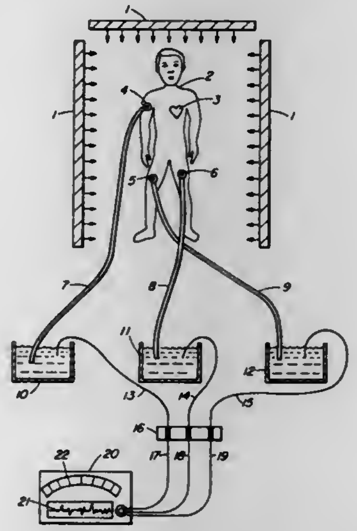
1. A method for anchoring suture to bone, comprising:
surgically preparing the bone by forming a slot in a cortical layer of the bone which overlays and communicates with a channel formed in a cancellous portion of the bone, the channel having a width greater than the width of the slot; and
introducing a length of suture into the channel whereby at least one end of the suture passes through the slot, said suture including a portion within the channel which is retained against passage through the slot.

5,690,679
INFANT FEEDING CONTAINER
John Gilbert Prentiss, P.O. Box 15458, Santa Fe, N. Mex. 87506-5458
Filed Dec. 30, 1991, Ser. No. 814,565
The portion of the term of this patent subsequent to Sep. 30, 2009, has been disclaimed.
Int. Cl.^{6} A61J *17/00*
U.S. Cl. 606—236 4 Claims



1. An infant feeding container wherein the feeding experience will closely resemble that of natural breast feeding, said container comprising a dome shaped member approximately in the form of a human female breast and a base, said dome shaped member having a crest, resilient walls, and a ducted nipple centrally disposed at said crest of said dome shaped member through which an infant may withdraw liquid nourishment, said base including a graspable annular member which is more rigid than said resilient walls and shaped to form a gripping means suitable for an infant's fingertips, said base further including means, attached to said graspable annular member, for closing said dome shaped member to provide a closed interior space for holding liquids.

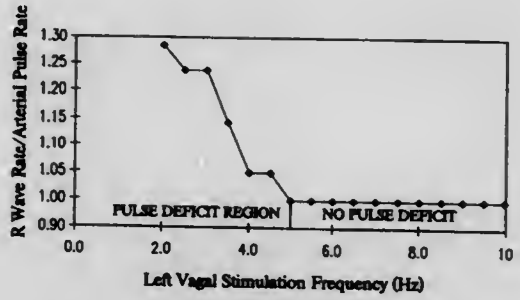
5,690,680
ELECTRICAL BRIDGE FOR MEDICAL USE AND METHOD
Morris Settler, 590 Niagara Street, Winnipeg, Manitoba, Canada, R3N 0V4, and Bert Settler, 723 Queenston Street, Winnipeg, Manitoba, Canada, R3N 0X8
Filed Feb. 16, 1996, Ser. No. 602,906
Claims priority, application United Kingdom, Feb. 21, 1995, 9503438
Int. Cl.^{6} A61B *5/0402;* A61N *1/08*
U.S. Cl. 607—2 23 Claims



1. A method of applying signals to an organ comprising connecting a pair of ionic conducting bridges to the organ, each bridge being comprised of an insulating tube filled with a liquid salt solution, a porous plug at one end of each tube touching the organ, immersing opposite ends of the tubes in separate reservoirs containing liquid salt solutions, immersing one end of a pair of metal wires into respective ones of the reservoirs, and connecting the other ends of the wires to an electric generator for generating said signals.

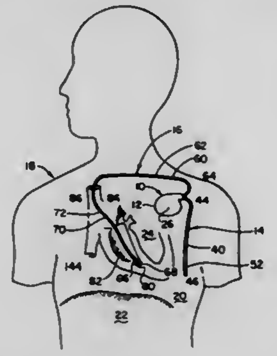
5,690,681
METHOD AND APPARATUS USING VAGAL STIMULATION FOR CONTROL OF VENTRICULAR RATE DURING ATRIAL FIBRILLATION
Leslie A. Geddes, West Lafayette, Ind.; Tarek Elabbady, Kirkland, Wash.; William E. Schoenlein, Lafayette, Ind.; Matthew Waninger, Frankfort, and Joe D. Bourland, West Lafayette, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.
Filed Mar. 29, 1996, Ser. No. 624,109
Int. Cl.^{6} A61N *1/00*
U.S. Cl. 607—2 5 Claims

1. An apparatus for automatically controlling ventricular rate by vagal stimulation to minimize pulse deficit during atrial fibrillation, comprising:
stimulating means for stimulating a vagal nerve at a variable stimulation frequency;
means for detecting a ventricular excitation rate;
means for detecting an arterial pulse rate;



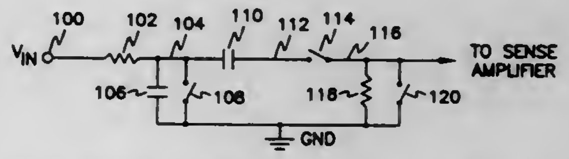
processing means for comparing said ventricular excitation rate and said arterial pulse rate and automatically adjusting said vagal stimulation frequency as a function of the difference between said ventricular excitation rate and said arterial pulse rate.

5,690,682
DEVICE AND METHOD FOR TREATMENT OF CARDIAC ARRHYTHMIA
Paul J. Buscemi, Long Lake; Brian Jackson, Mound; Stan Obino, Edina, all of Minn., and Robert Arzbaecher, Chicago, Ill., assignors to PharmaTarget, Inc., Minneapolis, Minn.
Filed Jun. 17, 1996, Ser. No. 666,889
Int. Cl.^{6} A61M *5/20*
U.S. Cl. 607—3 19 Claims



1. A programmable drug delivery system, said system comprising:
(a) a housing capable of being implanted in the human body, said human body having a heart with atrial and ventricular chambers, and a peritoneal and thoracic cavity;
(b) electronic means within the housing including electrical connection means and means for analyzing electrical signals of the type produced by the heart received through said electrical connection means, for identifying signals indicating the onset of arrhythmia in the heart, and for providing electrical energy to the heart through the connection means to effect sinus rhythm of the heart in response to a signal from said analyzing means indicating a predetermined condition of the heart;
(c) a rechargeable reservoir means within the housing having an outlet opening for supplying under pressure through the outlet opening a liquid chemical capable of treating the tissues of the heart in response to a signal from said analyzing means indicating the onset of arrhythmia of the heart;
(d) a first catheter, said first catheter comprising an elongate body having a peripheral surface, proximal and distal ends, a liquid lumen extending longitudinally in said body from an inlet end at said proximal end to an outlet port between said proximal and distal ends, valve means on said elongate body at said outlet port for affording movement of liquid under pressure in said liquid lumen out through said outlet port, said distal end adapted for positioning within the peritoneal cavity or the thorax cavity, adjacent the heart, and said first catheter including attachment means for attaching the first catheter to tissue in the peritoneal cavity or in the thorax cavity adjacent the heart; and
(e) a second catheter, said second catheter comprising an elongate body having a peripheral surface, an electrode on said peripheral surface, said electrode being at or adjacent said distal end to afford positioning the catheter in the heart, and an electrical lead extending longitudinally within said body from contact ends at said proximal end to said electrode;
the proximal end of said first catheter elongate body being attached to the housing with the contact end of said electrical lead being coupled to said electrical connection means so that the electronic means receives signals through said electrode, and the electrical energy to the heart is provided through said electrode.

5,690,683
AFTER POTENTIAL REMOVAL IN CARDIAC RHYTHM MANAGEMENT DEVICE
Paul A. Haefner, Crystal; Mark A. Stockburger, Inver Grove Heights, and William J. Linder, Golden Valley, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.
Filed Jun. 19, 1995, Ser. No. 492,199
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—4 43 Claims



34. An apparatus for effectively removing the after potential occurring after a pace pulse is delivered in a cardiac pacemaker system having an electrode for sensing electrical activity of the heart and carrying the pace pulse to the heart and a sense amplifier for detecting the electrical activity from the electrode, the apparatus comprising:
a lowpass filter coupled to the electrode and having filter components for filtering the sensed electrical activity and the pace pulse;
a highpass filter coupled to the lowpass filter and the sense amplifier and having filter components for further filtering the electrical activity passed from the lowpass filter; and
equilibrium means for allowing the filter components of the lowpass filter and the highpass filter to return to an equilibrium state following the delivery of the pace pulse.

5,690,684
PIVOT ASSISTED DEFIBRILLATOR PADDLE RETAINER
Jonathan N. Andrews, Monmouth, and William A. Dixon, Sheridan, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 2, 1995, Ser. No. 432,998
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—5 17 Claims

1. A retainer assembly for retaining a tool which has a handle and a center of mass, comprising:
retention means on said retainer assembly for slidingly receiving said tool to retain said tool with said retainer assembly against outward movement relative to said retainer assembly with a retention force of selected magnitude acting through said center of mass;
said retention means having a movable retainer member which has a storage position for engaging said tool to prevent outward movement of said tool, said retainer member being movable arcuately about a pivot point from said storage position to a release position, freeing said tool to be with-

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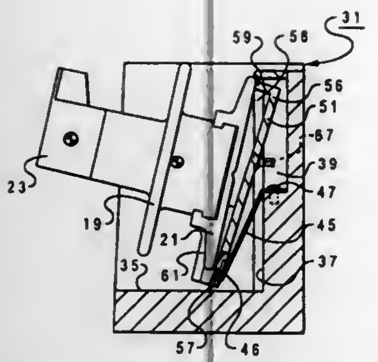


drawn from said retainer assembly, said retainer member being biased to the storage position; and wherein

while retained by said retainer assembly, a withdrawal moment arm exists between said handle and said pivot point, and a retention moment arm of lesser length than said withdrawal moment arm exists between said center of mass and said pivot point, such that an outwardly directed pull on said handle with a withdrawal force of lesser magnitude than said retention force will move said retainer member from the storage position to the release position, allowing withdrawal of said tool from said retainer assembly.

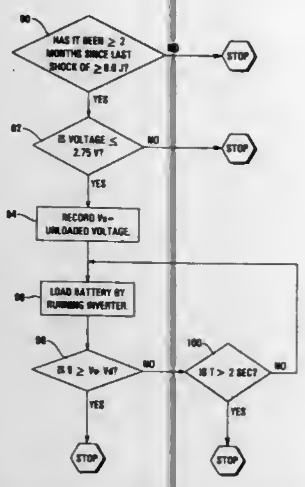
5,690,685

AUTOMATIC BATTERY-MAINTAINING IMPLANTABLE CARDIOVERTER DEFIBRILLATOR AND METHOD FOR USE

Mark W. Kroll, Minnetonka, and Joseph S. Perttu, Chanhassen, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Filed Oct. 27, 1995, Ser. No. 549,284
Int. Cl.⁶ A61N *1/39*

U.S. Cl. 607—5 **8 Claims**


90
HAS IT BEEN ≥ 2 MONTHS SINCE LAST SHOCK OF ≥ 0.8 J?
NO
STOP
YES
92
IS VOLTAGE ≤ 2.75 V?
NO
STOP
YES
94
RECORD Vo= UNLOADED VOLTAGE
96
LOAD BATTERY BY RUNNING INVERTER
98
IS Δ ≥ Vo-Vd?
NO
100
IS T > 2 SEC?
NO
YES
STOP
YES
STOP

8. A device to automatically charge a battery system, having a voltage leakage, to attenuate equivalent series resistance and thereby insure a competent state-of-charge inventory in the battery at all times, such that a capacitor system in an implantable cardioverter defibrillator (ICD) unit can be optimally charged on demand, the ICD unit containing the battery system, the capacitor system, a sensing system and a control system such that when a high voltage pulse is needed to arrest cardiac arrhythmia in a human patient, the control system can selectively discharge the high voltage pulse in the capacitor system through electrodes disposed in the human patient comprising:

means for measuring the state-of-charge of the battery;

means for comparing power loss of the battery due to said voltage leakage with said competent state-of-charge;

means for initiating an automatic charge to the battery based on a predetermined inverter frequency;

means for terminating said automatic charge to the battery;

said ICD unit including the systems therein being in electrical communication with and housing said device to automatically charge the battery system.

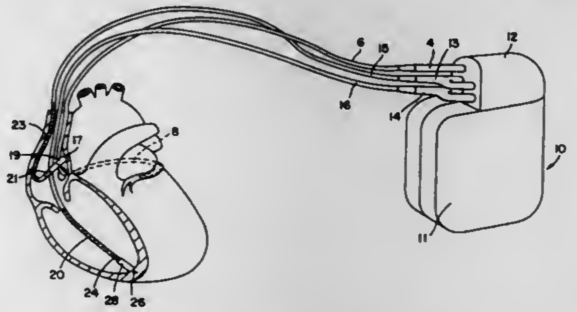
5,690,686

ATRIAL DEFIBRILLATION METHOD

Xiaoyi Min, Plymouth; Luc R. Mongeon, Minneapolis; Rahul Mehra, Stillwater, and Kenneth M. Anderson, Bloomington, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1996, Ser. No. 640,380
Int. Cl.⁶ A61N *1/39*

U.S. Cl. 607—5 **4 Claims**



1. A method of cardioverting a patient's heart, comprising:

locating a first electrode in the coronary sinus of said patient's heart;

locating a second electrode subcutaneously in a left pectoral location in said patient's chest;

locating a third electrode in the right atrium/superior vena cava portion of said patient's heart;

sensing an occurrence of atrial tachyarrhythmia;

coupling said first electrode to said second electrode; and

delivering a cardioversion pulse between said first and third electrodes and between said second and third electrodes in response to a detected occurrence of atrial tachyarrhythmia.

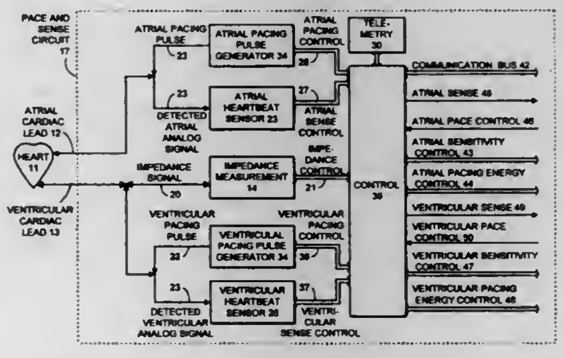
5,690,687

PACEMAKER WITH IMPROVED DISTRIBUTED RATE PACING

James C. Hansen, Denver, Colo., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Aug. 22, 1996, Ser. No. 701,386
Int. Cl.⁶ A61N *1/36*

U.S. Cl. 607—17 **17 Claims**


PACE AND SENSE CIRCUIT 17
ATRIAL PACING PULSE
23
ATRIAL PACING PULSE GENERATOR 34
ATRIAL PACING CONTROL
26
TELE-METRY 30
23
ATRIAL HEARTBEAT SENSOR 23
27
ATRIAL SENSE CONTROL
DETECTED ATRIAL ANALOG SIGNAL
ATRIAL CARDIAC LEAD 12
HEART 11
IMPEDANCE SIGNAL
20
IMPEDANCE MEASUREMENT 14
IMPE-DANCE CONTROL
21
CONTROL 36
VENTRICULAR CARDIAC LEAD 13
VENTRICULAR PACING PULSE
23
VENTRICULAR PACING PULSE GENERATOR 34
VENTRICULAR PACING CONTROL
36
23
VENTRICULAR HEARTBEAT SENSOR 28
37
DETECTED VENTRICULAR ANALOG SIGNAL
VENTRI-CULAR SENSE CONTROL
COMMUNICATION BUS 42
ATRIAL SENSE 45
ATRIAL PACE CONTROL 46
ATRIAL SENSITIVITY CONTROL 43
ATRIAL PACING ENERGY CONTROL 44
VENTRICULAR SENSE 49
VENTRICULAR PACE CONTROL 50
VENTRICULAR SENSITIVITY CONTROL 47
VENTRICULAR PACING ENERGY CONTROL 48

1. An implantable pacemaker comprising:

a pacing pulse generator for generating pacing pulses in accordance with a control signal;

a cardiac sensor for sensing intrinsic cardiac beats and for generating corresponding sensed signals;

a metabolic sensor for sensing a metabolic demand and for generating a corresponding metabolic demand signal; and

a controller for generating said control signal responsive to said sensed signal and said metabolic demand signal;

wherein said metabolic sensor includes a histogram generator for generating an initial histogram for said metabolic demand, said initial histogram having a first initial portion and a second initial portion, and a normalized histogram, said normalized histogram including said first initial portion and a normalized portion, a normalizer for generating said normalized portion by normalizing said second initial portion in accordance with a preselected criteria, and a demand rate generator for generating said demand rate from said normalized histogram.

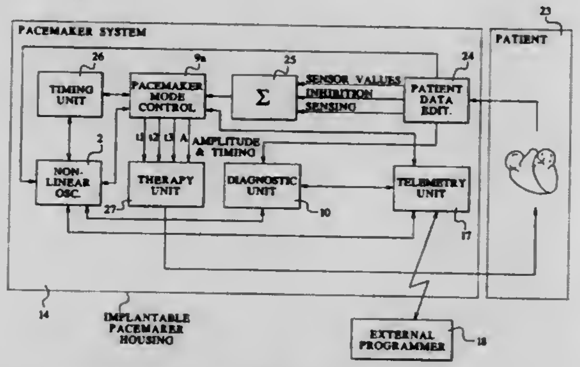
5,690,688

MEDICAL THERAPY APPARATUS WHICH ADMINISTERS THERAPY ADJUSTED TO FOLLOW NATURAL VARIABILITY OF THE PHYSIOLOGICAL FUNCTION BEING CONTROLLED

Kjell Norén, Solna, and Jakub Hirschberg, Täby, both of Sweden, assignors to Pacesetter AB, Solna, Sweden

Filed Nov. 12, 1996, Ser. No. 745,735
Int. Cl.⁶ A61N *1/362*

U.S. Cl. 607—17 **30 Claims**



1. A medical therapy apparatus comprising:

means for generating a basic therapy for artificially controlling a physiological function of a subject, said physiological function having a natural variability associated therewith;

a non-linear oscillator having an output;

means for matching said output of said non-linear oscillator to said natural variability of said physiological function to produce a variability adjustment;

means for combining said basic therapy and said variability adjustment to generate a variability-adjusted therapy; and

means for administering said variability-adjusted therapy to said subject.

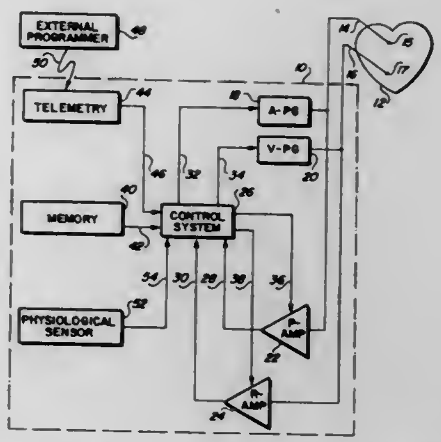
5,690,689

DUAL-CHAMBER IMPLANTABLE STIMULATION DEVICE HAVING ADAPTIVE AV INTERVALL AND METHOD FOR TREATING CARDIOMYOPATHY THEREOF

Jason A. Sholder, Beverly Hills, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 224,439, Apr. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 975,747, Nov. 13, 1992, Pat. No. 5,340,361. This application Mar. 29, 1996, Ser. No. 625,023
Int. Cl.⁶ A61N *1/36*

U.S. Cl. 607—24 **20 Claims**



1. A method of treating cardiomyopathy using an implanted dual-chamber pacemaker to provide preemptive ventricular pacing, the pacemaker having an atrial channel and a ventricular channel, means for sensing atrial activity in the atrial channel and natural ventricular activity (an R-wave) in the ventricular channel, a pulse generator that generates a ventricular stimulation pulse (V-pulse) in the ventricular channel at the conclusion of an AV/PV interval that commences with atrial activity and is reset with a sensed R-wave, said method comprising:

(a) measuring a natural conduction time interval as the elapsed time between atrial activity and an R-wave in a given cardiac cycle;

(b) automatically setting the AV/PV interval of the pacemaker to a prescribed amount less than the natural conduction time determined in step (a); and

(c) generating the V-pulse at the conclusion of the AV/PV interval to preemptively stimulate the ventricular channel before natural ventricular activity can occur.

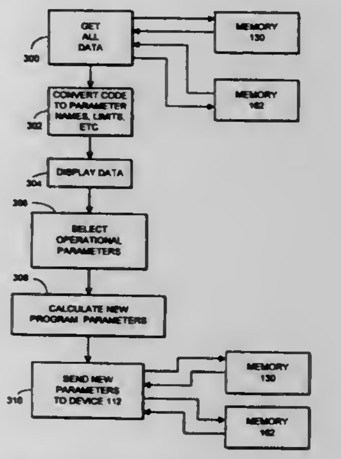
5,690,690

IMPLANTABLE CARDIAC STIMULATION SYSTEM

Tibor Nappholz, Englewood, and Steve Chinn, Denver, both of Colo., assignors to Pacesetter, Inc., Sylmar, Calif.

Continuation of Ser. No. 401,639, Mar. 8, 1995, abandoned. This application Sep. 12, 1996, Ser. No. 712,238
Int. Cl.⁶ A61N *1/362*

U.S. Cl. 607—30 **14 Claims**


GET ALL DATA
300
MEMORY 130
MEMORY 162
CONVERT CODE TO PARAMETER NAMES, LIMITS, ETC
302
DISPLAY DATA
304
306
SELECT OPERATIONAL PARAMETERS
308
CALCULATE NEW PROGRAM PARAMETERS
SEND NEW PARAMETERS TO DEVICE 112
310
MEMORY 130
MEMORY 162

1. A cardiac stimulation system comprising:

a plurality of implantable cardiac devices, each device operating in accordance with a device specific program, each device including (a) a memory holding a plurality of device specific characteristics, and a list containing said characteristics, said characteristics uniquely defining cardiac devices of different types, (b) a transmitter for transmitting said list and (c) a receiver for receiving said device specific program; and

a device programmer remote from said devices, said device programmer including a receiver for receiving said list, and a

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programming member, said programming member being provided to receive said list, and generate said device specific program in accordance with said list, said programmer including a transmitter for transmitting said device specific program to a corresponding device.

5,690,691

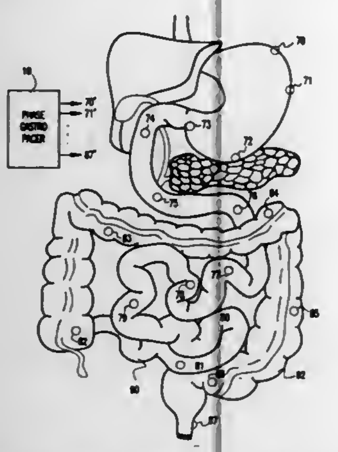
GASTRO-INTESTINAL PACEMAKER HAVING PHASED MULTI-POINT STIMULATION

Jian Dez Chen, Edmond, Okla.; Richard W. McCallum, Charlottesville, Va.; Ronald Williams, Charlottesville, Va.; Robert Ross, Charlottesville, Va.; Zhiyue Lin, Charlottesville, Va., and Jonathan Tillack, Charlottesville, Va., assignors to The Center for Innovative Technology, Herndon, Va.

Filed May 8, 1996, Ser. No. 646,959

Int. Cl.^{6} A61N *1/32*

U.S. Cl. 607—40 **12 Claims**



1. A method for electrically stimulating at least one organ in the gastro-intestinal tract for peristaltic movement, comprising the steps of:

connecting a plurality of electrodes to at least one organ in the gastro-intestinal tract of a patient along a peristaltic flow path, each of said plurality of electrodes being connected at a different location along said peristaltic flow path; and

providing electrical pulses to said organ from each one of said plurality of electrodes, said electrical pulsed provided by said plurality of electrodes being in a phased relationship according to a desired peristaltic flow through said at least one organ in said gastrointestinal tract.

5,690,692

BIO-ACTIVE FREQUENCY GENERATOR AND METHOD

Janet E. Fleming, San Diego, Calif., assignor to Regeneration Technology, Tijuana, Mexico

Continuation of Ser. No. 541,182, Oct. 11, 1995. This application Jan. 22, 1997, Ser. No. 787,158

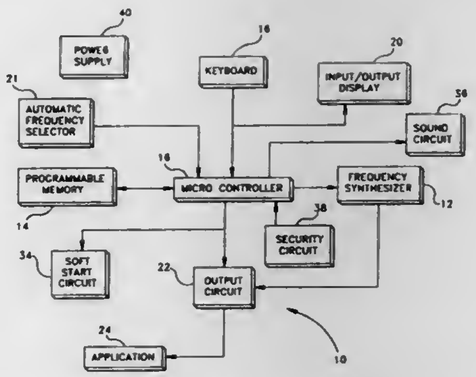
Int. Cl.^{6} A61N *1/32*

U.S. Cl. 607—50 **7 Claims**

1. A system to generate an output signal having a predetermined precise frequency and particularly adapted for use in applications including health science and industrial uses, comprising:

frequency generation means responsive to a control signal to generate an output signal having a predetermined precise frequency within a frequency range from at least 0.00004 Hz to 3 Mhz;

said frequency generation means includes a frequency synthesizer means, and a programmable memory means coupled to a keyboard means whereby actuation of the keyboard means to generate a signal representative of a predetermined frequency selected from the memory means for application to the frequency synthesizer means to cause such frequency synthesizer means to generate the selected predetermined precise frequency,



keyboard means coupled to the frequency generation means and actuable to generate a control signal representative of a predetermined frequency; said keyboard means is actuable to store within the memory means instructions representative of a sequence of predetermined precise frequencies whereby n number of frequencies can be generated serially upon command,

output means coupled to the frequency generation means to amplify the voltage of the generated frequency signal to a predetermined level, and

application means coupled to the output means for application of the output signal for applications including health science and industrial uses the shape of said output signal is a square wave having a 50% duty cycle.

5,690,693

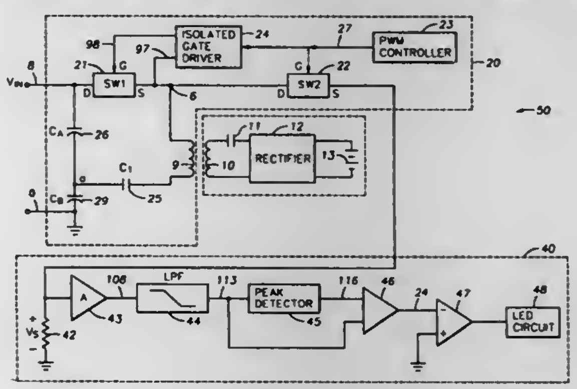
TRANSCUTANEOUS ENERGY TRANSMISSION CIRCUIT FOR IMPLANTABLE MEDICAL DEVICE

Xintao Wang, Lake Jackson, and Mohammed Zafar Amin Munshi, Missouri City, both of Tex., assignors to Sulzer Intermedics Inc., Angleton, Tex.

Filed Jun. 7, 1995, Ser. No. 482,786

Int. Cl.^{6} A61N *1/378*

U.S. Cl. 607—61 **26 Claims**



1. A transcutaneous energy transmission device for transmitting electrical power to an implanted medical device with a rechargeable battery to recharge the battery, said transcutaneous energy transmission device comprising:

a primary coil for transmitting said power transcutaneously to said medical implanted device;

a capacitor coupled to said primary coil, said primary coil and said capacitor forming a resonant circuit;

an alignment indicator electrically coupled to said primary coil to indicate proper alignment between said transcutaneous energy transmission device and said implanted medical device, said alignment indicator indicating proper alignment based on current through said primary coil;

a controller for controlling the power provided to said resonant circuit; and

a first switch and a second switch coupled to said controller, and being alternatively switched on and off by said controller to produce a sinusoidal current waveform through said primary coil.

CHEMICAL

5,690,694

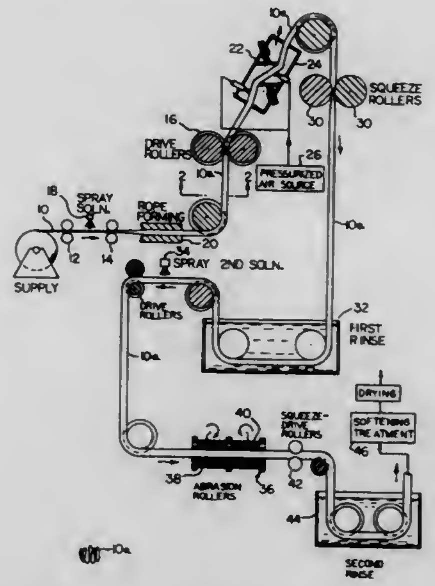
SIZING AGENTS FROM INDIGO BLUE DENIM FABRIC

Chul Soon Kang, 2721 N. Vista Knoll Rd., Orange, Calif. 92667

Filed Sep. 9, 1996, Ser. No. 708,793

Int. Cl.^{6} D06L *1/16*

U.S. Cl. 8—102 **5 Claims**



1. A method of removing coloring and sizing agents from indigo blue denim fabric comprising:

(a) coating a travelling sheet of indigo blue denim fabric with a first water solution containing a non-ionic lubricant, a non-ionic surfactant, and an antimigrant;

(b) forming the coated sheet into a travelling folded rope configuration;

(c) passing the rope-formed sheet across an impact mechanism, whereby impaction forces augment the action of the first water solution on the fabric;

(d) rinsing the rope-formed sheet a first time to dilute the first water solution and remove any suspended particles from the fabric;

(e) coating the rope-formed sheet with a second water solution containing an antimigrant; a non-ionic lubricant, a non-ionic surfactant, and a cellulase enzyme;

(f) passing the coated rope-formed sheet from (e) through an abrasion mechanism, whereby abrasion forces augment the cleaning action of the second water solution on the fabric;

(g) rinsing the rope-formed sheet a second time to remove any suspended particles from the fabric; and

(h) subjecting the rope-formed sheet to a softening process.

5,690,695

COMPOSITION FOR THE OXIDATION DYEING OF KERATINOUS FIBRES, COMPRISING A PARA-PHENYLENEDIAMINE DERIVATIVE AND A 6-HYDROXY-1, 4-BENZOMORPHOLINE AND DYEING PROCESS USING SUCH A COMPOSITION

Jean Cotteret, Verneuil Sur Seine, and Marie-Pascale Audousset, Asnieres, both of France, assignors to L'Oreal, Paris, France

Filed May 26, 1995, Ser. No. 451,505

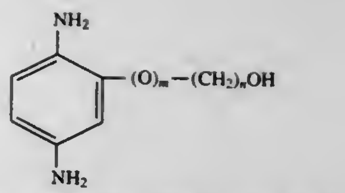
Claims priority, application France, May 26, 1994, 94 06394

Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—409 **21 Claims**

1. An oxidation dyeing composition for keratinous fibres, the composition comprising, in a medium appropriate for dyeing, at least one oxidation dye precursor and at least one coupler,

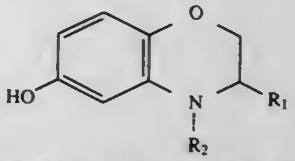
wherein said composition contains, as said at least one oxidation dye precursor, a para-phenylenediamine of the following formula (I):



(I)

in which m is an integer equal to zero, and n is an integer from 1 to 4 or an acid addition salt of said para-phenylenediamine, and

wherein said composition further contains, as said at least one coupling agent, a 6-hydroxy-1,4-benzomorpholine of the following formula (II):



(II)

in which the radicals R_1 and R_2 are the same or different and denote a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms or an acid addition salt of said benzomorpholine, said at least one oxidation dye precursor and said at least one coupler being present in amounts effective to dye keratinous fibres.

5,690,696

COMBINATIONS OF TWO PARA-PHENYLENEDIAMINE OXIDATION BASES AND A META-PHENYLENEDIAMINE COUPLER FOR THE OXIDATION DYEING OF KERATINOUS FIBERS

Eric Bone, Clichy, and Roland De La Mettrie, Le Vesinet, both of France, assignors to L'Oreal, Paris, France

Filed Jan. 19, 1996, Ser. No. 588,726

Claims priority, application France, Jan. 19, 1995, 95 00587

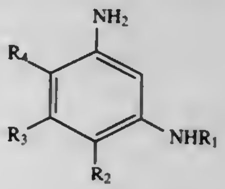
Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—411 **26 Claims**

1. A composition for the oxidation dyeing of keratinous fibres comprising, in a medium appropriate for dyeing:

from 0.0005 to 10% by weight of the total weight of the dyeing composition of at least one first oxidation base selected from para-phenylenediamine, an acid addition salt thereof, 2-methyl-para-phenylenediamine, and an acid addition salt thereof;

from 0.0001 to 5% by weight of the total weight of the dyeing composition of at least one coupler selected from meta-phenylenediamine compounds of formula (I) below:



(I)

in which:

R_1 represents a hydrogen atom or a C_1–C_4 alkyl, C_1–C_4 monohydroxyalkyl or C_2–C_4 polyhydroxyalkyl radical;

R_2 and R_3, which are identical or different, represent a hydrogen atom or a C_1–C_4 alkyl or C_1–C_4 hydroxyalkoxy radical;

R_4 represents a C_1–C_4 alkoxy, C_1–C_4 aminoalkoxy, C_1–C_4 monohydroxyalkoxy or C_2–C_4 polyhydroxyalkoxy radical or a 2,4-diaminophenoxy C_1–C_4 alkoxy radical, with the proviso that, when R_1 denotes a hydrogen atom, R_2 and R_4 do not simultaneously denote a β-hydroxyethyloxy radical, and that, when R_1, R_2 and R_3 simultaneously denote a hydrogen atom, R_4 is other than methoxy, and acid addition salts of the compounds of formula (I),

and from 0.0005 to 10% by weight of the total weight of the dyeing composition of at least one second oxidation base

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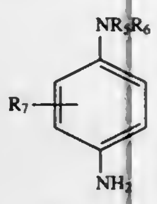
selected from para-phenylenediamine compounds of formula (II) below:



(II)

in which:

- R_5 represents a C_1–C_4 alkyl, C_1–C_4 monohydroxyalkyl or C_2C_4 polyhydroxyalkyl radical;
- R_6 represents a C_1–C_4 monohydroxyalkyl or C_2–C_4 polyhydroxyalkyl radical;
- R_7 represents a hydrogen atom, a C_1–C_4 alkyl or C_1–C_4 alkoxy radical or a halogen atom, and acid addition salts of the compounds of formula (II).

5,690,697

SET, PROCESS, AND DEVICE FOR DYEING KERATINOUS FIBERS WITH INDOLES OR INDOLINES AND MANGANESE SALTS AT SPECIFIC PH RANGES

Henri Samain, Blevres, France, assignor to L'Oreal, Paris, France

Filed Jul. 20, 1995, Ser. No. 504,744

Claims priority, application France, Jul. 22, 1994, 94 09118

Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—423 **26 Claims**

1. A set for dyeing keratinous fibres, which comprises,

a dyeing composition (A), wherein said dyeing composition (A) comprises, in a medium appropriate for dyeing, from 0.05 to 10% by weight with respect to the total weight of said dyeing composition (A) of at least one indole or indoline compound and from 0.002 to 5% by weight of metal equivalents with respect to the total weight of the dyeing composition (A) of at least one manganese salt which has an oxidation number equal to 2 or 3, and

a composition (B), wherein said composition (B) comprises, in a medium appropriate for dyeing, at least one basifying agent and at least one oxidizing agent selected from the group consisting of hydrogen peroxide, urea hydrogen peroxide, an alkali metal bromate and a persalt, wherein said oxidizing agent is present in an amount effective to accelerate the development of said indole or indoline compound,

wherein the pH of said dyeing composition (A) is less than 7, and the pH of said dyeing composition (B) is greater than 8.5, or

wherein the pH of said dyeing composition (A) ranges from 7 to 9, and the pH of said composition (B) is greater than 9.5, and

wherein said dyeing composition (A) and said composition (B) are present in an amount effective to dye said keratinous fibres.

5,690,698

BLACK DYE MIXTURES OF FIBER-REACTIVE AZO DYES AND THEIR USE FOR DYEING HYDROXYL- AND/OR CARBOXAMIDO-CONTAINING FIBER MATERIAL

Andreas Von Der Eltz, Frankfurt am Main; Werner Hubert Russ, Flörsheim, and Dirk Buchwald, Selters, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

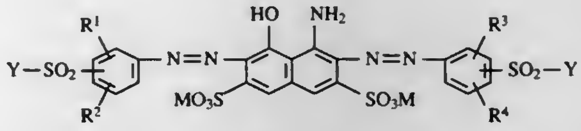
Filed Mar. 6, 1996, Ser. No. 611,630

Claims priority, application Germany, Mar. 8, 1995, 195 08 156.0

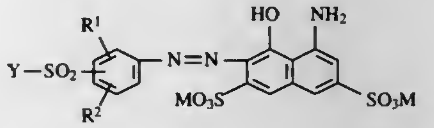
Int. Cl.^{6} C09B *67/22;* **D06P** *1/38;3/10;3/66*

U.S. Cl. 8—532 **11 Claims**

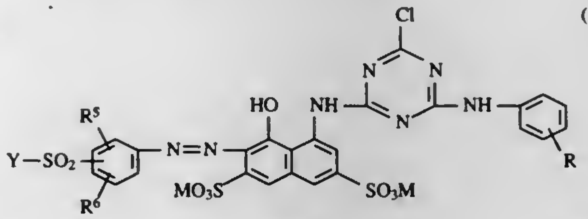
1. A dye mixture comprising one or more disazo dyes of the formula (1), one or more monoazo dyes of the formula (3), one or more monoazo dyes of the formula (4), optionally one or two monoazo dyes of the formula (2), and, optionally, one or more monoazo dyes of the formula (5):



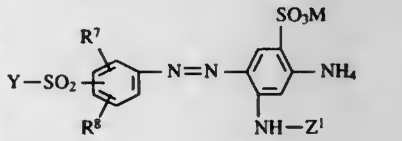
(1)



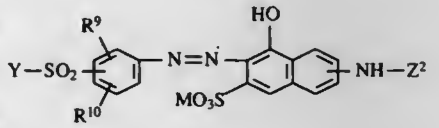
(2)



(3)



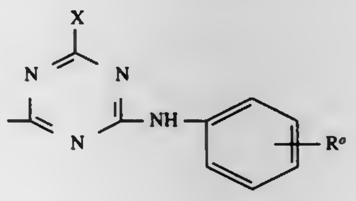
(4)



(5)

in which formulae

- M is hydrogen or an alkali metal,
- R^1 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^2 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^3 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^4 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^5 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^6 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^7 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^8 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^9 is hydrogen, methyl, ethyl, methoxy or ethoxy,
- R^{10} is hydrogen, methyl, ethyl, methoxy or ethoxy,
- each Y, independently of the others, is vinyl, β-chloroethyl, β-thiosulfatoethyl or β-sulfatoethyl,
- R is hydrogen, methyl, sulfo, carboxyl or a group of the formula —SO_2—Y where Y has one of the meanings given above,
- Z^1 is alkanoyl of 2 to 5 carbon atoms, benzoyl, dichloro-1,3,5-triazin-6-yl or a group of the formula (a)



(a)

in which

- X is chlorine or cyanamino and
- R^0 is sulfo, carboxyl or a group of the formula —SO_2—Y where Y has one of the meanings given above,
- Z^2 has one of the meanings of Z^1, and
- the group —NH—Z^2 in formula (5) is attached to the 6-sulfo-8-hydroxynaphth-2-yl in the 2 or 3 position.

5,690,699

AZO DYE MIXTURES AND THEIR USE

Klaus Hannemann, Lörrach, Germany, and Urs Lehmann, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Feb. 26, 1996, Ser. No. 606,899

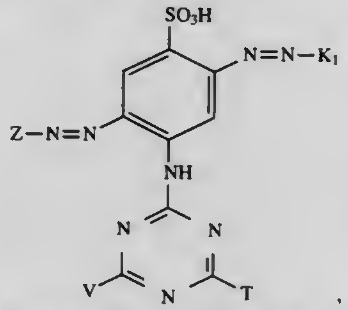
Claims priority, application Switzerland, Sep. 27, 1995, 554/95

Int. Cl.^{6} C09B *62/03;62/09;62/513*

U.S. Cl. 8—549 **12 Claims**

1. A dye mixture comprising

(a) a compound of the formula



(1)

in which K_1 is a naphthyl radical which is unsubstituted or further substituted by hydroxyl, amino, N-C_1–C_4alkylamino, C_2–C_4alkanoylamino, benzoylamino, sulfo or a radical of the formula —SO_2—Y,

Z is the radical of a diazo component of the benzene or naphthalene series which contains at least one fibre-reactive radical of the formula

$$—SO_2—Y \quad (3a),$$

$$—CONH—(CH_2)_m—SO_2—Y \quad (3b),$$

$$—CONH—(CH_2)_{m1}—O—(CH_2)_m—SO_2—Y \quad (3c),$$

$$—(O)_p—(CH_2)_q—CONH—(CH_2)_m—SO_2—Y \quad (3d),$$

$$—NH—CO—CHX—CH_2X \quad (3e) \text{ or}$$

$$—NH—CO—CX{=}CH_2 \quad (3f),$$

Y is vinyl or a radical —CH_2—CH_2—U and U is a leaving group,

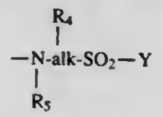
X is chlorine or bromine,

p is the number 0 or 1 and

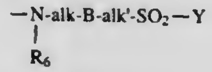
m, m1 and q independently of one another are each an integer from 1 to 6,

T is chlorine, fluorine, bromine, 3-carboxypyridin-1-yl or 3-carbamoylpyridin-1-yl,

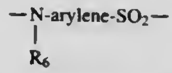
V is defined independently as T or is a non-reactive radical selected from the group consisting of hydroxyl, C_1C_4alkoxy, phenoxy, C_1–C_4alkylthio, morpholino and substituted or unsubstituted amino, or is a reactive radical of the formula



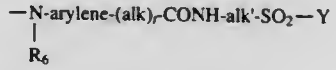
$$-\underset{R_5}{N}\text{-}\overset{R_4}{\text{alk}}\text{-}SO_2-Y \quad (4a)$$



$$-\underset{R_6}{N}\text{-alk-B-alk'-}SO_2-Y \quad (4b)$$

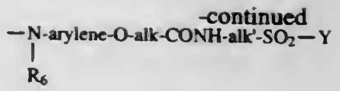


$$-\underset{R_6}{N}\text{-arylene-}SO_2-Y \quad (4c)$$

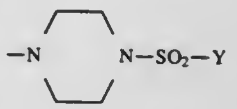


$$-\underset{R_6}{N}\text{-arylene-(alk)}_t\text{-CONH-alk'-}SO_2-Y \quad (4d)$$

-continued

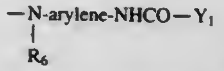


$$-\underset{R_6}{N}\text{-arylene-O-alk-CONH-alk'-}SO_2-Y \quad (4e)$$



(4f)

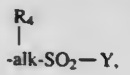
or



$$-\underset{R_6}{N}\text{-arylene-NHCO}-Y_1 \quad (4g)$$

R_4 is hydrogen, hydroxyl, sulfo, sulfato, carboxyl, cyano, halogen, C_1–C_4alkoxycarbonyl, carbamoyl or a group —SO_2—Y, in which Y is as defined above,

R_5 is hydrogen, C_1–C_4alkyl which is unsubstituted or substituted by hydroxyl, sulfo, sulfato, carboxy or cyano, or a radical



$$\overset{R_4}{\text{-alk}}\text{-}SO_2-Y,$$

in which R_4 and Y are each as defined above,

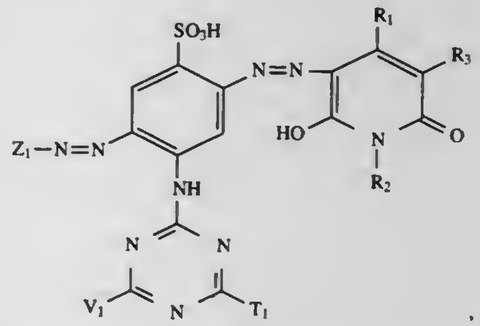
R_6 is hydrogen or C_1–C_4alkyl, alk and alk' independently of one another are each C_1–C_6alkylene, arylene is a phenylene or naphthylene radical which is unsubstituted or substituted by sulfo, carboxyl, hydroxyl, C_1–C_4alkyl, C_1–C_4alkoxy or halogen,

Y_1 is a group —CHX—CH_2X or —CX=CH_2, in which X is as defined above,

B is a radical —O—or —NR_6—, in which R_6 is as defined above, and

t is the number 0 or 1

(b) a compound of the formula



(2)

in which R_1 and R_2 independently of one another are each C_1–C_4alkyl,

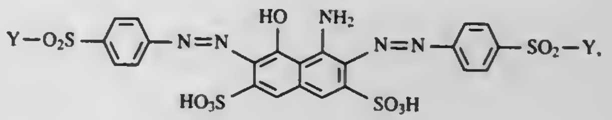
R_3 is carbamoyl, sulfomethyl or cyano, and

T_1 is defined independently as above for T,

V_1 is defined independently as above for V, and

Z_1 is defined independently as above for Z, and

c) a compound of the formula



in which Y is as defined above.

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PROCESS FOR THE PRECIPITATION OF ALUMINUM TRIHYDROXIDE FROM A SUPERSATURATED SODIUM ALUMINATE SOLUTION

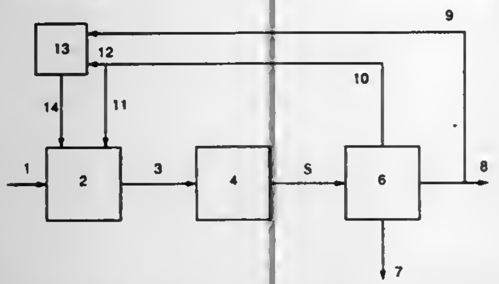
Iwan Dilip Kumar Hiralal, Leidschendam, Netherlands, assignor to Billiton Intellectual Property B.V., Netherlands

Filed Nov. 28, 1995, Ser. No. 563,384

Claims priority, application European Pat. Off., Nov. 30, 1994, 94203488

Int. Cl.^{6} C01F *7/14*

U.S. Cl. 23—301 **9 Claims**



1. A process for the precipitation of aluminum trihydroxide from a supersaturated sodium aluminate solution, consisting of the following steps

(a) feeding a stream of supersaturated sodium aluminate solution and a first stream of aluminum trihydroxide particles as seed particles to a first reaction zone,

(b) maintaining the sodium aluminate solution together with said seed particles in the first reaction zone under conditions resulting in precipitation and agglomeration of aluminum trihydroxide particles,

(c) passing the product from step (b) to a second reaction zone and maintaining said product under conditions resulting in precipitation and growth of aluminum trihydroxide particles,

(d) passing the product from step (c) to a separation/classification zone and separating said product of step (c) into a first aluminum trihydroxide product having a coarse particle size, a second aluminum trihydroxide product having a finer particle size and a spent liquor stream,

(e) admixing a portion of said second aluminum trihydroxide product having a finer particle size with a portion of said spent liquor stream and dissolving at least a portion of the aluminum trihydroxide in the spent liquor and admixing the solution thus obtained with the saturated supersaturated aluminate solution of step (a) together with the remaining portion of said second aluminum trihydroxide product having a finer particle size.

5,690,701

PROCESS FOR THE MANUFACTURE OF PARTICLES OF COATED PERSALTS

Stefano Bigini, Terni; Romano Pardini, Rosignano-Solvay, and Soraya Parvaneh, Leghorn, all of Italy, assignors to SOLVAY Interox (Société Anonyme), Brussels, Belgium

Filed Sep. 21, 1995, Ser. No. 531,950

Claims priority, application Italy, Sep. 22, 1994, MI94A1927

Int. Cl.^{6} C01B *31/24;15/10*

U.S. Cl. 23—302 R **10 Claims**

1. A continuous process for the manufacture of coated particles of at least one persalt of at least one alkali metal, comprising:

(a) continuously crystallizing a supersaturated aqueous persalt solution in a crystallizer in order to obtain a suspension of crystalline persalt particles,

(b) transferring the suspension of crystalline persalt particles leaving the crystallizer into a stirred post-crystallization vessel,

(c) introducing at least one coating agent selected from the group consisting of alkali metal salts of at least one inorganic acid into the said vessel, at a concentration lower than saturation,

(d) crystallizing said coating agent on the surface of the persalt particles in the post-crystallization vessel to obtain coated crystalline persalt particles,

(e) centrifuging the coated crystalline particles in a centrifuge, and

(f) drying the thus centrifuged coated crystalline persalt particles in a dryer.

5,690,702

METHOD OF MAKING ELECTROACTIVE HIGH STORAGE CAPACITY POLYCARBON-SULFIDE MATERIALS AND ELECTROLYTIC CELLS CONTAINING SAME

Terje A. Skotheim, and Igor P. Kovalev, both of Tucson, Ariz., assignors to Moltech Corporation, Tucson, Ariz.

Division of Ser. No. 478,330, Jun. 7, 1995, Pat. No. 5,601,947. This application Oct. 7, 1996, Ser. No. 729,713

Int. Cl.^{6} H01M *6/00*

U.S. Cl. 29—623.1 **18 Claims**

1. A method of forming a composite cathode which comprises: coating an electrically conducting cathode substrate with a mixture comprising an amount of an electrochemically active polycarbon-sulfide material effective to provide cathode activity, wherein said polycarbon-sulfide material in its oxidized state is of the general formula I

$$+C(S_x)+_n \qquad I$$

wherein x ranges from greater than 2.5 to about 50, and n is greater than or equal to 2.

5,690,703

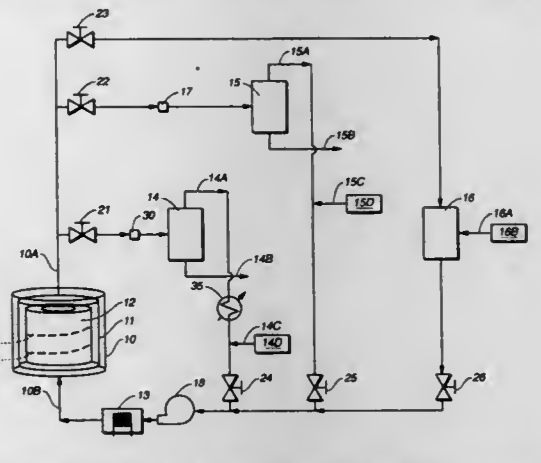
APPARATUS AND METHOD OF PREPARING ELECTROCHEMICAL CELLS

Porter H. Mitchell, Las Vegas, Nev.; David A. Velasquez, Fairfield, Calif.; Ib I. Olsen, Cockeysville, Md., and Douglas B. Holmes, Lexington, Mass., assignors to Valence Technology, Inc, Henderson, Nev.

Filed Mar. 15, 1996, Ser. No. 616,827

Int. Cl.^{6} H01M *10/38*

U.S. Cl. 29—623.5 **15 Claims**



1. A method of preparing an electrochemical cell comprising an anode, a cathode, and a polymeric layer positioned between the anode and cathode which comprises the steps of:

(a) forming an anode composition comprising a carbon material, a first polymer, and a first plasticizer;

(b) forming a cathode composition comprising a cathode active material, a second polymer, and a second plasticizer;

(c) forming a polymeric matrix comprising a third polymer and a third plasticizer that is positioned between the anode composition and cathode composition;

(d) removing said first, second, and third plasticizers by extraction with a supercritical fluid to form an electrochemical cell precursor by a process comprising the steps of:

(i) providing an apparatus that comprises:

a sealable chamber defining a compartment adapted to receive an article containing a plasticizer;

means for circulating a supercritical fluid into said compartment that comes into contact with said article; and

means for separating supercritical fluid and plasticizer from a mixture of supercritical fluid and plasticizer;

(ii) placing said anode composition, cathode composition, and polymeric matrix into said compartment and contacting the same with a supercritical fluid, wherein said supercritical fluid during said contacting is maintained under conditions of temperature and pressure such that said supercritical fluid takes up at least a portion of said plasticizers;

(iii) removing said supercritical fluid loaded with said portion of plasticizer taken up during said contacting; and

(d) inserting an electrolyte solution comprising an electrolyte solvent and salt into the electrochemical precursor.

5,690,704

ADDITIVE FOR CARBONACEOUS SOLID-WATER SLURRY, METHOD FOR PRODUCTION THEREOF, AND CARBONACEOUS SOLID-WATER SLURRY COMPOSITIONS

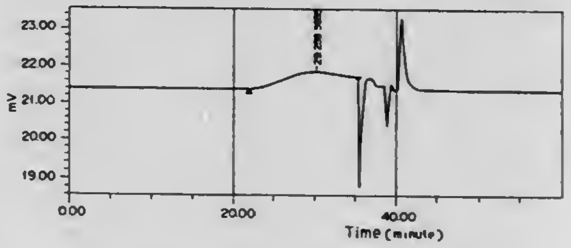
Kenichiro Hayashi; Satoshi Yamada, both of Kanagawa; Hideyuki Tahara, Osaka, and Shoichi Takao, Hyogo, all of Japan, assignors to Nippon Shokubai Co., Ltd., and Kawasaki Jukogyo Kabushiki Kaisha, both of Japan

Filed Jul. 5, 1995, Ser. No. 498,154

Claims priority, application Japan, Jul. 5, 1994, 6-153932

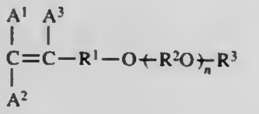
Int. Cl.^{6} C10L *1/32*

U.S. Cl. 44—280 **11 Claims**



1. An additive for a high concentration carbonaceous solid-water slurry comprising a copolymer (a) and a copolymer (b) selected from the group of water-soluble copolymers obtained by polymerizing the monomer components,

(A) from 0.2 to 20 mol % of a nonionic monomer represented by the formula (I):



$$\overset{A^1}{\underset{A^2}{C}}=\overset{A^3}{C}-R^1-O+R^2O+_n R^3 \qquad (I)$$

wherein

R^1 stands for $—CH_2—$, $—(CH_2)_2—$, $—(CH_3)_3—$, $—C(CH_3)_2—$, $— CO$, $CH_2CO—$,

A^1, A^2, and A^3 independently stand for a hydrogen atom or a methyl group where R^1 is $—CH_2—$, $—(CH_2)_2—$, $—(CH_2)_3—$, or $—C(CH_3)_2—$ or A^1 and A^2 independently stand for a hydrogen atom, a methyl group, or $—COOX$ and A^1 and A^2 do not simultaneously stand for $—COOX$ and A^3 stands for a hydrogen atom, a methyl group, $—COOX$, or CH_2COOX

where

R^1 is CO or

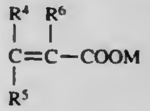
$—CH_2CO$ and A^1 and A^2 independently stand for a hydrogen atom or a methyl group where A^3 is $—COOX$ or $—CH_2COOX$, wherein X stands for a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium group, or an organic amine group

R^2 stands for an alkylene group of 2 to 4 carbon atoms,

n stands for a number of an average in the range of from 1 to 100,

R^3 stands for an alkyl group of 1 to 30 carbon atoms, an alkenyl group, an aryl group, an aralkyl group, a cyclic alkyl group, or a cyclic alkenyl group, or a monovalent organic group derived from a heterocyclic compound,

(B) from 50 to 99.8 mol % of at least one anionic monomer selected from the group consisting of (B-1) an unsaturated carboxylic acid monomer represented by the formula (II):



$$\overset{R^4}{\underset{R^5}{C}}=\overset{R^6}{C}-COOM \qquad (II)$$

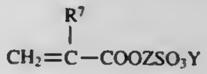
wherein

R^4 and R^5 independently stand for a hydrogen atom, a methyl group, or $—COOM$ and R^4 and R^5 do not simultaneously stand for $—COOM$,

R^6 stands for a hydrogen atom, a methyl group, or $—CH_2COOM$, providing that R^4 and

R^5 independently stand for a hydrogen atom or methyl group where R^6 is $—CH_2COOM$, and

M stands for a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium group, or an organic amine group and (B-2) a sulfoalkyl(meth)acrylate type monomer represented by the formula (III):



$$CH_2=\overset{R^7}{C}-COOZSO_3Y \qquad (III)$$

wherein

R^7 stands for a hydrogen atom or a methyl group, Z stands for an alkylene group of 1 to 4 carbon atoms, and

Y stands for a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium group, or an organic amine group, and

(C) from 0 to 49.8 mol % of an other monomer co-polymerizable with any of the monomers (A), (B-1), or (B-2), selected from the group consisting of: methacrylic acid alkyl esters; vinyl sulfonic acid, styrene sulfonic acid, allyl sulfonic acid, methallyl sulfonic acid, and 2-acrylamide-2-methylpropane sulfonic acid, and the monovalent metal salts, divalent metal salts, ammonium salts, and organic amine salts of the said acids; hydroxyl group containing (meth)acrylates; (meth)acrylamides; styrene and p-methyl styrene; vinyl acetate, propenyl acetate; and vinyl chloride; and mixtures thereof,

provided the total of the monomers of (A), (B-1), (B-2), and (C) is 100 mol % wherein said copolymer

(a) is a water soluble low molecular copolymer made from 0.2 to 20 mol % of the nonionic monomer (A), 50 to 99.8 mol % of at least one anionic monomer (B), and 0 to 49.8 mol % of the other monomer (C), having a weight-average molecular weight in a range of from 1000 to 39000, an adsorption ratio relative to carbonaceous solids in a range of from 5 to 50%, and an adsorption ratio relative to clayish mineral particles in the range of from 5 to 40% and said copolymer

(b) is a water soluble high molecular copolymer made from 0.2 to 20 mol % of the nonionic monomer (A), 50 to 99.8 mol % of at least one anionic monomer (B), and 0 to 49.8 mol % of the other monomer (C), having a weight-average molecular weight in a range not less than 40000, an adsorption ratio relative to carbonaceous solids in a range not less than 50%, and an adsorption ratio relative to clayish mineral particles in a range not less than 40% at a weight ratio, (a)/(b), in the range of from 10/90 to 99/1.

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5,690,705

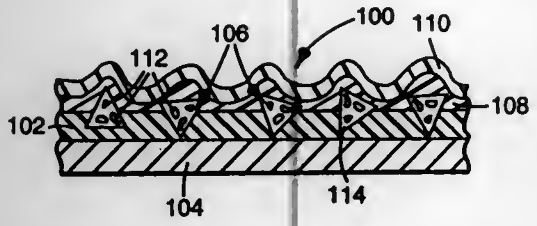
METHOD OF MAKING A COATED ABRASIVE ARTICLE COMPRISING PRECISELY SHAPED ABRASIVE COMPOSITES

Gary L. Holmes, Vadnais Heights; Scott R. Culler, Burnsville, both of Minn.; David H. Hardy, New Richmond; William A. Hendrickson, St. Joseph, both of Wis.; Thomas P. Klun, Lakeland, Minn.; Kimberly K. Harmon, Hudson, Wis.; Robert V. Helti, Hudson, Wis.; Kathryn M. Spurgeon, River Falls, Wis., and Charles J. Studiner, III, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 446,468, May 22, 1995, abandoned, which is a division of Ser. No. 85,638, Jun. 30, 1993, Pat. No. 5,549,962. This application Jun. 24, 1996, Ser. No. 673,456

Int. Cl.^{6} B24B *1/00*

U.S. Cl. 51—295 **4 Claims**



1. A method of making a coated abrasive article comprising the steps of:

a. providing a backing having a front surface and a back surface;
b. applying to the front surface of said backing a first curable bonding medium;
c. preparing a plurality of discrete, precisely shaped composites each comprising an organic binder and abrasive grits;
d. applying said plurality of discrete, precisely shaped composites into said bonding medium;
e. solidifying said curable bonding medium;
f. applying a second curable bonding medium over said precisely shaped composites; and
g. solidifying said second curable bonding medium.

5,690,706

ABRASIVE BODY

Iakovos Sigalas, 112 3rd Street, Linden, Johannesburg; Martin Kramer, 80 Davidson Street, Fairland, Johannesburg; Johan Myburgh, 13 Shelley Drive, Kloofendal Ext. 3, Florida; Serdar Ozbayraktar, 12 Frequency Turn, Radiokop Ext. 10, Roodepoort, and Siu-Wah Wai, 22 Buffalo Street, Albertsdal, Alberton, all of South Africa

Filed Dec. 5, 1995, Ser. No. 567,263

Claims priority, application South Africa, Dec. 6, 1994, 94/9699

Int. Cl.^{6} B24D *3/24*

U.S. Cl. 51—307 **6 Claims**

1. A method of manufacturing an abrasive body comprising the steps of:

providing a mixture comprising a mass of nanosized ceramic particles and a mass of ultra-hard abrasive particles comprised of diamond or cubic boron nitride particles, wherein the ultra-hard abrasive particles in the mixture do not exceed 35 percent by volume of the mixture; and

sintering of the mixture into a coherent body at a temperature of 800° C. to 1500° C. and a pressure of up to 300 MPa.

5,690,707

ABRASIVE GRAIN COMPRISING MANGANESE OXIDE

William P. Wood, Golden Valley, and Henry A. Larmie, Oakdale, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 284,042, Aug. 1, 1994, abandoned, which is a continuation of Ser. No. 173,401, Dec. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 995,964, Dec. 23, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 459,548

Int. Cl.^{6} C09C *1/68*

U.S. Cl. 51—309 **51 Claims**

1. An abrasive grain comprising a ceramic alpha alumina-based material (i) having an alpha alumina submicrometer, faceted microstructure and (ii) having therein:

(a) at least 0.1 percent by weight manganese oxide; and
(b) at least 0.1 percent by weight oxide selected from the group consisting of zirconium oxide, yttrium oxide, lanthanum oxide, neodymium oxide, cerium oxide, praseodymium oxide, samarium oxide, gadolinium oxide, erbium oxide, ytterbium oxide, dysprosium oxide, europium oxide, hafnium oxide, and mixtures thereof,

based on the total weight of said ceramic alpha alumina-based material, wherein said manganese oxide and said oxide of (b) are collectively present in an amount sufficient to provide an abrasive grain having an average hardness of at least 19 GPa.

5,690,708

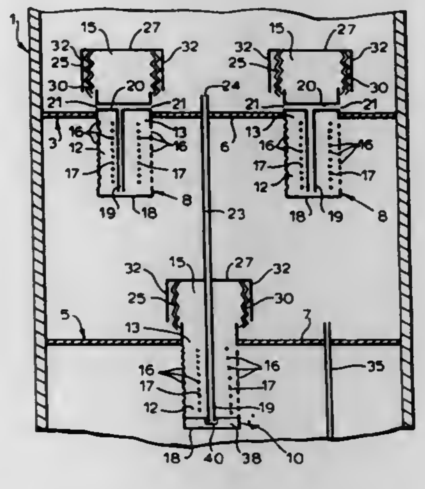
COLUMN FOR CONTACTING GAS AND LIQUID

Anton Matthijs Danckaarts, and Enno Frank Wijn, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 8, 1995, Ser. No. 555,060

Int. Cl.^{6} B01D *3/26*

U.S. Cl. 55—257.2 **7 Claims**



1. A column for contacting upwardly flowing gas with downwardly flowing liquid, wherein said column comprises a horizontal tray comprising a plate provided with a tubular gas/liquid contact device, wherein said tubular gas/liquid contact device comprises a contact section located below said plate, a separation section located above said contact section, and an outlet section located above said separation section and above said plate, wherein said contact section is closed at its bottom, wherein the wall of said contact section is provided with a plurality of tangential gas inlets, wherein a liquid delivery tube opens into the lower end of said contact section, wherein said outlet section comprises a gas permeable wall provided with coalescer means, wherein the top of said outlet section is provided with a cover and wherein said liquid delivery tube is a downcomer tube extending downwards through said cover and said tubular gas/liquid contact device.

5,690,709

SEPARATION APPARATUS TO REMOVE PARTICLES FROM A GAS STREAM

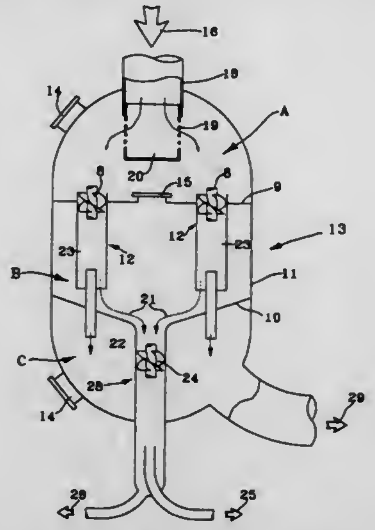
Peter Haddon Barnes, 29 Kokoda Avenue, Wahroonga, New South Wales 2076, Australia

Filed Aug. 6, 1996, Ser. No. 692,090

Claims priority, application Australia, Aug. 9, 1995, PN4740

Int. Cl.^{6} B01D *45/12*

U.S. Cl. 55—348 **6 Claims**



1. A separator apparatus for treating a heated feed gas having entrained particulate material, said separator apparatus comprising:

a casing divided into three separate casing zones separated by dividers, with a gas inlet into a first casing zone of said separate casing zones;

a plurality of uniflow centrifugal separators supported by the dividers, with a gas inlet for each of said uniflow centrifugal separators from the first casing zone of said casing zones, each of said uniflow centrifugal separators for centrifugally redistributing particulate material in a feed gas passing through the uniflow centrifugal separator for providing a particle rich underflow gas stream and a particulate lean larger volume overflow gas stream;

an overflow gas stream discharge from each of said uniflow centrifugal separators into the third casing zone of said casing zones;

a discharge port connecting the third casing zone of said casing zones to an exterior of said casing;

an underflow gas stream discharge from each of said uniflow centrifugal separators into the second casing zone of said casing zones; and,

underflow gas delivery means passing through the third casing zone of said casing zones for connecting the second of said casing zones to the exterior of said casing.

5,690,710

SELF-CLEANING FILTER

Paul F. Stephan, 1205 Sheppard Rd., Rockton, Ill. 61072

Filed Aug. 13, 1996, Ser. No. 665,253

Int. Cl.^{6} B01D *45/02*

U.S. Cl. 55—366 **11 Claims**

1. A filtering apparatus for removing entrained particulate from an intermittently flowing stream of fluid, said apparatus comprising:

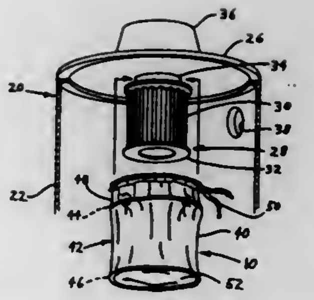
a filter portion located in the path of the fluid stream and formed from a porous cloth-like material for removal of particulate from the fluid, said filter portion being formed with first and second end portions;

means for holding said first end portion in a first position; and

means for biasing said second end portion toward a second position;

said filter portion being sufficiently flexible to bow in the direction of the fluid flow as the fluid flows therethrough such that said second end portion is drawn toward said first end portion;

said biasing means generally straightening said filter portion when said stream is not flowing.



5,690,711

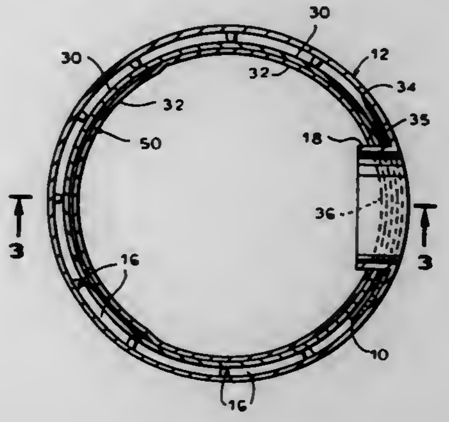
VACUUM BAG WITH REINFORCEMENT PATCH

Mark D. Bosses, Montvale, N.J., assignor to Home Care Industries, Inc., Clifton, N.J.

Filed Dec. 28, 1995, Ser. No. 579,912

Int. Cl.^{6} B01D *29/27*

U.S. Cl. 55—380 **11 Claims**



1. In a vacuum bag for a vacuum cleaner having a dirt-laden air outlet, said vacuum bag comprising:

(A) an air-permeable outer bag formed of paper;
(B) an air-permeable inner bag formed of meltblown thermoplastic polymeric material disposed within said outer bag; and
(C) an air-impermeable collar disposed on an outer surface of said outer bag;
said inner bag, said outer bag and said collar defining therethrough a channel of given area for passage therethrough of a dirt-laden air outlet into said inner bag;
the improvement wherein said vacuum bag additionally includes:
(D) an air-impermeable reinforcement patch; formed of flash-spun polyolefin material disposed opposite and at least partially below said channel when said vacuum bag is in use;
thereby to protect a portion of said outer bag generally opposite the outlet from penetration and tearing by particles entrained in the dirt-laden air expelled at high speed from the outlet.

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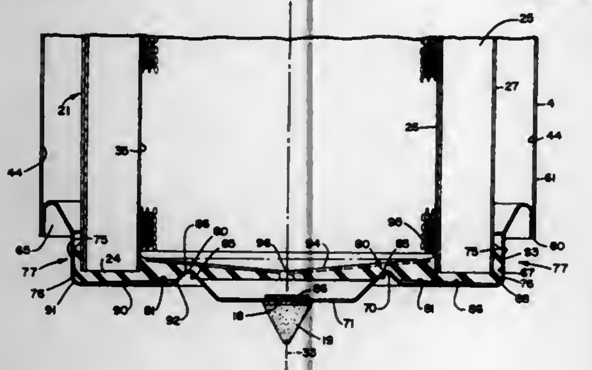
5,690,712
REVERSE FLOW AIR FILTER ARRANGEMENT AND METHOD

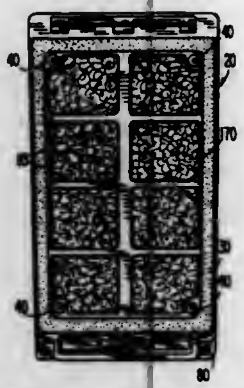
Donald Francis Engel, Prior Lake, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.
Division of Ser. No. 344,371, Nov. 23, 1994, Pat. No. 5,613,992. This application Oct. 31, 1996, Ser. No. 742,244
Int. Cl.⁶ B01D *27/06*
U.S. Cl. 55—428 **20 Claims**



1. An air filter element comprising:
(a) a first end cap having an air inlet opening therein;
(b) a second end cap;
(c) a cylindrical extension of filter media defining an open filter interior and having an inside diameter, the filter media being potted within the first and second end caps;
(d) an inner support liner;
(e) an outer support liner;
(f) the second end cap having:
  (i) a central drainage aperture, said central drainage aperture being substantially smaller than the inside diameter of the filter media; and,
(g) an interior surface positioned within said open filter interior and constructed and arranged to funnel moisture to said central drainage aperture; said interior surface extending between said inner support liner and said central drainage aperture, on an opposite side of said inner support liner from said filter media.

5,690,713
FILTER AND ACCESSORY MOUNT FOR UPRIGHT VACUUM CLEANER EXHAUST PORT

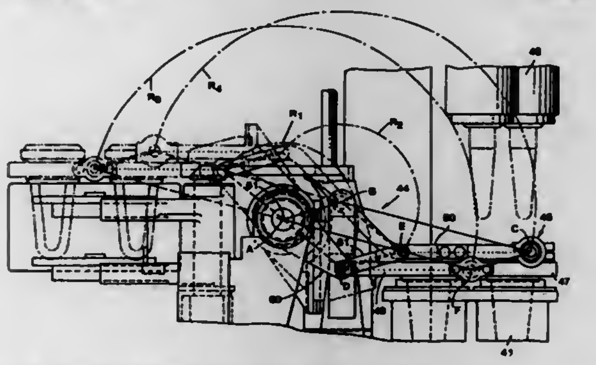
Leonard E. Bowerman, Abingdon, Va.; Jeffrey P. Chandler, Blountville; Peter Hoekstra, Bristol, both of Tenn.; Michael J. Kowalski, Bristol, Va., and Carla B. Rogers, Kingsport, Tenn., assignors to Electrolux Corporation, Atlanta, Ga.
Division of Ser. No. 527,696, Sep. 13, 1995. This application Jan. 22, 1997, Ser. No. 786,290
Int. Cl.⁶ B01D *35/02*
U.S. Cl. 55—490 **14 Claims**



10. An exhaust port adapter for use with an upright vacuum cleaner comprising (a) a suction base, and (b) a body, said body having therein (1) a filter bag and (2) a suction fan downstream of said filter bag for drawing air through said filter bag for filtering dirt from said air, said body further having (3) an exhaust port for exhausting air exiting from said filter bag, said exhaust port comprising at least one exhaust port opening in said body, each said at least one exhaust port opening having at least one exhaust port edge, said exhaust port adapter comprising:
a base for mounting on said body over said exhaust port, said base having:
double-sided adhesive closed-cell foam tape for attaching said base to said exhaust port, said foam tape surrounding said exhaust port and forming a seal between said exhaust port and said base for preventing air passing through said exhaust port from bypassing said exhaust port adapter; and
a releasable engagement structure for releasably attaching accessories to said exhaust port.

5,690,714
METHOD FOR FORMING WIDE MOUTH GLASSWARE

Wayne E. Eilers, Perrysburg, Ohio, assignor to Owens-Brockway Glass Container Inc., Toledo, Ohio
Division of Ser. No. 281,718, Jul. 28, 1994, Pat. No. 5,588,981. This application Nov. 18, 1996, Ser. No. 751,495
Int. Cl.⁶ C03B *9/193*
U.S. Cl. 65—76 **9 Claims**

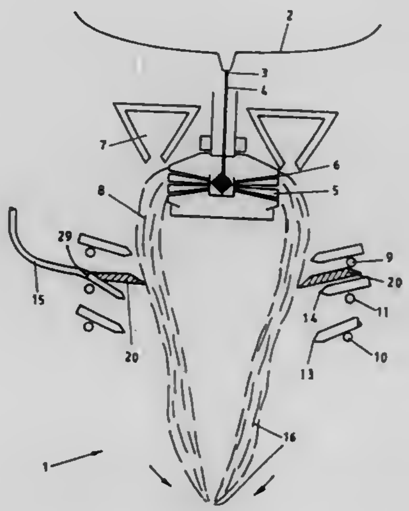


1. A method of making wide-mouth glassware comprising
providing a solid blank mold,
providing a split blow mold comprising mold halves,
providing a split neck ring,
providing a plunger carrier having a movable plunger thereon,
providing a neck ring holder for holding said neck ring,
pivotally supporting said neck ring holder on said neck ring arm,
pivotally supporting said arm about a first fixed horizontal axis,
positioning the neck ring on said blank mold,
delivering a gob of molten glass directly to said blank mold,
positioning said plunger carrier into engagement with said neck ring,
extending the plunger relative to the plunger carrier into said blank mold to deform the glass and force the glass into the neck ring to form a parison,
thereafter, retracting the plunger carrier relative to the blank mold and moving the plunger carrier away from the neck ring,
moving the neck ring with the parison thereon to a position between the open blow mold halves while maintaining the parison in vertical upright position,
said step of moving the neck ring with the parison thereon to a position between the open blow mold halves while maintaining the parison in vertical upright position comprises providing a transfer arm, pivoting one end of the transfer arm about a second fixed horizontal axis spaced from the first horizontal axis, pivoting the other end of the transfer arm to the neck ring holder and pivotally connecting said transfer arm to said first horizontal axis such that the pivotal movement of said neck ring arm about said first horizontal axis causes said transfer arm to move about said second horizontal axis and maintain said parison in vertical upright position as the neck ring is moved to a position between the open blow mold,
closing the blow mold about the parison,
opening the neck ring to release the parison to the blow mold,

returning the neck ring to its original position adjacent the blank mold,
blowing the parison into a hollow glass article,
opening the blow mold,
removing the blown glass article.

5,690,715
GLASS FIBER MANUFACTURING PROCESS AND PLANT

Helmut Schiwek, Am Waldessaum 7, Duisburg D-47057, Germany
PCT No. PCT/DE94/00007, § 371 Date Jul. 24, 1995, § 102(e) Date Jul. 24, 1995, PCT Pub. No. WO94/17004, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 7, 1994, Ser. No. 495,472
Claims priority, application Germany, Jan. 23, 1993, 43 01 837.8; Jan. 23, 1993, 43 01 842.4; Jul. 24, 1993, 43 24 897.7; Jul. 28, 1993, 43 25 267.2
Int. Cl.⁶ C03B *37/04;* **C03C** *25/02*
U.S. Cl. 65—448 **10 Claims**

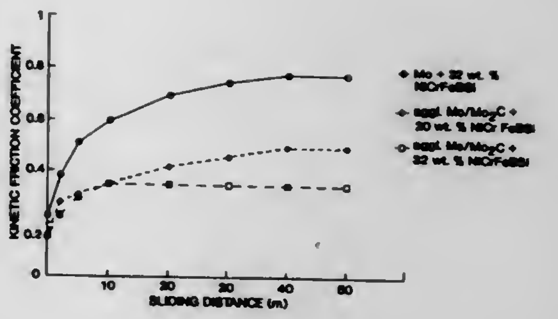


1. A process for manufacturing glass fibers from sand, recycled glass and additives comprising providing a glass material mixture, melting the mixture into liquid glass, forming glass fibers from the liquid glass by pressing the liquid glass through openings in a turn table, spraying water on the glass fibers, spraying a binder on the glass fibers, and shaping the glass fibers under pressure into a mat structure, wherein the binder is a mixture of starch and silicone, wherein the binder is about 6 to 8 weight percent related to the glass fibers, wherein the starch is a long-chain starch, wherein the starch is heated to a temperature of 50 to 60 degrees Celsius, kept at the temperature and stirred until sprayed, and wherein spraying the binder further comprises spraying the silicone and spraying the starch onto the glass fibers simultaneously through separate nozzles.

5,690,716
THERMAL SPRAY POWDER

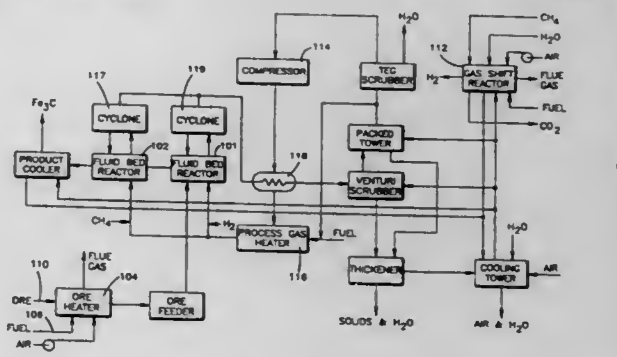
Sanjay Sampath, Setauket, N.Y., assignor to Osram Sylvania Inc., Danvers, Mass.
Continuation-in-part of Ser. No. 304,110, Sep. 9, 1994, abandoned. This application Feb. 17, 1995, Ser. No. 390,732
Int. Cl.⁶ C22B *19/03;* **B22F** *1/00*
U.S. Cl. 75—231 **11 Claims**

1. A thermal spray powder comprising a blend of an agglomerated molybdenum/dimolybdenum carbide powder and a self-fluxing NiCrFeBSi alloy powder.



5,690,717
IRON CARBIDE PROCESS

James E. Stevens, Bay Village, and Arden W. Swanson, North Olmsted, both of Ohio, assignors to Iron Carbide Holdings, Ltd., Lakewood, Colo.
Filed Mar. 29, 1995, Ser. No. 410,186
Int. Cl.⁶ C22B *5/14*
U.S. Cl. 75—381 **9 Claims**



1. In a process of producing iron carbide in a fluid bed reactor comprising introducing an iron containing reactor feed into a fluid bed reactor, contacting said feed in said reactor with a reactant gas comprising a reducing gas and a carburizing gas to convert at least a portion of said feed to iron carbide, the improvement comprising reacting said iron containing reactor feed in at least two separate fluid bed reactors, each of said reactors having respective reactant gas compositions, temperatures and pressures and wherein at least one process parameter selected from temperature, and reactant gas composition is controlled in each reactor independently of each other reactor.

5,690,718
BATTERY PASTE RECYCLING PROCESS

Cullen M. Sabin, San Diego, Calif., assignor to Global Aener/Cology Corp., Westlake Village, Calif.
Filed Oct. 6, 1995, Ser. No. 539,993
Int. Cl.⁶ C22B *3/04;* **C01G** *21/14*
U.S. Cl. 75—711 **21 Claims**

1. A method of separating lead containing particles from battery paste, comprising the steps of:
providing an aqueous slurry of used lead-acid battery paste material particles comprising aggregates of metallic lead-containing particles, wherein at least some of the aggregates include crystal lead sulfate bonds between metallic lead-containing particles;
breaking said battery paste material particles by impinging a flow of said slurry against a barrier to form an aqueous suspension of metallic lead-containing particles;
separating a portion of the metallic lead-containing particles from said battery paste material particles on the basis of particle size by directing said aqueous suspension in an upward flow of a solution having sufficient velocity that said

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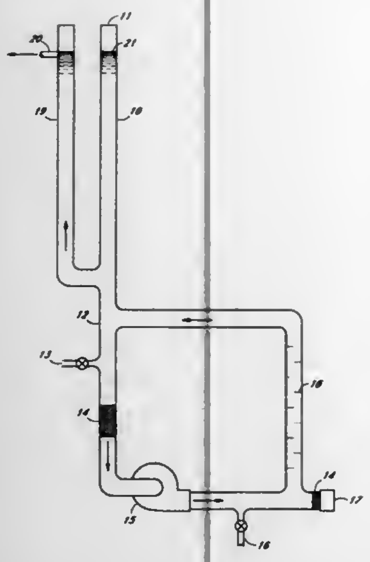


metallic lead-containing particles are carried upward with said upward flow and battery paste material particles larger than said metallic lead-containing particles are not carried upward; and

collecting a portion of said metallic lead-containing particles that are carried upward with said flow.

5,690,719

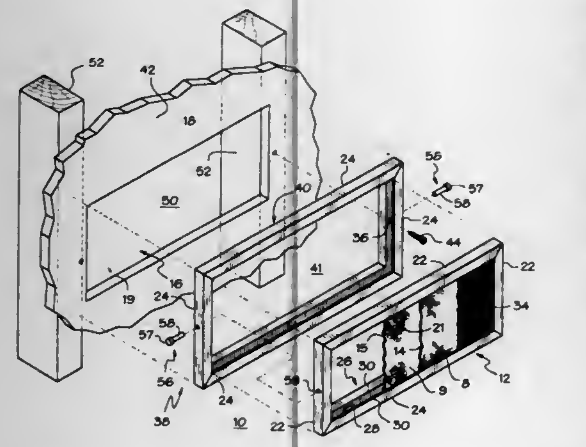
REMOVABLE FILTER FOR A FORCED AIR DUCT GRILL

Joseph Hodge, P.O. Box 652, Owensville, Ohio 45160

Filed Oct. 19, 1995, Ser. No. 545,234

Int. Cl.⁶ B03C *3/30;* B01D *46/10*

U.S. Cl. 96—17 **19 Claims**



1. A filter apparatus for mounting over an opening at an end of a duct of a forced air system, said filter apparatus comprising:

a filter frame having sidewalls between an open front end and an open back end,

said filter frame having a channel with channel wall elements extending generally perpendicular to and inwardly of said sidewalls such that said channel opens inwardly of said sidewalls,

a sheet of filter material behind a grill, both of which are peripherally disposed within said channel, wherein said filter material is a self charging electrostatic washable material, and

a wall mount means for mounting said filter frame on a wall over an opening.

5,690,720

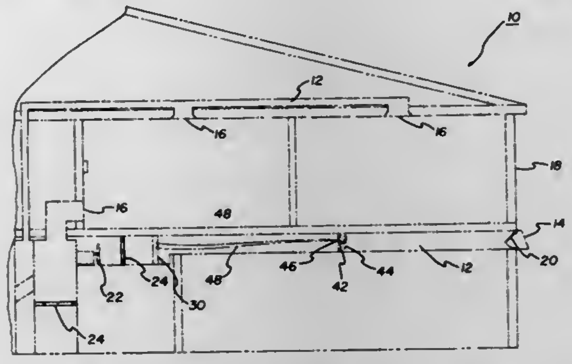
AROMATIC AIR CIRCULATION AND FILTRATION SYSTEM

Joel J. Spero, 715 Silverwood Cir., Annapolis, Md. 21403

Filed Mar. 4, 1996, Ser. No. 610,210

Int. Cl.⁶ B03C *3/68*

U.S. Cl. 96—26 **3 Claims**



2. A self-powered electrostatic filter comprising:

an electrostatic filter comprising a layer of an air pervious material including fiberglass and a pair of thin conductive mesh grids each coupled on an opposite side of the air pervious material, the filter comprising a sleeve coupled about the air pervious material and conductive grids for allowing the filter to be fitted within at least one air duct of an air circulation system,

a portable turbine for generating power, the turbine situated in at least one air duct and comprising vanes for rotating upon the receipt of flowing air generated via a fan and a pair of contacts for communicating said power, and

a pair of control lines connected between the electrostatic filter and the contacts of the turbine.

5,690,721

WATER-BASE INK FOR INK JET RECORDING

Hiroshi Itoh, Nagano-ken, Japan, assignor to Seiko Epson Corporation, Tokyo-to, Japan

PCT No. PCT/JP95/00206, § 371 Date Oct. 11, 1996, § 102(e) Date Oct. 11, 1996, PCT Pub. No. WO95/21897, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 14, 1995, Ser. No. 687,585

Claims priority, application Japan, Feb. 14, 1994, 6-017570; Jul. 22, 1994, 6-171297

Int. Cl.⁶ C09D *11/02*

U.S. Cl. 106—31.13 **20 Claims**

1. A water-base ink composition comprising a water-insoluble colorant, a water-soluble organic solvent, and water,

the ink composition being substantially free from any dispersant,

the water-insoluble colorant having a solubility in water at 20° C. of not more than 1% by weight and being soluble in the water-soluble organic solvent,

the water-insoluble colorant being in a dispersed state in the ink composition.

5,690,722

USE OF TETRAFLUOROPROPANOL AS CO-SOLVENT IN INK-JET INK VEHICLES

Norman E. Pawlowski, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 28, 1996, Ser. No. 738,531

Int. Cl.⁶ C09D *11/02*

U.S. Cl. 106—31.58 **22 Claims**

1. An ink-jet ink composition for ink-jet printing comprising at least one colorant and a vehicle, said vehicle including tetrafluoropropanol.

5,690,723

INK COMPOSITION SUITABLE FOR INK JET RECORDING

Yukari Sano; Junko Takatsuna; Kazuaki Watanabe, and Kiyohiko Takemoto, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 17, 1996, Ser. No. 587,578

Claims priority, application Japan, Jan. 18, 1995, 5-005854

Int. Cl.⁶ C09D *11/02*

U.S. Cl. 106—31.75 **15 Claims**

1. An ink composition comprising a pigment, a dispersant, and water,

the dispersant being a polymeric dispersant having a carboxyl group,

the ink composition further comprising

a hydroxide of an alkali metal and

an alcoholamine baving at least one hydroxyl group.

5,690,724

PROCESS AND COMPOSITION FOR SLIP CASTING A CERAMIC POWDER

Virgil R. Hester, Delavan; Kurtis C. Kelley, Washington, and Michael C. Long, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 536,762, Sep. 29, 1995. This application Sep. 23, 1996, Ser. No. 717,673

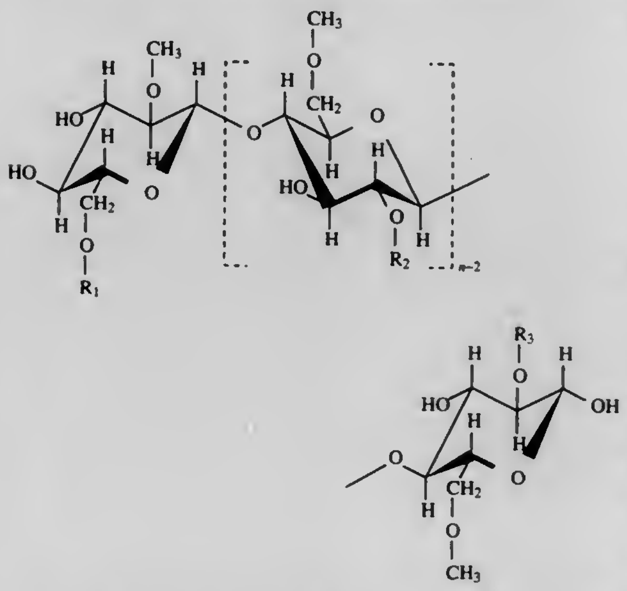
Int. Cl.⁶ C08L *1/28;* C04B *35/00*

U.S. Cl. 106—198.1 **6 Claims**

1. A ceramic slip composition, comprising:

a ceramic powder;

a polymeric cellulose ether having a general formula;



wherein R_1 is selected from the group consisting of CH_3 and $CH_2CH(OH)CH_3$; R_2 is selected from the group consisting of CH_3 and $CH_3CH(OCH_3)CH_3$; R_3 is selected from a group consisting of H and CH_3; and the value of n is at least 100;

water;

said ceramic powder and said polymeric cellulose ether being present in a weight ratio in the range of about 100:0.25 to about 100:1.25 ceramic powder:polymeric cellulose ether;

said blend of ceramic powder and polymeric cellulose ether being present in said water in a weight ratio of about 0.9:1.0 to about 1.0:0.9 blend:water; and

said ceramic slip composition having a viscosity in the range of about 1000 cP to about 5000 cP.

5,690,725

FORMULATION FOR INFUSION OF FRUIT

Jeffrey W. Tucker, Traverse City, Mich., assignor to Michigan Blueberry Growers Association, Grand Junction, Mich.

Filed Mar. 4, 1996, Ser. No. 610,182

Int. Cl.⁶ A23B *7/08*

U.S. Cl. 106—217.7 **8 Claims**

1. A formulation for the infusion of fruit or fruit pieces comprising a disaccharide sugar substance and a ketohexose substance wherein the disaccharide sugar substance is between 15% and 45% of the total amount of the disaccharide sugar substance and the ketohexose substance.

5,690,726

DIMETHYLALUMINUM HYDRIDE COMPOSITION, PROCESS FOR PRODUCING THE SAME AND METHOD OF REDUCING VISCOSITY OF DIMETHYLALUMINUM HYDRIDE

Kazuhisa Kajihara, and Tadaaki Yako, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 637,904, Apr. 26, 1996, abandoned. This application Dec. 11, 1996, Ser. No. 764,623

Claims priority, application Japan, Apr. 28, 1995, 7-106758; Jan. 30, 1996, 8-014117

Int. Cl.⁶ C07F *5/06*

U.S. Cl. 106—287.17 **24 Claims**

1. A dimethylaluminum hydride composition comprising dimethylaluminum hydride and at least one Lewis base in an amount of from about 0.001 to about 10% by weight based on the dimethylaluminum hydride.

5,690,727

THIN FILMS OF ABO_3 WITH EXCESS B-SITE MODIFIERS AND METHOD OF FABRICATING INTEGRATED CIRCUITS WITH SAME

Masamichi Azuma; Carlos A. Paz de Araujo, and Michael C. Scott, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Matsushita Electronics Corporation, Osaka, Japan

Division of Ser. No. 270,819, Jul. 5, 1994, Pat. No. 5,624,707, which is a continuation-in-part of Ser. No. 165,082, Dec. 10, 1993, which is a continuation-in-part of Ser. No. 132,744, Oct. 6, 1993, Pat. No. 5,514,822, which is a continuation-in-part of Ser. No. 993,380, Dec. 18, 1992, Pat. No. 5,456,945, Ser. No. 981,133, Nov. 24, 1992, Pat. No. 5,423,285, and Ser. No. 965,190, Oct. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991, abandoned, said Ser. No. 981,133is a continuation-in-part of Ser. No. 807,439. This application Jan. 27, 1997, Ser. No. 789,469

Int. Cl.⁶ C04B *35/46;* C07F *3/00;7/28*

U.S. Cl. 106—287.18 **4 Claims**

1. A non-stoichiometric metal oxide precursor solution for fabricating integrated circuit thin films, said precursor solution comprising:

a stoichiometric portion including total A-site and total B-site metals in a 1:1 ratio capable of satisfying a formula; and

excess B-site material added to said stoichiometric portion including B-site material in an amount ranging from 0.01 mol % to 100 mol % of the amount of total amount of B-site material required to satisfy said formula.

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5,690,728

WAY TO SYNTHESIZE STRUCTURED COMPOSITE PREMIUM PIGMENTS

Sathanjheri A. Ravishankar, Macon, Ga., assignor to Nord Kaolin Company, Jeffersonville, Ga.

Filed Jan. 2, 1996, Ser. No. 582,207

Int. Cl.^{6} C09C *1/36*

U.S. Cl. 106—416 **8 Claims**

1. A chemically aggregated kaolin based composite after removal from the slurry in which it was produced useful as a pigment comprising:

(a) from 2 to 60 parts by weight of particulate titanium dioxide;
(b) from 4 to 97.9 parts by weight of calcined clay;
(c) from 0.04 to 88.2 parts by weight of a pigment extender selected from the group consisting of:
  (i) hydrous kaolin;
  (ii) silica;
  (iii) ground calcium carbonate of particle size essentially 100% by weight finer than 5 μm e.s.d.;
  (iv) precipitated calcium carbonate of a particle size which is essentially 100% by weight finer than 5 μm e.s.d.;
  (v) needle-shaped woolastonite particles, with an aspect ratio of from 5:1 to 2:1 of the length of the particle in relation to its diameter; and
(d) from 0.01 to 20 parts by weight of polyaluminum chloride (PAC) with a degree of basicity as defined by the following relationship:

$$\% \text{ Basicity} = \frac{[OH]}{3*[Al]} *100,$$

of between 10 and 90%;

wherein the sum of the amount of said calcined clay in parts, by weight, and the amount of said pigment extender in parts, by weight, is from 40 to 98 parts, by weight.

5,690,729

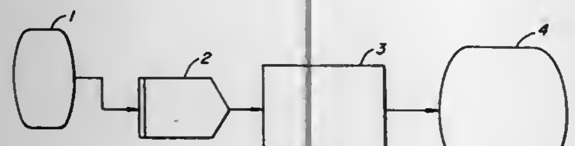
CEMENT MIXTURES WITH ALKALI-INTOLERANT MATTER AND METHOD

Roger H. Jones, Jr., Reno, Nev., assignor to Materials Technology, Limited, Reno, Nev.

Continuation-in-part of Ser. No. 309,955, Sep. 21, 1994, abandoned. This application Jan. 27, 1995, Ser. No. 390,468

Int. Cl.^{6} C04B *22/06*

U.S. Cl. 106—682 **58 Claims**



1. A method of protecting alkali-intolerant material in a cured cement product comprising the steps of mixing dry cement, ground calcite, and an alkali-sensitive material, adding water to form a paste, molding the paste into a product, curing the product, exposing the cured product to carbon dioxide, and reducing the pH of the mixture to about 7 by generating calcium carbonate in calcite form.

5,690,730

SINTERING METHOD OF CEMENT CLINKERS AND SINTERING APPARATUS OF THE SAME

Isao Hashimoto, Akashi; Shozo Kanamori, Miki; Mikio Murao, Kobe; Norio Yokota, Tokyo; Nichitaka Sato, Tokyo, and Katsuji Mukai, Tokyo, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, and Sumitomo Osaka Cement Co., Ltd., Tokyo, both of Japan

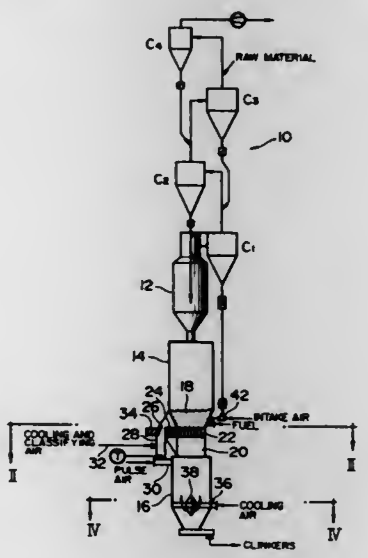
PCT No. PCT/JP95/01748, § 371 Date Apr. 23, 1996, § 102(e) Date Apr. 23, 1996, PCT Pub. No. WO96/07622, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 1, 1995, Ser. No. 637,765

Claims priority, application Japan, Sep. 8, 1994, 6-240686

Int. Cl.^{6} C04B *7/45;7/47;* **F27B** *7/02;15/00*

U.S. Cl. 106—744 **16 Claims**



1. A method of sintering cement clinkers comprising the steps of:

a) preheating raw cement powder material;
b) granulating and sintering said preheated raw cement powder material in a combined fluidized bed granulating and sintering furnace to form granulated and sintered clinkers;
c) classifying said clinkers above a clinker dropping hole and on a discharging grooved portion, said clinker dropping hole being provided in a radial direction extending from an upper surface of a fluidizing gas distributor of the granulating and sintering furnace through the discharging grooved portion, said grooved portion having a plurality of nozzles and being formed between the gas distributor and the clinker dropping hole;
d) discharging classified clinkers from the fluidized bed granulating and sintering furnace through said clinker dropping hole;
e) further classifying and cooling the clinkers by blowing air into a discharge chute connected to the clinker dropping hole while regulating the amount of the blown air in such a manner that granulated and sintered clinkers are quenched down to 1100° C. or lower, and wherein a flow velocity of the air blowing from the clinker dropping hole is different from a flow velocity of air flowing through the nozzles of the gas distributor; and
f) introducing the clinkers into a cooling device via hermetic discharge means provided below a classifying and cooling air intake position.

5,690,731

METHOD OF GROWING SINGLE CRYSTAL

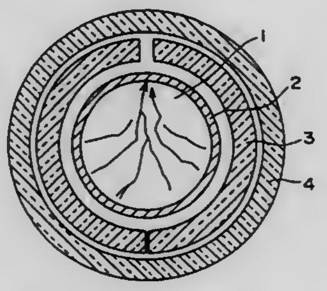
Yasushi Kurata; Kazuhisa Kurashige, and Hiroyuki Ishibashi, all of Tsukuba, Japan, assignors to Hitachi Chemical Company Ltd., Japan

Filed Mar. 30, 1995, Ser. No. 413,288

Claims priority, application Japan, Mar. 30, 1994, 6-059669; Mar. 30, 1994, 6-059670; Sep. 30, 1994, 6-236920

Int. Cl.^{6} C30B *15/20*

U.S. Cl. 117—13 **11 Claims**



11. A method of growing a single crystal, comprising the steps of:

a) heating raw materials in a crucible to obtain a melt of the raw materials;
b) contacting a lower end of a seed crystal with a surface of the melt; and
c) lifting the seed crystal, while rotating the seed crystal, to grow a single crystal, wherein:
  i) a solid-liquid interface configuration between the single crystal and said melt is changed from a protrusion toward the melt to a flat shape or a protrusion toward the seed crystal before the single crystal reaches a diameter within 50% of an inner diameter of the crucible; and
  ii) growing of a cylindrical body of said single crystal starts after the single crystal reaches said diameter.

5,690,732

METHOD OF AUTOMATICALLY GROWING A SINGLE CRYSTAL

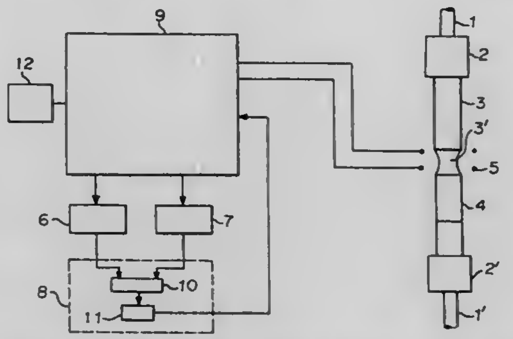
Shigeki Otani; Takaho Tanaka, and Yoshio Ishizawa, all of Tsukuba, Japan, assignors to National Institute for Research in Inorganic Materials, Tsukuba, Japan

Continuation of Ser. No. 725,898, Jul. 1, 1991, abandoned, which is a continuation of Ser. No. 469,053, Jan. 23, 1990, abandoned. This application Jun. 1, 1992, Ser. No. 891,914

Claims priority, application Japan, Jan. 26, 1989, 1-17076; Aug. 30, 1989, 1-223748

Int. Cl.^{6} C30B *15/20*

U.S. Cl. 117—14 **4 Claims**



1. A method of automatically growing a single crystal by using a floating-zone method in which a radio-frequency induction heating coil is utilized comprising the steps of:

monitoring the shape of a molten zone, after the formation thereof, only by comparing an anode voltage, in a radio-frequency oscillation tube, with a measured radio-frequency current flowing through said radio-frequency inducting heating coil, and

automatically adjusting the power for heating on the basis of the monitored comparison during and after the start of movement of said molten zone.

5,690,733

METHOD FOR RECHARGING OF SILICON GRANULES IN A CZOCHRALSKI SINGLE CRYSTAL GROWING OPERATION

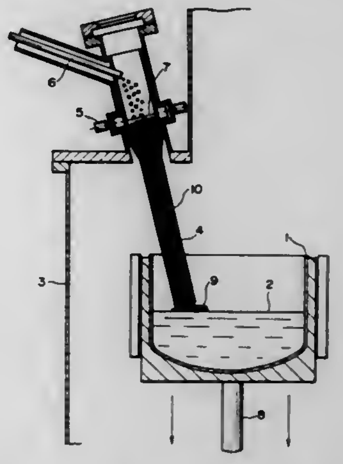
Naoki Nagai; Michiaki Oda; Seiichiro Ohtsuka, and Isamu Harada, all of Gunma-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1995, Ser. No. 552,494

Claims priority, application Japan, Nov. 21, 1994, 6-286246

Int. Cl.^{6} C30B *15/04*

U.S. Cl. 117—18 **7 Claims**



1. In a batch-wise process of Czochralski single crystal growing from a melt of silicon in a crucible, wherein a single crystal rod of silicon is grown and withdrawn from said crucible in a growing operation, after which growing is discontinued, and then said crucible is recharged with granules of polycrystalline silicon during a recharging operation in preparation for a subsequent growing operation, the improvement wherein said recharging operation comprises:

supplying said granules at a feed rate of at least about 50 g/second from a feeder into a feed conduit having a lower open end spaced by a gap above said melt in said crucible, and allowing said granules to fall through said feed conduit onto said melt and to form a backed-up supply of granules within said feed conduit; and

controlling an amount of said backed-up supply of granules within said feed conduit.

5,690,734

SINGLE CRYSTAL GROWING METHOD

Minoru Imaeda; Akihiko Honda; Katsuhiro Imai; Yuichiro Imanishi; Nobuyuki Kokune, all of Nagoya; Shoji Sogo, Komaki; Kazuaki Yamaguchi, Nagoya, and Tetsuo Taniuchi, Sendai, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 19, 1996, Ser. No. 616,525

Claims priority, application Japan, Mar. 22, 1995, 7-062585; Mar. 22, 1995, 7-062586; Mar. 24, 1995, 7-065883; Jun. 2, 1995, 7-0136578; Feb. 16, 1996, 8-029078

Int. Cl.^{6} C30B *15/02*

U.S. Cl. 117—18 **30 Claims**

1. A process for continuously producing single crystals products, comprising the steps of:

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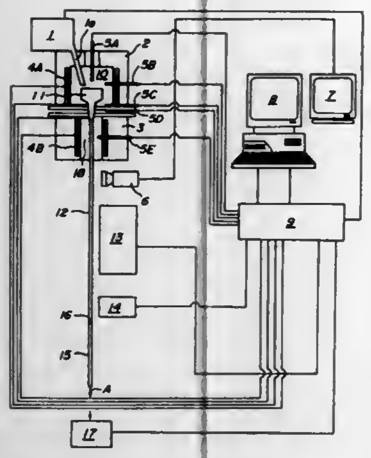


drawing downwardly a melt of a single crystal raw material through a nozzle extending from a crucible containing the melt, said nozzle having a single crystal growing-section, whereby a single crystal body is grown from the melt along the single crystal growing-section;
continuously downwardly moving the single crystal body; and
continuously forming a plurality of single crystal products by intermittently cutting the single crystal body being downwardly moved.

5,690,735
PROCESS FOR GROWING CRYSTALS

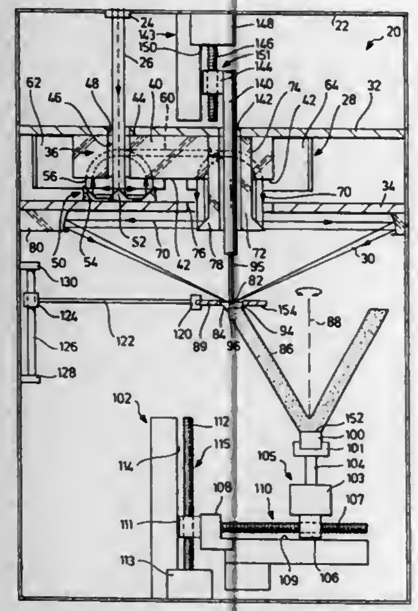
Uwe Becker, Stuttgart, Germany, assignor to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Germany

Filed Aug. 31, 1995, Ser. No. 521,686

Claims priority, application Germany, Aug. 31, 1994, 44 30 894.9

Int. Cl.^{6} C30B *13/02*

U.S. Cl. 117—35 **59 Claims**



1. A process for growing a crystal from a molten zone, said molten zone being heated and having a source material supplied to it, said source material being melted and deposited in crystalline form on a substrate from the molten zone, characterized in that the molten zone is mechanically stabilized by an annular wall member forming a boundary of the molten zone and being essentially immovable relative to the molten zone, a base member forming a lower boundary of the molten zone and being movable relative to the wall member and a meniscus arranged between the base member and the wall member.

5,690,736
METHOD OF FORMING CRYSTAL

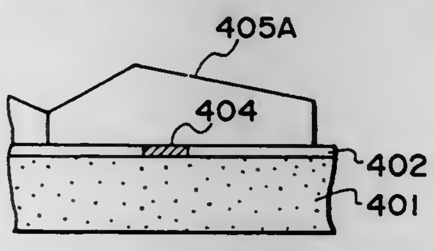
Hiroyuki Tokunaga, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 222,367, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 14,002, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 689,104, Apr. 23, 1991, abandoned, which is a continuation of Ser. No. 234,750, Aug. 22, 1988, abandoned. This application Jan. 31, 1996, Ser. No. 594,474

Claims priority, application Japan, Aug. 24, 1987, 62-209461

Int. Cl.^{6} C30B *25/04*

U.S. Cl. 117—86 **11 Claims**



1. A method for suppressing the generation of defects in a monocrystal which defects tend to form in applying crystal forming treatment to a substrate, comprising:

(a) minimizing generation of stress during said crystal forming treatment by providing a substrate having a surface which is divided into a nonnucleation surface subject to thermal stress at an interface with a growing monocrystal and a nucleation surface having a sufficiently small area so as to form only a single nucleus from which said monocrystal is grown and having a larger nucleation density than the nucleation density of said nonnucleation surface and said nonnucleation surface being a buffer layer sufficient to minimize the generation of thermal stress during a crystal forming step and having a thickness of at most 500 Å, wherein the surface of said buffer layer is constituted of a material having a nucleation density smaller by at least $10^3/cm^2$ than the nucleation density of said nucleation surface;

(b) forming by vapor deposition a single nucleus on said nucleation surface; and

(c) growing said monocrystal from said single nucleus by vapor deposition whereby said buffer layer causes structural change during the growing of said monocrystal and reduces generation of stress at the interface with said growing monocrystal.

5,690,737
PROCESS FOR FORMING EPITAXIAL BAF_2 ON GAAS

Francisco Santiago, Elkridge; Tak-Kin Chu, Bethesda, and Michael Stumborg, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 246,209, May 19, 1994, Pat. No. 5,435,264. This application May 31, 1995, Ser. No. 454,983

Int. Cl.^{6} C30B *25/18*

U.S. Cl. 117—92 **32 Claims**

1. A process for forming a uniform, single, crystal, epitaxial layer of barium fluoride on a single crystal gallium arsenide substrate comprising:

A. vapor depositing barium on a clean, hot single crystal gallium arsenide substrate at a temperature of from 500° C. to 700° C., in a vacuum having a background pressure of 10^{-8} millibars or less and wherein the barium deposition is slow enough to allow the barium vapor to react with the gallium arsenide substrate surface and form a uniform, epitaxial coating of barium/gallium arsenide reaction product and continuing until the reaction product layer is completed;

B. heating the barium/gallium arsenide reaction product layer at a temperature of from 500° C. to 700° C. in the absence of barium vapor in a vacuum having a background pressure of 10^{-8} millibars or less to remove unreacted barium; and then

C. reducing the temperature of the substrate to a temperature of from room temperature to a temperature less than 700° C. and depositing barium fluoride at a rate of from 1 to 100 Å per minute until the desired thickness of uniform, single crystal, epitaxial barium fluoride has been achieved.

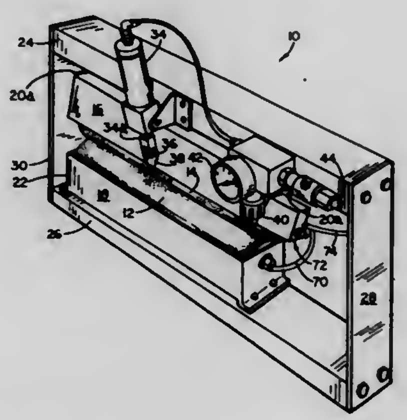
5,690,738
CONTACT LUBRICATOR WITH METERED SUPPLY

Charles W. Boelkins, 1188 Kirk Dr. SE., Grand Rapids, Mich. 49546

Continuation of Ser. No. 157,923, Nov. 24, 1993, abandoned. This application Dec. 12, 1995, Ser. No. 570,806

Int. Cl.^{6} B05C *1/00*

U.S. Cl. 118—249 **22 Claims**



1. A contact applicator for applying a metered and accurately controlled coating of liquid to surface areas of workpieces, comprising in combination:

at least one roller member of predetermined width having an outer surface and arranged to receive advancing workpieces on its outer surface and to rotate in contact such workpieces as they pass while applying said liquid to surfaces of such workpieces by contact therewith;

a source of said liquid, a pump in communication with said source for accurately and selectively metering uniform quantifies of said liquid from said source, and means coupled to said pump for conveying said metered liquid to said at least one roller:

said pump comprising a volumetric displacement device having a reciprocating member and a volumetric metering chamber which closely receives said reciprocating member and through which said reciprocating member is reciprocable to positively displace a precise quantity of said liquid therefrom whose volume is determined by the corresponding size of the metering chamber and reciprocating member, such that said positively displaced quantity of liquid comprises a specific metered volumetric quantity of said liquid, reciprocation of said member repeatedly displacing said specific metered quantity of said liquid to thereby precisely meter the amount of such liquid conveyed from said source to said roller; and

said means for conveying said metered liquid including outlet apertures for applying said metered quantities of liquid to said at least one roller to form a dispersion therefrom on the outer roller surface, for accurately controlled transfer of said liquid from said source to said workpiece surfaces by contact.

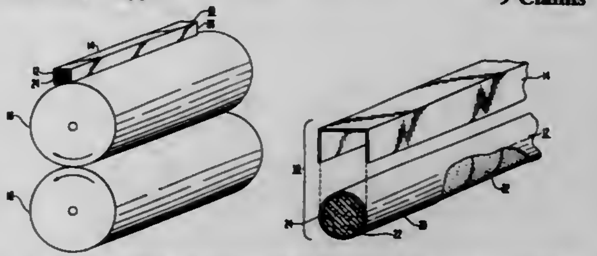
5,690,739
RELEASE AGENT SUPPLY WICK FOR PRINTER APPARATUS AND METHOD FOR MAKING AND USING SAME

Robert L. Sassa, Newark, Del.; Alex R. Hobson, and Elizabeth Marie Crowley, both of Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 127,670, Sep. 28, 1993. This application Jun. 1, 1995, Ser. No. 457,554

Int. Cl.^{6} B05C *1/06;11/105*

U.S. Cl. 118—260 **9 Claims**



1. A release agent delivery apparatus adapted to be mounted against a roller which comprises

an absorbent textile core filled with release agent;

a tubular permeable membrane of polytetrafluoroethylene (PTFE) surrounding the textile core to form a sheathed wick member with open ends; and

a mounting sleeve adapted to receive the sheathed wick member and retain the wick member in contact with the roller, wherein the sheathed wick member is readily removable from the sleeve and adapted to be reinserted therein with a different surface in contact with the roller.

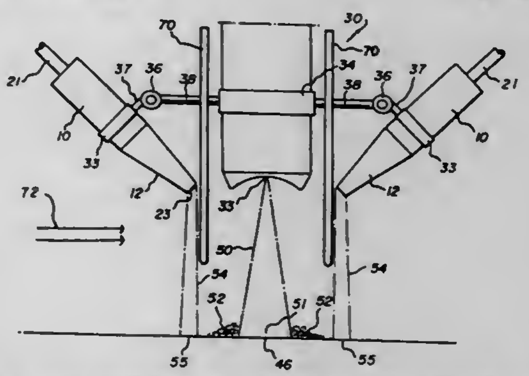
5,690,740
HIGH VOLUME LOW PRESSURE AIR ENTRAPMENT OF OVERSPRAY

William C. Smith, 7701 Whiterim Ter., Potomac, Md. 20854

Filed Jan. 19, 1996, Ser. No. 588,761

Int. Cl.^{6} B05B *1/28*

U.S. Cl. 118—300 **20 Claims**



1. Air chisel apparatus for containing overspray associated with the spraying of liquids and powders from a spray gun onto a work surface comprising:

an air chisel, said air chisel comprising:

a nozzle unit laterally disposed at the side of said spray gun,

said nozzle unit comprising an elongated nozzle for providing an air curtain of high volume low pressure air at said work surface,

conduit means for providing said elongated nozzle with high volume low pressure air,

a bore connecting said elongated nozzle and said conduit means, and wherein an air curtain consisting of high volume low pressure air is directed from said nozzle unit toward said work surface at an angle from 10° to 80° to a line perpendicular to said work surface, with said air curtain directed toward the point of impact of said spray with said work surface, and

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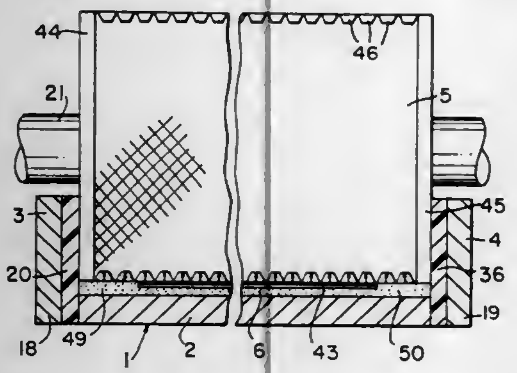
source means for providing said air chisel with high volume low pressure air, said air chisel having sufficient flow to blow said overspray against said work surface, thereby reducing the escape of said overspray into the atmosphere and producing a smoother finish on said work surface, and
support means for supporting said air chisel in proximity to said work surface.

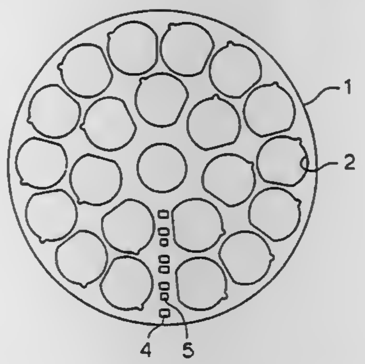
5,690,741
ARRANGEMENT FOR IMPREGNATING WEBS OF POROUS MATERIAL
Wolfram Dürr, Krefeld; Ernst Klas, Siegburg, and Udo Unger, Leichlingen, all of Germany, assignors to Vits Maschinenbau GmbH, Langenfeld, Germany
PCT No. PCT/EP95/03029, § 371 Date Mar. 27, 1996, § 102(e) Date Mar. 27, 1996, PCT Pub. No. WO96/06227, PCT Pub. Date Feb. 29, 1996
PCT Filed Jul. 31, 1995, Ser. No. 619,756
Claims priority, application Germany, Aug. 24, 1994, 44 29 939.7; Feb. 7, 1995, 295 01 918.2
Int. Cl.^{6} B05C *3/00*
U.S. Cl. 118—404 **9 Claims**



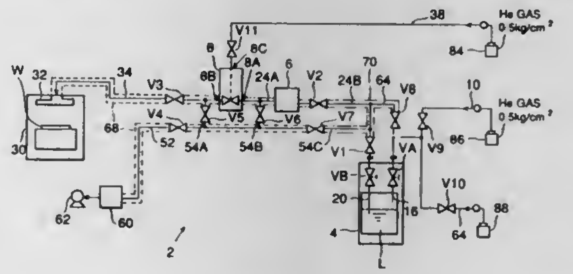
1. A device for impregnating webs composed of a porous material with a liquid impregnating agent under increased pressure, the device comprising, a cylinder rotatable around a horizontal axis and having end faces; a trough into which said cylinder partially dips so as to form a chamber between an inner surface of said trough and an outer surface of said cylinder, said trough having front faces with inner surfaces, a supply line for supplying the impregnating agent and terminating in said chamber; an inlet slit and an outlet slit for supplying and withdrawing a web to be impregnated; and sealing means for sealing said inlet slit, said outlet slit and a space between said end faces of said cylinder and said inner surfaces of said front ends of said trough, said sealing means having alternatingly arranged gaps and grooves to form a labyrinth seal, said grooves being provided with drain openings for flowing through of the impregnating agent.

5,690,742
SUSCEPTOR FOR AN EPITAXIAL GROWTH APPARATUS
Kazuro Ogata, Omura, and Kazuhisa Iwanaga, Takagi-machi, both of Japan, assignors to Komatsu Electronic Metals Co., Ltd., Hiratsuka, Japan
Filed Feb. 26, 1996, Ser. No. 607,211
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 118—500 **5 Claims**

1. A susceptor for an epitaxial growth apparatus comprising a plurality of pockets, said pockets adapted for holding semiconductor wafers with an orientation flat, said pockets having a periphery matching that of the semiconductor wafer including a flat edge matching the orientation flat of the semiconductor wafer, whereby a distance between centers of said pockets is reduced and a total number of said pockets is increased within said susceptor relative to pockets for semiconductor wafers having a completely circular periphery.

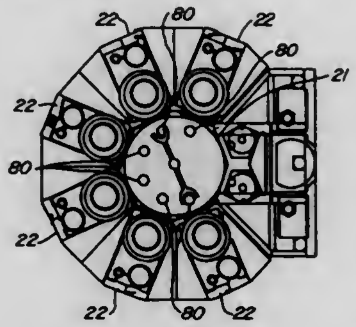


5,690,743
LIQUID MATERIAL SUPPLY APPARATUS AND METHOD
Seishi Murakami, Kofu, and Tatsuo Hatano, Nirasaki, both of Japan, assignors to Tokyo Electron Limited, Tokyo-to, Japan
Filed Jun. 27, 1995, Ser. No. 496,130
Claims priority, application Japan, Jun. 29, 1994, 6-170082
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 118—715 **5 Claims**



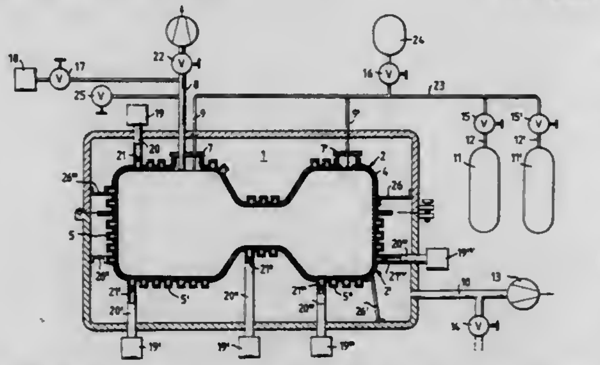
1. A deposition liquid material supply apparatus for supplying through pipes a low vapor pressure liquid material for deposition to a deposition chamber for depositing films on objects to be processed, the apparatus comprising:
a reservoir for storing the low vapor pressure liquid material;
an evaporator for exposing the low vapor pressure liquid material to a high flow rate gas to evaporate the liquid material;
a pressurization passage for pushing out the low vapor pressure liquid material by a pressure gas separately supplied by means connected to the reservoir;
a pressure liquid supply passage interconnecting the reservoir and the evaporator;
a flow rate control unit inserted in the pressure liquid supply passage for controlling a flow rate of the low vapor pressure liquid material flowing through the pressure liquid supply passage;
a vapor feed passage interconnecting the evaporator and the deposition chamber for flowing evaporated gas; and
heating means disposed in the vapor feed passage for preventing the evaporated liquid material from reliquefying,
wherein the pressure liquid supply passage and the vapor feed passage are connected to a discharge passage for low vapor pressure liquid material residue and gas residue in the pressure liquid supply passage and the evaporator through respective discharge shut-off valves, and the pressure liquid supply passage is connected to a purge liquid supply passage with a purge liquid supply valve inserted therein so as to clean the interior of the pressure liquid supply passage with a purge liquid when required, and discharge the used purge liquid through the discharge passage.

5,690,744
WAFER ORIENTATION ALIGNMENT SYSTEM
Richard F. Landau, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.
Continuation of Ser. No. 475,232, Jun. 7, 1995, abandoned. This application Oct. 10, 1996, Ser. No. 728,421
Int. Cl.^{6} C23C *36/00*
U.S. Cl. 118—715 **8 Claims**



1. A method of aligning a crystallographic orientation of a wafer in a sealable semiconductor processing system, said method comprising the steps of:
defining a desired wafer orientation;
remotely imaging said wafer with a video camera, said wafer coupled to a rotation stage;
determining said crystallographic orientation of said wafer while said system is sealed; and
rotating said stage until said crystallographic orientation of said wafer is aligned with said desired wafer orientation.

5,690,745
APPARATUS FOR PLASMA TREATMENT OF THE INSIDE SURFACE OF A FUEL TANK
Heinrich Grünwald, Butzbach; Hermann Kloberdanz, Linsengericht; Roland Lacher, Gelnhausen, and Siang-Hong Böll, Alzenau, all of Germany, assignors to Leybold AG, Hanau, Germany
Filed Oct. 17, 1995, Ser. No. 544,158
Claims priority, application Germany, Oct. 17, 1994, 44 37 050.4
Int. Cl.^{6} C23C *16/00*
U.S. Cl. 118—723 MW **8 Claims**



1. Apparatus for treating the inside surface of a hollow body having opening means therein, said apparatus comprising
a vacuum chamber,
shroud means located in said vacuum chamber and conforming to the shape of a hollow body received therein, said shroud means being provided with channel means which cooperate with said hollow body to form closed conduit means and opening means which align with the opening means of said hollow body,
closure means for closing the opening means of said shroud gas tight,
means for introducing a process gas into said hollow body, and
means for introducing microwaves into said closed conduit means.

5,690,746

Patent Not Issued For This Number

5,690,747
METHOD FOR REMOVING PHOTORESIST WITH SOLVENT AND ULTRASONIC AGITATION
Patrisha A. Doscher, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.
Division of Ser. No. 700,044, May 19, 1991, abandoned, which is a continuation of Ser. No. 354,529, May 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 196,903, May 19, 1988, Pat. No. 5,007,969. This application Jun. 5, 1995, Ser. No. 465,644
Int. Cl.^{6} B08B *3/12;* **C23G** *5/02*
U.S. Cl. 134—1 **7 Claims**

1. A method for removing photoresist comprising the step of contacting a part that is coated with photoresist with an effective amount of a solvent to remove the photoresist while ultrasonically agitating the solvent,
wherein the solvent comprises:
(a) 40–50 vol % of at least one aprotic, alicyclic carbonate, the carbonate including ethylene carbonate; and
(b) an effective amount of at least one aprotic polar compound selected from the group consisting of alkyl diesters, alkyl diethers, alkyl compounds containing both ester and ether groups, and mixtures thereof, the solvent being effective at removing photoresist by immersion of the photoresist-coated part in an ultrasonically agitated bath;
the polar compound including ethylene diacetate, ethylene dibutyrate, or mixtures thereof; and
the solvent including N-methyl-2-pyrrolidone and triethanolamine.

5,690,748
PROCESS FOR THE ACID PICKLING OF STAINLESS STEEL PRODUCTS
Dominique Henriet, Chambourcy, France, assignor to Ugine Aciers de Chatillon et Gueugnon, Gueugnon, France
Continuation of Ser. No. 840,183, Feb. 24, 1992, abandoned. This application Nov. 10, 1993, Ser. No. 150,254
Int. Cl.^{6} C23G *1/02*
U.S. Cl. 134—3 **21 Claims**

1. A process for pickling a stainless steel product, comprising:
providing a pickling bath having a redox potential and consisting essentially of (i) HF in an amount of from 60 grams per liter to 150 grams per liter, (ii) dissolved Fe^{3+} ions as the pickling agent, (iii) at least one oxidizing agent selected from the group consisting of ozone, chlorine, water vapor, alkaline earth and alkaline metal permanganates, peroxyurea, percarbonic acid, perboric acid, perbenzoic acid, persulfuric acid, perphosphoric acid, periodic acid, perphthalic acid, sodium precarbonate and magnesium percarbonate, and (iv) water; and
inserting said stainless steel product into said pickling bath wherein, during the pickling operation, the redox potential of said bath is monitored and maintained between about +100 mV and about +350 mV.

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5,690,749

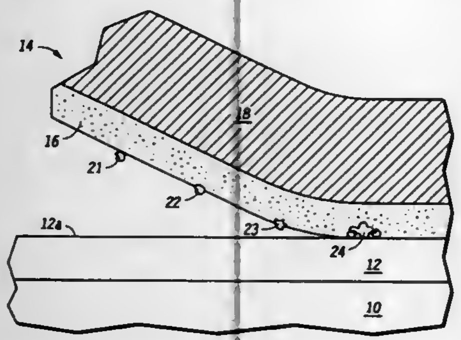
METHOD FOR REMOVING SUB-MICRON PARTICLES FROM A SEMICONDUCTOR WAFER SURFACE BY EXPOSING THE WAFER SURFACE TO CLEAN ROOM ADHESIVE TAPE MATERIAL

Chil-Chang Lee, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 18, 1996, Ser. No. 617,015

Int. Cl.^{6} B08B *7/04*

U.S. Cl. 134—6 **22 Claims**



1. A method for removing particles from an surface of a wafer on which integrated circuitry is formed, the method comprising the steps of:

providing the wafer having the surface wherein the surface of the wafer is in contact with the particles, the particles having a dimension which is sub-micron;

applying a tape which comprises a carrier film and an adhesion layer to the surface of the wafer such that the adhesion layer adheres to the particles, the tape being clean room tape which can be used in a clean room environment where wafers are manufactured;

removing the tape from the surface of the wafer with at least some particles still adhered to the adhesion layer to reduce a total number of particles on the surface of the wafer; and

exposing the wafer to an organic solvent solution to remove any adhesive material which may have remained on the wafer after exposure to the adhesion layer of the tape.

5,690,750

CLEANING METHOD AND CLEANING APPARATUS

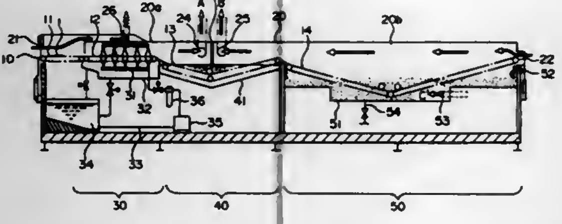
Minoru Inada, Yokohama; Yasutaka Imajo, Hachioji, and Masahide Uchino, Ohizumigakuenmachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 355,312, Dec. 12, 1994, Pat. No. 5,593,507, which is a continuation of Ser. No. 842,169, Apr. 1, 1992, abandoned. This application May 31, 1995, Ser. No. 455,890

Claims priority, application Japan, Aug. 20, 1990, 2-229221; Aug. 22, 1990, 2-220304; Sep. 12, 1990, 2-241974; Sep. 12, 1990, 2-241975; Jan. 21, 1991, 3-20471

Int. Cl.^{6} B08B *3/08;3/10;3/12;5/00*

U.S. Cl. 134—11 **88 Claims**



1. A method of cleaning a metal, electronic, semiconductor, ceramic, glass, plastic, optical or surface-treated part comprising the steps of:

a) cleaning the part in an immersion bath by use of a cleaning agent consisting essentially of a selected from at least one of the group consisting of perfluorocarbons, hydrocarbons, and silicones, and

b) drying said part by the use of a vapor drying agent comprising perfluorocarbons,

wherein during said drying said vapor drying agent condenses on the part and at a temperature below the boiling point of the perfluorocarbon, forms a miscible blend with said cleaning agent which remains on the part after step (a), and wherein said blend washes off the surface of the part, thereby drying and cleaning said part.

53. A method of cleaning a metal, electronic, semiconductor, ceramic, glass, plastic, optical or surface-treated part comprising the step of cleaning the part in an immersion bath with a cleaning agent consisting essentially of an inflammable solvent selected from the group consisting of hydrocarbons and silicones, wherein the cleaning is carried out in an atmosphere of an inactive vapor resulting from thermal vaporization of perfluorocarbon,

such that inactive vapor condenses on the part, and at a temperature below the boiling point of the perfluorocarbon, forms a miscible blend with said cleaning agent, and wherein said blend washes off the surface of the part, thereby drying and cleaning said part.

5,690,751

VAPOR PHASE CLEANING

Peter Hösel, Pforzheim; Wolfgang Müller, Mühlacker, both of Germany; Hans-Norbert Adams, and Werner Baggenstoss, both of Richterswil, Switzerland, assignors to The Dow Chemical Company, Midland, Mich., and EMO Oberflachentechnik GmbH, Bretten-Golshausen, Germany

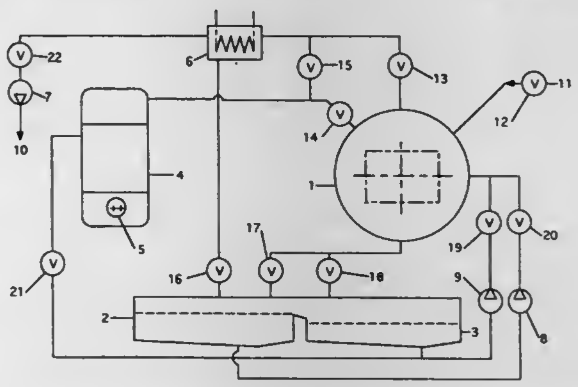
PCT No. PCT/EP94/02847, § 371 Date Feb. 28, 1996, § 102(e) Date Feb. 28, 1996, PCT Pub. No. WO95/06762, PCT Pub. Date Mar. 9, 1995

PCT Filed Aug. 29, 1994, Ser. No. 605,013

Claims priority, application Germany, Aug. 30, 1993, 43 29 178.3

Int. Cl.^{6} B08B *3/00;5/00*

U.S. Cl. 134—30 **20 Claims**



1. A process for cleaning one or more articles in the vapor phase of an organic solvent having a flash point of from 40° C. to 100° C., comprising the steps of feeding solvent vapor into a cleaning chamber, wherein an absolute pressure of 200 mbar or less is maintained, and cleaning of said one or more articles at a temperature at or above the flash point of the organic solvent and a pressure of 200 mbar or less.

5,690,752

PERMANENT MAGNET CONTAINING RARE EARTH METAL, BORON AND IRON

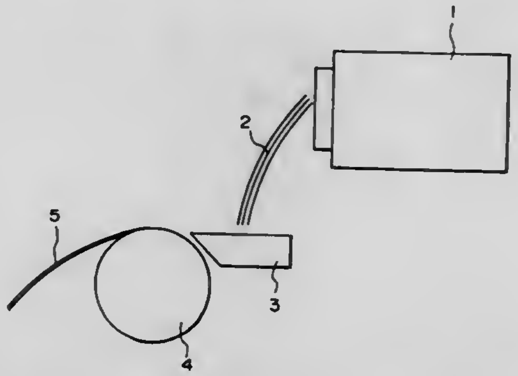
Kazuhiko Yamamoto; Yuichi Miyake, and Chikara Okada, all of Hyogo-ken, Japan, assignors to Santoku Metal Industry Co., Ltd., Japan

Continuation-in-part of Ser. No. 258,774, Jun. 13, 1994, abandoned. This application Jul. 27, 1995, Ser. No. 508,126

Claims priority, application Japan, Jun. 14, 1993, 5-142156

Int. Cl.^{6} H01F *1/057*

U.S. Cl. 148—302 **28 Claims**



1. A permanent magnet obtained by pulverizing, molding and sintering a starting material comprising 70 to 99.9 vol. % of an alloy ingot, said alloy ingot containing not less than 90% by volume of columnar crystals each having a columnar crystal grain size of 0.1 to 50 μm along a short axis thereof and a columnar crystal grain size of larger than 100 μm and not larger than 300 μm along a long axis thereof, said alloy ingot having been obtained by uniformly solidifying by a single roll method a molten alloy containing 25 to 31% by weight of a rare earth metal, 0.5 to 1.5% by weight of boron and iron under cooling conditions of a cooling rate of higher than 500° C./sec. and not higher than 10,000° C./sec. and a supercooling degree of 50° to 500° C.

5,690,753

STEEL CONTAINING SUPER-FINELY DISPERSED OXIDE SYSTEM INCLUSIONS

Yuji Kawauchi, Muroran, Japan, and Hirobumi Maede, deceased, late of Muroran, Japan, by Youko Maede, heiress, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP94/00230, § 371 Date Apr. 14, 1995, § 102(e) Date Apr. 14, 1995, PCT Pub. No. WO95/05492, PCT Pub. Date Feb. 23, 1995

PCT Filed Feb. 16, 1994, Ser. No. 416,845

Claims priority, application Japan, Aug. 16, 1993, 5-202416

Int. Cl.^{6} C22C *38/06*

U.S. Cl. 148—320 **3 Claims**

1. A carbon steel containing super-finely dispersed oxide system inclusions, comprising, by weight,

not more than 1.2% carbon,

0.01 to 0.10% Al,

total oxygen of not more than 0.0050%,

Mg which fulfills the relationship of the following formula:

$$(\text{total oxygen wt }\%\times 0.5)\leqq \text{total Mg wt }\% < (\text{total oxygen wt }\%\times 7.0)$$

and Mg oxides containing MgO·Al$_2$O$_3$ and free MgO.

5,690,754

Patent Not Issued For This Number

5,690,755

COLD-ROLLED STEEL SHEET AND HOT-DIP GALVANIZED COLD-ROLLED STEEL SHEET HAVING EXCELLENT BAKE HARDENABILITY, NON-AGING PROPERTIES AT ROOM TEMPERATURE AND GOOD FORMABILITY AND PROCESS FOR PRODUCING THE SAME

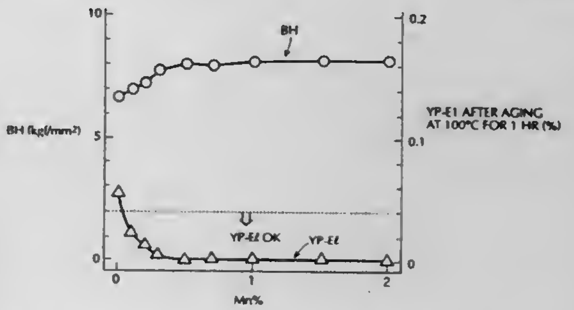
Naoki Yoshinaga; Kohsaku Ushioda; Osamu Akisue; Yoshikazu Matsumura, all of Futtsu, and Kunio Nishimura, Kitakyusyu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 232,066, Jun. 1, 1994, abandoned. This application Sep. 11, 1996, Ser. No. 712,247

Claims priority, application Japan, Aug. 31, 1992, 4-232301; Aug. 31, 1992, 4-232319; Mar. 4, 1993, 5-044108

Int. Cl.^{6} B32B *15/18;* **C21D** *7/02*

U.S. Cl. 148—533 **19 Claims**



18. A process for producing a hot-dip galvanized cold-rolled steel sheet having excellent bake hardenability and non-aging properties at room temperature, comprising the steps of: heating a slab consisting essentially of, in terms of % by weight, 0.0005 to 0.0070% of C, 0.001 to 0.8% of Si, 0.01 to 4.0% of Mn, 0.002 to 0.15% of P, 0.0005 to 0.015% of S, 0.005 to 0.1% of Al and 0.0003 to 0.0060% of N and at lease one element selected from the group consisting of 0.003 to 0.1% of Ti and 0.003 to 0.1% of Nb with the balance consisting of Fe and unavoidable impurities to provide a heated slab; hot-rolling the heated slab at a finish hot rolling temperature of not lower than (Ar$_3$—100)°C. to provide a hot-rolled steel strip; coiling the hot-rolled steel strip at a temperature of not higher than 750° C. to provide a coil of hot-rolled steel strip; cold-rolling the hot-rolled steel strip uncoiled from the coil of hot-rolled steel strip with a reduction ratio of not less than 60% to provide a cold-rolled steel strip; subjecting the cold-rolled steel strip to in-line annealing hot-dip galvanizing at an annealing temperature of not lower than the Ac$_3$ transformation point and in a γ single-phase region, thereby providing a hot-dip galvanized cold-rolled steel sheet having a structure of only low-temperature transformation products.

5,690,756

METHOD FOR PRODUCING CAST IRON GEAR

Yasuyuki Fujiwara, Nishikamo-gun; Izuru Yamamoto, Toyota; Masazumi Onishi, Toyota; Toshiaki Tanaka, Nagoya; Yoshinari Tsuchiya, Kasugai, and Atsushi Danno, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed Mar. 18, 1996, Ser. No. 617,282

Claims priority, application Japan, Mar. 29, 1995, 7-071751

Int. Cl.^{6} C21D *8/00;9/32;* **C23C** *8/26*

U.S. Cl. 148—586 **13 Claims**

1. A method for producing cast iron gears comprising the steps of:

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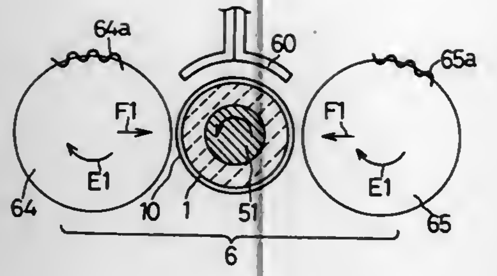


heating a blank composed of cast iron and having a teeth forming part adapted to be formed into a teeth part of said cast iron gears to such a temperature that at least said teeth forming part is at least austenitized; and

hot rolling said teeth forming part of said blank by pressing projecting teeth of a rolling machine against said teeth forming part which is in a hot state and within an austenitized range, while cooling said blank, thereby generating said teeth part in said teeth forming part of said blank,

wherein, in said heating step, said blank is heated such that said teeth forming part is austenitized to the depth of 1.5 to 1.8 times the total depth of said teeth part to be generated, and in said hot rolling step, the heating condition of said heating step is maintained and the temperature of said teeth forming part adapted to form not less than 90% of the total depth of said teeth part is maintained at not less than 750° C.

5,690,757

METHOD FOR CONTINUOUS RECRYSTALLIZATION ANNEALING OF A STEEL STRIP

Sten Ljungars, Torshälla, Sweden, assignor to Avesta Sheffield, Stockholm, Sweden

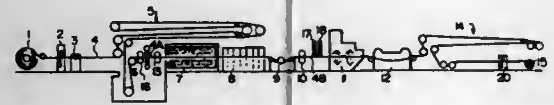
PCT No. PCT/SE92/00162, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO93/19000, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 17, 1992, Ser. No. 302,870

Claims priority, application Sweden, Sep. 21, 1990, 9003018

Int. Cl.^{6} C21D *8/02*

U.S. Cl. 148—603 **6 Claims**



1. Method for the continuous manufacture of steel strip, comprising:

(a) subjecting steel strip to at least one cold rolling step to produce cold rolled steel strip and cause a first strip thickness reduction;

(b) feeding said cold rolled steel strip into an annealing furnace at a certain feed-in rate and drawing out of the furnace at a feed-out rate which is higher than said feed-in rate;

(c) subjecting said cold rolled steel strip to a pulling tension in said annealing furnace at a temperature between 1000° and 1250° C. to give a permanent elongation of at least 8% to said steel strip corresponding to the difference between said feed-out and feed-in rates, and also to give a reduction in cross-section of the strip corresponding to said elongation, including a reduction in strip width and a second strip thickness reduction.

5,690,758

PROCESS FOR THE FABRICATION OF ALUMINUM ALLOY SHEET HAVING HIGH FORMABILITY

Binrun Oh; Yuichi Suzuki, and Kunihiko Kishino, all of Tokyo, Japan, assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.

PCT No. PCT/FR94/01547, § 371 Date Nov. 22, 1995, § 102(e) Date Nov. 22, 1995, PCT Pub. No. WO95/18244, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 28, 1994, Ser. No. 491,869

Claims priority, application Japan, Dec. 28, 1993, 5-352713

Int. Cl.^{6} C22F *1/05;1/057*

U.S. Cl. 148—700 **2 Claims**

1. A process for the fabrication of aluminum alloy sheet of high formability, characterized in that an aluminum alloy sheet composed of 0.3 to 1.7% (by weight) of Si, 0.01 to 1.2% Cu, 0.01 to 1.1% Mn, 0.4 to 1.4% Mg, less than 1.0% Fe and, the rest Al along with the inescapable impurities, is subjected to a continuous solution treatment for at least 3 seconds above 450° C., followed by cooling between 60° and 250° C. at a rate higher than 100° C./minute, followed by coiling at the same temperature in the 60° C.–250 ° C. range and a preaging process for a time between 1 minute and 10 hours at the previous cooling temperature of 60° to 250° C.

5,690,759

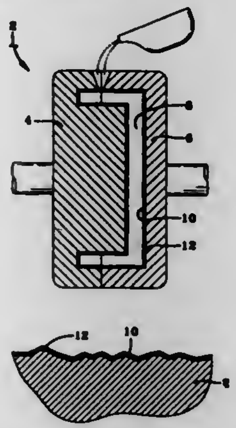
COATED PERMANENT MOLD HAVING TEXTURED UNDERSURFACE

Yucong Wang, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1996, Ser. No. 668,883

Int. Cl.^{6} B28B *7/36;* **B22C** *3/00*

U.S. Cl. 249—114.1 **4 Claims**



1. A mold for the permanent mold casting of aluminum comprising a metal body having an inner surface defining a molding cavity, and a physical vapor-deposited ceramic coating adhering to said surface, said coating having a thickness between about 2μ and about 20μ and conforming substantially to the microtopography of said surface, said microtopography comprising a plurality of peaks and valleys characterized by a Talysurf Series profile having (a) a mean line above and below which the areas under said peaks and said valleys are equal and a minimum, (b) a maximum height, R_p, of said peaks above said mean line of about 9μ to about 13μ, (c) a maximum depth, R_v, of said valleys beneath said mean line of about 9μ to about 15μ, (3) a roughness characteristic, R_a, of about 3μ to about 5μ, which characteristic is the arithmetic mean of the departures of the profile from the mean line over, and (4) a peak spacing at the mean line, S_m, of about 400μ to about 500μ which spacing is the arithmetic mean of the sum of the spacings between the beginning of one peak and the beginning of the next peak at the mean line over a sampling length, divided by the number of such spacings over said length.

5,690,760

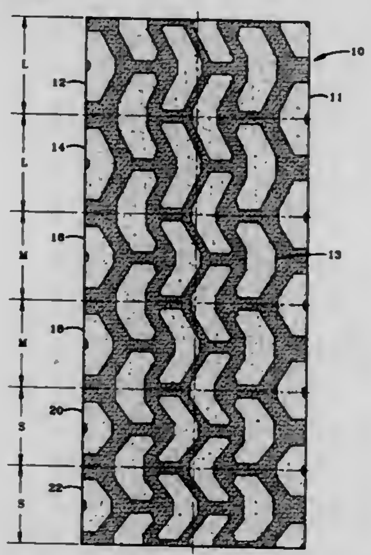
PITCH SEQUENCE

Jack Edward Brown, Jr., 936 Merriman Rd., Akron, Ohio 44303

Continuation of Ser. No. 263,154, Jun. 20, 1994, abandoned, which is a continuation of Ser. No. 13,264, Feb. 3, 1993, abandoned. This application Feb. 28, 1996, Ser. No. 608,094

Int. Cl.^{6} B60C *107/02;113/00;121/00*

U.S. Cl. 152—209 R **3 Claims**



1. A tire having a tread containing lug tread elements and comprising repeating design cycles placed continuously about the circumference of said tire in a pitch sequence wherein said tread has only 33 repeating design cycles, said design cycles having a total of three different design cycle lengths including a short length (S), a medium length (M) and a long length (L) wherein the pitch sequence is MSSSLMMSMLLMLLLMSMSSSMSLLLMMMMSSSS and wherein the three design cycle lengths have a ratio of 9:10:11.

5,690,761

PNEUMATIC TIRE INCLUDING BLOCKS

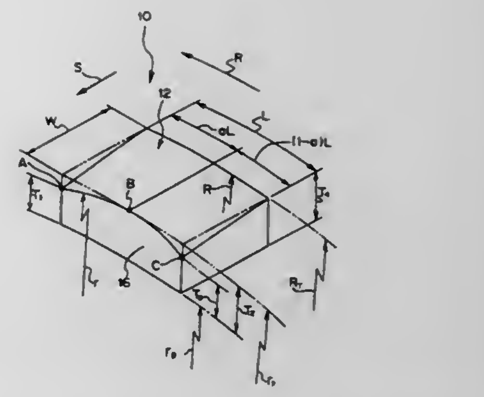
Ken Masaoka, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 334,367, Nov. 3, 1994, abandoned. This application May 23, 1996, Ser. No. 652,120

Claims priority, application Japan, Nov. 5, 1993, 5-277132; Mar. 15, 1994, 6-043603; Sep. 9, 1994, 6-216246

Int. Cl.^{6} B60C *107/00*

U.S. Cl. 152—209 R **10 Claims**



1. A pneumatic tire comprising; a pair of sidewalls and a cylindrical tread which extends over the sidewalls, said sidewalls and said tread connected in a toroidal shape, said tread having blocks which are segmented by at least one circumferential direction groove and a plurality of lug grooves which intersect said circumferential direction groove and open at tread ends, an outer surface of a block being formed so that a radius of curvature of an end portion of the block in the circumferential direction of the tire at an axial direction outer side of the tire is smaller than a radius of curvature of an end portion of the block in the circumferential direction of the tire at an equatorial plane side of the tire, and said radius of curvature of the end portion of the block in the circumferential direction of the tire at the axial direction outer side of the tire is smaller than a radius of curvature of the tire at the end portion of the block in the circumferential direction of the tire at said axial direction outer side of the tire.

5,690,762

EMERGENCY RING FOR A VEHICLE WHEEL

Andreas Bock; Martin Kunz, and Horst Binder, all of Munich, Germany, assignors to Bayerische Moteren Werke Aktiengesellschaft, Germany

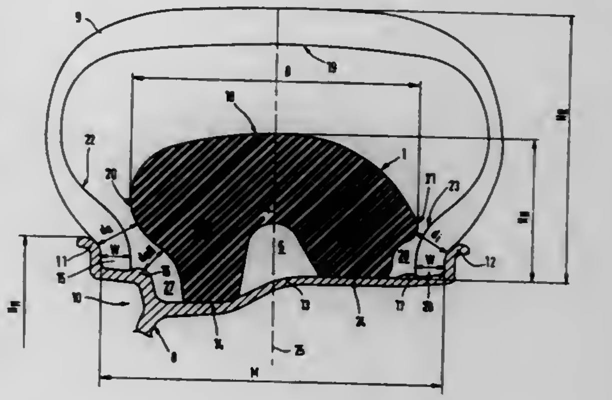
PCT No. PCT/EP94/00231, § 371 Date Aug. 10, 1995, § 102(e) Date Aug. 10, 1995, PCT Pub. No. WO94/18016, PCT Pub. Date Aug. 18, 1994

PCT Filed Jan. 27, 1994, Ser. No. 492,111

Claims priority, application Germany, Feb. 10, 1993, 43 03 922.7

Int. Cl.^{6} B60C *17/06*

U.S. Cl. 152—520 **18 Claims**



1. An emergency ring for a vehicle wheel which is composed of a one-piece rim with a rim bed and a pneumatic tire, comprising a one-piece annular elastic body having annular reinforcement inlays and a radially outside portion on which, in an emergency, a radially inside portion of the pneumatic tire remote from tire tread comes to rest, an axially outer side face, axially an inner side face, and a radially inside portion oriented toward the rim bed,

wherein the radially inside portion of the emergency ring is supported by at least a part of a surface thereof on the rim bed, and at least one of the axially outer and inner side faces is spaced apart from an adjacent side wall region of the pneumatic tire.

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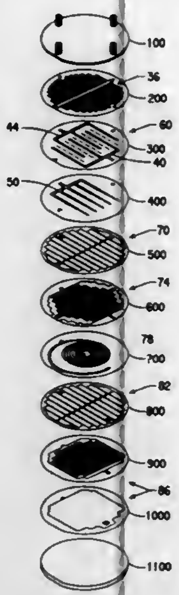
5,690,763
INTEGRATED CHEMICAL PROCESSING APPARATUS AND PROCESSES FOR THE PREPARATION THEREOF

James William Ashmead; Charles Thomas Blaisdell, both of Middletown, Del.; Melvin Harry Johnson; Jack Kent Nyquist, both of Chadds Ford, Pa.; Joseph Anthony Perrotto, Landenberg, Pa., and James Francis Ryley, Jr., Drexel Hill, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 161,379, Dec. 2, 1993, Pat. No. 5,534,328, which is a continuation-in-part of Ser. No. 33,915, Mar. 19, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,274

Int. Cl.^{6} B31B *1/60*

U.S. Cl. 156—60 **10 Claims**



1. A process for the preparation of an integral structure for chemical processing and manufacture comprising:

(a) processing a plurality of laminae each having a top portion and a bottom portion and a desired thickness, sufficient to form desired channels thereon or therethrough, said channels thereon being continuous along one or more laminae and discontinuous along one or more other laminae;

(b) stacking and bonding said laminae together in precise alignment with at least one inlet port and at least one outlet port formed therein for the receipt and discharge of chemicals, and wherein said continuous and discontinuous channels are precisely aligned between adjacent laminae to form at least one continuous three-dimensionally tortuous channel therethrough for accommodating chemicals to be processed, said channel connected to said inlet and outlet ports, and said laminae comprising a material selected for compatibility with the chemical process; and

(c) positioning one or more means to perform at least one unit operation to cooperate with said channel and to effect a desired control so that the chemicals are processed.

5,690,764
COLLAPSIBLE TUBE PACKAGE AND METHOD OF CONSTRUCTION

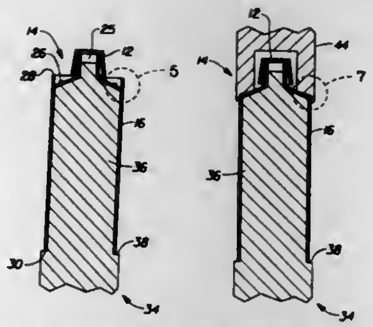
William P. Dirksing, Cleves, and Dana P. Gruenbacher, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 387,652, Feb. 13, 1995, abandoned. This application Mar. 5, 1996, Ser. No. 611,295

Int. Cl.^{6} B65B *7/00*

U.S. Cl. 156—69 **1 Claim**

1. A method of constructing a tube package comprising the steps of:



a) generating a tubular body, said tubular body having a first open end and a second open end;

b) generating a tube head having an inner shoulder surface, an outer shoulder surface, and a perimeter edge;

c) locating said tube head on a mandrel having an anvil surface which fits against said inner shoulder surface;

d) positioning said mandrel and said tube head inside said first open end of said tubular body such that a continuous wall portion of said tubular body extends longitudinally beyond said perimeter edge of said tube head to form an extended wall portion;

e) swaging said extended wall portion inwardly against said outer shoulder surface of said tube head to form a swaged end of said tubular body, said tube head being supported by said anvil surface of said mandrel; and

f) ultrasonically welding said swaged end of said tubular body to said outer shoulder surface of said tube head in order to close said first open end of said tubular body, and melting an energy concentration ring, which extends longitudinally from said outer shoulder surface of said tube head, into a sealing interface between said swaged end and said outer shoulder surface; said swaging and said ultrasonic welding steps occuring in one operation by a common tool in direct contact with said extended wall portion.

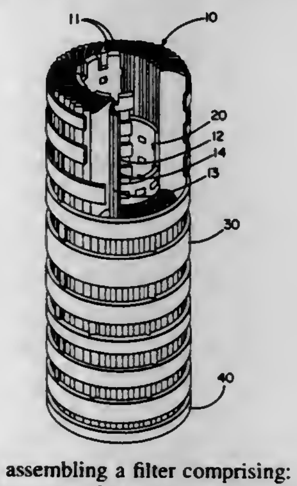
5,690,765
METHODS OF ASSEMBLING A FILTER

Richard C. Stoyell, Moravia; Kenneth M. Williamson, Jamesville; Scott D. Hopkins, Dryden; Stephen A. Gelbel, Cortland, and Terry L. Wolff, Marathon, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Division of Ser. No. 170,934, Dec. 21, 1993, Pat. No. 5,543,047, which is a continuation-in-part of Ser. No. 972,839, Nov. 6, 1992, abandoned. This application Jun. 7, 1996, Ser. No. 660,413

Int. Cl.^{6} B65B *7/00;* **B01D** *27/06*

U.S. Cl. 156—69 **75 Claims**



1. A method of assembling a filter comprising:

repairing a corrugated filter composite comprising a filter medium having upstream and downstream sides and at least one of an upstream drainage layer on the upstream side of the filter medium and a downstream drainage layer on the downstream side of the filter medium;

forming the composite into a cylindrical filter element having a center and pleats extending along a longitudinal axis, each pleat having first and second legs, each leg having first and second surfaces;

forming the pleats of the cylindrical filter element into a laid-over state in which the first surface of one leg of one pleat is in intimate contact with the first surface of an adjoining leg of said one pleat and the second surface of said one leg is in intimate contact with the second surface of an adjoining leg of an adjoining leg of an adjacent pleat over substantially the entire height of said one leg and over a continuous region extending for at least approximately 50% of the length of the filter element;

retaining the pleats in the laid-over state; and

capping at least a first end of the pleated, laid-over cylindrical filter element to prevent axial flow through the pleats at the first end.

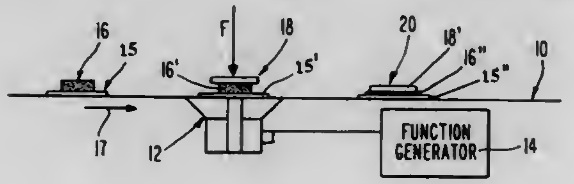
5,690,766
METHOD AND APPARATUS FOR DECREASING THE TIME NEEDED TO DIE BOND MICROELECTRONIC CHIPS

Kenneth John Zwick, Philadelphia, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Aug. 16, 1995, Ser. No. 515,863

Int. Cl.^{6} B32B *31/16*

U.S. Cl. 156—73.6 **22 Claims**



1. A method of bonding an integrated circuit chip to a lead frame, comprising the steps of:

applying an adhesive to a surface of said lead frame;

pressing the chip onto said surface on which the adhesive is applied; and

inducing, with an acoustic source, vibrations of a predetermined frequency and amplitude in at least said leadframe, said amplitude being approximately 10–50 μm, wherein the vibrations are induced with acoustic pressure waves that induce a vibrational force in said adhesive and chip, said force being substantially perpendicular to the chip surface in contact with said adhesive, whereby the adhesive rheology is temporarily changed in situ so that the adhesive flows to a predetermined thickness to permit the chip to be pressed to a predetermined distance from said leadframe.

5,690,767

Patent Not Issued For This Number

5,690,768
MANUFACTURING PROCESS OF RUBBER LAYERED STRUCTURE

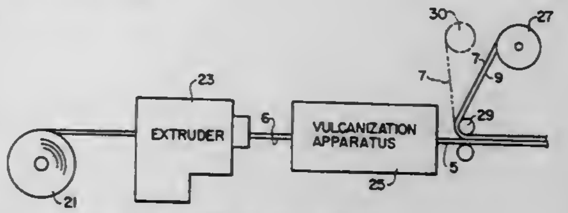
Tadanobu Iwasa, and Takemasa Yasukawa, both of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, Japan

Division of Ser. No. 227,988, Apr. 15, 1994, Pat. No. 5,489,461, which is a continuation of Ser. No. 126,740, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 793,730, Nov. 21, 1991, abandoned. This application Oct. 20, 1995, Ser. No. 545,932

Claims priority, application Japan, Nov. 22, 1990, 2-320192; Nov. 22, 1990, 2-320193

Int. Cl.^{6} B32B *31/06;31/08;31/20*

U.S. Cl. 156—108 **7 Claims**



1. A method of forming a rubber layered structure having a EPDM rubber base layer and a laminated film layer, comprising the steps of:

(a) preparing a laminated film comprising a first film layer of a non-polar olefin resin modified by the introduction of maleic arthydride to form a modified olefin resin, said modified olefin resin being directly bondable to the EPDM rubber base layer, and a second film layer of a polar thermoplastic resin directly attached to said modified olefin resin first film layer;

(b) extrusion-forming said EPDM rubber base layer;

(c) vulcanizing said EPDM rubber base layer; and

(d) attaching and roller pressing said non-polar olefin first film layer onto said EPDM rubber base layer by melting and re-solidifying at least surface of said non-polar olefin first film layer with heat from said EPDM rubber base layer remaining from said vulcanizing step.

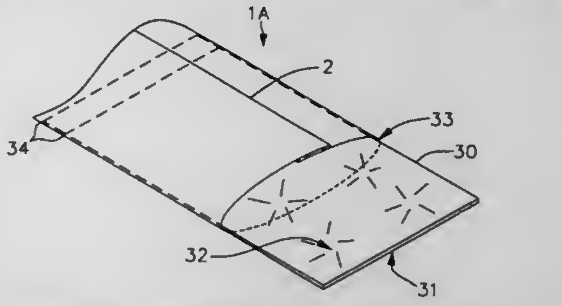
5,690,769
METHOD FOR SPLICING DRIP IRRIGATION HOSES USING SPLICING MEANS INTERNAL TO THE HOSES

Harold Daigle, and Scott Avenell, both of San Diego, Calif., assignors to T-Systems International, San Diego, Calif.

Filed Aug. 21, 1995, Ser. No. 517,600

Int. Cl.^{6} B65H *69/02*

U.S. Cl. 156—158 **29 Claims**



21. A method for splicing together a pair of drip irrigation hoses comprising the steps of:

inserting a first end of a splicing insert into an end of a collapsible first hose to be spliced;

inserting a second end of the splicing insert into an end of a collapsible second hose to be spliced;

bonding the insert to an inside surface of each hose;

collapsing the hose ends over the bonded insert by applying pressure over the hose ends;and

heating the collapsed hose ends fusing the hose ends together creating a splice.

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5,690,770

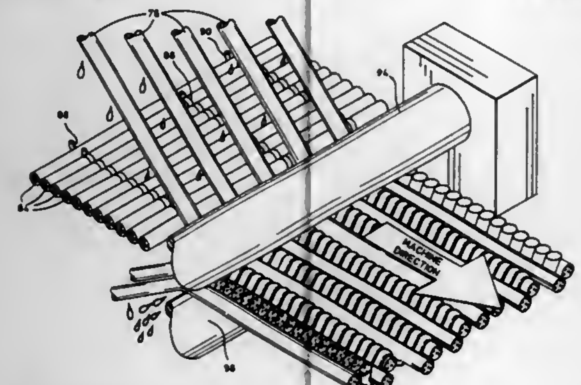
PULTRUSION METHOD OF MAKING COMPOSITE FRICTION UNITS

Benjamin V. Booher, Scottsdale, Ariz., assignor to Glasline Friction Technologies, Inc., Scottsdale, Ariz.

Continuation-in-part of Ser. No. 272,030, Jul. 8, 1994, Pat. No. 5,495,922, which is a continuation-in-part of Ser. No. 32,269, May 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 647,137, Jan. 29, 1991, Pat. No. 5,156,787. This application Feb. 1, 1996, Ser. No. 593,184

Int. Cl.⁶ B29C *70/52*

U.S. Cl. 156—177 **6 Claims**



1. A continuous manufacturing process for making composite friction units comprising the steps of:

selecting a substantially uniform array of predominately glass strands of primary reinforcing fibers;

wetting said plurality of strands of primary reinforcing fibers with a phenolic resin material;

pulling said wetted strands of reinforcing fibers in a predetermined uniform distribution and orientation through a composite forming die for forming a body having a peripheral configuration of said friction units;

introducing a continuous array of predominately transverse secondary fibers between selected pairs of said plurality of primary fibers prior to entry into said forming die;

solidifying said body by curing said resin; and

selectively cutting said body at least along one path transverse to said strands into it plurality of said friction units, thereby forming a plurality of friction units having a predetermined size and configuration and uniform distribution and alignment of fibers throughout.

5,690,771

ELECTRONIC PARTS SUCH AS AN INDUCTOR AND METHOD FOR MAKING SAME

Ikuo Kato, and Kenichiro Nogi, both of Tokyo, Japan, assignors to Taiyo Yuden Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 219,677, Mar. 29, 1994, abandoned. This application May 4, 1995, Ser. No. 434,985

Claims priority, application Japan, Mar. 31, 1993, 5-094959; Dec. 27, 1993, 5-348849; Mar. 11, 1994, 6-067539

Int. Cl.⁶ B29E *47/00;* **B22D** *11/00*

U.S. Cl. 156—244.11 **4 Claims**

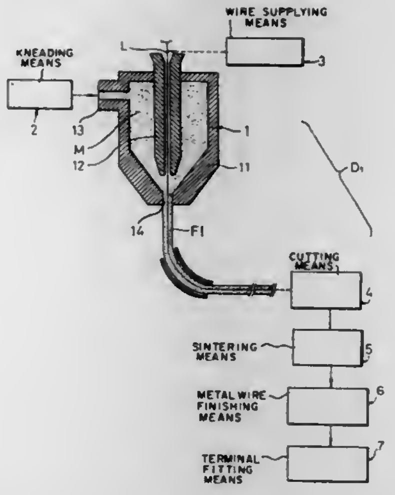
1. A method for making electronic parts comprising:

supplying a conductive material to an extruding means where a pasty magnetic material is to be charged;

extruding said magnetic material with said conductive material to be embedded therein to mold an intermediate;

sintering said intermediate to form a sintered material thereby partially exposing two external end surfaces of said magnetic material and said conductive material protruding outwardly from each of said two external end surfaces of said magnetic material;

subjecting said conductive material, which protrudes outwardly from each of said two external end surfaces of said magnetic material, to a flattening treatment; and



connectively fitting external electrodes to each of said two external end surfaces of said sintered material.

5,690,772

METHOD FOR MASS-PRODUCING ECCENTRIC FRESNEL LENS SHEETS

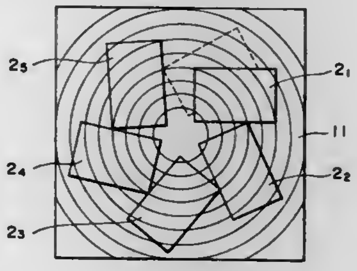
Hideaki Mitsutake, Tokyo; Nobuo Minoura, Yokohama; Katsumi Kurematsu, Kawasaki, and Haruyuki Yanagi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,769, Feb. 28, 1991, abandoned. This application Jun. 30, 1994, Ser. No. 268,870

Claims priority, application Japan, Mar. 2, 1990, 2-049429

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—253 **21 Claims**



1. A method for mass-producing eccentric Fresnel lens sheets, said method comprising the steps of:

providing a number of concentric Fresnel lens sheets, said concentric Fresnel lens sheets having a first set and a second set each including a plurality of Fresnel lens sheets;

cutting out a plurality of first sheets each corresponding to one portion of the eccentric Fresnel lens sheet from each of the Fresnel lens sheets of the first set;

cutting out a plurality of second sheets each corresponding to the other portion of the eccentric Fresnel lens sheet from each of the Fresnel lens sheets of the second set; and

combining each of the first sheets and each of the second sheets in such a manner that patterns on the first sheet and the second sheet are continuous to provide said eccentric Fresnel lens sheet.

5,690,773

METHOD FOR THE MANUFACTURE OF A CONTACT-FREE OR HYBRID CARD

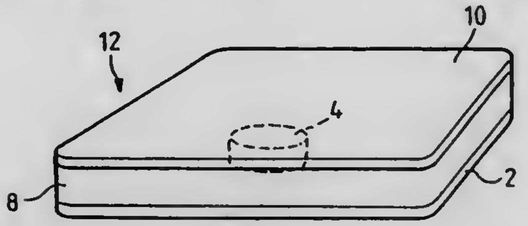
Jean Christophe Fidalgo, Gemenos, and Christiane Oi, Trets, both of France, assignors to Gemplus Card International, Gemenos Cedex, France

Filed Feb. 22, 1995, Ser. No. 393,108

Claims priority, application France, Feb. 24, 1994, 94 02130

Int. Cl.⁶ B29C *39/10;* **B32B** *31/06;31/18;* **G06K** *19/077*

U.S. Cl. 156—267 **15 Claims**



1. A method for the manufacture of a contact-free card comprising a card body and an electronic module having an integrated circuit chip connected to an antenna, wherein:

a frame is deposited on a lower thermoplastic sheet, thereby demarcating the edges of a cavity;

the electronic module is positioned at the bottom of said cavity;

this cavity is filled with a polymerizable resin;

the frame and the resin-filled cavity are covered with an upper thermoplastic sheet to which slight pressure is applied;

the resin is polymerized; and

the card is cut out within the frame.

5,690,774

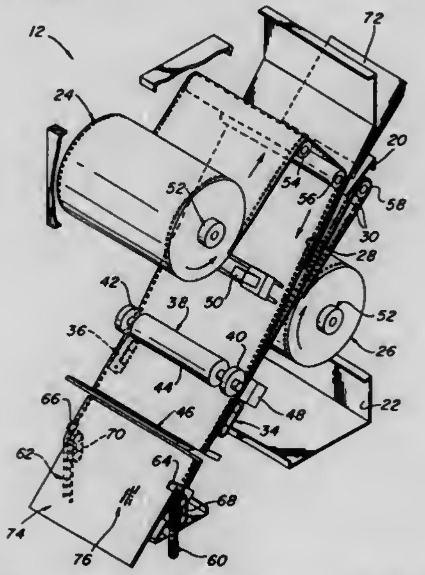
APPARATUS AND METHOD FOR MAINTAINING THE CONFIDENTIALITY OF PRINTED INFORMATION

Morton Greene, Arlington, Va., assignor to Gordian Holding Corporation, Tysons Corner, Va.

Continuation of Ser. No. 244,921, Jun. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 810,289, Dec. 19, 1991, Pat. No. 5,195,903. This application Jun. 5, 1995, Ser. No. 494,124

Int. Cl.⁶ B32B *35/00*

U.S. Cl. 156—269 **17 Claims**



17. A method for maintaining the confidentiality of information contained in a printed document wherein said information is sent by a sending party to an intended recipient, said method comprising the steps of:

sending said information from said sending party to said recipient, wherein said information is sent in a first signal;

receiving said first signal;

storing said first signal;

printing by printing means said information from said first signal on said document, wherein said document comprises one or more pages, such that said printed information cannot be viewed;

positioning each page of said document as said page is printed by and discharged from said printing means such that said document may be enclosed in an envelope and such that said printed information cannot be viewed, said positioning step further comprising the step of depositing each page of said document on a feed chute as said page is printed by and discharged from said printing means, said chute having sufficient angle such that each page of said document slides down said chute and on to a second envelope paper web by gravitational force, said document stopping where said second envelope paper web comes essentially in contact with a first envelope paper web;

enclosing said document in said envelope such that said information cannot be viewed and that said document may later be removed from said envelope by said intended recipient; and

controlling said receiving, storing, printing, positioning, and enclosing steps.

5,690,775

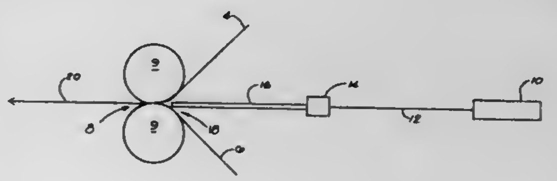
APPARATUS FOR HEAT SEALING PAPERBOARD SUBSTRATES USING A UNIFORM ENERGY DISTRIBUTED LIGHT ENERGY BEAM

Barry Gene Calvert, Covington, and Ralph Scott Peterson, Clifton Forge, both of Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 7, 1996, Ser. No. 612,476

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—272.8 **9 Claims**



1. An apparatus for heat sealing coated paperboard substrates with light energy which is comprised of:

at least two coated paperboard substrates with each of said substrates including a paperboard base and a heat sealable polymeric coating located adjacent to said paperboard base;

a coated paperboard substrate converging means wherein said at least two coated paperboard substrates are brought substantially adjacent to each other such that said polymeric coatings are brought substantially into an area of contact with each other;

a light energy means located at a predetermined distance from said paperboard substrate converging means which produces a first unfocused light energy beam, wherein said first unfocused light energy beam is further comprised of a gaussian energy distributed light energy beam; and

a light energy beam optical means located substantially in plane between said light energy means and said paperboard substrate converging means and at a predetermined distance away from said light energy means for producing a second uniform light energy beam, wherein said second uniform light energy beam is further comprised of a uniform energy distributed light energy beam such that said second uniform light energy beam impinges upon said area of contact between said polymeric coatings to substantially soften said polymeric coatings and create a seal between said at least two coated paperboard substrates.

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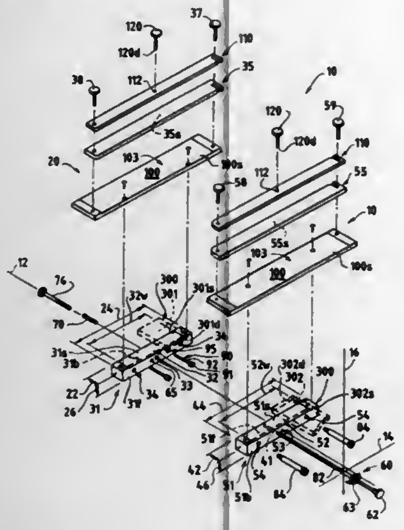
5,690,776
BELT SPLICING SYSTEM
Ted P. Anderson, St. Peters, Mo., assignor to Burrell Leder Beltech, Inc., Skokie, Ill.
Filed Nov. 23, 1994, Ser. No. 344,073
Int. Cl.^{6} B65H *21/00*
U.S. Cl. 156—304.2 **12 Claims**



1. A belt splicing tool for joining first and second belt ends comprising:

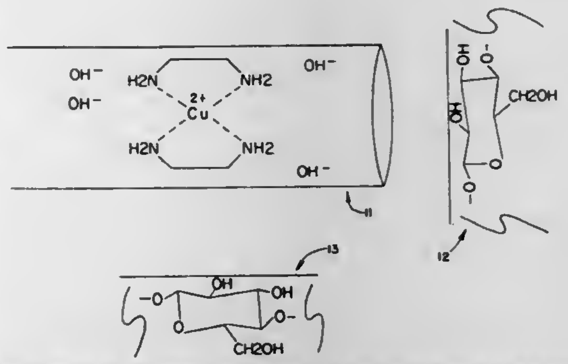
a) first and second clamping mechanisms cooperatively engaged and diametrically opposed along a longitudinal axis, wherein:
   i) each clamping mechanism has (A) a width measured along the longitudinal axis, (B) a length measured along a lateral axis orthogonal to the longitudinal axis, and (C) a height measured along a transverse axis orthogonal to both the longitudinal and the lateral axes; (ii) the first clamping mechanism is configured and arranged for holding a first end section of a belt; and (iii) the second clamping mechanism is configured and arranged for holding a second end section of a belt;

b) a position control means effective for repetitively repositioning the clamping mechanisms relative to one another in a linear fashion along the longitudinal axis between a first position and a second position wherein the first position provides a smaller longitudinal gap between the clamping mechanisms than the second position; and

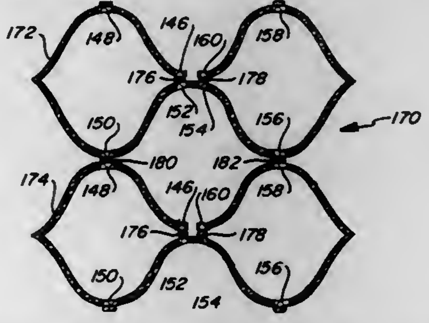
c) a means for biasing the clamping mechanisms in favor of the first position.

5,690,777
SEAMED CELLULOSIC MATERIALS USING ORGANOMETALLIC SOLVENTS
David F. Kuethe, Madison; Vernon D. Karman, Roynette, and Norman C. Abler, Madison, all of Wis., assignors to Kraft Foods, Inc., Northfield, Ill.
Filed Mar. 3, 1995, Ser. No. 398,035
Int. Cl.^{6} B31C *13/00;* **C09J** *1/00;5/02*
U.S. Cl. 156—308.4 **31 Claims**

1. A method for fusing, joining or seaming cellulosic materials, said method comprising: applying an organometallic solvent including a hydroxide containing solution of a selected organometallic compound or metal oxide compound to a first cellulosic surface and overlapping said first cellulosic surface with a second cellulosic surface so that the hydroxide containing solution is between the first and second surfaces, the first and second surfaces being fused, joined or seamed by a chemical reaction in which the metal contained in the selected organometallic or metal oxide compound crosslinks the first and second cellulosic surfaces to thereby fuse, join or seam the first and second cellulosic surfaces together, wherein the hydroxide concentration in the organometallic solvent is in the range of about 0.25 Normal up to its solubility limit at a given application temperature.



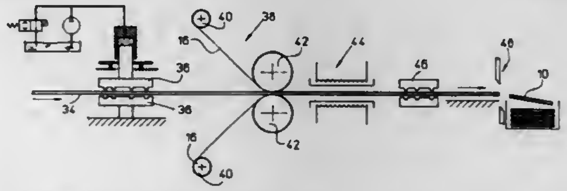
5,690,778
METHOD OF FABRICATING HONEYCOMB PANEL FOR WINDOW COVERING
Paul G. Swiszcz, and Wendell B. Colson, both of Boulder, Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.
Division of Ser. No. 791,156, Nov. 13, 1991. This application Jun. 7, 1995, Ser. No. 477,828
Int. Cl.^{6} B32B *31/20*
U.S. Cl. 156—308.4 **9 Claims**



1. A method of fabricating a window covering comprising the steps of:

providing a treated fabric panel having discrete untreated areas,
applying an adhesive line to less than all of the untreated areas; and
securing the areas with the adhesive lines thereon to respective untreated areas of an adjacent panel.

5,690,779
METHOD FOR THE PRODUCTION OF A COATED PLATE
Guenther Schmidt, Tamm, Germany, assignor to Robert Bosc GmbH, Stuttgart, Germany
Filed Jun. 6, 1995, Ser. No. 472,079
Claims priority, application Germany, Jun. 29, 1994, 44 22 734.5
Int. Cl.^{6} B32B *31/16*
U.S. Cl. 156—324 **7 Claims**



1. A method of forming a plate for use in a hydraulic block of a brake system which comprises:

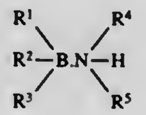
forming an elongated continuous strip of metal of a desired thickness and width, said continuous strip having first and second surfaces;
forming holes in said continuous strip of metal in duplicate patterns in successive areas of said continuous strip;
forming passages having a shape different than the shape of said holes in said metal plate in areas other than where said holes are formed, said passages also formed in duplicate patterns in successive areas of said continuous strip;
laminating each of said first and second surfaces of said strip of metal plate with a film of sealant material thereby covering said holes and passages; and
removing said film from areas of some of said holes and passages.

5,690,780
POLYMERIZABLE COMPOSITIONS MADE WITH POLYMERIZATION INITIATOR SYSTEMS BASED ON ORGANOBORANE AMINE COMPLEXES
Jury V. Zharov, Nizhny Novgorod, and Jury N. Krasnov, deceased, late of Nizhny Novgorod, both of Russian Federation, by Julia A. Krasnova, legal representative, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 391,642, Feb. 21, 1995, Pat. No. 5,539,070. This application Mar. 7, 1996, Ser. No. 612,363
Int. Cl.^{6} C09J *4/02*
U.S. Cl. 156—332 **23 Claims**

1. A method for adhesively bonding two substrates together, the method comprising the steps of:

(a) providing a low surface energy polymeric first substrate and a second substrate;
(b) applying to at least the first substrate the following materials:
   (i) at least one polymerizable acrylic monomer;
   (ii) an effective amount of an organoborane amine complex having a nitrogen atom to boron atom ratio of about 1:1 to 2:1; and
   (iii) an effective amount of an acid for initiating polymerization of the at least one acrylic monomer;
(c) mating the first and second substrates with the components of step (b) therebetween; and
(d) allowing the at least one acrylic monomer to polymerize, whereby the first and second substrates are adhesively bonded together.

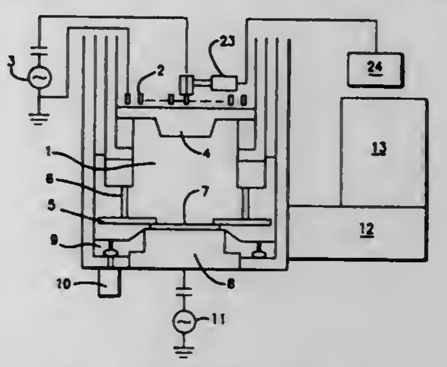
10. A method according to claim 1 wherein the organoborane amine complex bas the structure:



wherein:

R^1 is an alkyl group having 1 to 10 carbon atoms;
R^2 and R^3 are independently selected from the group consisting of alkyl groups having 1 to 10 carbon atoms and phenyl-containing groups;
R^4 is selected from the group consisting of CH_2CH_2OH and $(CH_2)_xNH_2$ wherein x is an integer greater than 2; and
R^5 is hydrogen or an alkyl group having 1 to 10 carbon atoms.

5,690,781
PLASMA PROCESSING APPARATUS FOR MANUFACTURE OF SEMICONDUCTOR DEVICES
Kazuyoshi Yoshida, and Hidenobu Miyamoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Sep. 13, 1995, Ser. No. 527,847
Claims priority, application Japan, Sep. 16, 1994, 6-258960
Int. Cl.^{6} H01L *21/205*
U.S. Cl. 156—345 **11 Claims**



1. A plasma processing apparatus comprising:

a reaction chamber in which a plasma is generated, said chamber having a dielectric plate with an inner main surface and an outer main surface, said inner main surface facing the interior of said chamber, said chamber being electrically grounded except for said dielectric plate;
a spiral coil placed outside said reaction chamber and adjacent said outer main surface;
a radio frequency power source for supplying a first high frequency electrical current to said coil;
a tuning mechanism for electromagnetically matching said radio frequency power source and said coil;
at least one inlet for introducing a plurality of process gas into said vacuum reaction chamber;
a pressure controller for controlling the pressure of said process gas;
a lower electrode for receiving a wafer to be processed, said lower electrode being contained within said reaction chamber and positioned remote from said dielectric plate;
a mechanism for varying the distance between said dielectric plate and said spiral coil; and
a second high frequency voltage supply connected to said lower electrode;
wherein said dielectric plate comprises a central portion with a constant first thickness, a circumferential portion with a constant second thickness, and a tapered portion between said central portion and said circumferential portion, said central portion of said dielectric plate having a diameter 0.2 to 0.4 times the diameter of said dielectric plate, and said first thickness being 2 to 5 times said second thickness.

5,690,782
APPARATUS FOR INTEGRALLY JOINING PREFORMED THERMOPLASTIC CORE ELEMENTS ESPECIALLY ADAPTED FOR THE CONTINUOUS MANUFACTURE OF MELT-BLOWN FILTER CARTRIDGES
Brian Mozelack, White Hall, Md.; Robert D. Connor, Spring Grove, and Robert J. Schmitt, Stewartstown, both of Pa., assignors to Memtec, Ltd., Timonium, Md.
Division of Ser. No. 686,012, Jul. 25, 1996. This application Dec. 4, 1996, Ser. No. 758,812
Int. Cl.^{6} B01D *27/02*
U.S. Cl. 156—429 **10 Claims**

1. In a continuous apparatus for forming melt-blown cylindrical filter cartridges by continuously rotating and axially translating a tubular thermoplastic core element relative to a melt-blowing die so as to collect an annular mass of non-woven, melt-blown, continuous fibers on the core element, the improvement comprising

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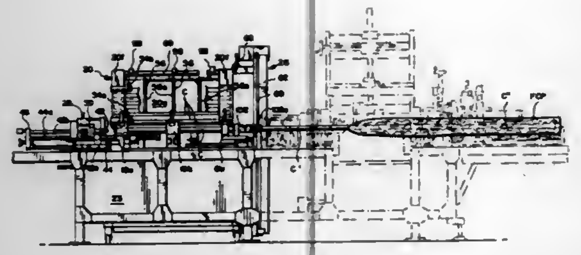


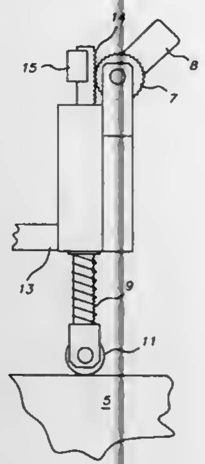
positioning means for coaxially abutting opposed ends of at least one pair of core elements, and means for affecting a friction-weld between said abutted opposed ends of said at least one pair of core elements so that said at least one pair of core elements is capable of being rotated and axially translated as a unit relative to the melt-blowing die assembly.

5,690,783

MECHANISM FOR REPOSITIONING LABEL APPLICATOR HEAD BEFORE APPLYING LABEL TO INTERIOR OF CARTON

William J. Meyers, Clarence Center, and Alex Saveliev, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1997, Ser. No. 784,170
Int. Cl.⁶ B65C *9/00*
U.S. Cl. 156—566 **4 Claims**



1. Apparatus for applying labels to the inside of product containers being conveyed through a packaging process and for repositioning label applicator head before applying labels to the interior of said containers comprising:

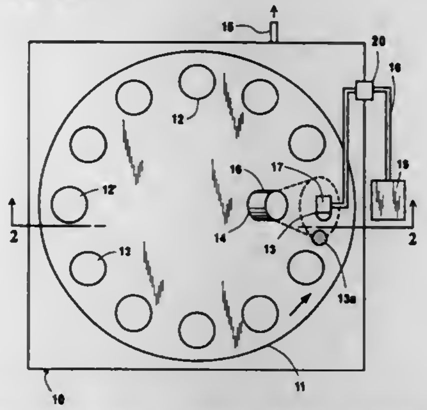
a vacuum applicator head containing a support for the applicator head to which the applicator head is coupled;
a pivot mount which couples the vacuum applicator head and the vacuum applicator head support;
a spur gear which is fastened to the vacuum head, the teeth of which are meshed with a rack gear which is mounted on the applicator support;
a roller bearing mounted on the far end of the rack;
a compression spring located on the rack between a bearing housing and housing that supports the rack gear; and
a stop collar attached to the far end of the rack.

5,690,784

ION MILLING END POINT DETECTION METHOD AND APPARATUS

William Harrington Brearley, Poughkeepsie; Donald Charles Forslund; Douglas William Ormond, Jr., both of Wappingers Falls, and Gerald Joseph Sliss, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1994, Ser. No. 262,204
Int. Cl.⁶ H01L *21/306;* G01N *21/00*
U.S. Cl. 156—626.1 **19 Claims**



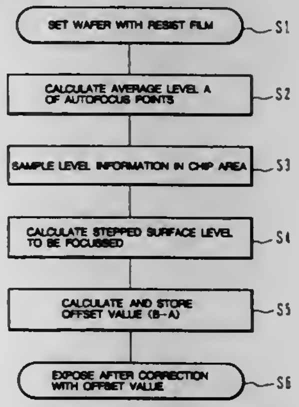
1. An end point detection method for an ion milling process for etching coated substrates which process is performed in an ion milling apparatus wherein an ion source generates light and ions for milling and the ions bombard the coated substrates comprises positioning a light passing monitor substrate in the apparatus in substantially the same orientation as the coated substrates being etched, the monitor substrate comprising a light passing substrate having a coating on at least a position thereof of the same material as on the coated substrate, measuring the light passing through the light passing monitor substrate, comparing the measured light values passing through the monitor substrate during the process with a preset reference value or reference value based on the uncoated monitor substrate and determining the end point of the milling process based on said values.

5,690,785

LITHOGRAPHY CONTROL ON UNEVEN SURFACE

Hiroshi Nakaya, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Mar. 11, 1996, Ser. No. 613,475
Claims priority, application Japan, Mar. 13, 1995, 7-080822
Int. Cl.⁶ H01L *21/00*
U.S. Cl. 156—626.1 **10 Claims**


SET WAFER WITH RESIST FILM
S1
CALCULATE AVERAGE LEVEL A OF AUTOFOCUS POINTS
S2
SAMPLE LEVEL INFORMATION IN CHIP AREA
S3
CALCULATE STEPPED SURFACE LEVEL TO BE FOCUSSED
S4
CALCULATE AND STORE OFFSET VALUE (B-A)
S5
EXPOSE AFTER CORRECTION WITH OFFSET VALUE
S6

1. A method of exposing a semiconductor wafer in which a reticle pattern is transferred to the semiconductor wafer with a coated resist film by a reduction exposure system having a focus sensor and an autofocus mechanism operating in response to an output of the focus sensor, the method comprising the steps of:

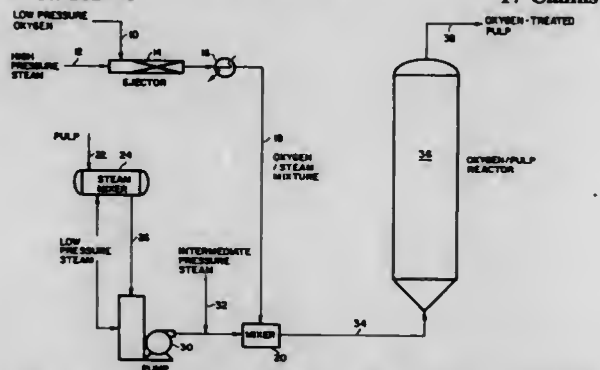
calculating an average level of a plurality of autofocus points in a chip area of the semiconductor wafer mounted on a stage;
scanning the semiconductor wafer and sampling levels of the surface in the chip area;
deriving a stepped surface level to be focussed in accordance with distributions of sampled surface levels;
calculating an offset value between the average level and the stepped surface level to be focussed; and
correcting an autofocus point by the offset value and exposing the chip area of the semiconductor wafer.

5,690,786

PROCESS FOR THE TREATMENT OF PULP WITH OXYGEN AND STEAM USING EJECTORS

John Frederick Cirucci; Jeffrey Alan Knopf, both of Allentown; Vincent Louis Magnotta, Wescosville, and William Paul Schmidt, Allentown, all of Pa., assignors to Air Products and Chemicals Inc., Allentown, Pa.

Filed Nov. 26, 1991, Ser. No. 797,866
Int. Cl.⁶ D21C *9/147*
U.S. Cl. 162—6 **17 Claims**



1. A process for the elevated pressure oxygen treatment of pulp at elevated temperature and pressure in which high pressure steam, as a motive fluid, is premixed with low pressure oxygen enriched gas, as a suction fluid, in an ejector to elevate the pressure of said oxygen enriched gas and the resulting steam and oxygen enriched single phase gas mixture, at an elevated pressure intermediate to said high and low pressure, is introduced into the pulp to provide a high dispersion of intermediate pressurized oxygen in the pulp and to effect an enhanced oxygen treatment of the pulp.

5,690,787

POLYMER REINFORCED PAPER HAVING IMPROVED CROSS-DIRECTION TEAR

David Paul Hultman, Munising; Donald David Watson, Christmas, and Edward Walter Heribacka, Munising, all of Mich., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of Ser. No. 167,746, Dec. 16, 1993, abandoned. This application Mar. 25, 1996, Ser. No. 622,498
Int. Cl.⁶ D21H *19/60*
U.S. Cl. 162—112 **17 Claims**

1. A method of forming a polymer-reinforced paper comprising:
preparing an aqueous suspension of fibers, at least about 50 percent of which on a dry weight basis are cellulosic fibers;
distributing the suspension on a forming wire; removing water from the distributed suspension to form a paper; and treating the paper with a latex reinforcing medium which comprises:
  a latex reinforcing polymer in an amount sufficient to provide the paper with from about 10 to about 70 percent, by weight, of reinforcing polymer, based on the dry weight of the paper; and
  from about 15 to about 70 percent by weight, based on the dry weight of the cellulosic fibers, of a polyethylene glycol having a molecular weight of from about 100 to about 1,500;

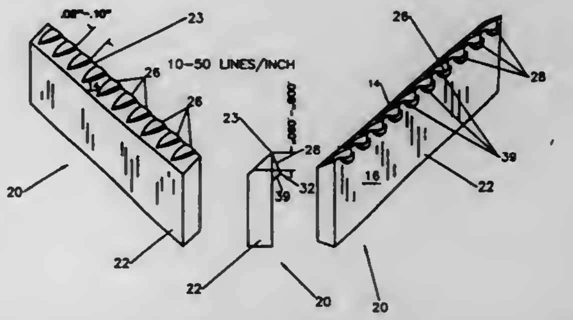
wherein the amounts of latex reinforcing polymer and polyethylene glycol are adapted to provide, when the polymer-reinforced paper has a moisture content less than about 5 percent by weight, an average cross-direction tear as measured with an Elmendorf Tear Tester in accordance with TAPPI Method T414 which is from about 10 to about 100 percent higher than the cross-direction tear of an otherwise identical polymer-reinforced paper which lacks the polyethylene glycol.

5,690,788

BIAXIALLY UNDULATORY TISSUE AND CREPING PROCESS USING UNDULATORY BLADE

Robert J. Marinack, Oshkosh; Anthony O. Awofeso, Appleton; Frank D. Harper, and Thomas N. Kershaw, both of Neenah, all of Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Continuation-in-part of Ser. No. 320,711, Oct. 11, 1994. This application Dec. 16, 1994, Ser. No. 359,318
Int. Cl.⁶ B31F *1/12*
U.S. Cl. 162—113 **29 Claims**



1. A creped paper suitable for use as bathroom tissue, towel napkin, and facial tissue having a basis weight of about 7 to 40 pounds for each 3,000 square foot ream comprising a biaxially undulatory cellulosic fibrous web characterized by a reticulum of intersecting undulations and crepe bars, said crepe bars extending transversely in the cross machine direction, said undulations defining: interspersed ridges and furrows extending longitudinally in the machine direction on the air side of the sheet; along with interspersed crests and sulcations disposed on the Yankee side of the web, wherein the spatial frequency of said transversely extending crepe bars is from about 10 to about 150 crepe bars per inch, and the spatial frequency of said longitudinally extending ridges is from about 10 to 50 ridges per inch.

5,690,789

PRODUCTION OF PATTERNED PAPER

Edward Charles Small, Aberdeen, and Brian Edward Evans, Kintore, both of Scotland, assignors to The Wiggins Teape Group Limited, England

Filed May 4, 1995, Ser. No. 434,538
Claims priority, application United Kingdom, May 7, 1994, 9409106; May 7, 1994, 9409107
Int. Cl.⁶ D21H *27/02*
U.S. Cl. 162—134 **17 Claims**

1. A process for the production of patterned paper, said process comprising the steps of:
(1) preparing speckle-forming material by either:
  (A) agglomerating a mixture comprising papermaking fibre, particulate pigment, and a latex or other binder in an amount of up to about 20% by weight, based on the weight of dry latex or other binder to weight of dry fibre in the speckle-forming mixture, by the addition to the mixture of at least one polyelectrolyte flocculant, polyelectrolyte coagulant or other polyelectrolyte agglomerating agent; or
  (B) dry comminution of cellulose fibre aggregates;

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(2) introducing the resulting speckle-forming material into a papermaking furnish having fibres of a contrasting colour to the colour of the speckle-forming material and in which dye, if present, has been fully fixed; and

(3) draining the speckle-containing furnish to produce a patterned paper web.

5,690,790
TEMPORARY WET STRENGTH PAPER

Michael Martyn Headlam, Cincinnati, and David Jay Smith, Montgomery, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 28, 1996, Ser. No. 624,765

Int. Cl.^{6} D21H *17/24;17/31;17/45*

U.S. Cl. 162—175 **15 Claims**

12. A method of making a paper product having a 30 minute total wet tensile strength of not more than about 40 g/inch, the method comprising the steps of:
(a) providing a slurry comprising water, papermaking fibers, a polyaldehyde comprising free aldehyde groups, and a water soluble polysaccharide having hydroxyl groups comprising cis-hydroxyl groups; said slurry having a pH of 7 or less;
(b) depositing said slurry onto a foraminous substrate;
(c) draining the water from said fibers;
(d) drying the paper made from said fibers; and
(e) reacting said aldehyde groups of said polyaldehyde with said cellulosic fibers and with said hydroxyl groups of said polysaccharide to form chemical bonds joining said fibers when said fibers are dry.

5,690,791
PRESS SECTION WITH AN EQUALIZING NIP IN A PAPER MACHINE

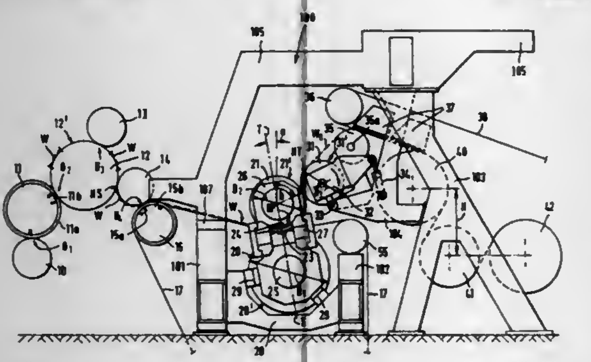
Oiva Vallius, Jyväskylä, Finland, assignor to Valmet Corporation, Helsinki, Finland

Filed Jan. 31, 1996, Ser. No. 594,923

Claims priority, application Finland, Feb. 2, 1995, 950451

Int. Cl.^{6} D21F *3/04*

U.S. Cl. 162—205 **19 Claims**



1. In a paper machine having a forming section in which a paper web is formed, a press section in which the web is pressed and a dryer section in which the web is dried, the dryer section including a drying wire for carrying the web, an initial drying cylinder over which the web first runs in the dryer section and an initial drying wire guide roll over which the drying wire runs before carrying the web thereon, the press section comprising:
first and second press rolls arranged in nip-defining relationship to form an extended nip, said first press roll having a flexible mantle, said second press roll having a rigid mantle,
a press felt or fabric for carrying the web through said extended nip whereby the web is dewatered in said extended nip,
a third press roll arranged in nip-defining relationship with said second press roll to form an equalizing nip through which the web passes after said extended nip, said third press roll comprising a smooth-faced equalizing-press roll structured and arranged to directly contact the web, the web being stretched in said equalizing nip to equalize asymmetry of roughness formed in the web at least in said extended nip before said equalizing nip, and
compensation means arranged after said equalizing nip for compensating for stretching of the web taking place in said equalizing nip and for tensioning the web, said compensation means comprising a guide roll arranged between said equalizing-press roll and the initial drying cylinder and between said equalizing-press roll and the initial drying wire guide roll in the running direction of the web and such that the web has an open draw from said equalizing-press roll to said guide roll, and drive means for rotating said guide roll such that the web has a different running speed about said guide roll than in said equalizing nip.

5,690,792
SET OF RIBS IN A DEWATERING DEVICE IN A PAPER MACHINE

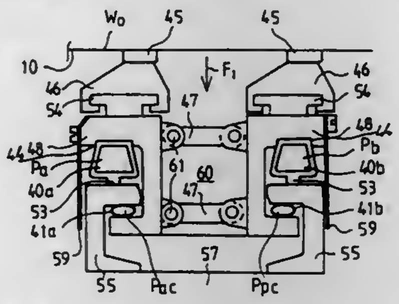
Jyrki Jaakkola, Montreal, Canada, and Samppa J. Salminen, Jyväskylä, Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Nov. 2, 1995, Ser. No. 552,202

Claims priority, application Finland, Nov. 16, 1994, 945388

Int. Cl.^{6} D21F *1/48;1/54*

U.S. Cl. 162—301 **20 Claims**



1. A set of ribs in a dewatering device in a paper machine over which a wire runs in a machine direction, comprising
at least two ribs extending in a direction transverse to the machine direction arranged one after the other and at a distance from one another in the machine direction, said at least two ribs each having an adjustable height position relative to the wire, and
a plurality of connecting mechanisms for articulatably interconnecting the ribs of at least one adjacent pair of said at least two ribs, said connecting mechanisms being arranged at a distance from one another at discrete locations in the transverse direction,
each of said connecting mechanisms at each location in the transverse direction comprising a set of a first intermediate part pivotally coupled to both of said interconnected ribs and a second intermediate part pivotally coupled to both of said interconnected ribs such that four pivotable joints are defined between said first and second intermediate parts and said interconnected ribs.

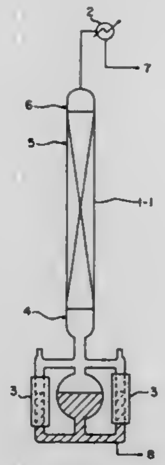
5,690,793
PURIFICATION PROCESS FOR CYCLIC FORMALS

Hubert H. Thigpen, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Warren, N.J.

Continuation of Ser. No. 180,173, Jan. 11, 1994, abandoned. This application Aug. 1, 1995, Ser. No. 509,793

Int. Cl.^{6} B01D *3/34;* **C07D** *317/12*

U.S. Cl. 203—17 **9 Claims**



1. A purification process for removing water from cyclic formals which comprises the steps of supplying a mixture of a cyclic formal selected from the group consisting of 1,3-dioxolan, 1,4-butanediol formal, diethylene glycol formal, 4-methyl-1,3-dioxolan and 1,3-dioxane, and water into a distillation tower at a supply position, effecting distillation while supplying a hydrophilic solvent (A) selected from the group consisting of 1,4-butanediol monomethyl ether, diethylene glycol monomethyl ether, 1,2-propanediol monomethyl ether, 1,3-propanediol monomethyl ether and dipropylene glycol monomethyl ether having a boiling point from 180° to 250° C. at a position on the tower higher than the mixture, and supplying a purified cyclic formal (X) containing not more than 200 ppm of water into the distillation tower at a position higher than the supply position of the hydrophilic solvent (A), and taking out a purified cyclic formal as a distillate from the top of the tower, and hydrophilic solvent (A) containing water from the bottom of the tower, wherein supplying the purified cyclic formal (X) into the distillation tower at a position higher than the supply position of the hydrophilic solvent (A) prevents migration of hydrophilic solvent (A) and water into the distillate.

5,690,794
METHOD OF GROWING DIAMOND FROM GRAPHITE

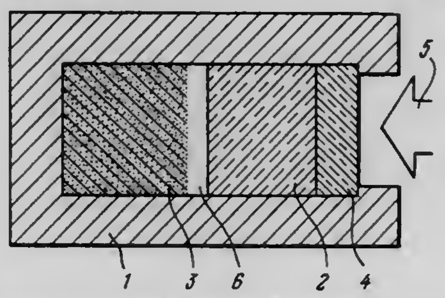
Alexandr Georgievich Molchanov, and Vladislav Borisovich Rozanov, both of Troitsk, Russian Federation, assignors to Fizichesky Institut Imeni P.N./Lebedeva Rossiiskoi Akademii Nauk, Moscow, Russian Federation

Filed Jun. 4, 1996, Ser. No. 657,549

Claims priority, application Russian Federation, Jun. 7, 1995, 95 109547

Int. Cl.^{6} C01B *31/00;31/06;* **B01J** *3/06*

U.S. Cl. 204—157.47 **14 Claims**



1. A method of growing diamond from graphite, comprising the following steps:
providing a high pressure chamber;
placing a sample consisting essentially of compressed graphite in said chamber;
maintaining an essentially constant high pressure during the whole process of growing diamond;
applying a pulse of pulse-periodical laser radiation having a wavelength in the transmission region of diamond to said sample of graphite so as to heat the heating the skin-layer of said sample of graphite with said laser radiation pulse absorbed in that layer to the graphite-to-diamond phase transition temperature and produce a layer of diamond from said skin-layer, wherein said layer is transparent to subsequent applications of pulse-periodical laser radiation such that a subsequent application will reach a next skin-layer of graphite underlying and adjacent said layer of diamond; and
cooling said layer of diamond.

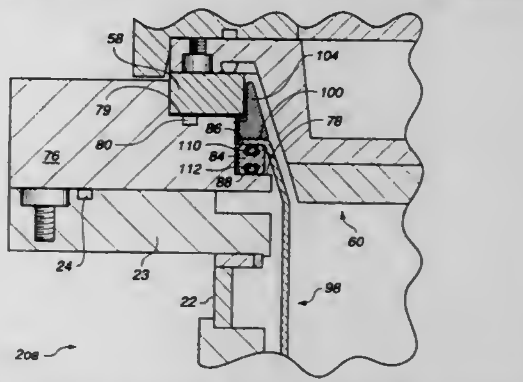
5,690,795
SCREWLESS SHIELD ASSEMBLY FOR VACUUM PROCESSING CHAMBERS

Michael Rosenstein, Sunnyvale; Howard Grunes, Santa Cruz, both of Calif., and Stephen Bruce Brodsky, Fishkill, N.Y., assignors to Applied Materials, Inc., Santa Clara, Calif., and International Business Machines Corporation, Amonk, N.Y.

Filed Jun. 5, 1995, Ser. No. 463,463

Int. Cl.^{6} C23C *14/34;16/00;* **C23F** *1/02*

U.S. Cl. 204—192.1 **16 Claims**



3. A configuration for attaching a shield to a substrate processing chamber comprising:
a substrate processing chamber assembly having one or more walls surrounding a substrate processing location, a top surface of the one or more walls forming an opening of said chamber,
a chamber opening cover member being configured to cover the opening of said chamber generally supported from and sealed to said top surface of said one or more walls;
an insulating ring to electrically isolate the one or more walls of the processing chamber from the chamber opening cover member, the insulating ring is generally configured to be disposed between said top surface of the walls of said chamber and said chamber opening cover member, generally vacuum tight seals being formed between the insulating ring and the top surface of the one or more walls of said chamber and between the insulating ring and said chamber opening cover member;
a first process chamber shield disposed to act as an internal liner for said one or more walls generally adjacent said substrate processing location, a portion of said shield in use generally acting as a barrier to prevent particles emitted from the processing location from reaching at least a portion of the processing chamber walls, said first process chamber shield including a flange portion;
a compliant spacer ring located within the processing chamber, said compliant spacer ring being configured to contact said flange portion and together with the flange portion form at least part of a shield clamping assembly, said shield clamping assembly being configured to clamp said flange portion at a spacer location located between said insulating ring and a clamping portion of said one or more walls of said processing chamber assembly, said compliant spacer ring in use providing contact pressure between adjacent members in the shield clamping assembly to assure electrical continuity between the flange portion of said shield and the one or more walls of the processing chamber assembly when a generally vacuum tight seal is formed to permit evacuation of gas molecules present in the processing chamber.

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5,690,796
METHOD AND APPARATUS FOR LAYER DEPOSITIONS

Francois DuPont, Thun, and Erich Bergmann, Mels, both of Switzerland, assignors to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

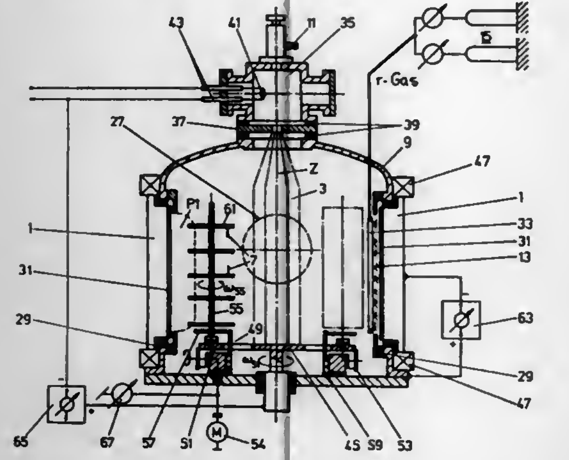
Continuation of Ser. No. 290,967, Sep. 9, 1994, abandoned.

This application Dec. 5, 1995, Ser. No. 567,217

Claims priority, application Switzerland, Dec. 23, 1992, 3924/92

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—192.16 **44 Claims**



1. A method for depositing a layer on a surface of a workpiece to be coated, comprising:

establishing a reactive gas atmosphere;

cathode sputtering a solid material phase using a sputtering plasma discharge in the reactive gas atmosphere;

depositing a layer on the surface of the workpiece to be coated, the layer comprising the reaction product of solid material sputtered from the solid material phase, and reactive gas from the reactive gas atmosphere;

establishing a substantially non-reactive gas atmosphere;

generating in the substantially non-reactive gas atmosphere, at least one further plasma discharge in addition to the sputtering plasma discharge;

repeatedly and cyclically exposing the surface of the workpiece to be coated, at repeated times, to the cathode sputtering in the reactive gas atmosphere, and at repeated different times to the further plasma discharge in the substantially non-reactive gas atmosphere, said further plasma discharge causing substantially no solid material to be deposited on the surface of the workpiece to be coated, and the surface of the workpiece being exposed to the cathode sputtering a plurality of said times and the surface of the workpiece being exposed to the further plasma discharge a plurality of said different times.

5,690,797
HYDROGEN AND OXYGEN GAS GENERATING SYSTEM

Hiroyuki Harada, Tokyo; Takashi Sasaki, Hyogo; Kiyoshi Hirai, Hyogo; Shinichi Yasui, Hyogo; Hiroko Kobayashi, Hyogo, and Mamoru Nagao, Osaka, all of Japan, assignors to Mitsubishi Corporation, Tokyo, and Shinko Pantec Co., Ltd., Hyogo, both of Japan

Filed Jan. 18, 1996, Ser. No. 588,336

Claims priority, application Japan, Jan. 18, 1995, 7-024737

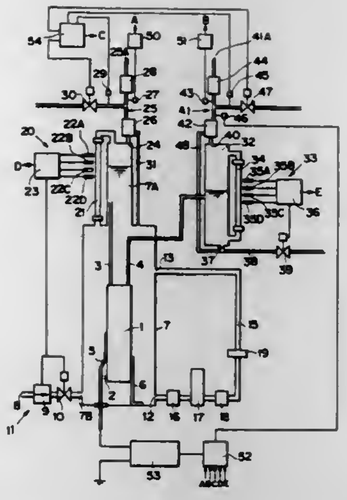
Int. Cl.^{6} C25B *9/00;15/08*

U.S. Cl. 204—229 **16 Claims**

1. A hydrogen and oxygen gas generating system comprising

a water electrolysis cell having anode and cathode compartments separated from one another by a diaphragm wherein deionized water is electrolyzed to generate oxygen and hydrogen gases in the anode and cathode compartments, respectively,

an oxygen outflow pipe connected to the anode compartment of said electrolytic cell for channeling oxygen gas resulting from electrolysis upward from the anode compartment,



a hydrogen outflow pipe connected to the cathode compartment of said electrolytic cell for channeling hydrogen gas resulting from electrolysis outward from the cathode compartment,

a container which can be filled with deionized water, surrounding the electrolytic cell and supporting the cell submerged in deionized water, said container including an upper portion defining an oxygen gas separating chamber where an upper end of said oxygen outflow pipe opens,

a deionized water feed means for feeding deionized water into said container,

said cell further having a communication port at the bottom of the anode compartment for communication of deionized water between the cell interior and the container interior,

a gas/liquid separator disposed outside said container and connected to the cathode compartment of said electrolytic cell through the hydrogen outflow pipe for receiving hydrogen gas,

a first gas pressure detecting means for detecting the pressure of oxygen gas accumulating in an upper space of said oxygen gas separating chamber,

a second gas pressure detecting means for detecting the pressure of hydrogen gas accumulating in an upper space of said gas/liquid separator,

a first gas piping line for delivering outward the oxygen gas accumulating in an upper space of said oxygen gas separating chamber,

a second gas piping line for delivering outward the hydrogen gas accumulating in an upper space of said gas/liquid separator,

a gas pressure control means for controlling said first and second gas piping lines in accordance with the values of gas pressure detected by said first and second gas pressure detecting means, to control the pressure of oxygen gas accumulating in an upper space of said oxygen gas separating chamber and the pressure of hydrogen gas accumulating in an upper space of said gas/liquid separator,

a DC power source for supplying electric power to said electrolytic cell, and

a power regulator coupled to said DC power source for controlling the power supply to said electrolytic cell to control the pressure of hydrogen gas and the pressure of oxygen gas.

5,690,798
CORNER PROTECTOR FOR ELECTROWINNING ELECTRODE

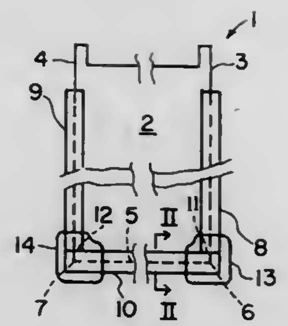
Graeme Alexander, and Manuel G. Santoyo, both of Tucson, Ariz., assignors to Quadna, Inc., Tucson, Ariz.

Filed Feb. 26, 1996, Ser. No. 607,183

Int. Cl.^{6} C25D *17/00*

U.S. Cl. 204—279 **20 Claims**

1. A corner protector for an electrolytic electrode having first and second edges which define a corner and are respectively provided with first and second coverings, said corner protector comprising:



a body provided with a first channel portion for receiving the first covering and a second channel portion for receiving the second covering,

said body also being provided with a cutout for receiving the electrode.

5,690,799
HYDROGEN-OCCLUDING ALLOY AND HYDROGEN-OCCLUDING ALLOY ELECTRODE

Makoto Tsukahara; Kunio Takahashi; Takahiro Mishima; Akihito Isomura, all of Aichi-ken; Tetsuo Sakai, Osaka; Hiroshi Miyamura, Osaka, and Itsuki Uehara, Osaka, all of Japan, assignors to IMRA Material R&D Co., Ltd., Aichi-ken, and Agency of Industrial Science and Technology, Tokyo-to, both of Japan

Filed Mar. 27, 1995, Ser. No. 410,798

Claims priority, application Japan, Mar. 28, 1994, 6-057513; Mar. 28, 1994, 6-057514

Int. Cl.^{6} C25B *11/04*

U.S. Cl. 204—293 **5 Claims**

1. A hydrogen-occluding alloy electrode comprising an alloy powder wherein the alloy comprises a Ti—V solid solution mother phase and a secondary phase containing a Ti—Ni phase,

said alloy having the formulation $TiV_{\alpha}Ni_{\beta}M_{\gamma}$ wherein M is at least one element selected from the group consisting of Co, Cu and Nb, and $1\leqq\alpha\leqq10$, $0.2\leqq\beta\leqq2$ and $0.02\leqq\gamma\leqq0.5$,

said secondary phase having the formulation $TiNi_{\delta}N_{\epsilon}$ wherein N is at least one element selected from the group consisting of V, Co, Cu and Nb, and $0.5\leqq\delta\leqq2$ and $0.1\leqq\epsilon\leqq1$, and forming a three-dimensional reticulate skeleton in the alloy.

5,690,800
ELECTROCHEMICAL MEASURING ELEMENT HAVING A POTENTIAL-FREE SENSOR ELEMENT

Karl-Hermann Friese, Leonberg, and Frank Stanglmeier, Moeglingen, both of Germany, assignors to Robeert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE95/01684, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO96/21147, PCT Pub. Date Jul. 11, 1996

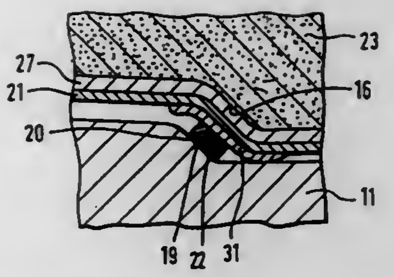
PCT Filed Nov. 28, 1995, Ser. No. 687,339

Claims priority, application Germany, Dec. 31, 1994, 44 47 306.0

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—424 **9 Claims**

1. Electrochemical measuring element for determining the oxygen content of gas mixtures in exhaust gases from combustion engines, with a potential-free arranged sensor element, having an oxygen ion conducting solid electrolyte body with electrodes and electrically conducting connections, wherein the sensor element with a sealing ring is inserted into a metal casing and the connection facing the casing is covered with an electrically insulating layer, at least in the area of the sealing ring, characterized in that at



least in the area of sealing ring (**20**), the insulating layer (**21**) has a ductile cover layer (**31**), with which the sensor element (**14**) rests on sealing ring (**20**).

5,690,801
METHOD OF RENDERING AN ELECTROCOAGULATION PRINTED IMAGE WATER-FAST

Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Technology Inc., Saint-Laurent, Canada

Filed Jan. 21, 1997, Ser. No. 786,635

Int. Cl.^{6} C25D *13/04*

U.S. Cl. 204—486 **40 Claims**

1. In an electrocoagulation printing method comprising the steps of:

a) providing a positive electrolytically inert electrode having a continuous passivated surface moving at a constant speed along a selected path, said passivated surface defining a positive electrode active surface;

b) forming on said positive electrode active surface a plurality of dots of colored, coagulated colloid representative of a desired image, by electrocoagulation of an electrolytically coagulable colloid present in an electrocoagulation printing ink comprising a liquid colloidal dispersion containing said electrolytically coagulable colloid, a dispersing medium, a soluble electrolyte and a coloring agent; and

c) bringing a substrate into contact with the dots of colored, coagulated colloid to cause transfer of the dots of colored, coagulated colloid from the positive electrode active surface onto said substrate and to imprint said substrate with said image; the improvement which comprises treating the dots of colored, coagulated colloid transferred onto said substrate in step (c) with a crosslinking agent to substantially completely crosslink said colored, coagulated colloid and to render the printed image water-fast.

5,690,802
METHOD OF INCREASING COAGULATION EFFICIENCY DURING ELECTROCOAGULATION PRINTING

Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Technology Inc., Saint-Laurent, Canada

Filed Jan. 21, 1997, Ser. No. 786,658

Int. Cl.^{6} C25D *13/04*

U.S. Cl. 204—486 **40 Claims**

1. In an electrocoagulation printing method comprising the steps of:

a) providing a positive electrolytically inert electrode formed of a trivalent metal and having a continuous passivated surface moving at constant speed along a selected path, said passivated surface defining a positive electrode active surface;

b) forming on said positive electrode active surface a plurality of dots of colored, coagulated colloid representative of a selected image, by electrocoagulation of an electrolytically coagulable colloid present in an electrocoagulation printing ink comprising a liquid colloidal dispersion containing said electrolyti-

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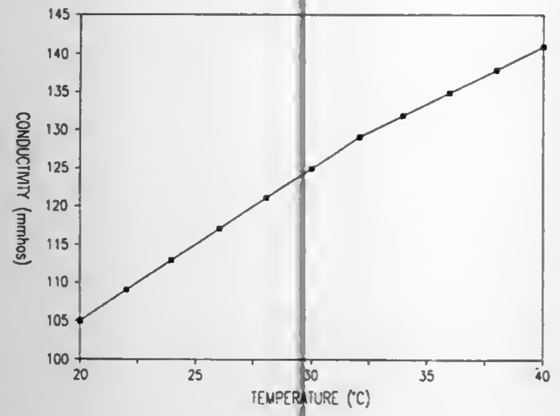


cally coagulable colloid, a dispersing medium, a soluble electrolyte and a coloring agent; and

c) bringing a substrate into contact with the dots of colored, coagulated colloid to cause transfer of the dots of colored, coagulated colloid from the positive electrode active surface onto said substrate and to imprint said substrate with said image; the improvement which comprises maintaining said positive electrode active surface and said ink at a temperature of about 35° C. to about 60° C. to increase conductivity of said ink and release of trivalent metal ions from said passivated surface into said ink in step (b) such that the trivalent metal ions initiate coagulation of said colloid and are released in a quantity sufficient to increase optical density of the coagulated colloid.

5,690,803

METHOD OF ENHANCING TRANSFER OF COAGULATED COLLOID ONTO A SUBSTRATE DURING ELECTROCOAGULATION PRINTING

Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Technology Inc., Saint-Laurent, Canada

Filed Jan. 27, 1997, Ser. No. 789,157

Int. Cl.^{6} C25D *13/04*

U.S. Cl. 204—486 **40 Claims**

1. In an electrocoagulation printing method comprising the steps of:

a) providing a positive electrode formed of an electrolytically inert metal and having a continuous passivated surface moving at a constant speed along a selected path, said passivated surface defining a positive electrode active surface;

b) forming on said positive electrode active surface a plurality of dots of colored, coagulated colloid representative of a desired image, by electrocoagulation of an electrolytically coagulable colloid present in an electrocoagulation printing ink comprising a liquid colloidal dispersion containing said electrolytically coagulable colloid, a dispersing medium, a soluble electrolyte and a coloring agent; and

c) bringing a substrate into contact with the dots of colored, coagulated colloid to cause transfer of the dots of colored, coagulated colloid from the positive electrode active surface onto said substrate and to imprint said substrate with said image;

the improvement which comprises maintaining said positive electrode active surface and said ink at a temperature of about 35° C. to about 60° C. to increase viscosity of the coagulated colloid in step (b) said that the dots of colored, coagulated colloid remain coherent during transfer in step (c) to enable the colored, coagulated colloid to be substantially completely transferred onto said substrate in step (c).

5,690,804

METHOD AND PLANT FOR REGENERATING SULFATE ELECTROLYTE IN STEEL STRIP GALVANIZING PROCESSES

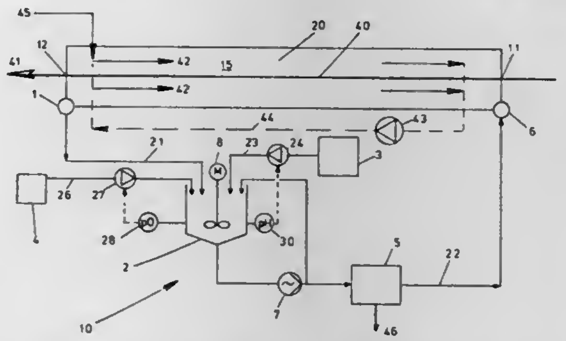
Joachim Kuhlmann, Kreuztal, and Ulrich Gläsker, Hilchenbach, both of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Feb. 14, 1996, Ser. No. 600,009

Claims priority, application Germany, Feb. 23, 1995, 195 06 297.3

Int. Cl.^{6} C25D *21/18*

U.S. Cl. 205—99 **10 Claims**



1. A method of regenerating zinc sulfate electrolyte in a steel strip electrogalvanizing process by precipitating dissolved iron from electrolyte circulating through a coating cell, the method comprising the steps of:

a) removing a partial quantity of circulating electrolyte to be regenerated;

b) oxidizing to Fe^{3+} the iron dissolved in the electrolyte by a redox-controlled addition of oxidizing agent;

c) recipitating as sludge any Fe^{3+} still dissolved in the electrolyte by a controlled addition of a ZnO/water suspension or a $ZnCO_3$/water suspension to raise the pH value to about 2.9 to 3.5;

d) dissolving excess ZnO or $ZnCO_3$ by adding fresh electrolyte; and

e) filtering the precipitated Fe^{3+} from the electrolyte and returning the regenerated partial quantity back into the circulating electrolyte.

5,690,805

DIRECT METALLIZATION PROCESS

Charles Edwin Thorn, Newport, Ky.; Frank Polakovic, Ringwood, N.J., and Charles A. Mosolf, Juno Beach, Fla., assignors to Electrochemicals Inc., Maple Plain, Minn.

Continuation-in-part of Ser. No. 340,849, Nov. 16, 1994, which is a continuation-in-part of Ser. No. 232,574, May 3, 1994, Pat. No. 5,476,580, which is a continuation-in-part of Ser. No. 62,943, May 17, 1993, Pat. No. 5,389,270. This application Jun. 7, 1995, Ser. No. 471,871

Int. Cl.^{6} C25D *5/02;5/54;5/56;* B05D *5/12*

U.S. Cl. 205—118 **34 Claims**

1. A method of applying a conductive graphite coating to a non-conductive layer, comprising the steps of:

A. providing a board comprising at least first and second electrically conductive metal layers seperated by a non-conductive layer, said board having a recess extending through at least one of said metal layers into said nonconductive layer, said recess having a non-conductive surface;

B. providing a liquid dispersion comprising electrically conductive synthetic graphite having a mean particle size no greater than about 50 microns, present in an amount effective to provide an electrically conductive coating when said composition is applied to said non-conductive surface of said recess; and

C. applying said graphite dispersing to said non-conductive surface of said recess to form a substantially continuous,

electrically conductive graphite coating thereon, wherein said graphite coating has an electrical resistivity of less than about 1000 ohms.

5,690,806

CELL AND METHOD FOR THE RECOVERY OF METALS FROM DILUTE SOLUTIONS

John Garry Sunderland, and Ian McCrady Dalrymple, both of Chester, United Kingdom, assignors to EA Technology Ltd., United Kingdom

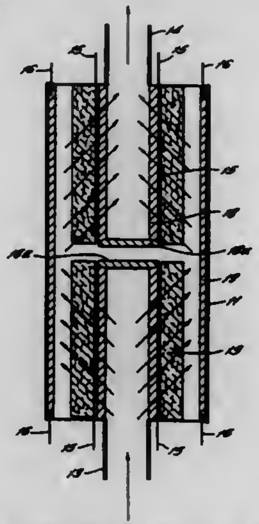
PCT No. PCT/GB94/01929, § 371 Date Mar. 7, 1996, § 102(e) Date Mar. 7, 1996, PCT Pub. No. WO95/07375, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 6, 1994, Ser. No. 602,778

Claims priority, application United Kingdom, Sep. 10, 1993, 9318194

Int. Cl.^{6} C25C *1/08;1/12;1/20;7/04*

U.S. Cl. 205—560 **65 Claims**



18. A method of removing at least one metal from a dilute solution, which method comprises passing a dilute solution of the said metal through an electrolytic cell, which cell comprises a porous tubular support which is provided with a cathode comprising a porous carbon fiber material, a current feeder for the cathode which feeder is supported on said porous tubular support and extends along the entire length of said cathode, a tubular anode spaced from said cathode and a current feeder for the anode, the anode and cathode being enclosed by a non-porous outer casing, wherein the passing comprises introducing said dilute solution from which said at least one metal is to be removed into said cell by means of an inlet so said diluted solution flows through the porous carbon fiber cathode and out from the cell through an outlet.

5,690,807

METHOD FOR PRODUCING SEMICONDUCTOR PARTICLES

Harry R. Clark, Jr., Townsend, and Brian S. Ahern, Boxboro, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

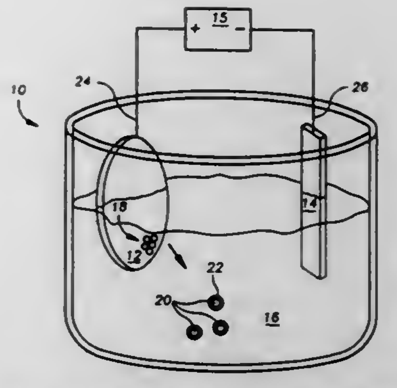
Filed Aug. 3, 1995, Ser. No. 510,802

Int. Cl.^{6} C25F *3/12*

U.S. Cl. 205—655 **23 Claims**

1. A method for producing semiconductor particles in solution, comprising the steps of:

providing a semiconductor material in an electrolytic solution of an anodic cell configured with a cathode positioned in the electrolytic solution, the electrolytic solution comprising an etchant and a selected surfactant that is characterized by an attractive affinity for the semiconductor material; and



applying an electrical potential between the semiconductor material and the cathode in the electrolytic solution to anodically etch the semiconductor material and remove particles from the material to produce particles of the semiconductor material in the solution, the selected surfactant acting to encapsulate semiconductor particles in the solution to inhibit etching of the particles and to prevent agglomeration of the particles in the solution.

10. The method of claim 1 wherein the electrical potential applied between the semiconductor material and the cathode is set at a potential to bias the semiconductor material at a positive electrical voltage with respect to the cathode.

11. The method of claim 10 further comprising the step of illuminating the semiconductor material placed in the anodic cell electrolytic solution.

5,690,808

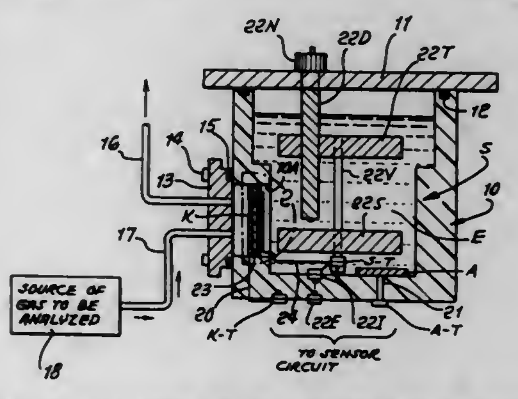
ELECTROCHEMICAL GAS SENSORS AND METHODS FOR SENSING ELECTROCHEMICAL ACTIVE GASES IN GAS MIXTURES

Naim Akmal, Hacienda Heights, and Yining Zhang, Rowland Heights, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 25, 1996, Ser. No. 591,886

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 205—775 **31 Claims**



24. A method for sensing the concentrations of an electrochemically active gas in a gas mixture by means of an electrochemical, galvanic sensing cell providing an electrical output current representative of the concentrations of the sensed electrochemically active gases including in sub-parts per billion range, said method including the steps of

providing an electrochemical, galvanic sensing cell which senses concentrations of such an active gas in the parts per billion range,

said sensing cell having a gas sensing cathode electrode, anode electrode and an electrolyte wherein the electrolyte has a dissolved active gas such as oxygen in the electrolyte in relatively high quantities relative to the quantities of the gas undergoing sensing, and

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continuously removing any dissolved active gas or partially reacted electrochemical gas from the electrolyte before being dissolved in the bulk electrolyte where said sensing cell continuously detects sub-parts per billion of the sensed active gas in a gas mixture without external sparging of the electrolyte.

5,690,809
IN SITU MITIGATION OF COKE BUILDUP IN POROUS CATALYSTS BY PRETREATMENT OF HYDROCARBON FEED TO REDUCE PEROXIDES AND OXYGEN IMPURITIES

Baia Subramaniam; Said Saim, and Michael C. Clark, all of Lawrence, Kans., assignors to Center for Research, Inc., Lawrence, Kans.

Continuation-in-part of Ser. No. 424,872, Apr. 18, 1995. This application Apr. 18, 1996, Ser. No. 634,293

Int. Cl.^{6} C10G *9/16*

U.S. Cl. 208—48 R **13 Claims**

1. In a method of carrying out a catalyzed reaction subject to catalyst deactivation by coke formation on the reaction catalyst including the steps of providing a feed stream including a reactant for the reaction and impurities comprising peroxide and oxygenate impurities, contacting said feed stream with a solid porous catalyst and causing the catalyzed reaction to occur and generate a reaction mixture, the improvement which comprises the steps of pretreating said feed stream to remove both oxygenate and peroxide impurities prior to said contacting step, and carrying out said contacting step at a catalyst temperature between 0.9–1.2 critical temperature of said reaction mixture.

5,690,810
SINGLE-STEP PROCESS TO UPGRADE NAPHTHAS TO AN IMPROVED GASOLINE BLENDING STOCK

Richard Vance Lawrence, Houston, and Pei-Shing Eugene Dai, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 14, 1994, Ser. No. 338,308

Int. Cl.^{6} C10G *47/02*

U.S. Cl. 208—135 **24 Claims**

1. In a process for converting naphtha feedstock to gasoline blending stock, a method of simultaneously

a) decreasing the concentration of total aromatics in the product by saturation of aromatics,

b) decreasing the concentration of C_7, C_{11} and C_{12} normal paraffins in the product, and

c) increasing the concentration of total C_4 and C_7 isoparaffins by isomerization of normal paraffins to more highly branched isomers by selective hydrocracking, which comprises

contacting said naphtha feedstock in a contact zone at a temperature of 300°–700° F., a pressure of 50–500 psig, and an LHSV of 1–6 volumes of liquid feed to volume of catalyst per hour and hydrogen to hydrocarbon mole ratio of 0.5 to 10 with a catalyst comprising

a solid acid support comprising at least one zeolitc selected from the group consisting of a Y-zeolite, zeolite beta, silcalite, ZSM-5 and mordenite, having deposited thereon a metal selected from Group VIII of the Periodic Table, optionally bound to an oxide of Group III and/or IV of the Periodic Table; and

producing a product characterized by reduced benzene and aromatics contents.

5,690,811
METHOD FOR EXTRACTING OIL FROM OIL-CONTAMINATED SOIL

Robert Mitchell Davis, Ft. Worth, and James Mark Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 17, 1995, Ser. No. 544,236

Int. Cl.^{6} C10G *1/04*

U.S. Cl. 208—428 **33 Claims**

1. A method for extracting oil from oil-contaminated soil comprising the steps of:

(a) mixing the oil-contaminated soil with a solvent to form a slurry of oil-contaminated soil particles suspended in the solvent;

(b) injecting the oil-contaminated soil slurry into the upper end of a vertically disposed, hollow chamber of uniform cross-section and substantially simultaneously injecting fresh solvent into the lower end of the hollow chamber that flows upwardly through the hollow chamber at a controlled rate so that the oil-contaminated soil particles fall by gravity through the upwardly flowing fresh solvent;

(c) subjecting the oil-contaminated soil particles and solvent in the hollow chamber to sonic energy in the frequency range of about 0.5 to 2.0 kHz without cavitation of the solvent whereby the oil on the soil particles is displaced therefrom and dissolved by the solvent; and

(d) recovering the substantially oil-free soil particles from the bottom of the hollow chamber.

5,690,812
PROCESS AND APPARATUS FOR THE SEPARATION OF SOLID MATTER VIA FLOTATION

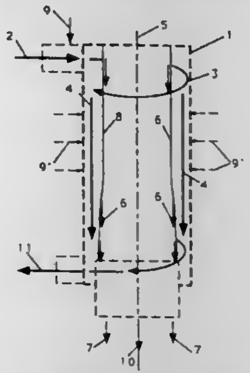
Herbert Britz, Ravensburg-Weissenau, and Alexander Peschl, Ravensburg, both of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Germany

Continuation of Ser. No. 295,090, Aug. 24, 1994, abandoned. This application Nov. 2, 1995, Ser. No. 552,205

Claims priority, application Germany, Sep. 10, 1993, 43 30 635.7

Int. Cl.^{6} B03D *1/04;* **B04C** *3/00;3/06*

U.S. Cl. 209—164 **10 Claims**



1. A process for the separation of solid matter from a suspension via flotation in a separating space having a longitudinal axis, the process including:

feeding the suspension into the separating space at an inlet end of the separating space and removing separated fractions of the suspension, including a flotation portion and a separation portion, at an outlet end of the separating space at a first location on said longitudinal axis, said inlet end comprising means for producing micro turbulence in the separating space at a second location on said longitudinal axis which is axially displaced from said first location;

producing air bubbles, in one of the inlet end and a position preceding the inlet end, by a drop in pressure within the suspension;

subjecting the suspension to a flotation process utilizing the produced air bubbles;

subjecting the suspension, during the flotation process, to a rotational movement about said longitudinal axis to produce a centrifugal field for enhancing the effect of the flotation process to form the flotation portion and the separated portion;

moving the flotation portion, containing said air bubbles, parallel to the longitudinal axis of the separating space, the flotation portion including components to be removed from the suspension;

moving the separation portion, including components to be separated from the suspension, in a same direction with said flotation portion; and

removing, at the outlet end, said separated fractions.

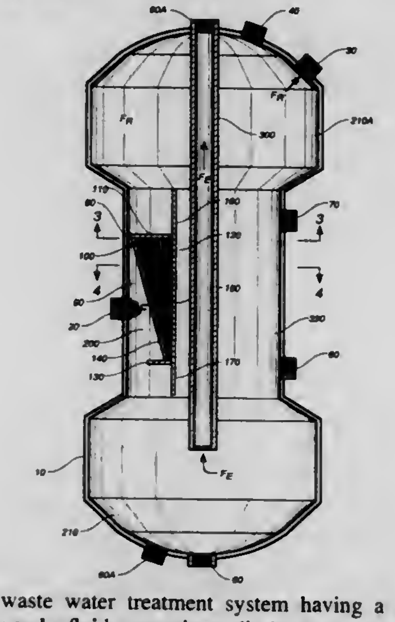
5,690,813
FLUID SEPARATOR APPARATUS

Christopher Frank Coale, 1501 S. Front, Angleton, Tex. 77515

Continuation-in-part of Ser. No. 429,351, Apr. 26, 1995, Pat. No. 5,534,138. This application Jul. 9, 1996, Ser. No. 677,404

Int. Cl.^{6} B01D *17/038*

U.S. Cl. 210—86 **7 Claims**



1. In a waste water treatment system having a waste water storage tank and a fluid contaminant discharge means, an apparatus for separating contaminated waste water into a substantially uncontaminated homogeneous extract water portion and into a heterogeneous raffinate fluid portion, with said raffinate fluid portion having a lower specific gravity than said extract water portion, said apparatus comprising:

an elongated housing means placed between said waste water storage tank and said fluid contaminant discharge means, and having a top portion, a bottom portion disposed below said top portion, and first and second lateral wall portions disposed medially and perpendicularly of said top potion and said bottom portion;

an inlet means disposed upon said first lateral wall portion of said elongated housing means, for receiving said contaminated waste water from said waste water storage tank into a separation region;

outlet means disposed upon said second lateral wall portion of said elongated housing means, for delivering said raffinate fluid portion to said fluid contaminant discharge means;

first heating means disposed upon said second lateral wall portion of said elongated housing means, for heating said waste water and said raffinate portion to promote flow and to prevent solidification thereof;

a separator chamber means contained within said elongated housing means and having a centrifugation means and said separation region therein;

said centrifugation means including longitudinal plate means having a partially frustoconically-shaped convex surface facing said first lateral wall portion and said separation region with a vertex end facing said bottom portion and an opposite base end facing said top portion, for causing circular turbulent flow of said contaminated waste water thereabout;

said longitudinal plate means of said partially frustoconically-shaped surface of said centrifugation means disposed obliquely relative to said first lateral wall portion of said elongated housing means and having a longitudinal axis;

said centrifugation means further having an impact plate means disposed oppositely of said longitudinal plate means and facing an extract collection region, for interrupting said circular turbulent flow of said contaminated waste water;

a first baffle plate means disposed perpendicularly to said longitudinal axis of said longitudinal plate means and disposed adjacent said vertex end of said partially frustoconically-shaped surface of said centrifugation means and projecting into said separation region, for controlling the gravitation rate of said extract portion from said contaminated waste water as said extraction portion gravitates from said separation region to an extract sump region disposed upon said bottom portion of said housing means;

a first discharge means disposed upon said bottom portion of said elongated housing means, for draining said extract portion from said extract sump region;

an extract collection region bounded by said second lateral wall portion of said elongated housing means and said impact plate means, and disposed contiguously with said extract sump region, for accumulating said separated extract portion;

a raffinate collection region bounded by said top portion and said first and second lateral wall portions of said elongated housing means, for receiving said raffinate portion from said separation region and for delivering said raffinate portion to said outlet means;

a second baffle plate means disposed parallel to and along said longitudinal axis of said longitudinal plate means and disposed adjacent said impact plate means and said top portion, for preventing admixing of said raffinate portion contained in said raffinate collection region with said extract portion contained in said extract collection region;

a third baffle plate means disposed parallel to and along said longitudinal axis of said longitudinal plate means and disposed adjacent said impact plate means and said bottom portion, for controlling the rate of flow of said extract portion from said extract sump region to said extract collection region;

sensor means disposed upon said second lateral wall portion disposed medially of said outlet means and said discharge means, for sensing the level of said extract portion accumulating in said extract collection region;

a fourth baffle plate means disposed perpendicularly to said longitudinal axis of said longitudinal plate means and disposed adjacent said base end of said partially frustoconically-shaped surface of said centrifugation means, for controlling the flow of said contaminated waste water from said separation region to said raffinate collection region;

second heating means disposed proximal to said extract sump region of said elongated housing means, for further heating said waste water and said raffinate potion to promote flow and to prevent solidification thereof; and

tube means interconnecting said extract sump region with a second discharge means disposed upon said top portion of said elongated housing means, for draining said extract portion from said extract sump region.

7. The apparatus recited in claim 1, wherein said fourth baffle plate means comprises a plurality of apertures therein, for limiting entry to only said raffinate portion into said raffinate collection region from said separation region, as said contaminated fuel rises in said separation region.

5,690,814
SPIN-ON FILTER WITH TRANSPARENT CONTAINER PORTION

Earl Thomas Holt, Gastonia, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 6, 1996, Ser. No. 597,109

Int. Cl.^{6} B01D *35/30*

U.S. Cl. 210—94 **10 Claims**

9. A replaceable filter assembly for filtering contaminants from liquid coolant used to cool an internal combustion engine, the filter assembly comprising:

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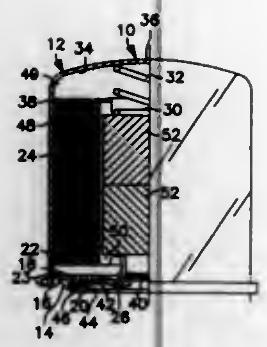


a round end plate of metal material, the round end plate having a threaded central outlet opening coaxial with a central axis of the filter and a plurality of inlet openings disposed in spaced relation around the central outlet opening, the round end plate having a circular peripheral edge surface, an inner surface facing into the assembly and outer surface facing away from the assembly;

an annular metal cover plate disposed in abutment with the outer surface of the end plate, the cover plate having a peripheral trough extending beyond the peripheral edge of the end plate and displaced in an axial direction away from the outer surface of the end plate;

a cylindrical filter element disposed proximate the inner surface of the end plate and having a portion thereof urged against the end plate by a coil spring disposed coaxially with said central axis;

a transparent unitary plastic container having a cylindrical portion, a closed end and an open end, the container fitting over the filter element and extending past the peripheral edge of the base plate, the open end of the container being surrounded by a unitary annular flange extending radially outwardly from the open end, the annular flange having a radially extending annular end surface, an axially extending peripheral surface and a radially extending shoulder, the annular flange being received in the trough of the cover plate and being retained therein by a portion of the trough deformed thereover; and

an annular seal disposed at least between the a first radially extending surface of the trough and the annular end and surface of the annular flange.

5,690,815
AUTOMATED SYSTEM FOR PROCESSING BIOLOGICAL FLUID

Eric J. Krasnoff, Old Brookville; Thomas J. Bormann, Melville; Thomas C. Gsell, Glen Cove; Frank R. Pascale, Glen Cove, and Vlado I. Matkovich, Glen Cove, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

PCT No. PCT/US93/06547, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO94/01193, PCT Pub. Date Jan. 20, 1994

Continuation-in-part of Ser. No. 912,731, Jul. 13, 1992, abandoned, and a continuation-in-part of Ser. No. 912,169, Jul. 13, 1992, abandoned, and a continuation-in-part of Ser. No. 47,446, Apr. 19, 1993, abandoned, and a continuation-in-part of Ser. No. 47,447, Apr. 19, 1993, abandoned. This PCT application Jul. 13, 1993, Ser. No. 367,296

Int. Cl.^{6} B01D *36/00;* **A61M** *1/36*

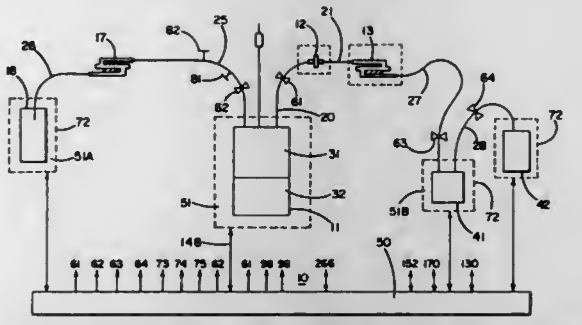
U.S. Cl. 210—97 **2 Claims**

2. An automated biological fluid processing system comprising:

a pressure differential generator;

a biological fluid processing assembly including:

- a first container operatively associated with the pressure differential generator, at least one satellite container in fluid communication with the first container, and
- a porous medium comprising a leukocyte depletion medium interposed between the first container and the satellite container;



a sensor downstream of the porous medium, said sensor for sensing the presence of red blood cells downstream of the porous medium, and providing a signal reflecting the presence of red blood cells downstream of the porous medium; and

an automated control arrangement coupled to the sensor to receive the signal from the sensor, and coupled to at least one of the pressure differential generator and the biological fluid processing assembly to control flow between the first container and the satellite container.

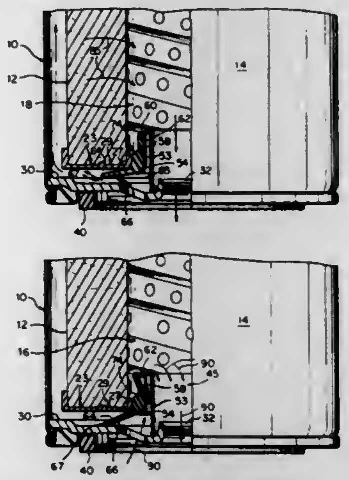
5,690,816
ANTI-DRAIN BACK/PRESSURE RELIEVED FILTER CARTRIDGES

Edward A. Covington, Gastonia, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 13, 1995, Ser. No. 556,595

Int. Cl.^{6} B01D *35/147*

U.S. Cl. 210—130 **20 Claims**



1. In a lubricating oil filter cartridge, a housing with an annular filter element therein; the annular filter element having a hollow core and having an end cap with an inner axially extending flange, the housing including an end plate having a central outlet therethrough surrounded by a plurality of inlet openings for allowing lubricating oil to enter the housing through the inlet openings in the end plate, to flow through the filter element to the hollow core thereof and to flow out of the filter element through the central outlet, the improvement comprising:

an annular valve support disposed between the end plate and the filter element, the annular valve support having an inner sleeve bearing against the end plate proximate the outlet and an outer sleeve spaced from the inner sleeve and including a plurality of holes therethrough, the outer sleeve having a radially extending flange extending outwardly therefrom for supporting the annular filter element; and

an annular valve member disposed between the filter element and the outer sleeve of the valve support, the annular valve member having a radially extending skirt overlying the inlet openings in the end plate, the radially extending skirt functioning as an anti-drain back valve by preventing oil from flowing out of the filter through the inlet openings while allowing oil under pressure to deflect the flaps and to flow pass the annular valve member and through the annular filter element when the annular filter element is not clogged, the valve member further including an expandable collar fitting around the outer sleeve and covering the holes, the expandable collar spreading to uncover the holes when the filter element is clogged so that liquid can flow through the holes in the outer sleeve and through the central outlet to bypass the filter element when the filter element is clogged, the expandable collar having a plurality of ribs disposed in spaced relation therearound, the ribs engaging the inner axially extending flange of the annular end cap.

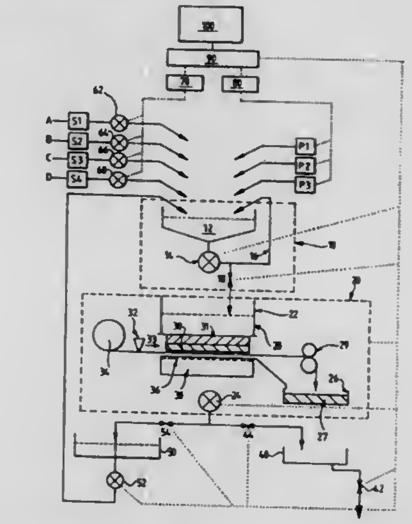
5,690,817
PHOTOGRAPHIC EFFLUENT TREATMENT APPARATUS

Edward Charles Timothy Samuel Glover, London, and Martyn Stuart Glover, Herts, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 190,006, Jan. 21, 1994, Pat. No. 5,503,751. This application Nov. 30, 1995, Ser. No. 565,370

Int. Cl.^{6} C02F *1/62;1/52*

U.S. Cl. 210—138 **7 Claims**



1. Apparatus for the treatment of photographic effluent comprising:

a source of untreated photographic effluent;

a mixing unit for mixing said untreated photographic effluent with treatment chemicals thereby forming a mixed and treated effluent containing precipitates;

delivery means for delivering said untreated photographic effluent to the mixing unit;

dispensing means for dispensing treatment chemicals into the mixing unit;

filtering means for separating the mixed and treated effluent into a non-toxic liquid phase and a solid phase that are both safe for disposal without further chemical treatment and filtering, said filtering means comprising a filter member on which a filter bed is established using the mixed and treated effluent, and

control means for controlling the delivery means, the dispensing means and the mixing unit to ensure that the treatment chemicals are correctly dispensed and mixed thoroughly with the effluent being treated.

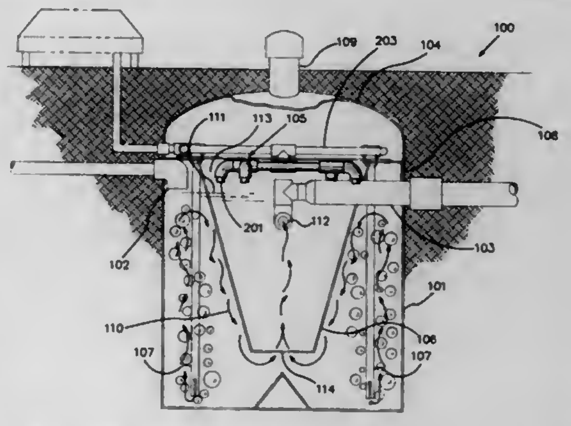
5,690,818
SPRAY SLUDGE SUPPRESSION SYSTEM

Monroe Wayne Guy, 12107 Lake Lora Cir., Baton Rouge, La. 70816

Filed Apr. 25, 1996, Ser. No. 637,850

Int. Cl.^{6} B08B *3/02;* **B01D** *21/30*

U.S. Cl. 210—139 **6 Claims**



1. In a waste water treatment system having a container and waste water disposed therein, said container having a cover, said waste water having a waste water/air interface located below said cover, said waste water having waste particles positioned therein, some of said particles being floatable on said waste water/air interface and combinable to form a sludge blanket, an apparatus for treating said sludge blanket comprising at least one spray assembly, said spray assembly fluidly connected to a source of fluid, said spray assembly having a spray head positioned inside said container and above said waste water/air interface, said spray head being adapted to spray fluid such that when fluid is sprayed from said spray head, said sprayed fluid will substantially suppress said sludge blanket on said waste water.

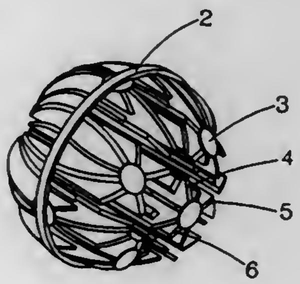
5,690,819
STRUCTURE OF BIOCHEMICAL FILTER BALL

Yung Huang Chianh, No. 46, Shoou Faa Road, Tao Yuan City, Taiwan

Filed Jul. 16, 1996, Ser. No. 680,661

Int. Cl.^{6} C02F *3/10;* **B01J** *19/30*

U.S. Cl. 210—150 **8 Claims**



1. A filter ball comprising:

a plurality of vertical plates,

a plurality of transverse plates,

a plurality of angled plates,

and a jointing ring; wherein

said jointing ring connects said vertical plates, said transverse plates, and said angled plates in a spherical conformation,

said vertical plates and said transverse plates meet at angles of approximately 90 degrees, and said angled plates meet said vertical plates and said transverse plates at angles of approximately 45 degrees, a plurality of connecting plates are provided on external ends of said vertical plates, said transverse plates, and said angled plates to connect said plates.

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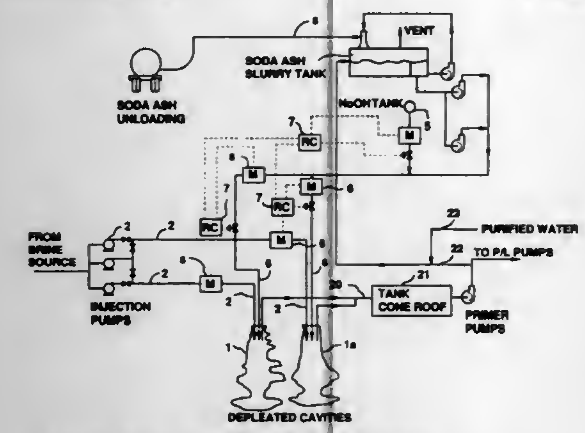
5,690,820
WELLHEAD BRINE TREATMENT

Lawrence F. Becnel, Jr., Sugarland, and Thomas M. Ellis, Houston, both of Tex., assignors to Texas Brine Corporation, Houston, Tex.

Division of Ser. No. 367,869, Jan. 3, 1995, Pat. No. 5,637,228. This application Feb. 10, 1997, Ser. No. 797,880

Int. Cl.^{6} C02F *1/58*

U.S. Cl. 210—170 **9 Claims**



1. A brine purification installation comprising:
a depleted salt cavern fitted with a wellhead injection apparatus comprised of tubing, a mixer and a radial distributor,
said tubing having means for injecting and removing fluids to and from said cavern,
means for mixing the fluids injected into the cavern,
reaction, precipitation, settling and clarification means, and
means for disposing and storing waste precipitates in the bottom of said cavern.

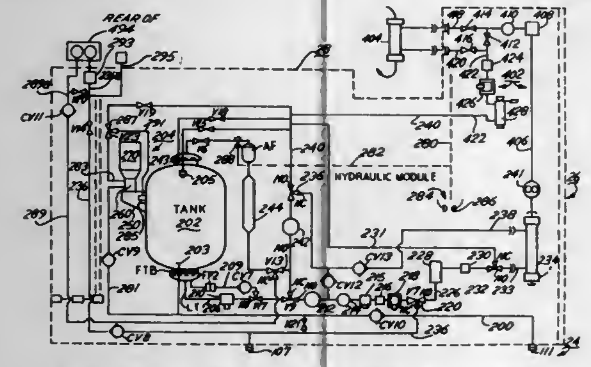
5,690,821
APPARATUS FOR SUPPLYING A BATCH OF CHEMICALS TO A DIALYSATE TANK

Rodney S. Kenley, Libertyville; Dennis M. Treu, Gurnee; Frederick H. Peter, Jr., Barrington; Thomas M. Feldsein, Palatine, and Kenneth E. Pawlak, Vernon Hills, all of Ill., assignors to AKSYS, Ltd., Lincolnshire, Ill.

Division of Ser. No. 388,275, Feb. 13, 1995, Pat. No. 5,591,344. This application Nov. 17, 1995, Ser. No. 560,305

Int. Cl.^{6} B01D *61/26;61/28*

U.S. Cl. 210—195.1 **3 Claims**



1. A dialysate tank and mixing apparatus for preparation of a batch of dialysate solution, comprising:
a hollow, closed tank having an interior region and a top, sidewalls and a bottom;
a first inlet disposed at said bottom of said tank through which fluids are introduced into said tank, said inlet directing incoming water substantially tangential to said sidewalls of said tank so as to create a vortex in said tank;
spray means suspended above said bottom of said tank within said interior region of said tank for spraying fluids within said tank, said spray means spraying said fluids in the same direction as water is introduced into said tank through said inlet;
said water inlet and said spray means cooperating to mix said fluids within said tank and prevent settling of dialysate chemicals at said bottom of said tank;
a recirculation loop comprising an outlet at the bottom of said tank, a second inlet at the top of said tank, and fluid circuitry connecting said outlet with said second inlet for circulation of fluid from said bottom of said tank to said top of said tank, with said spray means in fluid communication with said fluid circuitry, said recirculation loop cooperating with said water inlet and said spray means in promoting mixing of said dialysate solution in said tank; and
a dialysate chemical addition system in communication with said tank, said chemical addition system comprising a housing having an exterior surface and an interior region and a chemical receiving port in said exterior surface, and a mounting means on the exterior or said housing in registry with said chemical receiving port for receiving a bottle containing batch dialysate chemicals and further comprising an opening means for opening said bottle to release said chemicals, said chemical addition system further comprising a nozzle positioned between said mounting means and said chemical receiving port oriented such that fluids are sprayed from said nozzle into said bottle when said bottle is mounted to said mounting means and opened by said opening means.

5,690,822
WATER PURIFIER HAVING A STORAGE TANK AND AN EXCESS WATER DISCHARGE CONDUIT

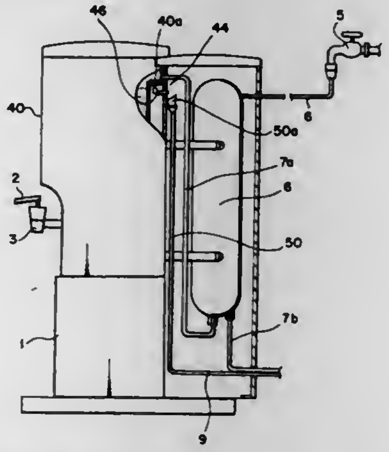
Sang-Wook Suh, Songtan, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 16, 1995, Ser. No. 558,982

Claims priority, application Rep. of Korea, Nov. 14, 1994, 94-30239 U

Int. Cl.^{6} B01D *35/00*

U.S. Cl. 210—248 **1 Claim**



1. A water purifier comprising:
a filter for purifying water; a storage tank connected to the filter for storing purified water; and an excess water discharge structure for discharging from the tank excess purified water disposed above a pre-set level in the tank; wherein the excess water discharge structure forms a water passage mounted stationarily with respect to the tank; wherein the water passage including an overflow hole disposed at said pre-set level and communicating directly with an upper water level of water stored in the tank so that the overflow hole receives a flow of the stored water from the upper water level when the upper water level exceeds the pre-set level; the water passage containing at least one interruption in the form of a vertical gap disposed in the passage; the vertical gap situated at an elevation below the upper water level of water stored in the tank and preventing a backflow of the discharged excess purified water back into the tank; the water passage further comprising an inflow member having an inlet disposed vertically beneath the overflow hole to receive excess water dropping therefrom; a vertical space disposed between the overflow hole and the inlet of the inflow member defining the vertical gap; wherein the inflow member includes an outlet spaced horizontally from the inlet; the water passage further comprising a water pipe spaced vertically beneath the outlet of the inflow member to define a second interruption in the form of a second vertical gap, wherein the water purifier further includes a body having a horizontal wall and an upright wall, the storage tank being seated on the horizontal wall and a side of the storage tank resting against the upright wall, and wherein a portion of the inflow member extends through the upright wall and includes a projection disposed therein for preventing rotation of the inflow member relative to the upright wall.

5,690,823
FILTRATION MEDIUM

John Reipur, Fabritius Allé 17, and Hans Olsen, Christiansholmsvej 32, both of DK-2930 Klampenborg, Denmark

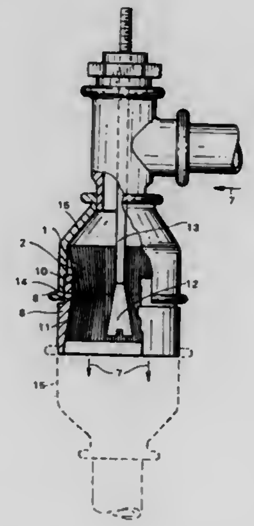
PCT No. PCT/DK93/00366, § 371 Date May 8, 1995, § 102(e) Date May 8, 1995, PCT Pub. No. WO94/11088, PCT Pub. Date May 26, 1994

PCT Filed Sep. 9, 1993, Ser. No. 433,390

Claims priority, application Denmark, Nov. 9, 1992, 1361/92

Int. Cl.^{6} B01D *63/00*

U.S. Cl. 210—321.8 **28 Claims**



1. A filtration medium for use in filtering a fluid comprising:
a plurality of solid fibers all extending in alignment for at least a predetermined distance in substantially the same general direction;
a retaining element disposed at the outer side of the plurality of aligned fibers;
a displacement member inserted inside the plurality of aligned fibers, for pressing essentially all the aligned fibers into a close packed configuration along a portion thereof adjacent the retaining member and displacement member; and
a plurality of fluid-flow passages defined between the closed packed fibers, each of the fluid flow passages having a cross-sectional area sufficiently small to retain particles to be filtered from the fluid passing therethrough, each of the fibers having a ratio of length to maximum cross sectional dimension of at least 10.

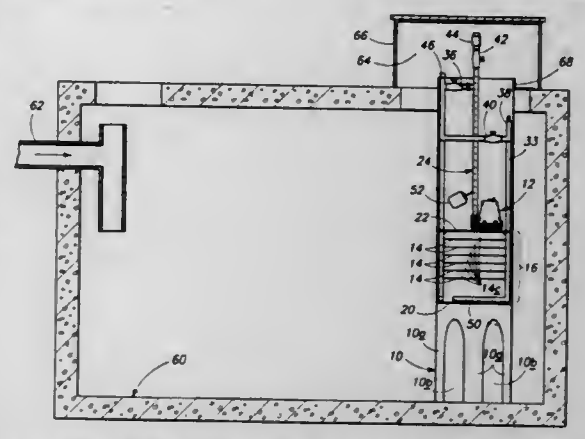
5,690,824
SEPTIC SYSTEM SCREENED PUMP VAULT

William L. Stuth, P.O. Box 950, Maple Valley, Wash. 98038

Filed May 17, 1996, Ser. No. 649,793

Int. Cl.^{6} B01D *35/02;35/027*

U.S. Cl. 210—333.01 **12 Claims**



1. A septic system filtered pump vault which comprises a housing for an effluent pump, said housing having an effluent inlet communicating with a filter 5 compartment within said housing; a plurality of effluent filters contained within said filter compartment; filter support means within said housing, said filters being secured to said filter support means in spaced relation to one another so as to provide filtering sections between said filters, said filter support means including at least one backflush conduit provided with a plurality of backflush orifices oriented to direct backflush fluid into said filtering sections onto upper surfaces of said filters; pump means including an effluent pump contained within said housing for effecting flow of effluent through said effluent inlet and through said filters, said pump means including discharge conduit means for discharging filtered effluent from said housing; and valve means communicating with said backflush conduit and said discharge conduit means so that said pump may be selectively communicated with said backflush conduit to effect backflushing of said filters with filtered effluent.

5,690,825
FILTRATION METHOD AND APPARATUS

Adrian Parton, Exning, England, assignor to Genera Technologies Limited, Cambridge, England

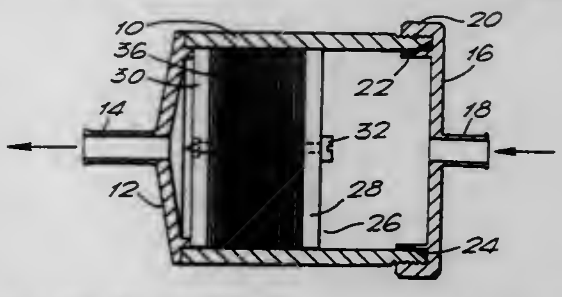
PCT No. PCT/GB94/02782, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO95/17238, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 21, 1994, Ser. No. 669,278

Claims priority, application United Kingdom, Dec. 21, 1993, 9326079; Nov. 22, 1994, 9423688

Int. Cl.^{6} B01D *39/00;29/58;29/78;* **G01N** *33/569*

U.S. Cl. 210—350 **14 Claims**



14. A filter cartridge comprising a first compression member and a second compression member and compressed between said compression members by a factor of at least 5 as a filter medium a plurality of stacked layers of an expansible, compressed, open cell, solid foam.

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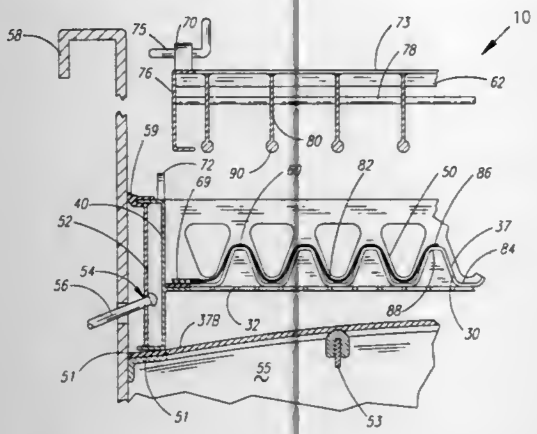
5,690,826
SHAKER SCREEN ASSEMBLY

William Myron Cravello, 12535 E. 20th Pl., Tulsa, Okla. 74128
Division of Ser. No. 644,313, Sep. 10, 1996. This application Sep. 26, 1996, Ser. No. 718,961
Int. Cl.^{6} B01D *29/07*
U.S. Cl. 210—384 **9 Claims**



1. A shaker screen assembly comprising:

at least one compartment box securable between opposite walls of a shaker, each side compartment box comprised of left and right side walls jointed together in spaced apart manner by a front wall and opposite rear wall,

a perforated bottom removable secured within each said compartment box,

a corrugated filter removably secured to each said compartment box between each said lid and its associated said perforated bottom,

a lid removable secured to each said compartment box for securing said corrugated filter between each said lid and its associated said perforated bottom,

right and left lid wails being secured to said lid,

support rods extending approximately perpendicular to a longitudinal axis of a shaker screen assembly and extending between and secured to right and left lid walls,

at least four spring-loaded hinge clips provided on each said lid, each said clip removable engagable with an associated clip receiving eye provided secured to said walls of said shaker, and

a plurality of blades secured to and extending downward from and approximately perpendicular to said support rods.

5,690,827
SEWAGE TREATMENT SYSTEM USING PEAT AND A CONSTRUCTED WETLAND

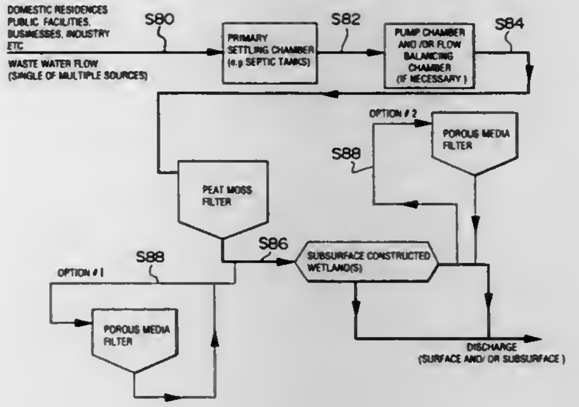
Stephen G. Simmering, 689 Broadview Avenue, Ottawa, Ontario, Canada, K2A 2L9, and Dennis Martin, 14E Knollsbrook Avenue, Nepean, Ontario, Canada
Filed Oct. 19, 1995, Ser. No. 545,029
Claims priority, application Canada, Dec. 29, 1994, 2139247
Int. Cl.^{6} C02F *3/04;3/32*
U.S. Cl. 210—602 **23 Claims**

1. A method of sewage treatment comprising the sequential steps of:

(i) subjecting waste water to be treated to primary settling to remove settleable solids and suspended solids and produce settled effluent;

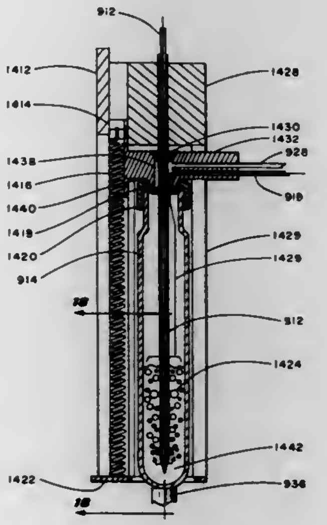
(ii) passing the settled effluent through an aerobic filter medium consisting entirely of sphagnum peat; and

(iii) collecting the aerated aerobic effluent from the peat filter and passing it through a sub-surface constructed wetland, which exposes the aerated aerobic effluent to anaerobic conditions prior to discharge.


DOMESTIC RESIDENCES PUBLIC FACILITIES, BUSINESSES, INDUSTRY ETC
WASTE WATER FLOW (SINGLE OF MULTIPLE SOURCES)
S80
PRIMARY SETTLING CHAMBER (e.g SEPTIC TANKS)
S82
PUMP CHAMBER AND /OR FLOW BALANCING CHAMBER (IF NECESSARY)
S84
OPTION # 2
POROUS MEDIA FILTER
S88
PEAT MOSS FILTER
S86
SUBSURFACE CONSTRUCTED WETLAND(S)
S88
OPTION # 1
POROUS MEDIA FILTER
DISCHARGE (SURFACE AND/ OR SUBSURFACE)

5,690,828
APPARATUS AND METHOD FOR SUPERCRITICAL FLUID EXTRACTION

Dale Lee Clay; Robert William Allington; Phillip Bearnard Liescheski, III; Robin Randall Winter, and Daniel Gene Jameson, all of Lincoln, Nebr., assignors to Isco, Inc., Linclon, Nebr.
Continuation of Ser. No. 133,964, Oct. 8, 1993, abandoned, which is a division of Ser. No. 27,077, Mar. 5, 1993, Pat. No. 5,268,102, which is a continuation-in-part of Ser. No. 908,458, Jul. 6, 1992, Pat. No. 5,198,197, which is a division of Ser. No. 795,987, Nov. 22, 1991, Pat. No. 5,160,624, which is a continuation-in-part of Ser. No. 553,119, Jul. 13, 1990, Pat. No. 5,094,753. This application Feb. 14, 1996, Ser. No. 601,250
Int. Cl.^{6} B01D *11/00;17/12*
U.S. Cl. 210—634 **15 Claims**



11. A method of supercritical fluid extraction, comprising the steps of:

performing supercritical fluid extraction;

the step of performing supercritical fluid extraction including the substeps of collecting analyte in an at least one collection vial of a plurality of collection vials stored in a collection means;

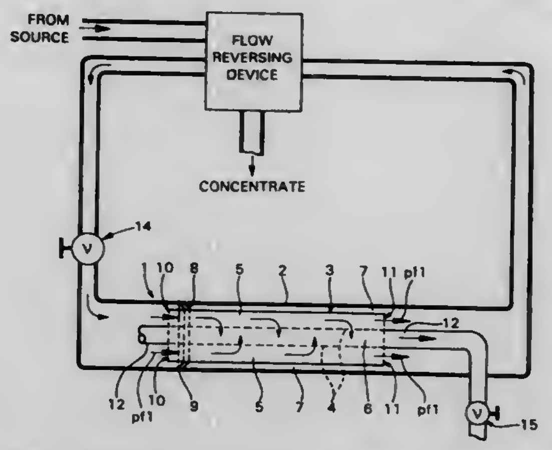
said at least one vial being pressurized to a pressure greater than atmospheric pressure;

moving the at least one collection vial into position to receive analyte; and

controlling the temperature of the at least one collection vial.

5,690,829
CONDITIONING PROCESS AND DEVICE FOR PRODUCING PURE WATER

Günter Lauer, Hartmattenstrasse 19, Lörrach D-79539, Germany
PCT No. PCT/EP93/01348, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO93/24212, PCT Pub. Date Dec. 9, 1993
PCT Filed May 28, 1993, Ser. No. 347,406
Claims priority, application Germany, Jun. 2, 1992, 42 18 115.1
Int. Cl.^{6} B01D *61/00*
U.S. Cl. 210—636 **12 Claims**



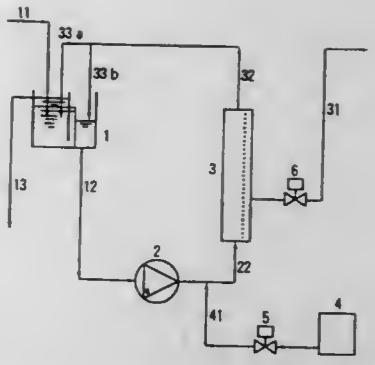
1. Process for the production of pure water, in which raw water is fed in a first flow direction to a treatment apparatus having a raw water side and a pure water side, comprising the steps of:

passing a partial quantity of raw water through at least one semi-permeable membrane disposed within the treatment apparatus under a driving force of a pressure differential to obtain pure water;

discharging the remaining quantity of raw water flowing past the membrane in the first flow direction from the treatment apparatus as a concentrate;

reducing the discharge of pure water at timed intervals to increase static water pressure on the pure water side of the membrane;

following the increase in the static water pressure on the pure water side, reversing the direction of flow of the raw water that flows past the membrane to lower static water pressure that exists on the raw water side of the treatment apparatus relative to the static water pressure on the pure water side to reverse the flow of pure water through the membrane; and increasing pure water discharge.



5,690,830
WASTE WATER TREATMENT APPARATUS AND WASHING METHOD THEREOF

Akira Ohtani; Kenichi Inoue; Naoki Tada, and Toshiyuki Kawashima, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan
Continuation of Ser. No. 294,042, Aug. 24, 1994, abandoned. This application Jun. 24, 1996, Ser. No. 668,719
Claims priority, application Japan, Aug. 26, 1993, HEI.5-211536; Jan. 27, 1994, HEI.6-007445
Int. Cl.^{6} B01D *61/00;24/00;* **C02F** *1/44*
U.S. Cl. 210—636 **15 Claims**

13. A method for removing deposited, insoluble granular material from a separation membrane having a spiral-wound module structure of a waste water treatment apparatus, comprising the steps of:

passing waste water to a feed side of said membrane treatment apparatus to produce a permeate and retentate;

interrupting the flow of permeate through a permeate water outlet of said treatment apparatus, and introducing a compressed gas into a waste water inlet of said separation membrane to form a mixture of gas and liquid in said water inlet;

flowing said mixture of gas and liquid into contact with said separation membrane to remove said deposited, insoluble, granular material from said separation membrane; and

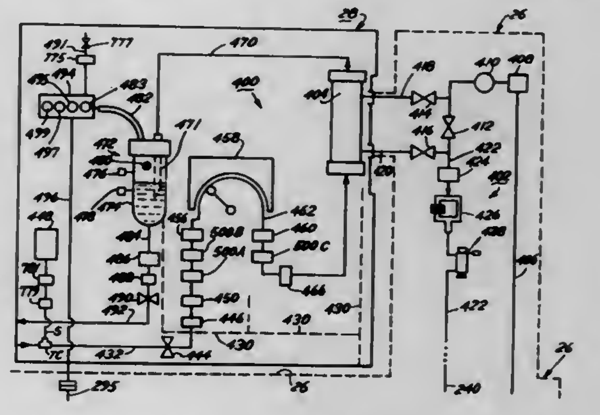
recycling said waste water and insoluble granular material removed from said separation back to said separation membrane;

stopping the introduction of gas into said waste water inlet; introducing compressed gas into said permeated water outlet to form a mixture of gas and liquid in said permeate water outlet; and

flowing said mixture of gas and liquid in said permeated water outlet through said separation membrane from a permeate side of said separation membrane to a feed side of said separation membrane, to further remove said deposited insoluble granular material from said membrane.

5,690,831
METHOD OF RINSING BACK BLOOD TO HEMODIALYSIS PATIENT

Rodney S. Kenley, Libertyville; Dawn Matthews, Grayslake; Dennis M. Treu, Gurnee; Frederick H. Peter, Jr., Barrington, and Thomas M. Feldsein, Palatine, all of Ill., assignors to Aksys, Ltd., Lincolnshire, Ill.
Division of Ser. No. 388,275, Feb. 13, 1995, Pat. No. 5,591,344. This application Nov. 17, 1995, Ser. No. 559,124
Int. Cl.^{6} B01D *61/24;61/32*
U.S. Cl. 210—646 **5 Claims**



1. A method of automatically rinsing back blood from a dialyzer to a patient, said method performed in a dialysis machine having a dialyzer, a dialysate circuit and an extracorporeal circuit having arterial and venous blood lines connected to a patient and a blood pump, the method comprising the steps of:

pumping dialysate from said dialysate circuit through said dialyzer into said extracorporeal circuit;

pumping blood in said extracorporeal circuit our of said arterial and venous lines back to said patient;

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monitoring with optical sensors the concentration of blood in said arterial and venous lines as said blood is being pumped from said extracorporeal circuit back to said patient; and

ceasing the flow of blood back to said patient when the concentration of blood in said arterial and venous lines drops to a predetermined threshold level indicative of substantial dilution of said blood with said dialysate, thereby preventing excess fluids from being returned to said patient.

5,690,832
CHEMICALLY ACTIVE CERAMIC COMPOSITIONS WITH A PHOSPHO-ACID MOIETY

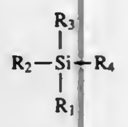
Lawrence L. Tavlarides, Fayetteville, and Nandu Deorkar, Syracuse, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Division of Ser. No. 313,019, Sep. 27, 1994, Pat. No. 5,612,275. This application Jan. 27, 1997, Ser. No. 788,217

Int. Cl.^{6} B01D *15/00;* C02F *1/42*

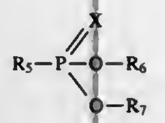
U.S. Cl. 210—661 **36 Claims**

1. A method of removing heavy metal ions from a liquid stream comprising the step of contacting the stream with a composite material under conditions effective to complex said heavy metal ions on said composite material, said composite material having the formula:

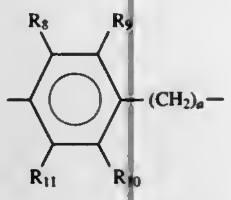


$$\begin{array}{c} R_3 \\ | \\ R_2-\mathrm{Si}-R_4 \\ | \\ R_1 \end{array}$$

wherein at least one of R_1, R_2, and R_3 is SUPPORT—O— and R_4 is



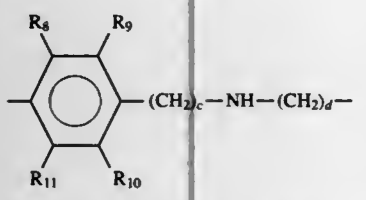
wherein X is S or O; R_5 is —$(CH_2)_a$—, where a is an integer from 1 to 5; or



wherein R_8–R_{11} are the same or different and are —H or —$(CH_2)_bCH_3$ where b is an integer from 0 to 20; or

$-(CH_2)_c-NH-(CH_2)_d-$

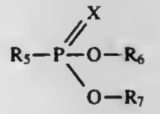
or



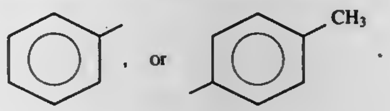
wherein c and d are integers from 1 to 5 and c+d are no greater than 6;

R_6 and R_7 can be the same or different and are —H or —$(CH_2)_bCH_3$; and

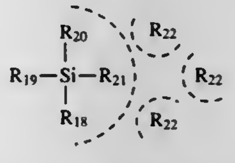
remaining of R_1, R_2 and R_3 are



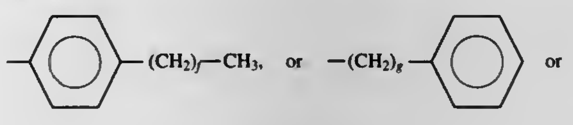
or an alkyl group having 1 to 5 carbon atoms; or



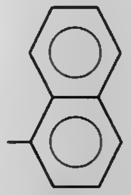
15. A method of removing heavy metal ions from a liquid stream comprising the step of contacting the stream with a composite material under conditions effective to complex said heavy metal ions on said composite material and breaking said complex to free or recover said metal ion or ions in the stripping solution to regenerate composite material, said composite material having the formula:



wherein at least one of R_{18}, R_{19} and R_{20} is SUPPORT—O— and R_{21} is unsubstituted or lower alkyl substituted or lower aryl substituted hydrocarbon chain having 1 to 20 carbon atoms, or

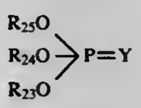


or

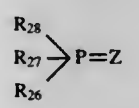


wherein f is an integer from 0 to 20 and g is an integer from 1 to 10; and other of R_{18}, R_{19} and R_{20} are R_{21}; and

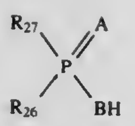
R_{22} is a ligand having the formula



wherein Y is O and only one of R_{23}, R_{24}, and R_{25} is —H and other of R_{23}, R_{24} and R_{25} are unsubstituted or lower alkyl substituted hydrocarbon chains having 5 to 25 carbon atoms or all of R_{23}, R_{24} and R_{25} are unsubstituted or lower alkyl substituted hydrocarbon chain having 5 to 25 carbon atoms, or



wherein Z is O or S and R_{26}–R_{28} are hydrocarbon chains having 5 to 25 carbon atoms, or



wherein A and B are same or different and are O or S, and wherein R_{22} is adsorbed on R_{21}.

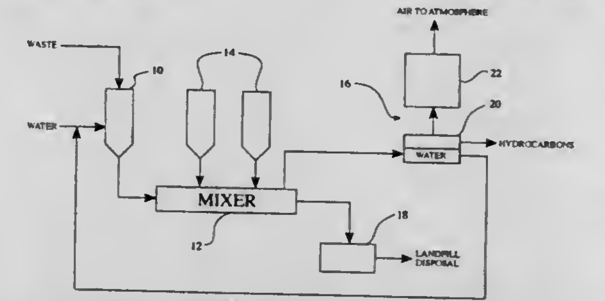
5,690,833
METHOD FOR THE STABILIZATION AND DETOXIFICATION OF WASTE MATERIAL

Paul B. Crawford, Bryan, and James Gafford, Ingleside, both of Tex., assignors to Thomas Guelzow, Corpus Christi, Tex.

Continuation-in-part of Ser. No. 177,127, Jan. 4, 1994, Pat. No. 5,484,533. This application Oct. 25, 1995, Ser. No. 547,941

Int. Cl.^{6} C02F *1/28*

U.S. Cl. 210—662 **20 Claims**



1. A process for waste treatment comprising the steps of:

determining an amount of free, unbound water in a waste stream and hydrating waste material therein to form a slurry;

mixing the slurry with a treatment composition containing natural zeolite seed, crystalline quartz, aluminum trihydrate, and a compound selected from the group consisting of sodium carbonate, sodium hydroxide, potassium carbonate, potassium hydroxide, and combinations thereof, to form a mixture containing natural zeolite crystals and synthetic zeolite crystals, thereby producing stabilized waste material.

5,690,834
PROCESS AND APPARATUS FOR SEPARATING OFF SUSPENDED MATTER FROM LIQUIDS

Horst Bennolt, Völklingen; Gerhard Müller, Königstein, and Friedhelm Zorn, Ebertshausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

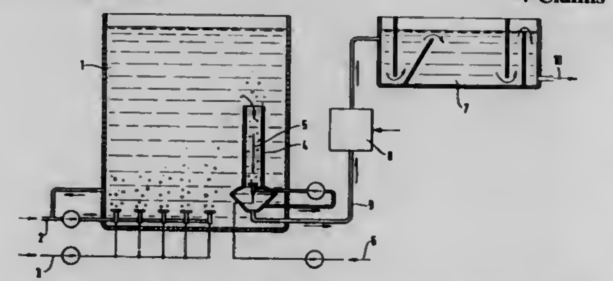
PCT No. PCT/EP95/01156, § 371 Date Dec. 1, 1995, § 102(e) Date Dec. 1, 1995, PCT Pub. No. WO95/27566, PCT Pub. Date Oct. 19, 1995

PCT Filed Mar. 28, 1995, Ser. No. 553,697

Claims priority, application Germany, Apr. 11, 1994, 44 11 991.7

Int. Cl.^{6} C02F *1/24*

U.S. Cl. 210—703 **4 Claims**



1. A process for separating off suspended matter from liquids which are present in a gas-introduction reactor by pressure release flotation, which comprises introducing gas into the liquid which contains said suspended matter, conducting the gasified liquid containing suspended matter in a downflow reactor at a flow velocity of 0.01 m/s to 0.3 m/s downwardly against the natural direction of bubble rise, while introducing gas in a lower portion of said downflow reactor which contacts said downwardly flowing gasified liquid containing suspended matter, withdrawing a gas-treated liquid containing suspended matter at the bottom of the downflow reactor and feeding it to pressure release flotation wherein suspended matter attached to microbubbles is separated off by floating away from the liquid.

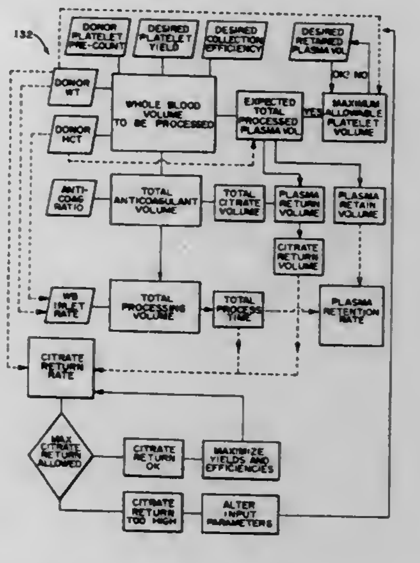
5,690,835
SYSTEMS AND METHODS FOR ON LINE COLLECTION OF CELLULAR BLOOD COMPONENTS THAT ASSURE DONOR COMFORT

Richard I. Brown, Northbrook, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 551,579, Nov. 1, 1995, abandoned, which is a continuation of Ser. No. 97,967, Jul. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 965,088, Oct. 22, 1992, Pat. No. 5,370,802, which is a continuation-in-part of Ser. No. 814,403, Dec. 23, 1991, abandoned. This application Sep. 24, 1996, Ser. No. 719,312

Int. Cl.^{6} B01D *21/26;21/30;37/04;* A61M *1/38*

U.S. Cl. 210—739 **6 Claims**



5. A blood processing method for obtaining during a processing period a cellular-rich concentrate from an anticoagulated cellular suspension conveyed from donor, while returning a cellular-poor component containing anticoagulant to the donor, without significant adverse anticoagulant-related donor reactions, comprising the steps of

(a) conveying into a separation device a cellular blood suspension including plasma from the donor, while adding anticoagulant to the cellular blood suspension in an added anticoagulant-to-cellular suspension volume ratio,

(b) separating the anticoagulant-containing cellular blood suspension in the separation device into a cellular-rich concentrate having a first plasma and anticoagulant volume and a cellular-poor component having a second plasma and anticoagulant volume, the second plasma and anticoagulant volume being greater than the first plasma and anticoagulant volume,

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(c) conveying the cellular-poor component from the separation device to the donor, while diverting a portion of the cellular-poor component away from the donor for retention in a collection container,

(d) deriving an operative anticoagulant infusion rate based upon operating parameters and physiological parameters of the donor, the operating parameters including a portion of cellular-poor component to be diverted into the collection container during the processing period, a volume of cellular-rich component to be collected during the processing period, and the added anticoagulant-to-cellular suspension volume ratio, the physiological parameters of the donor including donor body weight, volume of cellular component present per unit volume of cellular blood suspension conveyed from the donor, and a physiological infusion rate of anticoagulant physiologically tolerated by the donor without significant adverse reactions, taking donor body weight into account,

(e) comparing the operative infusion rate to the physiological infusion rate,

(f) generating a first control signal when the operative infusion rate is equal to or less than the physiological infusion rate and a second control signal when the operative infusion rate exceeds the physiological infusion rate, and either

(g) in response to the first control signal, carrying out steps (a), (b), and (c) to achieve the operating parameters, or

(h) in response to the second control signal, carrying out steps (a), (b), and (c) while adjusting at least one of the operating parameters, except the added anticoagulant-to-cellular suspension volume ratio, to lower the operative anticoagulant infusion rate to be equal to or below the physiological infusion rate.

5,690,836

METHOD OF REMOVING CATALYST

Matthew Raskin, Huntington Station, N.Y., and James R. Gallagher, Wollaston, Mass., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 196,518, Feb. 15, 1994, abandoned, which is a continuation of Ser. No. 922,880, Jul. 31, 1992, abandoned. This application May 30, 1995, Ser. No. 454,007

Int. Cl.⁶ B01D ***24/46;*** **B01J** ***20/34***

U.S. Cl. 210—791 **25 Claims**

1. A method of removing a catalyst from a liquid catalytic reaction product, wherein said catalyst has a mean particle diameter of about 20 microns or less, which method comprises (a) passing a liquid catalytic reaction product containing a solid catalyst through a hollow tubular filter medium which comprises a nonwoven web of fibers, has a tapered pore distribution such that the pore size of the filter medium decreases in the direction of normal fluid flow, and is backwashable, (b) backwashing said filter medium, and (c) repeating steps (a) and (b) at least about 50 times.

15. A method of removing a catalyst from a liquid catalytic reaction product, which method comprises (a) passing a liquid hydrogenation reaction product containing Raney nickel catalyst having a mean particle diameter of about 3 microns or less through a hollow cylindrical filter medium which comprises a nonwoven web of fibers, has a tapered pore distribution such that the pore size of the filter medium decreases in the direction of normal fluid flow, has a 99.98% removal efficiency at about 10 microns or less, and is backwashable, (b) backwashing said filter medium, and (c) repeating steps (a) and (b) at least about 50 times.

5,690,837

PROCESS FOR PRODUCING MULTILAYER PRINTED CIRCUIT BOARD

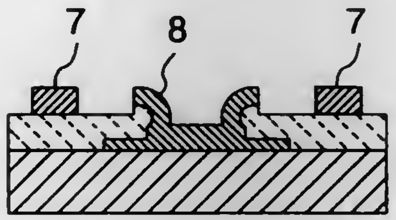
Akishi Nakaso, Oyama; Koichi Tsuyama; Kazuhisa Otsuka, both of Shimodate; Haruo Ogino, Tochigi-ken; Yoshihiro Tamura; Teiichi Inada, both of Shimodate; Kazunori Yamamoto, Tsukuba; Akinari Kida, Tochigi-ken; Atsushi Takahashi, Yuki; Yoshiyuki Tsuru, Shimodate, and Shigeharu Arike, Tochigi-ken, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Dec. 21, 1995, Ser. No. 576,488

Claims priority, application Japan, May 23, 1995, 7-123575; May 23, 1995, 7-123576

Int. Cl.⁶ B44C ***1/22;*** **C23F** ***1/00***

U.S. Cl. 216—17 **13 Claims**



1. A process for producing a multilayer printed circuit board, which comprises the steps of:

a) drilling holes on positions of a film material selected from the group consisting of a film material obtained from a single sided copper-clad laminate having an insulating adhesive layer with a semi-cured state on an insulating surface and a film material obtained by forming an insulating adhesive layer with a semi-cured state on one side of a copper foil,

b) laminating the hole-drilled film material on an innerlayer circuit substrate so as to contact the insulating adhesive layer with the innerlayer circuit substrate and pressing with heating to give an integral laminate,

c) roughening surfaces of the insulating adhesive layer flowed into the holes at the time of lamination under pressure and heating,

d) conducting electrical connection between a circuit on the inner layer circuit substrate and the copper cladding or foil of the film material by plating inner walls of the holes or by filling the holes with an electroconductive paste, and

e) forming a circuit by processing the copper of the film material.

5,690,838

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING SAME

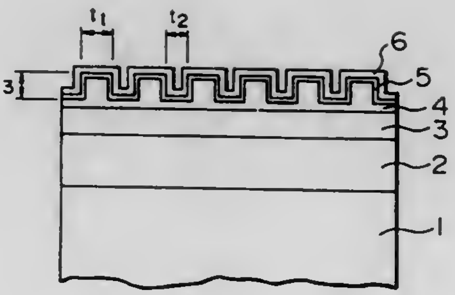
Yoshihiro Moriguchi, Hiratsuka; Youichi Inomata; Hiroshi Yashiki, both of Odawara; Yoshiki Kato, Tokyo; Kenichi Gomi, Hitachi, and Hideaki Tanaka, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 279,931, Jul. 25, 1994, abandoned, and a continuation-in-part of Ser. No. 198,592, Feb. 18, 1994, and Ser. No. 077,874, Jun. 18, 1993, Pat. No. 5,504,646. This application Jun. 5, 1995, Ser. No. 460,928

Int. Cl.⁶ B44C ***1/22;*** **G11B** ***5/72***

U.S. Cl. 216—22 **24 Claims**

1. A process for producing a magnetic recording medium which comprises forming a magnetic layer on a substrate, forming a protective layer on the magnetic layer, forming a number of concavities and convexities on the surface of the protective layer, and subsequently forming a modified layer having hydrophobicity on the protective layer by modifying the surface of the protective layer.



5,690,839

METHOD FOR FORMING AN ARRAY OF THIN FILM ACTUATED MIRRORS

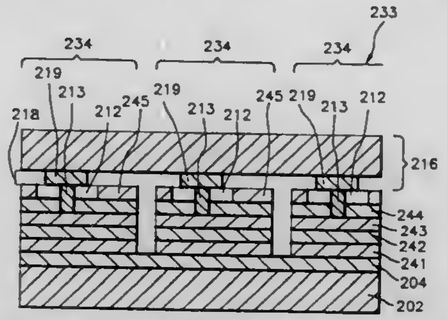
Yong-Ki Min, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed May 4, 1995, Ser. No. 434,825

Claims priority, application Rep. of Korea, May 4, 1994, 94-9768; Jun. 22, 1994, 94-14154

Int. Cl.⁶ G02B ***5/08***

U.S. Cl. 216—24 **20 Claims**



1. A method for manufacturing an array of M×N thin film actuated mirrors for use in an optical projection system, wherein M and N are integers, said method comprising the steps of:

(a) providing a base made of an insulating material, the base having a top and a bottom surfaces;

(b) forming a separation layer made of a water soluble material on the top surface of the base;

(c) depositing a first thin film layer made of an electrically conducting and light reflecting material on top of the separation layer;

(d) forming a thin film electrodisplacive layer made of an electrodisplacive material on top of the first thin film layer;

(e) providing a second thin film layer made of an electrically conducting material on top of the thin film electrodisplacive layer;

(f) depositing a thin film elastic layer made of a first insulating material on top of the second thin film layer;

(g) depositing a sacrificial layer on top of the thin film elastic layer to thereby form a semifinished multilayered structure;

(h) forming an array of M×N supporting members on the semifinished multilayered structure by removing portions of the sacrificial layer and filling therein with a second insulating material, wherein each of the supporting members extends from top of the thin film elastic layer to top of the sacrificial layer;

(i) forming a conduit in each of the supporting members by removing a part of each of the supporting members and parts of the thin film elastic layer and filling therein with a metal to thereby forms multilayered structure including the first thin film layer, the thin film electrodisplacive layer, the second thin film layer, the thin film elastic layer and the sacrificial layer, the conduit extending from top of each of the supporting members to top of the second thin film layer;

(j) patterning the multilayered structure into an array of M×N multilayered actuated mirror structures, wherein each of the multilayered actuated mirror structures includes a bias electrode layer, a motion-inducing layer, a signal electrode layer, an elastic member, a sacrificial member and the supporting member, the bias electrode layer, the motion-inducing layer, the signal electrode layer, the elastic member and the sacrificial member being a part of the first the film layer, the thin film electrodisplacive layer, the second thin film layer, the thin film elastic layer and the sacrificial layer, respectively;

(k) providing an active matrix including a substrate, an array of M×N connecting terminals;

(l) attaching the active matrix on top of the array of M× N multilayered actuated mirror structures in such a way that each of the conduits in each of the supporting members is in an electrical contact with each of the connecting terminals to thereby form an array of M×N semifinished actuated mirrors; and

(m) separating the base from the array of M×N semifinished actuated mirrors by dissolving the separation layer and removing the sacrificial member in each of the semifinished actuated mirrors to thereby form said array of M× N thin film actuated mirrors.

5,690,840

METHOD AND COMPOSITION FOR PROMOTING IMPROVED ADHESION TO SUBSTRATES

Joseph M. Antonucci, Kensington, and Patricia A. Bennett, Germantown, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 189,709, Feb. 1, 1994, Pat. No. 5,498,643. This application Nov. 27, 1995, Ser. No. 562,903

Int. Cl.⁶ A61K ***6/08***

U.S. Cl. 216—34 **19 Claims**

1. A method for preparing a dental or other substrate surface for adhesion of a polymeric material comprising contacting the surface with an etchant/primer/adhesive monomer composition comprising:

a compound having the formula

$$RN\,(CH_2YCO_2M)_2 \qquad (I)$$

wherein

$R=R^1$or R^2;

R^1=an aromatic group;

R^2=a conjugated aliphatic group;

Y=a single bond, CH_2, $CHCH_3$ or $C{=}CH_2$; and each M is independently H, an alkali metal, an alkaline earth metal, aluminum, a transition or redox metal or an alkyl group having 1 to 18 carbon atoms, with the proviso that when both M groups are alkyl groups, the compound corresponding to formula I be capable of being easily hydrolyzed, displaced, or exchanged with other reagents present in the etchant/primer composition; and

a polar solvent.

5,690,841

METHOD OF PRODUCING CAVITY STRUCTURES

Håkan Elderstig, Bromma, Sweden, assignor to Pharmacia Biotech AB, Uppsala, Sweden

PCT No. PCT/SE94/01181, § 371 Date Jun. 10, 1996, § 102(e) Date Jun. 10, 1996, PCT Pub. No. WO95/16192, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 8, 1994, Ser. No. 663,043

Claims priority, application Sweden, Dec. 10, 1993, 9304145

Int. Cl.⁶ H01L ***21/306;*** **G01L** ***9/00***

U.S. Cl. 216—39 **11 Claims**

1. A method of producing sealed cavity structures in the surface

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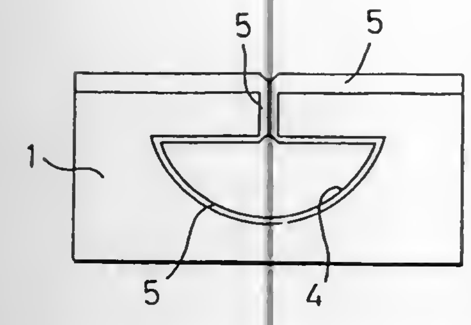
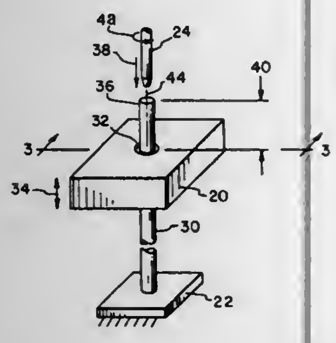


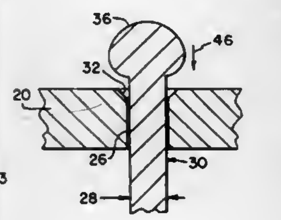
layer of a selectively etchable substrate, comprising the steps of:
- a) depositing a masking layer of etchable polysilicon material on the substrate wherein said substrate is silicon dioxide,
- b) etching at least one hole in the masking layer down to the substrate surface,
- c) selectively etching the substrate in under the masking layer through said hole or holes so as to form one or more cavities which extend under the masking layer; and
- d) sealing said hole or holes in the masking layer by oxidation of polysilicon to silicon dioxide, and thereby expansion of the masking layer.

5,690,842
ORTHOPAEDIC WIRE WITH AN ENLARGED END AND METHOD OF FORMING THE SAME

Clarence M. Panchison, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed Sep. 12, 1995, Ser. No. 527,149
Int. Cl.⁶ B21J *1/06;* **B21C** *37/04;* **B21F** *21/00;45/16*
U.S. Cl. 219—58 **18 Claims**



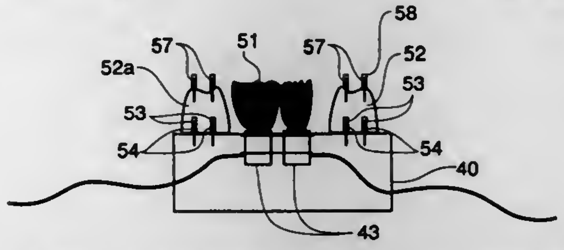


1. A method of manufacturing an orthopaedic wire, comprising the steps of:
- providing a block having an opening therethrough, said opening sized to receive the wire therein;
- placing the wire within said opening such that an end of the wire extends a predetermined distance above said block;
- applying an electrical current to the extending end of the wire, said electrical current being of sufficient magnitude to increase the temperature of the extending end to the melting point of the wire; and
- allowing the molten metal to fall via gravitational force against the block, whereby said extending end forms an enlarged end on said wire.

5,690,843
METHOD OF FABRICATING PRECISE CAST OR NONCAST IMPLANT-RETAINED DENTAL RESTORATIONS USING ELECTRICAL DISCHARGE MACHINING

Stephen M. Schmitt, San Antonio, and David A. Chance, Helotes, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 2, 1996, Ser. No. 581,795
Int. Cl.⁶ B23H *9/00;* **A61C** *13/00;13/36*
U.S. Cl. 219—69.17 **16 Claims**

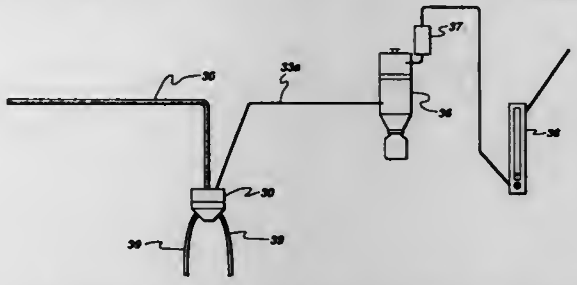


1. A method of fabricating an anatomically correct dental restoration for installation on an implant mounted at a predetermined location in the alveolar bone of a patient, said restoration having a cavity coinciding with said implant for securely mounting said restoration to said implant, said method comprising the following steps:
- (a) fabricating a rough cast restoration from a pattern baving the desired configuration of said restoration;
- (b) fabricating a first accurate electrode conforming to the configuration of said implant; and,
- (c) in an electric discharge machine, mounting said rough cast restoration in radial and axial alignnment with said first electrode, with said first electrode in alignment with the corresponding cavity of said rough restoration and finish machining said cavity of said rough restoration to the configuration of said first electrode by electric discharge machining.

5,690,844
POWDER FEED FOR UNDERWATER WELDING

Raymond Alan White, Schenectady; Robert Anthony Fusaro, Jr., Cobleskill, and Dennis Michael Gray, Delanson, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 26, 1996, Ser. No. 701,930
Int. Cl.⁶ B23K *10/00*
U.S. Cl. 219—121.47 **10 Claims**



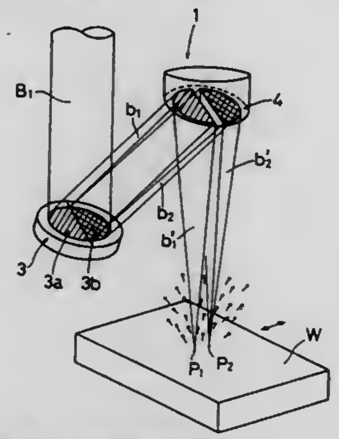
1. An underwater welding apparatus for underwater welding under a surface of a body of water, the apparatus comprising:
- a first powder supply pressurized with a powder carrier gas positioned above the surface of the body of water;
- a second powder supply container positioned below the surface of the body of water and the second powder supply container comprising at least one powder outlet port and a gas vent open to the above surface atmosphere;
- at least one powder conduit connecting the first container with the second container;
- an underwater welding torch positioned near the second container and having at least one powder inlet;

- at least one powder conduit connecting the second powder supply container to the at least one powder inlet of the torch.

5,690,845
OPTICAL DEVICE FOR LASER MACHINING

Keiji Fuse, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 4, 1995, Ser. No. 539,161
Claims priority, application Japan, Oct. 7, 1994, 6-243913
Int. Cl.⁶ B23K *26/06*
U.S. Cl. 219—121.74 **7 Claims**

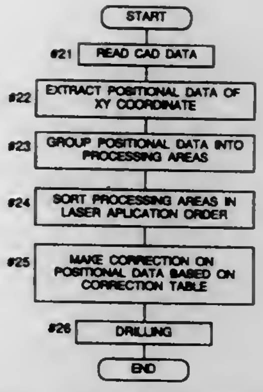


1. An optical device comprising:
- a laser oscillator;
- a transmitting means for transmitting a laser beam produced by said laser oscillator; and
- a converging means for converging the laser beam from said transmitting means onto a plurality of focal points, said converging means comprising:
  - a laser beam splitting unit for splitting the laser beam into a plurality of split beams, and
  - a converging unit for converging the plurality of split beams on to the surface of a workpiece,
  - wherein said laser beam splitting unit is provided separately from and upstream of said converging unit;
- wherein said laser beam splitting unit comprises a reflecting mirror having a plurality of flat reflecting mirror members separated from each other along straight lines; and
- wherein said reflecting mirror has a center and is rotatable about said center.

5,690,846
LASER PROCESSING METHOD

Toshiharu Okada, Ibaraki; Izuru Nakai, and Yuji Uesugi, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Dec. 21, 1995, Ser. No. 576,638
Claims priority, application Japan, Dec. 22, 1994, 6-320238
Int. Cl.⁶ B23K *26/08*
U.S. Cl. 219—121.78 **2 Claims**


START
#21 READ CAD DATA
#22 EXTRACT POSITIONAL DATA OF XY COORDINATE
#23 GROUP POSITIONAL DATA INTO PROCESSING AREAS
#24 SORT PROCESSING AREAS IN LASER APLICATION ORDER
#25 MAKE CORRECTION ON POSITIONAL DATA BASED ON CORRECTION TABLE
#26 DRILLING
END

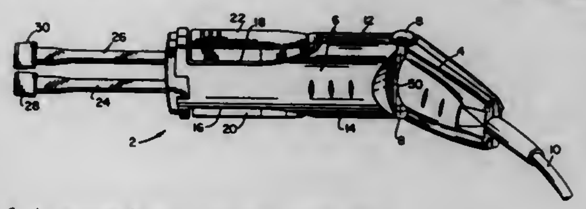
1. A laser processing method to be executed by a pair of turning mirrors of which axes of rotation are arranged in mutually twisted positions, a flat field lens for converging a laser beam reflected on the pair of turning mirrors on a specified plane, and an X-Y stage which carries and moves thereon an object to be processed to which the laser beam is applied, the surface of the object being divided into a plurality of identically shaped contiguous non-overlapping rectangular planar areas disposed as a matrix,

the method comprising:
- a first step of executing application of the laser beam of which a laser applying position is determined by the pair of turning mirrors and the flat field lens to one of the rectangular planar areas of the object;
- a second step of moving an X-axis stage or a Y-axis stage of the X-Y stage after the first step is completed;
- a third step of executing application of the laser beam to one of the rectangular planar areas which is adjacent to the rectangular planar area to which the laser beam has most recently been applied; and
- a fourth step of executing the second and third steps alternatively to process the plurality of rectangular planar areas of the object; and
- wherein each of the first and third steps comprises:
  - a step of grouping laser beam application points, which exist in the planar area to be subjected to the laser application and are expressed by coordinate values of an orthogonal coordinate system including all of the planar areas, into the rectangular planar areas arranged in the matrix form; and
  - a step of transforming the coordinate values at each of the laser beam application points in each of the rectangular planar areas into coordinate values of an orthogonal coordinate system defined by a combination of the pair of turning mirrors and the flat field lens with a center of each of the rectangular planar areas made to serve as an origin,
  - whereby the pair of turning mirrors are driven based on resulting transformed coordinate values to execute the laser beam application to an inside of each of the rectangular planar areas.

5,690,847
PIVOTAL TWEEZER HAVING GEARS AND SELF-REGULATING CURIE-POINT HEATERS

Ronald W. LaValley, Belmont; Michael Carlomagno, Redwood City; Jeffrey Philips, San Jose, and Tark Abed, Palo Alto, all of Calif., assignors to Metcal, Inc., Menlo Park, Calif.

Filed Feb. 17, 1995, Ser. No. 390,590
Int. Cl.⁶ H05B *3/42*
U.S. Cl. 219—233 **20 Claims**



1. A tweezer heater structure comprising
- a main body,
- a pair of hollow arms having a generally elongated body and two ends,
- means for pivotally securing said arms in said main body for rotation of one end of each of said arms about a different pivot,
- means to cause the other ends of said arms to move toward and away from one another,
- at least one end of each end said arm being open ended,
- a heater for the ends of the arms,

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an electrical connector having at least two contacts located in at least one of said arms facing the open end of said arm,

said electrical connector connected to the heater to supply electrical energy thereto.

5,690,848

SUCTION HOOD WITH INTEGRATED GRILL

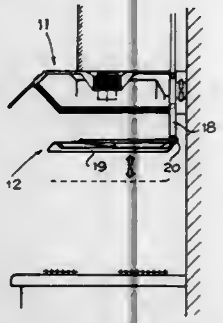
Silvano Lamberti, Via Galli 49, Gussago (Brescia), Italy

Filed Jul. 27, 1995, Ser. No. 507,817

Claims priority, application Italy, Dec. 6, 1994, BS94A0144

Int. Cl.^{6} H05B *3/68;* **F24C** *15/20*

U.S. Cl. 219—444 **8 Claims**



1. A suction hood arrangement for cookers, comprising:

a suction hood;

an electric grill;

support means connecting said electric grill to said suction hood for integrating the electric grill and suction hood, said support means including means for supporting the electric grill in a horizontal position for use, said horizontal position being parallel to said suction hood, and positioned underneath said suction hood, spaced a short distance from said suction hood and means for moving said electric grill from said horizontal position for use to a folded-away position, concealed behind said suction hood.

5,690,849

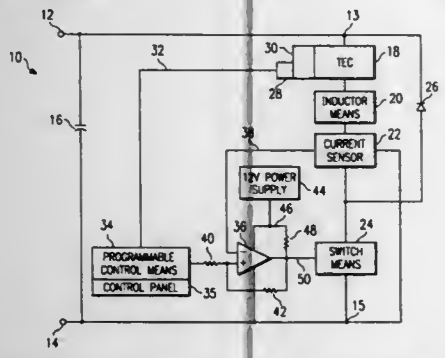
CURRENT CONTROL CIRCUIT FOR IMPROVED POWER APPLICATION AND CONTROL OF THERMOELECTRIC DEVICES

Roger S. DeVilbiss, Dallas; Tony M. Quisenberry, Highland Village, both of Tex., and Harry C. Powell, Shipman, Va., assignors to Thermotek, Inc., Carrollton, Tex.

Filed Feb. 27, 1996, Ser. No. 607,713

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—497 **19 Claims**



1. A current control system for a thermoelectric device to maintain the temperature of the thermoelectric device at a set point, said current control system comprising:

a pair of terminals across which a DC voltage is to be applied;

at least one thermoelectric device;

an inductor means;

a current sensor;

a switch means;

said at least one thermoelectric device, said inductor means, said current sensor and said switch means being operatively connected in a series connection across said pair of terminals to allow current to flow therethrough when said switch means is activated to the "on" condition;

a temperature sensor operatively positioned to monitor the temperature associated with said at least one thermoelectric device;

comparator means having an inverting input, a non-inverting input and an output, said comparator means receiving an input on the inverting input from said current sensor and providing an output to said switch means;

programmable control means to receive an output from said temperature sensor and to provide an output to the non-inverting input of said comparator means, the value of said output being determined by the difference between the sensed temperature of said at least one thermoelectric device and the desired set point temperature of said at least one thermoelectric device;

said comparator means activates said switch means for a predetermined time, determined by the output from said programmable control means, to allow DC current to flow through said at least one thermoelectric device to achieve the set point temperature at which time said comparator means deactivates said switch means.

5,690,850

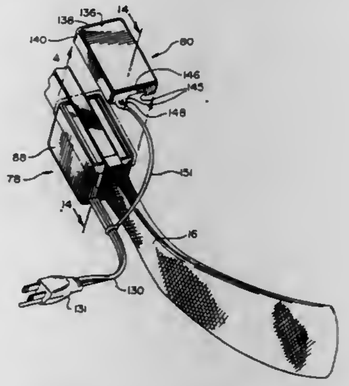
HOCKEY STICK BLADE APPLICATION/REMOVAL TOOL

Thomas W. Anderson, 4 Fenlea Cir., Dellwood, Minn. 55110

Continuation-in-part of Ser. No. 3,547, Jan. 13, 1993. This application Mar. 22, 1995, Ser. No. 408,914

Int. Cl.^{6} H05B *3/58;3/06;* **A63B** *59/00*

U.S. Cl. 219—535 **15 Claims**



1. A method of applying a replacement blade to or removing a replacement blade from the blade receiving end of a hockey stick shaft, said hockey stick shaft having top, bottom and side edges defining an outer shaft configuration and outer shaft dimensions and a hollow blade receiving end, with an inner shaft configuration and inner shaft dimensions, said replacement blade having a connecting end for insertion into said hollow receiving end, said connection end having an outer blade configuration and outer blade dimensions approximating, or slightly smaller than, said inner shaft, dimensions, either said blade receiving end or said connecting end being coated with a heat sensitive adhesive, said method comprising the steps of:

providing a blade application/removal tool comprising a rigid U-shaped heat plate of a heat conductive material having an inner cavity substantially conforming to said outer shaft configuration and with dimensions slightly greater than said outer shaft dimensions and an open top, a selectively removable top heat plate having dimensions sufficiently large to span said open top, a heating element connected with said U-shaped heat plate and an outer housing;

placing said hollow blade receiving end into said inner cavity and placing said top heat plate over said open top so that said top heat plate spans said open end;

heating said hollow blade receiving end with said tool;

inserting said connecting end into said hollow blade receiving end or removing said connecting end from said hollow blade receiving end; and

removing said top heat plate and removing said hollow blade receiving end from said inner cavity.

5,690,851

INDUCTION HEATING APPARATUS FOR DRINK CAN

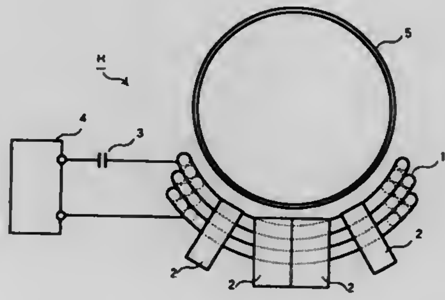
Tsuyoshi Yoshioka, Tokyo; Masami Matsunaga; Tetsuya Takatomi, both of Sagamihara; Hideo Kanai, Shimada, and Tsutomu Ishima, Inagi, all of Japan, assignors to SPC Electronics Corp., and Daiwa Can Co., both of Tokyo, Japan

Filed Oct. 4, 1995, Ser. No. 539,312

Claims priority, application Japan, Oct. 7, 1994, 6-243749

Int. Cl.^{6} H05B *6/10*

U.S. Cl. 219—635 **4 Claims**



1. A drink can induction heating apparatus for induction-heating a drink can in a vending machine, said drink can having a bottomed tubular can body with a drinking liquid contained therein, said apparatus comprising:

a plurality of ferrite cores each having a plurality of projected portions arranged along a longitudinal axis of the drink can and confronting a circumferential wall of the drink can at portions thereof other than at axial ends thereof, said plurality of ferrite cores arranged in a circumferential direction of the drink can so that each of said projected portions is oriented toward the longitudinal axis of the drink can in a non-contact manner when the drink can is temporally held at a given position in the vending machine, each of said ferrite cores further having one or more recesses formed between the projected portions;

a saddle-shaped heating coil having a central open portion and received in the recesses of said ferrite cores with said central open portion receiving therethrough at least one of said projected portions of each of said ferrite cores, said heating coil having a coil surface which covers a portion of the circumferential wall of said drink can in a non-contact manner; and

an inverter including a resonance circuit for producing AC power at a given frequency for feeding to said heating coil, said given frequency being no greater than a value where a current penetration depth becomes about five times a thickness of the circumferential wall of the drink can in case the drink can is formed of a non-magnetic material, said resonance circuit including a resonance capacitor having a given capacitance and said heating coil which are connected electrically in one of series and parallel,

wherein, when the AC power is fed to said heating coil, one or more magnetic circuits are formed between said projected portions of each of said ferrite cores and the circumferential wall of the drink can confronting said projected portions.

5,690,852

BABY BOTTLE STERLIZING CONTAINER FOR USE IN MICROWAVE OVEN

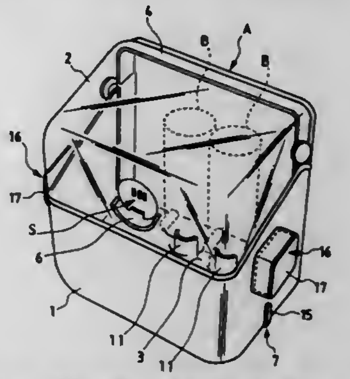
Hideo Saito, Saitama, and Hiroaki Matsuda, Tokyo, both of Japan, assignors to Combi Corporation, Tokyo, Japan

Filed Jan. 3, 1996, Ser. No. 582,616

Claims priority, application Japan, Jan. 6, 1995, 7-016460

Int. Cl.^{6} H05B *6/80;* **A61L** *2/06*

U.S. Cl. 219—725 **13 Claims**



1. A baby bottle sterilizing container for use in a microwave oven, comprising:

a container main body for storing a plurality of baby bottles therein, said container having a front portion, and having a receptacle portion which can hold water;

a cover member for covering said container main body and including a water pouring opening in a front portion of said cover member;

a support member stored within said container main body and including a plurality of holders respectively for supporting baby bottles; and

a tray member connected to said support member at a substantially right angle, and stored along a back area of said container main body, said tray member including a receptacle portion which can hold water; wherein in a normal position of the sterilizing container, said tray member is disposed along the back area of said container main body, and in a recumbent position, the sterilizing container is positioned such that said tray member is disposed along a bottom area of said container main body, wherein said sterilizing container is able to store water therein and heat and sterilize baby bottles in a microwave oven in either the normal position or the recumbent position.

5,690,853

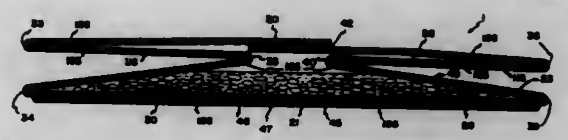
TREATMENTS FOR MICROWAVE POPCORN PACKAGING AND PRODUCTS

Eric Craig Jackson, Maple Grove, and Denise Ellen Hanson, Elk River, both of Minn., assignors to Golden Valley Microwave Foods, Inc., Edina, Minn.

Filed Sep. 27, 1995, Ser. No. 534,831

Int. Cl.^{6} H05B *6/80*

U.S. Cl. 219—727 **14 Claims**



1. A microwave popcorn package comprising:

(a) a sheet construction of flexible paper folded in the form of an expandable bag; said sheet construction comprising inner and outer plies of paper;

(i) said inner ply of paper having an inner surface and an outer surface; and

(b) a first adhesive on at least a portion of said outer surface of said inner ply of paper, said first adhesive being in an amount sufficient, and having greaseproof properties in combination

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with the inner ply of paper sufficient, to provide a portion of said inner ply of paper to which it is applied with improved greaseproofness;

(i) said first adhesive being a material which, when applied in a test lamination as a laminating adhesive between two plies of non-greaseproof paper, provides the test lamination with a greaseproofness as measured by the turpentine test of at least 2 hours.

5,690,854

REGULATION AND CLOSURE APPARATUS FOR A METALLURGICAL VESSEL

Raimund Brückner, Engenhahn-Niedernhausen, Germany; Rick Ardell, Loveland, and Bernhard Schiefer, Cincinnati, both of Ohio, assignors to Didier-Werke AG, Wiesbaden, Germany

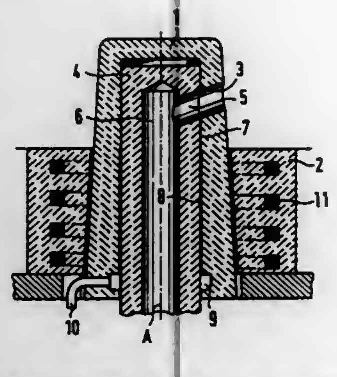
PCT No. PCT/EP95/04649, § 371 Date Nov. 19, 1996, § 102(e) Date Nov. 19, 1996, PCT Pub. No. WO96/20801, PCT Pub. Date Jul. 11, 1996

PCT Filed Nov. 25, 1995, Ser. No. 702,633

Claims priority, application Germany, Jan. 2, 1995, 195 00 012.9

Int. Cl.^{6} B22D ***41/14***

U.S. Cl. 222—593 **3 Claims**



1. A regulation and closure apparatus for use with a metallurgical vessel, said apparatus comprising:

a stator to be disposed in a vessel walls

a rotor rotatably supported in said stator;

said stator and rotor having throughflow openings which, by rotation of said rotor, can be made to coincide to receive melt from the vessel, and said rotor having therein a through-passage channel to receive the melt;

an inductor encompassing said rotor and operable to generate an electromagnetic field; and

said rotor comprising an electrically conducting, refractory ceramic material, whereby said rotor but not the melt therein is coupled to said field of said inductor, thus heating said rotor, with said rotor transferring heat to the melt.

5,690,855

POLYOL BLEND, CELLULAR POLYURETHANE FOAM PRODUCT MADE THEREFROM, AND HALOGENATED HYDROCARBON-FREE PROCESS THEREFOR

Charles B. Nichols, New Milford; Michael R. Sandner, Newtown, and Richard R. Zielinski, II, New Milford, all of Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Jan. 11, 1994, Ser. No. 180,086

Int. Cl.^{6} C08J ***9/08;*** **C08G** ***18/48***

U.S. Cl. 252—182.27 **46 Claims**

1. A polyol blend comprising, in the absence of amine initiated polyols:

a) water in an amount of from about 2 to 8 percent by weight based upon the total weight of said blend;

b) a first polyol that is the reaction product of one or more alkylene oxides and a compound selected from the group consisting of aliphatic diols, aliphatic triols, pentaerythritol, water in an amount sufficient to form a diol upon reaction with alkylene oxide, and mixtures thereof, wherein said first polyol has a functionality of from about 2 to 4, a hydroxyl number of from about 100 to 500; and an equivalent weight of from about 110 to 560; and

c) a second polyol that is the reaction product of one or more alkylene oxides and a compound selected from the group consisting of carbohydrates, a mixture of carbohydrates, and a mixture of one or more carbohydrates and one or more compounds selected from the group consisting of aliphatic diols, aliphatic triols, water in an amount sufficient to form a diol upon reaction with alkylene oxide, and mixtures thereof, wherein said second polyol has an average functionality of from about 4 to 8, a hydroxyl number of from about 200 to 600, and an equivalent weight of from about 90 to 280, and wherein said first and second polyols are present in said blend in a ratio by weight to said first polyol to said second polyol of from about 1.5:1 to 2.5:1 sufficient for preparation of dimensionally stable polyurethane foams in the absence of halogenated hydrocarbon blowing agents.

5,690,856

SOLID DIACYL ORGANIC PEROXIDE DISPERSIONS

Bryce Milleville, New Fairfield, Conn., and Borys F. Schafran, Ossining, N.Y., assignors to Akzo Nobel N.V., Arnhem, Netherlands

Filed Mar. 7, 1995, Ser. No. 400,146

Int. Cl.^{6} C01B ***15/055***

U.S. Cl. 252—186.26 **26 Claims**

1. A stabilized dispersion in paste form with increased thermal stability which comprises: (1) diacyl peroxide, (2) at least one dispersing plasticizer, and (3) at least one phlegmatizing vehicle having minimal or no solid peroxide solubility, wherein the ratio of diacyl peroxide to dispersing plasticizer is in the range of about 7.1:1 to about 12:1.

5,690,857

THERMOCHROMIC EFFECT PIGMENT AND PROCESS FOR PRODUCING THE SAME

Karl Osterried, Dieburg; Magarete Herbski, Ober-Ramstadt, both of Germany, and Ian Charles Sage, Dorset, Great Britain, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

PCT No. PCT/EP92/02799, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994, PCT Pub. No. WO93/12195, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 3, 1992, Ser. No. 244,617

Claims priority, application European Pat. Off., Dec. 9, 1991, 911211007

Int. Cl.^{6} C09K ***19/00;*** **C08K** ***5/00;*** **A61K** ***7/021;*** **C09D** ***11/00***

U.S. Cl. 252—299.1 **21 Claims**

1. A thermochromic effect particulate pigment, comprising a thermochromic liquid crystal material encapsulated within a polymeric encapsulating material and on the outer surface of the encapsulating material a coating comprising one or more inorganic metal oxides or metal oxide hydrates, mixtures of inorganic metal oxides or metal oxide hydrates or $BaSO_4$.

5,690,858

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DEVICE

Hiroyuki Nohira, Urawa; Michihiro Yamada, Matsuyama, and Kazuo Yoshinaga, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

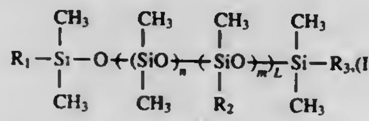
Continuation of Ser. No. 156,689, Nov. 24, 1993, abandoned. This application Sep. 16, 1996, Ser. No. 714,512

Claims priority, application Japan, Nov. 25, 1992, 4-336768

Int. Cl.^{6} C09K ***19/52***

U.S. Cl. 252—299.01 **18 Claims**

1. A mesomorphic compound represented by the following formula (I):

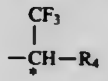


$$R_1-\underset{CH_3}{\overset{CH_3}{Si}}-O\!\!\left(\!\left(\underset{CH_3}{\overset{CH_3}{SiO}}\right)_{\!n}\!\left(\underset{R_2}{\overset{CH_3}{SiO}}\right)_{\!m}\right)_{\!L}\underset{CH_3}{\overset{CH_3}{Si}}-R_3,(I)$$

wherein R_1 and R_3 denote methyl and R_2 denotes a mesomorphic residual group represented by the following formula (II):

$$B\!\left(Y\right)_P\!-A\!\left(X\right)_Q\!-C- \qquad (II),$$

wherein A is a mesogen group comprising at least two cyclic groups; B is a terminal flexible group; C is a spacer flexible group; and X and Y each is independently selected from the group consisting of —OCO—, —COO—, —CH_2O—, —OCH_2— and —O—; and P and Q are independently 0 or 1, the terminal flexible group having an optically active group of the formula:



$$-\overset{CF_3}{\underset{*}{CH}}-R_4$$

wherein R_4 is an alkyl group having 1–12 carbon atoms; n is an integer of 1–5; m is an integer of 1–10; and L is an integer of 1–100; and

said mesomorphic compound has a number-average molecular weight of 500–1,000,000.

5,690,859

LIQUID CRYSTAL POLYMER COMPOSITION

Motoo Takayanagi, 20-20, Tani 2-chome, Chuo-ku, Fukuoka-shi, Fukuoka, Japan

Continuation of Ser. No. 369,912, Jan. 6, 1995, abandoned. This application Feb. 20, 1996, Ser. No. 603,353

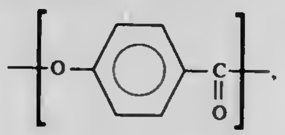
Claims priority, application Japan, Jan. 10, 1994, 6-000968; Feb. 21, 1994, 6-022369; Nov. 15, 1994, 6-280448

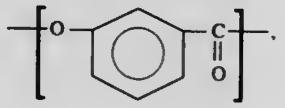
Int. Cl.^{6} C09K ***19/20;19/52***

U.S. Cl. 252—299.67 **6 Claims**

1. A liquid-crystal polymer composition which comprises (A) a wholly aromatic liquid-crystal polymer, (B) a semi-aromatic liquid-crystal polymer which contains units of at least one aliphatic group and the balance of which is composed of units of at least one group selected from the group consisting of carbonyl, ester, sulfone, amide, ether, thio ether, imide and azo groups, and (C) a thermoplastic resin other than liquid-crystal polymers, in which component (A) has repeating structural units based on the following formulas:

(A$_1$)





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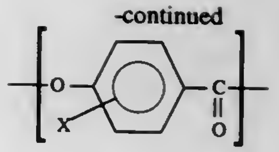
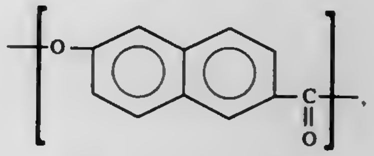
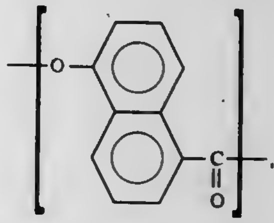


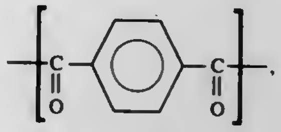
wherein X is halogen or alkyl,

(A$_2$)

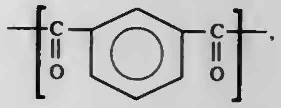


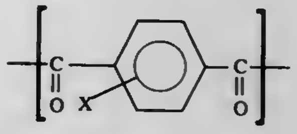


(B$_1$)

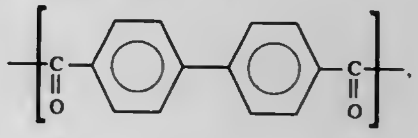


(B$_2$)

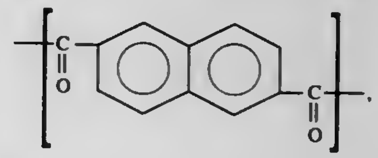


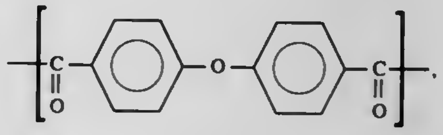


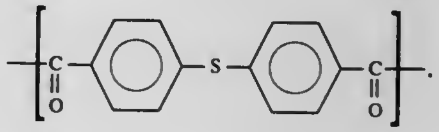
wherein X is halogen, alkyl or aryl,



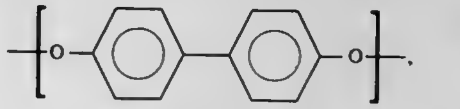
(B$_3$)



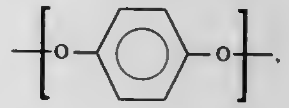




(C$_1$)



(C$_2$)



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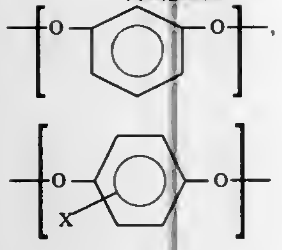
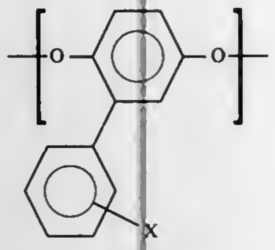
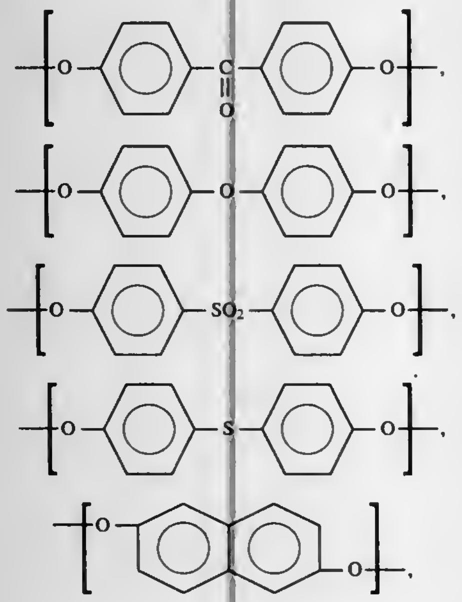


(C₃)

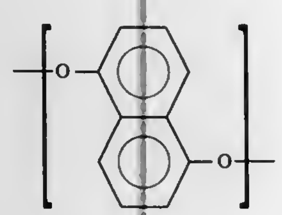
wherein X is halogen, alkyl or aryl,



wherein X is hydrogen, halogen, or alkyl,



and



wherein component (A) has repeating structural units selected from one of the following groups:

(1) (A_1), (B_1), (B_2) and (C_1);
(2) (A_2), (B_1), (B_2) and (C_1);
(3) (A_1), (B_3), (B_2) and (C_1);
(4) (A_1), (B_1), (B_2) and (C_3); and
(5) (A_1), (A_2), (B_2), (B_2) and (C_1).

5,690,860
PARTICULATE INORGANIC OXIDE TREATED WITH CYCLIC POLYSILOXANE

Gary Edward LeGrow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 4, 1995, Ser. No. 566,627

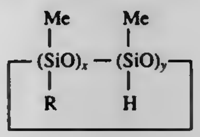
Int. Cl.⁶ B01J *13/00;* **C09C** *1/36*

U.S. Cl. 252—309 **20 Claims**

1. A coated particulate inorganic oxide comprising:

(A) a particulate inorganic oxide selected from the group consisting of silica, titania and mixtures thereof, said inorganic oxide being coated with

(B) a cyclic polysiloxane having the formula



$$\overset{\text{Me}}{\underset{\text{R}}{(\text{SiO})_x}}-\overset{\text{Me}}{\underset{\text{H}}{(\text{SiO})_y}}$$

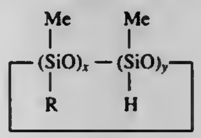
in which Me represents a methyl radical. R is an alkyl group having 2 to 12 carbon atoms, x has an average value of 1 to 5, y has an average value of 1 to 5 and (x+y) has an average value of 4 to 6, wherein from 0.1 to 5 parts by weight of said cyclic polysiloxane (B) is used for each 100 parts by weight of said inorganic oxide (A).

8. A composition comprising a dispersion of

(I) a coated particulate inorganic oxide comprising

(A) a particulate inorganic oxide selected from the group consisting of silica; titania and mixtures thereof, said inorganic oxide being coated with

(B) a cyclic polysiloxane having the formula



$$\overset{\text{Me}}{\underset{\text{R}}{(\text{SiO})_x}}-\overset{\text{Me}}{\underset{\text{H}}{(\text{SiO})_y}}$$

in which Me represents a methyl radical, R is an alkyl group having 2 to 12 carbon atoms, x has an average value of 1 to 5, y has an average value of 1 to 5 and (x+y) has an average value of 4 to 6, wherein from 0.1 to 5 parts by weight of said cyclic polysiloxane (B) is used for each 100 parts by weight of said inorganic oxide (A), in

(II) a non-polar organic medium.

5,690,861
COUPLING OF POLYMERS MADE BY CATIONIC POLYMERIZATION

Rudolf Faust, Lexington, Mass., assignor to University of Massachusetts Lowell, Lowell, Mass.

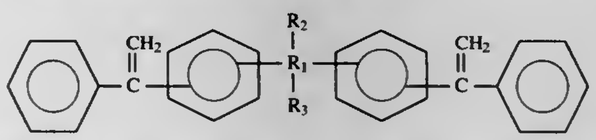
Filed Mar. 2, 1995, Ser. No. 398,953

Int. Cl.⁶ C08F *10/10;297/00;293/00*

U.S. Cl. 525—319 **11 Claims**

1. A method for coupling a cationic polymer, comprising the steps of:

a) forming a reaction mixture of a cationic polymer and a bis(diphenylethylene) having the formula:



wherein R_1 includes at least one carbon, and R_2 and R_3 are hydrogen or alkyl groups; and

b) exposing the reaction mixture to a temperature which causes the bis(diphenylethylene) to react with the cationic polymer, thereby coupling said cationic polymer.

5,690,862
NO FLASH POINT SOLVENT SYSTEM CONTAINING NORMAL PROPYL BROMIDE

Robert M. Moore, Jr.; Robert L. Davis; William E. Moehle; Burnell Lee, and Edgar E. Spielman, Jr., all of Baton Rouge, La., assignors to Albemarle Corporation, Richmond, Va.

Filed Nov. 1, 1995, Ser. No. 551,641

Int. Cl.⁶ C11D *7/24;7/30;7/50;* **C23G** *5/028*

U.S. Cl. 252—364 **16 Claims**

1. A solvent system comprised of:

(a) a hydrocarbon solvent selected from the group consisting of alkanes, alkenes, cycloalkanes, cycloalkenes and (i) having a flash point which is below about 38° C., (ii) having a boiling point which is within ±15° C. of the boiling point of the second solvent in (b), and (iii) being present in an amount which is at least 10 vol % of the total solvent system; and

(b) a second solvent which consists essentially of at least about 90 wt % n-propyl bromide and less than 10 to 0 wt % other brominated propane(s), based upon the total weight of the second solvent, the second solvent,

(1) being present in an amount which is,

(i) at least from about 35 to about 85 vol % of the total solvent system, and

(ii) is sufficient to obtain no flash point for the solvent system when tested in accordance with ASTM D-93; and

(2) being the sole halogenated solvent and halogenated flash point suppressor constituent in the solvent system.

5,690,863
CURABLE INTER-POLYMER OPTICAL FIBER CLADDING COMPOSITIONS

Paul D. Schuman, Hawthorne, Fla., assignor to Optical Polymer Research, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 279,161, Jul. 22, 1994, abandoned. This application May 10, 1996, Ser. No. 644,352

Int. Cl.⁶ F21V *9/00;* **G02B** *6/00*

U.S. Cl. 252—582 **5 Claims**

1. A method for producing an optically clear, cladding inter polymer with a low refractive index on a silica or plastic optic fiber comprising the steps of

(a) providing one or more monomers selected from monomers of the formula:

$CH_2{=}C(R)\ COOCHXY$

wherein

R is hydrogen or methyl,

X is hydrogen or perfluoromethyl,

Y is hydrogen or perfluoromethyl, providing that if X is hydrogen then Y is $(CH_2)n\ (CF_2)m\ Z$ wherein

Z is hydrogen or fluorine,

n is 0 to 4 and

m is 1 to 10;

(b) polymerizing the one or more monomers in the presence of a polymerization initiator and a polymer chain transfer agent to form a low molecular weight soluble pre-polymer;

(c) dissolving the pre-polymer in monomers of the same formula provided in step (a) in the presence of an ultra violet or thermal polymerization initiator to form a reactive pre-polymer solution;

(d) admixing a cross-linking di- or poly-functional acrylate or methacrylate ester with the reactive pre-polymer solution;

(e) applying the solution of (d) to an optical fiber and

(f) initiating the polymerization of the solution of (d) to form a cured cladding polymer on the optical fiber.

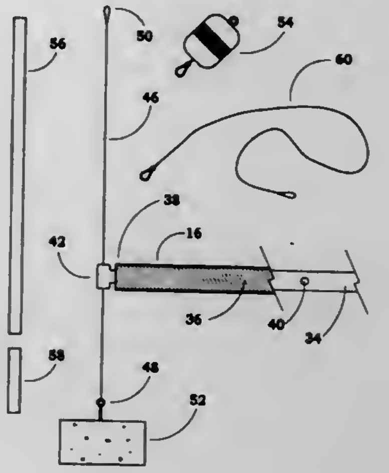
5,690,864
RETRIEVABLE AERATION SYSTEM

Robert R. Tyer, 9410 FM 1097 West, Willis, Tex. 77378

Continuation-in-part of Ser. No. 664,405, Jun. 17, 1996. This application Nov. 8, 1996, Ser. No. 746,299

Int. Cl.⁶ B01F *3/04*

U.S. Cl. 261—122.1 **21 Claims**



11. An aeration system for a wastewater treatment plant, comprising:

an air supply lateral for receiving compressed air;

the air supply lateral having a plurality of outlets;

an aerator feedline extending from each outlet to an aerator having ends;

an end fitting connected to the aerator at each end thereof, with walls in each end fitting defining a cable passageway;

a cable having lower and upper ends, the cable being loosely interfitted with each aerator end fitting to permit relative movement between the aerator and cable;

the lower end of the cable being fixed with respect to the bottom of the wastewater treatment basin floor;

the upper end of the cable being attached to a removable stop member;

an upper spacer tube for each end of the aerator, the upper spacer tube having upper and lower ends, the upper end contacting the stop member and the lower end contacting the aerator end fitting, such that the aerator is vertically positioned from the cable upper ends by the upper spacer tubes, but the aerator may be retrieved by removing the stop members.

5,690,865
MOLD MATERIAL WITH ADDITIVES

Ture Kindt-Larsen, Holte, Germany; Jeffery Longo, and Keith O'Brien, both of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Mar. 31, 1995, Ser. No. 414,999

Int. Cl.⁶ B29D *11/00*

U.S. Cl. 264—1.38 **28 Claims**

1. A mold material constituting a mold half for use in the production of contact lenses, said mold material comprising a thermoplastic polymer and an internal additive which is impregnated into said thermoplastic material by compounding said internal additive and said thermoplastic polymer, said internal additive is present in amounts ranging from about 0.1% to about 20% by weight, said thermoplastic material being polystyrene or polypropylene and said additive being a polyethylene or polypropylene wax having a molecular weight ranging from about 5,000 to about 200,000, stearate salt, a glycerol ester having a molecular weight

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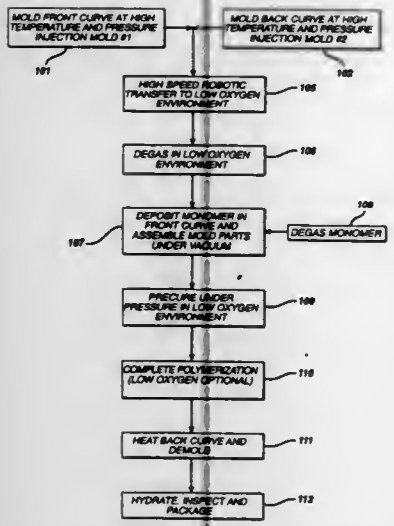

MOLD FRONT CURVE AT HIGH TEMPERATURE AND PRESSURE INJECTION MOLD #1
101
MOLD BACK CURVE AT HIGH TEMPERATURE AND PRESSURE INJECTION MOLD #2
102
HIGH SPEED ROBOTIC TRANSFER TO LOW OXYGEN ENVIRONMENT
105
DEGAS IN LOW OXYGEN ENVIRONMENT
106
DEPOSIT MONOMER IN FRONT CURVE AND ASSEMBLE MOLD PARTS UNDER VACUUM
107
DEGAS MONOMER
108
PRECURE UNDER PRESSURE IN LOW OXYGEN ENVIRONMENT
109
COMPLETE POLYMERIZATION (LOW OXYGEN OPTIONAL)
110
HEAT BACK CURVE AND DEMOLD
111
HYDRATE, INSPECT AND PACKAGE
112

of about 200–2,000, an amide wax of the formula R_1CONH_2, wherein R_1 is a hyrocarbyl group, and the amide wax has a molecular weight ranging from about 2,000 to about 100,000, Montan wax, oxidized wax, fatty acid having a molecular weight of about 200 to 2,000, a complex ester or a combination thereof.

5,690,866

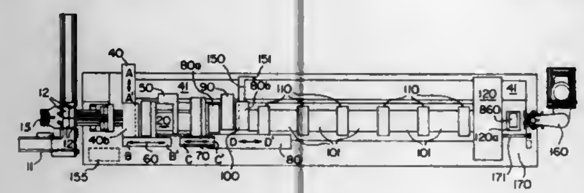
AUTOMATED METHOD FOR HYDRATING SOFT CONTACT LENSES

Finn Thrige Andersen, Vedbaek; Kaj Bjerre, Ballerup; Svend Christensen, Allinge, all of Denmark; Darren Scott Keene, Jacksonville, Fla.; Ture Kindt-Larsen, Holte, Denmark; Timothy Patrick Newton, Jacksonville, Fla.; Daniel Tsu-Fang Wang, Jacksonville, Fla., and Michael Francis Widman, Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation of Ser. No. 258,556, Jun. 10, 1994, Pat. No. 5,476,111. This application Jun. 5, 1995, Ser. No. 463,360

Int. Cl.^{6} B29D *11/00*

U.S. Cl. 264—2.6 **28 Claims**



1. An automated method for hydrating a molded hydrophilic contact lens, said automated method comprising:

(a) removing a plurality of contact lens molds from at least one carrier, each mold having a contact lens therein, and automatically assembling said molds with a lens transfer plate to form a first hydration carrier;

(b) immersing said first hydration carrier in a hydration bath at a speed not exceeding 40 mm per second with robotic handling to hydrate the lens and release said lens from said mold, and allow each of said lenses to transfer from its respective mold to a related lens transfer surface carries by said first hydration carrier,

(c) removing said first hydration carriers from said bath with robotic handling after said transfer;

(d) removing said molds from said lens transfer plate and transporting said lens transfer plate and said lenses to a subsequent processing station.

5,690,867

PROCESS FOR THE MANUFACTURE OF AN EXPLOSIVE AMMUNITION COMPONENT WITH CONTROLLED FRAGMENTATION

Bruno Nouguez, Vert le Petit; Claude Grimelli, Alfortville; Pierre Vitrant, Itteville; Alain Bonnel, and Alain Tinet, both of Sorgues, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris Cedex, France

Filed Oct. 24, 1996, Ser. No. 736,249

Claims priority, application France, Nov. 16, 1995, 95 13591

Int. Cl.^{6} C06B *21/00;* **F42B** *12/22*

U.S. Cl. 264—3.1 **12 Claims**

1. Process for the manufacture of an explosive ammunition component with controlled fragmentation, comprising a solid explosive charge contained in a metal casing whose internal wall is clad with a sleeve externally provided with indentations, characterized in that:

a rigid sleeve made of plastic or elastomer, externally provided with indentations and which has a form of a vessel provided with a single opening, is produced first of all,

the sleeve is next introduced into a metal casing comprising an opening and whose shape and the dimensions are such as to allow the sleeve to clad the internal wall of the casing, the sleeve being introduced through the opening of the casing so that the opening of the sleeve will be situated facing the opening of the casing in order to make the interior of the sleeve accessible through the opening of the casing,

a pasty or liquid explosive composition is next cast into the sleeve and the composition is then solidified.

5,690,868

MULTI-LAYER HIGH ENERGY PROPELLANTS

Bernard Strauss, Rockaway; Thelma Manning, Montville; Joseph P. Prezelski, Budd Lake, and Sam Moy, Parsippany, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 6,671, Jan. 19, 1993, Pat. No. 5,244,511. This application Nov. 7, 1996, Ser. No. 744,392

Int. Cl.^{6} C06B *21/00;45/10*

U.S. Cl. 264—3.1 **4 Claims**

1. A method of making a multi-layer propellant having at least one slow burning formulation and at least one fast burning formulation, comprising:

forming a first formulation having a high energy elastomer binder and a slow rate oxidizer having a burning rate about that of RDX, said first formulation being formed into at least one slow burn layer; and

forming a second formulation having the same high energy elastomer binder and a fast rate oxidizer having a burning rate about that of CL-20, said second formulation being formed into at least one fast burn layer;

bonding said at least one slow burn layer and at least one fast burn layer into a single geometric shape such that said layers are bonded together by said binder to provide structural integrity of the resulting multi-layer propellant.

5,690,869

USE OF A POLYMER MATERIAL ON THE BASIS OF MODIFIED HYDROCOLLOIDS AS COVERING MATERIAL

Rudolf Hinterwaldner, Moosach-Altenburg; Bruno Hertrich, Munich, and Wilfried Babel, Eberbach, all of Germany, assignors to omniTECHNIK, Munich, Germany

PCT No. PCT/EP95/02107, § 371 Date Oct. 5, 1995, § 102(e) Date Oct. 5, 1995, PCT Pub. No. WO95/33554, PCT Pub. Date Dec. 14, 1995

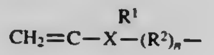
PCT Filed Jun. 2, 1995, Ser. No. 537,665

Claims priority, application Germany, Jun. 6, 1994, 44 19 724.1

Int. Cl.^{6} B01J *13/08;13/14*

U.S. Cl. 264—4.1 **19 Claims**

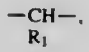
1. Polymeric microcapsule wall material comprising a modified hydrocolloid with a content of ≧0.1 mass % (m-%) of polymerizable or cross-linkable groups of the general formula:



$$CH_2{=}\overset{R^1}{C}{-}X{-}(R^2)_n{-}$$

in which

X stands for —CO—, —COO—, —OCO—, —CONH—,



$$-\underset{R_1}{CH}-,$$

R^1 is a hydrogen atom, a hydroxy, nitrile, halogen, or C_1–C_8-alkyl residue;

R^2 is a saturated or unsaturated, at least bivalent hydrocarbon residue R^3 is a hydrogen atom, a hydroxy group or a C_1–C_4 alkyl residue;

n stands for 0 or 1; and

these groups being linked over a linking member with the backbone of the hydrocolloid.

5,690,870

METHOD OF MANUFACTURING A POLYIMIDE-TYPE GAS PERMEATION MEMBRANE INCLUDING FLUORINE

Hisao Hachisuka, Osaka; Ping Xu, Kyoto, and Tomomi Ohara, Osaka, all of Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Oct. 17, 1995, Ser. No. 544,202

Claims priority, application Japan, Oct. 26, 1994, 6-262783; Oct. 26, 1994, 6-262784

Int. Cl.^{6} B29C *47/00;47/06;67/20;70/68*

U.S. Cl. 264—41 **16 Claims**

1. A method of manufacturing a fluorine including polyimide-type gas separation membrane comprising the steps of:

extruding a polyimide dope which consists of a fluorine including polyimide resin and an organic solvent (A) in a tube form; or coating said dope on a supporting body; and

immersing the extruded tube or the coated supporting body in a solvent (B) to form a membrane; wherein said fluorine including polyimide resin comprises at least three fluorine atoms in a repeating molecular unit; wherein said organic solvent (A) comprises at least two ether bonds in a repeating molecular unit; and wherein said organic solvent (A) is miscible with said solvent (B).

5,690,871

PROCESS FOR THE PRODUCTION OF STRUCTURAL THERMOINSULATING ELEMENTS

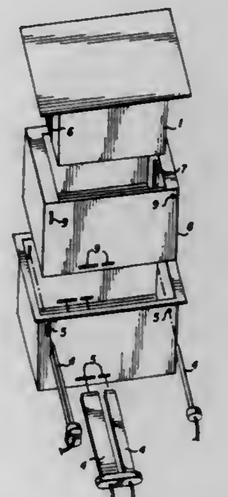
Giampiero Pirotta, Virgilio, and Romano Reggiani, Mantova, both of Italy, assignors to Enichem S.P.A, Milan, Italy

Filed Nov. 29, 1995, Ser. No. 564,006

Claims priority, application Italy, Dec. 1, 1994, MI94A2436

Int. Cl.^{6} B29C *44/06;44/12*

U.S. Cl. 264—45.4 **1 Claim**



1. Process for the production of thermoinsulating structural elements and fluid circulation pipes thereon, consisting of:

a) producing a thermoplastic material by thermoforming;

b) pulling said material onto a male half shell of a mold for the production of a structural element;

c) closing the mold by inserting said half shell in the corresponding negative half shell of said mold in order to form an intermediate cavity between said half shells;

d) inserting a plurality of hollow bored elements with the same external dimensions and geometry as pipes to be produced in the intermediate cavity;

e) filling said intermediate cavity with foamed or semifoamed pearls or granules of a thermoplastic polymer;

f) sintering the pearls by feeding saturated steam or hot air through said hollow elements, and maintaining walls of the thermoplastic material at a temperature of at least 10° C. below the glass transition temperature of the thermoplastic material;

g) cooling the sintered pearls and extracting said hollow bored elements from the mold; and

h) removing from the mold the thermoinsulating structural element with produced pipes.

5,690,872

METHOD FOR THE PRODUCTION OF HIGHLY FILLED POLYMETHYL METHACRYLATE BASED PLASTICS

Manfred Krieg, Darmstadt, and Guenther Ittmann, Gross-Umstadt, both of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed Mar. 7, 1996, Ser. No. 612,446

Claims priority, application Germany, Mar. 7, 1995, 195 07 875.6

Int. Cl.^{6} B29C *39/12*

U.S. Cl. 264—73 **20 Claims**

1. A method for the casting of highly filled plastics comprising polymethyl methacrylate, comprising:

preparing a filler suspension by combining from 30 to 80 wt %, based on the amount of filler suspension, of at least one particle-shaped, inorganic filler with a polymer precursor under stirring, wherein the polymer precursor comprises methyl methacrylate and a polymethyl methacrylate prepolymer, wherein the filler suspension further comprises from 1 to

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20 parts by weight, based on the amount of filler suspension, of a colored, filled, comminuted polymer material having a density precisely adapted to the density of the filler suspension and wherein the comminuted polymer material comprises a polymer component which is crosslinked; and

polymerizing the filler suspension by contacting the filler suspension with at least one radical initiator.

5,690,873
POLYARYLENE SULFIDE MELT BLOWING METHODS AND PRODUCTS

Colin F. Harwood, Tucson, Ariz.; Isaak Vasserman, Whitestone, and Thomas C. Gsell, Glen Head, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation-in-part of Ser. No. 570,313, Dec. 11, 1995, abandoned. This application Feb. 8, 1996, Ser. No. 598,475

Int. Cl.^{6} B29C *39/14*

U.S. Cl. 264—103 **36 Claims**

1. A method of preparing polyarylene sulfide fibers comprising melt blowing a blend of a polyarylene sulfide resin and a polyolefin resin through one or more fiberizing nozzles or orifices, wherein said polyolefin resin is present in an amount of up to about 40% by weight of the total blend.

5,690,874
FIBER PRODUCTION PROCESS

Kathryn Diana Bell, Coventry; Ian Graveson, Nuneaton, and Timothy John Ollerenshaw, Towcester, all of United Kingdom, assignors to Courtaulds Fibres (Holdings) Limited, United Kingdom

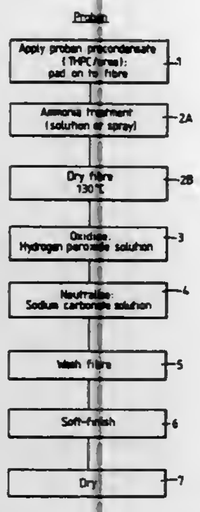
PCT No. PCT/GB94/00956, § 371 Date Nov. 7, 1995, § 102(e) Date Nov. 7, 1995, PCT Pub. No. WO94/26962, PCT Pub. Date Nov. 24, 1994

PCT Filed May 4, 1994, Ser. No. 549,742

Claims priority, application United Kingdom, May 11, 1993, 9309617

Int. Cl.^{6} D01F *2/00;11/02;* **D06M** *13/285*

U.S. Cl. 264—129 **10 Claims**


Proban
Apply proban precondensate (THPC/urea): pad on to fibre
1
Ammonia treatment (solution or spray)
2A
Dry fibre 130°C
2B
Oxidise. Hydrogen peroxide solution
3
Neutralise: Sodium carbonate solution
4
Wash fibre
5
Soft-finish
6
Dry
7

1. A method of forming a flame retardant cellulose fibre comprising the steps of producing lyocell fibre and incorporating a flame retardant chemical into the fibre whilst the fibre is in the never-dried condition prior to first drying.

5,690,875
METHOD AND APPARATUS FOR MANUFACTURING SURFACE FASTENER

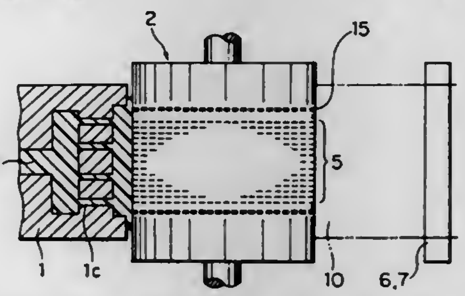
Keisuke Sakakibara; Ryuichi Murasaki, and Tsuyoshi Minato, all of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Dec. 20, 1995, Ser. No. 575,596

Claims priority, application Japan, Dec. 26, 1994, 6-322182

Int. Cl.^{6} B29C *47/32;47/90*

U.S. Cl. 264—146 **10 Claims**



1. A method of continuously manufacturing a surface fastener, comprising:

(a) extruding molten thermoplastic resin, in a predetermined width, from an extrusion nozzle to a circumferential surface of a die wheel having a multiplicity of engaging-element-forming cavities;

(b) driving said die wheel for rotation;

(c) molding a multiplicity of engaging elements integrally with a plate-like substrate sheet while filling the molten thermoplastic resin in said engaging-element-forming cavities of said die wheel in rotation; and

(d) molding pseudo elements integrally with said substrate sheet along opposite side edges across said width of said substrate sheet, using pseudo-element-forming cavities in opposite side circumferential surfaces of said die wheel, simultaneously with said molding of said engaging elements, said pseudo elements shaped to have a larger peeling resistance from said pseudo-element-forming cavities than a peeling resistance of said engaging elements from said engaging-element-forming cavities.

6. An apparatus for continuously manufacturing a surface fastener, comprising:

(a) a die wheel having in its circumferential surface a multiplicity of engaging-element-forming cavities and adapted to be driven for rotation in one way; and

(b) an extrusion nozzle situated facing the circumferential surface of said die wheel and having inside a predetermined width of molten thermoplastic resin extrusion channel;

(c) said die wheel further having in opposite side circumferential surfaces a plurality of pseudo-element-forming cavities spaced a predetermined distance from said engaging-element-forming cavities, said pseudo-element-forming cavities shaped to have a greater resistance to peeling therefrom of solidified molten thermoplastic resin than a resistance of said engaging-element-forming cavities to peeling therefrom of solidified molten thermoplastic resin.

5,690,876
SYSTEM FOR CONTINUOUS PRODUCTION OF ROOFING SHAKES

Francis Anthony Gallo, Jr., 16135 Gleneagle Dr., Fountain Hills, Ariz. 85268

Filed Jul. 25, 1994, Ser. No. 279,398

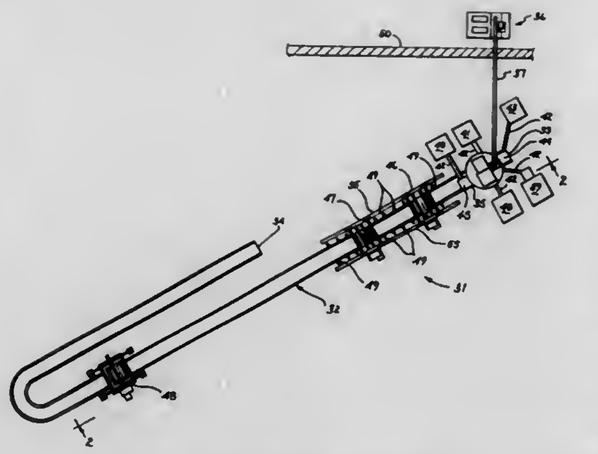
Int. Cl.^{6} B29C *69/02;59/04*

U.S. Cl. 264—151 **8 Claims**

5. In a method for the continuous manufacture of roofing shakes, the steps of:

a. providing a supply of thermoplastic material;

b. heating said thermoplastic material to a temperature of about 350–400 degrees Fahrenheit;



c. providing selected other shake ingredients;

d. hot-mixing said selected other shake ingredients with said heated thermoplastic material at a temperature of about 300–350 degrees Fahrenheit to provide heated shake material;

e. providing conveyor-belt means for carrying said heated shake material;

f. continuously extruding said heated shake material as a shake material layer onto said conveyor-belt means at a temperature of at least about 240 degrees Fahrenheit and under an extrusion pressure of from about 20 psi to about 50 psi when being continuously extruded onto said conveyor-belt means;

g. providing at least two shake embossing means located along said conveyor-belt means for embossing a top surface portion of said shake material layer to provide varying embossing patterns on said shake material layer;

h. providing means to variably control the location of at least one of said shake embossing means along said conveyor-belt means; and

i. cutting said shake material layer to provide roofing shakes.

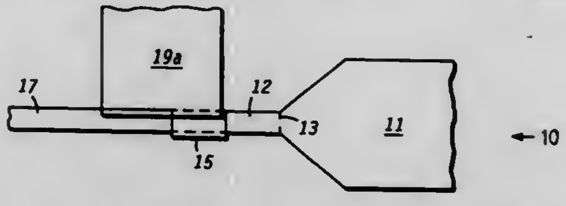
5,690,877
METHOD OF PROCESSING A SEMICONDUCTOR CHIP PACKAGE

Alex Elliott, 2828 S. Calle Rosa Cir., Mesa, Ariz. 85202, and Allen Koesser, 4421 E. Frye Rd., Phoenix, Ariz. 85044

Continuation of Ser. No. 767,593, Sep. 30, 1991, abandoned. This application Mar. 16, 1995, Ser. No. 405,563

Int. Cl.^{6} B29C *33/44;45/40*

U.S. Cl. 264—161 **14 Claims**



1. A method of processing a semiconductor chip package, comprising the steps of:

providing the semiconductor chip package having a lead and encapsulated by a mold compound, the lead having a dam bar formed thereon and having an excess mold compound abutting the dam bar wherein the dam bar and the excess mold compound form a bond;

moving the dam bar to a first level wherein the dam bar is not removed from the lead after the step of providing the semiconductor chip package;

stopping the act of moving; and

moving the dam bar to a second level wherein the dam bar is removed from the lead and excess mold compound remains which prevents cracks from being formed in the mold compound.

5,690,878
METHOD FOR FORMING SOLUTION CAST TETRAFLUOROETHYLENE POLYMER FILMS

William Howard Tuminello, Newark, and Robert John Cavanaugh, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 467,251, Jun. 6, 1995, abandoned, which is a division of Ser. No. 220,477, Mar. 31, 1994, Pat. No. 5,459,191, which is a division of Ser. No. 936,449, Aug. 28, 1992, Pat. No. 5,328,946, which is a continuation-in-part of Ser. No. 751,481, Aug. 29, 1991, abandoned. This application Aug. 9, 1996, Ser. No. 693,630

Int. Cl.^{6} C08J *5/18*

U.S. Cl. 264—203 **2 Claims**

1. In a process for making a film of a polymer containing tetrafluoroethylene units by using a solution of the polymer in a perfluorinated cycloalkane, said process comprising:

(1) making a thin film of the solution and removing the solvent by evaporation or extraction, or

(2) drawing the solution and evaporating the solvent, or

(3) extruding or co-extruding the solution, followed by removal of the solvent;

the improvement wherein: the solvent is a perfluorinated cycloalkane or a perfluorinated cycloalkane containing one or more perfluoroalkyl and perfluoroalkylene groups; wherein a total number of carbon atoms in said perfluoroalkyl and perfluoroalkylene groups, when present, is less than a total number of ring carbon atoms in said perfluorocycloalkane; and wherein

(a) the solvent has a critical temperature of 340° C. or more; and

(b) the polymer has a melting point of about 250° C. or more.

5,690,879
METHOD FOR INJECTION MOLDING A GOLF CLUB BODY

Dennis Lee, Lake Zurich, Ill., assignor to Solid Golf, Inc., St. Charles, Ill.

Filed Jul. 25, 1995, Ser. No. 506,830

Int. Cl.^{6} B29C *45/73*

U.S. Cl. 264—237 **16 Claims**

1. A method for injection molding a golf club body comprising the steps of:

filling a mold cavity with polymethylmethacrylate;

varying pressure acting on said polymethylmethacrylate in said cavity during filling of said cavity until reaching a first pressure;

holding said polymethylmethacrylate in said cavity at a second pressure higher than said first pressure for a period of approximately 3–4 minutes;

providing a selected temperature profile in said mold surrounding said cavity during holding of said polymethylmethacrylate in said cavity at said second pressure;

cooling said polymethylmethacrylate in said cavity for a period of approximately 4–5 minutes;

ejecting said polymethylmethacrylate from said cavity in the form of a molded body; and

cooling said molded body in a hot oil bath at 180°–200° F. after ejection for a period in the range of 20 to 40 minutes to produce a golf club body consisting entirely of a solid mass of polymethylmethacrylate.

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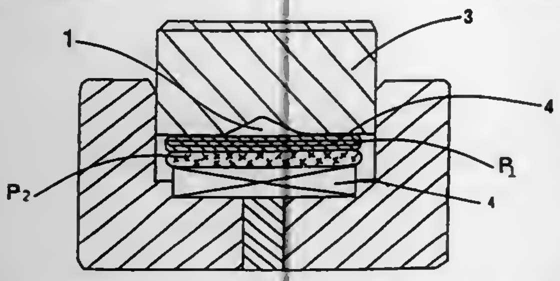
5,690,880

PROCESS FOR THE PRODUCTION OF PLASTIC MATERIAL PARTS BY CONTROLLED MOLDING-THERMOFORMING

Fernand Le Coent, 1 Avenue des Lilas, 44470 Thouare sur Loire, France
PCT No. PCT/FR93/00844, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/05481, PCT Pub. Date Mar. 17, 1994
PCT Filed Mar. 9, 1993, Ser. No. 392,891
Claims priority, application France, Sep. 3, 1992, 92 10658
Int. Cl.⁶ B29C *51/02;51/12*
U.S. Cl. 264—257 **9 Claims**

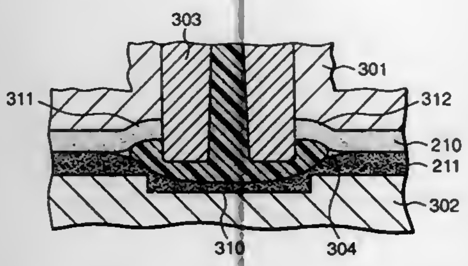


1. A process for the production of a plastic material part with a wear-resistant surface having a predetermined nonplanar shape, comprising heating a blank of plastic material on a first side thereof opposite a second side on which second side it is desired to produce the wear-resistant surface, said plastic material comprising a polymer having molecular chains oriented parallel to said second side at least adjacent said second side, said heating of said first side bringing the temperature of said first side to adjacent the melting temperature of the plastic material while leaving the temperature of the second side substantially lower than the temperature of the first side, introducing said blank into a mold cavity, and subjecting said blank to elevated pressure in said mold cavity with a surface of said mold cavity in contact with said second side having a nonplanar shape complementary to said predetermined nonplanar shape, thereby to impart to said second side said predetermined shape while said second side is at said substantially lower temperature.

5,690,881

MANUFACTURING METHOD OF RESIN DAMPER HAVING FOAMED RESIN SEAL MATERIAL

Takaaki Horie, Nagoya, and Kazutoshi Higashi, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., and Shimizu Industry Co., Ltd., both of Kariya, Japan
Filed May 13, 1994, Ser. No. 242,099
Int. Cl.⁶ B29C *45/16*
U.S. Cl. 264—263 **4 Claims**



1. A method for producing a damper which comprises a damper body for controlling air flow, and foam resin seal materials attached to surfaces of said damper body for sealing said damper body, the method comprising:

disposing said seal materials within metal molds, wherein at least one of said molds has a recessed part formed within said at least one mold nearby an injection nozzle;

compressing said seal materials by clamping said molds together;

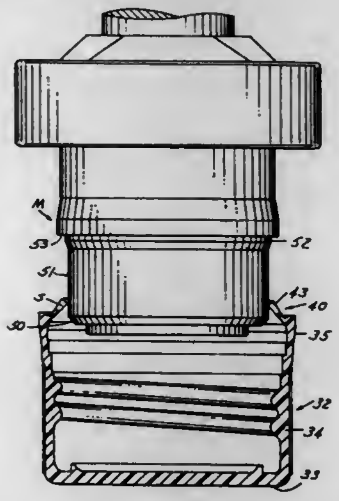
forming said damper body within a mold space formed by clamping said metal molds, then injecting a resin with said injection nozzle into the mold space through a passage defined through said seal materials, and at the same time joining said damper body and said seal materials by partly impregnating the resin into cells of said seal material; and

arranging a flow of the resin injected from said injection nozzle into said mold space so as not to be parallel to a portion of said seal material nearby said injection nozzle and then reversing the flow of resin injected into said mold space through the passage defined through said seal materials within said mold space whereby resin flows towards said recessed part so that said seal materials are prevented from being displaced in a direction perpendicular to a direction of compressing of said seal materials and resin is prevented from flowing between a seal material and a metal mold.

5,690,882

METHOD FOR MAKING A TAMPER INDICATING PACKAGE

Frank L. Sprowl, Sturgis, Mich., assignor to Owens-Illinois Closure Inc., Toledo, Ohio
Division of Ser. No. 38,152, Mar. 26, 1993, Pat. No. 5,443,171. This application Jun. 7, 1995, Ser. No. 486,094
Int. Cl.⁶ B65D *51/00;* **B29C** *53/02*
U.S. Cl. 264—295 **3 Claims**



1. A method of making a tamper indicating closure adapted to be applied to a container having a neck with a threaded finish, and an annular bead on said neck, said closure having an annular bend in an annular flange extending axially inwardly with respect to a base wall, which method comprises:

forming a plastic closure having a base wall, a depending peripheral skirt having threads for interengaging threads of the container, and

a tamper indicating band attached to said skirt by at least one weakened portion defining a line of severing and an annular flange extending radially inwardly and axially outwardly with respect to the base wall,

said annular flange comprising a continuous annular portion and a second portion having a free edge, said annular flange connected to the tamper indicating band by a hinge portion,

said second portion of said annular flange having a plurality of circumferentially spaced narrow slits extending from the free edge and defining a plurality of circumferentially spaced segment portions separated by said narrow slits extending downwardly and outwardly from the continuous annular portion,

said narrow slits having a narrow width and extending entirely through said flange to define said segment portions such that when the closure is fully applied to a container, and the closure is rotated to remove the closure, the free ends of the adjacent segment portions engage the annular bead on the

container and are moved radially inwardly and the sides of the slits .adjacent the free ends of substantially all the segment portions contact one another in an interfering manner to enhance resistance to removal and inhibit tampering,

thereafter advancing a plunger into the closure to engage said annular flange to form said bend in the continuous annular portion intermediate the hinge portion and the free edge of said second portion, and to

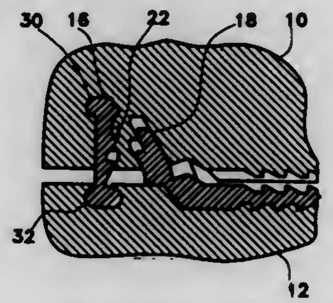
deform the continuous annular portion so that it forms a lesser bend with the axis of the closure than the bend formed initially, and to

invert the annular flange so that it extends radially inwardly and upwardly relative to the base wall of the closure.

5,690,883

REMOVAL OF INJECTION-MOLDED TIE FROM MOLD BY UTILIZING BULGES AT OPPOSITE ENDS OF ABUTMENT WALL OF TIE

Soren Christian Sorensen, and Jens Ole Sorensen, both of Cayman Islands, Cayman Islands, assignors to GB Electrical, Inc., Milwaukee, Wis.
Filed Jan. 5, 1996, Ser. No. 583,800
Int. Cl.⁶ B29C *45/44*
U.S. Cl. 264—318 **8 Claims**



1. A method of injection molding a tie that includes an elongated tongue with two ends and two broad sides, a locking head at one end of the tongue, a first set of ratchet teeth extending along one broad side of the tongue and a second set of ratchet teeth extending along the other broad side of the tongue, wherein the locking head has sides defining an opening for receiving the tongue, the sides include a movable pawl that is hinged at one side of said opening and an abutment wall that is across the opening from the pawl, and the pawl has at least one pawl tooth disposed for engaging the set of first ratchet teeth when the tongue has been inserted through said opening with the first set of ratchet teeth facing the pawl, wherein the pawl, when the at least one pawl tooth is so engaged, is movable toward an abutment surface of the abutment wall in response to pressure applied to the tongue in a direction opposite to the direction of said insertion in order to force the second set of ratchet teeth against the abutment surface; and wherein the abutment surface includes at least one tooth for locking engagement with the second set of ratchet teeth when the tongue has been inserted through the opening with the second set of ratchet teeth facing the abutment surface and the side of the tongue including the second set of ratchet teeth is forced against the abutment surface by movement of the pawl; the method comprising the steps of

(a) providing a mold that includes mold parts for defining a cavity between the mold parts in the general shape of the tie;
(b) injecting molten plastic material into the mold cavity;
(c) solidifying the plastic material in the mold cavity to form the tie;
(d) separating the mold parts to enable removal of the tie from the mold; and
(e) removing the tie from the mold;

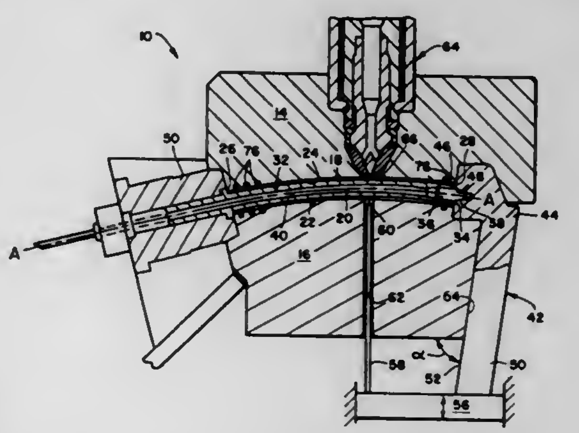
wherein step (a) comprises providing a said mold which defines a tie in which the abutment wall includes at least one bulge adjacent each of opposite ends of the abutment wall for holding the abutment wall in the respective mold parts when the mold parts are first separated, with the at least one bulge adjacent one end of the abutment wall being defined by a first mold part and the at least one bulge adjacent the opposite end of the abutment wall being defined by a second mold part; and

wherein during step (d), as the first and second mold parts are being separated, the bulges initially hold the abutment wall in the respective first and second mold parts and thereby stretch and reduce the thickness of the abutment wall so that the tie can be removed from the mold pursuant to step (e) without significantly damaging the at least one abutment surface tooth.

5,690,884

METHOD OF INJECTION MOLDING A THIN WALLED ARTICLE

Zdenek Frank Cerny, Covina, Calif., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.
Filed May 4, 1995, Ser. No. 434,894
Int. Cl.⁶ B29C *45/40;45/64*
U.S. Cl. 264—328.1 **6 Claims**



1. A method of injection molding a thin walled article using a mold having first and second mold blocks which are mateable with one another to form a mold cavity therebetween, said mold cavity having a peripheral surface and first and second ends, a third mold block designed to mate with said first and second mold blocks and close off said first end of said mold cavity, said third mold block having an elongated core pin which extends into said mold cavity when said third mold block mates with said first and second mold blocks, a lifter designed to mate with said first and second mold blocks and close off said second end of said mold cavity, and said elongated core pin being engageable with said lifter to assure that said core pin is radially spaced away from said peripheral surface of said mold cavity, said method comprising the steps of:

a) moving said lifter into registration with said second mold block;
b) moving said third mold block and attached core pin into registration with said second mold block such that said core pin mates with said lifter;
c) closing said first and second mold blocks to form said mold cavity;
d) inserting molten material into said mold cavity and allowing said molten material to solidify to form a molded thin walled article;
e) opening said mold by separating said first and second mold blocks;
f) withdrawing said core pin from inside said molded article; and
g) withdrawing said lifter from registration with said second mold block and removing said molded thin willed article from said second mold block.

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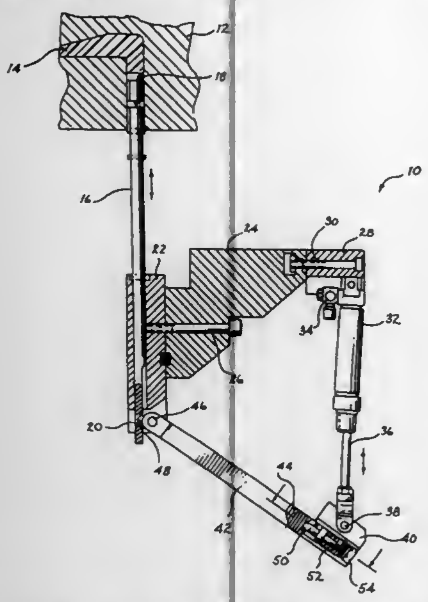
5,690,885
METHOD FOR FORMING ENCAPSULATED SEMICONDCUTOR CHIPS

Richard H. J. Flerkens, Keurbeek 15, 6914 AE Herwen, Netherlands

Division of Ser. No. 230,304, Apr. 20, 1994, Pat. No. 5,478,226. This application Sep. 5, 1995, Ser. No. 523,135

Int. Cl.⁶ B29C *45/02;45/53*

U.S. Cl. 264—328.4 **9 Claims**



1. A method for compressing molten plastic into a cavity for forming an encapsulated semiconductor device comprising the steps of:
- providing compressing means including a single plunger member for compressing and directing said molten plastic to flow in a forward direction into said cavity; and
- providing overload compensation means coupled to said single plunger member and having a first configuration for moving said single plunger member in said forward direction to compress and to direct said molten plastic into said cavity and having a second configuration for permitting said single plunger member to withdraw in a reverse direction when said single plunger member is prevented from compressing and directing said molten plastic to flow in said forward direction into said cavity.

5,690,886
METHOD FOR MOLDING A SPEAKER GRILLE

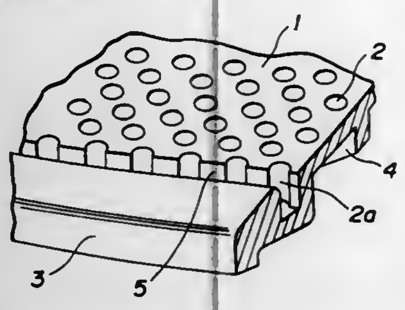
Kazumasa Kurihara, Yokohama, Japan, assignor to Nifco, Inc., Kanagawa-Ken, Japan

Division of Ser. No. 408,786, Mar. 23, 1995, Pat. No. 5,623,133. This application Jul. 30, 1996, Ser. No. 689,154

Claims priority, application Japan, Apr. 15, 1996, 6-101956

Int. Cl.⁶ G10K *11/00;* **B29C** *45/37*

U.S. Cl. 264—328.12 **2 Claims**



1. In a molding method for a speaker grille formed of a synthetic resin, said speaker grille comprising: a grille plate having a plurality of through holes and a frame integrally formed with said grille plate to surround an outer periphery of said grille plate, said speaker grille being molded by charging said synthetic resin into a metal mold having a cavity provided with a grille plate forming portion having a plurality of pins for forming said through holes and also provided with a frame forming portion around said grille plate forming portion; a ring-shaped dam for blocking flow of said molding resin in said metal mold is provided at a boundary between said grille plate forming portion and said frame forming portion of said cavity to surround said pins.

5,690,887
METHOD FOR OBTAINING A ZIRCONIA BASED ITEM

Pierre Magnin, Mont-sur-Lausanne, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Nov. 30, 1995, Ser. No. 565,248

Claims priority, application Switzerland, Dec. 7, 1994, 03706/94

Int. Cl.⁶ C04B *35/48*

U.S. Cl. 264—430 **2 Claims**

1. A method for obtaining a finished or semi-finished item in sintered zirconia having a metallic appearance, said method comprising the steps of:
- providing a previously shaped and sintered zirconia item;
- placing said shaped and sintered zirconia item in an oven in which there is a plasma containing hydrogen;
- bringing said item to a temperature of around 800° C. or more; and,
- maintaining said item at said temperature for a period of time from around a quarter of an hour to three hours.

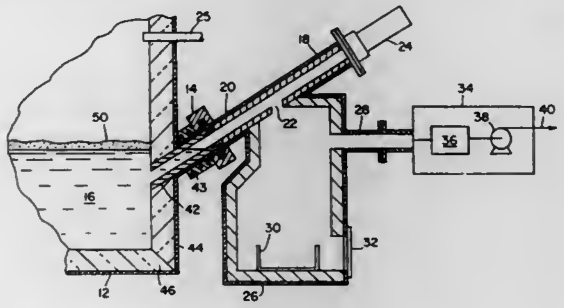
5,690,888
APPARATUS AND METHOD FOR TAPPING A REACTOR CONTAINING A MOLTEN FLUID

Edgar J. Robert, Glenshaw, Pa., assignor to Molten Metal Technologies, Inc., Waltham, Mass.

Filed Jun. 7, 1995, Ser. No. 479,508

Int. Cl.⁶ C21B *7/12*

U.S. Cl. 266—45 **13 Claims**



1. An apparatus for tapping a reactor containing a molten fluid, comprising:
- a) a straight conduit extending from the reactor at an acute angle measured from a horizontal surface of the molten fluid;
- b) heating means at the conduit for heating the conduit to a temperature that causes fluid extracted from the reactor to remain molten while in the conduit;
- c) a receiving vessel at said conduit;
- d) pressure reducing means at the receiving vessel for reducing the pressure within said receiving vessel, whereby the molten fluid within the reactor is extracted from said reactor through the conduit and directed into the receiving vessel, thereby tapping the reactor; and
- e) cooling means at a portion of said conduit most proximate to said reactor, whereby solidification and consequent accumulation of molten fluid within said conduit can be controlled by controlling said cooling means.

5,690,889
PRODUCTION METHOD FOR MAKING RARE EARTH COMPOUNDS

R. William McCallum; Timothy W. Ellis; Kevin W. Dennis; Robert J. Hofer, and Daniel J. Branagan, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 15, 1996, Ser. No. 605,324

Int. Cl.⁶ C22C *38/00*

U.S. Cl. 420—83 **16 Claims**

1. A method of making a rare earth compound, comprising reacting a rare earth carbide, a compound-forming element, and a carbide-forming element that forms a carbide more thermodynamically favorable than said rare earth carbide, so as to form the rare earth compound and a carbide of said carbide-forming element as a separate carbide phase in said compound.

5,690,890
SOLDER

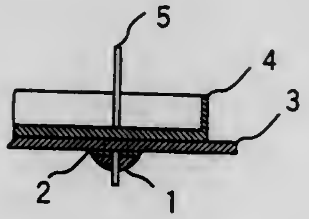
Yasuji Kawashima, Ibaraki; Takashi Nagashima, Takatsuki; Akihiko Matsuike, Takarazuka; Takeshi Meguro, Ibaraki; Kaoru Shimizu, Osaka; Hideo Chaki, Ibaraki, and Toshiaki Ogura, Mino, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., and Kabushiki Kaisha Nihon Genma, both of Osaka, Japan

Filed Nov. 4, 1994, Ser. No. 334,236

Claims priority, application Japan, Nov. 9, 1993, 5-279381; Mar. 24, 1994, 6-053489

Int. Cl.⁶ B23K *35/36*

U.S. Cl. 420—559 **1 Claim**



1. A tin-lead alloy solder having improved thermal fatigue characteristics which consists of

15–80 wt. % lead,

0.1–5 wt. % silver,

0.1–10 wt. % antimony, .

0.0005–0.3 wt. % phosphorus, and

the balance being essentially tin,

wherein a portion up to 70% of lead is replaced with at least one metal selected from the group consisting of cadmium, zinc and gallium, wherein cadmium is present in an amount of 5–22 wt. %, zinc is present in an amount up to 22 wt. %, and gallium is present in an amount of 0.001 to 1 wt. %, all weight percentages of the replacement metal being based upon the total weight of the solder, and

wherein a portion of the antimony, up to 70% thereof, is replaced with at least one metal selected from the group consisting of aluminum, gold, magnesium, cerium, platinum, palladium, cobalt, germanium, chromium, manganese, zirconium, nickel and tellurium, each present in an amount of from 0.001 to 1 wt. %, which proportions of said metal are based upon the total weight of the solder.

5,690,891
PROCESS FOR THE PRODUCTION OF ALLOYS IN AN INDUCTIVELY HEATED COLD-WALLED CRUCIBLE

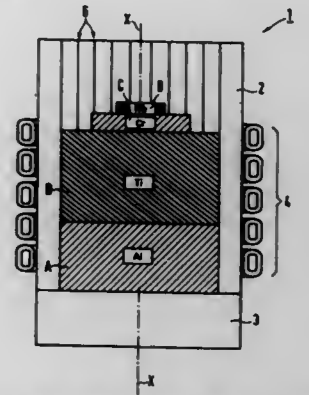
Alok Choudhury, Püttlingen; Matthias Blum, Büdingen; Harald Scholz, Rodenbach, and Georg Jarczyk, Grosskrotzenburg, all of Germany, assignors to Ald Vacuum Technologies GmbH, Erlensee, Germany

Filed Jan. 30, 1996, Ser. No. 594,009

Claims priority, application Germany, Feb. 10, 1995, 195 04 359.6

Int. Cl.⁶ C22C *1/02*

U.S. Cl. 420—590 **17 Claims**



1. A process for the production of an alloy containing at least two alloy components, each component having a melting point and a density, said process comprising
- providing a cold walled crucible having inside walls and a base, and surrounded by induction coil means which provides heating energy to a material in the crucible,
- first introducing into the crucible a first alloy component having the lowest melting point of the alloy components, said first alloy component being introduced in solid form,
- subsequently and sequentially introducing into the crucible at least one additional alloy component in solid form over the first alloy component, said at least one additional alloy component comprising a second alloy component having a higher melting point than said first alloy component, and
- switching on the induction coil means which provides sufficient heating energy to melt the alloy components in the crucible.

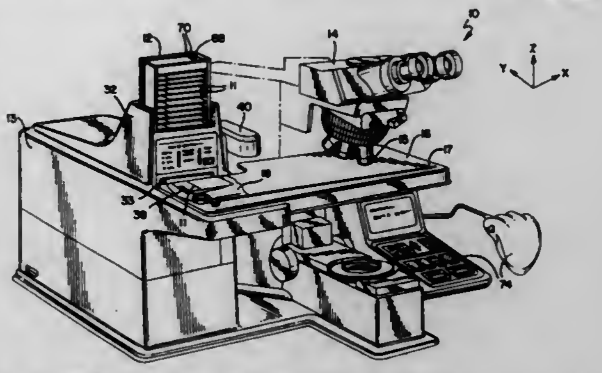
5,690,892
CASSETTE FOR USE WITH AUTOMATED SPECIMEN HANDLING SYSTEM

Egan Babler, Northbrook; Richard A. Domanik, Libertyville; Peter G. Gombrich, Chicago, and William J. Mayer, South Barrington, all of Ill., assignors to AccuMed, Inc., Chicago, Ill.

Filed Sep. 15, 1995, Ser. No. 528,791

Int. Cl.⁶ G01N *35/04*

U.S. Cl. 422—63 **9 Claims**



1. A portable cassette for use with an automated specimen handling system, said cassette comprising:

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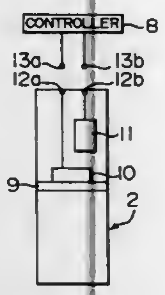
- a body portion, said body portion including right and left opposing sidewalls, a front face between the opposing sidewalls, and a plurality of ribs compartmentalizing the body portion into superimposed sections, each section capable of containing a specimen, said front face being substantially open permitting the specimens to be inserted into and withdrawn from the cassette;
- an electronic programmable memory device attached to the body portion;
- at least one electrically conductive member physically coupled to the memory device for interfacing with the specimen handling system and for permitting communication between the memory device and the specimen handling system.

5,690,893
ANALYZER HAVING SENSOR WITH MEMORY DEVICE

Satoshi Ozawa, Musashino; Takafumi Kikuchi, Kokubunji; Yoshiki Murakami, Kawasaki; Masaaki Nakai, Tokorozawa; Koutarou Yamashita; Toshiko Fujii, both of Kokubunji; Yuji Miyahara, Kodaira, and Yoshio Watanabe, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 461,160
Claims priority, application Japan, Jun. 10, 1994, 6-129244
Int. Cl.^{6} G01N *27/333*
U.S. Cl. 422—67 **48 Claims**



1. An analyzer comprising:
- an analyzer body including means for holding a sample, means for reading an analyzing condition from memory means, means for performing analysis of said sample on the basis of the read analyzing condition, and means for outputting a result of said analysis of said sample; and
- an assembly detachably mounted on said analyzer body, said assembly including a passage through which said sample passes during said analysis of said sample, sensing means having a characteristic of inherently defining an analyzing condition of said sample, said sensing means being in contact with said passage, and said memory means, said memory means being for holding the analyzing condition defined by said sensing means.

5,690,894
HIGH DENSITY ARRAY FABRICATION AND READOUT METHOD FOR A FIBER OPTIC BIOSENSOR

Daniel Pinkel, Walnut Creek, and Joe Gray, San Francisco, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

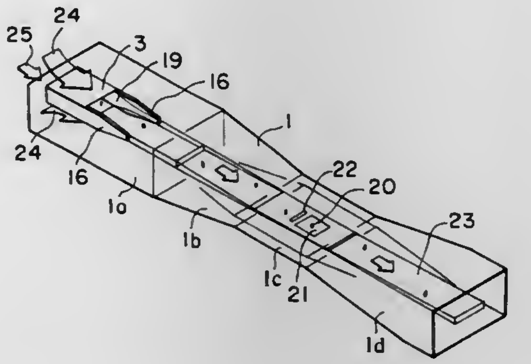
Filed May 23, 1995, Ser. No. 448,043
Int. Cl.^{6} G01N *15/06;21/29;* **C03B** *37/15;* **C12Q** *1/68*
U.S. Cl. 422—68.1 **19 Claims**

1. A process for constructing a fiber optic bundle for sensing a plurality of biological binding partners within a sample, the process comprising the steps of:
- providing a plurality of optical fibers with each fiber having a sensor end and a transmission end wherein each fiber has attached to its sensor end a species of biological binding partner;
- combining said fibers with differing binding partners to form an optical fiber array wherein said fibers have commonly aligned sensor ends for simultaneous assay of a sample; and,
- addressing the transmission end of the combined discrete fibers for interrogation to produce the fiber optic sensor for the sample.

5,690,895
FLOW CELL APPARATUS

Masaetsu Matsumoto, Sendai; Isao Yamazaki, Tsuchiura; Ryo Miyake, Ibaraki-ken; Masaharu Ishii, Ushiku; Ryohei Yabe, Katsuta; Hiroshi Ohki, Tsuchiura; Hideyuki Horiuchi, Abiko, and Shinichi Sakuraba, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 503,881, Jul. 18, 1995, abandoned, which is a continuation of Ser. No. 186,478, Jan. 26, 1994, abandoned. This application Dec. 6, 1996, Ser. No. 761,143
Claims priority, application Japan, Jan. 26, 1993, 5-010471; May 25, 1993, 5-122338
Int. Cl.^{6} G01N *21/05*
U.S. Cl. 422—73 **51 Claims**

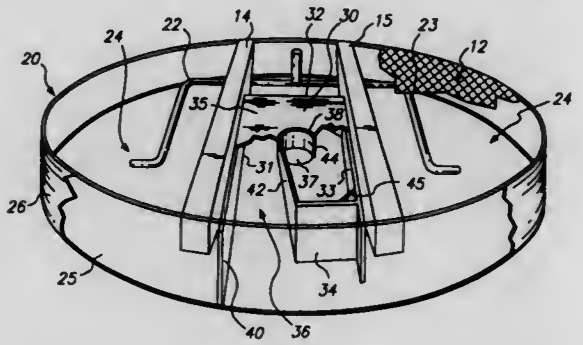


1. A flow cell apparatus, comprising;
- sample liquid supply means for supplying a sample liquid to be measured;
- sheath liquid supply means for supplying a sheath liquid;
- flow cell means for defining a flow passage, said flow cell means having a transparent measuring portion providing an unobstructed view of said flow passage in at least one transversal direction thereof, said flow passage having a substantially constant width in a direction perpendicular to said direction of the unobstructed view;
- nozzle means provided in fluid communication with said sample liquid supply means for causing the sample liquid to flow into said flow passage of said flow cell means, said nozzle means having at least one discharge port disposed in said flow passage in a spaced relation from an inner wall thereof; said sheath liquid supply means being in fluid communication with said flow passage of said flow cell means at a position upstream of said at least one discharge port of said nozzle means with respect to a flow of the sample liquid to cause the sheath liquid to flow around said at least one discharge port and surround the sample liquid flow from said at least one discharge port to form a sheath flow; and
- guides provided at said at least one discharge port for regulating a width of the sample liquid flow in at least the direction perpendicular to said direction of the unobstructed view in said measuring port, wherein said guides are arranged so as to provide the sample liquid flow in said flow passage with a constant width at least at a portion of said flow passage at which said transparent measuring portion is provided.

5,690,896
DISTRIBUTOR ASSEMBLY FOR MULTI-BED DOWN-FLOW CATALYTIC REACTORS

Bruce E. Stangeland, Berkeley; Krishniah Parimi, Concord, and Dennis R. Cash, Novato, all of Calif., assignors to Chevron U.S.A. Inc., San Francisco, Calif.

Filed May 5, 1995, Ser. No. 435,564
Int. Cl.^{6} B01J *8/04*
U.S. Cl. 422—191 **18 Claims**



1. A distributor assembly for a catalytic reactor including a cylindrical sidewall, two or more catalyst beds, and means mounted to said reactor sidewall for supporting the catalyst beds in vertically superimposed relation to each other to permit liquid and gas to flow from a first catalyst bed to a second catalyst bed, the distributor assembly being mounted within the reactor between said first and second catalyst beds, said distributor assembly comprising an annular trough for collecting liquid flowing down from said first catalyst bed, a box shape mixing chamber disposed centrally within said trough and having an inlet for receiving liquid collected in said trough, said mixing chamber including a partially cylindrical baffle that extends from a second wall of said inlet passageway around a portion of an outlet for directing liquid and gas from said chamber toward said second catalyst bed, said baffle terminating at a downstream end portion that forms a constricted passageway with a proximal side wall of the mixing chamber, to thereby impart a turbulent flow pattern as the liquid and gas flows downstream of said baffle, and a divider wall traversing said trough adjacent to said inlet to cause liquid collected in said trough to circulate through said trough around a substantial portion of said chamber prior to reaching said inlet in order to ensure mixing of liquid from all zones of said first catalyst bed.

5,690,897
METHOD FOR PURIFICATION OF CALCIUM CARBONATE

Donald Kendall Drummond, Glenmoore, Pa., assignor to Minerals Technologies Inc., New York, N.Y.

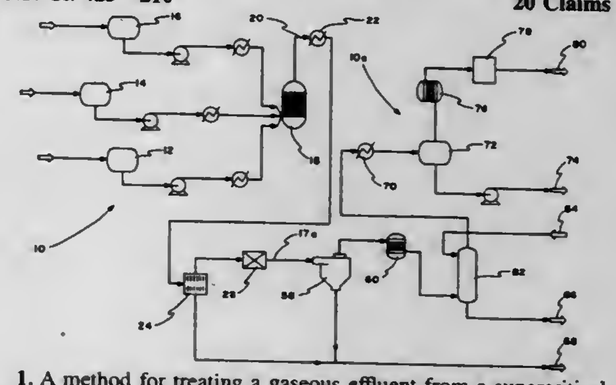
Filed Nov. 21, 1994, Ser. No. 343,002
Int. Cl.^{6} C01F *11/18*
U.S. Cl. 423—173 **10 Claims**

1. A process for lowering the iron content of calcium carbonate which contains iron comprising treating an aqueous slurry of said calcium carbonate with a chelating agent, heating said aqueous calcium carbonate slurry containing said chelating agent and treating said aqueous calcium carbonate slurry containing said chelating agent with carbon dioxide gas, wherein said treating with said chelating agent is performed while heating and agitating said slurry and introducing said carbon dioxide gas to maintain a pH of said slurry in the range of about 5.5 to no higher than 7.0.

5,690,898
PROCESS FOR TREATING EFFLUENT FROM A SUPERCRITICAL WATER OXIDATION REACTOR

Charles M. Barnes, and Carolyn Shapiro, both of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 3, 1995, Ser. No. 433,301
Int. Cl.^{6} B01D *47/00*
U.S. Cl. 423—210 **20 Claims**

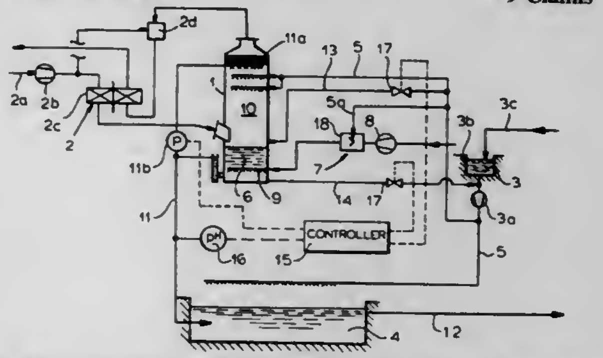


1. A method for treating a gaseous effluent from a supercritical water oxidation reactor containing entrained solids comprising the steps of:
- a) expanding the gas/solids effluent from a first to a second lower pressure at a temperature at which no liquid condenses;
- b) separating the solids from the gas effluent;
- c) neutralizing the effluent to remove any acid gases;
- d) condensing the effluent;
- e) purifying the effluent; and
- f) returning the purified effluent to the supercritical water oxidation reactor.

5,690,899
PROCESS FOR REMOVING SULPHUR DIOXIDE FROM FLUE GAS

Navid Makkinejad, Gummersbach; Mathias Küper, Waltrop, and Hildemar Böhm, Gladbeck, all of Germany, assignors to Lentjes Bischoff GmbH, Essen, Germany

Filed Jul. 26, 1996, Ser. No. 687,742
Claims priority, application Germany, Jul. 29, 1995, 195 27 836.4; Sep. 23, 1995, 195 35 475.3
Int. Cl.^{6} B01D *53/50*
U.S. Cl. 423—243.01 **9 Claims**



1. A process for separating sulfur dioxide from a flue gas consisting essentially of the steps of:
- (a) contacting a flue gas containing sulfur dioxide with sea water in an absorption column to collect a liquid phase in a sump of said column containing bisulfite resulting from sulfur dioxide scrubbed from said flue gas by the sea water and to produce a scrubbed gas having a reduced sulfur dioxide content;
- (b) aerating said liquid phase in said sump to transform said bisulfite to bisulfate;
- (c) withdrawing said liquid phase containing bisulfate from said sump and mixing the withdrawn liquid phase with fresh sea

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water in a reaction basin to convert the bisulfate to sulfate and at least partially neutralize the liquid phase in said reaction basin;

(d) measuring a pH of the liquid phase withdrawn from said sump and determining a deviation of the measured pH from a setpoint pH in the range of pH=4.0 to pH=5; and

(e) depending upon said deviation selectively feeding an additional stream of sea water directly to said sump, and recycling a liquid stream withdrawn from said sump to an absorption zone of said column at a controlled rate to minimize said deviation and to keep the pH value of the liquid phase in the sump for the aeration step (c) in the range of pH 4.0 to 5.

5,690,900
AMMONIA OXIDATION CATALYST

Radmil Smojver, P.O. Box 750-910, Petaluma, Calif. 94975
Filed Oct. 10, 1996, Ser. No. 729,250
Int. Cl.^{6} C01B *21/26;21/38*

U.S. Cl. 423—392 **3 Claims**

1. A method of manufacturing nitric acid comprising:

providing a catalyst composition which includes a porous ceramic structure having a coating, the coating including at least one washcoat layer which includes alumina, zirconium and cerium, at least one layer which includes cobalt, cerium, zirconium and optionally manganese, and at least one layer which includes platinum;

contacting the catalyst composition with ammonia and oxygen and heating so as to form;

NO/NO_2; and

converting the NO/NO_2 into nitric acid.

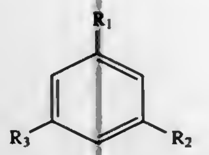
5,690,901
CARBON ELECTRODE MATERIALS FOR ELECTROCHEMICAL CELLS AND METHOD OF MAKING SAME

Jinshan Zhang, Duluth, and Anaba A. Anani, Norcross, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 534,427, Sep. 27, 1995, Pat. No. 5,589,289. This application Oct. 30, 1996, Ser. No. 759,237
Int. Cl.^{6} C01D *3/00*

U.S. Cl. 423—449.6 **9 Claims**

1. A method of fabricating an amorphous carbon material for use as an electrode in a rechargeable electrochemical cell, said method comprising the steps of:

providing a multi-functional organic monomer having the structure



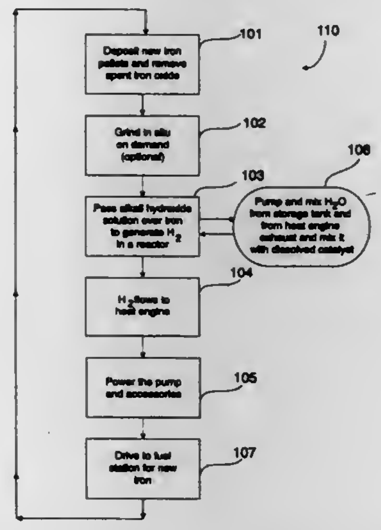
wherein R_1, R_2, and R_3 are all selected from the group consisting of carboxylic acids of eight carbons or less, carboxylic esters of eight carbons or less, alcohols of eight carbons or less, carboxylic anhydrides of eight carbons or less, amines, and combinations thereof, and wherein at least one of R_1, R_2, and R_3 is different than the others; and

subjecting said mixture to a solid state carbonization process in an inert environment.

5,690,902
HYDROGEN-POWERED AUTOMOBILE WITH IN SITU HYDROGEN GENERATION

John Werth, Princeton, N.J., assignor to H Power Corporation, Belleville, N.J.
Continuation-in-part of Ser. No. 52,561, Apr. 23, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 477,520
Int. Cl.^{6} C01B *3/08*

U.S. Cl. 423—658 **18 Claims**



1. An improved H_2O-iron reaction method, comprising reacting H_2O and iron material to form hydrogen in situ, aboard an automotive vehicle having a heat engine that is designed to internally combust hydrogen, the H_2O-iron reaction taking place in the presence of a catalyst comprising a dissolved alkali hydroxide, said iron material comprising particles or pellets of iron, said particles being bulk-loaded into a reactor chamber, said alkali hydroxide enhancing said H_2O-iron reaction.

18. An improved H_2O-iron reaction method, comprising reacting H_2O and iron material to form hydrogen in situ, aboard an automotive vehicle having a heat engine that is designed to internally combust hydrogen, said iron material comprising particles or pellets of iron, said particles being bulk-loaded into a reactor chamber, said H_2O-iron reaction being enhanced by grinding said iron material in situ aboard said automotive vehicle, said reaction between said H_2O and said iron proceeding at temperatures below approximately 250° C.

5,690,903
LOADING AND CONJUGATING CAVITY BIOSTRUCTURES

James F. Hainfeld, 44 Bradley Dr., Shoreham, N.Y. 11786
Division of Ser. No. 711,208, Jun. 6, 1991, Pat. No. 5,443,813. This application May 30, 1995, Ser. No. 453,686
Int. Cl.^{6} A61K *51/08;51/12*

U.S. Cl. 424—1.49 **8 Claims**

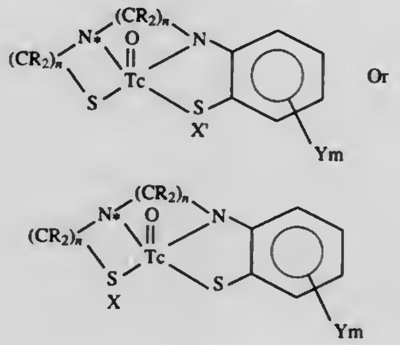
1. A method for treating a host by providing a delivery system to said host, said delivery system comprising apoferritin, said apoferritin having a load-bearing structure which is biologically compatible with said host, said load-bearing structure containing a therapeutically effective quantity of uranium-235.

5,690,904
DIAGNOSTIC RADIOPHARMACEUTICAL COMPOUNDS (THAT)

Susan E. MacWhorter, Belmont; Tiann-long Wu, Emeryville, and Douglas S. White, San Francisco, all of Calif., assignors to Amersham International plc, Buckinghamshire, United Kingdom
Continuation of Ser. No. 89,952, Jul. 12, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,284
Int. Cl.^{6} A61K *51/04;* **C07F** *13/00*

U.S. Cl. 424—1.65 **6 Claims**

1. A neutral ^{99m}Tc complex of the structure:



where

n is 2 or 3;

m is 0 to 4;

one CR_2 group adjacent the starred nitrogen atom represents CO and forms, together with the adjacent N atom, a —CONH— amide group, other groups R are the same or different at different places in the molecule, and each is H or C_1 to C_6 alkyl;

Y is the same or different at different places in the molecule and each is C_1–C_4 alkyl, alkoxyalkyl, alkoxy, amino, isothiocyanate or acyloxy;

each of X and X' is C_1–C_6 alkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, aminoalkyl, carboxyalkyl, acyloxyalkyl, aminoalkyl, haloalkyl of nitriloalkyl.

5,690,905
PEPTIDE-METAL ION PHARMACEUTICAL LABELING METHOD

Paul O. Zamora, and Buck A. Rhodes, both of Albuquerque, N. Mex., assignors to Rhomed Incorporated, Albuquerque, N. Mex.
Division of Ser. No. 840,077, Feb. 20, 1992, Pat. No. 5,443,816, which is a continuation-in-part of Ser. No. 565,275, Aug. 8, 1990, Pat. No. 5,102,990. This application May 31, 1995, Ser. No. 454,950
Int. Cl.^{6} A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.69 **35 Claims**

1. A method of labeling a peptide containing at least one disulfide bond with a medically useful metal ion to obtain stable labeling, comprising the steps of:

a) incubating the peptide containing at least one disulfide bond with a first reducing agent, the period of incubation being sufficient to reduce available disulfide bonds to thiolate groups while preventing excessive fragmentation of the peptide;

b) substantially removing the first reducing agent from the thiolate-containing peptide;

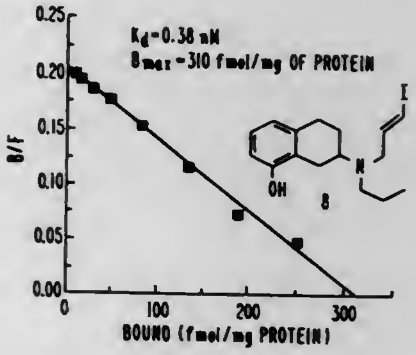
c) adding a source of Sn (II) agent to the thiolate-containing peptide in a sufficient amount to form Sn (II)-containing and sulfur-containing complexes; and

d) labeling the Sn (II)-containing and sulfur-containing complexes by adding the medically useful metal ion, whereby the medically useful metal ion displaces the Sn (II) agent and the medically useful metal ion and thiolate-containing peptide form medically useful metal ion-containing and sulfur-containing complexes.

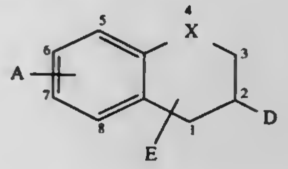
5,690,906
DOPAMINE D-3 AND SEROTONIN (5-HT$_{1A}$) RECEPTOR LIGANDS AND IMAGING AGENTS

Hank F. Kung, Wynnewood, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.
Continuation of Ser. No. 40,497, Mar. 31, 1993, abandoned. This application May 19, 1995, Ser. No. 445,161
Int. Cl.^{6} A61K *51/04;* **C07D** *221/00;311/00;335/04*

U.S. Cl. 424—1.85 **41 Claims**



1. Compounds of the formula



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where

A is selected from the group consisting of OH and OCH_3 and is at the 7- or 8-ring position;

X is selected from the group consisting of CH_2, O and S;

D is $—N(CH_2CH_2CH_3)(R)$;

R is selected from the group consisting of H, C_1–C_5 alkyl and $(CH_2)_nCH=CHR'$;

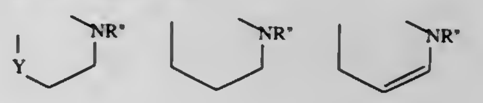
n is 1 or 2;

R' is selected from the group consisting of an iodine atom, a bromine atom, a methyl group and an ethyl group;

E is selected from the group consisting of H, C_1–C_5 alkyl and $(CH_2)_nCH=CHR'$ and is at the 1- or 3-ring position;

provided that one of D and E contains the moiety $(CH_2)_nCH=CHR'$ wherein R' is selected from the group consisting of an iodine atom and a bromine atom;

or D and E may be taken together to form a ring selected from the group consisting of



where

R" is $(CH_2)_nCH=CH—R'$, provided that R' is here selected from the group consisting of an iodine atom and a bromine atom; and

Y is selected from the group consisting of CH_2. O and S;

provided that such compound is an R-isomer;

and pharmaceutically acceptable salts thereof.

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5,690,907
AVIDIN-BIOTIN CONJUGATED EMULSIONS AS A SITE SPECIFIC BINDING SYSTEM

Gregory M. Lanza, and Samuel A. Wickline, both of St. Louis, Mo., assignors to The Jewish Hospital of St. Louis, St. Louis, Mo.

Filed Jun. 8, 1995, Ser. No. 488,743

Int. Cl.⁶ A61K *49/04;9/66;* **G01N** *33/53;* **B01D** *17/04*

U.S. Cl. 424—9.5 **41 Claims**

1. A method for enhancing the acoustic reflectivity of a surface comprising administering to said surface:

a. a site-specific ligand conjugated with a biotin activating agent;

b. an avidin activating agent; and

c. an emulsion conjugated with a biotin activating agent;

whereby said ligand is conjugated to said emulsion through an avidin-biotin interaction and the resulting conjugate is bound to said biological surface to enhance the acoustic reflectivity thereof for ultrasonic imaging.

5,690,908
TREATED APATITE PARTICLES FOR MEDICAL DIAGNOSTIC IMAGING

Edward A. Deutsch; Karen F. Deutsch, both of Maryland Heights; William P. Cacheris, Florissant; William H. Ralston, St. Charles; David H. White, Ballwin; Dennis L. Nosco, Florissant; Robert G. Wolfangel, Ballwin; Janet Braddock Wilking, Ferguson; Linda Meeh, St. Louis, and Steven R. Woulfe, Ballwin, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 271,921, Jul. 6, 1994, Pat. No. 5,468,465, which is a division of Ser. No. 948,540, Sep. 22, 1992, Pat. No. 5,344,640, which is a continuation-in-part of Ser. No. 784,325, Oct. 22, 1991, abandoned. This application Nov. 13, 1995, Ser. No. 557,759

Int. Cl.⁶ A61B *5/055*

U.S. Cl. 424—9.32 **20 Claims**

1. An apatite particle for use in magnetic resonance imaging of body organs and tissues having the following general formula:

$$Ca_nM_mX_rY_s$$

wherein M is a paramagnetic ion or stoichiometric mixture of metal ions having a valence of 2+ or 3+, X is a simple anion, Y is a tetrahedral oxyanion, carbonate, tetrahedral anion, or mixtures thereof, m is from 1–10, n is from 1–10, where M is a 2+ metal ion, then m+n=10, and where M is a 3+ metal ion, then m+1.5n=10, and r and s are adjusted as needed to provide charge neutrality.

5,690,909
FLUORINE-CONTAINING MACROCYCLIC METAL COMPLEXES

Johannes Platzek; Bernd Radüchel; Ulrich Niedballa; Hanns-Joachim Weinmann; Hans Bauer, and Klaus Roth, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP94/01377, § 371 Date Mar. 19, 1996, § 102(e) Date Mar. 19, 1996, PCT Pub. No. WO94/27978, PCT Pub. Date Dec. 8, 1994

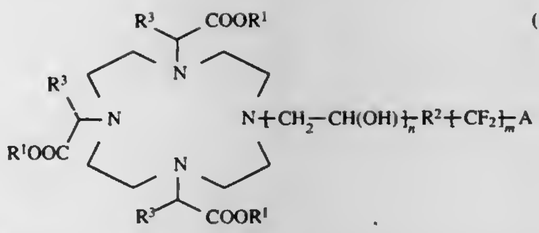
PCT Filed Apr. 29, 1994, Ser. No. 553,432

Claims priority, application Germany, May 24, 1993, 43 17 588.0

Int. Cl.⁶ A61K *49/00*

U.S. Cl. 424—9.363 **15 Claims**

1. A fluorine-containing macrocyclic metal complex having at least one metal ion of an element of atomic numbers 21–29, 42, 44 or 57–83 and a complexing agent of formula I



(I)

in which:

n and m independently of one another, stand for the numbers 0 or 1;

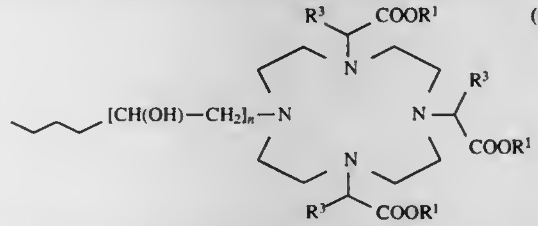
R^1 independently of one another, stand for a hydrogen atom or a metal ion equivalent;

R^3 stands for a hydrogen atom, a straight-chain or branched C_1–C_{10} alkyl group, which optionally is substituted by 1–5 C_1–C_6 alkoxy groups, hydroxy-C_1–C_6 alkyl groups and/or hydroxy groups;

R^2 stands for a straight-chain or branched C_1–C_{10} alkylene group which is substituted by 1 to 3 —CF_3 groups and which optionally is interrupted by 1 to 5 oxygen atoms and/or carbonyl groups and/or optionally is substituted by 1 to 5 hydroxy groups, C_1–C_6 alkoxy-C_1– C_6 alkyl groups, —OR^4, —CO—NR^5R^6, NR^5R^6 and/or —NR^5—CO—R^6 radicals,

in which R^4 stands for a straight-chain or branched C_1–C_4 alkyl radical and R^5, R^6, independently of one another, have the meaning of R^3; and

A stands for a fluorine atom when m is 1 or A stands for a hydrogen atom or a second macrocyclic radical of formula II,



(II)

in which:

n, R^1 and R^3 have the indicated meanings, when m is 0; and salts thereof with inorganic and/or organic bases or amino acids; and C_1–C_6 alkyl or C_6–C_{10} aryl or aralkyl esters or amides thereof; provided that at least two radicals R^1 stand for a metal ion equivalent.

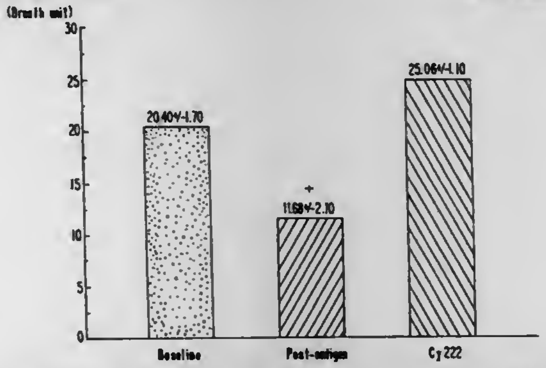
5,690,910
METHOD FOR TREATING ASTHMA

Tahir Ahmed, Coral Gables; Samuel Broder, and John K. Whisnant, both of Ft. Lauderdale, all of Fla., assignors to Baker Norton Pharmaceuticals, Inc., Miami, Fla.

Filed Aug. 18, 1995, Ser. No. 516,786

Int. Cl.⁶ A61K *9/12*

U.S. Cl. 424—45 **20 Claims**



1. A method of treating a patient suffering from antigen-induced asthma who has been challenged with an asthma-inducing antigen consisting essentially of the intrabronchial administration to the patient after the antigen challenge of a pharmaceutical composition containing about 0.05 to about 1.0 mg of ultra-low molecular weight heparins (ULMWH) per kilogram of patient body weight in each dose, said ULMWH having an average molecular weight of 3,000 daltons or less.

5,690,911
ORAL COMPOSITION CONTAINING A MIXED SURFACTANT SYSTEM FOR PROMOTING ANTIBACTERIAL COMPOUND UPTAKE ON DENTAL TISSUE

Yelloji Rao K. Mirajkar, Edison; John Afflitto, Brookside; Nuran Nabi, Cranbury, and Abdul Gaffar, Princeton, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Filed Jun. 7, 1996, Ser. No. 664,225

Int. Cl.⁶ A61K *7/16*

U.S. Cl. 424—49 **24 Claims**

1. An aqueous oral composition exhibiting increased uptake by dental tissue of antibacterial compounds contained therein, the composition comprising in an orally acceptable vehicle containing less than 60% by weight water, an effective therapeutic amount of a halogenated diphenyl ether or phenolic antibacterial compound and a mixture of an anionic and a nonionic surfactants at a weight ratio of about 14:1 to about 9:1.

5,690,912
SNF_2 GEL OF IMPROVED STAND-UP AND EFFICACY IN THE TREATMENT OF DENTINE HYPERSENSITIVITY

Shannon K. Campbell, North Brunswick; Edward Albert Tavss, Kendall Park, both of N.J.; George Edward Fuslak, Louisville, Ky.; Marilou Joziak, South River, and Steven W. Fisher, Middlesex, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Filed Apr. 25, 1994, Ser. No. 200,034

Int. Cl.⁶ A61K *7/16;7/18*

U.S. Cl. 424—52 **6 Claims**

1. A gel composition exhibiting improved stand-up and efficacy in treating dentine hypersensitivity which composition comprises about 0.3 to about 1.8% by weight SnF_2, about 87 to about 97% by weight anhydrous glycerine and about 2.0 to about 10% by weight of a polyethylene glycol having an average molecular weight of 1000 as the sole polyethylene glycol said Sn^{2+} being stable, freely available, and not in chemical combination with other ingredients.

5,690,913
MULTILAYER BICARBONATE/PEROXIDE DENTIFRICE

Donald P. Hsu, Monmouth Junction; Rajnish Kohli, Belle Meade; Richard J. Crawford, Asbury; Nagarj S. Dixit, Plainsboro; Michael A. Collins, Hazlet, and David B. Viscio, Monmouth Junction, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 339,370, Nov. 14, 1994, Pat. No. 5,599,525. This application Jul. 30, 1996, Ser. No. 688,322

Int. Cl.⁶ A61K *7/16;7/20;33/40*

U.S. Cl. 424—53 **4 Claims**

1. An extrudable composite multilayer dentifrice composition for cleaning teeth containing a calcium peroxide ingredient which does not react with other ingredients of the composition during storage or when extruded from a container onto a toothbrush, the composition comprising two substantially anhydrous dentifrice components, one component containing a calcium peroxide ingredient and colorant but free of any colorants reactive with calcium dentifrice components one component containing sodium bicarbonate and a colorant reactive with the peroxide ingredient, the components having substantially equivalent viscosity which are maintained in stable discrete layered phases in interfacial contact with each other prior to extrusion without interaction of the peroxide and the colorant ingredients and which are extrudable together in interfacial contact without interaction of the ingredients the colorants being of contrasting color to form a striped dentifrice when extruded.

5,690,914
EXTERNAL PREPARATION FOR SKIN

Masaru Suetsugu; Manami Ohnuma; Yoshihiro Morikawa; Yuki Yamase; Naoe Akiyama, and Kenji Kitamura, all of Yokohama, Japan, assignors to Shiseido Co., Ltd, Tokyo, Japan

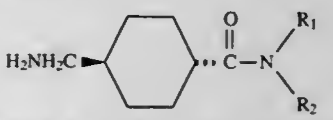
Filed Aug. 27, 1993, Ser. No. 112,797

Claims priority, application Japan, Aug. 27, 1992, 4-252324; Aug. 27, 1992, 4-252325; Aug. 31, 1992, 4-255822; Aug. 31, 1992, 4-255823; Aug. 31, 1992, 4-255824; Sep. 1, 1992, 4-257348; Sep. 1, 1992, 4-257349; Sep. 1, 1992, 4-257350; Sep. 1, 1992, 4-257351

Int. Cl.⁶ A61K *7/42;7/44;7/135*

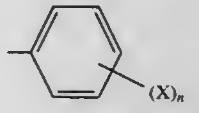
U.S. Cl. 424—59 **10 Claims**

1. A composition for skin depigmentation comprising amide derivatives of tranexamic acid and salts thereof represented by the following formula B:



Formula B

in the formula B, R_1 and R_2 are the same or different and represent hydrogen, straight or branched allyl group having 1 to 18 carbon atoms, cycloalkyl group having 5–8 carbon atoms, benzyl group or having the structure in the following formula C:



Formula C

in the formula C, X represents lower alkyl group, lower alkoxy group atoms, hydroxy group, amino group or halogen atom, and n=0–3.

5,690,915
SCREENING COSMETIC COMPOSITION CONTAINING A MIXTURE OF 1,4-BENZENEDI(3-METHYLIDENE-10-CAMPHOSULFONIC) ACID, PARTIALLY OR COMPLETELY NEUTRALIZED, AND METAL OXIDE NANOPIGMENTS

Martine Eteve, and Isabelle Hansenne, both of Paris, France, assignors to L'Oreal, Paris, France

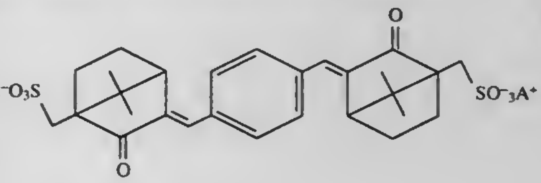
Division of Ser. No. 119,651, Sep. 13, 1993, Pat. No. 5,643,557, which is a continuation of Ser. No. 897,498, Jun. 12, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 458,187

Claims priority, application France, Jun. 13, 1991, 91 07255

Int. Cl.⁶ A61K *7/40;7/48*

U.S. Cl. 424—60 **14 Claims**

1. A screening cosmetic composition comprising, in a cosmetically acceptable carrier, a zirconium oxide nanopigment having a mean diameter of less than 100 nm but greater than 5 nm, admixed with partially or completely neutralized 1,4-benzenedi(3-methylidene-10-camphosulfonic) acid of formula



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wherein

A represents hydrogen, alkali metal or $NH(R)_3^+$, wherein said R's each independently represent hydrogen, $C_1–C_4$ alkyl, $C_1–C_4$ hydroxyalkyl or M^{n+}/n wherein $M^{n+}$is a polyvalent metal cation wherein n represents 2, 3 or 4.

5,690,916

SKIN-COLOR ADJUSTING METHOD, SKIN-COLOR ADJUSTING COMPOSITION AND COLORED TITANIUM OXIDE COATED MICA USED THEREFOR

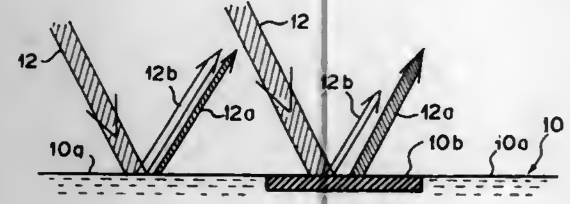
Asa Kimura, Yokohama; Toshihiro Tanaka, Tokyo; Mari Yoshida, and Yoshiaki Yagita, both of Yokohama, all of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1995, Ser. No. 528,110

Claims priority, application Japan, Sep. 14, 1994, 6-243714; Sep. 14, 1994, 6-247315; Sep. 14, 1994, 6-247316

Int. Cl.^{6} A61K *7/42;7/00;* **C04B** *14/00*

U.S. Cl. 424—59 **35 Claims**



1. A method of adjusting a skin color comprising:
(a) using a material having a coherent light component, and
(b) adjusting said coherent light component to a wavelength so as to make a hyperchromic portion of the skin inconspicuous due to an interference action.

5,690,917

SCREENING COSMETIC COMPOSITION CONTAINING A MIXTURE OF 1,4-BENZENEDI (3-METHYLIDENE-10-CAMPHOSULFONIC) ACID, PARTIALLY OR COMPLETELY NEUTRALIZED, AND METAL OXIDE NANOPIGMENTS

Martine Eteve, and Isabelle Hansenne, both of Paris, France, assignors to L'Oreal, Paris, France

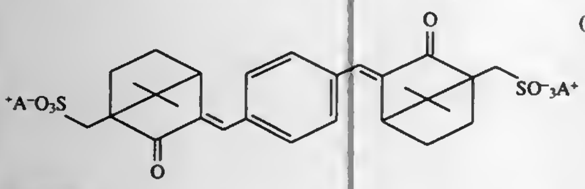
Division of Ser. No. 119,651, Sep. 13, 1993, which is a continuation of Ser. No. 897,498, Jun. 12, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 458,191

Claims priority, application France, Jun. 13, 1991, 91 07255

Int. Cl.^{6} A61K *7/40;7/48*

U.S. Cl. 424—60 **14 Claims**

1. A screening cosmetic composition comprising, in a cosmetically acceptable carrier, a cerium oxide nanopigment having with a mean diameter of less than 100 nm but greater than 5 nm, admixed with partially or completely neutralized 1,4-benzenedi(3-methylidene-10-camphosulfonic) acid of formula



(I)

wherein

A represents hydrogen, alkali metal or $NH(R)_3^+$, wherein said R's each independently represent hydrogen, $C_1–C_4$ alkyl, $C_1–C_4$ hydroxyalkyl or M^{n+}/n wherein M^{n+} is a polyvalent metal cation wherein n represents 2, 3 or 4.

5,690,918

SOLVENT-BASED NON-DRYING LIPSTICK

Terry Jacks, Olive Branch, Miss., and Brian Mattox, Memphis, Tenn., assignors to Maybelline, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 575,134, Dec. 19, 1995, abandoned. This application May 24, 1996, Ser. No. 653,230

Int. Cl.^{6} A61K *7/027*

U.S. Cl. 424—64 **11 Claims**

1. In a wax based non-smearing solid pigment containing colored lipstick cosmetic product containing volatile solvent and non-volatile silicone polymer, the improvement comprising a moisturizer mixture comprising moisturizing effective amounts of
(i) diisoarachidyl dilinoleate;
(ii) C_{14} to C_{22} fatty acid ester of alpha-tocopherol;
(iii) moisture retaining emulsion stabilizing emollient selected from the group consisting of cholesteryl/behenyl/octyldodecyl/lauroyl glutamate complex, pyrrolidone carboxylic acid, glyceryl oleate, dipalmitoylhydroxyproline, cetearylglucoside, polyprepolymer-2, petrolatum, caprylic/capric/stearic triglyceride, Shea butter, cholesterol, lecithin, phospholipids, and Illipe butter; and
(iv) lipophile moisturizer having delayed and remanent effect selected from the group consisting of lauryl pyrrolidone carboxylic acid ester, lauryl methyl pyrrolidone carboxylic acid ester,. phytoglycolipids, cholesterol, glycosphingo-lipids, palmitoyl hydrolyzed milk protein, and Illipe Butter.

5,690,919

DEODORIZING COSMETIC COMPOSITIONS

Manfred Röckl, Wedel/Holst.; Bernd Traupe, Hamburg; Manfred Klier, Aumühle, and Florian Wolf, Hamburg, all of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Filed Aug. 11, 1995, Ser. No. 513,703

Claims priority, application Germany, Aug. 19, 1994, 44 29 467.0

Int. Cl.^{6} A61K *7/32;31/19;31/20*

U.S. Cl. 424—65 **22 Claims**

1. A process for selectively reducing coryneform bacteria comprising applying to the bacteria a mixture comprising a selectively reducing effective amount of
(a) dodecanoic acid (lauric acid)
(b) at least one other fatty acid, selected from the group of unbranched saturated fatty acids having a chain length of C_{6-20}, at least one of the other fatty acids having to have a chain length of greater than C_{12},
(c) at least one of glyceryl monocaprylate or glyceryl monocaprate
(d) with omission of ethoxylated glyceryl fatty acid esters and propoxylated glyceryl fatty acid esters

wherein the pH of said mixture is below 8, said mixture being an active principle for selectively reducing coryneform bacteria.

5,690,920

FOAMABLE WASHING COMPOSITION BASED ON SELECTED INSOLUBLE SILICONES AND AN ALKYLPOLYGLYCOSIDE, AND COSMETIC AND DERMATOLOGICAL USES THEREOF

Claude Dubief, Le Chesnay, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 64,015, May 17, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,478

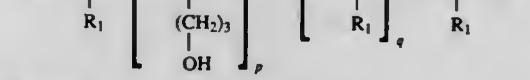
Claims priority, application France, Nov. 15, 1990, 90 14223

Int. Cl.^{6} A61K *7/06*

U.S. Cl. 424—70.12 **18 Claims**

1. Foamable washing composition for hair or skin treatment, consisting essentially of, in an aqueous medium:

a) from 0.2 to 30% by weight relative to the total weight of the composition of a silicone which is insoluble in said medium and unreactive with said medium selected from the group consisting of:
(i) silicone gums consisting of polydiorgano-siloxanes having high molecular weight between 200,000 and 1,000,000;
(ii) organopolysiloxane resins which are cross-linked siloxane systems, containing $R'_2SiO_{2/2}$, $R'SiO_{3/2}$ and $SiO_{4/2}$ units in which R' represents a hydrocarbon group having 1 to 6 carbon atoms or a phenyl group;
(iii) polyalkylsiloxanes, polyarylsiloxanes or polyalkylarylsiloxanes containing, in their structure, one or a number of functional groups selected from the GROUP consisting of thiol, carboxylate, hydroxyalkylsulfonate, hydroxyalkylthiosulfate and hydroxyacylamino connected to the siloxane chain and connected via a hydrocarbon radical;
(iv) organomodified silicones containing γ-hydroxypropyl groups corresponding to the formula:



$$R_1-\overset{R_1}{\underset{R_1}{Si}}-\left[O-\overset{R_1}{\underset{\underset{OH}{(CH_2)_3}}{Si}}\right]_p-\left[O-\overset{R_1}{\underset{R_1}{Si}}\right]_q-O-\overset{R_1}{\underset{R_1}{Si}}-R_1$$

(III)

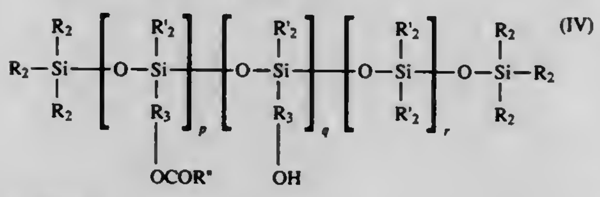
in which:

the radicals R_1, which are identical or different, are selected from the group consisting of methyl and phenyl radicals, at least 60 mol % of the radicals R_1 denoting methyl:

p is between 1 and 30 inclusive; and

q is between 1 and 150 inclusive;

(v) organomodified silicones containing acyloxy alkyl groups corresponding to the formula:



$$R_2-\overset{R_2}{\underset{R_2}{Si}}-\left[O-\overset{R'_2}{\underset{\underset{OCOR''}{R_3}}{Si}}\right]_p-\left[O-\overset{R'_2}{\underset{\underset{OH}{R_3}}{Si}}\right]_q-\left[O-\overset{R'_2}{\underset{R'_2}{Si}}\right]_r-O-\overset{R_2}{\underset{R_2}{Si}}-R_2$$

(IV)

in which

R_2 denotes a methyl, phenyl, —OCOR" or hydroxyl group, only one of the radicals R_2 per silicon atom may be OH;

R'_2 denotes methyl or phenyl, at least 60 mol % of the radicals R_2 and R'_2 combined denoting methyl;

R" denotes a $C_8–C_{20}$ alkyl or alkenyl;

R_3 denotes a linear or branched, divalent $C_2–C_{18}$ alkylene hydrocarbon radical;

r is between 1 and 120 inclusive;

p is between 1 and 30;

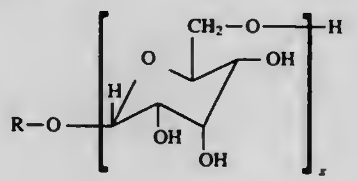
q is equal to 0 or less than 0.5 p, p+q being between 1 and 30; it being possible for the polyorganosiloxanes of formula (IV) to contain $CH_3Si—OH$

$O_{2/2}$

in proportions not exceeding 15% of the sum p+q+r; and

(vi) mixtures of the organomodified silicones as defined in paragraphs (iii) to (v); and

b) from 4 to 60% by weight relative to the total weight of the composition of at least one compound corresponding to the expanded structure:



(II)

in which:

R denotes a straight- or branched-chain, $C_8–C_{24}$ alkyl or alkenyl radical or a mixture of straight- or branched-chain, $C_8–C_{24}$ alkyl or alkenyl radicals;

x is a number from i to 15;

the compound of formula (II)/silicone ratio by weight being greater than or equal to 1.

5,690,921

HAIR FIXING COMPOSITION IN THE FORM OF AN AQUEOUS SOLUTION, FOAM OR GEL

Günther Lang, Reinheim, and Thomas Clausen, Alsbach, both of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

Continuation of Ser. No. 244,365, May 24, 1994, abandoned. This application Nov. 22, 1995, Ser. No. 561,957

Claims priority, application Germany, Oct. 15, 1992, 42 34 743.2

Int. Cl.^{6} A61K *7/11*

U.S. Cl. 424—70.13 **7 Claims**

1. Hair fixing composition in the form of an aqueous solution, foam or gel and containing from 0.1 to 5 percent by weight of a film-forming natural polymer consisting of chitosan; from 5 to 60 percent by weight of at least one water-soluble, halogen-free organic solvent selected from the group consisting of C_1- to C_4-alcohols, C_1- to C_4-glycols, esters of polyethylene glycol and C_2- to C_{20}-carboxylic acids, liquid polyethylene glycols, alkyl ethers of polyethylene glycol and C_1- to C_4-alcohols and ketones of C_1- to C_5-alcohols; from 30 to 95 percent by weight of water and 0.05 to 2 percent by weight of at least one compound, wherein said at least one compound is water insoluble at room temperature, but soluble in the composition, and is selected from the group consisting of C_8- to C_{20}-alkanediols, C_8- to C_{20}-alkanetriols, monoglycerides of C_{12}- to C_{20} fatty acids, monodiglycerides of C_{12}- to C_{20}-fatty acids, C_{12}- to C_{20}-fatty alcohols ethoxylated with from 2 to 3 moles of ethylene oxide, polysiloxane/polyether copolymers having a cloud point at a temperature of less than 20° C., polyoxyethylene/polyoxypropylene block polymers and polyoxyethylene/polyoxybutylene block polymers; and

wherein said at least one organic solvent and said at least one compound are present in a weight ratio of from 1000:1 to 2.5:1.

5,690,922

DEODORIZABLE FIBERS AND METHOD OF PRODUCING THE SAME

Motoya Mouri, Suita; Hiroyuki Koyou, Warabi; Tatsuro Takeuchi, Moriyama, and Kenji Hiramatsu, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 14, 1996, Ser. No. 601,588

Claims priority, application Japan, Feb. 15, 1995, 7-051693

Int. Cl.^{6} A61K *7/00*

U.S. Cl. 424—76.1 **19 Claims**

1. A deodorizable fiber comprising a phosphate of a tetravalent metal, a hydroxide of a divalent metal and a photocatalyst which acts as a photooxidizing catalyst by producing an active oxygen on exposure to light irradiation.

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5,690,923

STABLE TOPICAL RETINOID COMPOSITIONS

Tom DeVringer, Zoetermeer; Antoon Van Harrewijn, Delft, and Aart Muehlenbruch, Haarlem, all of Netherlands, assignors to Yamanouchi Europe B.V., Leiderdorp, Netherlands

PCT No. PCT/NL94/00151, § 371 Date Dec. 28, 1995, § 102(e) Date Dec. 28, 1995, PCT Pub. No. WO95/01160, PCT Pub. Date Jan. 12, 1995

PCT Filed Jul. 1, 1994, Ser. No. 571,898

Claims priority, application European Pat. Off., Jan. 7, 1993, 93201931

Int. Cl.^{6} A61K *31/74*

U.S. Cl. 424—78.02 **8 Claims**

1. A composition for topical application to the skin comprising a retinoid in an aqueous vehicle said aqueous vehicle further comprising up to 5 wt % of an organic solvent, and at least one non-ionic surfactant wherein the aqueous vehicle has a pH of between 3 and 7 and the non-ionic surfactant is a crystallization preventing and stabilizing agent for said retinoid and is selected from the group consisting of

a) polyoxyethylene mono fatty alcohol ethers,
b) polyoxyethylene glyceryl fatty acid triesters, and
c) ethylene oxide/proclaim oxide block copolymers.

5,690,924

HAIR TREATMENT COMPOSITIONS

Wolfgang Keil, Mülheim; Bernd Stein, Hösbach, and Jürgen Schmenger, Weiterstadt, all of Germany, assignors to Wella AG, Darmstadt, Germany

Filed Jul. 12, 1996, Ser. No. 667,580

Claims priority, application Germany, Aug. 24, 1995, 195 31 145.0

Int. Cl.^{6} A61K *31/74*

U.S. Cl. 429—78.03 **5 Claims**

1. A hair treatment composition based on a polymer combination, said hair treatment composition comprising

(A) 0.01 to 40 percent by weight of a salt of a chitosan having a molecular weight of at least 100,000 g/mol and 2-pyrrolidon-5-carboxylic acid, and

(B) 0.01 to 50 percent by weight of at least one member selected from the group consisting of synthetic, film-forming hair fixing nonionic polymers, synthetic anionic film-forming hair fixing polymers and natural, film-forming hair fixing polymers.

5,690,925

RECOMBINANT GAMMA INTERFERONS HAVING ENHANCED STABILITY AND METHODS THEREFOR

Patrick W. Gray, San Francisco, and Ernst H. Rinderknecht, San Carlos, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 93,455, Sep. 4, 1987, abandoned, which is a division of Ser. No. 584,217, Feb. 27, 1984, Pat. No. 4,855,238, which is a continuation-in-part of Ser. No. 562,009, Dec. 16, 1983, abandoned. This application Mar. 22, 1994, Ser. No. 216,511

Int. Cl.^{6} A61K *38/21;* **C07K** *14/57*

U.S. Cl. 424—85.5 **9 Claims**

1. A polypeptide exhibiting the characteristic properties of native human gamma interferon and consisting of the amino acid sequence, extending from the N-terminus:

```
X-Y-ASP-PRO-TYR-VAL-LYS-GLU-ALA-
  1   2   3   4   5   6   7   8

-GLU-ASN-LEU-LYS-LYS-TYR-PHE-
  9  10  11  12  13  14  15
```

-continued

```
ASN-ALA-GLY-HIS-SER-ASP-VAL-ALA-
 16  17  18  19  20  21  22  23

-ASP-ASN-GLY-THR-LEU-PHE-LEU-
  24  25  26  27  28  29  30

GLY-ILE-LEU-LYS-ASN-TRP-LYS-GLU-
 31  32  33  34  35  36  37  38

-GLU-SER-ASP-ARG-LYS-ILE-MET-
  39  40  41  42  43  44  45

GLN-SER-GLN-ILE-VAL-SER-PHE-TYR-
 46  47  48  49  50  51  52  53

-PHE-LYS-LEU-PHE-LYS-ASN-PHE-
  54  55  56  57  58  59  60

LYS-ASP-ASP-GLN-SER-ILE-GLN-LSY-
 61  62  63  64  65  66  67  68

-SER-VAL-GLU-THR-ILE-LYS-GLU-
  69  70  71  72  73  74  75

ASP-MET-ASN-VAL-LYS-PHE-PHE-ASN-
 76  77  78  79  80  81  82  83

-SER-ASN-LYS-LYS-LYS-ARG-ASP-
  84  85  86  87  88  89  90

ASP-PHE-GLU-LYS-LEU-THR-ASN-TYR-
 91  92  93  94  95  96  97  98

-SER-VAL-THR-ASP-LEU-ASN-VAL-
  99 100 101 102 103 104 105

GLN-ARG-LYS-ALA-ILE-HIS-GLU-LEU-
106 107 108 109 110 111 112 113

-ILE-GLN-VAL-MET-ALA-GLU-LEU-
 114 115 116 117 118 119 120

SER-PRO-ALA-ALA-LYS-THR-Z
121 122 123 124 125 126
```

wherein X is a methionine residue or hydrogen and Y is a glutamine residue or where X is hydrogen, Y is either a glutamine or a pyroglutamate residue, and Z is

```
GLY-LYS-ARG-LYS-ARG-SER-GLN-MET-LEU-
127 128 129 130 131 132 133 134 135

              PHE-ARG-GYL-ARG
              136 137 138 139.
```

5,690,926

PLURIPOTENTIAL EMBRYONIC CELLS AND METHODS OF MAKING SAME

Brigid L. M. Hogan, Brentwood, Tenn., assignor to Vanderbilt University, Nashville, Tenn.

Continuation-in-part of Ser. No. 958,562, Oct. 8, 1992, Pat. No. 5,453,357. This application Mar. 25, 1994, Ser. No. 217,921

Int. Cl.^{6} C12N *5/06;5/16;15/09;* **A01N** *63/00*

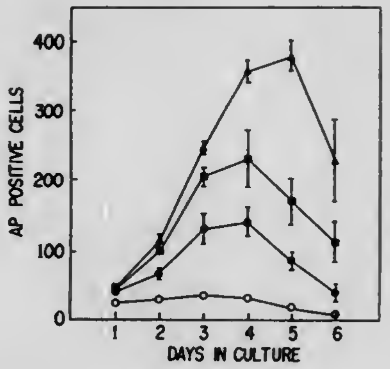
U.S. Cl. 424—93.1 **7 Claims**

1. An isolated non-murine mammalian pluripotential cell wherein said cell exhibits the following characteristics:

(a) can be maintained on feeder layers for at least 20 passages; and

(b) gives rise to embryoid bodies and differentiated cells of multiple phenotypes in monolayer culture; and wherein said cell is derived from a primordial germ cell by the process of:

(1) culturing a non-murine mammalian primordial germ cell in a composition comprising basic fibroblast growth factor, leukemia inhibitory factor, membrane associated steel factor, and soluble steel factor;



(2) selecting cells that have characteristics (a) and (b), above, and

(3) isolating said non-murine pluripotential cell.

5,690,927

USE OF NEURO-GLIAL FETAL CELL LINES FOR TRANSPLANTATION THERAPY

Eugene O. Major, Oakton, Va.; Carlo S. Tornatore, University Park, Md., and Kris Bankiewicz, Walnut Creek, Calif., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 46,527, Apr. 13, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,136

Int. Cl.^{6} C12N *5/10*

U.S. Cl. 424—93.21 **21 Claims**

1. A method for treating a mammal having a neurological syndrome or disease characterized by a dopamine deficiency comprising implanting into said mammal a therapeutically effective amount of a nontumorigenic and noninflammatory immortalized human neuro-glial cell line capable of inducing neuromigration and/or neurite extension in the mammal.

5,690,928

METHOD OF TREATING BLADDER CANCER CELLS

David C. Heimbrook, Ringoes, N.J.; Allen I. Oliff, Gwynedd Valley, Pa.; Steven M. Stirdivant, Warrington, Pa., and Janet Ahern, Horsham, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 669,269, Mar. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 542,281, Jun. 21, 1990, abandoned. This application Apr. 11, 1994, Ser. No. 224,422

Int. Cl.^{6} A61K *38/45*

U.S. Cl. 424—94.5 **20 Claims**

1. A method of treating bladder cancer comprising administering to a patient having bladder cancer a therapeutically effective amount of a hybrid protein selected from the group consisting of TGF-alpha-PE_{40}Ab, TGF-alpha-PE_{40}aB and TGF-alpha-PE_{40}ab, wherein "a" and "b" represent substitution of the cysteine residues at the A and B locus, respectively, with alanine or glycine residues.

5,690,929

USE OF METHIONINASE AND CHEMOTHERAPY AGENTS IN CHEMOTHERAPY

Valeryi Lishko; Yuying Tan; Qinghong Han; Mingxu Xu, and Huiyan Guo, all of San Diego, Calif., assignors to AntiCancer, Inc., San Diego, Calif.

PCT No. PCT/US93/11311, § 371 Date Apr. 24, 1995, § 102(e) Date Apr. 24, 1995, PCT Pub. No. WO94/11535, PCT Pub. Date May 26, 1994

Continuation-in-part of Ser. No. 979,165, Nov. 19, 1992, abandoned. This PCT application Nov. 19, 1993, Ser. No. 424,300

Int. Cl.^{6} A61K *38/51;* **C12N** *9/88*

U.S. Cl. 424—94.5 **10 Claims**

1. A method for inducing tumor cell death in vivo comprising the step of contacting a population of tumor cells in vivo with a therapeutically effective amount of a methioninase composition, said methioninase having a K_m of about 1 mM or less, a specific activity of at least about 16 units per mg protein and less than about 10 ng endotoxin per mg protein in combination with a chemotherapeutic agent.

5,690,930

DNA ENCODING THE HEME-REGULATED EUKARYOTIC INITIATION FACTOR 2α KINASE

Jane-Jane Chen, Belmont, and Irving M. London, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 938,782, Aug. 31, 1992, Pat. No. 5,525,513. This application Apr. 10, 1996, Ser. No. 630,524

Claims priority, application Japan, Mar. 2, 1992, 4-081664

Int. Cl.^{6} A61K *38/45*

U.S. Cl. 424—94.5 **12 Claims**

1. A pharmaceutical composition comprising heme-regulated eukaryotic initiation factor 2α kinase in combination with a suitable pharmaceutical carrier for administration to cells.

5,690,931

METHOD FOR TREATING THROMBOEMBOLIC CONDITIONS VIA THE USE OF MULTIPLE BOLUS ADMINISTRATION OF THROMBOLYTICALLY ACTIVE PROTEINS

Ulrich Martin, Mannheim, Germany, and Reinhard König, San Carlos, Calif., assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation-in-part of Ser. No. 137,116, Jun. 30, 1994, Pat. No. 5,500,411. This application Mar. 25, 1994, Ser. No. 217,616

Claims priority, application Germany, Apr. 16, 1991, 41 12 398.0; Jul. 18, 1991, 41 23 845.1

Int. Cl.^{6} A61K *38/48;38/49;* **C12N** *9/64;15/55*

U.S. Cl. 424—94.64 **20 Claims**

1. Method for treatment of a thromboembolic condition comprising administering to a subject with a thromboembolic condition a thrombolytically effective amount of a thrombolytically active protein which has a half life greater than recombinant human t-PA, in the form of at least two boli over a twenty four hour period, wherein the second bolus contains an amount of thrombolytically active protein which is less than or equal to the amount of thrombolytically active protein in the first bolus.

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5,690,932

CLINICAL DISORDERS ASSOCIATED WITH CARBOXYPEPTIDASE E MUTATION

Jürgen K. Naggert, and Edward H. Leiter, both of Bar Harbor, Me., assignors to The Jackson Laboratory, Bar Harbor, Me.

Division of Ser. No. 452,262, May 26, 1995, Pat. No. 5,593,837. This application Oct. 17, 1996, Ser. No. 734,550

Int. Cl.^{6} A61K *38/46;* **C12G** *1/68;* **C12N** *9/48*

U.S. Cl. 424—94.67 8 Claims

1. A therapeutic method for treating a clinical disorder associated with a mutation in the carboxypeptidase E gene, the clinical disorder being selected from the group consisting of obesity, diabetes and impaired glucose tolerance associated with aberrant insulin processing, the method comprising introducing into the plasma of the individual an arginine carboxypeptidase which is characterized by the ability to remove a diarginyl C-terminal extension from the insulin β-chain under physiological conditions.

5,690,933

MONOCLONAL ANTIBODIES FOR INDUCING TOLERANCE

Stephen Paul Cobbold, and Herman Waldmann, both of Cambridge, England, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 181,170, Jan. 13, 1994, abandoned, which is a continuation of Ser. No. 47,344, Mar. 29, 1993, abandoned, which is a continuation of Ser. No. 768,868, Jul. 27, 1991, abandoned. This application Aug. 12, 1994, Ser. No. 289,532

Claims priority, application United Kingdom, May 31, 1989, 8912497

Int. Cl.^{6} A61K *39/395;37/02*

U.S. Cl. 424—144.1 4 Claims

1. A method of treating in a human a disorder mediated by an immune reaction to a self-antigen, said method comprising administering to a human in need of said treatment an amount of a non-depleting anti-CD4 monoclonal antibody as the whole antibody sufficient to induce long-term specific immunological unresponsiveness to said self-antigen thereby effecting said treatment.

5,690,934

PEPTIDES RELATING TO THE EXTRACELLULAR MEMBRANE-BOUND SEGMENT OF HUMAN ALPHA CHAIN

Tse Wen Chang, and Nancy T. Chang, both of Houston, Tex., assignors to Tanox Biosystems, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 249,558, May 26, 1994, and Ser. No. 180,145, Jan. 11, 1994, which is a continuation-in-part of Ser. No. 137,253, Oct. 14, 1993, which is a continuation-in-part of Ser. No. 90,527, Jul. 9, 1993, Pat. No. 5,342,924, which is a continuation-in-part of Ser. No. 973,321, Oct. 29, 1992, Pat. No. 5,254,671, which is a continuation-in-part of Ser. No. 515,604, Apr. 27, 1990, Pat. No. 5,274,075, which is a continuation-in-part of Ser. No. 468,766, Jan. 23, 1990, Pat. No. 5,260,416, which is a continuation-in-part of Ser. No. 369,625, Jun. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 272,243, Nov. 16, 1988, Pat. No. 5,091,313, which is a continuation-in-part of Ser. No. 229,178, Aug. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 226,421, Jul. 29, 1988, Pat. No. 5,422,258, which is a continuation-in-part of Ser. No. 140,036, Dec. 31, 1987, abandoned, said Ser. No. 249,558is a continuation-in-part of Ser. No. 140,721, Oct. 22, 1993, Pat. No. 5,484,907, which is a continuation-in-part of Ser. No. 95,068, Jul. 20, 1993, Pat. No. 5,362,643, which is a continuation of Ser. No. 760,765, Sep. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 455,080, Dec. 22, 1989, Pat. No. 5,089,603, which is a continuation-in-part of Ser. No. 369,479, Jun. 21, 1989, Pat. No. 5,079,344. This application Mar. 20, 1996, Ser. No. 619,790

Int. Cl.^{6} A61K *39/395*

U.S. Cl. 424—178.1 5 Claims

1. A peptide having the sequence of the peptide shown in SEQ ID NO:1.

5,690,935

BIOTHERAPY OF CANCER BY TARGETING TP-3/P80

Fatih M. Uckun, White Bear Lake, and Peter M. Anderson, St. Louis Park, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jan. 13, 1995, Ser. No. 372,608

Int. Cl.^{6} A61K *39/44;* **C07K** *14/415;16/28;* **C12N** *15/13*

U.S. Cl. 424—183.1 4 Claims

1. A biotherapeutic agent comprising a cytotoxic amount of pokeweed antiviral protein linked to antibody TP-1, antibody TP-3, or a fragment of either antibody, which antibody or fragment binds to the p80 osteosarcoma antigen.

5,690,936

Patent Not Issued For This Number

5,690,937

TEMPERATURE SENSITIVE CLUSTERED CHANGED-TO-ALANINE MUTANTS OF INFLUENZA VIRUS PB2 GENE

Neil T. Parkin, Belmont, and Kathleen L. Coelingh, San Francisco, both of Calif., assignors to Aviron, Mountain View, Calif.

Filed Jun. 5, 1995, Ser. No. 462,388

Int. Cl.^{6} A61K *39/145;* **C12N** *7/04;15/44*

U.S. Cl. 424—199.1 4 Claims

1. A recombinant RNA sequence encoding an influenza PB2 protein, wherein said RNA sequence comprises a mutation selected from the group consisting of the mutations set forth as ALA1, ALA4, ALA6, ALA7 and ALA8.

5,690,938

ORAL IMMUNIZATION WITH MULTIPLE PARTICULATE ANTIGEN DELIVERY SYSTEM

Thomas H. Ermak; Jacques Pappo; Farshad Guirakhoo; Richard D. Nichols, Jr.; Thomas P. Monath, all of Cambridge, Mass., and Polly Roy, Oxford, England, assignors to Oravax, Inc., Cambridge, Mass., and Natural Environment Research Council, Swindon, England

Continuation-in-part of Ser. No. 853,696, Jun. 3, 1992, abandoned. This application Oct. 5, 1993, Ser. No. 131,630

Claims priority, application United Kingdom, Jul. 7, 1989, 8915572

Int. Cl.^{6} A61K *39/15*

U.S. Cl. 424—215.1 5 Claims

1. A method of inducing a mucosal and a systemic immune response in a host, said method comprising the step of orally administering to a mucosal surface of said host a bluetongue antigen in the form of virus core like particles or in the form of virus like particles and in an amount effective to induce said immune response.

5,690,939

RECOMBINANT VACCINE AGAINST MAREK'S DISEASE

Robin Wilson Morgan, Landenberg, Pa.; Johannes Antonius Joseph Claessens, and Paulus Jacobus Antonius Sondermeijer, both of Boxmeer, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Division of Ser. No. 67,416, May 24, 1993, which is a continuation of Ser. No. 917,721, Jul. 20, 1992, abandoned, which is a continuation of Ser. No. 699,467, May 14, 1991, abandoned. This application May 15, 1995, Ser. No. 440,846

Int. Cl.^{6} A61K *39/255;* **C07K** *14/055*

U.S. Cl. 424—229.1 6 Claims

1. An isolated polypeptide comprising at least one immunogenic determinant of a MD06 MDV protein having an amino acid sequence shown in SEQ ID NO:2 or a functional variant thereof.

5,690,940

LOW PATHOGENCITY PRRS LIVE VIRUS VACCINES AND METHODS OF PREPARATION THEREOF

Han Soo Joo, New Brighton, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 21, 1995, Ser. No. 493,265

Int. Cl.^{6} C12N *15/38;7/01;* **C07K** *14/055*

U.S. Cl. 424—229.1 12 Claims

1. A vaccine comprising a virus having the designation ATCC VR2509.

4. A method of immunizing a swine against North American porcine reproductive and respiratory syndrome, comprising the step of administering to the swine the vaccine of claim 1.

9. A vaccine comprising a North American porcine reproductive and respiratory syndrome virus (PRRSV) strain, wherein the strain gives plaques having an average diameter of less than 2 mm when the plaques are obtained by a method comprising the steps of:

(a) inoculating an aliquot of cells with the strain, wherein the cells have the designation ATCC CRL-12219, wherein the aliquot is obtained from a confluent monolayer of the cells maintained in Eagle's minimum essential medium supplemented with 3% fetal calf serum and 0.15% sodium carbonate, wherein the aliquot includes 1–2 X 10^5 cells per ml of Eagle's minimum essential medium supplemented with 3% fetal calf serum and 0.15% sodium carbonate;
(b) incubating the aliquot at 37° C. for 60 minutes;
(c) removing the inoculum from the aliquot;
(d) washing the aliquot with Eagle's minimum essential medium;
(e) resuspending the aliquot in 5 ml of 2X Eagle's minimum essential medium and 1.6% boiled Noble agar supplemented with 250 μg of diethylaminoethyl (DEAE)-dextran;
(f) plating the aliquot; and
(g) further incubating the aliquot at 37° C. for 5 days in a CO_2 incubator to give the plaques.

5,690,941

MOLECULES CONTAINING AT LEAST ONE PEPTIDE SEQUENCE CARRYING ONE OR SEVERAL EPITOPES CHARACTERISTIC OF A PROTEIN PRODUCED BY *P. FALCIPARUM* AT THE SPOROZOITE STAGE AND IN THE HEPATOCYTES

Pierre Druilhe, Saint-Mandé, and Claudine Guerin-Marchand, Paris, both of France, assignors to Institut Pasteur, France

Continuation of Ser. No. 104,597, Aug. 10, 1993, abandoned, which is a continuation of Ser. No. 758,724, Sep. 9, 1991, abandoned, which is a continuation of Ser. No. 507,215, Apr. 11, 1990, abandoned. This application May 13, 1994, Ser. No. 242,060

Claims priority, application France, Apr. 12, 1989, 89 04847

Int. Cl.^{6} A61K *39/015;* **C07K** *14/445*

U.S. Cl. 424—272.1 9 Claims

1. A peptide having 10 to 87 amino acids of the following sequence:

Glu-Phe-Arg-Val-Ser-Thr-Ser-Asp-Thr-Pro-Gly-Gly-Asn-Glu-Ser-Ser-Ser-Ala-Ser-Pro-Asn-Leu-Ser-Gly-Ala-Arg-Glu-Lys-Lys-Asp-Glu-Lys-Glu-Ala-Ser-Glu-Gln-Gly-Glu-Glu-Ser-His-Lys-Lys-Glu-Asn-Ser-Gln-Glu-Ser-Ala-Asn-Gly-Lys-Asp-Asp-Val-Lys-Glu-Glu-Lys-Lys-Thr-Asn-Glu-Lys-Lys-Asp-Asp-Gly-Lys-Thr-Asp-Lys-Val-Gln-Glu-Lys-Val-Leu-Glu-Lys-Ser-Pro-Lys-Glu-Phe

which peptide is recognized by antibodies recognizing the sporozoite and hepatic stages of *Plasmodium falciparum* and is not recognized by antibodies recognizing the blood stage of *Plasmodium falciparum.*

5,690,942

ADJUVANTS FOR VIRAL VACCINES

Richard N. Hjorth, King of Prussia, Pa., assignor to American Home Products Corporation, Madison, N.J.

Filed Jun. 2, 1995, Ser. No. 459,602

Int. Cl.^{6} A61K *45/00;39/145;* **A01N** *57/26*

U.S. Cl. 424—283.1 10 Claims

1. A mammalian vaccine composition comprising an inactivated whole or subunit vaccine and an effective amount of an adjuvant, the adjuvant consisting essentially of any one of squalene, squalane, or a mixture thereof, in the amount of from about 1% to about 40% by volume of the total composition, a lecithin in the amount of from about 0.5% to about 4% by volume of the total composition, and a polyoxyethylenesorbitan ester surfactant in the amount of from about 0.1% to about 4.0% of the total composition.

5,690,943

STORAGE OF PARENTERALLY ADMINISTERABLE PRODUCTS

Yves Bourboulou, Rilhac-Rancon; Micheline Boucheteil, Saint-Yrieix-sous-Aixe; Céline Philippon, Limoges, and Jean Tronchet, Couzeix, all of France, assignors to Pharmacia & Upjohn Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE93/00915, § 371 Date Jun. 30, 1995, § 102(e) Date Jun. 30, 1995, PCT Pub. No. WO94/10064, PCT Pub. Date May 11, 1994

PCT Filed Nov. 2, 1993, Ser. No. 428,178

Claims priority, application Sweden, Nov. 3, 1992, 9203250

Int. Cl.^{6} A61K *9/00*

U.S. Cl. 424—400 21 Claims

1. Method of increasing the physical stability of a product for parenteral administration comprising a lipid emulsion packaged in an at least partially gas permeable container which comprise storing said lipid emulsion in an inert gas consisting essentially of helium.

5,690,944

COSMETIC COMPOSITIONS CONTAINING LACTATE DEHYDROGENASE INHIBITORS

John Brian Bartolone, Bridgeport, Conn.; Christine Marie Penska, Westwood, N.J.; Uma Santhanam, Tenafly, N.J., and Brian David Lang, North Bergen, N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Dec. 20, 1994, Ser. No. 359,975

Int. Cl.^{6} A61K *6/00*

U.S. Cl. 424—401 8 Claims

1. A composition for topical application to human skin, the composition comprising:

(i) from about 0.001% to about 20% of an inhibitor of lactate dehydrogenase selected from the group consisting of oxamic acid, an N-substituted oxamic acid, 1,6-dihydro NAD, 4-pyridyl pyruvic acid, quinoline-2-carboxylic acid, suramin sodium, isoquinoline, papaverine, berberine, and mixtures thereof; and
(ii) from about 0.01% to about 20% by weight of the composition of a co-active ingredient selected from the group consisting of pyruvic acid, acetic acid, acetoacetic acid, β-hydroxybutyric acid, citric acid, isocitric acid, cis-aconitic acid, 2-ketoglutaric acid, succinic acid, fumaric acid, malic acid, oxaloacetic acid, an aliphatic saturated or an unsaturated fatty acid containing from 8 to 26 carbon atoms, an ω-hydroxy acid containing from 22 to 34 carbon atoms, glutamic acid, glutamine, valine, alanine, leucine, and mixtures thereof,
(iii) a cosmetically acceptable vehicle for the lactate dehydrogenase inhibitor, wherein the vehicle comprises water; wherein the pH of the composition is from about 3 to about 8; and wherein the lactate dehydrogenase inhibitor acts within the human skin.

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5,690,945

COSMETIC SKIN-CLEANSING MASK COMPOSITIONS CONTAINING GRADED SPHEROIDAL POLYAMIDE PARTICLES

Lien Bui-Bertrand, Savigny sur Orge, and Nathalie Louvet-Plaisant, Chevilly Larue, both of France, assignors to L'Oreal, Paris, France

Filed Mar. 24, 1995, Ser. No. 409,608

Claims priority, application France, Mar. 24, 1994, 94 03452

Int. Cl.⁶ A61K *7/00*

U.S. Cl. 424—401 **16 Claims**

1. A gelled cosmetic composition for use as a cleansing mask, said composition comprising an aqueous gel and, as principal cleansing agent, graded spheroidal polyamide particles which are dispersed in said aqueous gel, wherein said aqueous gel contains at least one gelling agent present in an amount ranging from 0.3 to 1.0% by weight relative to the total weight of the composition and said particles are present in an amount greater than or equal to 12% by weight relative to the total weight of the composition.

5,690,946

COSMETIC AND/OR DERMATOLOGICAL COMPOSITION CONTAINING THERMAL SPRING WATER OR MINERAL WATER AND AN ACTIVE AGENT, IN ORDER TO COMBAT ACNE OR AGING

Constantin Koulbanis, Le Kremlin-Bicetre; Jean-Pierre Laugier, Antony; Francoise Gagnebien-Cabanne, Chatillon, and Sabine Deprez, Thiais, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 21, 1995, Ser. No. 505,484

Claims priority, application France, Jul. 22, 1994, 94 09119

Int. Cl.⁶ A61K *7/48;31/60*

U.S. Cl. 424—401 **23 Claims**

1. A method of reducing the irritant effect caused by a cosmetic and/or dermatological composition comprising an active agent having an irritant side effect when applied to skin, said method comprising incorporating a water having a mineralization of 700 mg/L up to an amount which does not result in formation of precipitates during preparation in said cosmetic and/or dermatological composition comprising at least one active agent having an irritant side effect,

wherein said water is selected from the group consisting of eau de Vittel, eaux du bassin de Vichy, eau d'Uriage, eau de la Roche Posay, eau de la Bourboule, eau d'Enghien-les-bains, eau de Saint-Gervais-les-bains, eau de Néris-les-bains, eau d'Allevard-les-bains, eau de Digne, eau des Maiziéres, eau de Neyrac-les-bains, eau de Lons le Saunier, Eaux Bonnes, eau de Rochefort, eau de Saint Christau, eau des Fumades and eau de Tercis-les-bains.

5,690,947

BORAGE SEED OIL AS AN ANTI-IRRITANT IN COMPOSITIONS CONTAINING HYDROXY ACIDS OR RETINOIDS

Stephan Samuel Habif, Demarest, N.J.; John Brian Bartolone, Bridgeport, Conn.; Dennis Brian Sinfield, Highland Lakes, and Falguni Snehal Nanavaty, Lawrenceville, both of N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Aug. 30, 1996, Ser. No. 706,009

Int. Cl.⁶ A61K *7/40*

U.S. Cl. 424—401 **7 Claims**

1. A oil-in-water cosmetic emulsion comprising:

(i) a cosmetic benefit ingredient selected from the group consisting of an α-hydroxy acid, retinol, retinoic acid, retinal, C_2–C_5 retinyl ester and mixtures thereof;

(ii) borage seed oil in an amount effective to ameliorate the irritation to the skin induced by the cosmetic benefit ingredient; and

(iii) from about 50% to about 99% of water.

5,690,948

ANTISEBUM AND ANTIOXIDANT COMPOSITIONS CONTAINING GUGULIPED AND ALCOHOLIC FRACTION THEREOF

John Patrick McCook, Guilford; Joseph Michael Corey, Waterbury; Peter Ladislaus Dorogi, Norwalk, all of Conn.; John Steven Bajor, Ramsey, N.J.; Helen Elizabeth Knaggs, Weehawken, N.J.; Beth Anne Lange, Woodbridge, N.J., and Erwin Sharpe, West New York, N.J., assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.

Filed Jan. 10, 1997, Ser. No. 781,767

Int. Cl.⁶ A61K *7/48;35/78;47/28;47/46*

U.S. Cl. 424—401 **7 Claims**

1. A method of obtaining an alcoholic fraction of gugulipid, comprising

(a) mixing said gugulipid with petroleum ether,

(b) separating the petroleum ether soluble components of gug ulipid from the non soluble components,

(c) mixing the non soluble components from step (b) with alcohol, and (d) recovering the alcohol soluble components.

5,690,949

MICROPOROUS MEMBRANE MATERIAL FOR PREVENTING TRANSMISSION OF VIRAL PATHOGENS

William K. Weimer, Woodbury; Gretchen E. Keenan, Edina; Robert J. Kinney, Woodbury; James S. Mrozinski, Oakdale, and Philip D. Radovanovic, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 384,079, Feb. 6, 1995, which is a continuation-in-part of Ser. No. 105,430, Aug. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 962,416, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 779,014, Oct. 18, 1991, abandoned. This application Oct. 19, 1995, Ser. No. 545,554

Int. Cl.⁶ A01N *25/34*

U.S. Cl. 424—402 **22 Claims**

1. A microporous membrane material for preventing transmission of viral pathogens comprising (1) a thermoplastic polymer, (2) a processing compound which is miscible with the thermoplastic polymer at the melting point of the polymer but phase separates on cooling to or below the crystallization temperature of the polymer and (3) a water- and oil-repellent fluorochemical compound which provides said membrane with oleophobic, hydrophobic and vital barrier properties prepared by the steps of melt blending said thermoplastic polymer, said processing compound and said fluorochemical compound, forming a microporous membrane from the melt blend, cooling the microporous membrane to a temperature at which said thermoplastic polymer crystallizes to cause phase separation to occur between said processing compound and said thermoplastic polymer.

5,690,950

INSECTICIDAL ALIPHATIC CARBOXYLIC ACID COMPOSITONS

James R. Beadle, San Diego, Calif.; Lee R. Zehner, Brookeville, Md.; Gilbert V. Levin, Annapolis, Md.; James P. Saunders, Rockville, Md., and Robert C. Bozsa, Silver Spring, Md., assignors to Biospherics, Inc., Beltsville, Md.

Continuation of Ser. No. 328,875, Oct. 25, 1994, abandoned. This application Oct. 4, 1996, Ser. No. 725,982

Int. Cl.⁶ A01N *33/12;37/02;37/06;25/06;25/12*

U.S. Cl. 424—405 **10 Claims**

1. A method for killing insect larvae comprising the step:

applying a larvacidal amount of one or more C_2 to C_6 aliphatic carboxylic acids excluding acetic acid to the site of habitation of said insect larvae.

5,690,951

BAIT WITH HOT MELT BINDER

Chel W. Lew, San Antonio, Tex., and Kelly Scott Johns, Hahira, Ga., assignors to Micro Flo Company, Mulberry, Fla.

Continuation-in-part of Ser. No. 784,506, Oct. 31, 1991, Pat. No. 5,484,587, Ser. No. 189,355, Jan. 31, 1994, Pat. No. 5,571,522, and Ser. No. 194,358, Feb. 8, 1994. This application Jun. 6, 1995, Ser. No. 470,342

Int. Cl.⁶ A01N *25/14*

U.S. Cl. 424—410 **21 Claims**

1. A particulate bait composition useful for controlling insect populations, said composition comprising a homogeneous mixture of:

(a) a binding agent comprising a polymer that is solid at 25° C. and exhibits a melting point within the range from about 35° C. to about 65° C. and is selected from the group consisting of polyethylene glycol, block copolymers of ethylene oxide and propylene oxide, solid fats, monoglycerides, diglycerides;

(b) an erosion rate modifier for said binder; and

(c) 0.01–99 wt % based on total weight of said bait of an insecticide; and

(d) 0.01–99 wt % based on total weight of said bait of a feeding stimulant for said insect population selected from the group consisting of a cucurbitacin and corn germ having less than 10% endosperm associated therewith and in the form of a finely divided particulate or liquid.

5,690,952

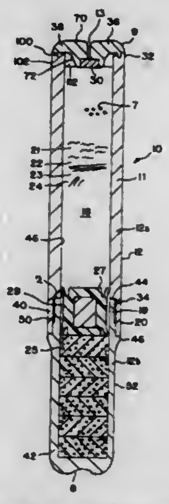
IMPLANTABLE SYSTEM FOR DELIVERY OF FLUID-SENSITIVE AGENTS TO ANIMALS

Judy A. Magruder, Mt. View; James B. Eckenhoff, deceased, late of Los Altos, by Bonnie J. Eckenhoff, executrix; Richard Cortese, Los Gatos; Jeremy C. Wright, Los Altos; John R. Peery, Stanford, all of Calif.; James B. Pike, St. Louis, Mo.; Urano A. Robinson, St. Louis, Mo.; Jonathan P. Smith, St. Louis, Mo., and Lyle E. Ziemann, Chesterfield, Mo., assignors to Judy A. Magruder et al., Mountain View, Calif.

Filed Jun. 7, 1995, Ser. No. 485,870

Int. Cl.⁶ A61F *2/02;* **A61K** *9/22*

U.S. Cl. 424—423 **20 Claims**



1. A device for delivering a beneficial agent to a fluid environment of use, the device comprising:

a) a housing comprising a fluid impermeable wall section, the housing containing the beneficial agent;

b) an exit passageway for fluidly connecting the housing interior to the environment of use;

c) an energy source for increasing pressure within the housing when the device is in the environment of use;

d) a sealing material, adjacent the exit passageway, the material being effective to seal the exit passageway before the housing is pressurized, at least a portion of the material being expelled through the passageway after the housing is pressurized, thereby opening the exit passageway, thereafter allowing continuous release of a therapeutically effective amount of beneficial agent during the entire time of delivery.

5,690,953

POLYMERIC OPHTHALMIC LENS WITH CROSSLINKER CONTAINING SACCHARIDE RESIDUE

Frank F. Molock, Orange Park; Ivan M. Nunez, Jacksonville; James D. Ford, Orange Park, and Laura D. Elliott, Jacksonville, all of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation of Ser. No. 409,385, Mar. 23, 1995, abandoned, which is a continuation of Ser. No. 164,504, Dec. 9, 1993, abandoned, which is a continuation of Ser. No. 17,709, Apr. 12, 1993, abandoned. This application Sep. 13, 1996, Ser. No. 712,657

Int. Cl.⁶ C08B *37/00*

U.S. Cl. 424—429 **21 Claims**

1. A crosslinked polymer comprising the reaction product of a hydrophilic monomer and a crosslinking amount of a polyfunctional compound having the following formula:

$$[S—(A)_n]_y$$

wherein

S is the residue of a five or six membered saccharide ring;

$A=—(CH_2)_b—O—R_2—(R_3)_c—(R_4)_t—(CONH—R_5)_u$

n is between 2 and 4, inclusive;

y is between 1 and 4, inclusive;

b is 0 or 1; provided that for at least one A, b is 1;

c is 0 or 1;

$R_2=—(CH_2CHR_6O)_x—$;

R_6 is hydrogen or methyl;

x is between 8 and 250, inclusive;

$R_3=—CONH—R_7—NHOC—$

R_7 is a divalent radical which is a residue of either isophorone diisocyanate or toluene diisocyanate;

$R_4=X_1—(CH_2(CHR_6)_aX)_zCH_2(CHR_6)_aX$ when c is 1 and u is 1, or alternatively,

$R_4=O—R_8$ when u=0;

t=0 or 1;

x_1=O or NH;

X=O or NH;

a is between 0 and 3, inclusive;

z is between 10 and 180, inclusive;

$R_8=—(CHR_6CH_2O)_f(CH_2)_e(C(R_9)_2)_dC(R_9)_3$;

R_9=H or F;

d is between 0 and 30, inclusive;

e is between 1 and 69, inclusive;

f is between 0 and 50, inclusive;

u is 0 or 1, provided that u is 1 for at least one A per y;

R_5 is a free radical reactive end group.

5,690,954

ENHANCED UPTAKE DRUG DELIVERY SYSTEM HAVING MICROSPHERES CONTAINING AN ACTIVE DRUG AND A BIOAVAILABILITY IMPROVING MATERIAL

Lisbeth Illum, Nottingham, United Kingdom, assignor to Danbiosyst UK Limited, Nottingham, England

Continuation of Ser. No. 142,844, Oct. 25, 1993, abandoned, which is a continuation of Ser. No. 865,855, Apr. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 760,854, Sep. 17, 1991, abandoned, which is a continuation of Ser. No. 424,320, Nov. 20, 1989, abandoned. This application Mar. 28, 1995, Ser. No. 412,094

Claims priority, application United Kingdom, May 22, 1987, 8712176

Int. Cl.⁶ A61K *9/16*

U.S. Cl. 424—434 **17 Claims**

1. A liquid or particulate drug delivery system for administration of an active drug to vertebrates comprising bioadhesive microspheres,

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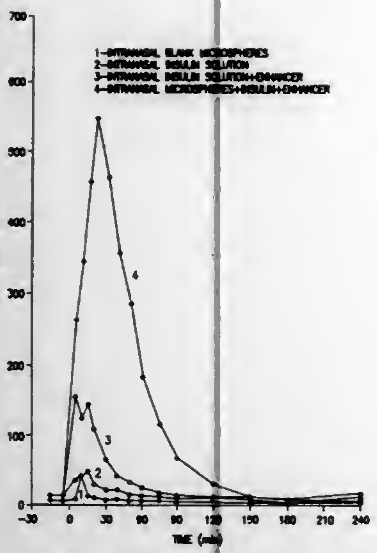


wherein said bioadhesive microspheres are of a size in the range of from about 10 micrometers to about 100 micrometers and formed of a material selected from the group consisting of proteins, polysaccharides, hyaluronic acid esters, and synthetic polymers,

each of said microspheres including a physiologically effective amount of the active drug and an absorption enhancing material associated with each microsphere which enhances passage of the active drug through a membrane and increases the bioavailability of the active drug as compared to when the drug delivery system is administered without said material, wherein the absorption enhancing material is selected from the group consisting of phospholipids, chelating agents, mucolytics, peptide inhibitors, and surface active agents selected from the group consisting of bile salts, fatty acids, fatty acid salts, acylglycerols, tyloxapols, acylcarnitines, fusidates, and mixtures thereof.

5,690,955
SUSTAINED RELEASE ALGINATE FIBRE AND PROCESS FOR THE PREPARATION THEREOF

Bryan Griffiths, New Tredegar, and Pter Michael John Mahoney, Llanarmon, D.C., both of United Kingdom, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

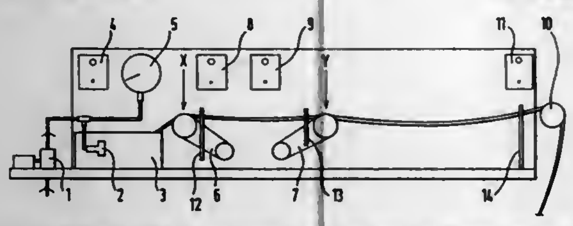
PCT No. PCT/GB93/01350, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1994, PCT Pub. No. WO94/00164, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 28, 1993, Ser. No. 338,635

Claims priority, application United Kingdom, Jun. 29, 1992, 9213773

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—443 **19 Claims**



1. An alginate fibre comprising one or more medicaments incorporated into the fibre core, and one or more medicaments attached to the surface of the fibre, wherein the concentration of medicament attached to the surface of the fibre is 0.01% to 2.0% w/w, whereby the one or more medicaments attached to the surface of the fibre can be released therefrom over a period of minutes or hours, and the one or more medicaments incorporated into the fibre core can be released in a sustained manner over a period of hours, days or weeks.

5,690,956
HAIR CARE PERMING AGENT

John R. Lau, Howard, Ohio, assignor to SDG, Inc., Wooster, Ohio

Filed Sep. 27, 1995, Ser. No. 534,296

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 424—450 **6 Claims**

1. In a hair perming procedure, wherein said hair is structured by naturally occurring disulfide bonds, the procedure being to force the hair into the physical form that will establish the final hair set, thereafter chemically breaking the natural occurring disulfide bonds of the hair, and finally oxidizing the hair to create new disulfide bonds to set the hair into the new form, the improvement comprising:

the step of breaking the disulfide bonds with a reducing agent comprising TCEP in a mildly acidic environment, and to complete the reduction in about 10–15 minutes, the reducing agent being water soluble at about 300 g/L, and being odorless and non-volatile.

5,690,957
PROSTAGLANDIN DERIVATIVES

Akio Nishiura; Takuya Seko; Ryoji Matsumoto, and Shin-ichi Hamano, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

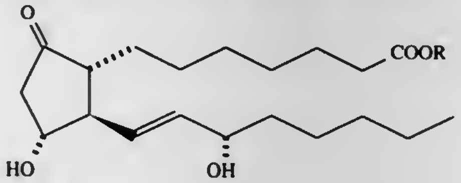
Filed Aug. 14, 1996, Ser. No. 699,700

Claims priority, application Japan, Aug. 16, 1995, 7-230763

Int. Cl.^{6} C07C *405/00;* **A61K** *31/557*

U.S. Cl. 424—450 **12 Claims**

1. A prostaglandin E_1 ester derivative of formula (I):



(I)

wherein R is

(i) $—CH_2CH_2—O—CO—R^1$, or

(ii) $—CH_2CH_2—O—CO—CH_2—O—R^2$, and

R^1 and R^2 each independently is C10–20 alkyl;

or a cyclodextrin clathrate thereof.

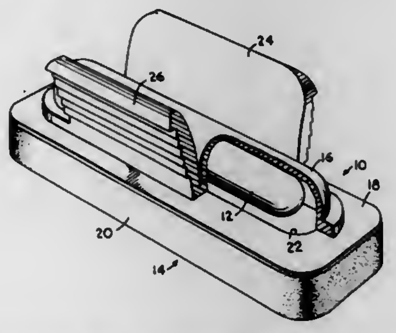
5,690,958
UNIT DOSE CHLORHEXADINE GLUCONATE(CHG) APPLICATOR HAVING EXTENDED CHG SHELF LIFE

Patrick D. McGrath, Lenexa, Kans., assignor to Medi-Flex Hospital Products, Inc., Overland Park, Kans.

Filed Sep. 30, 1996, Ser. No. 723,686

Int. Cl.^{6} A61K *9/48*

U.S. Cl. 424—451 **14 Claims**



1. A bactericidal agent dosage applicator having an extended shelf life comprising:

a unit dose of chlorhexadine gluconate; and

a manually crushable glass ampule containing said unit dose of chlorhexadine gluconate,

the internal volume of said ampule not being significantly greater than the volume of said unit dose,

said glass ampule having an extremity which was closed at the time of filling of the ampule with the chlorhexadine gluconate and an extremity which was heat-sealed after filling of the ampule with the chlorhexadine gluconate to provide a hermetic closure for the ampule.

5,690,959
PHARMACEUTICAL THERMAL INFUSION PROCESS

Nageswara R. Palepu, Lansdale, and Gopadi M. Venkatesh, King of Prussia, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

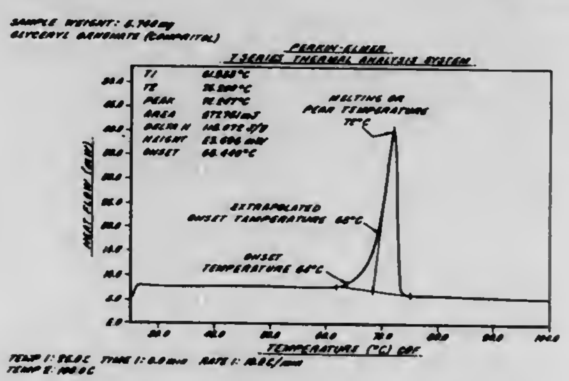
PCT No. PCT/US94/05930, § 371 Date May 4, 1995, § 102(e) Date May 4, 1995, PCT Pub. No. WO94/27557, PCT Pub. Date Dec. 8, 1994

PCT Filed May 26, 1994, Ser. No. 433,368

Claims priority, application United Kingdom, May 29, 1993, 9311188; Aug. 5, 1993, 9316252; Sep. 11, 1993, 9318920

Int. Cl.^{6} A61K *9/24*

U.S. Cl. 424—472 **34 Claims**



1. A process for preparing controlled release solid dosage forms of pharmaceutically active materials which comprises:

(a) blending a pharmaceutically active material, a hydrophobic waxy material and optional additives;

(b) compacting, milling and screening said blend; and

(c) thermally infusing the screened blend in a granulator at a thermal infusion temperature to yield thermal infusion granules.

5,690,960
PHARMACEUTICAL FORMULATION OF OMEPRAZOLE

Inga Slv Bengtsson, Göteborg, and Kurt Ingmar Lövgren, Mölnlycke, both of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

PCT No. PCT/SE94/00681, § 371 Date Sep. 27, 1994, § 102(e) Date Sep. 27, 1994, PCT Pub. No. WO95/01783, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 8, 1994, Ser. No. 313,036

Claims priority, application Sweden, Jul. 9, 1993, 9302395

Int. Cl.^{6} A61K *9/32;9/36*

U.S. Cl. 424—480 **22 Claims**

1. A stable oral formulation comprising:

a core containing a magnesium salt of omeprazole said salt having more than 70% crystallinity as determined by x-ray powder diffraction;

a subcoating layer; and

an enteric coating layer, whereby the thickness of the enteric coating layer does not effect the release of omeprazole into solution at the pH predominantly present in the small intestine.

5,690,961
ACIDIC POLYSACCHARIDES CROSSLINKED WITH POLYCARBOXYLIC ACIDS AND THEIR USES

Tuyen T. Nguyen, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 22, 1994, Ser. No. 362,689

Int. Cl.^{6} A61K *47/36;* **C08L** *5/00;* **C08J** *3/24;* **C08K** *5/092*

U.S. Cl. 424—488 **4 Claims**

1. A crosslinked composition comprising linked hyaluronic acid or salts thereof wherein at least one hydroxyl group of each linked hyaluronic acid or salt thereof is esterified with a carboxyl group contained in a monomeric polycarboxylic acid having at least four carboxyl groups, wherein at least two carboxyl groups of the polycarboxylic acid are esterified with hydroxyl groups of the polysaccharides, and wherein said crosslinked composition has substantially greater resistance to the enzyme hyaluronidase or to hydroxyl radicals than does hyaluronic acid or salts thereof.

5,690,962
STABLE SOLID FORMULATION OF ENALAPRIL SALT AND PROCESS FOR PREPARATION THEREOF

Bernard Charles Sherman, Willowdale, Canada, assignor to Apotex Corporation, Buffalo Grove, Ill.

Continuation of Ser. No. 511,297, Aug. 4, 1995, Pat. No. 5,573,780. This application Sep. 10, 1996, Ser. No. 711,826

Int. Cl.^{6} A61K *9/14;9/16*

U.S. Cl. 424—489 **8 Claims**

1. A process of manufacture of a pharmaceutical solid composition comprising enalapril sodium, which process comprises the steps of:

i)

a) mixing enalapril maleate with an alkaline sodium compound and at least one other excipient, adding water sufficient to moisten, and mixing to achieve a wet mass, or

b) mixing enalapril maleate with at least one excipient other than an alkaline sodium compound, adding a solution of an alkaline sodium compound in water, sufficient to moisten and mixing to achieve a wet mass; thereby to achieve a reaction without converting the enalapril maleate to a clear solution of enalapril sodium and maleic acid in water.

ii) drying the wet mass, and

iii) further processing the dried material into a pharmaceutical solid composition.

5,690,963
FREEZE DRIED RED BLOOD CELLS

Barry J. Spargo, Baltimore; Alan S. Rudolph, Potomac, both of Md.; Byeong S. Chang, Thousand Oaks, Calif., and Thomas R. Groel, II, Manassas, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1995, Ser. No. 497,708

Int. Cl.^{6} A61K *35/18;* **A01N** *1/02*

U.S. Cl. 424—533 **4 Claims**

1. A process for treating erythrocytes for storage comprising in order the steps of

(a) resuspending erythrocytes in a first phosphate-citrate incubation buffer which comprises glucose in a concentration range of 10–1500 mM, sodium citrate in a concentration range of 1–50 mM, sodium diphosphate dibasic in a concentration range of 1–50 mM, sodium phosphate monobasic in a concentration range of 1–15 mM, ammonium phosphate in a concentration range of 1–100 mM and adenine in a concentration range of 0–5 mM;

(b) incubating the resuspended erythrocytes in said phosphate-citrate incubation buffer;

(c) removing said first phosphate-citrate incubation buffer;

(d) resuspending the incubated erythrocytes in a second phosphate-citrate incubation buffer comprising the phosphate-

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citrate incubation buffer of step (a) and an additional carbohydrate in a concentration of from about 500 to about 1000 mM;

(e) incubating the resuspended erythrocytes in the second phosphate-citrate incubation buffer;

(f) removing the second phosphate-citrate incubation buffer;

(g) resuspending the incubated erythrocytes in a phosphate-citrate lyophilization buffer comprising the phosphate-citrate incubation buffer of step (d) and a polymer having a molecular weight of from about 100 kD to about 500 kD in a concentration of about 10–30% w/v;

(h) lyophilizing the resuspended erythrocytes of step (g) by the steps of

(1) slowly cooling the resuspended erythrocytes to −15° C.;

(2) incubating said cooled erythrocytes at −10° to −15° C.;

(3) primary drying the erythrocytes of step (2) by further cooling said erythrocytes of step (2) to −50° C. and placing said primary-dried erythrocytes under a vacuum;

(4) further drying the primary-dried erythrocytes of step (3) by keeping the primary-dried erythrocytes under vacuum while elevating the temperature of said primary-dried erythrocytes to −15° C., until the residual water content of the lyophilized erythrocytes is less than 10% by weight;

(i) sealing the lyophilized erythrocytes under vacuum for storage; and

(j) storing the sealed erythrocytes;

wherein the step (b) of incubating the erythrocytes in the first phosphate-citrate incubation buffer is carried out for a sufficient time such that when the stored erythrocytes of step (j) are subsequently rehydrated, the rehydrated erythrocytes have an ATP level of at least 100% and a 2,3 DPG level of at least 150–200% that of freshly drawn packed erythrocytes.

5,690,964
NON-TOXIC RODENT DETERRENT

Cindy J. Hill, 18511 - 273rd Ave. SE., Monroe, Wash. 98322

Filed Nov. 6, 1996, Ser. No. 743,890

Int. Cl.^{6} A01N *25/08;25/26;63/00*

U.S. Cl. 424—545 **10 Claims**

1. A non-toxic mice and rat (*Rattus norvegicus* and/or *Rattus rattus*) deterrent which comprises:

a container; and

an effective amount of deterrent material, said deterrent material residing inside said container, said deterrent material comprising:

dried fecal matter from a mammal of the Mustelidae Family; and

substrate coated with dried urine from a mammal of the Mustelidae Family.

5,690,965

Patent Not Issued For This Number

5,690,966
PROCESS FOR THE PREPARATION OF AN EXTRACT FROM HUMAN PLACENTA CONTAINING GLYCOSPHINGOLIPIDS AND ENDOTHELLIN-LIKE CONSTITUENT PEPTIDES USEFUL FOR THE TREATMENT OF VITILIGO

Ranjan Bhadra; Prajnamoy Pal, both of Calcutta, India; Rabindra Roy, Dickinson, Tex., and Ajit Kumar Dutta, Calcutta, India, assignors to Council of Scientific & Industrial Research, India

Filed Oct. 17, 1996, Ser. No. 734,462

Int. Cl.^{6} A61K *35/50;35/12;7/42*

U.S. Cl. 424—583 **9 Claims**

1. A process for the preparation of an extract from human placenta containing glycosphingolipids and endothelin-like peptides useful for the treatment of vitiligo which comprises:

(a) chopping the whole placenta into small pieces;

(b) triturating the chopped material by a known method using an aqueous solvent;

(c) extracting the whole triturated material by heating in a phased manner, first at about 40°–50° C. for about 20–40 minutes and then at about 60°–70° C. for about 5–15 minutes, avoiding the application of direct heat;

(d) aging the triturated and heated material in the dark for a suitable period of time at room temperature while minimizing exposure to air;

(e) filtering through a coarse filtering aid to remove larger residues/tissue debris;

(f) depending on the solvent concentration, adjusting said concentration to a strength of not less than 40% and not more than 60% by weight using distilled water;

(g) aging the supernatant further by keeping the material for a suitable period of time in the dark at room temperature while minimizing exposure to air;

(h) filtering through a finer filtering aid;

(i) aging the supernatant thus obtained to allow finer particles to settle down and

(j) centrifuging the resultant material to get the clear straw colored extract.

5,690,967
COMPOSITIONS FOR IMPROVED TOPICAL DELIVERY OF LACTIC ACID

Ruey J. Yu, Ambler, and Eugene J. Van Scott, Abington, both of Pa., assignors to Tristrata Technology, Inc., Wilmington, Del.

Continuation of Ser. No. 135,841, Oct. 7, 1993, which is a continuation of Ser. No. 840,149, Feb. 24, 1992, abandoned, which is a division of Ser. No. 393,749, Aug. 15, 1989, Pat. No. 5,091,171, which is a continuation-in-part of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 472,310

Int. Cl.^{6} A61K *31/66;31/70;31/19*

U.S. Cl. 424—642 **12 Claims**

1. A composition comprising in combination lactic acid and an amphoteric or pseudoamphoteric agent selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, cysteine, cystine, methionine, asparagine, glutamine, arginine, lysine, 5-hydroxylysine, histidine, phenylalanine, tyrosine, tryptophan, 3-hydroxyproline, 4-hydroxyproline, proline, homocysteine, homocystine, homoserine, ornithine, citrulline, creatine, aminoaldonic acids, aminouronic acids, aminoaldaric acids, lauryl aminopropylglycine, neuraminic acid, desulfated heparin, deacetylated hyaluronic acid, hyalobiuronic acid, chomdrosine, deacetylated chondroitin, creatinine, 2-aminobutanoic acid, 4-aminobutanoic acid, 2-amino-2-methylpropanoic acid, 2-methyl-3-aminopropanoic acid, theanine, phenylglycine, canavanine, canaline, 4-hydroxyarginine, 4-hydroxyornithine, 2,4-diaminobutanoic acid, 2,3-diaminopropanoic acid, 2,6-diaminopinelic acid, 2-amino-3-phenylbutanoic acid, taurine, methionine sulfoxide, methionine sulfone, 3,5-diiodotyrosine, thyroxine, monoiodotyrosine, pipecolic acid, 4-aminopipecolic acid, 4-methylproline, glycylglycine, carnosine, anserine, ophidine, homocarnosine, β-alanyllsine, β-alanylarginine, glutathione, ophthalmic acid, norophthalmic acid, cocoamphoglycine, cocoamphopropionate, cocoamphopropylsulfonate, phosphatidyl ethanolamine, phosphatidyl serine, and sphingomyelin, wherein said composition has a pH of less than or equal to 4.2.

5,690,968
ANALGESIC ANAESTHETIC COMPOSITIONS

John Alexander Strachan Ross, Aberdeen; Michael Eric Tunstall, Stonehaven, both of Scotland, and Robert Colin Rodgers, Carlisle, England, assignors to Aberdeen University, Aberdeen, Scotland

PCT No. PCT/GB94/00839, § 371 Date Oct. 31, 1995, § 102(e) Date Oct. 31, 1995, PCT Pub. No. WO94/23727, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 21, 1994, Ser. No. 537,809

Claims priority, application United Kingdom, Apr. 22, 1993, 93 08 306

Int. Cl.^{6} A61K *33/00;31/08*

U.S. Cl. 424—718 **5 Claims**

1. An analgesic anesthetic composition comprising up to 50% v/v nitrous oxide, an analgesically effective amount of an ether-based analgesic anesthetic selected from the group consisting of isoflurane, enflurane, sevoflurane, and desflurane and the balance being oxygen and another respirable gas disposed in a single container above its pseudo-critical temperature at a pressure of up to 2000 psi, thereby to form and maintain an analgesically effective homogenous composition in use.

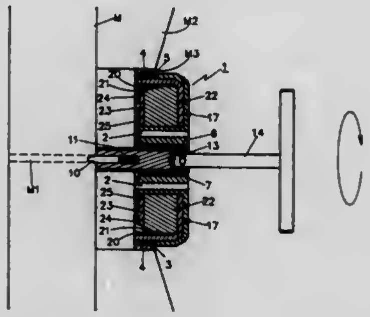
5,690,969
CENTER POSITION DEVICE FOR A MOLD

Chin-Lung Fang, 9F3R,No.210,Chung Hsueh Rd., Tainan, Taiwan

Filed Apr. 15, 1996, Ser. No. 632,264

Int. Cl.^{6} B29C *45/17*

U.S. Cl. 425—3 **5 Claims**



1. A center position device for a mold comprising:

a sleeve tubular bolt; a plurality of engagement blocks; a headless tubular bolt; an annular permanent magnet; a correct pin; an outer housing of a U-shaped cross-section having an open lower side, a closed upper side, a plurality of view holes spaced equidistantly around a center through threaded hole, a center tubular wall defining said center through hole and extending down from the center of the closed upper side, said center through threaded hole being for said sleeve tubular bolt to engage therein, and a vertical peripheral surface provided with a plurality of dovetail-shaped grooves spaced apart equidistantly for said plurality of engagement blocks to engage therewith, said sleeve tubular bolt having an inner female thread for said headless tubular bolt to engage therewith;

an inner housing of a U-shaped cross-section fitted in said outer housing and having an open lower side, a closed upper side with a center hole for said center tubular wall of said outer housing to pass through and an inner annular cavity for said annular permanent magnet to fit therein;

a disc with an annular projecting down wall fixed under said permanent magnet and secured in place by two washers so as to form a flat surface at said lower side of said outer housing; and

two annular magnetic bands formed by means of said permanent magnet to enable said center position device to be attracted to an outer surface of said mold, with said correct pin being fitted in said headless bolt and being fitted in an injecting hole of said mold, whereby when said mold is hung up and moved to a mold wall of an injecting molding machine said center position device is fitted in a threaded rod hole of said mold wall, and said threaded rod hole being thus aligned to the injecting hole of said mold.

5,690,970
SPLIT MOLD OPENING/CLOSING DEVICE FOR A TIRE VULCANIZER

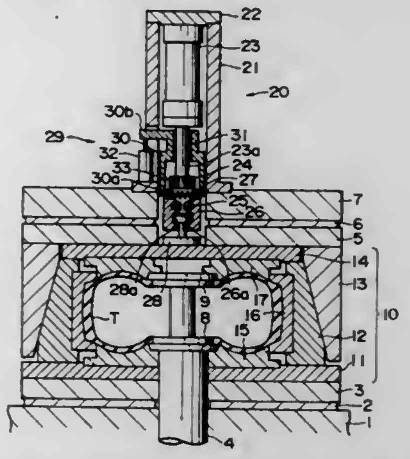
Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1996, Ser. No. 642,891

Claims priority, application Japan, May 31, 1995, 7-133844

Int. Cl.^{6} B29C *33/24;* **B29D** *30/06*

U.S. Cl. 425—46 **4 Claims**



1. A split mold opening/closing device for a tire vulcanizer, which is used by being incorporated in a tire vulcanizer, comprising: a flange fixed to either one of a top plate of a split mold and a piston rod tip end of a split mold opening/closing cylinder, a plurality of fingers assembled to the other of the top plate of the split mold and the piston rod tip end of the split mold opening/closing cylinder in such a manner as to be capable of oscillating, and a finger driving device for holding and releasing said flange by oscillating said fingers.

5,690,971
TILTABLE EXTRUSION DIE HAVING SEALING LIP CONNECTED BY THIN ANNULAR ZONE

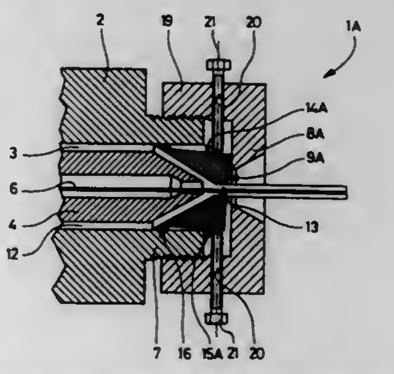
Bruno Buluschek, Echandens, Switzerland, assignor to E. Kertscher S.A., Yvonand, Switzerland

Filed Jun. 26, 1996, Ser. No. 670,431

Claims priority, application France, Jun. 29, 1995, 95 07845

Int. Cl.^{6} B29C *47/06*

U.S. Cl. 425—113 **5 Claims**



1. An extrusion head for extruding plastic material, said head comprising:

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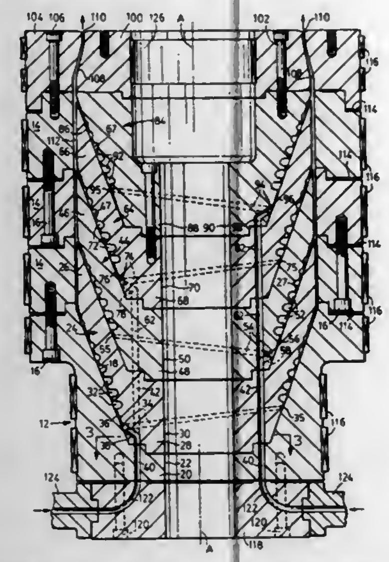
- a body having a hollow generally cylindrical shape with an internal surface defining at least in part a first duct extending in an axial direction and having a first diameter;
- a die having one end extending into said first duct, said die having a generally cylindrical external surface with a diameter less than said first diameter to permit tilting of said die relative to said axial direction, said die having an internal surface defining at least in part a second duct; and
- a sealing device for sealing a junction between said first duct and said second duct to permit flow of a plastic material under high pressure between the first and second ducts even though said die is tilted relative to said axial direction, said sealing device comprising a metal annular lip protruding radially from the external cylindrical surface of said die at said one end of said die, said lip being connected to said die by a thin annular zone, said lip having an external cylindrical surface abutting the internal surface of said body under a mechanical bias due to dimensional tolerances of said external surface of said lip and said internal surface of said body, said annular zone being thin enough to flex when said die is not aligned in said axial direction with said first duct.

5,690,972

ANNULAR CO-EXTRUSION DIE

Mirek Planeta; Surendra M. Sagar, both of Mississauga, and Weining Song, Markham, all of Canada, assignors to Macro Engineering & Technology Inc., Mississauga, Canada
Filed Jul. 1, 1996, Ser. No. 674,004
Int. Cl.^{6} B29C *47/26*
U.S. Cl. 425—133.1 **7 Claims**



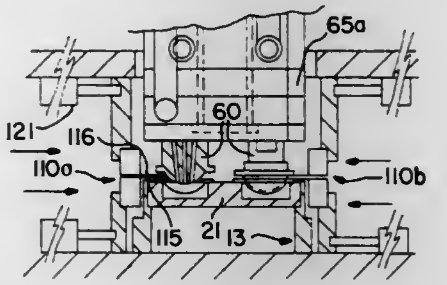
1. An annular co-extrusion die for extruding multi-layer tubular plastic film, said die comprising:

- inner die members stacked one upon another and having radially outwardly extending surfaces forming radially outwardly extending helical passages between respective pairs of said die members, each inner die member also having a central aperture,
- an annular outer die member surrounding said stacked inner die members and forming a longitudinally extending annular passage therebetween for conveying plastic material from said radially outwardly extending helical passages to an annular extrusion orifice,
- each inner die member forming with an adjacent inner die member a first feed passage extending at least partly around the inner die member radially inwardly of the helical passages, said inner die member and the adjacent inner die member having a circumferentially extending clearance therebetween to enable plastic material fed into the first feed passage to pass through said clearance into the helical passages,
- at least one said inner die member also having further feed passages spaced around said central aperture and extending substantially parallel to the longitudinal axis of the die from a lower end of the at least one said inner die member to an upper end thereof for respective communication with said first feed passage or at least one further feed passage of the inner die member immediately above, and
- the die also having passages in a lower end portion thereof for feeding different plastic materials from extruders to said further feed passages in the inner die members.

5,690,973

MOLD SEPARATION APPARATUS

Ture Kindt-Larsen, Holte, Denmark; Stephen Robert Beaton, Neptune Beach, Fla.; Wallace Anthony Martin, Orange Park, Fla.; Stephen Craig Pegram, Jacksonville, Fla., and Craig William Walker, Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.
Division of Ser. No. 258,265, Jun. 10, 1994. This application Jun. 5, 1995, Ser. No. 462,501
Int. Cl.^{6} B29D *11/00*
U.S. Cl. 425—436 R **9 Claims**



1. A steam nozzle assembly for heating a back curve half of a contact lens mold assembly, wherein said contact lens mold assembly includes a contact lens molded between a front curve half and a back curve half, said steam nozzle assembly including:

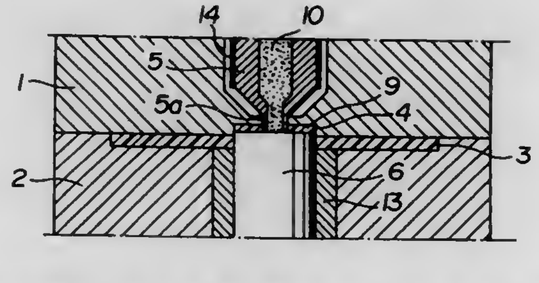
- (a) a plurality of steam nozzles for engaging a plurality of contact lens mold assemblies, each of said nozzles including:
  - (i) means for sealing said nozzle to said mold assembly to create a heating chamber between said nozzle and said contact lens mold assembly;
  - (ii) a steam orifice for discharging steam into said heating chamber; and
  - (iii) at least one port defined in each of said nozzles for exhausting steam from said heating chamber;
- (b) means for moving said steam nozzles into engagement with said contact lens mold assemblies;
- (c) a first plenum for distributing steam to each of said nozzles; and
- (d) a second plenum for drawing a vacuum through each said port in each of said nozzles to exhaust steam from said heating chamber whereby a temperature gradient may be created between said back curve mold half and the contact lens in said contact lens mold assembly.

5,690,974

METAL MOLD FOR MOLDING RUNNERLESS PRODUCT

Kazuki Miyairi, Hanishina-gun, Japan, assignor to Nissei Plastic Industrial Co., Ltd., Nagano-ken, Japan
Filed Apr. 10, 1996, Ser. No. 631,614
Claims priority, application Japan, Apr. 17, 1995, 7-114036
Int. Cl.^{6} B29C *45/38*
U.S. Cl. 425—577 **6 Claims**

1. A metal mold for molding a runnerless product, said mold comprising:



- a stationary mold half provided at the center thereof with a recess having a port at the center thereof,
- a movable mold half provided with a compression core to be retractably received by said recess, said stationary and movable mold halves defining a cavity for the runnerless product,
- a hot nozzle disposed in the port of said recess of the stationary mold half and having a tip projecting therefrom to allow resin to be left around the nozzle,
- where a temporary runner section and a gate are defined by said recess and the compression core so as that they are closable by the movement of said compression core such that said temporary runner section and said gate are occupied by said compression core when said compression core is retractably received by said recess.

5,690,975

METHODS FOR PRODUCING CALCIUM ENRICHED FERMENTED MILK AND FERMENTED MILK DRINK

Ryoichi Akahoshi; Mika Irie, and Yoshiharu Kuma, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan
Filed Oct. 13, 1995, Ser. No. 542,922
Claims priority, application Japan, Oct. 17, 1994, 6-277085
Int. Cl.^{6} A23C *9/12*
U.S. Cl. 426—34 **5 Claims**

1. A method for producing calcium enriched fermented milk or fermented milk drink having excellent physical stability, which comprises separately adding blockwise-type HM pectin and calcium, individually, either or both of them, together with syrup into lactic acid-fermented acidified milk, and then subjecting the resulting mixture to a homogenizing treatment.

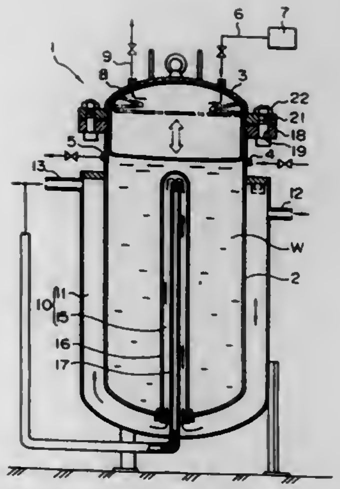
5,690,976

METHOD OF MANUFACTURING COLORED ICE AND APPARATUS THEREFOR

Junya Nakayama, Kawaguchi, Japan, assignor to Nakayama Engineering Co. Ltd., Kawaguchi, Japan
Filed Oct. 16, 1995, Ser. No. 543,642
Int. Cl.^{6} F25D *31/00*
U.S. Cl. 426—68 **13 Claims**

1. A method of manufacturing colored ice which comprises:

- dissolving coloring agent in source liquid to form colored source liquid;
- placing colored source liquid in a pressure resistant housing, said housing comprising an inflatable, resilient pouch which separates a pressurizing agent from direct contact with the colored source liquid; and
- during freezing of the colored source liquid, injecting the pressurizing agent into said pouch and varying the level of high and low pressure on the colored source liquid, such that at levels of high pressure, there is contact between said pouch and the surface of the colored liquid.



5,690,977

TUBULAR FOOD CASING HAVING A MODIFIED LIQUID SMOKE SOLUTION APPLIED THERETO AND PROCESS OF MAKING

Klaus-Dieter Hammer, Mainz-Mombach; Leo Mans, Saulheim; Manfred Siebrecht, and Hermann Winter, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Continuation of Ser. No. 26,827, Mar. 5, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 375,171
Claims priority, application Germany, Mar. 6, 1992, 42 07 131.3
Int. Cl.^{6} A22C *13/00*
U.S. Cl. 426—105 **24 Claims**

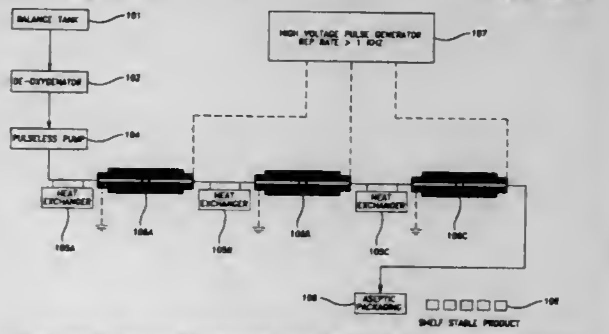
1. A tubular cellulose hydrate food casing having a modified liquid smoking solution applied to one or both of its inner and outer surfaces wherein the modified liquid smoking solution comprises a mixture of:

- a) an unmodified aqueous liquid smoke solution,
- b) an oil or lecithin,
- c) an alkaline neutralizing agent,
- d) a viscosity increasing component, and
- e) one or more emulsifiers.

5,690,978

HIGH VOLTAGE PULSED ELECTRIC FIELD TREATMENT CHAMBERS FOR THE PRESERVATION OF LIQUID FOOD PRODUCTS

Yongguang Yin, Changchun, China; Quinghua Howard Zhang, Columbus, and Sudhir Kartikeya Sastry, Dublin, both of Ohio, assignors to Ohio State University, Columbus, Ohio
Filed Sep. 30, 1996, Ser. No. 723,419
Int. Cl.^{6} A23L *3/00;3/26;3/32*
U.S. Cl. 426—237 **20 Claims**



1. A pulsed electric field treatment device for preserving a liquid product, comprising:

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(a) a first electrode for supplying an electric field to the liquid product and having an electrode flow chamber for accepting the liquid product and for making electrical contact with the liquid product; wherein the electrode flow chamber comprises an inlet aperture and an outlet aperture;
(b) a second electrode for supplying an electric field to the liquid product and having an electrode flow chamber for accepting the liquid product and for making electrical contact with the liquid product; wherein the electrode flow chamber comprises an inlet aperture and an outlet aperture;
(c) at least one insulator positioned between the first and second electrodes for electrically insulating the first and second electrodes from each other; the insulator comprising an insulator flow chamber, for accepting liquid product from the electrode flow chamber of the first electrode, comprising an inlet aperture and an outlet aperture;
  (1) wherein the insulator flow chamber inlet aperture and the first electrode flow chamber outlet aperture are positioned adjacent to each other and have substantially similar cross-sectional geometry; and
  (2) wherein the insulator flow chamber outlet aperture and the second electrode flow chamber inlet aperture are positioned adjacent to each other and have substantially similar cross-sectional geometry; and

wherein the pulsed electric field treatment device permits a continuous flow of liquid product.

5,690,979

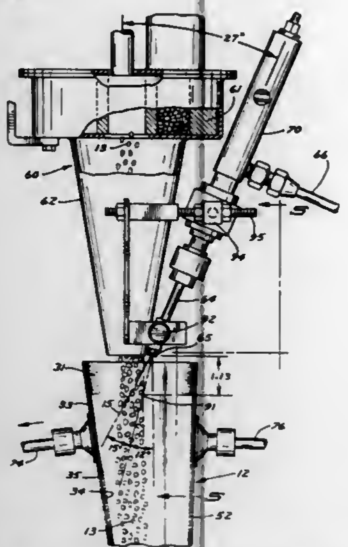
METHOD OF PREPARING REDUCED FAT MICROWAVE POPCORN

Tricia J. Bourns, St. Louis Park; Brian E. Glass, Brooklyn Park; Timothy J. Gluszak, Maple Grove, and Myron M. Uecker, Buffalo, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 86,607, Jul. 2, 1993, abandoned. This application Mar. 10, 1995, Ser. No. 402,276

Int. Cl.⁶ A23L *1/18*

U.S. Cl. 426—307 **22 Claims**



1. A method for filling a microwave popcorn bag with unpopped popcorn kernels coated with a fat or fat/salt slurry evenly dispersed thereon having improved evenness of coating of the kernels with the fat, comprising the steps of:

A. providing a microwave popcorn (**12**) having a sealed bottom end (**28**), an open sealable top end (**30**) defining an upper orifice and a transversely extending seal area (**31**) in an open configuration and in a vertically aligned orientation;
B. filling the bag with a quantity of unpopped popcorn kernels (**13**), and slurry (**15**) comprising the substeps of:
  1. dispensing a quantity of unpopped popcorn kernels in an airborne stream; and concurrently
  2. spraying a quantity of a fat or fat/salt slurry into the airborne popcorn stream to coat the popcorn kernels with the slurry as the popcorn kernels are charged into the bag, wherein the slurry is fluid and has a temperature ranging from about 114° to 130° F., and wherein the weight ratio of popcorn kernels to slurry ranges from about 5 to 30:1; and
C. sealing the open top end of the popcorn bag (12).

5,690,980

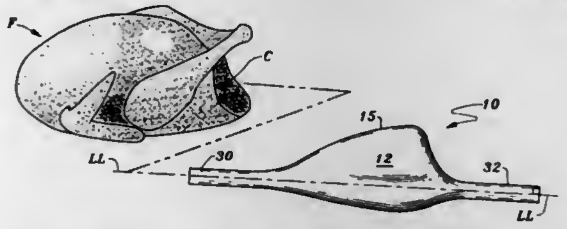
METHOD AND APPARATUS FOR THE PREPARATION OF FOWL

Robert L. Fraga, 886 Cardoze, Tulare, Calif. 93274

Division of Ser. No. 539,309, Oct. 4, 1995, Pat. No. 5,586,489. This application Aug. 12, 1996, Ser. No. 695,648

Int. Cl.⁶ A23L *1/00*

U.S. Cl. 426—523 **4 Claims**



1. The method of preparing a previously dressed fowl for consumption, comprising the steps of:

forming a heat transfer member along a horizontal axis, said member having an exterior surface, such that the exterior surface of said member substantially conforms to the cavity within a dressed fowl, by the removal of internal organs;
preheating said heat transfer member to a predetermined temperature;
inserting said member into the cavity of the fowl in such a manner that the exterior surface of said member makes substantial heat transferring contact with the wall of the cavity;
placing the fowl, with said member inserted, into a heated environment, applying heat to the heat transfer member so as to cause the heat to uniformity transmit to the interior cavity wall of the fowl to thereby initially sear in juices, and continuously applying heat to the heat transfer member so as to cook the fowl from the interior while applying heat to the exterior of the fowl to cook the fowl for consumption.

5,690,981

LOW CALORIE FOODSTUFF, AQUEOUS PASTE COMPOSITION, AS WELL AS PRODUCTION PROCESS THEREOF

Kunihiko Watanabe; Hideo Kanoh; Shigeru Yamanaka; Atsushi Okiyama, and Takahide Kawanishi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 369,261, Jan. 5, 1995, abandoned, which is a continuation of Ser. No. 247,409, May 23, 1994, abandoned, which is a continuation of Ser. No. 1,223, Jan. 6, 1993, abandoned, which is a continuation of Ser. No. 723,651, Jun. 26, 1991, abandoned, which is a continuation of Ser. No. 565,576, Aug. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,573, Aug. 18, 1989, abandoned. This application Aug. 22, 1995, Ser. No. 518,016

Claims priority, application Japan, Aug. 23, 1988, 63-208562; Oct. 7, 1988, 63-253490; Feb. 21, 1989, 1-40672; Apr. 17, 1989, 1-96780

Int. Cl.⁶ A23L *1/05*

U.S. Cl. 426—531 **7 Claims**

1. A low calorie mayonnaise product or margarine product comprising as a substitute for part or all of protein, carbohydrate, oil, fat or a mixture thereof, 0.7 to 10% by weight of paste-like konjak mannan hydrogel, based on total weight of said product and measured on the basis of dry konjak mannan, said konjak mannan

hydrogel having a particle size of 5 to 80 μm and a water holding capacity of at least 9 grams of water per gram of dry konjak mannan, obtained by mechanically pulverizing konjak gel in the presence of water and hydrolyzing the resultant pulverized mixture to partially decompose it, followed by centrifugation to form a centrifuged product.

5,690,982

BAKED POTATO-BASED CHIP-LIKE SNACK FOODS AND METHOD OF PREPARING

Richard D. Fazzolare, Randolph; Joseph A. Szwerc, Mahwah, and Richard R. McFeaters, Teaneck, all of N.J., assignors to Nabisco Technology Company, Wilmington, Del.

Continuation of Ser. No. 257,814, Jun. 8, 1994, Pat. No. 5,554,405, which is a continuation of Ser. No. 848,889, Mar. 10, 1992, Pat. No. 5,320,858, which is a continuation of Ser. No. 310,096, Feb. 14, 1989, Pat. No. 5,104,673, which is a continuation of Ser. No. 62,673, Jun. 16, 1987, Pat. No. 4,834,996, which is a continuation-in-part of Ser. No. 772,918, Sep. 5, 1985, Pat. No. 4,873,093, which is a continuation-in-part of Ser. No. 681,647, Dec. 14, 1984, abandoned. This application Jun. 2, 1995, Ser. No. 459,241

Int. Cl.⁶ A23L *1/164;1/217*

U.S. Cl. 426—550 **37 Claims**

1. A baked starch-based snack consisting essentially of at least about 68% by weight, based upon the weight of the snack, of a blend of a gelatinized corn starch and at least one starch-containing ingredient selected from the group consisting of dried potato products, said snack being produced by baking a sheeted dough having a plurality of laminae to obtain a crisp, chip-like texture, and a thin, flat chip-like appearance or a thin, partially delaminated, blistered chip-like appearance, said blistered appearance being present over the surface of said snack.

5,690,983

METHOD OF PRODUCING UNFROZEN EXPANDED ICE CREAM MIX POSSESSING SUPERIOR STORAGE AND SHELF-LIFE PROPERTIES

Per Sponholtz, Gentofte, Denmark, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Continuation of Ser. No. 482,793, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 228,009, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 899,322, Jun. 16, 1992, abandoned. This application Jul. 29, 1996, Ser. No. 688,143

Claims priority, application Sweden, Jun. 18, 1991, 9101883

Int. Cl.⁶ A23G *9/02*

U.S. Cl. 426—566 **15 Claims**

1. A method of producing and pre-distribution preparing unfrozen, expanded ice cream mix with superior storage and shelf-life properties comprising the steps of mixing together both the starting ingredients necessary for producing an ice cream mix and a combined emulsifier and stabilizer; said combined emulsifier and stabilizer consisting of a lactic acid ester of mono- or diglycerides of fatty acids 20–30%, microcrystalline cellulose 20–30%, modified starch 20–30%, and gelatin 10–20%; then homogenizing the ice cream mix, treating the homogenized ice cream mix to exterminate micro-organisms in the ice cream mix; continuously expanding the treated ice cream mix with cooling to about 5° C. until an overrun of about 90% is achieved, which expansion is retained during the shelf-life of said treated mix; and thereafter packing the expanded ice cream mix in packages ready for distribution employing a packing or filling machine, which from a web of a packaging material, forms, fills and seals the finished packages, and storing and distributing said unfrozen, expanded ice cream mix for a period of time at non-freezing refrigeration temperatures.

5,690,984

PROCESS FOR MAKING A BEVERAGE FROM PINE NEEDLES

Jung Geun Lim, 736, Hoengchon-Ri, Hoengchon-Myon, Hadong-Gun Kyungsangnamdo, Rep. of Korea

Filed Sep. 1, 1995, Ser. No. 522,569

Int. Cl.⁶ A23L *2/385*

U.S. Cl. 426—590 **20 Claims**

1. A method for making a pine needle beverage, consisting essentially of:

a) boiling a mixture of water, pine needles, licorice root, cinnamon powder, black bean, and *Ganoderma Lucidum*;
b) cooling the mixture;
c) reheating the mixture; and
d) filtering the mixture.

5,690,985

2-ELAIDOYLTRIACYLGLYCEROL AS A TEMPERING ACCELERATOR IN AN EDIBLE EMULSION SPREAD

Johanna Antonia Van Meeteren, Vlaardingen, and Leendert Hendrik Wesdorp, Schiedam, both of Netherlands, assignors to Van Den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 289,043, Aug. 11, 1994, abandoned, which is a continuation of Ser. No. 16,479, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 830,084, Feb. 3, 1992, abandoned. This application Oct. 15, 1996, Ser. No. 729,893

Claims priority, application United Kingdom, Feb. 4, 1991, 9102349

Int. Cl.⁶ A23D *7/02*

U.S. Cl. 426—601 **6 Claims**

1. A method of making an edible emulsion spread comprising the steps of:

(a) selecting a blend of spread fats;
(b) incorporating from 2 to 10 wt. % of a 2-elaidoyl triacylglycerol as a tempering accelerator in the blend of fats, provided that at least one of 1,3 position residues of the 2-elaidoyl triacylglycerol is a palmitic or stearic fatty acid residue; and
(c) forming an edible emulsion spread having N-line values at 10° C. of 20–40 and at 35° C. of 0–4.

5,690,986

OIL-IN-WATER TYPE EMULSION AND PROCESS FOR PRODUCING THE SAME

Yasuo Okutomi, and Toshihiro Shimada, both of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1996, Ser. No. 618,175

Claims priority, application Japan, Apr. 14, 1995, 7-089889

Int. Cl.⁶ A23D *7/00*

U.S. Cl. 426—604 **21 Claims**

1. An oil-in-water type emulsion comprising (1) an emulsifying agent, (2) a lysophospholipoprotein, (3) a protein other than said lysophospholipoprotein as component (2) (4) oil and (5) water, said protein (3) having a larger molecular weight than the protein as component (2).

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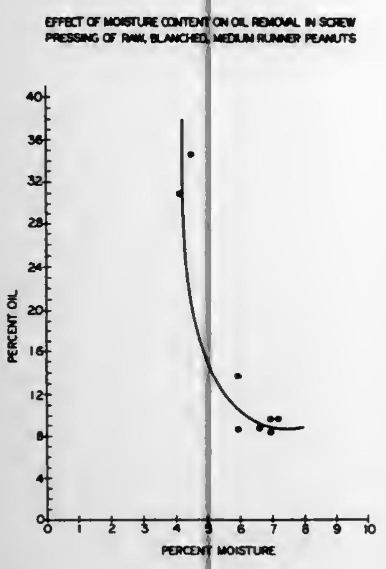
5,690,987
FOOD GRADE PROCESSING METHOD AND PRODUCTS OBTAINED THEREFROM

Wilbur A. Parker; James R. Baxley; Ricky C. Boyce, all of Edenton, and Thomas Mitchel Morris, Hertford, all of N.C., assignors to Seabrook Enterprises, Inc., Atlanta, Ga.

Continuation of Ser. No. 266,936, Jun. 27, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,339

Int. Cl.^{6} A23P *1/12*

U.S. Cl. 426—632 **30 Claims**



1. A continuous method for producing a high-quality, food-grade protein rich cake from edible oil seeds comprising the steps of:

(a) adjusting uncooked edible oil seeds to a selected moisture content;

(b) sterilizing the uncooked edible oil seeds by heating them for not more than approximately two minutes so that the edible oil seeds reach a final temperature of between about 71°–99 ° C. and so that the moisture content of the edible oil seeds is maintained at or decreased below the selected moisture content;

(c) preheating an expelling device to a temperature between about 107°–132° C.; and

(d) pressing the sterilized oil seeds in the heated expelling device so that low-fat solid protein rich cake and oil are separated from the sterilized oil seeds.

5,690,988
PET FOOD COMPOSITION OF IMPROVED PALATABILITY AND A METHOD OF ENHANCING THE PALATABILITY OF A FOOD COMPOSITION

Charles F. Lin; Jack K. Lin, both of Topeka; Dennis E. Jewell, Auburn; Philip W. Toll, Vally Falls; Neil P. Stout, Topeka, and Larry R. Prewitt, Auburn, all of Kans., assignors to Colgate Palmolive Company, New York, N.Y.

Filed Feb. 2, 1996, Ser. No. 594,607

Int. Cl.^{6} A23K *1/18;1/16;* **A23L** *1/29;1/302*

U.S. Cl. 426—635 **20 Claims**

1. A food composition having an enhanced palatability to pet animals comprising a nutritious food mass and a palatability enhancing amount of a choline compound of at least about 0.25% by weight.

5,690,989
MEAT STEAK PRODUCT

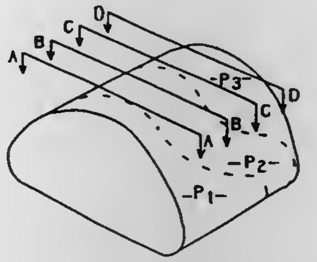
Edward Thomas Clarke; Harvey William Jull, both of Herefordshire, and Rebecca Susan Stock, Malvern, all of England, assignors to Sun Valley Poultry Limited, Hereford, United Kingdom

Division of Ser. No. 427,711, Apr. 19, 1995, Pat. No. 5,631,035, which is a continuation of Ser. No. 159,378, Nov. 29, 1993, abandoned. This application Aug. 12, 1996, Ser. No. 700,684

Claims priority, application United Kingdom, Oct. 1, 1991, 9120867

Int. Cl.^{6} A23L *1/314;1/318*

U.S. Cl. 426—641 **17 Claims**



1. A meat steak of predetermined size and shape, the steak produced by a method comprising;

(a) injecting a body of meat with a liquid comprising oil and water;

(b) forming the injected body of meat into an initial shape close to a final shape;

(c) freezing the initial shaped body of meat at a rate effective to limit the size of ice crystals formed within the body of meat;

(d) pressing the frozen body of meat into a desired shape under a pressure of 750 to 4000 psi, wherein the pressure is effective for producing liquification of ice in the body of meat such that muscle fibers in the body of meat are allowed to slip across one another without any significant disruption of muscle structure;

(e) quickly releasing the pressure applied in step (d) to re-freeze the ice liquified in step (d) and to limit ice-crystal growth during re-freezing; and then

(f) slicing the frozen body of meat into portions of desired predetermined size and shape, wherein the method provides portions of meat without significant disruption of the muscle structure of the meat and which portions retain the texture of untreated meat.

5,690,990
PROCESS FOR ENCAPSULATING THE FLAVOR WITH COLLOID GEL MATRIX

Michael J. Bonner, Westfield, N.J., assignor to Arnhem, Inc., Cranford, N.J.

Continuation-in-part of Ser. No. 361,445, Dec. 21, 1994, Pat. No. 5,498,439, which is a continuation of Ser. No. 208,894, Mar. 4, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,521

Int. Cl.^{6} A23L *1/221;1/222;1/05;1/318*

U.S. Cl. 426—650 **11 Claims**

1. The method for preparing a uniform suspension of at least one liquid flavor oil, oleoresin or spice encapsulated in a gel matrix comprising:

forming a gel matrix by high shear mixing a colloidal gelling agent in water at a temperature below ambient temperature and above the freezing point of water, for a time which is sufficient to form a gel matrix; and

dispersing said flavor oil, oleosin or spice into said gel matrix to thereby form a stable gel matrix of microencapsulated liquid flavor oil, oleoresin or spice.

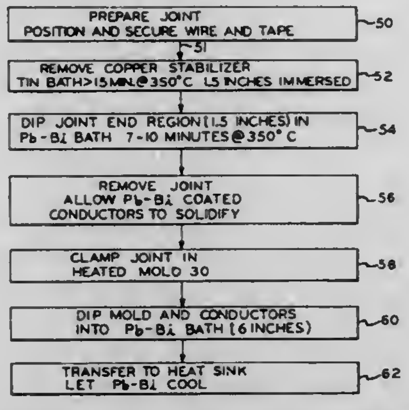
5,690,991
SUPERCONDUCTING JOINT BETWEEN NB$_3$SN TAPE AND NBTI WIRE FOR USE IN SUPERCONDUCTING MAGNETS

Bu-Xin Xu, Florence; O'Neil T. McClam, Effingham, and Geer Ward, Florence, all of S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 21, 1995, Ser. No. 576,707

Int. Cl.^{6} B05D *1/18;5/12*

U.S. Cl. 427—62 **20 Claims**


PREPARE JOINT POSITION AND SECURE WIRE AND TAPE
50
51
REMOVE COPPER STABILIZER TIN BATH>15MIN.@350°C 1.5 INCHES IMMERSED
52
DIP JOINT END REGION(1.5 INCHES) IN Pb-Bi BATH 7-10 MINUTES@350° C
54
REMOVE JOINT ALLOW Pb-Bi COATED CONDUCTORS TO SOLIDIFY
56
CLAMP JOINT IN HEATED MOLD 30
58
DIP MOLD AND CONDUCTORS INTO Pb-Bi BATH (6 INCHES)
60
TRANSFER TO HEAT SINK LET Pb-Bi COOL
62

1. A method of forming superconducting joints for use in superconducting magnets between an Nb_3Sn superconductor tape NbTi superconductor wire comprising;

positioning said Nb_3Sn superconductor tape into contact with said NbTi superconductor wire to form a contact area;

applying molten Pb-Bi to coat said contact area; and

allowing said coating to cool.

5,690,992
CATHODE RAY TUBE AND METHOD OF MANUFACTURING A CATHODE RAY TUBE

Leonardus Th. M. Van Hout, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 870,020, Apr. 17, 1992, Pat. No. 5,536,997. This application Apr. 1, 1996, Ser. No. 625,954

Claims priority, application European Pat. Off., May 8, 1991, 91201103

Int. Cl.^{6} B05D *5/06*

U.S. Cl. 427—64 **1 Claim**

1. A method of manufacturing a cathode ray tube comprising a glass neck portion and a cone portion, said method comprising providing a suspension of glass-enamel particles and particles of a material having a secondary emission coefficient smaller than 1 on the inside of the neck portion and then melting the glass-enamel particles to form a glass-enamel layer, the weight percentage of said particles of a material having a secondary emission coefficient smaller than 1 in said suspension being such that the weight percentage of said particles in said glass-enamel layer is higher than about 30% and the surface resistance of said glass-enamel layer ranges between about 10^{10} and 10^{14} Ω/□.

5,690,993
OVERCOATED MIGRATION IMAGING MEMBERS

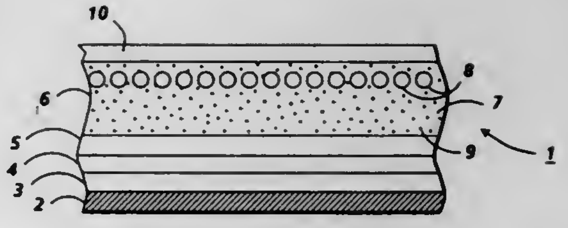
Shadi L. Malhotra, and Arthur Y. Jones, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1995, Ser. No. 432,448

Int. Cl.^{6} G03G *13/00*

U.S. Cl. 427—145 **11 Claims**

1. A process which comprises (a) providing a migration imaging member comprising (1) a substrate, and (2) a softenable layer situated on the substrate, said softenable layer comprising a softenable material and a photosensitive migration marking material; (b) applying to the surface of the softenable layer a composition comprising (1) a solvent selected from the group consisting of (A) methanol, (B) ethanol, (C) isopropanol, (D) n-propanol, (E) acetone, (F) water, and (G) mixtures thereof, and (2) an overcoating material selected from the group consisting of poly (hydroxyalkyl methacrylates), poly (hydroxyalkylacrylates), aryl celluloses, hydroxyalkyl cellulose acrylates, hydroxyaryl cellulose acrylates, hydroxyalkyl cellulose methacrylates, hydroxyaryl cellulose methacrylates, cellulose-acrylamide adducts, cyanoethylated celluloses, cellulose acetate hydrogen phthalates, hydroxypropylmethyl cellulose phthalates, hydroxypropyl methyl cellulose succinates, cellulose triacetates, and mixtures thereof; and (c) allowing the solvent to evaporate, thereby forming a layer of the overcoating material on the softenable layer.



5,690,994
POLYMETRIC FILM

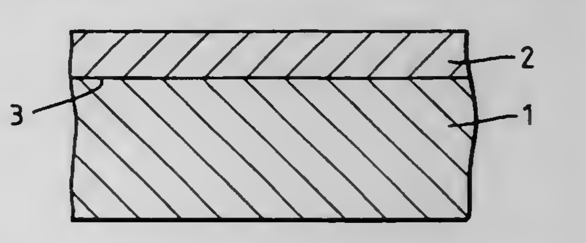
Julian Neal Robinson, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 257,460, Jun. 9, 1994, which is a continuation of Ser. No. 18,059, Feb. 17, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 465,096

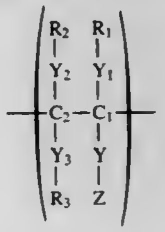
Claims priority, application United Kingdom, Feb. 17, 1992, 9203350

Int. Cl.^{6} B32B *27/06*

U.S. Cl. 427—171 **12 Claims**



1. A method of producing a coated film by forming a substrate layer of polymeric material, and applying, prior to the completion of any film stretching operation, to at least one surface of the substrate, a subbing layer composition comprising an organic acid which has a molecular weight in the range from 70 to 800 and a polymer comprising at least one or more repeating units comprising at least one or more pendant nitrogen atoms, the ratio of organic acid to polymer in the subbing layer being in the range from 1:0.1 to 20 by weight, said repeating unit having the structure



$$\left(\begin{array}{cc} R_2 & R_1 \\ | & | \\ Y_2 & Y_1 \\ | & | \\ -C_2 & -\,C_1- \\ | & | \\ Y_3 & Y \\ | & | \\ R_3 & Z \end{array}\right).$$

wherein

Z represents amine, amide, quaternary ammonium, and/or wherein Z is protonated and associated with a negatively charged counter ion wherein the counter ion is selected from the group consisting of halide, phosphate and carboxylate,

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R_1, R_2 and R_3 are the same or different and represent hydrogen, halogen, alkyl, nitrile, amine, amide, quaternary ammonium, ketone, ether, vinyl, and/or halide, phosphate or carboxylate salts thereof, and

Y, Y_1, Y_2 and Y_3 are optional alkylene groups having up to 10 carbon atoms, which may be the same or different.

5,690,995
SPRAY BOOTH FOR POWDER COATING

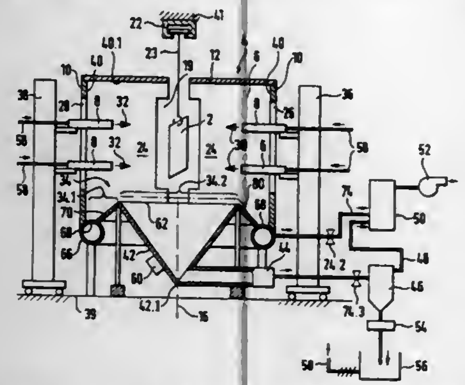
Gallus Fischli, Tubach; Silvano Gelain, Abwil, and Markus Lenherr, Arnegg, all of Switzerland, assignors to Gema Volstatic AG, St. Gallen, Switzerland

Filed Dec. 29, 1995, Ser. No. 581,401

Claims priority, application Germany, Jan. 13, 1995, 195 00 873.1

Int. Cl.^{6} B05D *1/02;1/12;* **B05B** *15/12;* **B05C** *19/06*

U.S. Cl. 427—180 **13 Claims**



10. A method of spray coating articles with powder from a spray booth, said booth containing a side wall which surrounds the perimeter of the booth to define and enclose a coating space, and a floor connected to said side wall and forming a bottom for the coating space, said floor including an outer collection means arranged around the perimeter of said booth and along said side wall to collect and remove surplus powder dropped onto said floor along said side wall, and an inner collection means positioned on said floor and spaced interiorly of said side wall to collect and remove surplus powder dropping onto said floor interiorly of said side wall, comprising spray coating articles with the powder in the booth with a coating means, collecting surplus powder dropping around the perimeter of said booth and near said side wall with said outer collection means, and simultaneously collecting surplus powder dropping interiorly of said side wall with said inner collection means, thereby separating the surplus powder dropping on the interior of said floor from the surplus powder dropping on said floor around the perimeter of said booth along the side wall so that the surplus powder collected by said inner collection means can be reclaimed.

5,690,996
CROSS-LINKED CELLULOSE SPONGE

Alan Sanderson, Newcastle-upon-Tyne; Rod Dove, Swansea; Fang Ming, and John Howell, both of Bath, all of Great Britain, assignors to Sepragen, Hayward, Calif.

Division of Ser. No. 945,652, Nov. 2, 1992, Pat. No. 5,492,723.

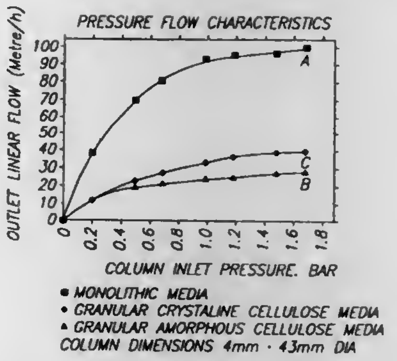
This application Oct. 19, 1995, Ser. No. 545,270

Int. Cl.^{6} B05D *5/00*

U.S. Cl. 427—244 **13 Claims**

1. A method of producing a cross-linked cellulose sponge, comprising:

a) providing:
  i) viscose,
  ii) at least one cross-linking agent selected from the group consisting of epichlorohydrin, dichlorohydrin, formaldehyde, dibromomethane, bis-epoxypropyl ether, 1,4 butane-



diol-bisepoxy ether, epoxies, dialdehydes, glyoxal, divinyls, divinyl benzene, and divinylsulphone,
  iii) at least one pore-forming agent, and
  iv) a molding means;

b) mixing said viscose, said cross-linking agent, and said pore-forming agent to produce a paste; and

c) molding said paste with said moulding means, under conditions such that a cross-linked cellulose sponge is produced.

5,690,997
CATALYTIC CARBON—CARBON DEPOSITION PROCESS

Dana T. Grow, Grand Forks, N. Dak., assignor to Sioux Manufacturing Corporation, Fort Totten, N. Dak.

Continuation of Ser. No. 131,989, Oct. 4, 1993, abandoned.

This application May 9, 1995, Ser. No. 437,508

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 427—249 **16 Claims**

1. A process for production of a carbon-loaded composite; said process comprising steps of:

(a) loading carbon into a porous substrate;
  (i) the porous substrate having a first void fraction wherein the first void fraction is 0.70 or greater;
  (ii) said step of loading carbon being a loading only by chemical vapor deposition of carbon from methane gas and being conducted at a rate of carbon loading such that:
    1) at least 25% of the first void fraction is carbon-loaded, and a void fraction, of a resulting carbon-loaded composite, of 0.30 is achieved, within a time period of chemical vapor deposition of not greater than six hours; and
  (iii) the porous substrate having a nickel-based or iron-based catalyst thereon in an amount of at least about 22% by weight and not greater than about 27% by weight: and

(b) conducting said step of loading carbon until both:
  (i) at least 25% of the first void fraction of the porous substrate is loaded; and
  (ii) a void fraction of no greater than 0.30 is obtained in the resulting carbon-loaded composite.

5,690,998
METHOD OF COATING A CONDUCTIVE PROBE NEEDLE

Yasushi Nagasawa, Yamanashi-Ken; Satoru Yamashita, and Masahiko Matsudo, both of Kofu, all of Japan, assignors to Tokyo Electron Kabushiki kaisha, Tokyo-to, and Tokyo Electron Yamanashi Kabushiki Kaisha, Yamanashi-ken, both of Japan

Division of Ser. No. 227,638, Apr. 14, 1994, Pat. No. 5,532,613.

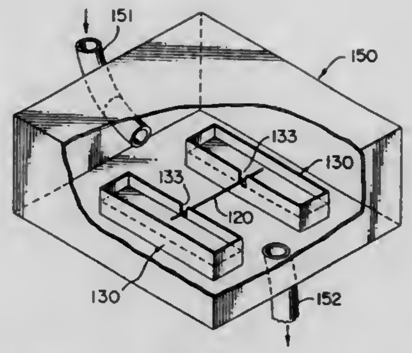
This application Mar. 29, 1996, Ser. No. 622,854

Claims priority, application Japan, Apr. 16, 1993, 5-113690; Apr. 27, 1993, 5-123335

Int. Cl.^{6} B05D *1/32;1/36*

U.S. Cl. 427—255.6 **14 Claims**

1. A method of coating a probe needle comprising the steps of:



covering a portion of said probe needle with a melted thermally liquefiable wax to form a masked portion by positioning the portion of said probe needle within a tank such that melted thermally liquefiable wax within said tank comes in contact with said portion;

hardening at room temperature said thermally liquefiable wax that covers said masked portion;

implementing a coating of poly-para-xylene by vacuum deposition over said probe needle provided in said tank while said probe needle and said tank are in a vacuum chamber under a vacuum condition;

heating said thermally liquefiable wax following the vacuum deposition of the poly-para-xylene to place said thermally liquefiable wax in a molten state; and

removing said probe needle from the heated molten wax by pulling out said probe needle in an axial direction thereof.

5,690,999
METHOD AND COATING DEVICE FOR THE COATING OF A SIZE-PRESS ROLL, PAPER OR BOARD

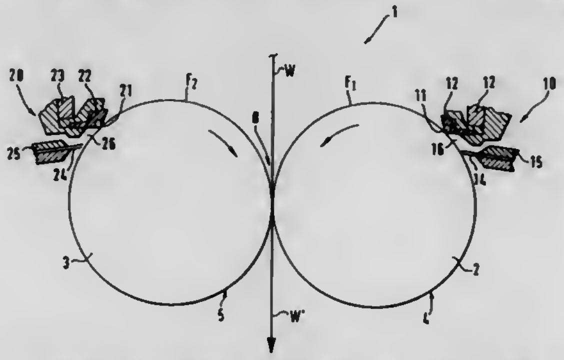
Rauno Rantanen, Muurame, Finland, assignor to Valmet Corporation, Heisinki, Finland

Filed Sep. 11, 1992, Ser. No. 944,064

Claims priority, application Finland, Sep. 16, 1991, 914327

Int. Cl.^{6} B05D *3/12;1/28;* **B05C** *1/12*

U.S. Cl. 427—355 **12 Claims**



1. A method for coating a size-press roll, paper, board or a surface of a moving object, comprising the steps of:

providing a coating bar having a diameter greater than about 18 mm and a smooth outer surface,

supporting said coating bar in a cradle of a coating device substantially over its entire length,

fitting said coating bar against a moving base, said coating bar extending in a transverse direction across a width of said moving base,

applying a loading pressure against said revolving coating bar,

introducing a coating agent into a pressurized coating-agent chamber in said coating device, said pressurized coating-agent chamber being defined at least in part by said coating bar,

applying an unmetered amount of the coating agent from said pressurized coating-agent chamber onto said moving base in the running direction of said moving base before said coating bar,

metering the coating agent on said moving base by regulating the loading pressure of said coating bar in the transverse direction to thereby regulate the quantity of the coating agent being applied onto said moving base, said metering step comprising the step of adjusting the degree of flatness of a loading hose in said coating device which provides the loading pressure of said coating bar.

5,691,000
PROCESS FOR SURFACE TREATMENT OF CELLULOSIC, METALLIC, VITREOUS MATERIALS, OR CEMENTS, MARBLES, GRANITES AND THE LIKE

Laura Montagna, Milan; Mauro Scapin, Varese, and Rosaldo Picozzi, Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

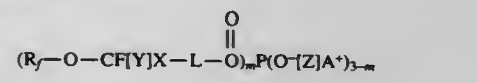
Filed Jun. 7, 1995, Ser. No. 487,233

Claims priority, application Italy, Jun. 14, 1994, MI94A1230

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—388.4 **13 Claims**

1. Process for surface treatment of a material selected from the group consisting of cellulosic materials, metallic materials, vitreous materials, cements, marbles, and granites, which comprises applying onto a surface of said material a phosphoric monoester having the formula:



$$(R_f{-}O{-}CF[Y]X{-}L{-}\overset{\overset{\displaystyle O}{\|}}{O})_mP(O^-[Z]A^+)_{3-m} \qquad (I)$$

wherein:

R_f is a polyperfluoro-alkyleneoxide chain, X is —F or —CF_3, L is a divalent organic group, m–1, and A^+ is selected from the group consisting of H^+, M^+ where M is an alkali metal, and $N(R)_4^+$ where the R groups, equal or different from each other, are H or C_1–C_4 alkyls.

5,691,001
METHOD FOR SURFACE TREATMENT OF A METALLIC MATERIAL

Markku Sakari Ainali; Bror Thomas Johansson, and Lena Marie-Louise Wickman, all of Västerås, Sweden, assignors to Outokumpu Cooper Oy, Espoo, Finland

Filed May 6, 1996, Ser. No. 643,513

Claims priority, application Finland, May 11, 1995, 952284

Int. Cl.^{6} B05D *3/00*

U.S. Cl. 427—398.1 **8 Claims**

1. A method for surface treatment of an object of a copper bearing material, comprising the following steps:

(a) forming a precipitate by mixing an aqueous solution of at least one copper salt and an aqueous solution of an alkali metal hydroxide,

(b) filtering and washing the precipitate,

(c) adding water to the filtered and washed precipitate to form a sludge having a solids content from about 15% to about 50% by weight, and

(d) applying the sludge as a patination agent to a surface of the copper bearing material,

and wherein the method includes, after step (c), storing the sludge at a temperature below about 5° C. until just before step (d).

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5,691,002

COATING METHOD

Hiroaki Oda, Hiratsuka; Masaru Mitsuji, Zama; Yasumasa Okumura, Yokohama; Hiroshi Inoue, and Hisashi Isaka, both of Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited., Amagasaki, Japan

PCT No. PCT/JP95/01079, § 371 Date Jan. 31, 1996, § 102(e) Date Jan. 31, 1996, PCT Pub. No. WO95/33578, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 1, 1995, Ser. No. 596,094

Claims priority, application Japan, Jun. 3, 1994, 6-145696

Int. Cl.^{6} B05D *1/36*

U.S. Cl. 427—407.1 **6 Claims**

1. A coating method comprising sequentially applying an amine-neutralized aqueous intermediate coating composition and an amine-neutralized aqueous top coating composition, wherein a coating composition comprising (A) an amine-neutralized base resin having a hydroxyl value of 30 to 150 KOH mg/g and an acid value of 15 to 50 KOH mg/g, (B) an amino resin and (C) an organic sulfonic acid amine salt is used as the amine-neutralized aqueous intermediate coating composition.

5,691,003

PLATING METHOD BY MEANS OF AN ELECTROLESS GOLD PLATING SOLUTION AND SYSTEM THEREFOR

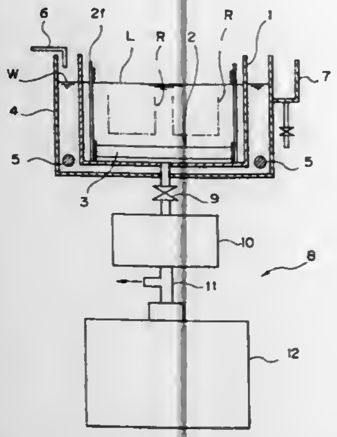
Takayuki Sone, and Hiroshi Wachi, both of Kanagawa-ken, Japan, assignors to Electroplating Engineers of Japan Limited, Tokyo, Japan

Filed Oct. 23, 1995, Ser. No. 546,722

Claims priority, application Japan, Oct. 26, 1994, 6-262893; Dec. 12, 1994, 6-307381

Int. Cl.^{6} B05D *1/18*

U.S. Cl. 427—437 **6 Claims**



1. A plating method by means of an electroless gold plating solution, comprising the steps of:

filling a first tank with said electroless gold plating solution for gold plating parts positioned in said first tank;

injecting air over a wide enough area at the bottom of said first tank for forming air bubbles that rise uniformly into the region of said first tank where said parts are positioned for gold plating, for surrounding said parts with air bubbles;

maintaining a plating temperature substantially higher than the storage temperature of said electroless gold plating solution for periods of time between plating operations; and

adjusting the flow rate of injected air at a given plating temperature, while maintaining substantially uniform plating, whereby said adjusting step includes the step of reducing the flow rate of injected air to a substantially lower flow rate relative to that used at plating temperatures, at times that the temperature of said electroless gold plating solution is at the lower storage temperature, whereby the ratio of the flow rate of air used at plating temperatures to the flow rate of air used at storage temperatures is ten to one.

5,691,004

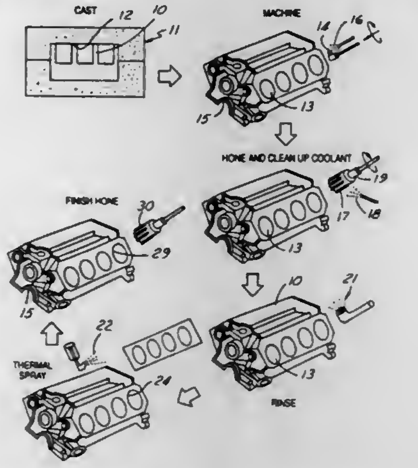
METHOD OF TREATING LIGHT METAL CYLINDER BORE WALLS TO RECEIVE THERMAL SPRAYED METAL COATINGS

Christopher K. Palazzolo, Ann Arbor; V. Durga Nageswar Rao, Bloomfield, and Barry E. Shepley, Novi, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 11, 1996, Ser. No. 678,310

Int. Cl.^{6} C23C *4/02;4/06*

U.S. Cl. 427—455 **8 Claims**



1. A method of treating light metal cylinder bore walls to adherently receive a thermally sprayed metallic coating thereon, said treatable walls carrying a film of grease or oil resulting from machining operations, comprising; (a) honing said walls to produce a near net shape cylinder surface having spiral overlapping cross-abrasions with some peaks and valleys folded over and molded to create surface tears, folds or undercuts rendering a hook and ladder effect, said honing being carried out with the use of a machining coolant to prevent burnishing of said walls; (b) either concurrent therewith or following step (a), washing said honed surface with a mildly alkaline solution comprising (i) an aluminate forming agent that produces an aluminate residue oh the walls and (ii) surfactants that provide for wetting of the walls even when steam is present in the solution; (c) rinsing the washed surface to remove the solution except for said residue; and (d) thermally spraying onto said washed and rinsed surface a metalized bond coat that is sprayed with sufficient velocity, impact and heating of the sprayed particles to promote migration of such particles into said tears, folds and undercuts for mechanical interlocking with said honed surface as well as chemical metallurgical interaction with said prepared surface through said residue; and (e) thermally spraying a top coat onto said bond coat which has increased wear resistance and has lubricity.

5,691,005

MANUFACTURING METHOD OF A SEPARATOR FOR A LITHIUM SECONDARY BATTERY AND AN ORGANIC ELECTROLYTE LITHIUM SECONDARY BATTERY USING THE SAME SEPARATOR

Kenichi Morigaki, Nishinomiya; Noriko Kabuto, Moriguchi, and Kazunori Haraguchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 319,738, Oct. 7, 1994, Pat. No. 5,597,659. This application Jan. 21, 1997, Ser. No. 785,093

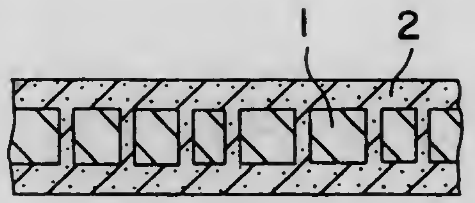
Claims priority, application Japan, Oct. 7, 1993, 5-277829; Dec. 7, 1993, 5-306383

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—508 **6 Claims**

3. A manufacturing method for producing a separator for a lithium secondary battery comprising the steps of:

treating a microporous membrane comprising a polyolefin to produce a separator matrix having a surface which is lyophilic,



impregnating said separator matrix with a solution comprising a resin capable of being polymerized by ultraviolet radiation and an organic electrolyte, and

developing said impregnated separator matrix on a glass board having a surface coated with at least one fluoroplastic material by irradiating ultraviolet rays through said glass board to polymerize said solution to produce a separator matrix comprising an ionic conductive gel electrolyte.

5,691,006

SOLDER RESIST COATING FROM PHOTOSENSITIVE COMPOSITION CONTAINING WATER AS SOLVENT OR DISPERSANT

Roger Pierre-Elie Salvin, Weil am Rhein, Germany, and Adrian Schulthess, Tentlingen, Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of Ser. No. 304,643, Sep. 12, 1994, Pat. No. 5,501,942, which is a continuation of Ser. No. 990,827, Dec. 14, 1992, abandoned, which is a continuation of Ser. No. 808,385, Dec. 16, 1991, abandoned. This application Dec. 6, 1995, Ser. No. 568,092

Claims priority, application Switzerland, Dec. 18, 1990, 4010/90

Int. Cl.^{6} C08J *7/04;* **C08F** *4/00;2/50;* **C08L** *31/02*

U.S. Cl. 427—510 **5 Claims**

2. A process for the production of a solder resist coating, which comprises the steps of:

applying to a substrate a photosensitive composition which contains at least 30% by weight of water as solvent and/or dispersing medium for the components thereof and which comprises at least the following components in the indicated amounts:

10–50% by weight of water-soluble solid, crosslinkable film-forming polymers as bindér selected from the group consisting of acrylic acid and methacrylic acid polymers and copolymers, and carboxyl group-containing acrylate and methacrylate polymers and copolymers, the carboxyl group of which are reacted with ammonia and/or amines in an amount sufficient to ensure the water-solubility of said polymers and copolymers in the form of a solution which consists essentially of said film-forming polymers reacted with ammonia and/or the amine and water, the amines being chosen such that, at least at the temperatures suitable for the thermal cure of the polymers in the composition, the amines will substantially volatilise from a film which forms or has formed from said composition, which polymers are present in the composition in form of an aqueous solution,

4–50% by weight of water-soluble and/or water-dispersible photopolymerisable acrylate and/or methacrylate monomers and/or corresponding oligomers,

0.1–10% by weight of water-soluble and/or water-dispersible photoinitiator compounds for the photopolymerisable acrylate and/or methacrylate monomers and/or corresponding oligomers, and with the proviso that when the binder contains non-selfcrosslinking polymers, then the composition further comprises

2.5–40% by weight of a thermal hardener for the binder which hardener is a water-soluble and/or water-dispersible crosslinking agent for the polymeric binder, selected from the group consisting of epoxy resins, melamine resins, blocked polyisocyanates and mixtures thereof,

removing water from the applied composition to form a film of the photosensitive composition on the substrate,

exposing the coated substrate to radiation with actinic light in a desired pattern, removing the unexposed areas of said coating with an aqueous or aqueous-alkaline solution to uncover the substrate, and

subjecting the coating remaining on the substrate to a thermal cure and an optional ultraviolet cure.

5,691,007

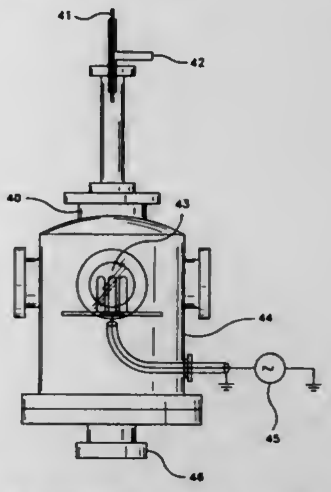
PROCESS FOR DEPOSITING BARRIER FILM ON THREE-DIMENSIONAL ARTICLES

David B. Montgomery, Cary, N.C., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 30, 1996, Ser. No. 724,486

Int. Cl.^{6} B05D *5/12*

U.S. Cl. 427—576 **15 Claims**



1. A method for applying a plasma assisted chemical vapor deposited barrier film coating to the exterior wall surface of three-dimensional articles comprising:

a) providing an apparatus capable of applying said barrier film coatings to exterior walls of said articles which are held in proximity, said apparatus having: a vacuum tight chamber; a means for containing the below elements in said vacuum chamber; a means for delivering a monomer to said articles; a means for delivering an oxidizer to said articles; a means for connecting and/or putting electrodes into the interior walls of said articles; at least two electrodes; a means for creating and maintaining a vacuum in said chamber; and further wherein said apparatus is mounted on a pumping station; and wherein said chamber is attached to a means for importing energy inside said article wherein said means is a radio frequency power generator;

b) positioning at least two three dimensional articles, each having an open end, a closed end, an exterior, an interior and an external and internal wall surface so that the said open ends are placed over the said electrodes;

c) evacuating said chamber containing said articles to below 5 mTorr;

d) delivering a monomer gas to said exterior surfaces of said articles from about 1 sccm to 5 sccm and from about 80 mTorr to 160 mTorr;

e) delivering an oxidizer gas to said surfaces from about 50 to 150 sccm and from about 80 mTorr to 160 mTorr;

f) delivering a radio frequency power to said electrode of about 1 to 50 MHz and from about 0.1 to 2 watts/cm^2 to form a plasma which generates reactive species and simultaneously to produce an electric field at the surface of the articles to accelerate ions to bombard the surface, where the articles housing the electrodes are in proximity to each other so as to allow the discharge zones produced by each electrode to reinforce the effects of the other electrode(s); and

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g) obtaining a barrier film coating on said article at a rate of 40 to 100 nm/min.

5,691,008
MAGNETIC RECORDING MEDIA FABRICATION METHOD

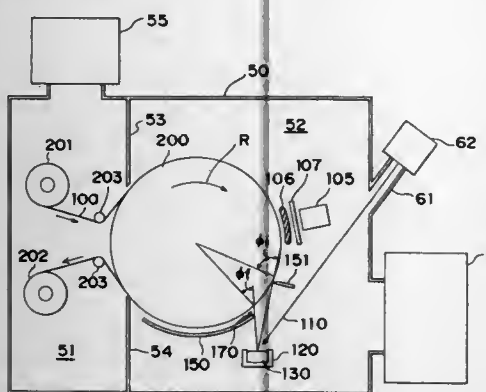
Kiyokazu Thoma, Hirakata; Kazunari Yoshimoto, Kyoto; Ryuji Sugita, Hirakata, and Tatsuaki Ishida, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 395,818, Feb. 28, 1995, Pat. No. 5,569,523. This application Oct. 12, 1995, Ser. No. 542,420

Claims priority, application Japan, Feb. 28, 1994, 6-029582; Apr. 12, 1994, 6-073200

Int. Cl.^{6} C23C *14/14*

U.S. Cl. 427—531 **5 Claims**



1. A magnetic recording medium fabrication method for forming a magnetic layer by vapor deposition on a substrate being conveyed in a downstream direction along a cylindrical drum functioning as a cooling drum, said method comprising:
directing ions on a surface of a substrate from an ion gun positioned upstream from a plate-like shielding plate that defines an initial incident angle of evaporated atoms with respect to the substrate, the ions being directed onto the substrate surface from the ion gun at an acceleration voltage of less than or equal to 400 V; and
forming a magnetic layer by holding a temperature of a cooling body placed between the ion gun and the cylindrical drum to a temperature which is below a temperature of the cylindrical drum.

5,691,009
METHOD OF REDUCING CARBON INCORPORATION INTO FILMS PRODUCED BY CHEMICAL VAPOR DEPOSITION INVOLVING ORGANIC PRECURSOR COMPOUNDS

Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 336,260, Nov. 8, 1994, Pat. No. 5,576,071. This application Sep. 18, 1996, Ser. No. 715,458

Int. Cl.^{6} C23C *16/56*

U.S. Cl. 427—534 **26 Claims**

1. A chemical vapor deposition method comprising the following steps:
chemical vapor depositing a first layer over a wafer, the first layer comprising incorporated hydrocarbons;
generating a first reactive hydrogen plasma adjacent the first layer to displace hydrocarbons away from the first layer;
forming a second layer over the wafer, the second layer comprising incorporated carbon; and
generating a second reactive hydrogen plasma adjacent the second layer to displace carbon away from the second layer.

5,691,010
ARC DISCHARGE PLASMA CVD METHOD FOR FORMING DIAMOND-LIKE CARBON FILMS

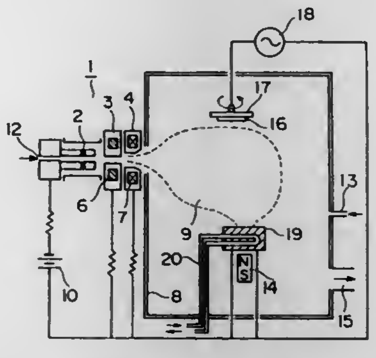
Keiichi Kuramoto, Hirakata; Hitoshi Hirano, Nishinomiya; Yoichi Domoto, Hirakata, and Seiichi Kiyama, Takatsuki, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Oct. 18, 1994, Ser. No. 324,783

Claims priority, application Japan, Oct. 19, 1993, 5-261120; Nov. 29, 1993, 5-298241

Int. Cl.^{6} B05D *3/06;* **C23C** *16/26;* **H05H** *1/48*

U.S. Cl. 427—577 **20 Claims**



1. A method of forming a diamond-like carbon film on a substrate arranged in a vacuum chamber, said method comprising the steps of:
generating an arc-discharge plasma current comprising applying a d.c. discharge voltage between a cathode and an anode in said vacuum chamber;
supplying a reaction gas containing carbon atoms into said arc-discharge plasma current;
applying a high-frequency voltage to said substrate so that said substrate develops a self-bias that is not more than −200 V; and
forming said diamond-like carbon film from said reaction gas on said substrate to which said high-frequency voltage is applied; wherein said d.c. discharge voltage is controlled so as to control the hardness of said diamond-like carbon film to be formed.

5,691,011
DISPERSION-PREVENTING PATTERN FOR LIQUID CRYSTAL DISPLAY DEVICE

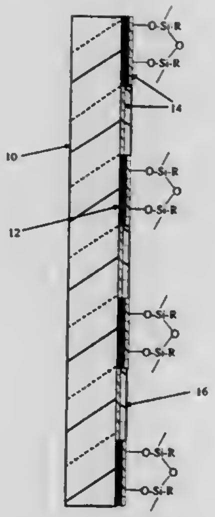
Mark D. Newsham, and Benjamin M. DeKoven, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 14, 1996, Ser. No. 665,203

Int. Cl.^{6} G02B *5/20;* **G02F** *1/1335*

U.S. Cl. 428—1 **11 Claims**

1. A liquid crystal display device comprising a color filter which comprises:
a) a transparent substrate;
b) an opaque material disposed as a pattern on a major surface of the substrate, which pattern defines borders within which a coloring agent or agents can be received;
c) a silicate layer superposing the opaque material, the silicate layer having reactive sites;
d) a sufficient concentration of organosiloxane groups bonded to the reactive sites of the silicate layer to render the opaque material dispersion inhibiting; and



e) at least one coloring agent disposed within the borders defined by the opaque material.

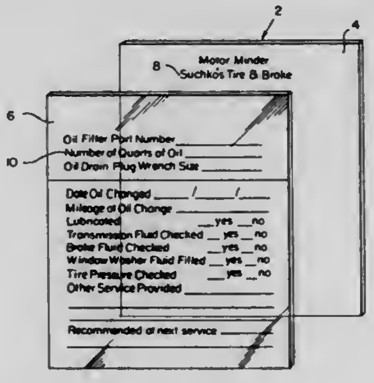
5,691,012
MARKABLE SIGN

Allen Suchko, 206 Kestwick Dr., W., Martinez, Ga. 30907

Continuation-in-part of Ser. No. 510,319, Aug. 2, 1995. This application Dec. 22, 1995, Ser. No. 577,329

Int. Cl.^{6} G09F *7/04*

U.S. Cl. 428—13 **7 Claims**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4
8
Motor Minder
Suchko's Tire & Brake
6
10
Oil Filter Part Number
Number of Quarts of Oil
Oil Drain Plug Wrench Size
Date Oil Changed / /
Mileage at Oil Change
Lubricated yes no
Transmission Fluid Checked yes no
Brake Fluid Checked yes no
Window Washer Fluid Filled yes no
Tire Pressure Checked yes no
Other Service Provided
Recommended at next service

1. A markable sign, comprising
(a) a flexible layer of backing material having a front surface for receiving permanent printing and a rear surface for mounting on a support object;
(b) a flexible transparent layer of synthetic plastic material having a rear surface for receiving permanent printing and a front surface;
(c) means for connecting said transparent layer with said backing layer, said transparent layer rear surface being arranged adjacent to said backing layer front surface; and
(d) first and second coatings applied to said transparent layer front surface, said first coating being adapted to receive permanent markings and said second coating being adapted to receive erasable markings, whereby when the sign is mounted on a motor vehicle, information regarding specifications for the vehicle can be applied in the form of a permanent marking to said first coating and information regarding maintenance performed at time intervals can be applied in the form of an erasable marking to said second coating.

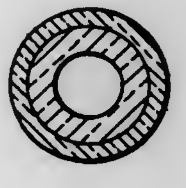
5,691,013
GLASS TUBING

Abdelouahed Soufiane, 2525 Elwood Dr., Unit 108, Ames, Iowa 50010, and Gerald J. Shirk, 3414 Eliwinn La. SE., Cedar Rapids, Iowa 52403

Filed Jul. 16, 1996, Ser. No. 683,030

Int. Cl.^{6} B32B *13/00*

U.S. Cl. 428—34.4 **8 Claims**



1. Glass tubing for conveying fluids or guiding light waves, said tubing comprising an annular wall of silica-titania glass, said tubing having an interior passageway through which the fluids or light waves can pass, the annular wall of silica-titania glass having a concentration of titania (TiO_2) in the range of 1%–20% by weight with the balance of 80%–99% being silica (SiO_2), and a second annular wall of silica glass, the second annular wall being contiguous with the annular wall of silica-titania glass.

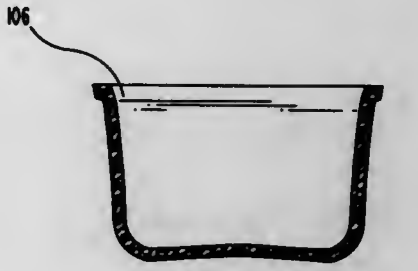
5,691,014
COATED ARTICLES HAVING AN INORGANICALLY FILLED ORGANIC POLYMER MATRIX

Per Just Andersen, and Simon K. Hodson, both of Santa Barbara, Calif., assignors to E. Khashoggi Industries, Santa Barbara, Calif.

Division of Ser. No. 218,967, Mar. 25, 1994, Pat. No. 5,545,450, which is a continuation-in-part of Ser. No. 95,662, Jul. 21, 1993, Pat. No. 5,385,764, Ser. No. 982,383, Nov. 25, 1992, abandoned, Ser. No. 105,741, Aug. 10, 1993, Ser. No. 105,352, Aug. 10, 1993, and Ser. No. 152,354, Nov. 19, 1993, Pat. No. 5,508,072, each which is a continuation-in-part of Ser. No. 929,898, Aug. 11, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 475,367

Int. Cl.^{6} B32B *23/18;27/20;* **B65D** *13/00*

U.S. Cl. 428—34.5 **63 Claims**



1. An article of manufacture comprising an inorganically filled matrix including a substantially homogenous mixture of organic binder and aggregate, the matrix having a coating on at least a portion thereof such that the matrix is substantially nonporous and having a thickness in a range from about 0.01 mm to about 1 cm, the matrix comprising:
a water-dispersible organic polymer binder selected from the group consisting of polysaccharides, proteins, and mixtures or derivatives thereof;
an inorganic aggregate having a concentration in a range from about 20% to about 95% by weight of total solids in the inorganically filled matrix; and
fibrous material substantially homogeneously dispersed throughout the inorganically filled matrix.

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5,691,015

COMPOSITE FILM BAGS FOR PACKAGING

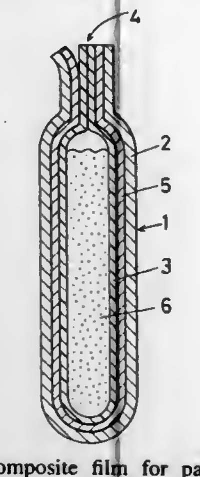
Yoshinori Tsukamoto, and Michio Shimizu, both of Aichi, Japan, assignors to Aicello Chemical Co., Ltd., Toyohashi, Japan

Continuation-in-part of Ser. No. 186,271, Jan. 25, 1994, abandoned. This application Dec. 28, 1995, Ser. No. 580,199

Claims priority, application Japan, Jan. 25, 1993, 5-028548

Int. Cl.^{6} B65D *65/40;30/02*

U.S. Cl. 428—35.2 **5 Claims**



1. A bag of a composite film for packaging comprising a composite film of a water-insoluble film and a water-soluble polyvinyl alcohol film which are adhered to one another with adhesive comprising acrylic polymer resin polymerized with monomers of at least one member selected from the group consisting of methacrylate, acrylate, methyl methacrylate, methyl acrylate, ethyl methacrylate, ethyl acrylate, propyl methacrylate, propyl acrylate, butyl methacrylate, butyl acrylate, hydroxyethyl methacrylate, hydroxyethyl acrylate, hydroxypropyl methacrylate and hydroxypropyl acrylate and followed by crosslinking with a melamine prepolymer or a prepolymer having an isocyanate group, so that the water-insoluble film is peelable from the polyvinyl alcohol film, and which are formed into a bag so that the polyvinyl alcohol film serves as an internal layer of the bag and the water-insoluble film serves as an outer layer of the bag.

5,691,016

PERMEATION RESISTANT CONTAINERS

John Peter Hobbs, Lansdale, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 337,355, Nov. 10, 1994, abandoned, which is a division of Ser. No. 91,485, Jul. 13, 1993, Pat. No. 5,401,451. This application Jan. 25, 1996, Ser. No. 590,020

Int. Cl.^{6} B23D *23/00;* **B32B** *1/08;27/32*

U.S. Cl. 428—35.7 **3 Claims**

1. A thermoplastic polymeric container having an interior surface fluorinated layer in which the fluorine concentration is greater than 15 μg fluorine per cm^2, an oxygen-to-carbon ratio in the fluorinated layer of less than about 0.08, and a ratio of actual surface area to geometric surface area of less than 1.8.

5,691,017

AIRBAG STORING CASING

Kazuo Inaba, Fuji; Tatsuo Hamanaka, Ichihara, and Mitsuyo Maeda, Sagamihara, all of Japan, assignors to Nihon Plast Co., Ltd., Fuji; Sumitomo Chemical Co., Ltd., and Tanabe Chemical Industrial Inc., both of Osaka, all of Japan

Division of Ser. No. 159,269, Nov. 30, 1993, abandoned. This application Jun. 5, 1996, Ser. No. 655,217

Claims priority, application Japan, Nov. 30, 1992, 4-320027

Int. Cl.^{6} C08L *23/12;23/14*

U.S. Cl. 428—35.7 **20 Claims**

1. A combination of an airbag storing casing with a paint coated on a surface of said casing, said casing being for storing an airbag for an airbag restraint, said casing being formed of a material comprising:

(a) a thermoplastic elastomer composition in an amount of 100 parts by weight, said thermoplastic elastomer composition being prepared by a process including mixing 10 to parts by weight of a polyolefin resin with 100 parts by weight of an olefin copolymer rubber to obtain a mixture, dynamically heat-treating said mixture in the presence of an organic peroxide, and then adding 5 to 50 parts by weight of a mineral oil relative to 100 parts by weight of the dynamically heat-treated mixture, said olefin copolymer rubber having a Mooney viscosity (ML_{1+4}, 100° C.) ranging from 50 to 100;

(b) a random copolymer resin in an amount of 20 to 50 parts by weight, containing propylene and at least one kind of 1-olefin other than propylene and having a Melt Flow Rate ranging from 30 to 100 g/10 min at a temperature of 230° C. under a load of 2.16 kg; and

(c) a modified polypropylene oligomer containing hydroxyl group, in an amount ranging from 1 to 5 parts by weight,

wherein said paint comprises: a resin component including chlorinated polyolefin resin, and polycaprolactone polyol resin; a modifier including alcohol-modified silicone; and a hardener including a mixture of an addition product of hexamethylene diisocyanate, isophorone diisocyanate and polyol and an addition product of hexamethylene diisocyanate and polyester polyol.

5,691,018

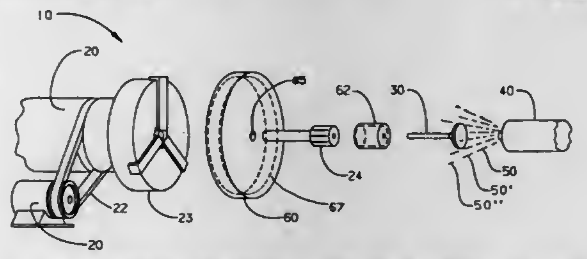
SILICONE MASK FOR THERMAL SPRAY COATING SYSTEM

Kurtis C. Kelley, Washington; Jack R. Davis, and Karan J. Shane, both of Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 15, 1995, Ser. No. 573,159

Int. Cl.^{6} B05B *1/28*

U.S. Cl. 428—36.8 **10 Claims**



1. In an apparatus for thermally spraying a coating on a work piece, the apparatus including means spaced from the work piece for melting a coating material and propelling the molten coating material to a surface area on the work piece, means for directing a flow of gas at the coated surface area on the work piece, and means for rotating the work piece, the improvement comprising:

a flexible elastomeric mask for protecting said apparatus, said mask being a hollow tubular cylinder having a closed end with a centrally located opening in said closed end, said tubular cylinder being adapted for covering said means for rotating said work piece, said tubular cylinder being made from a filled silicone elastomer having a composition comprising;

silicone rubber in the range of about 40% to about 70% by weight of said silicone elastomer; and silica filler in the range of about 30% to about 60% by weight of said silicone elastomer;

said silicone rubber being prepared by curing a vinyl silicone polymer with a curing agent comprising a silicone polymer, dimethyl methylhydrogen siloxane, dimethylvinylated silica and xylene; and

said tubular cylinder having an elongation of at least 200% at break.

5,691,019

FOUL RELEASE SYSTEM

Kenneth Michael Carroll, Albany; Owen Maynard Harblin, Clifton Park, and Slawomir Rubinsztajn, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 1, 1995, Ser. No. 432,873

Int. Cl.^{6} B08B *17/00;* **B63B** *59/00*

U.S. Cl. 428—40.1 **18 Claims**

1. A foul release article for use in aquatic applications comprising:

a. a substrate,

b. an adhesion promoting layer on said substrate, and

c. a release layer in direct contact with said adhesion promoting layer,

wherein said adhesion promoting layer comprises an anticorrosive material and a bonding agent, said anticorrosive material comprises an epoxy functionalized base material and a curing catalyst and said release layer comprises an amount upto 20% by weight moisture cured grafted copolymer with the balance being organopolysiloxane.

5,691,020

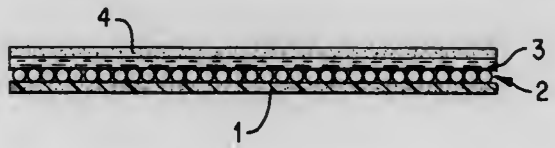
FLEXIBLE TRANSFER SEAL

Fumio Kondoh, 7-go, 27-ban, 6-chome, Naka, Hakata-ku, Fukuoka-City 816, and Toshimasa Nakahara, 10-go, 11-ban, 1-chome, Kuhkohmae, Hakata-ku, Fukuoka-City 812, both of Japan

Filed Sep. 22, 1995, Ser. No. 532,290

Int. Cl.^{6} B32B *7/02;* **B44C** *1/16*

U.S. Cl. 428—40.1 **8 Claims**



1. A flexible transfer device for transfer to a skin surface comprising a transfer film which includes a silicone layer and a transparent transfer layer, a screen printed flexible urethane ink layer on said silicone layer formed by screen printing a layer of flexible urethane ink directly on said silicone layer, said flexible urethane ink layer having a flexibility matching the flexibility of the surface of human skin, and a pressure-sensitive adhesive layer on said printed flexible urethane ink layer, said adhesive layer and said flexible urethane ink layer being transferred to the skin surface by adhering said adhesive layer to said skin surface and separating said transfer film from said flexible urethane ink layer by separating said silicone layer from said flexible urethane ink layer and effecting adhesion of said flexible urethane ink layer to said adhesive layer, whereby the adhesive layer and the flexible urethane ink layer are thereby transferred and adhered to the skin surface such that the flexible urethane ink layer flexes with the skin surface to thereby enhance the duration that the flexible urethane ink layer remains adhered to the skin surface.

5,691,021

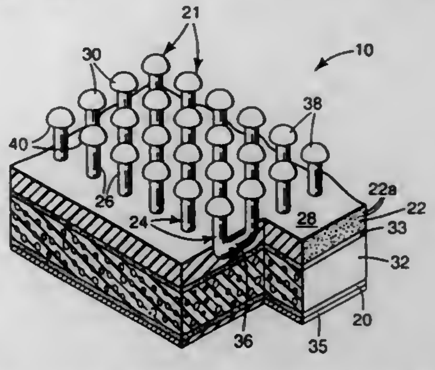
FLAME RETARDANT FASTENER AND METHOD FOR MAKING THE SAME

James J. Kobe, Newport, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1996, Ser. No. 608,265

Int. Cl.^{6} B32B *3/06;5/18*

U.S. Cl. 428—40.1 **23 Claims**



1. A flame retardant fastener adapted for releasable engagement to a second fastener, comprising:

a backing layer of a flame retardant polymeric material having an exposed bonding surface and a support surface;

a multiplicity of flexible, resilient stem portions extending generally perpendicular to said bonding surface, the stem portions comprising a non-flame retardant, polymeric material embedded in the bonding surface, said distal stem portions having an enlarged head portion located on a distal end of said stem portion, said enlarged head region having a top surface opposite said distal stem portions and a latching surface opposite said bonding surface, the head portions being disposed to afford movement along different portions of the backing layer and into releasable engagement with the second fastener; and

a non-flame retardant, pressure sensitive adhesive applied to said support surface wherein the fastener is capable of satisfying the requirements of F.A.R. 25.853(a)(1)(i) vertical flammability test unattached to a substrate.

5,691,022

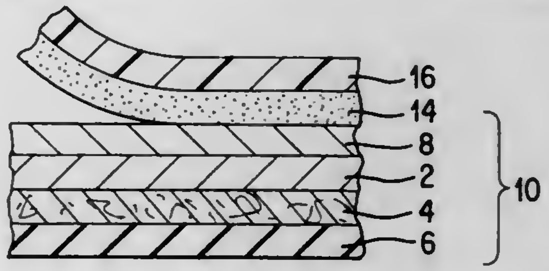
RELEASE LINER BASE STOCK FOR PRINTED FILMS OR LABELS

Gary H. Knauf, Appleton, Wis., assignor to International Paper Company, Tuxedo Park, N.Y.

Continuation-in-part of Ser. No. 326,501, Oct. 20, 1994. This application Apr. 10, 1996, Ser. No. 627,812

Int. Cl.^{6} C09J *7/02*

U.S. Cl. 428—40.1 **21 Claims**



1. A release liner base stock, for dispensing die cut film labels onto a surface, comprising:

a paper substrate having a front side and a back side;

a polypropylene coating layer located on said front side of said paper substrate; and

a protective sealant layer located on said back side of said paper substrate selected from the group consisting of:

a soap-based acrylic resin, polyvinylidene dichloride, starch, styrene butadiene rubber latex;

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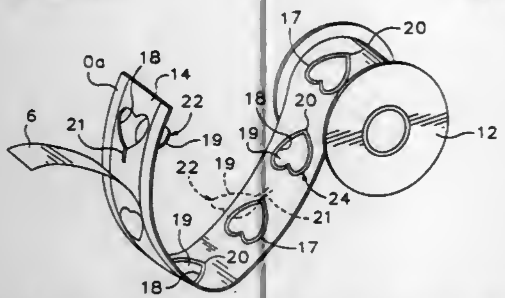
and polyvinyl alcohol located on said back side of said paper substrate.

5,691,023

DECORATIVE PACKAGING RIBBON

Shiela Keller, 7630 SE. Lake Rd., Milwaukie, Oreg. 97222
Continuation of Ser. No. 909,230, Jul. 6, 1992, abandoned.
This application Jul. 3, 1995, Ser. No. 497,962
Int. Cl.^{6} B65D *65/28*
U.S. Cl. 428—43 **16 Claims**



1. A decorative ribbon for attachment to the surface of an article to be decorated therewith, the ribbon comprising:
- an elongate, substantially-flat, flexible ribbon element having a top display side, a bottom side, and opposed, laterally spaced side edges;
- an adhesive layer adhered on at least portions of said bottom side, whereby said ribbon element may be attached to a surface of an article for decorative packaging purposes; and
- a peripherally incomplete cut line spaced inwardly of the side edges of said ribbon element and defining the periphery of a decorative design element interrupted by an uncut portion of the ribbon element by which the decorative design element is secured to the ribbon element, said cut line extends substantially fully through the thickness of the ribbon and the adhesive layer intercepted by the cut line, the decorative design element being displaceable out of the plane of the ribbon element along said cut line by bending at said uncut portion to form a stand-up decorative design element, providing a three-dimensional decorative ribbon effect.

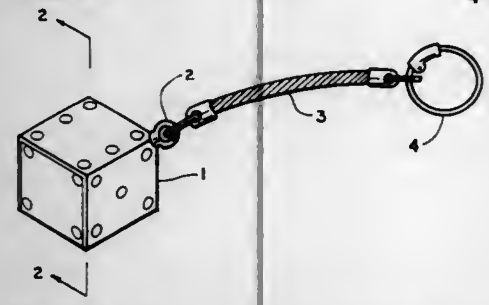
5,691,024

Patent Not Issued For This Number

5,691,025

HOLLOW OBJECT CARRYING DIE

James D. Hardin, 306 Valley Dr. P.O. Box 6, Rochester, Pa. 15074
Filed May 28, 1996, Ser. No. 672,379
Int. Cl.^{6} A44B *15/00*
U.S. Cl. 428—99 **4 Claims**

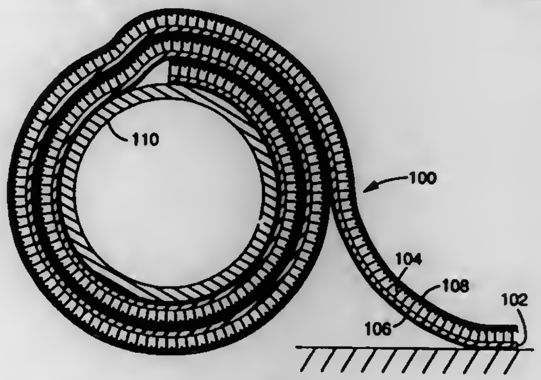


1. A hollow die of a pair of dice, a ring attached to one corner of said hollow die, a flexible carrying chain secured at one end onto said ring, said hollow die comprising two relatively movable parts to permit introduction into said hollow die of an object to be carried by said hollow die, said relatively moveable parts comprised of slidably inter engageable parts of U-shaped cross section wherein each part provides three of six external die faces of said hollow die.

5,691,026

FASTENER MEMBER WITH A DUAL PURPOSE COVER SHEET

Bradley D. Zinke, Woodbury, and Timothy N. Narum, Circle Pines, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 97,984, Jul. 27, 1993, abandoned. This application Mar. 8, 1994, Ser. No. 207,596
Int. Cl.^{6} B32B *3/06*
U.S. Cl. 428—100 **21 Claims**



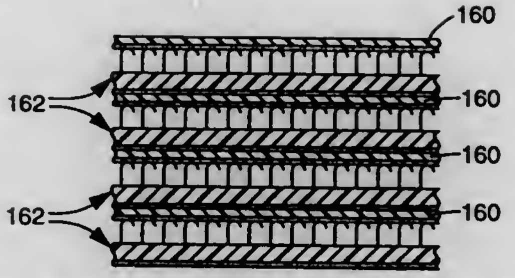
1. A fastener arrangement, comprising:
- a first fastener member including a base sheet having a first major surface, and a plurality of engaging members adjoining and projecting from the first major surface;
- a dual purpose cover sheet having first and second major surfaces, the first major surface including means for releasably affixing said cover sheet to the first fastener member including an adhesive coated on said first major surface of said cover sheet, said adhesive transitioning from a first non-tacky state at a first temperature to a second tacky state at a second, higher temperature to releasably affix said cover sheet to the first fastener member; and
- a second fastener member overlying said first fastener member, the second fastener member including a base sheet having first and second major surfaces, a multiplicity of engaging members adjoining and projecting from the first major surface; and an adhesive layer disposed on the second major surface of said base sheet, such that said adhesive layer releasably affixes the second fastener member to the second major surface of said cover sheet.

5,691,027

FASTENER WITH A DUAL PURPOSE COVER SHEET

Carey J. Eckhardt, Mounds View, and Bradley D. Zinke, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 97,984, Jul. 27, 1993, abandoned.
This application Sep. 29, 1995, Ser. No. 536,192
Int. Cl.^{6} B32B *3/06*
U.S. Cl. 428—100 **19 Claims**

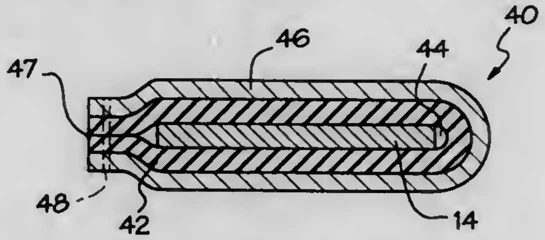
1. A fastener arrangement, comprising:
- a) a first fastener member, comprising:
  - i) a base sheet having a first major surface; and
  - ii) a plurality of engaging members attached to and projecting from the first major surface;
- b) a dual purpose cover sheet having first and second major surfaces, the first major surface including means for releasable affixation to the engaging members of the first fastener member, to affix the cover sheet to the first fastener member; and
- c) a second fastener member overlying said first fastener member, comprising:
  - i) a base sheet having first and second major surfaces;
  - ii) a multiplicity of engaging members attached to and projecting from the first major surface;
  - iii) a layer of pressure sensitive adhesive interposed between the second major surface of said base sheet and said second major surface of said cover sheet, for releasably affixing the second fastener member to said cover sheet.



5,691,028

REMOVABLE SLEEVE FOR PADDING A HAZARDOUS-DUTY GARMENT STRAP

Nicholas J. Curtis, Dayton, Ohio, assignor to Lion Apparel, Inc., Dayton, Ohio
Filed Nov. 9, 1995, Ser. No. 555,613
Int. Cl.^{6} A41D *27/26*
U.S. Cl. 428—101 **4 Claims**



1. A sleeve for padding a hazardous-duty garment support strap, comprising:
- an elongated inner strip of substantially heat and flame-resistant closed cell foam padding material; and
- an outer layer of abrasion, heat and flame resistant material substantially surrounding said inner padding strip;
- said sleeve being shaped to be slidably attached to said strap; and
- said outer layer material being selected from a group consisting of an aramid polymer material, a polybenzamidazole material, and a blend of aramid polymer material and polybenzamidazole material.

5,691,029

FILAMENT-REINFORCED NONWOVEN-FABRIC SHEETING

Leonardus Johannes Lucas, Duiven, Netherlands, assignor to AKzo Nobel NV, Arnhem, Netherlands
Filed Jun. 6, 1995, Ser. No. 470,611
Claims priority, application Germany, Jun. 16, 1994, 44 20 811.1
Int. Cl.^{6} B32B *5/12*
U.S. Cl. 428—107 **25 Claims**

1. Filament-reinforced nonwoven-fabric sheeting reinforced by sheets of parallel reinforcement yarns integrated into said nonwoven-fabric sheeting, wherein a binder binds filaments A of the nonwoven fabric to filaments B of said reinforcement yarns at crossing points of filaments A and B, and binds filaments B to each other at least at some crossing points BB, and binds filaments A of said nonwoven-fabric to each other at crossing points AA, and wherein said nonwoven-fabric sheeting has a breaking strength of 300 to 600N per 5 cm and per 100 g in each direction of said reinforcement yarn, and a tear propagation resistance of 100 to 300N per 100 g.

5,691,030

STABILIZED FABRICS AND REINFORCED PRODUCTS CONTAINING THEM

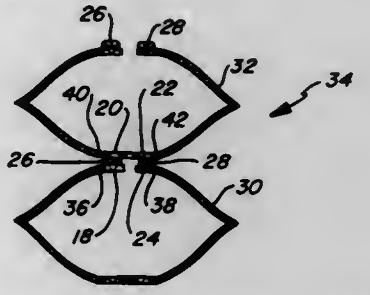
Willy De Meyer, Drongen, Belgium, assignor to Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 335,196, Nov. 7, 1994, abandoned, which is a continuation of Ser. No. 114,906, Sep. 2, 1993, abandoned. This application Aug. 16, 1995, Ser. No. 515,867
Claims priority, application United Kingdom, May 14, 1993, 9309951
Int. Cl.^{6} D03D *13/00;15/00*
U.S. Cl. 428—107 **1 Claim**

1. A fabric designed for the formation of formed products comprising: a first plurality of core-sheath filaments extending in one direction, a second plurality of core-sheath filaments meshed with said first plurality of core-sheath filaments and extending at an angle to said first plurality of core-sheath filaments, said first plurality of core-sheath filament being adhered to said second plurality of core-sheath filaments to hold them in fixed relation to one another such adherence being capable of breaking or yielding under pressure without breaking the core filaments of the core-sheath filaments in said fabric, said core-sheath filaments of said first plurality are adhered to said plurality of second core-sheath filaments at the cross-over points of said filaments, said fabric including a plurality of longitudinally extending filaments sewn, tufted, stretched, bonded or knit around tho cross-over points of said core-sheath filaments wherein a portion of said longitudinal extending filaments form a selvage for said fabric and said fabric is less than 1 mm thick.

5,691,031

CELLULAR PANEL

Paul G. Swiszcz, and Wendell B. Colson, both of Boulder, Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.
Division of Ser. No. 791,156, Nov. 13, 1991. This application Jun. 7, 1995, Ser. No. 477,825
Int. Cl.^{6} B32B *3/12*
U.S. Cl. 428—116 **3 Claims**



1. A cellular panel comprising a plurality of adjoining longitudinally extending cells formed of textile material adhesively secured together along spaced adhesive lines, said textile material having a length and a width defining a lengthwise direction and a widthwise direction, respectively, said textile material comprising portions treated with a fabric treatment composition from the group consisting of soil retardant compositions, flame retardant compositions, and anti-fray compositions, and portions without

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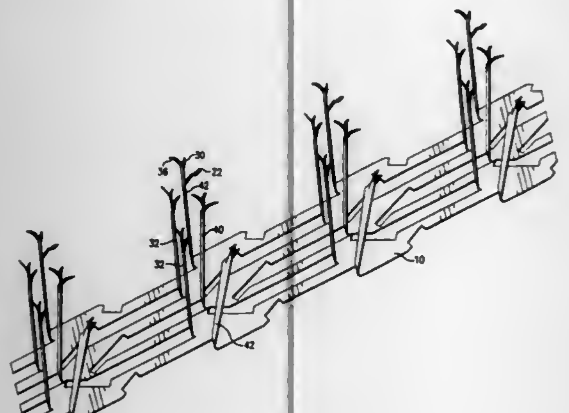
said fabric treatment composition, said portions left untreated to provide adhesive bond sites for said adhesive, said coated textile having a stiffness in its lengthwise direction significantly greater than its stiffness in the widthwise direction.

5,691,032

METHOD OF MAKING A BIRD REPELLANT STRUCTURE AND BLANK FOR USE THEREIN

Terry L. Trueblood, Onalaska, and Timmy J. Trueblood, La Crosse, both of Wis., assignors to Jack B. Shaw, Johnstown, Pa.

Filed Feb. 14, 1996, Ser. No. 601,589
Int. Cl.^{6} E04B *1/72*
U.S. Cl. 428—136 **17 Claims**



17. A blank base for the manufacture of a bird repellant structure, said blank base comprising:
a continuous base strip with a plurality of cut-out diagonal slots disposed therein;
said plurality of diagonal slots including first slots, a second slot and third slots;
said first slots including two apposing diagonal slots of substantially the same dimension disposed substantially equidistant from a center longitudinal axis of said base strip;
said second slot being substantially the same dimension as said apposing first diagonal slots and substantially on the center longitudinal axis of said base strip, said slot being parallel to one or the other of said first diagonal slots and being disposed between said first slots such that a leading of the second slot rests approximately on a lateral line extending between the terminal ends of the first diagonal slots;
said third slots being lesser in dimension than the first and second slots and disposed approximately equidistant from said second slot, said third diagonal slots being parallel to one of the first diagonal slots and disposed such that the terminal end of the third slots rest approximately on a lateral line extending along the terminal end of the second slot.

5,691,033

COATING COMPOSITIONS CONTAINING ALUMINUM PIGMENT AND METHODS OF COATING

Martha A. Davies, Louisville, Ky., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 481,949, Jun. 7, 1995, abandoned. This application Mar. 29, 1996, Ser. No. 623,525
Int. Cl.^{6} C08K *5/37;3/08*
U.S. Cl. 428—147 **17 Claims**

1. A coating composition, comprising (a) aluminum pigment, (b) a neoprene latex asphalt emulsion, (c) at least one surfactant comprising an alkoxylated alkyl mercaptan for reducing reaction of the aluminum pigment with water and with the neoprene latex, (d) at least one organic solvent, and (e) water;
wherein the weight ratio of neoprene latex asphalt emulsion to aluminum pigment is in the range of from about 90:10 to about 50:50;
wherein the weight ratio of neoprene latex asphalt emulsion to water is in the range of from about 90:10 to about 50:50; and wherein the surfactant comprises about 4 to about 10 weight percent, based on the total of the aluminum pigment, surfactant and organic solvent.

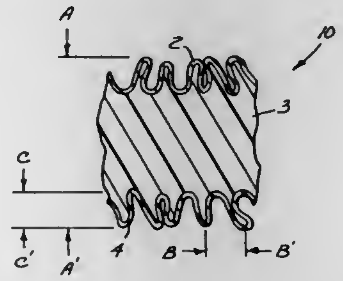
13. A roof structure having a coating thereon, said coating comprising (a) aluminum pigment, (b) a neoprene latex asphalt emulsion, (c) at least one surfactant comprising an alkoxylated alkyl mercaptan for reducing reaction of the aluminum pigment with water and with the neoprene latex, (d) at least one organic solvent, and (e) water;
wherein the weight ratio of neoprene latex asphalt emulsion to aluminum pigment is in the range of from about 90:10 to about 50:50;
wherein the weight ratio of neoprene latex asphalt emulsion to water is in the range of from about 90:10 to about 50:50; and wherein the surfactant comprises about 4 to about 10 weight percent, based on the total of the aluminum pigment, surfactant and organic solvent.

5,691,034

ELASTOMERIC LAMINATES WITH MICROTEXTURED SKIN LAYERS

Dennis L. Krueger; Joseph T. Bartusiak; Thomas P. Hanschen, and Karen M. Capik, all of P.O. Box 33427, St. Paul, Minn. 55133-3427

Division of Ser. No. 503,716, Mar. 30, 1990, Pat. No. 5,501,679, which is a continuation-in-part of Ser. No. 438,593, Nov. 17, 1989, abandoned. This application May 16, 1995, Ser. No. 442,506
Int. Cl.^{6} D06N *7/04*
U.S. Cl. 428—152 **14 Claims**



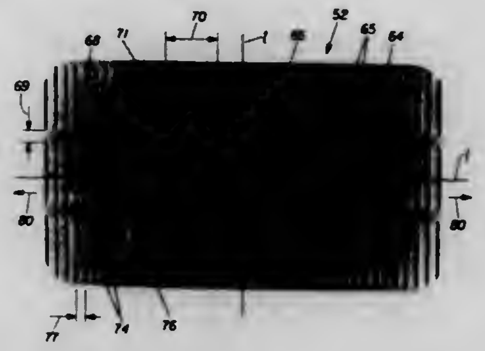
1. An elastomeric laminate consisting essentially of at least one elastomeric layer and at least one continuous microtextured skin layer over substantially the entire laminate wherein:
(a) the microtexture on said skin layer is formed by stretching an untextured laminate past the deformation limit of at least one untextured skin layer and allowing the stretched laminate to elastically recover over the entire region stretched and
(b) said at least one elastomeric layer and said at least one continuous microtextured skin layer are in substantially continuous contact.

5,691,035

WEB MATERIALS EXHIBITING ELASTIC-LIKE BEHAVIOR

Charles W. Chappell, West Chester; Eugene R. Sorensen, Sharonville; Kenneth B. Buell, Cincinnati; John J. Curro, Cincinnati, and Michele A. Mansfield, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 574,214, Dec. 18, 1995, abandoned, which is a continuation of Ser. No. 203,087, Feb. 28, 1994, Pat. No. 5,518,801, which is a continuation-in-part of Ser. No. 100,958, Aug. 3, 1993, abandoned. This application Jan. 25, 1996, Ser. No. 670,026
Int. Cl.^{6} B32B *3/28*
U.S. Cl. 428—152 **1 Claim**



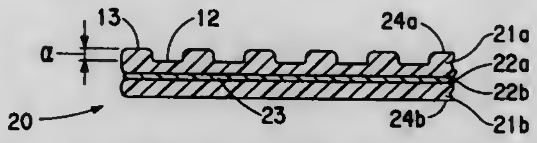
1. A web material comprising:
a pair of first regions each having a first axis in a first direction, a second axis in a second direction perpendicular to said first direction, and a surface pathlength measured generally parallel to said first axis when the web material is in an untensioned condition;
a second region disposed between said first regions, said second region having a first axis in said first direction, a second axis in said second direction perpendicular to said first direction, a plurality of raised rib-like elements having a major axis substantially perpendicular to said first axis, and a surface pathlength measured generally parallel to said first axis when the web material is in an untensioned condition, the surface-pathlength of said first regions being less than the surface-pathlength of the second region; and
a transitional region at the interface between each said first region and said second region.

5,691,036

HIGH PRESSURE HIGH TEMPERATURE CUSHIONING MATERIAL

Michael Yuan-Chang Lin; Yen-Jung Hu; Hsu-Yeh Huang, and Der-Guey Luo, all of Hsinchu, Taiwan, assignors to Du Pont Taiwan Limited, and Industrial Technology REsearch Institute, both of Taiwan

Filed Feb. 23, 1996, Ser. No. 606,142
Int. Cl.^{6} B32B *5/02*
U.S. Cl. 428—172 **13 Claims**



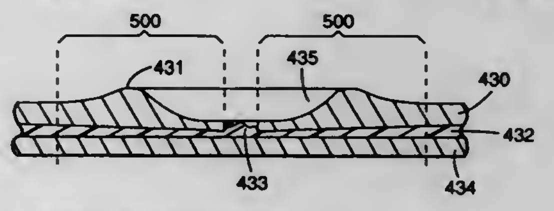
1. A cushioning material comprising at least two fibrous batts of staple fibers with adjacent facing surfaces and at least one outer surface and a layer of scrim between the facing surfaces,
characterized in that
the fibrous batts are staple fibers and are from 1.5 to 10 millimeters thick, at least one of the fibrous batts has embossing on an outer surface, in which depressions having a depth of 10 to 40 percent of the thickness of the batt and an average width of 0.5 to 4 millimeters cover, 25 to 70 percent of the total outside surface; and,
the scrim has a density from 30 to 120 grams per square meter.

5,691,037

DAMPED LAMINATES WITH IMPROVED FASTENER FORCE RETENTION, A METHOD OF MAKING, AND NOVEL TOOLS USEFUL IN MAKING

Jeffrey W. McCutcheon, and Donald T. Landin, both of Eagan, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 372,337, Jan. 13, 1995, abandoned. This application Jul. 3, 1996, Ser. No. 674,935
Int. Cl.^{6} F16F *15/12;* B32B *3/28*
U.S. Cl. 428—172 **42 Claims**



1. A laminate article comprising:
a first substrate layer and a second substrate layer:
at least one layer of vibration damping material comprising a viscoelastic material positioned between said first and second substrate layers;
optionally one or more additional substrate layers positioned between said first and second substrate layers;
optionally 1 or more bonding material layers bonded between a substrate layer and a vibration damping layer, wherein the storage modulus of each bonding material layer is higher than the storage modulus of the viscoelastic material contained in a vibration damping layer to which it is bonded;
wherein the storage modulus of each substrate layer is greater than that of the viscoelastic material in any vibration damping material layer with which it is in contact;
wherein at least one deformation area is present in said article, wherein a deformation area is an area of the article wherein at least one substrate layer is plastically deformed such that at least two substrate layers are touching or positioned closer to each other than in an area of the article in which none of the substrates are plastically deformed;
wherein in at least 1 vibration damping material layer, within at least a 5% area of the deformation area, the vibration damping material is non-existent or, if present, has a mass that is 90% or less than the average mass of the vibration damping material layer of an equal area in an area of the article which is not in a deformation area;
wherein at least one substrate has a variable thickness in a deformation area; and
wherein at least one of the first and second substrates contains protrusion(s) and/or depression(s) in a deformation area.

5,691,038

COVER TAPE AND COATING APPLICATOR

Akira Hirata; Mikio Komiyama; Katsuhisa Taguchi, all of Urawa, and Takanori Saitoh, Misato, all of Japan, assignors to Lintec Corporation, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 361,362
Claims priority, application Japan, Dec. 22, 1993, 5-068644 U; Oct. 18, 1994, 6-252465
Int. Cl.^{6} C09J *7/02;* B32B *7/12*
U.S. Cl. 428—194 **22 Claims**

1. A cover tape to be adhered to a surface of a carrier tape having a tape shape and having accommodation parts for accommodating chips and other small items formed discontinuously

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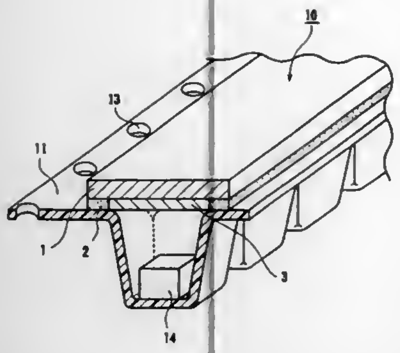


along the longitudinal direction of the carrier tape to thereby seal the accommodation parts, the cover tape comprising:

a base material having edges;

adhesive parts formed on one side of the base material adjacent both edges of the base material and extending along a longitudinal direction of the base material, wherein the adhesive parts are configured to oppose none of the accommodation parts; and

a nonadhesive resin part formed on the one side of the base material between the adhesive parts and having substantially the same thickness as the adhesive parts, wherein the nonadhesive resin part is configured to oppose the accommodation parts.

2. A cover tape for a carrier assembly for the packing, storage, transportation and automatic takeout of a plurality of parts while keeping the parts unsoiled and separate from each other, the carrier assembly including a carrier tape having a plurality of recesses or through-holes for retaining the parts separate from each other, wherein the carrier tape and the cover tape cooperate to retain the parts therebetween, said cover tape comprising:

a) a base material having edges;

b) a pair of substantially parallel spaced apart adhesive layers formed on one surface of said base material and extending along the longitudinal axis of said one surface of said base material at both edges of said base material, said adhesive layers adapted to contact a pair of receiving surfaces extending along the longitudinal axis of the carrier tape when said cover tape is placed over the carrier tape and wherein neither of said adhesive layers is disposed above the parts when said cover tape is placed over the carrier tape; and

c) a nonadhesive layer formed on said one surface of said base material, said nonadhesive layer located in a space formed between said spaced apart adhesive layers, and wherein said nonadhesive layer is disposed over the parts when said cover tape is placed over the carrier tape,

wherein said nonadhesive layer has substantially the same thickness as that of said adhesive layers and prevents the parts from contacting said adhesive layers.

5,691,039
TONER FIXING METHOD AND RECEIVING SHEET

Donald S. Rimai, Webster, and Muhammad Aslam, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 810,008, Dec. 18, 1991, Pat. No. 5,516,394, which is a division of Ser. No. 405,258, Sep. 11, 1989, Pat. No. 5,089,363. This application Jun. 7, 1995, Ser. No. 485,873

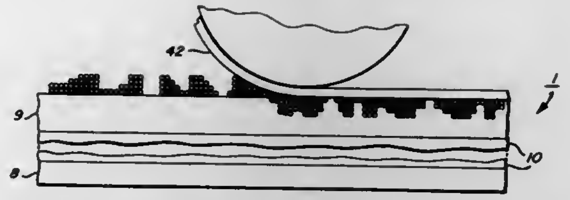
Int. Cl.⁶ B32B *3/00*

U.S. Cl. 428—195 **11 Claims**

1. An image bearing receiving sheet comprising:

a paper support,

a thermoplastic layer on one side of said support having a toner image at least partially embedded therein, said thermoplastic layer having a glass transition temperature between 45° and 70° C., and



a curl preventing layer on the other side of said support to prevent curl of said sheet in changing ambient conditions and having a melting temperature above 115° C.

5,691,040
LINER FOR FIREFIGHTER GARMENT MADE OF A LAMINATE OF A WOVEN FABRIC AND A NON-WOVEN MATERIAL

Claude Barbeau, Saint-Lambert, and Ross Cochran, Ville Mont-Royal, both of Canada, assignors to Marcanada Inc., Montreal, Canada

Filed Dec. 18, 1995, Ser. No. 573,993

Int. Cl.⁶ B32B *27/14*

U.S. Cl. 428—198 **6 Claims**

1. In a firefighter garment including a fire-resistant outer shell, moisture barrier and thermal liner, the improvement wherein said thermal liner comprises a laminate formed of a sheet of woven textile material derived from multifilamentary aramid, polyimide, polyamide, polybenzimidazole or cellulose fire-resistant yarns; a second sheet of non-woven fire-resistant textile material acting as a thermal insulating barrier, and adhesive means enabling said sheet of textile material and sheet of non-woven textile material to be laminated in such a manner that said sheet of textile material and said sheet of non-woven textile material are non-slipping relative to one another while enabling said laminate to be air permeable, with a minimum of ten (10) cubic feet per minute (CFM) air permeability when tested in accordance with ASTM D737 and that the laminate also inhibits fraying of the woven textile material.

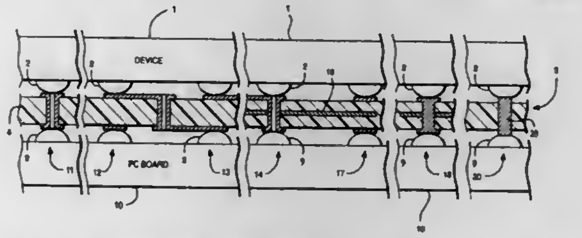
5,691,041
SOCKET FOR SEMI-PERMANENTLY CONNECTING A SOLDER BALL GRID ARRAY DEVICE USING A DENDRITE INTERPOSER

Richard Francis Frankeny, Elgin; Jerome Albert Frankeny, Taylor; Danny Edward Massey, Georgetown, and Keith Allan Vanderlee, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1995, Ser. No. 536,880

Int. Cl.⁶ B32B *3/00;* **H01R** *4/58;* **H05K** *5/00;7/16*

U.S. Cl. 428—209 **16 Claims**



1. A socket apparatus, comprising:

a planar interposer of flexible dielectric material having a multiplicity of vias or pads covered with dendrites, which vias or pads are distributed in an array pattern substantially conforming to an array pattern of balls on a surface of an electronic ball grid array device;

a rigid cap with a planar surface alignable to be substantially coplanar with the surface of the ball grid array device;

means for aligning the array pattern of balls on the ball grid array device with the planar interposer and with an array pattern of contact regions on a board; and

means for translating the cap to compress the ball grid array device, the interposer, and the contact regions of the board adequately to cause dendrite penetration into ball grid array device balls and contact regions on the board.

5,691,042
PRINTABLE RIBBED COATED SHEET AND PROCESS FOR PRODUCING SAME

Michel Goguelin, Charavines; Emeric Thibierge, Asnieres, and Alain Barthez, Paris, all of France, assignors to Arjo Wiggins S.A., Paris, France

PCT No. PCT/FR91/01047, § 371 Date Aug. 18, 1993, § 102(e) Date Aug. 18, 1993, PCT Pub. No. WO92/11413, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 20, 1991, Ser. No. 78,248

Claims priority, application France, Dec. 21, 1990, 90 16141

Int. Cl.⁶ B32B *3/00*

U.S. Cl. 428—211 **18 Claims**

1. A pigment-coated offset printing paper comprising

a base material made of cellulose fibers and having at least one marked side with hollow and embossed portions and

a pigment coating directly on at least one of the marked sides of the base material that uniformly coats the hollow and embossed portions but does not fill up the hollow portions, whereby the paper retains a marked appearance.

5,691,043
UNIAXIALLY SHRINKABLE BIAXIALLY ORIENTED POLYPROPYLENE FILM AND ITS METHOD OF PREPARATION

Lajos E. Keller, and Marie-France Nothnagle, both of Fairport, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 276,124, Jul. 15, 1994, abandoned. This application Apr. 25, 1995, Ser. No. 427,785

Int. Cl.⁶ B32B *27/08;27/32;5/16*

U.S. Cl. 428—212 **34 Claims**

1. A uniaxially heat-shrinkable, biaxially oriented, multilayer film having a polypropylene-containing core layer and at least one polyolefin-containing skin layer adjacent said core layer, said core layer containing isotactic polypropylene and a modifier which reduces the crystallinity of the polypropylene by increasing chain imperfections of the polypropylene-containing core layer or reducing isotacticity of the polypropylene-containing core.

5,691,044
LIGHT ABSORPTIVE ANTIREFLECTOR

Takuji Oyama, Yokohama, and Yoshihito Katayama, Funabashi, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

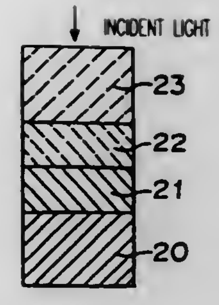
Filed Dec. 12, 1995, Ser. No. 571,299

Claims priority, application Japan, Dec. 13, 1994, 6-309116; Sep. 27, 1995, 7-249873

Int. Cl.⁶ C03C *17/23*

U.S. Cl. 428—216 **26 Claims**

1. A light absorptive antireflector consisting essentially of a substrate, a light absorbing film formed on the substrate and a silica film formed on the light absorbing film, to reduce reflection of incident light from the silica film side, wherein the geometrical film thickness of the light absorbing film is from 5 to 25 nm, and the geometrical film thickness of the silica film is from 70 to 110 nm, and wherein an oxidation barrier layer of geometrical film thickness of from 1 to 20 nm is present and consists essentially of a metal or a metal nitride with oxidation barrier properties and formed between and next to the light absorbing film and the silica film.



5,691,045
INSULATED ASSEMBLY INCORPORATING A THERMOPLASTIC BARRIER MEMBER

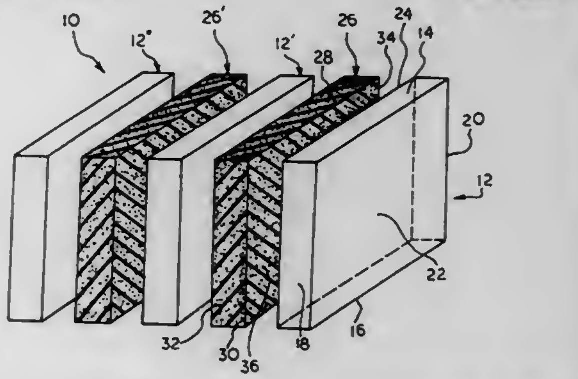
Luc Lafond, 23 Woodvailey Dr., Etobicoke, Ontario M9A 4H4, Canada

Continuation-in-part of Ser. No. 513,180, Aug. 9, 1995, which is a continuation-in-part of Ser. No. 477,950, Jun. 7, 1995, Pat. No. 5,616,415, which is a continuation-in-part of Ser. No. 871,016, Apr. 20, 1992, Pat. No. 5,441,779. This application Oct. 26, 1995, Ser. No. 548,919

Claims priority, application Canada, Apr. 22, 1991, 2040636

Int. Cl.⁶ B32B *3/26;* **E06B** *3/24*

U.S. Cl. 428—304.4 **20 Claims**



1. An insulating spacer and sealant strip having a pair of substrate engaging surfaces and opposed faces extending therebetween and serving as an insulating spacer and seal adapted for positioning between a pair of opposed substrates, comprising:

overlying layers of differing insulating and sealing materials in an alternating face-to-face relationship with one another to form a partial strip and a further layer of insulating and sealing material overlying a different layer of said partial strip; one of said materials being a cellular insulant and another being a resilient sealant.

5,691,046
RECORDING MEDIUM

Toshiya Matsubara, and Nobuyuki Yokota, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed May 3, 1996, Ser. No. 642,397

Claims priority, application Japan, May 12, 1995, 7-114683

Int. Cl.⁶ B41M *5/00*

U.S. Cl. 428—310.5 **20 Claims**

1. A recording medium comprising at least one crystalline boehmite-containing porous layer on a substrate, wherein the porous layer has pores having a pore radius of from 1 to 30 nm in a pore volume of from 0.3 to 1.2 ml/g, pores having a pore radius of from 10 to 30 nm in a pore volume of from 0.2 to 1.0 ml/g and pores having a pore radius of from 30 nm to 100 nm in a pore volume of not more than 0.3 ml/g, and the b-axis of the boehmite is oriented vertically with respect to the surface of the substrate.

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POROUS MULTI-LAYER FILM

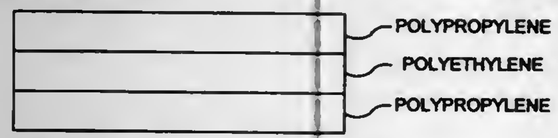
Hiroshi Kurauchi; Tetuo Akazawa, and Akira Kawabata, all of Osaka, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed May 12, 1995, Ser. No. 440,075

Claims priority, application Japan, May 12, 1994, 6-098394; May 12, 1994, 6-098395

Int. Cl.^{6} B32B *3/26;27/32;* **H01M** *2/16*

U.S. Cl. 428—315.7 **18 Claims**



1. A porous multi-layer film comprising two polypropylene layers with a polyethylene layer sandwiched therebetween, said three layers being combined to form a united structure with a peel strength of at least 3 g/15 mm, which has a pore volume in the range of 30 to 80%, a maximum pore size in the range of 0.02 to 2 μm, a gas permeability in the range of 150 to 1,500 in terms of Gurley Number, a shutdown temperature in the range of 135° to 140° C., and a thermal durability to maintain the shutdown condition up to at least 180° C.

5,691,048

DUAL COATED METAL SUBSTRATES AND METHODS OF MAKING THE SAME

Oscar E. Roberto, Farmington Hills, and Marc A. Maxim, Sterling Heights, both of Mich., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation of Ser. No. 276,284, Jul. 18, 1994, Pat. No. 5,486,414. This application Jan. 22, 1996, Ser. No. 589,828

Int. Cl.^{6} B32B *15/04;15/08;* **B05D** *3/04;* **C23F** *7/26*

U.S. Cl. 428—334 **20 Claims**

1. A method for coating a metal substrate, said method comprising steps of:

- (I) applying onto the metal substrate a first liquid coating composition comprising, in an aqueous liquid medium, an intimate mixture of:
  - (i) a hexavalent chromium-providing substance, supplied by about 80 to about 100 weight percent chromic acid and providing above 5 but below about 100 grams per liter of chromium, expressed as CrO_3;
  - (ii) above 50 but below about 500 grams per liter of liquid medium of pulverulent metal selected from the group consisting of zinc, aluminum, mixtures thereof and alloys of same, said first composition having a weight ratio of chromium, expressed as CrO_3, to pulverulent metal of between about 1:1 and 1:15;
  - (iii) below about 50 volume percent but substantially above about 15 volume percent, based on the volume of the total liquid of the first liquid coating composition, of water soluble organic liquid substance that maintains liquidity above 100° C. and is selected from the group consisting of tri- and tetra-ethylene glycol, di- and tri-propylene glycol, and the water soluble C_1–C_4 ethers of all such foregoing glycols, diacetone alcohol, the water soluble C_1–C_4 ethers of diethylene glycol, and mixtures of the foregoing; and
- (iv) above about 0.0005 volume percent based on the total volume of first liquid coating composition, of dispersing agent;
- (II) heating the substrate and the liquid coating formed thereon in step (I) at a temperature, and for a period of time, sufficient to convert the liquid coating formed in step (I) to an adherent, water insoluble first solid coating on the substrate;
- (III) applying onto the surface of the first solid coating formed in step (II) a second liquid coating of an acidic aqueous composition comprising dispersed resin solids and an activator, which acidic aqueous composition forms on a metallic surface a resinous coating that increases in thickness the longer the surface is contacted with the composition, to form an uncured autodeposited second liquid coating over said first solid coating; and
- (IV) curing the uncured autodeposited second liquid coating formed in step (III) to form an autodeposited second solid coating bonded to the adherent, water insoluble first coating.

5,691,049

HEAT SHRINKABLE POLYOLEFIN LAMINATE FILM

Shuichi Morita; Koji Sueoka; Fumio Horita; Toshikatsu Oyama, and Hideo Isozaki, all of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

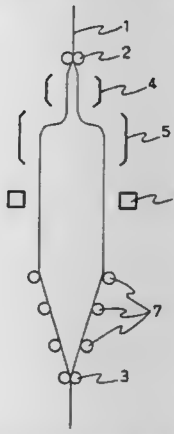
PCT No. PCT/JP95/01914, § 371 Date May 24, 1996, § 102(e) Date May 24, 1996, PCT Pub. No. WO96/09930, PCT Pub. Date Apr. 4, 1996

PCT Filed Sep. 22, 1995, Ser. No. 648,006

Claims priority, application Japan, Sep. 29, 1994, 6-258978

Int. Cl.^{6} B32B *27/32;* **B65B** *53/02*

U.S. Cl. 428—336 **1 Claim**



1. A heat shrinkable polyolefin laminate film comprising an intermediate layer and surface layers, said intermediate layer comprising an ethylene resin composition consisting essentially an ethylene resin composition consisting essentially of (A) 80 to 50 parts by weight of a linear low density polyethylene comprising ethylene and an α-olefin and having a density of 0.91 to 0.93 g/cm^3 at 25° C. and a melt index of 0.2 to 3.0 g/10 minutes and (B) 20 to 50 parts by weight of a syndiotactic polypropylene, and said surface layers comprising a crystalline polypropylene resin, wherein the thickness of said intermediate layer is not less than 30% of the total thickness, the thickness of each of said surface layers is at least 1 μm, said film is stretched at least two times in both the machine and transverse directions, and the syndiotactic pentad fraction measured by ^{13}C-NMR of said syndiotactic polypropylene (B) is not less than 0.7.

5,691,050

CONCRETE MOLDING WITH IMPROVED ACID RESISTANCE

Volkmar Berg, Graben, and Helmut Rinno, Hofheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 358,337, Dec. 16, 1994, Pat. No. 5,599,597, which is a continuation of Ser. No. 45,559, Apr. 9, 1993, abandoned. This application May 25, 1995, Ser. No. 450,076

Claims priority, application Germany, Apr. 13, 1992, 42 12 325.9

The portion of the term of this patent subsequent to Feb. 4, 2017, has been disclaimed.

Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—344 **7 Claims**

1. A molded unreinforced or reinforced concrete molding, which may also be a concrete pipe, bound by hydraulic inorganic binders, with improved corrosion resistance to acids and acidic sewage, improved penetration resistance to inorganic and organic liquids and gases and improved mechanical stability, produced by molding and hardening of plastic-viscous concrete mixtures of hydraulic inorganic binders, which may comprise cement or contain cement, aggregates and water, which additionally contains finely distributed plastics components from anionic dispersion copolymers prepared from ethylenically unsaturated monomers by copolymerization, are hydrolysis resistant with respect to the hydraulic inorganic binder and with respect to the hydraulic inorganic binder and with respect to acidic sewage and have been mixed with the plastic-viscous concrete mixtures as an aqueous plastics dispersion which is compatible with the hydraulic inorganic binder and whose minimum film forming temperature (MFT) is above the hardening temperature of the plastic-viscous concrete mixtures; the glass transition temperature T_g) of the anionic dispersion copolymer is higher than 23° C., and the anionic dispersion copolymer contains, in each case based on the dispersion copolymer, 0.05 to 5% by weight of monomer units selected from the group consisting of ethylenically unsaturated sulfonic acids and ethylenically unsaturated phosphonic acids and, 0.05 to 1.5% by weight of monomer units from ethylenically unsaturated monomers with organosilicon radicals, which may be reactive, or contains 0.05 to 1.5% by weight of epoxysilanes mixed with the aqueous plastics dispersion.

5,691,051

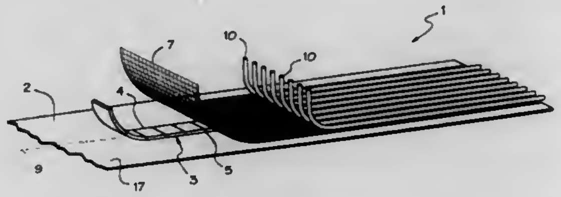
HEAT BOND SEAMING TAPE AND METHOD OF MANUFACTURE

James A. Matthews, 811 17th St., NW., Massillon, Ohio 44646

Filed Nov. 1, 1995, Ser. No. 551,423

Int. Cl.^{6} B32B *7/12*

U.S. Cl. 428—354 **9 Claims**



1. A seam tape for connecting adjoining edges of carpet at a seam thereof to reduce buckling of said edges along said seam, said tape including:

- an elongated base strip of flexible sheet material;
- an elongated strip of a rigid plastic material extending longitudinally along the base strip, said strip having a width substantially less than the width of the base strip and having a plurality of transversely extending serrations spaced along the longitudinal length of said strip enabling the seam tape to be formed into a roll configuration;
- an elongated strip of open mesh material extending along the base strip in an overlying relationship to said strip of rigid plastic material; and
- a thermoplastic adhesive material applied to the mesh material for bonding said mesh material and the rigid plastic material to a backing of the carpet.

5,691,052

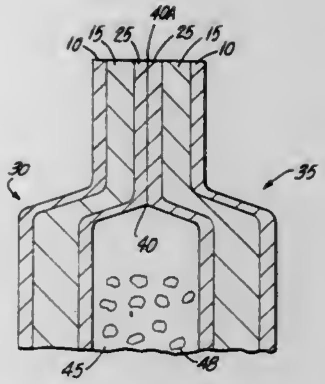
POLYMERIC COMPOSITIONS WITH HIGH SELF-ADHESION AND PACKAGING MATERIALS AND PACKAGES MADE THEREFROM

Gregory K. Jones, Appleton, Wis., assignor to American National Can Company, Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 486,435

Int. Cl.^{6} C09J *3/14;* **B32B** *7/12*

U.S. Cl. 428—355 **31 Claims**



1. An extrudable polymeric composition comprising a blend of 40% to 80% by weight of a tacky adhesive and 60% to 20% by weight of a non-tacky resin, said composition having a seal strength of at least 0.2 lbs. per inch when sealed to itself at a temperature of less than 120° F.

5,691,053

COATING COMPOSITION WITH THERMALLY-INFLUENCED COLOR

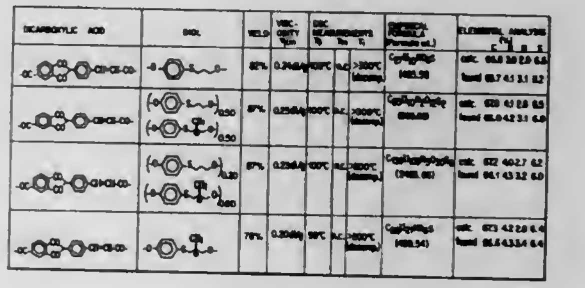
Michael Gailberger; Anne Barth, both of Neu-Ulm; Hans Ruetger Kricheldorf, Hamburg; Volkmar Vill, Hamburg; Mihai Gurau, Hamburg, and Matthias Berghahn, Hamburg, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany

Filed May 15, 1995, Ser. No. 441,686

Claims priority, application Germany, May 13, 1994, 44 16 993.0

Int. Cl.^{6} B32B *19/00*

U.S. Cl. 428—357 **3 Claims**



1. A colored coating material comprising a paint vehicle for coating articles, said paint vehicle comprising at least one curable liquid-crystal polymer having a colored appearance at least partially determined by mesogens therein which exhibit an interference effect, said mesogens being main-chain mesogens and being uncrosslinked when the coating material is applied to an article surface and not crosslinkable by heat and upon application to the article surface automatically aligning themselves approximately perpendicular to said surface and adopting a chiral-nematic configuration in which they form helixes having a pitch length which can be varied by heat, said at least one liquid-crystal polymer being a main-chain polymer comprising a chiral center, wherein the pitch length of the helix is varied by heat to adjust the color only at a temperature above the temperature at which the article to which it is applied is used and wherein the polymer is then irreversibly cross-linked by means other than heat.

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THREE DIMENSIONAL MACROSCOPIC ASSEMBLAGES OF RANDOMLY ORIENTED CARBON FIBRILS AND COMPOSITES CONTAINING SAME

Howard Tennent, Kennett Square, Pa.; Robert W. Hausslein, Lexington, Mass.; Nicholas Leventis, Somerville, Mass., and David Moy, Winchester, Mass., assignors to Hyperion Catalysis Int'l., Inc., Cambridge, Mass.

Continuation of Ser. No. 57,328, May 5, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 428,496

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—359 **33 Claims**

1. A composition of matter consisting essentially of a three-dimensional, macroscopic assemblage of a multiplicity of randomly oriented carbon fibrils, said fibrils being substantially cylindrical with a substantially constant diameter, being substantially free of pyrolytically deposited carbon and having a diameter ranging from about 3.5 and 70 nanometers, said assemblage having a bulk density of from 0,001 to 0.50 gm/cc and at least two dimensions greater than about 0.02 mm.

5,691,055

CARBON FIBERS AND PROCESS FOR PREPARING SAME

Masanobu Kobayashi, Iyo-gun; Motol Itoh, Iyo; Yoji Matsuhisa, Iyo-gun, and Kazuharu Shimizu, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Division of Ser. No. 462,753, Jun. 5, 1995, Pat. No. 5,587,240, which is a division of Ser. No. 293,817, Aug. 22, 1994, Pat. No. 5,462,799. This application Jun. 13, 1996, Ser. No. 661,323

Claims priority, application Japan, Aug. 25, 1993, 5-210282; Jan. 14, 1994, 6-002582; Feb. 16, 1994, 6-019219

Int. Cl.^{6} D02G *3/00;* **B32B** *9/00*

U.S. Cl. 428—367 **6 Claims**

1. A carbon fiber comprising a surface oxygen concentration (O/C ratio) of 0.20–0.02 and a surface nitrogen concentration (N/C ratio) of 0.02–0.30, as measured by X-ray photoelectron spectroscopy, and comprising a sizing agent comprising an aliphatic polymer having multiple epoxy groups, said aliphatic compound including an atomic chain and said atomic chain containing 20–200 atoms.

5,691,056

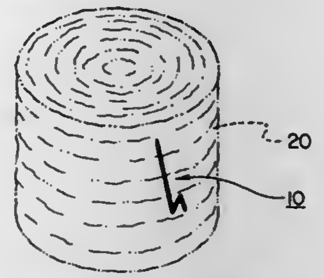
TARP SECURING HOOK

Gerald Vandyk, Box 7124, Edson, Alberta, Canada, T7E IV4

Filed Sep. 23, 1994, Ser. No. 311,321

Int. Cl.^{6} A44B *13/00*

U.S. Cl. 428—369 **11 Claims**



1. A tarp securing hook system comprising:.
at least one bale of hay;
a substantially straight, elongated main shank having a first end spaced from a second end, said shank having an insertion tip integrally formed at said first end thereof for facilitating a piercing insertion of said main shank into a pierceable substrate, said main shank being inserted into said bale of hay;
and,
an engaging means coupled to said second end of said main shank for capturing and engaging a connector;
wherein said engaging means comprises a first hook portion coupled at a first end thereof to said second end of said main shank by a first integral bend such that said first hook portion is oriented at an oblique angle relative to said main shank; a second hook portion coupled to a second end of said first hook portion by a second integral bend, with said second hook portion being oriented at an oblique angle relative to said first hook portion.

5,691,057

POLYESTER MIXED YARNS WITH FINE FILAMENTS

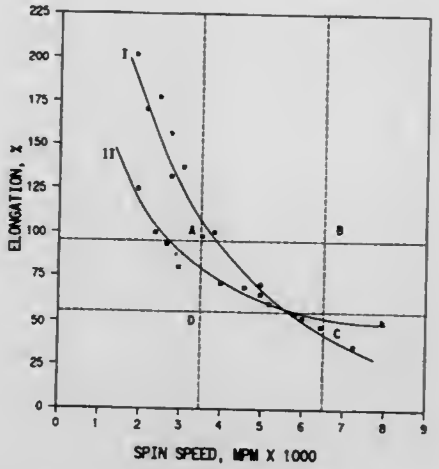
David George Bennie, Rocky Point; Robert James Collins, Wilmington; Hans Rudolf Edward Frankfort, Kinston; Stephen Buckner Johnson, Wilmington, all of N.C.; Benjamin Hughes Knox, Wilmington, Del.; Joe Forrest London, Jr., Greenville, N.C.; Elmer Edwin Most, Jr., Durham, N.C., and Girish Anant Pai, Matthews, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 214,906, Mar. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 925,041, Aug. 5, 1992, abandoned, and Ser. No. 93,156, Jul. 23, 1993, Pat. No. 5,417,902, which is a continuation-in-part of Ser. No. 926,538, Aug. 5, 1992, abandoned, and Ser. No. 925,042, Aug. 5, 1992, abandoned, each which is a continuation-in-part of Ser. No. 647,381, Jan. 29, 1991, abandoned, and Ser. No. 860,776, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,371, Jan. 29, 1991, said Ser. No. 93,156is a continuation-in-part of Ser. No. 15,733, Feb. 10, 1993, Pat. No. 5,250,245, Ser. No. 5,672, Jan. 19, 1993, Pat. No. 5,288,553, Ser. No. 753,769, Sep. 3, 1991, Pat. No. 5,261,472, and Ser. No. 786,582, Nov. 1, 1991, Pat. No. 5,244,616, which is a continuation-in-part of Ser. No. 338,251, Apr. 14, 1989, Pat. No. 5,066,447, which is a continuation-in-part of Ser. No. 53,309, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 824,363, Jan. 30, 1986, abandoned, said Ser. No. 753,769is a continuation-in-part of Ser. No. 338,251. This application Jun. 6, 1995, Ser. No. 468,908

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—373 **10 Claims**

1. A mixed-filament polyester yarn comprised of fine filaments and fatter filaments that differ in denier but are of the same polyester polymer, wherein said fine filaments are of filament denier 0.2 to 1, said fatter filaments are of higher filament denier more than 1, and wherein the ratio of the average filament denier of said fatter filaments to the average filament denier of said fine filaments is in the range 2:1 to 6:1, wherein the polyester polymer is of relative viscosity (LRV) in the range of 13 to 23, of zero-shear melting point (T_M^o) in the range of 240° C. to 265° C., and of glass-transition temperature (T_g) in the range of 40° C. to 80° C., and wherein the yarn has an elongation-to-break (E_B) of 40% to 160%, a tenacity-at-7% elongation (T_7) in the range of 0.5 to 1.75 g/d, and shrinkage values such that the thermal stability value (S_2=DHS−S) is +2% or less, and the (1−S/S_m) value is at least 0.1, where S is the boil-off shrinkage, S_m is the maximum shrinkage potential and DHS is the dry heat shrinkage measured at 180° C., and the maximum dry heat Shrinkage Tension (ST_{max}) is 0.2 g/d or less at a peak temperature T(ST_{max}) that is in a range of 5 to 30 degrees above the glass-transition temperature (T_g).



5,691,058

SHEET MATERIAL FOR ELECTRICAL INSULATION, PREPREG AND ELECTRICALLY INSULATED COIL USING THE SAME

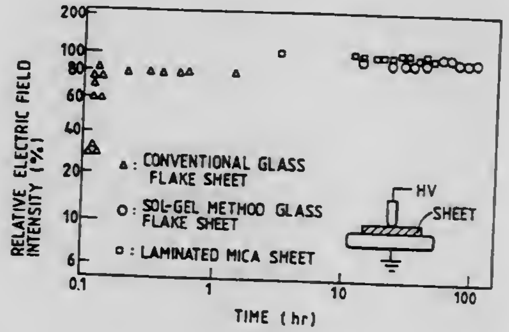
Hiroshi Miyao, Hitachinaka; Yutaka Higashimura, Hitachi; Makoto Takamura, Hitachi; Takanori Satoo, Hitachi; Hiroyuki Kamiya, Hitachi, and Mitsuru Onoda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 9, 1995, Ser. No. 370,197

Claims priority, application Japan, Jan. 11, 1994, 6-001092

Int. Cl.^{6} B32B *15/02*

U.S. Cl. 428—379 **8 Claims**



1. An electrically insulated coil, comprising:
an electrical insulation layer wound around an electrical conductor, said electrical insulation layer being formed by laminating layers of glass flakes having a thickness of 0.2–1 μm and a diameter of 40–250 μm on a backing member of a sheet of electrical insulation material, and by impregnating the laminated layers with a semi-cured thermosetting resin.

5,691,059

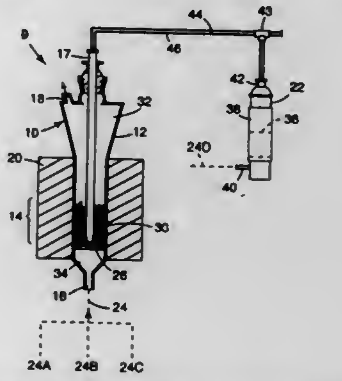
GLASS AND GLASS-CERAMIC BUBBLES HAVING AN ALUMINUM NITRIDE COATING

Kyung H. Moh, Woodbury, Minn., assignor to Minnesota Mining and Manfacturing Company, St. Paul, Minn.

Filed Nov. 21, 1995, Ser. No. 560,794

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—404 **28 Claims**



1. A composite bubble comprising (a) a bubble of a silicate glass having a softening point of less than 900° C., said bubble having an outer surface, and (b) aluminum nitride coated onto 100% of said outer surface of said bubble.

5,691,060

UTILIZATION OF A TRANSACYLATION REACTION BETWEEN AN ESTERIFIED POLYSACCHARIDE AND A POLYAMINATED OR POLYHYDROXYLATED SUBSTANCE FOR FABRICATING MICROPARTICLES, MICROPARTICLES THUS OBTAINED, METHODS AND COMPOSITIONS CONTAINING THEM

Marie-Christine Levy, Reims, France, assignor to Coletica, Lyons, France

PCT No. PCT/FR93/00792, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO94/04261, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 4, 1993, Ser. No. 387,776

Claims priority, application France, Aug. 20, 1992, 92 10173

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—402.21 **61 Claims**

1. Microparticles comprising an outer wall comprising the reaction product of a polysaccharide carrying esterified carboxyl groups and an organic substance which performs a transacylation reaction with said polysaccharide, selected from the group consisting of a polyamine substance and a polyhydroxylic substance.

5,691,061

REFRACTORY SHAPE HAVING AN EXTERNAL LAYER CAPABLE OF FORMING A LAYER IMPERMEABLE TO GASES AND PROCESS FOR ITS PREPARATION

Eric Hanse, Elouges, Belgium, and Phillipe Dumas, Feignies, France, assignors to Vesuvius Crucible Company, Wilmington, Del.

Filed Jun. 15, 1995, Ser. No. 490,792

Claims priority, application France, Jun. 15, 1994, 94 07413; Nov. 28, 1994, 94 14337

Int. Cl.^{6} B22D *11/10*

U.S. Cl. 428—408 **15 Claims**

1. A refractory article for the pouring of steel, comprising a body of a refractory material containing carbon and one or more metal oxides, said article having a refractory layer integral with the body and covering molten steel contacting surfaces of said refractory article, containing one or more metal oxides, 4–9% by weight carbon and at least one sintering precursor, wherein said layer is adapted to form a densified, carbon free and gas impermeable

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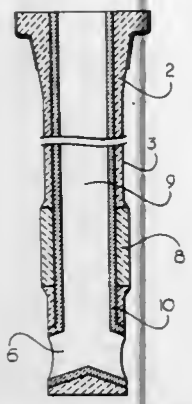


surface when the layer is heated to a temperature above 1000° C. in an oxygen bearing atmosphere such that the carbon in the layer is removed by oxidation along the surface to provide a porous refractory structure which is simultaneously densified by virtue of the sintering precursor.

5,691,062
MOLECULARLY BONDED INHERENTLY CONDUCTIVE POLYMERS ON SUBSTRATES AND SHAPED ARTICLES THEREOF

Shalaby W. Shalaby; Richard V. Gregory, both of Anderson, S.C., and Jacqueline M. Allan, Bowie, Md., assignors to Clemson University, Clemson, S.C.

Filed Feb. 16, 1995, Ser. No. 390,066

Int. Cl.^{6} B32B *9/04*

U.S. Cl. 428—411.1 **6 Claims**

1. An electrically conductive article comprising:

a polymeric substrate having acid-forming functional groups covalently bonded thereto; and

a coherent, uniform outer layer of an electrically conductive material wherein said electrically conductive material is molecularly bonded to said acid-forming functional groups.

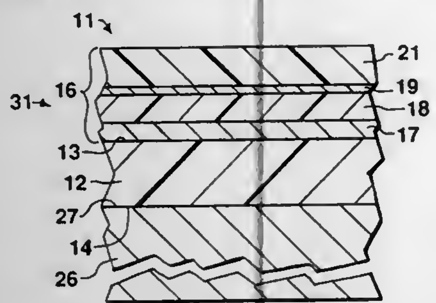
5,691,063
LASER IMAGEABLE TUNED OPTICAL CAVITY THIN FILM AND PRINTING PLATE INCORPORATING THE SAME

Gregory F. Davis, Guerneville; Richard A. Bradley, Jr., Santa Rosa; Shari Powell Fisher, Santa Rosa, and Roger W. Phillips, Santa Rosa, all of Calif., assignors to Flex Products, Inc., Santa Rosa, Calif.

Filed Feb. 29, 1996, Ser. No. 608,645

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—411.1 **16 Claims**



1. A laser imageable tuned optical cavity thin film for use with a laser producing laser radiation at a laser wavelength comprising a flexible sheet of an organic plastic having first and second surfaces serving as a film substrate and a thin film optical cavity stack disposed on the first surface of the film substrate, said thin film stack comprising a first vacuum-deposited metal layer carried by the first surface, a dielectric layer deposited on the first metal layer and a second vacuum-deposited semi-opaque metal layer deposited onto the dielectric layer, said thin film stack being tuned to provide maximum absorption at the laser wavelength.

5,691,064
RELEASE FILM FOR PART WITH PRESSURE-SENSITIVE ADHESIVE ATTACHED

Kiyoshi Ogata, Sagamihara, and Shinobu Sato, Itsukaichimachi, both of Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US94/12664, § 371 Date Mar. 18, 1996, § 102(e) Date Mar. 18, 1996, PCT Pub. No. WO95/12642, PCT Pub. Date May 11, 1995

PCT Filed Nov. 4, 1994, Ser. No. 617,748

Claims priority, application Japan, Nov. 4, 1993, 5-275573

Int. Cl.^{6} B32B *9/04*

U.S. Cl. 428—411.1 **5 Claims**

1. A structure comprising (i) a part with a first pressure-sensitive adhesive attached to the part and (ii) a release film comprising a second pressure-sensitive adhesive on a base material, wherein said part and said release film are attached by their corresponding pressure-sensitive adhesive layers, wherein said pressure-sensitive adhesive layer on the base material has a Tg value ranging from −50° C. to −20° C. and a thickness ranging from 3 μm to 50 μm and wherein the adhesion value between the pressure-sensitive adhesive on the base material and the pressure-sensitive adhesive attached to the part is within the range between 10 and 400 g/25 mm.

5,691,065
POLYMERIZABLE COMPOSITIONS MADE WITH POLYMERIZATION INITIATOR SYSTEMS BASED ON ORGANOBORANE AMINE COMPLEXES

Jury V. Zharov, Nizhny Novgorod, and Jury N. Krasnov, deceased, late of Nizhny Novgorod, both of Russian Federation, by Julia A. Krasnova, Legal Representative, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 391,642, Feb. 21, 1995, Pat. No. 5,539,070. This application Mar. 7, 1996, Ser. No. 612,035

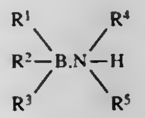
Int. Cl.^{6} B32B *27/32;27/30*

U.S. Cl. 428—421 **20 Claims**

1. A bonded composite comprising a first substrate, a second substrate, and a polymerized acrylic composition that adhesively bonds the first and second substrates together wherein the acrylic composition is the polymerization product of a polymerizable acrylic system that comprised:

(a) at least one acrylic monomer;

(b) an effective mount of an organoborane amine complex having the structure:



wherein:

R^1 is an alkyl group having 1 to 10 carbon atoms;

R^2 and R^3 are independently selected from the group consisting of alkyl groups having 1 to 10 carbon atoms and phenyl-containing groups;

R^4 is selected from the group consisting of CH_2CH_2OH and $(CH_2)_3NH_2$ wherein x is an integer greater than 2;

R^5 is hydrogen or an alkyl group having 1 to 10 carbon atoms; and

the nitrogen atom to boron atom ratio is about 1:1 to 1.5:1; and

(c) an effective mount of an acid for initiating polymerization of the acrylic monomer.

4. A bonded composite according to claim 1 wherein both the first and second substrates have a low surface energy.

5. A bonded composite according to claim 4 wherein both the first and second substrates are independently selected from the group consisting of a polyethylene, a polypropylene, a polyvinylchloride and a fluoroplastic.

5,691,066
GOLF BALL COMPRISING FLUOROPOLYMER AND METHOD OF MAKING SAME

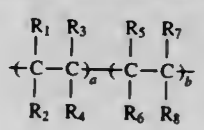
Murali Rajagopalan, South Dartmouth, Mass., assignor to Acushnet Company, Fairhaven, Mass.

Filed Jun. 25, 1996, Ser. No. 668,652

Int. Cl.^{6} A63B *57/00;* **C08F** *214/18;* **C08L** *27/12;33/02*

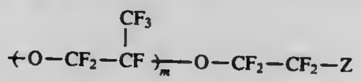
U.S. Cl. 428—421 **23 Claims**

1. A golf ball having an outer surface wherein the improvement comprises forming at least said outer surface of a thermoplastic material comprising at least one functionalized fluoropolymer, wherein said fluoropolymer has the formula



$$\left(\overset{R_1}{\underset{R_2}{C}} - \overset{R_3}{\underset{R_4}{C}} \right)_a \left(\overset{R_5}{\underset{R_6}{C}} - \overset{R_7}{\underset{R_8}{C}} \right)_b$$

in which a is a number from 1 to 100; b is a number from 99 to 1; R_1–R_7 are independently selected from the group consisting of H, F, alkyl, and aryl; and R_8 is H, F, or a moiety of the formula



$$\left(O-CF_2-\overset{CF_3}{CF} \right)_m O-CF_2-CF_2-Z$$

in which m is a number from 1 to 18; and Z is selected from the group consisting of SO_2F, SO_3H, $SO_3^-M^{v+}$, COF, CO_2 H, and $CO_2^-M^{v+}$, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

5,691,067
NON-STICK/RELEASE POWDER COATINGS FOR COOKWARE AND BAKEWARE

Rajendra Patel, Schaumburg, Ill., assignor to Coatings America, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 429,204, Apr. 26, 1995, abandoned. This application Aug. 8, 1996, Ser. No. 695,664

Int. Cl.^{6} C08F *283/12*

U.S. Cl. 428—447 **16 Claims**

1. A powder coating for cookware and bakeware comprising a powder silicone resin selected from the group consisting of phenyl polysiloxane powder resin, methyl polysiloxane powder resin and phenyl alkyl polysiloxane powder resin, and a polysiloxane additive selected from the group consisting of dimethyl polysiloxane and methyl alkyl polysiloxane, wherein the powder coating is characterized by heat stability from about 250° F. to about 900° F. and non-stick and release properties.

5,691,068

Patent Not Issued For This Number

5,691,069
ACRYLIC EMULSION COATINGS FOR RUBBER ARTICLES

Ivan Lee, Arcadia, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.

Filed Feb. 14, 1995, Ser. No. 388,030

Int. Cl.^{6} C08L *33/08;27/12;83/04*

U.S. Cl. 428—500 **16 Claims**

1. A rubber article having a coating deposited on a surface thereof from an aqueous suspension of an emulsion copolymer of from about 0.7 to about 20% by weight of at least one copolymerizable low surface energy monomer selected from the group consisting of reactive silicones, reactive fluorocarbons and reactive fatty acids esters, said low surface energy monomer having a functionality selected from vinyl, acrylic and methacrylic, from about 30 to about 85% by weight of at least one alkyl acrylate containing from 1 to about 10 carbon atoms in the alkyl group, the balance of the monomers comprising hard monomers, said hard monomers, when homopolymerized having a glass transition temperature greater than about 25° C. and present in an amount sufficient to provide non-tacky acrylic based emulsion.

5,691,070
POLYOLEFIN COMPOSITION, MOLDED ARTICLE THEREOF AND MULTILAYERED LAMINATE

Kazuyuki Watanabe, and Satoshi Iwamoto, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 321,517, Oct. 12, 1994. This application Jun. 11, 1996, Ser. No. 661,544

Claims priority, application Japan, Oct. 13, 1993, 5-280240

Int. Cl.^{6} B32B *37/32;1/02;* **B65D** *30/08*

U.S. Cl. 428—516 **4 Claims**

1. A multilayered laminate which comprises the following (i) and (ii):

(i) a layer of a polyolefin composition comprising;

(A) 1 to 99% by weight of a polyolefin having the following properties of (a) to (e);

(a) a ratio (η_1/η_2) of kinematic viscosity η_1 at a frequency of 10^{-1} rad/sec to kinematic viscosity η_2 at a frequency of 10 rad/sec at a temperature of 190° C. according to a kinematic viscoelasticity determination method of 4 to 20,

(b) a crystallization peak temperature Tcp according to a Differential Scanning Calorimetry (DSC) of 110° to 130° C.,

(c) a ratio (Tmp/Tcp) of melting peak temperature Tmp to crystallization peak temperature Tcp according to a Differential Scanning Calorimetry (DSC) of 1.1 to 1.5,

(d) Tmp/(Tmp−Tcp)=3.0 to 9.8, and

(e) a crystal structure exhibiting a-axial orientation in a diffraction pattern according to a X-ray diffraction method, and

(B) 99 to 1% by weight of a propylene resin having the following properties of (f) and (g);

(f) a ratio (η_1/η_2) of kinematic viscosity η_1 at a frequency of 10^{-1} rad/sec to kinematic viscosity η_2 at a frequency of 10 rad/sec at a temperature of 190° C. according to a kinematic viscoelasticity determination method of below 4, and

(g) and no crystal structure exhibiting a-axial orientation in a diffraction pattern according to a X-ray diffraction method, and

(ii) a layer of (C) block copolymer of propylene/ethylene.

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5,691,071
SURFACE-TREATED METAL WIRE FOR USE IN THE MANUFACTURE OF REINFORCEMENT STRUCTURES FOR PRODUCTS MADE OF ELASTOMER MATERIAL, AND A PROCESS THEREFOR

Pietro Cavallotti, Milan, and Federico Pavan, Florence, both of Italy, assignors to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy

Filed Jul. 27, 1995, Ser. No. 508,026
Claims priority, application Italy, Jul. 28, 1994, MI94A1627
Int. Cl.^{6} B60C *9/00;* **B32B** *15/06*
U.S. Cl. 428—607 **33 Claims**

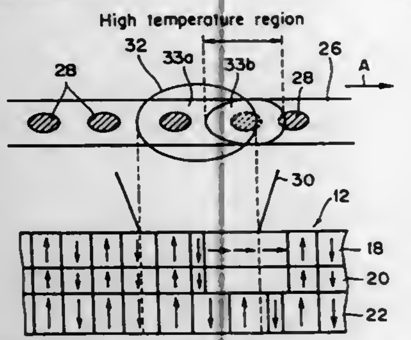
CLADDING	TIME FOR FORMATION OF RUST (MIN)
BRASS	30
Zn	240
ZnCo	1152
NiZn/ZnCo	1720
ZnMn 5%	360
ZnMn 30%	2400
ZnMn 80%	20000

1. A cord for reinforcement structures for products made of elastomer material, said cord consisting of a plurality of surface-treated metal wires, each wire comprising a steel core provided with a metal alloy surface cladding consisting essentially of a zinc/manganese binary alloy with a manganese content of between 5% and 80%.

5,691,072
MAGNETO-OPTICAL RECORDING MEDIUM AND METHOD OF REPRODUCING INFORMATION RECORDED ON SUCH MEDIUM

Haruhiko Izumi; Ken Tamanoi; Masaharu Moritsugu; Miyozo Maeda; Toshio Sugimoto; Koji Matsumoto, and Motonobu Mihara, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 31, 1995, Ser. No. 381,642
Claims priority, application Japan, Mar. 15, 1994, 6-044390; Sep. 19, 1994, 6-223277
Int. Cl.^{6} G11B *5/66;11/00*
U.S. Cl. 428—694 ML **26 Claims**

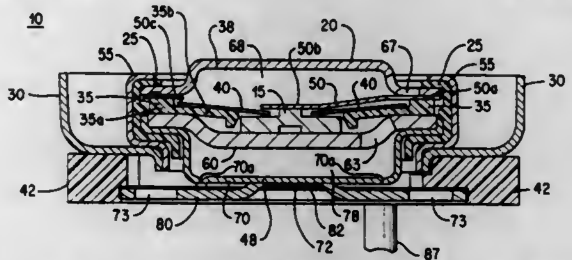


1. A magneto-optical recording medium comprising:
a substrate transparent to a laser beam;
a magnetic reproducing layer formed on said transparent substrate and having an easy direction of magnetization perpendicular to a film plane at a room temperature, and having an in-plane easy direction of magnetization when heated beyond a first predetermined temperature above said room temperature;
a magnetic switch layer having a specific composition formed on said reproducing layer and having an easy direction of magnetization perpendicular to said film plane at said room temperature; and
a magnetic recording layer formed on said switch layer and having an easy direction of magnetization perpendicular to said film plane at said room temperature;
wherein respective Curie temperatures Tc1, Tc2 and Tc3 of said reproducing layer, switch layer and recording layer satisfy the relationship of Tc1>Tc3>Tc2.

5,691,073
CURRENT INTERRUPTER FOR ELECTROCHEMICAL CELLS

Viet H. Vu, Milford; Jane A. Blasi, Acton, both of Mass.; Robert J. Pinault, West Warwick, R.I.; William T. McHugh, Westwood, Mass., and Lucien P. Fontaine, Lincoln, R.I., assignors to Duracell Inc., Bethel, Conn.

Filed Oct. 2, 1996, Ser. No. 720,616
Int. Cl.^{6} H01M *2/12;10/50*
U.S. Cl. 429—7 **30 Claims**

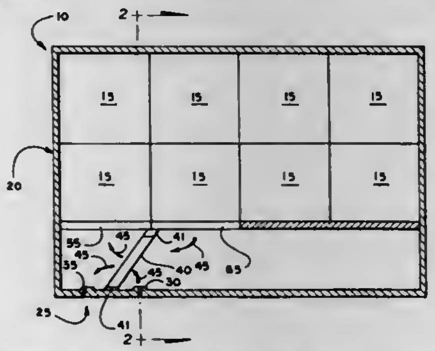


1. An end cap assembly for application to an electrochemical cell having a positive and a negative terminal and a pair of internal electrodes, said end cap assembly comprising a housing and an exposed end cap plate, said plate functional as a cell terminal, said end cap assembly having an electrically conductive pathway therethrough permitting the end cap plate to be electrically connected to a cell electrode when said end cap assembly is applied to a cell, said end cap assembly further comprising a) thermally responsive means for preventing current from flowing through said electrical pathway, wherein said thermally responsive means is activatable when the temperature within said end cap assembly reaches a predetermined level causing a break in said electrical pathway, and b) a pressure responsive means comprising a rupturable member located at the end of said end cap assembly opposite said end cap plate, said rupturable member rupturing when gas pressure on the side thereof furthest from said end cap plate reaches a predetermined level producing a rupture in said member allowing gas to pass therethrough.

5,691,074
DIFFUSION CONTROLLED AIR VENT FOR A METAL-AIR BATTERY

Christopher S. Pedicini, Marietta, Ga., assignor to AER Energy Resources, Inc., Atlanta, Ga.

Filed Oct. 18, 1995, Ser. No. 544,707
Int. Cl.^{6} H01M *12/08*
U.S. Cl. 429—27 **27 Claims**



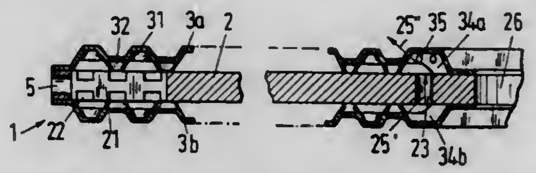
1. A ventilation system for a metal-air battery, comprising:
a housing for enclosing at least one metal-air cell;
said housing having at least one air inlet opening and at least one air outlet opening; and

a fan positioned to force said air into said air inlet opening and out of said air outlet opening when said fan is turned on;
said openings each being sized with a length in the direction through the thickness of said housing being greater than a width in the direction perpendicular to said thickness of said housing;
said openings being unobstructed when said fan is turned off.

5,691,075
HIGH TEMPERATURE FUEL CELL

Emad Batawi, Winterthur, Switzerland, assignor to Sulzer Innotec AG, Winterthur, Switzerland

Filed Apr. 30, 1996, Ser. No. 640,370
Claims priority, application European Pat. Off., Jun. 13, 1995, 95810390
Int. Cl.^{6} H01M *8/06*
U.S. Cl. 429—32 **13 Claims**

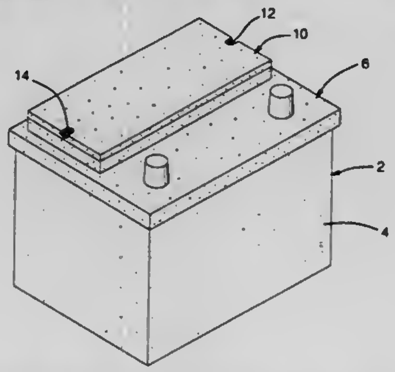


1. A high temperature fuel cell having a planar, substantially centrally symmetrical structure and comprising:
an electrochemically active plate; and
an interconnector formed as an air heat exchanger having air infeed positions arranged at the periphery, the interconnector comprising three layers;
wherein a middle layer of the three layers consists of a plate that has approximately at least the same thermal expansion as the electrochemically active plate;
wherein side layers of the three layers are formed of metal sheets having uneven surfaces and are thinner than the middle layer plate, the side layers being connected to the middle plate via a plurality of contact positions; and
wherein the side layers are configured such that they have direct contacts with the electrochemically active plate as well as a neighboring cell.

5,691,076
LEAK PROOF VENTING SYSTEM FOR ELECTRIC STORAGE BATTERY

David Thomas Poe, Yorktown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 14, 1995, Ser. No. 528,113
Int. Cl.^{6} H01M *2/12*
U.S. Cl. 429—53 **4 Claims**

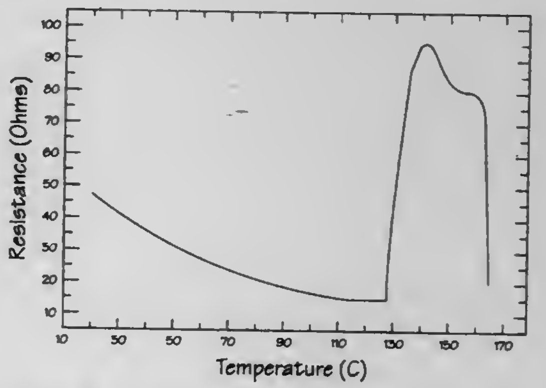


1. An electric storage battery comprising a case for housing the battery's active elements, said case having a pair of opposing ends and a pair of opposing sides, a cover secured to said case and a horizontal-type vent system formed in said cover for relieving gases from the innards of the battery when the battery is in an upright position and preventing electrolyte escape therefrom when the battery is tilted ninety degrees from said upright position onto either of its ends or sides, said venting system comprising:
a. an exhaust port for passing said gasses to the ambient when the battery is in said upright position;
b. an exhaust chamber adjacent said exhaust port;
c. an electrolyte drainage aperture for venting and refluxing electrolyte from and to said innards respectively when the battery is in said upright position;
d. inner and outer partitions spaced apart one from the other and together defining a reservoir superjacent said aperture when said battery is in said upright position for trapping said electrolyte exiting from said innards when the battery is tilted said ninety degrees, said reservoir having an inner chamber surrounded by an outer chamber each separated from the other by said inner partition;
e. a first opening in said inner partition communicating said chambers and lying in a plane spaced above said aperture when said battery is tilted onto either a first said end or first said side;
f. a second opening in said outer partition communicating said outer chambers with an isolation chamber and lying in a plane spaced above said aperture when said battery is tilted onto either a second said end or second said side;
g. said first and second openings each lying in a plane beneath said aperture when the other of said openings lies in a plane above said aperture;
h. an isolation chamber interjacent said exhaust and reservoir chambers for inhibiting any electrolyte exiting said reservoir chamber from entering said exhaust chamber, said isolation chamber having a floor which slopes downwardly from said exhaust chamber toward said reservoir chamber when the battery is in said upright position;
i. a bulkhead separating said exhaust chamber from said isolation chamber; and
j. a third opening in said bulkhead intermediate the ends of said bulkhead for admitting said gas into said exhaust chamber and refluxing any electrolyte that might enter said exhaust chamber back into said isolation chamber;
whereby electrolyte invading said reservoir chamber from said innards while the battery is in any of said tilted positions is trapped primarily in said reservoir chamber and prevented from migrating therefrom into said exhaust chamber.

5,691,077
SHUTDOWN, TRILAYER BATTERY SEPARATOR

Wei-Ching Yu, Charlotte, N.C., assignor to Hoechst Celanese Corporation, Warren, N.J.

Continuation of Ser. No. 359,772, Dec. 20, 1994, abandoned.
This application May 20, 1996, Ser. No. 650,210
Int. Cl.^{6} H01M *10/50*
U.S. Cl. 429—62 **20 Claims**



1. A shutdown, trilayer battery separator comprising a first and a third microporous polypropylene membranes sandwiching a microporous polyethylene membrane.

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5,691,078
REMAINING BATTERY CAPACITY METER AND METHOD FOR COMPUTING REMAINING CAPACITY

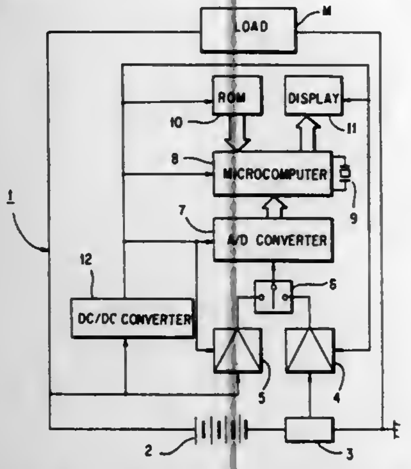
Minoru Kozaki, and Toshihiko Yamazaki, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 21, 1995, Ser. No. 561,242

Claims priority, application Japan, Nov. 21, 1994, 6-286671; Oct. 18, 1995, 7-269932

Int. Cl.^{6} H01M *10/48;* **G01R** *31/30*

U.S. Cl. 429—92 **10 Claims**



1. A remaining battery capacity meter, wherein a) the accumulated amount of electric current or electric power from a battery is computed and used to compute a corresponding remaining battery capacity, and b) the computed remaining battery capacity is displayed, comprising:

display means for displaying the computed remaining battery capacity;

memory means for storing at least one data table relating a terminal voltage of the battery at a predetermined discharge current or discharge power to a remaining capacity of the battery;

detection means for detecting when a discharge current or discharge power of the battery approximately matches the predetermined discharge current or discharge power;

reading means for reading the remaining capacity relating to the terminal voltage from the data table when the detection means detects that the discharge current or discharge power of the battery approximately matches the predetermined discharge current or discharge power; and

correction means for recognizing a difference between the remaining capacity read by the reading means from the data table and the computed remaining battery capacity displayed on the display means, and correcting the computed remaining battery capacity according to the difference.

5,691,079
BATTERY FORMED OF STACKED FLAT CELLS

Jørgen Daugaard, Højbjerg, Denmark, assignor to Alkaline Batteries A/S, Thisted, Germany

PCT No. PCT/DK95/00295, § 371 Date Jan. 6, 1997, § 102(e) Date Jan. 6, 1997, PCT Pub. No. WO96/02072, PCT Pub. Date Jan. 25, 1996

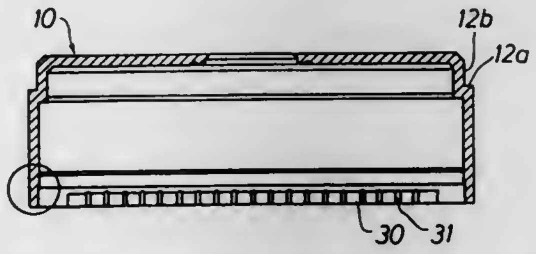
PCT Filed Jul. 7, 1995, Ser. No. 765,060

Claims priority, application Denmark, Jul. 8, 1994, 0820/94

Int. Cl.^{6} H01M *6/46;6/00*

U.S. Cl. 429—152 **10 Claims**

1. A battery formed of stacked flat cells comprising an electrochemical battery system having an anode and a cathode, the casings of said cells being formed of upwardly open plastic trays (**10**) stacked to form a unit, the upwardly facing edge (**11***a*) of a subjacent tray (**10**) in the stack being sealingly connected with a circumferential edge portion (**12***a*) of the bottom of the superjacent tray along the entire periphery, the upper edges (**11***a*, **11***b*) of the trays (**10**) and the circumferential edge portions (**12***a*, **12***b*) thereof in the bottom having essentially complementary guiding and joining faces (**11***a*, **12***a*, **11***b*, **12***b*), characterised in that the circumferential edge portion (**12***a*) in the bottom of the tray and/or the upper edge (**11***a*) of the tray (**10**) is provided with fluid permeable means to facilitate intrusion of the solvent by capillary effect at fusion of the trays.



5,691,080
METHOD OF PREPARING THIN FILM POLYMERIC GEL ELECTROLYTES

Dora K. Derzon, and Charles Arnold, Jr., both of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Division of Ser. No. 568,029, Dec. 6, 1995, Pat. No. 5,589,295. This application Jul. 16, 1996, Ser. No. 645,172

Int. Cl.^{6} H01M *10/38*

U.S. Cl. 429—190 **10 Claims**

1. A method of preparing a thin film polymer gel electrolyte comprising the steps of:

a) dissolving a lithium salt and a gel forming polymer in a solvent comprising ethylene carbonate and an organonitrile to form a solution;
b) spreading the solution to form a thin film; and
c) removing a portion of the solvent from the film to initiate gelation.

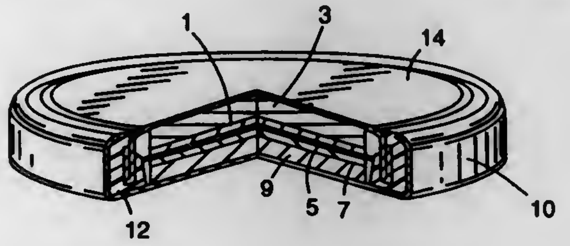
5,691,081
BATTERY CONTAINING BIS(PERFLUOROALKYLSULFONYL)IMIDE AND CYCLIC PERFLUOROALKYLENE DISULFONYLIMIDE SALTS

Larry J. Krause, Stillwater, and John W. Summerfield, Rosemount, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

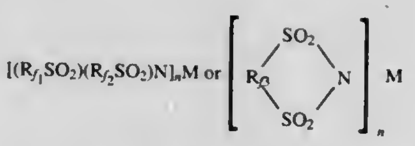
Continuation-in-part of Ser. No. 531,598, Sep. 21, 1995. This application May 29, 1996, Ser. No. 654,650

Int. Cl.^{6} H01M *10/40;4/66*

U.S. Cl. 429—192 **18 Claims**



1. A battery comprising:
at least one positive electrode;
at least one negative electrode;
at least one aluminum current collector in electrical contact with the positive electrode;
an electrolyte composition comprising a salt disposed in a matrix, said salt having the formula



$$[(R_{f_1}SO_2)(R_{f_2}SO_2)N]_nM \text{ or } \left[R_{f3} \begin{matrix} SO_2 \\ SO_2 \end{matrix} N \right]_n M$$

in which R_{f1} and R_{f2} are each independently a straight or branched perfluoroalkyl group of 1 to 12 carbon atoms, a perfluorocycloalkyl group or a perfluorocycloalkyl perfluoroalkyl group of 4–7 ring carbon atoms and 1–4 carbon atoms on the alkyl chain wherein the ring carbon atoms may be optionally substituted by a straight or branched perfluoroalkyl group of 1 to 12 carbon atoms, with R_{f1} and R_{f2} taken together having a total of at least 3 carbon atoms;

R_{f3} is a perfluoroalkylene moiety of 2 to 6 carbon atoms optionally substituted by a straight or branched perfluoroalkyl group of 1 to 12 carbon atoms or a perfluorocycloalkyl group of 4–7 carbon atoms;

M is a cation with a valence equal to n; and

n is an integer of 1 to 4, wherein the voltage measured at the positive electrode is greater than 3.0 volts vs. Li/Li$^+$; and

the electrolyte composition further comprises a NO_3^- salt.

5,691,082
BETA-ALUMINA SOLID ELECTROLYTE AND PROCESS FOR PRODUCTION THEREOF

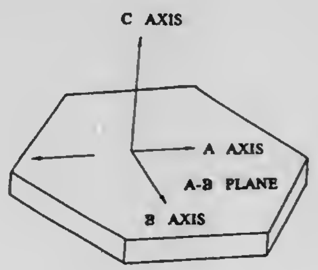
Masaharu Kajita, Tajimi; Takehiro Kajihara, Komaki, and Takao Totoki, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 397,756, Mar. 2, 1995, Pat. No. 5,612,154. This application Sep. 3, 1996, Ser. No. 707,293

Claims priority, application Japan, Mar. 29, 1994, 6-58972

Int. Cl.^{6} H01M *6/18;* **C01F** *7/00*

U.S. Cl. 429—193 **4 Claims**



1. A process for producing a beta-alumina solid electrolyte using an alumina source material, a magnesium source material and a sodium source material, which comprises using a magnesium-aluminum spinel as the magnesium source material and subjecting all materials to mixing, granulation, molding and firing to obtain a beta-alumina solid electrolyte without subjecting the materials to calcination.

5,691,083
POTASSIUM ION ADDITIVES FOR VOLTAGE CONTROL AND PERFORMANCE IMPROVEMENT IN NONAQUEOUS CELLS

Mary Elizabeth Bolster, Bay Village, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jun. 7, 1995, Ser. No. 487,370

Int. Cl.^{6} H01M *6/14*

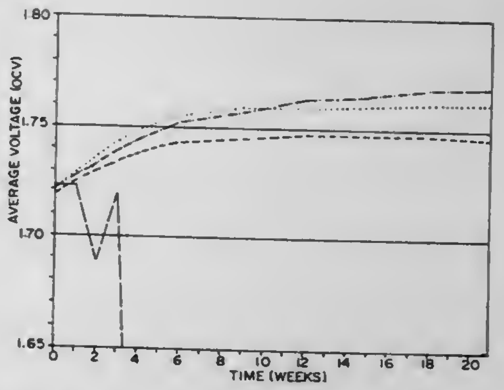
U.S. Cl. 429—194 **20 Claims**

1. An electrochemical cell having an open circuit voltage, comprising:

a lithium anode or a lithium alloy anode;

a solid cathode; and

a nonaqueous, liquid electrolyte including an organic solvent, an electrochemically active amount of a primary salt, other than lithium perchlorate, and an amount of a potassium salt which is effective to lower the open circuit voltage of said electrochemical cell.



5,691,084
ORGANIC ELECTROLYTIC SOLUTION SECONDARY CELL

Fusaji Kita; Masaharu Higashiguchi, both of Suita; Kouji Murakami, Ibaraki, and Akira Kawakami, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd, Osaka, Japan

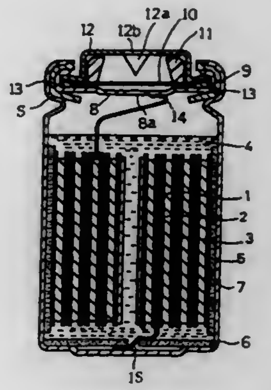
PCT No. PCT/JP95/00464, § 371 Date Nov. 17, 1995, § 102(e) Date Nov. 17, 1995, PCT Pub. No. WO95/26057, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 17, 1995, Ser. No. 553,666

Claims priority, application Japan, Mar. 19, 1994, 6-074320; Aug. 15, 1994, 6-214219

Int. Cl.^{6} H01M *6/14*

U.S. Cl. 429—194 **9 Claims**



1. An organic electrolytic solution secondary cell comprising a positive electrode, a negative electrode and an organic electrolytic solution, wherein a solvent of said organic electrolytic solution contains a triester of phosphoric acid, and said negative electrode comprises a carbonaceous material, and wherein the ratio (I_{135}/I_c) of peak intensity of phosphorus around 135 eV (I_{135}) to a sum of peak intensities of carbon from around 284 eV to around 289 eV (I_c) in an X-ray photoelectron spectroscopy on a surface of the negative electrode is at least 0.05.

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5,691,085
NON-SINTERED ELECTRODE FOR AN ALKALINE ELECTROLYTE SECONDARY CELL

Isabelle Coco, Talence; Jean-Michel Cocciantelli, Bordeaux, and Jean-Jacques Villenave, Talence, all of France, assignors to Saft, Romainville, France

Filed Sep. 30, 1996, Ser. No. 723,252

Claims priority, application France, Jul. 23, 1996, 96 09211

Int. Cl.^{6} H01M *4/62*

U.S. Cl. 429—217 **20 Claims**

1. An electrode for an alkaline electrolyte secondary cell, comprising a current collector supporting a paste containing an electrochemically active material and a binder, characterized in that said binder is a copolymer selected from copolymers of maleic anhydride and a vinyl monomer, said binder being cross-linked after said electrode has been formed.

5,691,086
NICKEL ACTIVE MATERIAL FOR USE IN ALKALI STORAGE CELLS AND ITS MANUFACTUIRING METHOD

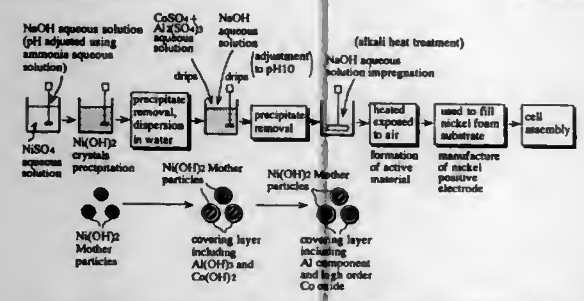
Yoshitaka Baba, Naruto; Motoo Tadokoro; Takeo Hamamatsu, both of Itano-gun, and Akifumi Yamawaki, Naruto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Feb. 12, 1996, Ser. No. 598,598

Claims priority, application Japan, Feb. 14, 1995, 7-025476

Int. Cl.^{6} H01M *4/02*

U.S. Cl. 429—218 **14 Claims**


NaOH aqueous solution (pH adjusted using ammonia aqueous solution)
CoSO4 + Al2(SO4)3 aqueous solution
NaOH aqueous solution
drips
drips
(adjustment to pH10)
(alkali heat treatment)
NaOH aqueous solution impregnation
precipitate removal, dispersion in water
precipitate removal
heated exposed to air
used to fill nickel foam substrate
cell assembly
NiSO4 aqueous solution
Ni(OH)2 crystals precipitation
Ni(OH)2 Mother particles
Ni(OH)2 Mother particles
formation of active material
manufacture of nickel positive electrode
Ni(OH)2 Mother particles
covering layer including Al(OH)3 and Co(OH)2
covering layer including Al component and high order Co oxide

1. A nickel active material in particle form comprising a covering layer formed on a surface of a mother particle comprising nickel hydroxide, wherein

the covering layer includes a cobalt compound and at least one of the following metal compounds; an aluminum compound, a magnesium compound, an indium compound and a zinc compound, and the cobalt compound in the covering layer is converted into cobalt compound where an oxidization number of cobalt is higher than 2 by heat treatment of the nickel active material in the presence of oxygen and alkali.

5,691,087
SEALED LEAD-ACID CELLS AND BATTERIES

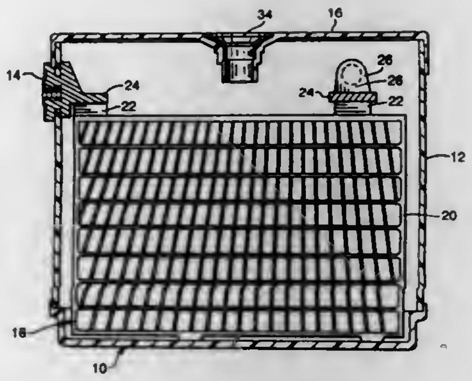
Purushothama Rao, Aurora, Ill., and Thomas F. Uhlemann, Edina, Minn., assignors to GNB Technologies, Inc., Mendota Heights, Minn.

Continuation-in-part of Ser. No. 340,631, Nov. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 852,803, Mar. 17, 1992, Pat. No. 5,298,350, which is a continuation-in-part of Ser. No. 675,298, Mar. 26, 1991, abandoned. This application Jul. 1, 1996, Ser. No. 673,149

Int. Cl.^{6} H01M *4/68*

U.S. Cl. 429—245 **4 Claims**

1. A sealed, lead-acid cell comprising a container normally sealed from the atmosphere in service, at least one positive plate and a negative plate disposed within said container, a separator disposed within said container and separating said positive and negative plates, and an electrolyte substantially completely absorbed in said separator and said plates, said positive plate comprising a grid supporting structure having a layer of active material pasted thereto, said grid supporting structure comprising a lead-based alloy consisting essentially of lead, from about 0.025% to about 0.06% calcium, from about 0.3% to about 0.9% tin, and from about 0.025% to about 0.045% silver, the percentages being based upon the total weight of said lead-based alloy.



5,691,088
PELLICLE FOR PROTECTION OF PHOTOLITHOGRAPHIC MASK

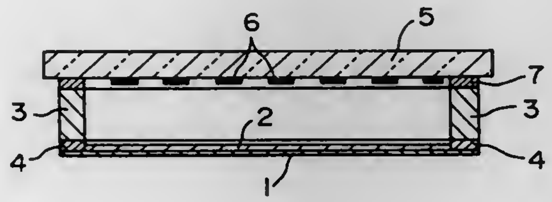
Yoshihiro Kubota; Meguru Kashida; Yoshihiko Nagata; Hitoshi Noguchi; Yuichi Hamada, and Kimitaka Kumagae, all of Gunma-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokto, Japan

Filed Sep. 22, 1992, Ser. No. 949,389

Claims priority, application Japan, Sep. 26, 1991, 3-274564

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **4 Claims**



1. A frame-supported pellicle for dust-proofing of a photolithographic mask which comprises:

(a) a frame member;

(b) a transparent film of a polymeric material flatly supported by the frame member by adhesive bonding; and

(c) a layer of a sticky adhesive on one of the surfaces of the transparent film of a polymeric material, the sticky adhesive being an organopolysiloxone composition comprising:

(A) 100 parts by weight of an organopolysiloxane resin consisting of monofunctional siloxane units expressed by the unit formula $(CH_3)_3SiO_{0.5}$ and tetravalent siloxane units expressed by the unit formula SiO_2 in a molar ratio in the range from 1:0.4 to 1:1.5; and

(B) from 20 to 50 parts by weight of a diorganopolysiloxane represented by the general formula

$$R^1—SiMe_2—O—(—SiMe_2—O—)_x—(—SiMeR^2—O—)_y—SiMe_2—R^1,$$

in which Me is a methyl group, R^1 is a hydroxy group, methyl group or vinyl group, R^2 is a methyl group or vinyl group, x is a positive integer and y is 0 or a positive integer with the proviso that x+y is in the range from 100 to 10,000; or a partial or complete condensation product thereof.

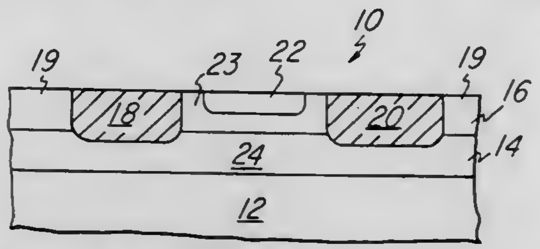
5,691,089
INTEGRATED CIRCUITS FORMED IN RADIATION SENSITIVE MATERIAL AND METHOD OF FORMING SAME

Michael C. Smayling, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 37,050, Mar. 25, 1993, Pat. No. 5,567,550. This application Jun. 7, 1995, Ser. No. 479,380

Int. Cl.^{6} H01L *29/12;* **G03F** *9/00*

U.S. Cl. 257—40 **22 Claims**



1. A transistor device comprising:

a first polarity doped layer of radiation sensitive polyimide formed over a substrate;

a neutral layer of radiation sensitive polyimide formed over said first polarity doped layer of radiation sensitive polyimide;

a first source/drain region of a second polarity formed in said neutral layer and extending to a top portion of said first polarity doped layer;

a second source/drain region of said second polarity formed in said neutral layer and extending to a top portion of said first polarity doped layer; and

a gate region formed in a top portion of said neutral layer between said first source/drain region and second source/drain region such that a channel region is formed in said doped layer beneath said gate region and insulated therefrom;

wherein said first source/drain region, said second source/drain region and said gate region are formed by irradiation.

14. A transistor device comprising:

a first layer of radiation sensitive polybenzimidazole (PBI) material formed over a substrate;

a non-conductive layer of radiation sensitive PBI material formed over said first layer of radiation sensitive material;

a first conductive source/drain region formed by irradiation in said non-conductive layer and extending to a top portion of said first layer;

a second conductive source/drain regions formed by irradiation in said non-conductive layer and extending to a top portion of said first layer, said first source/drain region spaced from said second source/drain region; and

a gate region formed by irradiation in a top portion of said non-conductive layer between said first source/drain region and second source/drain region such that a first channel region is formed in said first layer beneath said gate region and insulated therefrom.

5,691,090
PHASE SHIFT MASK AND MANUFACTURING METHOD THEREOF AND EXPOSURE METHOD USING PHASE SHIFT MASK

Akihiko Isao; Ryoichi Kobayashi, both of Saitama; Nobuyuki Yoshioka, Hyogo; Yaichiro Watakabe, Hyogo, and Junji Miyazaki, Hyogo, all of Japan, assignors to Ulvac Coating Corporation, Saitama, and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of Japan

Continuation of Ser. No. 480,371, Jun. 7, 1995, Pat. No. 5,629,114, which is a division of Ser. No. 155,370, Nov. 22, 1993, Pat. No. 5,474,864. This application Dec. 20, 1996, Ser. No. 772,226

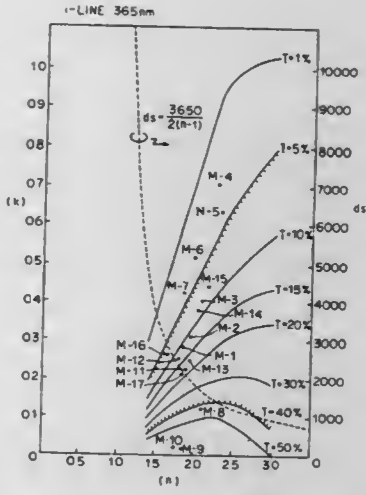
Claims priority, application Japan, Nov. 21, 1992, 4-335523; Apr. 19, 1993, 5-91445; Nov. 15, 1993, 5-285327

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **27 Claims**

1. A phase shifter film formed on a substrate transmitting exposure light, wherein

the phase of transmitted exposure light is converted by 180° with respect to the phase of exposure light transmitted only through said substrate, the transmittance is in the range from 5% to 40%, said film being formed of a single film selected from the group consisting of an oxide film of metal silicide, and a nitride oxide film of metal silicide.



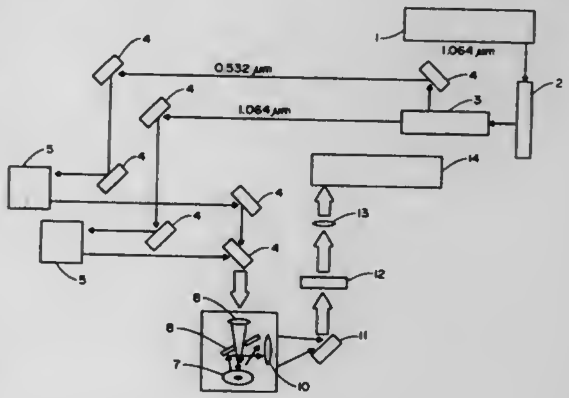
5,691,091
OPTICAL STORAGE PROCESS

Joseph Chaiken, Fayetteville, and Joseph M. Osman, Utica, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Jun. 7, 1995, Ser. No. 481,818

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 430—19 **16 Claims**



1. A data storage process which comprises:

a. providing an erasable high speed, high density, storage medium which includes a transition metal oxide layer where said oxide layer is capable of undergoing an optically readable chemical change when simultaneously exposed to heat and to light of a selected wavelength; and

b. simultaneously exposing said layer to heat and to radiation in the blue-green or shorter wavelength spectrum under ambient conditions which include oxygen, whereby a photochemical reaction is induced which includes an exchange of oxygen, resulting in the formation of an optically readable image in the exposed regions of said oxide layer.

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5,691,092

METHOD FOR PRODUCING OPTICAL ELEMENT

Masanobu Ninomiya; Ryojiro Akashi; Takashi Morikawa, and Takashi Uematsu, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1995, Ser. No. 545,157

Claims priority, application Japan, Dec. 2, 1994, 6-324028; Jan. 20, 1995, 7-024483

Int. Cl.^{6} G02F *1/13*

U.S. Cl. 430—20 **12 Claims**

3. A method for producing an optical element, said method comprising the steps of:

- forming a layer of a liquid crystal polymer having a multidomain structure on a sheet-form substrate;
- carrying out a first heat-treatment for controlling the multidomain structure of said liquid crystal polymer layer;
- forming a surface protective layer on said liquid crystal polymer layer; and thereafter
- carrying out a second heat-treatment for crosslinking said liquid crystal polymer layer.

5,691,093

METHOD OF FORMING A FULL-COLOR TONER IMAGE ONTO A LAMINATED FILM

Makoto Kanbayashi, Kawasaki; Takashige Kasuya, Soka; Tatsuya Nakamura, Tokyo; Tatsuhiko Chiba, Tokyo, and Kazuyuki Miyano, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 83,936, Jun. 28, 1993, abandoned.

This application Jul. 25, 1995, Ser. No. 506,177

Claims priority, application Japan, Jun. 29, 1992, 4-192707

Int. Cl.^{6} G03G *13/20*

U.S. Cl. 430—47 **112 Claims**

1. An image forming method comprising the steps of:

- providing a recording medium comprising a laminated film having a substrate layer and a wax component absorption layer;
- fixing a toner image comprised of a toner containing a wax component on the recording medium by applying heat and pressure to the recording medium; and
- absorbing a wax component flowing from the toner due to fixing performed in said fixing step using the wax component absorption layer so as to prevent crystal growth of the wax component;
- wherein the wax component absorption layer comprises a resin capable of inhibiting crystal growth of the wax component contained in the toner and thereby increasing light transmittance by at least 20% in a toner image-fixed recording medium in an amount sufficient to inhibit crystal growth of the wax component,
- wherein a difference between a melting point of the resin in the wax component absorption layer and a melting point of the wax component is not more than 100° C., and
- wherein the toner comprises a pulverization toner obtained by kneading toner materials containing the wax component followed by pulverization, the pulverization toner containing the wax component in an amount of from 0.1% by weight to 10% by weight based on the weight of the toner.

5,691,094

METHOD FOR PREPARATION OF PRINTING PLATE BY ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS FOR USE THEREIN

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

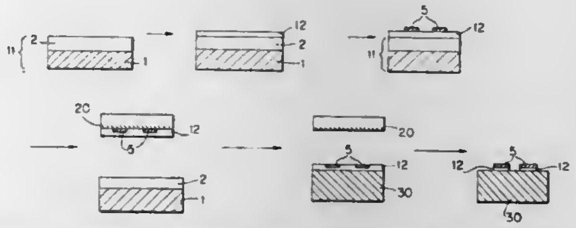
Filed Nov. 30, 1995, Ser. No. 565,232

Claims priority, application Japan, Dec. 1, 1994, 6-321192

Int. Cl.^{6} G03G *13/26*

U.S. Cl. 430—49 **28 Claims**

1. A method for preparation of a printing plate by an electrophotographic process comprising providing a peelable transfer layer mainly containing a resin (A) capable of being removed upon a chemical reaction treatment on an electrophotographic light-sensitive element, forming a toner image on the transfer layer by an electrophotographic process, transferring the toner image together with the transfer layer onto a primary receptor, transferring the toner image together with the transfer layer from the primary receptor onto a receiving material having a surface capable of providing a hydrophilic surface suitable for lithographic printing at the time of printing, and removing the transfer layer on the receiving material in a non-image area by the chemical reaction treatment.



5,691,095

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE AND PROCESS FOR PRODUCING THE SAME

Kinji Shinzo; Hideki Watanabe; Seiichi Uno; Nansei Tashiro, all of Chiba, and Minoru Nomura, Saitama, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Dec. 7, 1995, Ser. No. 568,688

Claims priority, application Japan, Dec. 9, 1994, 6-306110

Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—106 **14 Claims**

1. A toner for developing an electrostatic latent image which contains at least a colorant and a resin, in which said resin is a polyester resin having a total acid radical content of 2 to 50 mg equivalents per 100 g and having a weight-average molecular weight of 2,000 to 100,000, and said toner is spherical and has an average particle diameter of 3 to 13 μm.

5,691,096

FLASH FUSIBLE TONER RESINS

Brian William Baird, Lee Way, Colo.; Art Fred Diaz, San Jose, Calif.; William Harve Dickstein, Morgan Hill, Calif., and Charles Mark Seymour, Gilroy, Calif., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Apr. 4, 1989, Ser. No. 333,524

Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—109 **5 Claims**

1. The process of fusing toner to form a fused image comprising the step of flash fusing a flash fusible toner comprising a binder resin which is a bisphenol A polyester consisting of the reaction product of bisphenol A and an aliphatic diacid selected from the group consisting of succinic acid, glutaric acid and adipic acid with or without comonomers selected from the group consisting of hydroxyarenecarboxylic acid and 1,3,5-trihydroxybenzene.

5,691,097

TONER COMPOSITIONS

Janet M. Bortfeldt, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1996, Ser. No. 742,022

Int. Cl.^{6} G03G *9/097*

U.S. Cl. 430—110 **20 Claims**

1. A process for the preparation of toner with enhanced flowability consisting essentially of admixing resin, charge additive, wax, and magnetite, and thereafter adding thereto a surface additive comprised of a hydrophobic silica coated with a dimethyl silicone fluid, and further wherein said surface additive possesses a surface area, BET of from about 80 to about 120 m^2/g, a carbon weight percent of from about 4.5 to about 6.1 percent, a size diameter of from about 15 to about 40 nanometers, and wherein said toner possesses a cohesivity of from about 3 to about 15 percent.

5,691,098

LASER-INDUCED MASS TRANSFER IMAGING MATERIALS UTILIZING DIAZO COMPOUNDS

Stanley C. Busman, Minneapolis; Gregory D. Cuny, Woodbury; Krzysztof A. Zaklika, St. Paul, all of Minn., and Richard J. Ellis, Great Dunmow, Great Britain, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 3, 1996, Ser. No. 627,160

Int. Cl.^{6} G03F *7/11*

U.S. Cl. 430—158 **17 Claims**

1. A thermal transfer donor element comprising a substrate having coated on at least a portion thereof, in one or more layers:

- (a) a compound having a diazo substituent and at least one electron withdrawing functional group adjacent the diazo substituent;
- (b) a nondiazo radiation absorber; and
- (c) a thermal mass transfer material;

wherein the diazo compound has a decomposition temperature of no greater than about 250° C.

5,691,099

THERMAL DEVELOPING TYPE DIAZO COPYING MATERIAL UTILIZING WATER SOLUBLE QUANIDINE SALT

Shigeru Kusakata, Susono; Masanori Rimoto, Mishima; Kazuo Matsuda, Numazu, and Naohito Shimota, Shizuoka-ken, all of Japan, assignors to Ricoh Company, Ltd., Toyko, Japan

Filed Sep. 18, 1995, Ser. No. 529,674

Claims priority, application Japan, Sep. 22, 1994, 6-254316; Sep. 5, 1995, 7-251958

Int. Cl.^{6} G03F *7/021;* **G03C** *5/18*

U.S. Cl. 430—162 **6 Claims**

1. A thermal developing type diazo copying material comprising:

- a support;
- a photosensitive layer formed on said support, said photosensitive layer including a diazo compound; and
- a coupler layer formed on said support, said coupler layer including a coupler component, said coupler layer having a water-soluble quanidine salt and having a copolymer resin including a monomer having a carboxylic acid.

5,691,100

PATTERN FORMING MATERIAL INCLUDING PHOTOACID AND PHOTOBASE GENERATORS FOR LARGE EXPOSURE LATITUDE

Takanori Kudo, Sayama; Seiya Masuda, Tokorozawa; Yoshiaki Kinoshita, Tokyo, all of Japan; Klaus Przybilla, Frankfurt, Germany; Natsumi Endo, Kawagoe, Japan; Natsumi Suehiro, Kawagoe, Japan, and Hiroshi Okazaki, Kawagoe, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Continuation of Ser. No. 296,361, Aug. 25, 1994, abandoned.

This application Mar. 29, 1996, Ser. No. 623,735

Claims priority, application Japan, Dec. 25, 1992, 4-347042

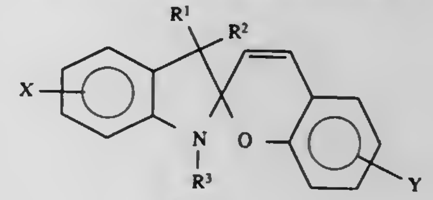
Int. Cl.^{6} G03C *1/54;1/56;1/685*

U.S. Cl. 430—170 **9 Claims**

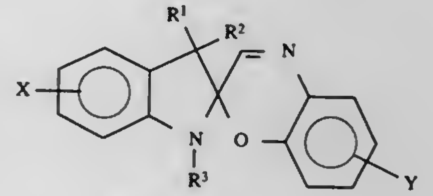
1. A material for the formation of a pattern, comprising:

- (A)' a compound capable of producing an acid upon irradiation with an active beam,
- (B) a compound capable of increasing its basicity upon irradiation with an active beam,
- (C) a compound having at least one bond cleavable with an acid and/or
- (D) a polymer insoluble in water but soluble in an aqueous alkaline solution,

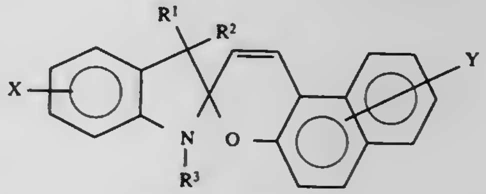
wherein said compound capable of increasing its basicity upon irradiation with an active beam is selected from the group consisting of those represented by the general formula (IV) to (VII):



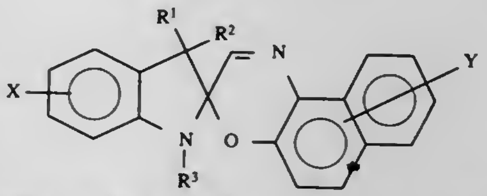
[IV]



[V]



[VI]



[VII]

wherein R^1, R^2 and R^3, which may be the same or different from each other, independently represent a hydrogen atom or an alkyl group and X and Y, which may be the same or different from each other, independently represent an alkyl group, an alkoxy group, a halogen group, a nitro group or a hydrogen atom.

5,691,101

PHOTOSENSITIVE COMPOSITION

Toru Ushirogouchi, Yokohama; Naomi Shida, Kawasaki; Takuya Naito, Tokyo; Koji Asakawa, Kawasaki; Akinori Hongu; Makoto Nakase, both of Tokyo, and Hirokazu Niki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 402,358, Mar. 13, 1995, abandoned.

This application May 9, 1996, Ser. No. 644,395

Claims priority, application Japan, Mar. 15, 1994, 6-043623; Nov. 16, 1994, 6-281805

Int. Cl.^{6} G03F *7/021;7/023*

U.S. Cl. 430—176 **7 Claims**

1. A slurry photosensitive composition containing:

- (i) from 0.01 to 20 parts by weight of an acid generating compound which generates an acid when irradiated with light or ionizing radiation and selected from the group consisting of a (1) quinonediazide compound, (2) an organic halide or (3) an onium salt which is a (3a) diazonium salt selected from the group consisting of:

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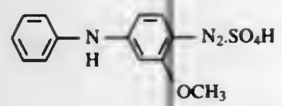
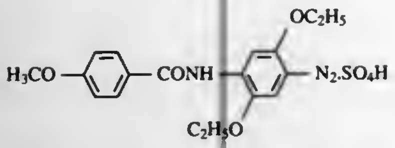
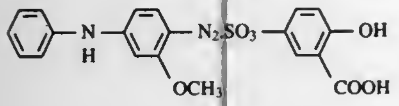
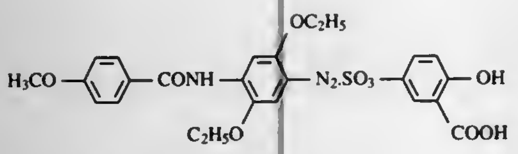


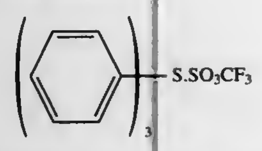




and



or a (3b) salt of the formula:



said acid functioning as a catalyst for a crosslinking reaction or a decomposition reaction;

ii) at least one acid-crosslinkable or acid decomposable resin; and

iii) from 14 to 98 parts by weight of a powder.

5,691,102
PROCESS OF PRODUCING INK-OOZING PLATE FOR A STAMP

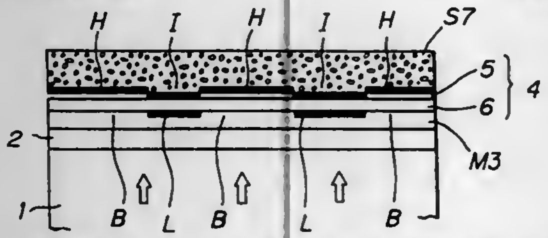
Yoichi Ando, Sagamihara, Japan, assignor to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1996, Ser. No. 594,952

Claims priority, application Japan, Feb. 3, 1995, 7-017357

Int. Cl.^{6} G03F *7/00*

U.S. Cl. 430—200 **3 Claims**



1. A process of producing an ink-oozing plate for a stamp, comprising:

superposing an exothermally fusible sheet comprising an infrared ray-transmittable film coated thereon with a heat-fusing substance which is heated by irradiating with infrared rays to melt at temperatures higher than a melt temperature of an elastic resin-made stamp material having stamp ink-impregnable open cells, to a thickness of 0.5 to 10μ, on the surface of the stamp material so that the above heat-fusing substance contacts the surface of the stamp material;

superposing thereon a desired impress image copy so that it becomes a mirror image;

irradiating with a flash containing infrared rays from the upper part of the copy while compressing the stamp material by 5 to 70% to allow the infrared rays to be transmitted through a copy image-absent part on the impress image copy and cause the infrared rays reaching the exothermally fusible sheet to heat and melt the heat-fusing substance present on a part corresponding to said copy image-absent part;

causing this heated heat-fusing substance to penetrate into the stamp material and melt the surface of the stamp material to form a penetrating molten part (a stamp ink-non-oozing part) where the open cells are blocked, and

allowing the copy image part of the impress image copy to cut off or absorb the infrared rays to cause no heat-fusing substance present on the part of the exothermally fusible sheet corresponding thereto to be heated and molten, which does not lead to blocking the cells present on the surface of the corresponding stamp material, to form a non-molten part (a stamp ink-oozing part) to thereby form a concave part in which the penetrating molten part is lower by 0.01 mm or more than the non-molten part of the stamp material.

5,691,103
IMAGE FORMING MATERIAL, METHOD OF PREPARING THE SAME AND IMAGE FORMING METHOD EMPLOYING THE SAME

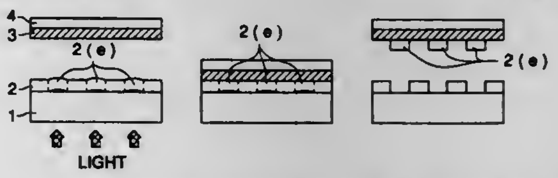
Toshihisa Takeyama; Al Katsuda; Kunihiro Koshizuka; Tomonori Kawamura; Masataka Takimoto, and Yoshitaka Goto, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 9, 1996, Ser. No. 599,186

Claims priority, application Japan, Feb. 17, 1995, 7-029477; Apr. 6, 1995, 7-081379; Apr. 11, 1995, 7-085488; Apr. 28, 1995, 7-105068; Apr. 28, 1995, 7-105071

Int. Cl.^{6} G03C *1/73;1/805;* **G03F** *7/34*

U.S. Cl. 430—200 **10 Claims**



1. An image forming material comprising a support and provided thereon, an image forming layer containing a colorant, the image forming layer having been hardened and subjected to calendar treatment, wherein an image is formed by removing exposed portions of the image forming layer of the image forming material.

5,691,104
METHOD FOR MAKING BY PHOTOTYPESETTING A LITHOGRAPHIC PRINTING PLATE ACCORDING TO THE SILVER SALT DIFFUSION TRANSFER PROCESS

Lode Deprez, Wachtebeke, Belgium, assignor to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 12, 1996, Ser. No. 745,831

Claims priority, application European Pat. Off., Nov. 16, 1995, 95203140

Int. Cl.^{6} G03C *1/34;8/06;* **G03F** *7/07*

U.S. Cl. 430—204 **9 Claims**

1. A method for making a lithographic printing plate according to the silver salt diffusion transfer process comprising the following steps:

image-wise exposing with a high intensity-short time exposure an imaging element comprising on a support in the order given a photosensitive layer comprising at least one photosensitive silver halide emulsion and a heterocyclic compound containing at least one nitrogen atom in the ring and an image receiving layer comprising physical development nuclei in water permeable relationship with said photosensitive layer,

developing said imaging element using an alkaline processing liquid in the presence of (a) developing agent(s) and (a) silver halide solvent(s),

wherein said heterocyclic compound containing at least one nitrogen atom in the ring comprises at least one mercapto- or thione group and one substituent comprising at least 5 carbon atoms selected from the group consisting of linear or branched alkyls, alkenyls, alkynyls, aralkyls and alkylaryls.

5,691,105
METHOD FOR MAKING AN IMAGING ELEMENT AND A PRINTING PLATE ACCORDING TO THE SILVER SALT DIFFUSION TRANSFER PROCESS

René De Keyzer, Waasmunster, and Yves Van Meenen, Berchem, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 12, 1996, Ser. No. 745,843

Claims priority, application European Pat. Off., Nov. 20, 1995, 95203170.6

Int. Cl.^{6} G03C *8/28;* **G03F** *7/07*

U.S. Cl. 430—204 **11 Claims**

1. A method for obtaining an imaging element suitable for use in a silver salt diffusion transfer process comprising the steps of coating a support with an image receiving layer comprising physical development nuclei and a photosensitive layer comprising a photosensitive silver halide emulsion, said photosensitive layer being in water permeable relationship with said image receiving layer,

characterized in that said physical development nuclei consist of a substantially homogeneous solid solution of two or more different metals and are prepared by pulsed high flux radiolysis.

5,691,106
PHOTOSENSITIVE MATERIAL FOR THE PRODUCTION OF LITHOGRAPHIC PRINTING PLATES UTILIZING PEEL DEVELOPMENT

Willi-Kurt Gries, Wiesbaden, Germany, assignor to AGFA-Gevaert AG, Leverkusen, Germany

Filed Oct. 5, 1994, Ser. No. 318,542

Claims priority, application Germany, Oct. 22, 1993, 43 36 115.3

Int. Cl.^{6} G03F *7/34*

U.S. Cl. 430—254 **20 Claims**

1. A photosensitive material useful for the production of lithographic printing plates which comprises in the following order:

(a) a support suitable for lithographic printing plates,

(b) a hydrophilic layer which comprises a crosslinkable organic polymer which is crosslinked during processing of the material or is a layer formed by crosslinking an organic polymer, wherein the hydrophilic layer (b) has a layer weight from 0.001 to 1 g/m^2,

(c) a photopolymerizable layer, and

(d) a transparent cover film,

wherein the adhesion of the photopolymerizable layer (c) to the hydrophilic layer (b) and/or to the cover film (d) is changed by exposure.

5,691,107
SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Satoshi Kaneko, and Akira Tanaka, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Continuation of Ser. No. 351,597, Dec. 7, 1994, abandoned.

This application Feb. 20, 1996, Ser. No. 603,352

Int. Cl.^{6} G03C *1/06*

U.S. Cl. 130—264 **7 Claims**

1. A silver halide photographic photosensitive material which comprises;

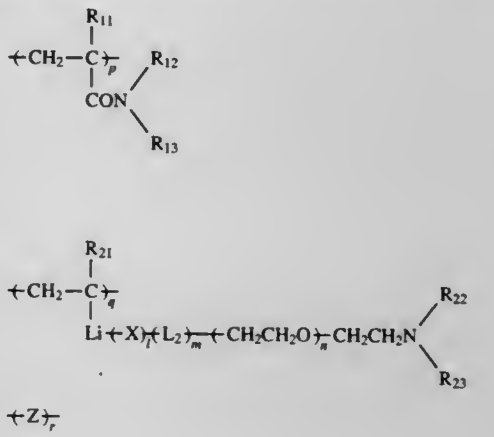
a support,

at least one hydrophilic colloid layer which is a silver halide emulsion layer, and

at least one additional hydrophilic colloid layer, which is not a silver halide emulsion layer,

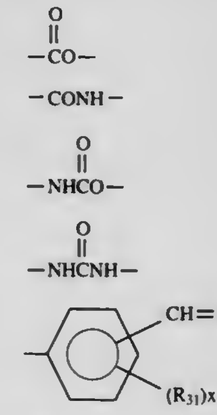
a hydrazine compound being contained in said at least one silver halide layer or said at least one additional hydrophilic colloid layer,

wherein the same or different at least one silver halide layer or at least one additional hydrophilic colloid layer contains a water-soluble vinyl polymer having an amino group exclusive of a primary amino group as a promoter for contrast enhancement by the hydrazine compound represented by the following formula (1):


(1)

$$-(CH_2-\overset{R_{11}}{\underset{CON(R_{12})(R_{13})}{C}})_p- \quad -(CH_2-\overset{R_{21}}{\underset{L_1-(X)_l-(L_2)_m-(CH_2CH_2O)_n-CH_2CH_2N(R_{22})(R_{23})}{C}})_q- \quad -(Z)_r-$$

wherein R_{11}, R_{12}, R_{13}, R_{21}, R_{22} and R_{23} each represents an hydrogen atom or an alkyl group, R_{12} and R_{13} may be the same or different and may form a ring together, R_{22} and R_{23} may be the same or different and may form a ring together, R_{22} and R_{23} cannot be simultaneously hydrogen atom, X represents an alkylene group, l and m each represent 0 or 1, n represents an integer of 2–30, Z represents a residue of an ethylenically unsaturated monomer, and p, q and r each represent wt %, and p is 0–95 wt %, q is 5–100 wt % and r is 0–50 wt %, L_1 and L_2 each represent a linkage group selected from the group consisting of the following,

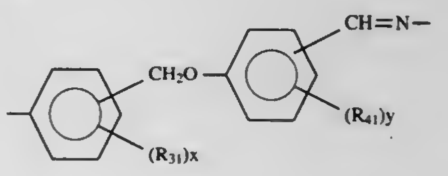

$-\overset{O}{\overset{\|}{C}}O-$

$-CONH-$

$-NH\overset{O}{\overset{\|}{C}}O-$

$-NH\overset{O}{\overset{\|}{C}}NH-$

and



wherein R_{31} and R_{41} each represent a lower alkyl group or an alkoxy group and x and y each represent an integer of 0–4.

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5,691,108
METHOD FOR DEVELOPING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Mitsunori Hirano, and Kouta Fukui, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., LTD., Kanagawa, Japan

Filed Oct. 24, 1996, Ser. No. 736,425

Claims priority, application Japan, Oct. 24, 1995, HEI 7-298801; Dec. 21, 1995, HEI 7-349037

Int. Cl.^{6} G03C *5/315*

U.S. Cl. 430—264 **3 Claims**

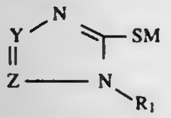
1. A process for developing a silver halide photographic light-sensitive material comprising processing, after exposure, a silver halide photographic light-sensitive material with a developer (i) having a pH of from 9.0 to 11.0 and (ii) containing:

(1) from 0.2 to 0.75 mol/l of a dihydroxybenzene-base developing agent;

(2) from 0.001 to 0.06 mol/l of a 1-phenyl-3-pyrazolidone-base or p-aminophenol-base auxiliary developing agent;

(3) from 0.3 to 1.2 mol/l of free sulfite ions; and

(4) a compound represented by the following formula (II):


(II)

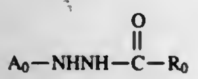
wherein Y and Z each represents N or CR_2, wherein R_2 represents an alkyl group or an aryl group; R_1 represents an alkyl, aryl or heterocyclic group substituted by at least one selected from the group consisting of $—SO_3M$, —COOM, —OH, $—NHSO_2R_3$, $—SO_2NR_3R_4$ and $—NR_5CONR_3R_4$, or a group comprising an alkyl, aryl or heterocyclic group bonded through a linking group; R_3, R_4 and R_5 each represents a hydrogen atom or a lower alkyl group having from 1 to 4 carbon atoms; and M represents a hydrogen atom, an alkali metal atom, a quaternary ammonium or a quaternary phosphonium;

wherein the replenishing amount of the developer is 225 ml/m^2 or less; and

wherein said silver halide photographic light-sensitive material comprises a support having provided thereon at least one light-sensitive emulsion layer, wherein said emulsion layer or another hydrophilic colloid layer contains:

(i) a hydrazine-base nucleating agent having, in the vicinity of the hydrazine group thereof, at least one of an anion group or a nonion group which forms an intramolecular hydrogen bond with the hydrogen atom of the hydrazine; or

at least one hydrazine nucleating agent selected from the compounds represented by the following formula (I)



$$A_0-NHNH-\overset{\displaystyle O}{\overset{\|}{C}}-R_0$$

(I)

wherein R_0 represents a difluoromethyl group or a monofluoromethyl group; and A_0 represents an aromatic group, provided that A_0 contains, as a substituent, at least one of a non-diffusible group, an adsorption accelerating group to silver halide, an alkylthio group, an arylthio group, a heterocyclic thio group, a quaternary ammonium group, a nitrogen-containing heterocyclic group containing a quaternized nitrogen atom, an alkoxy group containing an ethyleneoxy or propyleneoxy unit, a saturated heterocyclic group having a sulfide bond or a disulfide bond, and a combination thereof; and

(ii) a nucleating accelerator.

5,691,109
METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC MATERIALS, AND DEVELOPER AND SILVER HALIDE PHOTOGRAPHIC MATERIAL USED THEREIN

Tetsuro Kojima; Elichi Okutsu, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

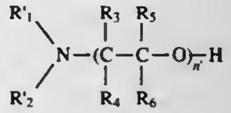
Continuation of Ser. No. 546,840, Oct. 23, 1995, abandoned, which is a continuation of Ser. No. 811,228, Dec. 19, 1991, abandoned, which is a division of Ser. No. 596,272, Oct. 12, 1990, Pat. No. 5,102,779. This application Feb. 10, 1997, Ser. No. 798,144

Claims priority, application Japan, Oct. 13, 1989, 1-266592; Jul. 3, 1990, 2-176164

Int. Cl.^{6} G03C *1/38*

U.S. Cl. 430—264 **4 Claims**

1. A silver halide photographic material comprising: at least one compound represented by general formula (X'):



$$R'_1R'_2N-(CR_3R_4-CR_5R_6-O)_{n'}-H$$

(X')

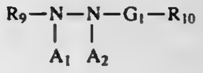
wherein

R'_1 and R'_2 each represents a hydrogen atom, an alkyl group containing from 5 to 20 carbon atoms, an alkenyl group containing from 3 to 30 carbon atoms, or an aralkyl group containing from 7 to 30 carbon atoms, provided that the total number of carbon atoms contained in R'_1 and R'_2 together amounts to 10 or more in all when both are alkyl groups and R'_1 and R'_2 are not both hydrogen atoms; or R'_1 and R'_2 are combined to form a ring;

R_3, R_4, R_5, and R_6 each represents a hydrogen atom; and

n' represents an integer from 3 to 20;

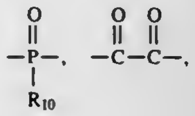
and at least one hydrazine compound represented by general formula (1):



$$R_9-\underset{\displaystyle A_1}{\underset{|}{N}}-\underset{\displaystyle A_2}{\underset{|}{N}}-G_1-R_{10}$$

(1)

wherein R_9 represents an aliphatic group or an aromatic group; R_{10} represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an amino group, a hydrazino group, a carbamoyl group, or an oxycarbonyl group; G_1 represents a carbonyl group, a sulfonyl group, a sulfoxy group,



$$-\underset{\displaystyle R_{10}}{\underset{|}{\overset{\displaystyle O}{\overset{\|}{P}}}}-,\quad -\overset{\displaystyle O}{\overset{\|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-,$$

a thiocarbonyl group, or an iminomethylene group; and both A_1 and A_2 represent a hydrogen atom, or one of them is a hydrogen atom and the other represents a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or a substituted or unsubstituted acyl group;

wherein said at least one compound represented by general formula (X') is present in an amount of from 1×10^{-6} to 1×10^{-4} mol/m^2;

and

wherein said at least one hydrazine compound is present in an amount of from 10^{-6} to 1×10^{-1} mole per mole of silver halide.

5,691,110
PROCESS FOR CONTROLLED DEPROTECTION OF POLYMERS AND A PROCESS FOR FABRICATING A DEVICE UTILIZING PARTIALLY DEPROTECTED RESIST POLYMERS

Michael Philip Bohrer, Lebanon, and David Anton Mixon, Basking Ridge, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 234,501, Apr. 28, 1994, Pat. No. 5,385,809, which is a continuation of Ser. No. 8,029, Jan. 25, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 277,852

Int. Cl.^{6} G03C *1/76*

U.S. Cl. 430—270.1 **15 Claims**

1. A process for producing a chemically amplified resist comprising: dissolving a protected polymer comprising a backbone to which substituent groups are attached and acid labile functional groups that are attached to at least a portion of the substituent groups in an organic solvent with a pK_a of greater than 5 to form a polymer solution; heating the polymer solution to an elevated temperature of about 100° C. to about 150° C.; and maintaining the polymer solution at the elevated temperature for an amount of time sufficient to remove at least 5% of the acid labile functional groups from the polymer to obtain a partially deprotected polymer wherein the partial deprotection is accomplished without adding acid or base to the polymer solution; separating the partially deprotected polymer from the solvent; and after partial deprotection preparing a resist solution by combining the partially deprotected polymer with a spinning solvent.

5,691,111
PHOTOSENSITIVE RESIN COMPOSITION USEFUL AS RESIST FOR DEEP UV LITHOGRAPHY CONTAINING SULFONIUM SALTS

Shigeyuki Iwasa; Kaichiro Nakano, and Etsuo Hasegawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

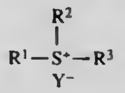
Filed Jul. 13, 1995, Ser. No. 502,251

Claims priority, application Japan, Jul. 14, 1994, 6-162244

Int. Cl.^{6} G03F *7/004*

U.S. Cl. 430—270.1 **22 Claims**

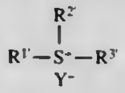
1. A photosensitive resin composition which is useful as a photoresist for photolithographic processes using deep UV radiation, the resin composition comprising an organic polymer having at least one acidolysis-susceptible functional group and an alkylsulfonium salt represented by the general formula (1A) or the general formula (1B):



$$R^1-\overset{\displaystyle R^2}{\overset{|}{S^+}}-R^3 \quad Y^-$$

(1A)

where R^1 is a C_7 to C_{12} alkyl group having a C_7 to C_{10} bridged alicyclic hydrocarbon structure, R^2 is (i) a C_7 to C_{12} alkyl group having a C_7 to C_{10} bridged alicyclic hydrocarbon structure or (ii) a C_1 to C_7 linear, branched or monocyclic alkyl group, R^3 is a C_5 to C_7 β-oxomonocyclic alkyl group, and Y^- is a counter ion:



$$R^{1'}-\overset{\displaystyle R^{2'}}{\overset{|}{S^+}}-R^{3'} \quad Y^-$$

(1B)

where $R^{1'}$ is a C_5 to C_7 monocyclic alkyl group, $R^{2'}$ is (i) a C_5 to C_7 monocyclic alkyl group or (ii) a C_1 to C_8 linear, branched or monocyclic alkyl group, $R^{3'}$ is a C_7 to C_{10} bridged cyclic alkyl group having oxo group at the β-position, and Y^- is a counter ion.

5,691,112
SULFONIUM SALT AND CHEMICALLY AMPLIFIED POSITIVE RESIST COMPOSITION

Satoshi Watanabe; Youichi Ohsawa; Toshinobu Ishihara; Kazumasa Maruyama; Yoshihumi Takeda; Junji Shimada, all of Niigata-ken; Fujio Yagihashi, Kanagawa, and Katsuya Takemura, Niigata-ken, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

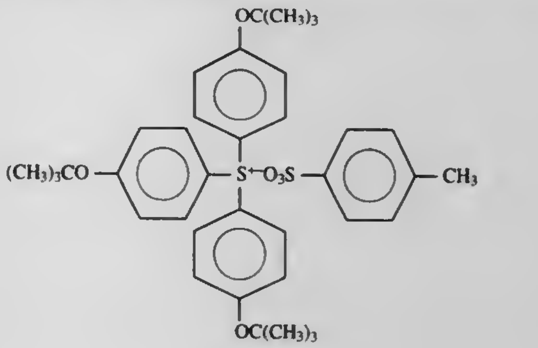
Division of Ser. No. 379,986, Jan. 27, 1995, Pat. No. 5,633,409. This application Dec. 10, 1996, Ser. No. 762,861

Claims priority, application Japan, Jan. 28, 1994, 6-026171; Mar. 29, 1994, 6-082359; Apr. 8, 1994, 6-095560; Nov. 28, 1994, 6-317626

Int. Cl.^{6} G03F *7/004*

U.S. Cl. 430—270.1 **7 Claims**

1. A chemically amplified, positive resist composition comprising a sulfonium salt of formula (1)



5,691,113
ANIONIC PHOTOINITIATION

Charles R. Kutal, Athens, Ga., assignor to The University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation of Ser. No. 790,355, Nov. 12, 1991, abandoned. This application Oct. 18, 1994, Ser. No. 325,623

Int. Cl.^{6} G03C *1/735*

U.S. Cl. 430—274.1 **18 Claims**

1. A method for polymerizing a monomer or oligomer or crosslinking an oligomer or polymer, in the absence of protic solvents, comprising irradiating a mixture of a monomer, oligomer, or polymer and an inorganic transition metal complex, under irradiation conditions sufficient for the inorganic transition metal complex to photochemically react to release a polymerization initiating substance consisting essentially of an anionically charged nucleophile, and said anionically charged nucleophile initiates a polymerization reaction of said monomer or oligomer or a crosslinking reaction of said oligomer or polymer, in the absence of protic solvents to form a product polymer material.

5,691,114
METHOD OF IMAGING OF LITHOGRAPHIC PRINTING PLATES USING LASER ABLATION

Mitchell Stewart Burberry, Webster; Charles David DeBoer, Rochester, and Sharon Wheten Weber, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 614,437, Mar. 12, 1996, Pat. No. 5,605,780. This application Sep. 24, 1996, Ser. No. 719,098

Int. Cl.^{6} G03F *7/20;7/09;* B41M *1/06*

U.S. Cl. 430—302 **20 Claims**

1. A method of providing a positive image comprising:

A) providing a lithographic printing plate comprising an anodized aluminum support and an image-forming layer overlying said support,

said image-forming layer comprising an infrared-absorbing agent dispersed in a film-forming polymeric binder, said film-

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forming polymeric binder being a cyanoacrylate polymer and said infrared-absorbing agent being dispersed therein in an amount sufficient for said image-forming layer to be imaged by laser-induced thermal ablation which completely removes said image-forming layer in exposed regions thereof to thereby reveal said underlying support, and

B) imagewise directing infrared laser radiation to said printing plate to thermally ablate said image-forming layer in said exposed regions thereof to form a positive image.

18. A method of imaging comprising:

A) mounting a lithographic printing plate on a printing press or plate setting device, said plate comprising an anodized aluminum support and an image-forming layer overlying said support,

said image-forming layer comprising an infrared-absorbing agent dispersed in a film-forming polymeric binder, said film-forming polymeric binder being a cyanoacrylate polymer and said infrared-absorbing agent being dispersed therein in an amount sufficient for said image-forming layer to be imaged by laser-induced thermal ablation which completely removes said image-forming layer in exposed regions thereof to thereby reveal said underlying support, and

B) imagewise directing infrared laser radiation to said printing plate to thermally ablate said image-forming layer in said exposed regions thereof to form a positive image.

5,691,115

EXPOSURE METHOD, ALIGNER, AND METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

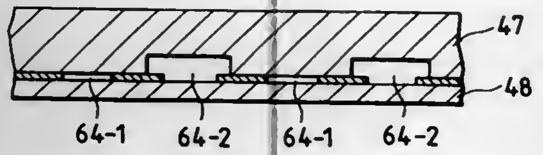
Yoshihiko Okamoto, Kodaira; Tsuneo Terasawa, Ome; Akira Imai, Hachioji; Norio Hasegawa, Hinode-machi, and Shinji Okazaki, Urawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 397,355, Mar. 2, 1995, Pat. No. 5,521,033, which is a continuation of Ser. No. 897,455, Jun. 10, 1992, Pat. No. 5,418,092. This application Oct. 20, 1995, Ser. No. 546,313

Claims priority, application Japan, Oct. 26, 1994, 6-262938; Mar. 3, 1995, 7-43861; Aug. 31, 1995, 7-223727

Int. Cl.^{6} G03C *5/00*

U.S. Cl. 430—311 **15 Claims**



1. A method of making semiconductor devices, comprising the steps of:

(1) irradiating an ultraviolet exposure light beam, having a substantially constant wavelength and being at least partially coherent, onto a phase shifting mask where enlarged circuit patterns are formed, and

(2) reducing and projecting a real image of the enlarged circuit patterns With the exposure light beam passing through the mask, by an optical reduction projection system having a predetermined numerical aperture, so that the real image can be formed onto a photosensitive resist film overlying a major surface of a wafer, whereby reduced circuit patterns corresponding to the enlarged circuit patterns of the mask are transferred onto the wafer,

said mask comprising:

(a) a first transparent mask substrate having a light shielding region overlying a major surface thereof and first and second opening regions corresponding to the enlarged circuit patterns; and

(b) a second transparent mask substrate having a major surface, superposed to the first transparent mask substrate such that the major surfaces of the first and second transparent mask substrates are in close proximity or in contact with each other,

said second transparent mask substrate having a phase shifting groove region, which phase shifting groove region is opposed to the second opening region and extends widthwise over the periphery of the second opening region, for inverting a phase of an exposure light beam transmitted through the second opening region as compared with a phase of exposure light beam transmitted through the first opening region where the phase shifting groove region does not exist, and thereby clearly forming the real image of the enlarged circuit patterns onto the photosensitive resist film overlying the major surface of the wafer owing to interference between transmitted exposure light beams transmitted through the phase shifting mask.

5,691,116

PATTERN TRANSFER TECHNIQUES FOR FABRICATION OF LENSLET ARRAYS FOR SOLID STATE IMAGERS

Joseph F. Revelli; Jeffrey I. Hirsh; Joseph Jech, all of Rochester; Douglas R. Robello, Webster; Stephen P. Barry, Albion, and Alan C. G. Nutt, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 369,235, Jan. 6, 1995, Pat. No. 5,605,783. This application Sep. 20, 1996, Ser. No. 710,591

Int. Cl.^{6} G03F *7/00*

U.S. Cl. 430—321 **2 Claims**

1. A method for forming lenslets which collect light and focus light onto photosensitive elements of an electronic imager, comprising the steps of:

(a) providing a transparent lenslet-forming layer on a substrate or on layer(s) on the substrate;

(b) forming a thin etch-stop layer of a spin-on organometallic glass on the transparent lenslet-forming layer and patterning a thin photosensitive resin mask on the etch-stop layer so that the mask pattern corresponds to lenslets to be formed;

(c) transferring by dry etching the pattern of the photosensitive resin mask to the thin etch-stop layer to form a thin etch-stop mask;

(d) anisotropically plasma etching the transparent lenslet-forming layer according to the patterned thin etch-stop mask;

(e) removing the thin etch-stop mask; and

(f) thermally reflowing the etched transparent lenslet-forming layer to form the lenslets.

5,691,117

METHOD FOR STRIPPING PHOTORESIST EMPLOYING A HOT HYDROGEN ATMOSPHERE

Rebecca Christine Lutsic, Johnson City; James Richard Murray, Owego, and David William Sissenstein, Jr., Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 172,511, Dec. 22, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,526

Int. Cl.^{6} G03C *5/00;* **B08B** *3/12;7/00;* **B44C** *1/22*

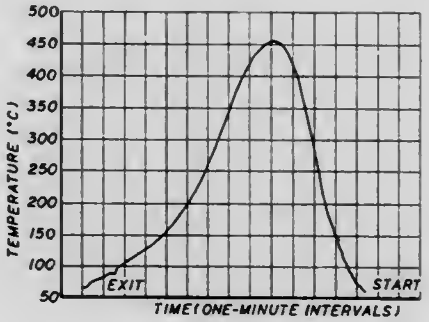
U.S. Cl. 430—329 **22 Claims**

1. A method for stripping photoresist from a substrate comprising the following steps:

a. providing a substrate coated with photoresist;

b. placing said substrate in a hydrogen atmosphere conveyor furnace;

c. exposing said substrate to a hot hydrogen atmosphere of a hydrogen atmosphere conveyor furnace at a temperature of at least about 430° C. for sufficient time to remove the photoresist, wherein the oxygen content inside the furnace does not exceed about 10 parts per million and further wherein the photoresist is essentially completely stripped by said hot hydrogen atmosphere, without using organic solvent wherein the photoresist comprises a polyisoprene.



5,691,118

COLOR PAPER PROCESSING USING TWO ACIDIC STOP SOLUTIONS BEFORE AND AFTER BLEACHING

Shirleyanne E. Haye, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1996, Ser. No. 728,813

Int. Cl.^{6} G03C *7/407*

U.S. Cl. 430—357 **20 Claims**

1. A method for photoprocessing comprising, in order:

A) color developing an imagewise exposed color photographic paper comprising at least one predominantly silver chloride photographic emulsion, said paper having a total silver coverage of less than or equal to 1 g/m^2,

B) stopping color development by contacting said paper with a first acidic solution having a pH of less than or equal to 4,

C) bleaching said paper with a peroxide bleaching composition comprising a peroxide bleaching agent, and chloride ions,

D) contacting said bleached paper with a second acidic solution having a pH of less than or equal to 5, and

E) fixing said paper.

5,691,119

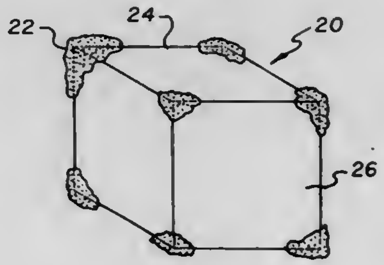
PROCESS FOR PREPARATION OF DIGITALLY IMAGING HIGH CHLORIDE EMULSIONS

Jerzy Mydlarz, and Jerzy Antoni Budz, both of Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1996, Ser. No. 601,513

Int. Cl.^{6} G03C *1/035;1/09;7/00*

U.S. Cl. 430—363 **25 Claims**



1. A method of treating silver chloride emulsions comprising providing a silver chloride emulsion, adding gold and sulfur chemical sensitizers, heating to chemically sensitize said emulsion, cooling to below about 50° C., adding bromide to the emulsion and then after bromide addition adding spectral sensitizing dye.

5,691,120

SUCCINIC ACID DERIVATIVE DEGRADABLE CHELANTS, USES AND COMPOSITIONS THEREOF

David A. Wilson, Richwood; Druce K. Crump, Lake Jackson, both of Tex., and Eric R. Brown, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 521,261, Aug. 30, 1995. This application Jan. 14, 1997, Ser. No. 783,257

Int. Cl.^{6} G03C *7/42*

U.S. Cl. 430—393 **54 Claims**

1. A method of bleaching or bleach-fixing a developed silver halide photographic material comprising contacting said photographic material with a bleaching solution containing a bleaching agent comprising at least one metal complex of a polyamino disuccinic acid and one or more metal complexes of a polyamino monosuccinic acid, wherein the polyamino substituent of the at least one metal complex of a polyamino disuccinic acid and the polyamino substituent of the at least one metal complex of a polyamino monosuccinic acid are the same, and wherein the molar ratio of said polyamino disuccinic acid to said polyamino monosuccinic acid is from 10:1 to 1:1.

5,691,121

METHOD FOR MAKING NEGATIVE LITH IMAGES DIRECT POSITIVE IMAGES

Jean-Marie Dewanckele, Drongen; David Terrell, Lint; Hieronymus Andriessen, Beerse, and Kris Viaene, Bonheiden, all of Belgium, assignors to AGFA-Gevaert. N.V., Mortsel, Belgium

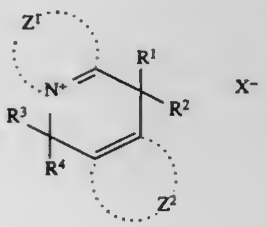
Continuation-in-part of Ser. No. 532,052, Sep. 22, 1995, abandoned. This application Jul. 15, 1996, Ser. No. 680,358

Claims priority, application European Pat. Off., Sep. 27, 1994, 94202772

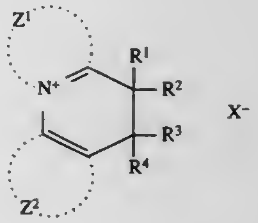
Int. Cl.^{6} G03C *1/73*

U.S. Cl. 430—410 **10 Claims**

1. Photographic light-sensitive silver halide material, said material comprising a support and in at least one light-sensitive emulsion layer, dispersed in a hydrophilic colloid binder and/or in a hydrophilic colloid layer in water-permeable relationship with said emulsion layer, development-nucleating amounts ranging from about 10^{-5} to about 10^{-1} mole per mole of silver halide of at least one compound corresponding to at least one of the general formulae I to III,



(I)



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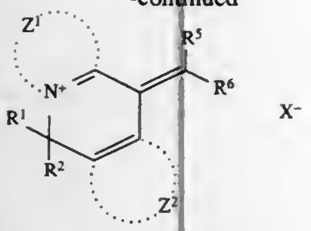


(III)

wherein:

Z^1 represents the carbon atoms necessary to complete a conjugated nucleus containing from 5 to 6 atoms including the quaternary nitrogen atom;

Z^2 represents the carbon atoms necessary to complete a conjugated ring;

R^1, R^2, R^3, R^4, R^5 and R^6 are independently an alkyl, amino, acyl, carboxy, sulfonyl, halide, sulfinyl group or hydrogen with the proviso that at least one of R^1 and R^2; at least one of R^3 and R^4 at least and one of R^5 and R^6 is hydrogen.

5,691,122

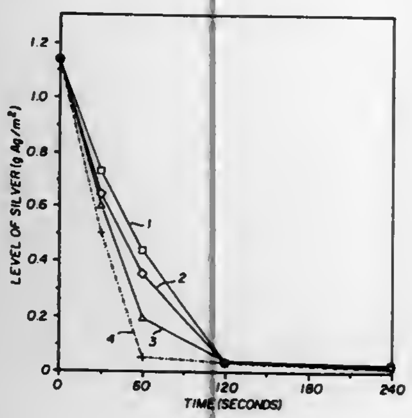
PHOTOGRAPHIC PROCESSING COMPOSITION AND METHOD USING ORGANIC CATALYST FOR PEROXIDE BLEACHING AGENT

Terrence Robert O'Toole, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 569,406, Dec. 6, 1995, which is a continuation-in-part of Ser. No. 362,384, Dec. 22, 1994, abandoned. This application Nov. 12, 1996, Ser. No. 745,528

Int. Cl.^{6} G03C *7/42*

U.S. Cl. 430—430 **14 Claims**



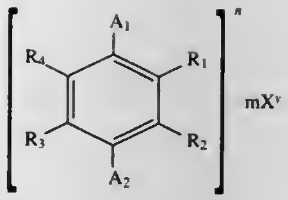
1. A method for processing a photographic element comprising: treating an imagewise exposed and developed photographic element with a solution that has a pH of from about 3 to about 5, is substantially free of ferric ions, and consists essentially of from about 0.1 to about 2 mol/l of a peroxide or a perborate or percarbonate peroxide precursor bleaching agent and from about 0.0005 to about 0.1 mol/l of an organic carbocyclic or heterocyclic compound which has the following properties:

a) a reduced form which is oxidizable by peroxide or a peroxide precursor at a pH of from about 1 to about 7,

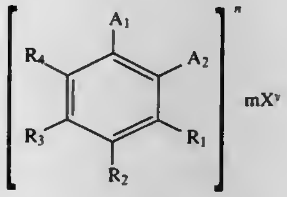
b) an oxidized form which is reducible by silver metal in the presence of bromide or chloride at a pH of from about 1 to about 7, and

c) a chemically reversible redox couple, versus a saturated calomel electrode, of from about −0.20 to about +1.5 volts at a pH of from about 1 to about 7,

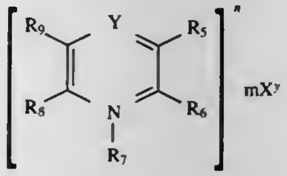
said organic carbocyclic or heterocyclic compound having a neutral or net positive charge, and being represented by any of the structures:



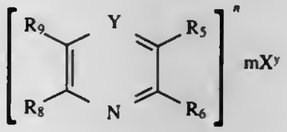
(I)



(II)



(III)



(IV)

wherein

A1 and A2 are independently hydroxy or primary, secondary or tertiary amino,

R1, R2, R3, R4, R5, R6, R7, R8 and R9 are independently hydrogen, halo, cyano, nitro, amide, sulfonamide, hydroxy, an ester, an ether, a primary, secondary or tertiary amino, an alkyl group of 1 to 12 carbon atoms, an aryl group of 6 to 12 carbon atoms in the ring structure, a cycloalkyl group of 5 to 12 carbon atoms in the ring structure or a quaternized aliphatic or aromatic amine or imine, or

any two adjacent groups chosen from R1, R2, R3, R4, R5, R6, R7, R8 and R9, can represent the carbon, nitrogen, oxygen and sulfur atoms necessary to complete a 5- to 12-membered fused carbocyclic or heterocyclic ring structure connected to the primary nucleus of structures (I)–(IV),

Y is a sulfur, oxygen or nitrogen atom,

X is an anion with a charge y of −1 to −3,

m is the absolute value of the ratio of n to y, and

n is 0 or a positive integer up to 3.

5,691,123

METHOD TO SELECTIVELY REMOVE LUBRICANT FROM ONE SIDE OF LUBRICANT-COATED SUPPORT

Bradley Keith Coltrain, Fairport; Dennis Ray Freeman, Spencerport, and David Appler Glocker, West Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1996, Ser. No. 587,123

Int. Cl.^{6} G03C *11/06;1/76*

U.S. Cl. 430—495.1 **27 Claims**

20. A method for preparing a photographic element comprising a polymeric film or resin-coated paper support having on both sides thereof a lubricant that provides a coefficient of friction of less than about 0.5, said method comprising:

A) subjecting only one side of said support to glow discharge treatment for a time and at an energy level sufficient to remove substantially all of said lubricant from that only one side of said support, and

B) applying a radiation sensitive layer to said only one side of said support.

5,691,124

COLOR PHOTOGRAPHIC ELEMENT WITH IMPROVED PUSH PROCESSING

Sang Hyung Kim, Pittsford, and Spencer Alan Pugh, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1995, Ser. No. 581,297

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—505 **27 Claims**

1. A color silver halide photographic element comprising a support having situated thereon a red light-sensitive, cyan dye-forming unit comprising a photosensitive silver halide emulsion layer and an image dye-forming coupler; a green light-sensitive, magenta dye-forming unit comprising a photosensitive silver halide emulsion layer and an image dye-forming coupler; and a blue light-sensitive, yellow dye-forming unit comprising a photosensitive silver halide emulsion layer and an image dye-forming coupler; the photographic element further comprising a first layer and a second layer, the first layer containing between 260 and 2200 mg of gelatin/m^2 and the second layer being a layer which provides a site of development for solution physical development; wherein at least one of the dye-forming units comprises two or more emulsion layers spectrally sensitized to the same region of the visible spectrum, but exhibiting different photographic sensitivities and wherein the first layer is positioned adjacent to the layer containing the slowest emulsion of said dye-forming unit and between the layer containing the slowest emulsion and the second layer wherein in the layer containing the slowest emulsion of said dye-forming unit the slowest emulsion comprises tabular silver halide grains having a mean equivalent circular diameter of greater than 0.44 microns and less than 0.89 microns and wherein such grains account for at least 50% of the projected area of the grains in the emulsion layer when the layer contains a single emulsion and at least 25% of the projected area of the grains in the emulsion layer when the layer contains a blended emulsion.

5,691,125

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takefumi Hara; Kazuyoshi Yamakawa; Sadanobu Shuto; Mitsuru Yamamoto; Makoto Suzuki; Yasuhiro Shimada; Katsuro Nagaoka; Satoshi Nagaoka; Yoshihiko Shibahara, and Hideo Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

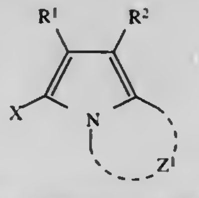
Division of Ser. No. 453,398, May 30, 1995, Pat. No. 5,578,436, which is a division of Ser. No. 43,027, Apr. 5, 1993, abandoned. This application Jun. 19, 1996, Ser. No. 665,897

Claims priority, application Japan, Apr. 3, 1992, 4-109131

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—505 **25 Claims**

1. A silver halide color photographic material having at least one red-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer, and at least one blue-sensitive silver halide emulsion layer on a support, which comprises at least one cyan dye-forming coupler represented by the following formula (I) in at least one of said silver halide emulsion layers:



formula (I)

wherein R^1 represents a hydrogen atom or a substituent, R^2 represents a substituent, X represents a hydrogen atom or a group capable of being released upon a coupling reaction of the coupler represented by formula (I) with an oxidized product of a color-developing agent, and Z^1 represents a group of nonmetallic atoms required for forming a nitrogen-containing 6-membered heterocyclic ring, which contains at least one group capable of being dissociated; wherein the emulsion layer containing said cyan dye-forming coupler and/or an intermediate layer adjacent to said emulsion layer contains colloidal silver.

5,691,126

CLASS OF YELLOW DYES FOR USE IN PHOTOGRAPHIC MATERIALS

Eric Kiekens, Zele; Antonius Van Gils, Meer, and Roland Claes, Dendermonde, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

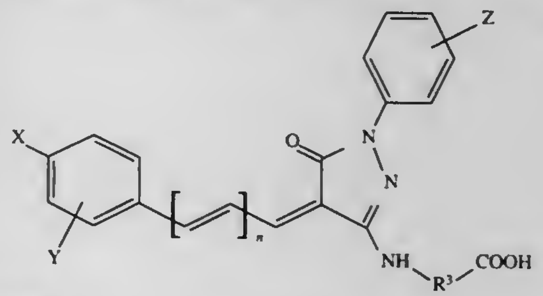
Filed Aug. 29, 1996, Ser. No. 705,523

Claims priority, application European Pat. Off., Oct. 16, 1995, 95202788

Int. Cl.^{6} G03C *1/83*

U.S. Cl. 430—522 **5 Claims**

1. Photographic material containing at least one silver halide emulsion layer and optionally one or more non-light sensitive layer(s) characterized in that at least one of those layers contains a dye represented by general formula (I):



(I)

wherein,

X represents —N(R^1R^2) or —OH, wherein each of R^1 and R^2 represents substituted or unsubstituted alkyl or aryl, or the necessary atoms to form a fused-on aromatic ring,

each of Y and Z independently represents hydrogen or one or more substituent(s),

R^3 represents alkylene, which may be substituted, and

n=0 or 1.

5,691,127

EPITAXIALLY SENSITIZED ULTRATHIN TABULAR GRAIN EMULSIONS CONTAINING STABILIZING ADDENDA

Richard Lee Daubendiek; Timothy Richard Gersey; Robert Don Wilson; Joseph George Lighthouse; Joseph Charles Deaton, all of Rochester; Myra Toffolon Olm; Donald Lee Black, both of Webster, and Xin Wen, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 2, 1996, Ser. No. 595,679

Int. Cl.^{6} G03C *1/035;1/09;1/34*

U.S. Cl. 430—567 **20 Claims**

1. An emulsion comprising tabular silver halide grains, sensitizing dye(s) and silver salt epitaxial deposits, and addenda that include

a mercaptotetrazole and a tetraazaindene wherein said tabular silver halide grains comprise grains

(a) having {111} major faces,

(b) containing greater than 70 mole percent bromide and at least 0.25 mole percent iodide, based on silver,

(c) accounting for greater than 90 percent of total grain projected area,

(d) exhibiting an average equivalent circular diameter of at least 0.7 µm,

(e) exhibiting an average thickness of less than 0.07 µm, and

(f) having latent image forming chemical sensitization sites on the surfaces of the tabular grains,

and a spectral sensitizing dye adsorbed to at least the major faces of the tabular grains, wherein the surface chemical sensitization sites include at least one silver salt epitaxially located on and confined to laterally displaced regions of said tabular grains.

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5,691,128

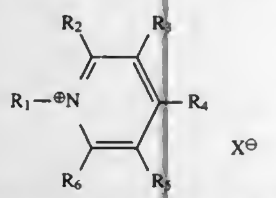
METHODS FOR PRODUCING PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Katsuhisa Ohzeki, Minami-ashigara, Japan, and Yuji Yoshida, deceased, late of Minami-ashigara, Japan, by Hideno Yoshida, Mutsumi Yoshida, Hitomi Yoshida, legal heirs/representatives, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 6, 1996, Ser. No. 709,030
Claims priority, application Japan, Sep. 8, 1995, 7-230906
Int. Cl.^{6} G03C *1/07;1/035*

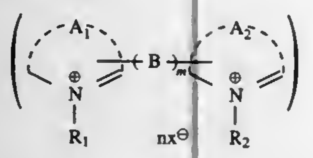
U.S. Cl. 430—569 **8 Claims**

1. A method for producing a silver halide emulsion having a silver chloride content of 50 mol % or more and containing silver halide grains in which (111) faces occupy 30% or more of their surface area, wherein said silver halide grains are formed in the presence of at least one compound represented by formula (I), (II) or (III), and a thiocyanate and a sensitizing dye are added prior to a washing step of emulsion production:



(I)

wherein R_1 represents an alkyl group, an alkenyl group or an aralkyl group; R_2, R_3, R_4, R_5 and R_6 each represents a hydrogen atom or a substituent group; R_2 and R_3, R_3 and R_4, R_4 and R_5 and R_5 and R_6 may each be cyclocondensed, with the proviso that at least one of R_2, R_3, R_4, R_5 and R_6 represents an aryl group; and X^- represents a counter anion;



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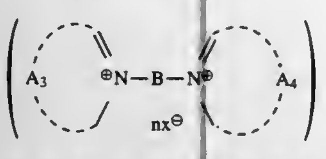


(III)

wherein A_1, A_2, A_3 and A_4, which may be the same or different, each represents a nonmetallic atom group for completing a nitrogen-containing heterocyclic ring; B represents a divalent connecting group; m represents 0 or 1; R_1 and R_2 each represents an alkyl group; X represents an anion; and n represents 0 or 1, and n is 0 in the case of an internal salt.

5,691,129

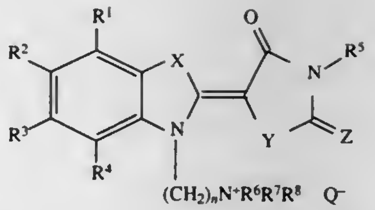
ZEROMETHINE MEROCYANINE DYES USEFUL AS SPECTRAL SENSITIZERS IN PHOTOGRAPHIC ELEMENTS

Dietrich Max Fabricius, Hendersonville, N.C.; Ralf Hermann Harms, Neu-Isenburg, Germany, and James Joseph Welter, Flat Rock, N.C., assignors to Sterling Diagnostic Imaging, Inc., Glasgow, Del.

Division of Ser. No. 612,354, Mar. 7, 1996, Pat. No. 5,587,482.
This application Nov. 12, 1996, Ser. No. 747,411
Int. Cl.^{6} G03C *1/10*

U.S. Cl. 430—578 **12 Claims**

1. A photographic element comprising a support with at least one hydrophilic colloid layer coated thereon; said hydrophilic colloid layer comprises silver halide grains which are spectrally sensitized with at least one dye represented by



wherein
- R^1, R^2, R^3, and R^4 each independently represents H; halogen; alkyl of 1–6 carbons; aryl of 6–24 carbons; alkoxy of 1–6 carbons; carbonyl; or sulfonate; or R^1 and R^2, R^2 and R^3, or R^3 and R^4 taken together represent the atoms necessary to complete a six-membered carbocylic ring;
- R^5 represents hydrogen, alkyl of 1–6 carbons or aryl of 6–24 carbons;
- R^6, R^7, and R^8 independently represent alkyl 1–6 carbons; aryl of 6–24 carbons; or any pair of R^6, R^7 and R^8 taken together represent a five- or six-member heterocyclic ring;
- X represents O, S, CH═CH, Se, Te or N—R^{10};
- Y represents O, S, or N—R9;
- Z represents O, S or Se;
- R^9 represents alkyl of 1–6 carbons; or an aryl of 6–24 carbons;
- R^{10} represents alkyl of 1–6 carbons;
- n is an integer of 1–6; and
- Q represents a counterion.

5,691,130

COLOR RECORDING PHOTOGRAPHIC ELEMENTS EXHIBITING AN INCREASED DENSITY RANGE, SENSITIVITY AND CONTRAST

Lois Ann Buitano, and Richard Peter Szajewski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1995, Ser. No. 563,818
Int. Cl.^{6} G03C *1/06*

U.S. Cl. 430—611 **13 Claims**

1. A color recording photographic element comprised of
a support and, superimposed on the support,
blue, green and red recording layer units each containing at least one silver halide emulsion,
wherein
the layer unit nearest the support contains a high chloride tabular grain emulsion and an optionally esterified glycolic ether having a molecular weight of at least 300 and containing at least one thioether moiety and
the layer unit farthest from the support is free of the thioether moiety containing glycolic ether.

5,691,131

HIGH BROMIDE TABULAR GRAIN EMULSIONS WITH DISLOCATIONS IN PERIPHERAL REGIONS

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1996, Ser. No. 754,584
Int. Cl.^{6} G03C *1/005;1/047*

U.S. Cl. 430—639 **15 Claims**

1. A photographic emulsion comprised of radiation-sensitive silver halide grains and a hydrophilic colloid peptizer,
wherein
(1) at least 50 percent of total grain projected area is accounted for by tabular grains each comprised of
(a) less than 12 mole percent iodide and greater than 50 mole percent bromide, based on silver,
(b) a central region accounting for at least 50 percent of grain projected area, and

(c) a peripheral region containing crystal lattice dislocations and a higher iodide concentration than the overall average iodide concentration of the tabular grains, and
(2) the hydrophilic colloid peptizer is derived from a water dispersible cationic starch.

5,691,132

METHOD FOR INACTIVATING PATHOGENS IN RED CELL COMPOSITIONS USING QUINACRINE MUSTARD

Susan Wollowitz; David Cook, both of Walnut Creek, and Alleen Nerio, Fremont, all of Calif., assignors to Cerus Corporation, Concord, Calif.

Filed Nov. 14, 1994, Ser. No. 338,040
Int. Cl.^{6} A01N *1/02;63/00;43/42;* **C12N** *7/06*

U.S. Cl. 435—2 **7 Claims**

1. A method of inactivating pathogens in a red blood cell containing composition, comprising:
a) adding N1,N1-bis(2-chloroethyl)-N4-(6-chloro-2-methoxy-9-acridinyl)-1,4-pentanediamine to a blood product comprising red blood cells, where said blood product is suspected of containing pathogens, to create a mixture, said N1,N1-bis(2-chloroethyl)-N4-(6-chloro-2-methoxy-9-acridinyl)-1,4-pentanediamine reaching a final concentration of N1,N1-bis(2-chloroethyl)-N4-(6-chloro-2-methoxy-9 -acridinyl)-1,4-pentanediamine of between 1 μg/ml and 250 μg/ml, and
b) incubating said mixture in vitro for between 1 minute and 48 hours.

5,691,133

METHOD TO QUICKLY ADD CRYOPROTECTANTS TO SPERM CELLS WHILE MAINTAINING VIABILITY

John K. Critser, Carmel, and D. Y. Gao, Indianapolis, both of Ind., assignors to Methodist Hospital of Indiana, Indianapolis, Ind.

Division of Ser. No. 250,675, May 27, 1994, Pat. No. 5,595,866. This application Jun. 7, 1995, Ser. No. 475,215
Int. Cl.^{6} A01N *1/02*

U.S. Cl. 435—2 **12 Claims**

1. A method to add cryoprotectant to the sperm cells of an animal species comprising:
a) predetermining a lower cellular volume limit below which a user-defined fraction of sperm cells lose their viability,
b) selecting a first concentration of cryoprotectant solution,
c) calculating whether said first concentration of cryoprotectant solution will cause the sperm cells to shrink below the lower cellular volume limit by a calculation which uses the water permeability coefficient and the cryoprotectant permeability coefficient of the sperm cells, repeating steps b) and c) as necessary in order to calculate a predetermined concentration of cryoprotectant solution which will permit increasing of the concentration of cryoprotectant in the sperm cells while still maintaining the viability of a user-defined fraction of the sperm cells,
d) contacting said sperm cells with the solution of the predetermined concentration of cryoprotectant.

5,691,134

POLIOVIRUS SPECIFIC PRIMERS AND METHODS OF DETECTION UTILIZING THE SAME

David R. Kilpatrick, Norcross, Ga., assignor to The United States of America as represented by Secretary, Dept. HHS, NTH, OTT, Washington, D.C.

Continuation-in-part of Ser. No. 92,110, Jul. 13, 1993, Pat. No. 5,585,477. This application Jul. 11, 1994, Ser. No. 273,474
Int. Cl.^{6} C12Q *1/70;* **C07H** *21/04*

U.S. Cl. 435—5 **11 Claims**

1. A method for detecting the presence or absence of a poliovirus in a sample containing nucleic acids comprising the steps of:
a) amplifying the nucleic acids from the sample with a primer pair comprised of a first primer comprised of the nucleotide sequence set forth in the Sequence Listing as SEQ ID NO: 1 and a second primer comprised of the nucleotide sequence set forth in the Sequence Listing as SEQ ID NO: 2; and
b) determining the presence or absence of nucleic acid from poliovirus, thereby detecting the presence or absence of poliovirus in the sample.

5,691,135

IMMUNOGLOBULIN SUPERANTIGEN BINDING TO GP 120 FROM HIV

Jonathan Braun, Sherman Oaks, and Lee A. Goodglick, Los Angeles, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 259,669, Jun. 14, 1994, abandoned, which is a continuation of Ser. No. 9,705, Jan. 26, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 306,116
Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **3 Claims**

1. A method of determining the HIV−1 disease state of a patient infected with HIV−1, comprising:
obtaining a biological sample from said patient, said sample containing antibodies;
determining the level of VH3-containing antibodies having gp120 binding activity in said sample; and
comparing the determined level of said antibodies with a predetermined level of said antibodies in a biological sample from an asymptomatic HIV−1 infected patient, wherein a lower level in said biological sample from said patient relative to said predetermined level is indicative of a disease state more advanced than said asymptomatic HIV−1 infected patient.

5,691,136

FINGERPRINTING BACTERIAL STRAINS USING REPETITIVE DNA SEQUENCE AMPLIFICATION

James R. Lupski; James Versalovic, and Thearith Koeuth, all of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 781,424, Oct. 23, 1991, abandoned. This application Aug. 24, 1993, Ser. No. 111,077
Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **113 Claims**

1. A method for identifying a species of bacteria in a sample, comprising the steps of:
amplifying DNA between interspersed, non-coding BOX repetitive sequences in a sample containing said bacteria by
adding an outwardly-directed BOX primer pair to said sample,
hybridizing primers of said primer pair to the interspersed, non-coding BOX repetitive DNA sequences in the bacterial DNA and
extending said primers outwardly from one hybridizable interspersed, non-coding, BOX repetitive sequence to another hybridizable interspersed, non-coding BOX repetitive sequence;
separating the extension products generated in the amplification step by size; and
determining the specific species of bacteria by measuring the pattern of sized extension products.

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5,691,137

METHODS OF SCREENING CANDIDATE AGENTS FOR BIOLOGICAL ACTIVITY USING YEAST CELLS

Michael Rosbash, Newton Lower Falls, and Francoise Stutz, Brookline, both of Mass., assignors to Brandeis University, Waltham, Mass.

Filed Aug. 30, 1994, Ser. No. 297,808

Int. Cl.⁶ C12Q *1/11;* **C12N** *15/00;7/04;* **C07H** *21/04*

U.S. Cl. 435—6 **6 Claims**

1. A method of screening a candidate agent for biological activity against HIV-1 Rev protein comprising:

a) contacting a yeast double transformant with a candidate agent to be tested for activity against HIV-1 Rev protein, said yeast double transformant produced by introducing into a yeast strain which lacks the gene encoding a copper chelator protein:

  i) a reporter construct comprising regulatory control sequences operably linked to a DNA sequence encoding a copper chelator protein and a DNA sequence encoding the Rev Response Element, wherein the DNA sequence encoding the copper chelator protein is interrupted with a synthetic intron, and the intron sequence is out of frame with the DNA sequence encoding the copper chelator protein; and

  ii) a recombinant plasmid comprising regulatory sequences operably linked to a DNA sequence encoding the HIV-1 Rev protein,

said yeast double transformant being maintained in culture medium containing low copper concentration;

b) increasing the copper concentration in the culture medium, and determining the growth rate of the yeast double transformant; and

c) comparing the growth rate of the yeast double transformant grown in the presence of the candidate agent with the growth rate of the yeast double transformant grown under similar conditions but in the absence of the candidate agent to determine if the candidate agent has activity against HIV-1 Rev protein, wherein if the candidate agent has activity against HIV-1 Rev, the growth rate of the yeast double transformant cultured in the presence of the candidate agent will be greater than the growth rate of the yeast double transformant grown in the absence of the candidate agent.

5,691,138

NUCLEOTIDE SEQUENCES WHICH HYBRIDIZE SPECIFICALLY WITH A *CAMPYLOBACTER JEJUNI* GENOMIC NUCLEIC SEQUENCE

Jean-luc Guesdon, Sevres, and Véronique Stonnet, Asnieres, both of France, assignors to Institut Pasteur, Paris Cedex, France

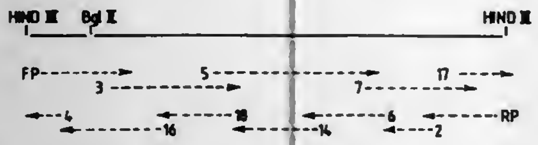
PCT No. PCT/FR94/00122, § 371 Date Sep. 29, 1994, § 102(e) Date Sep. 29, 1994, PCT Pub. No. WO94/17205, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 31, 1994, Ser. No. 307,591

Claims priority, application France, Jan. 29, 1993, 9300978

Int. Cl.⁶ C12Q *1/68;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **15 Claims**



9. A method of detecting the presence of *Campylobacter jejuni* in a biological sample, comprising the steps of:

(a) contacting said biological sample with a pair of primers, wherein each primer consists of 18 to 30 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of:

  a nucleotide sequence of SEQ ID NO:1;

  a nucleotide sequence of SEQ ID NO:2;

  a nucleotide sequence fully complementary to SEQ ID NO:1;

  a nucleotide sequence fully complementary to SEQ ID NO:2;

  a nucleotide sequence which hybridizes with SEQ ID NO:1 under stringent conditions within a temperature range of (Tm— 15° C.) to (Tm—20° C.);

  a nucleotide sequence which hybridizes with a nucleotide sequence fully complementary to SEQ ID NO:1 under stringent conditions;

  a nucleotide sequence which hybridizes with SEQ ID NO:2 under stringent conditions; or

  a nucleotide sequence which hybridizes with a nucleotide sequence fully complementary to SEQ ID NO:2 under stringent conditions;

wherein stringent conditions are

  hybridizing for 16–18 hours at 65° C. in 6X SSC buffer containing 10% dextran sulfate, a 5X concentrated Denhardt's solution 10 mM EDTA, 0.05% SDS, 100 μg/ml denatured salmon sperm DNA;

  washing twice for 10 minutes at 65° C. in 2X SSC, once for 30 minutes at 65° C. in 2X SSC+0.1% SDS and once for 10 minutes at 65° C. in 0.1X SSC; and

  detecting hybridization to *C. jejuni* but not to other Campylobacter species;

(b) amplifying any genomic nucleic acid sequences of *Campylobacter jejuni* in said sample; and

(c) detecting the presence of any amplified genomic nucleic acid sequences.

5,691,139

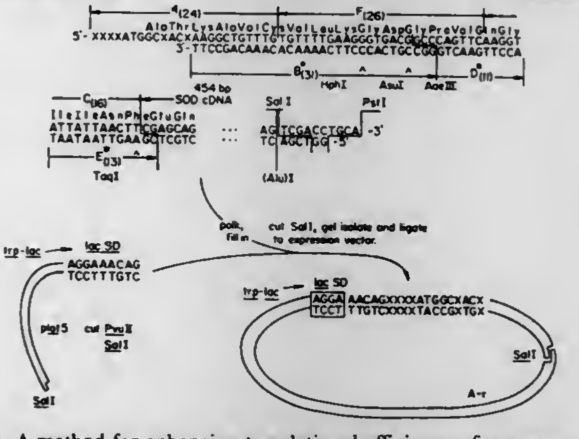
GENETIC MODIFICATION OF SUPEROXIDE DISMUTASE TO INCREASE EXPRESSION IN MICROORGANISMS

Robert A. Hallewell, San Francisco, and Guy T. Mullenbach, Oakland, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 232,595, Apr. 25, 1994, abandoned, which is a continuation of Ser. No. 64,737, May 19, 1993, abandoned, which is a continuation of Ser. No. 750,608, Aug. 27, 1991, abandoned, which is a continuation of Ser. No. 121,212, Nov. 16, 1987, Pat. No. 5,066,591, which is a division of Ser. No. 931,920, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 609,412, May 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 538,607, Oct. 3, 1983, abandoned. This application Apr. 21, 1995, Ser. No. 426,278

Int. Cl.⁶ C12Q *1/68;* **C12P** *21/02;* **C12N** *9/00;15/66*

U.S. Cl. 435—6 **7 Claims**



1. A method for enhancing translational efficiency of a superoxide dismutase gene, in a DNA construct containing a ribosomal binding site, and an initiation codon separated by a polynucleotide spacer, said method comprising:

  synthesizing a mixture of linkers having overhangs varying in length, including at least a portion of said spacer, and varing in composition in the region of said spacer;

  joining said mixture of linkers to flanking regions to provide a DNA construct having transcriptional and translational initiation and termination regulatory signal sequences upstream and downstream, respectively from said superoxide dismutase gene and varying spacer regions between said ribosomal binding site and said initiation codon;

  providing for filling in of said overhang; and

  cloning said construct and screening said clones for efficiency of translation.

5,691,140

BIDIRECTIONAL IN VITRO TRANSCRIPTION VECTORS UTILIZING A SINGLE RNA POLYMERASE FOR BOTH DIRECTIONS

Christopher J. Noren, Rockport, Mass., and Paul D. Evans, Camp Verde, Ariz., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed May 18, 1995, Ser. No. 443,640

Int. Cl.⁶ C12Q *1/68;* **C12N** *15/64;15/66;15/70*

U.S. Cl. 435—6 **15 Claims**

1. A cloning/in vitro transcription vector comprising a vector engineered to have at least one polylinker, wherein the polylinker is flanked by opposing promoters, which promoters are recognized by a single species of RNA polymerase, and which have been modified by introduction of a first restriction endonuclease site into or proximate the first opposing promoter and a second restriction endonuclease site into or proximate the second re-opposing promoter to permit unidirectional transcription from one of the opposing promoters when the other opposing promoter has been rendered inoperable.

5,691,141

DNA SEQUENCING BY MASS SPECTROMETRY

Hubert Köster, Concord, Mass., assignor to Sequenom, Inc., Boston, Mass.

Division of Ser. No. 178,216, Jan. 6, 1994, Pat. No. 5,547,835, which is a continuation-in-part of Ser. No. 1,323, Jan. 7, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,123

Int. Cl.⁶ C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04;21/02*

U.S. Cl. 435—6 **26 Claims**

1. A kit for sequencing one or more species of nucleic acids by multiplex mass spectrometric nucleic acid sequencing, comprising:

a) a solid support having a linking functionality (L');

b) a set of nucleic acid primers suitable for initiating synthesis of a set of nucleic acids which are complementary to the different species of nucleic acids, the primers each including a linking group (L) able to interact with the linking functionality (L') and reversibly link the primers to the solid support and optionally, a tag probe;

c) a set of chain-elongating nucleotides for synthesizing the complementary nucleic acids;

d) a set of chain-terminating nucleotides for terminating synthesis of the complementary nucleic acids and generating sets of base-specific terminated complementary nucleic acid fragments; and

e) a polymerase for synthesizing the complementary nucleic acids from the nucleic acid primers, chain-elongating nucleotides and terminating nucleotides,

wherein in the absence of a tag probe, at least one reagent selected from the group consisting of the primers, the chain-elongating nucleotides, and the chain-terminating nucleotides is mass modified to provide distinction between each set of base-specifically terminated nucleotides of each species of nucleic acid by mass spectrometry.

5,691,142

DETECTION OF TARGET NUCLEIC ACID MOLECULES USING SYNTHESIS-DEFICIENT THERMOSTABLE DNA POLYMERASE

James E. Dahlberg; Victor I. Lyamichev, and Mary Ann D. Brow, all of Madison, Wis., assignors to Third WaveTechnologies, Inc., Madison, Wis.

Division of Ser. No. 73,384, Jun. 4, 1993, Pat. No. 5,541,311, which is a continuation-in-part of Ser. No. 986,330, Dec. 7, 1992, Pat. No. 5,422,253. This application Jun. 6, 1995, Ser. No. 483,043

Int. Cl.⁶ C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04;* **G01N** *33/48*

U.S. Cl. 435—6 **8 Claims**

1. A method of detecting the presence of a specific target DNA molecule comprising:

a) providing:

  i) a target nucleic acid having a first and a second portion;

  ii) a first oligonucleotide complementary to said first portion of said target nucleic acid, and

  iii) a second oligonucleotide having a 5' and a 3' end and a region of which is complementary to said second portion of said target nucleic acid, said non-complementary region of said second oligonucleotide providing a single-stranded arm at its 5' end;

b) mixing said target nucleic acid, said first oligonucleotide and said second oligonucleotide under conditions wherein said first oligonucleotide and the 3' end of said second oligonucleotide are annealed to said target DNA sequence so as to create a first cleavage structure having a single-stranded arm;

c) providing a cleavage means under conditions such that cleavage of said first cleavage structure occurs at a site located within said second oligonucleotide in a manner dependent upon the annealing of said first and second oligonucleotides on said target nucleic acid, thereby liberating said single-stranded arm of said cleavage structure generating a third oligonucleotide;

d) providing a first hairpin structure having a single-stranded 3' arm and a single-stranded 5' arm under conditions wherein said third oligonucleotide anneals to said single-stranded 3' arm of said first hairpin thereby creating a second cleavage structure having a single-stranded 5' arm;

e) providing conditions under which cleavage of said second cleavage structure occurs by said cleavage means liberating said single-stranded 5' arm of said second cleavage structure so as to create reaction products comprising a fourth oligonucleotide and a first cleaved hairpin detection molecule;

f) providing a second hairpin structure having a single-stranded 3' arm and a single-stranded 5' arm under conditions wherein said fourth oligonucleotide anneals to the single-stranded 3' arm of said second hairpin thereby creating a third cleavage structure having a single-stranded 5' arm;

g) providing conditions under which cleavage of said third cleavage structure occurs by said cleavage means liberating said single-stranded 5' arm of said third cleavage structure so as to create reaction products comprising generating a fifth oligonucleotide identical in sequence to said third oligonucleotide and a second cleaved hairpin detection molecule; and

h) detecting the presence of said first and second cleaved hairpin detection molecules.

5,691,143

AMPLIFICATION AND DETECTION OF THE ALPHA ANTIGEN GENE OF MYCOBACTERIUM AVIUM COMPLEX SPECIES

Silvia A. Bustos, Catonsville; Christine A. Rostkowski; Keith C. Williams, both of Baltimore, and Leslie A. Stringfellow, Mt. Airy, all of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 15, 1996, Ser. No. 616,398

Int. Cl.⁶ C07H *21/04;* **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **25 Claims**

5. A method for amplifying a target nucleic acid of the *Mycobacterium avium* complex comprising:

a) hybridizing to the target nucleic acid

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i) a first amplification primer consisting of a target binding sequence selected from the group consisting of the target binding sequences of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5 and SEQ ID NO:6 and, optionally, a sequence required for an amplification reaction, and
ii) a second amplification primer consisting of a target binding sequence selected from the group consisting of the target binding sequences of SEQ ID NO:2, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 and SEQ ID NO:10 and, optionally the sequence required for the amplification reaction, and;

b) extending the hybridized first and second amplification primers on the target nucleic acid whereby the target nucleic acid is amplified.

5,691,144
METHODS OF DETECTING NOVEL MUTATIONS RELATING TO X-LINKED CHARCOT-MARIE-TOOTH DISEASE

Michael Alan Boss, Arlington; Uma Ananth, Shrewsbury, and Kimberley Ottaway, Belmont, all of Mass., assignors to Athena Diagnostics, Inc., Worcester, Mass.

Filed Jun. 5, 1996, Ser. No. 658,469

Int. Cl.^{6} C12Q *1/68;* **C07H** *21/04*

U.S. Cl. 435—6 **15 Claims**

1. A method of diagnosing X-linked Charcot-Marie-Tooth disease in an individual, comprising detecting a mutation in the connexin-32 gene of the individual, the mutation being in at least one codon selected from the group consisting of: 28, 44, 86, 100, 103, 124, 154, 157, 160, 161, 179, 181, 183, 187, 198, 204, 205, 219, 230 and 235, wherein the presence of the mutation in the connexin-32 gene is indicative of X-linked Charcot-Marie-Tooth disease.

5,691,145
DETECTION OF NUCLEIC ACIDS USING G-QUARTETS

J. Bruce Pitner, Durham; Glenn P. Vonk, Fuquay-Varina, and James G. Nadeau, Chapel Hill, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 27, 1996, Ser. No. 703,755

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04;21/02*

U.S. Cl. 435—6 **23 Claims**

1. An oligonucleotide which forms an intramolecular G-quartet structure, the oligonucleotide being labeled with a donor fluorophore and an acceptor, the donor fluorophore and the acceptor selected such that fluorescence of the donor fluorophore is quenched by the acceptor when the oligonucleotide forms the G-quartet structure and quenching of donor fluorophore fluorescence is reduced upon unfolding of the G-quartet structure.

5,691,146
METHODS FOR COMBINED PCR AMPLIFICATION AND HYBRIDIZATION PROBING USING DOUBLY LABELED FLUORESCENT PROBES

Paul E. Mayrand, Pacifica, Calif., assignor to The Perkin Elmer Corporation, Foster City, Calif.

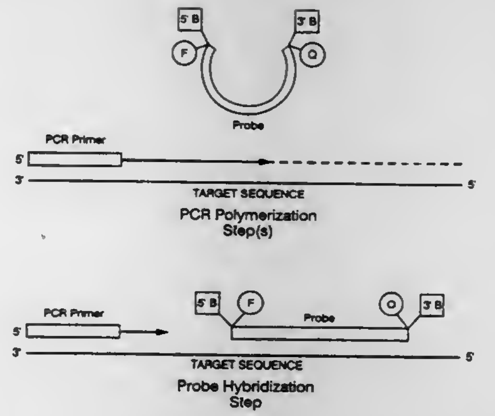
Division of Ser. No. 435,509, May 5, 1995. This application Sep. 11, 1996, Ser. No. 710,075

Int. Cl.^{6} C12Q *1/68;1/70;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **10 Claims**

1. A method for performing combined PCR amplification and hybridization probing comprising the steps of:

contacting a target nucleic acid with PCR reagents, including at least two PCR primers and a polymerase enzyme, and an oligonucleotide probe comprising:
an oligonucleotide capable of hybridizing to a target nucleic acid;
a fluorescer molecule attached to a first end of the oligonucleotide;



a quencher molecule attached to a second end of the oligonucleotide such that the quencher molecule substantially quenches the fluorescer molecule whenever the oligonucleotide probe is in a single-stranded state and such that the fluorescer is substantially unquenched whenever the oligonucleotide probe is hybridized to the target nucleic acid;
a 5' end which is rendered impervious to digestion by the 5'→3' exonuclease activity of a polymerase; and
a 3' end which is rendered impervious to the 5'→3' extension activity of the polymerase; and

subjecting the target nucleic acid, the oligonucleotide probe, and the PCR reagents to thermal cycling, including a polymerization step, the thermal cycling being sufficient to amplify the target nucleic acid specified by the PCR reagents.

5,691,147
CDK4 BINDING ASSAY

Giulio Draetta, and Jeno Gyuris, both of Winchester, Mass., assignors to Mitotix, Inc., Cambridge, Mass.

Filed Jun. 2, 1994, Ser. No. 253,155

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.1 **1 Claim**

1. An assay for screening test compounds for an inhibitor of an interaction of a cyclin dependent kinase (CDK) with a CDK4-binding protein (CDK-BP) comprising

i. combining a CDK and a CDK4-BP comprising an amino acid sequence selected from a group consisting of SEQ ID Nos. 25–48, under conditions wherein said CDK and said CDK4-BP are able to interact;
ii. contacting said combination with a test compound; and
iii. detecting the formation of a complex comprising said CDK and said CDK4-BP,

wherein a decrease in the formation of said complex in the presence of said test compound is indicative of an inhibitor of the interaction between said CDK and said CDK4-binding protein.

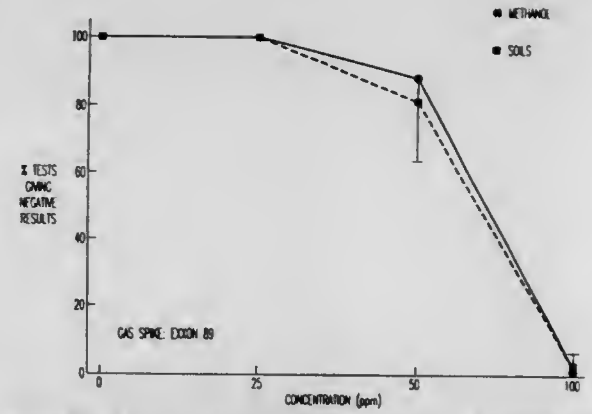
5,691,148
PETROLEUM IMMUNOASSAY METHOD, ITS COMPONENTS AND A KIT FOR USE IN PERFORMING THE SAME

Stephen B. Friedman, Chapel Hill, and Randy L. Allen, Apex, both of N.C., assignors to ENSYS, Inc., Morrisville, N.C.

Continuation of Ser. No. 984,098, Dec. 1, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,954

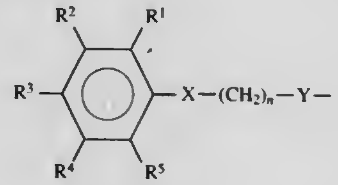
Int. Cl.^{6} G01N *33/577;* **C07K** *16/44*

U.S. Cl. 435—7.1 **16 Claims**

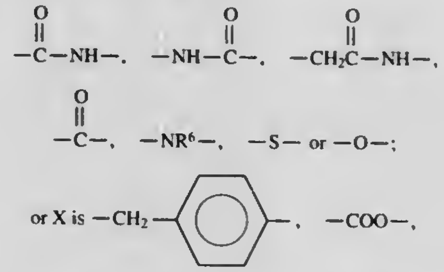


1. A monoclonal antibody useful for detecting the presence of petroleum-based fuel in a sample, which specifically binds a characteristic plurality of compounds found in petroleum-based fuel, said characteristic plurality of compounds being a C_{1-2} alkyl substituted monocyclic aromatic hydrocarbon and unsubstituted bi- and tri-cyclic aromatic hydrocarbons, wherein said monoclonal antibody has a cross reactivity with benzene of <1%, wherein said monoclonal antibody is obtained by a process comprising:

(i) producing an immune response in a vertebrate host by immunization with an immunogen comprised of a derivative moiety of the formula.



wherein
R^1 to R^5 are each independently H, CH_3 or CH_2CH_3;
X and Y are each, independently



$$-\overset{\displaystyle O}{\overset{\|}{C}}-NH-,\quad -NH-\overset{\displaystyle O}{\overset{\|}{C}}-,\quad -CH_2\overset{\displaystyle O}{\overset{\|}{C}}-NH-,$$

$$-\overset{\displaystyle O}{\overset{\|}{C}}-,\quad -NR^6-,\quad -S-\text{ or }-O-;$$

or X is $-CH_2-C_6H_4-$, $-COO-$,

or a single bond wherein R^6 is selected from the group consisting of H, C_1–C_2 alkyls, and linear, branched and cyclic C_3–C_6 alkyls; and
n is 0 or an integer from 1 to 4, linked to an immunogen carrier molecule;

(ii) preparing a hybridoma from the lymphoid cells of said host;
(iii) selecting said hybridoma to produce said monoclonal antibody; and
(iv) obtaining said monoclonal antibody.

5,691,149
NUCLEIC ACID PROBES AND METHOD FOR DETECTING *MYCOPLASMA PNEUMONIAE*

James John Hogan; Richard Dana Smith, and Sherrol Hoffa McDonough, all of San Diego, Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

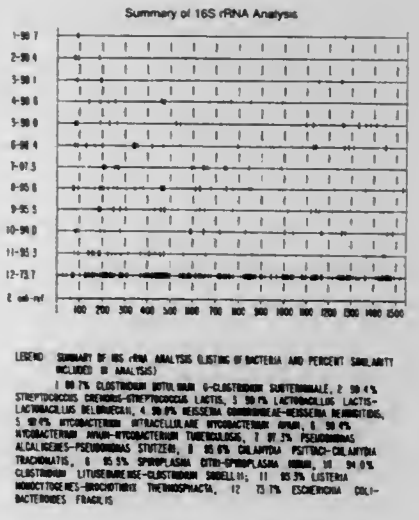
Division of Ser. No. 200,866, Feb. 22, 1994, Pat. No. 5,541,308, which is a continuation of Ser. No. 806,929, Dec. 11, 1991, abandoned, which is a continuation of Ser. No. 295,208, Dec. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 83,542, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 934,244, Nov. 24, 1986, abandoned. This application May 30, 1995, Ser. No. 454,073

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **55 Claims**

1. A probe comprising an oligonucleotide 10 to 100 nucleotides in length able to hybridize to a *Mycoplasma pneumoniae* nucleic acid target region to form a detectable target:probe duplex under high stringency hybridization conditions, said target region corresponding to, or fully complementary to and of the same length as a nucleic acid corresponding to, a region selected from the group consisting of:

bases 65–108 of *E. coli* 5S rRNA,
bases 190–230 of *E. coli* 16S rRNA,
bases 450–490 of *E. coli* 16S rRNA,
bases 820–860 of *E. coli* 16S rRNA, and
bases 1255–1290 of *E. coli* 16S rRNA; wherein said oligonucleotide comprises a segment of 10 contiguous bases which is at least 75% complementary to a target sequence of 10 contiguous nucleotides present in said target region and said oligonucleotide does not hybridize to nucleic acid from *Mycoplasma gallisepticum* to form a detectable non-target:probe duplex under said hybridization conditions.



5,691,150
IMMUNOASSAY FOR INSULIN-LIKE GROWTH FACTORS

Kazumine Mori, Chiba; Shigeto Takasu; Hiroyuki Kasahara, both of Sakura, and Shuji Horikawa, Narita, all of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

Filed Nov. 9, 1995, Ser. No. 556,397

Claims priority, application Japan, Nov. 15, 1994, 6-304234

Int. Cl.^{6} G01N *33/53;33/48*

U.S. Cl. 435—7.1 **17 Claims**

1. An immunoassay for the insulin-like growth factors, IGF-I or IGF-II, or both in a biological sample, which comprises:

(a) treating a biological sample with an acid solution to liberate IGF-I or IGF-II or both from binding proteins therefor;
(b) neutralizing the acid treated biological sample with a neutralizing buffer containing a recombination inhibitor other than IGF-I or IGF-II; and
(c) conducting an immunoassay for IGF-I or IGF-II or both;

wherein purification of the liberated IGF-I or IGF-II of both from the binding proteins therefor is not required.

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5,691,151
METHODS OF SCREENING FOR ULCERATIVE COLITIS AND CROHN'S DISEASE BY DETECTING VH3-15 AUTOANTIBODY AND PANCA

Jonathan Braun, Encino, and Stephan R. Targan, Los Angeles, both of Calif., assignors to Regents of University of California, Oakland, Calif.

Filed Oct. 7, 1994, Ser. No. 320,515
Int. Cl.⁶ G01N *33/564*

U.S. Cl. 435—7.2 **66 Claims**

1. A method of screening a patient for Crohn's disease ("CD") and ulcerative colitis ("UC"), comprising:

(a) determining the amount of VH3-15 autoantibody in a sample from the patient,

(b) detecting the presence or absence of pANCA in a sample from the same patient,

wherein an amount of VH3-15 autoantibody in the sample which exceeds the amount of VH3-15 autoantibody in a VH3-15 assay control and the absence of pANCA indicates CD, and

wherein an amount of VH3-15 autoantibody in the sample that does not exceed the amount of VH3-15 autoantibody in a VH3-15 assay control and the presence of pANCA indicates UC.

5,691,152
STABLE AVIDIN COMPOSITION

Steven James Burton, Peterborough; James C. Pearson, Cambridge, and Peter A. D. Edwardson, Chester, all of United Kingdom, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 9, 1995, Ser. No. 556,244
Int. Cl.⁶ G01N *33/53;* C12P *21/06;* C12N *11/02*

U.S. Cl. 435—7.5 **3 Claims**

1. A solid or powder composition comprising:

an inert support material; and,

avidin immobilized on said inert support material wherein said composition has at least 1000 biotin binding units of activity per gram of the composition.

5,691,153
GENETIC MARKERS TO DETECT HIGH BONE MASS

Robert R. Recker; Mark L. Johnson; Donald B. Kimmel; Guodong Gong, and Susan M. Recker, all of Omaha, Nebr., assignors to Creighton University, Omaha, Nebr.

Filed Sep. 6, 1996, Ser. No. 708,175
Int. Cl.⁶ C12Q *1/68*

U.S. Cl. 435—6 **10 Claims**

1. A method for detecting the presence in a subject of a polymorphism linked to an autosomal dominant gene associated with high bone mass which comprises:

analyzing human chromosome 11 of the subject and detecting the presence of a polymorphism located about 30 cM around D11S987 and linked to the autosomal dominant gene associated with high bone mass, wherein the presence of the polymorphism is indicative of a subject having high bone mass.

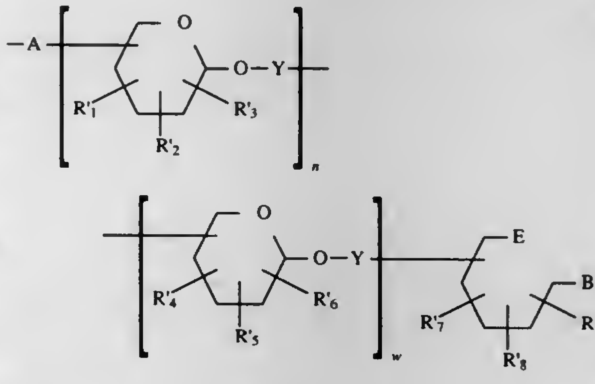
5,691,154
ENZYME LINKED IMMUNOASSAY WITH STABILIZED POLYMER SACCHARIDE ENZYME CONJUGATES

Matthew R. Callstrom, Columbus, Ohio; Mark D. Bednarski, Berkeley, Calif., and Patrick R. Gruber, St. Paul, Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

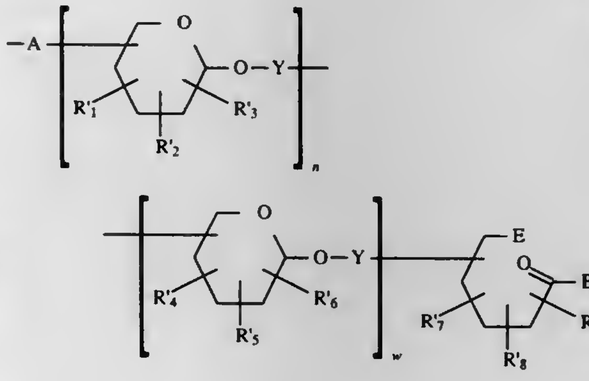
Division of Ser. No. 791,915, Nov. 13, 1991, Pat. No. 5,492,821, which is a continuation-in-part of Ser. No. 613,224, Nov. 14, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 469,662
Int. Cl.⁶ G01N *33/53;* C12N *11/06;11/08;9/96;9/00*

U.S. Cl. 435—7.6 **16 Claims**

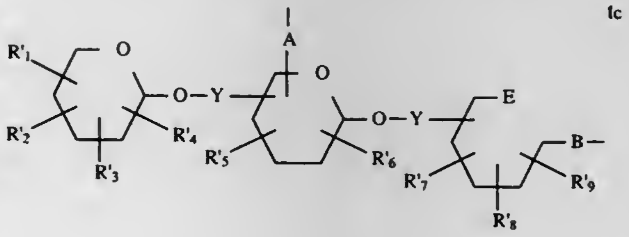
1. In an immunoassay method of detection wherein the immunoassay method comprises contacting an antibody polymer conjugate with an antigen so as to bind the antigen, and measuring the amount of antigen bound to the antibody polymer conjugate, the improvement wherein the antibody polymer conjugate comprises antibody covalently bonded to a polymer by linker groups, wherein the polymer is selected from the group consisting of a polyvinyl polymer, a polyester polymer, a polyamide polymer and mixtures thereof, the polymer having a main chain molecular weight of at least 5,000, and wherein three or more linker groups covalently bond both the antibody and polymer and said linker groups have at least three hydroxyl groups and not more than 60 carbon atoms, each of said linker groups being selected from the group consisting of



Ia



Ib



Ic

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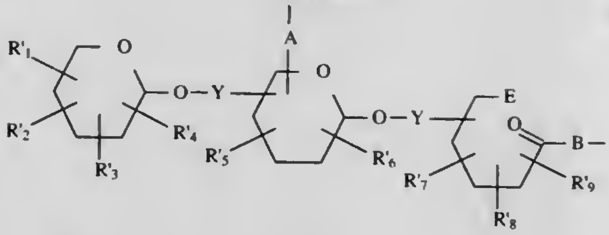

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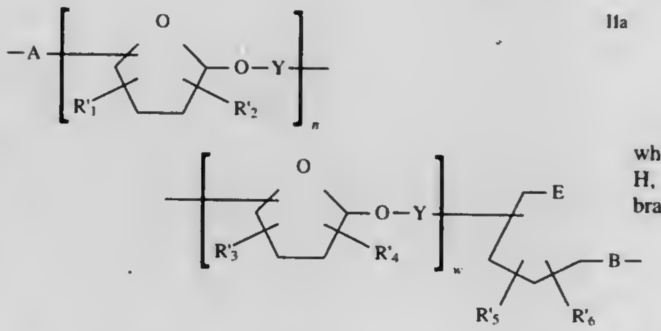
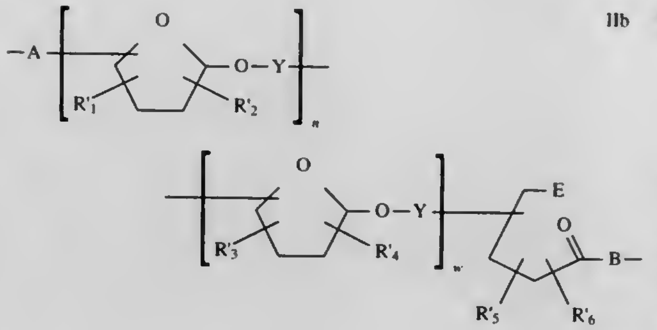
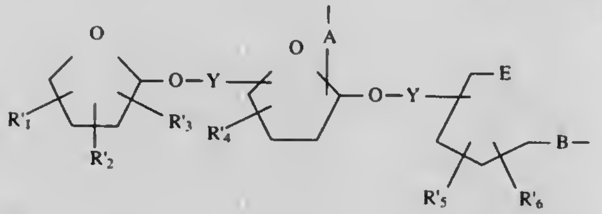


IIa

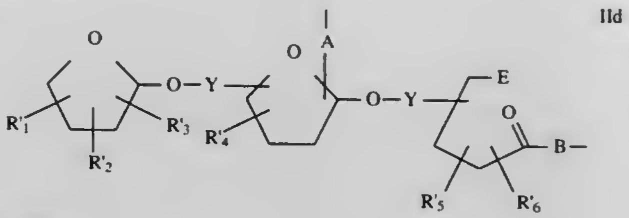


IIb



IIc

and



IId

wherein

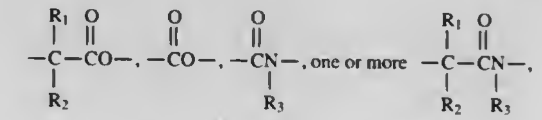
E=—OH or —SH;

n=0 or 1;

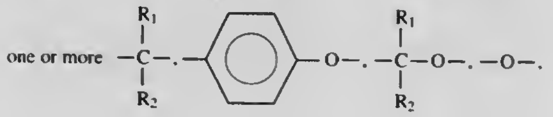
W=0 or 1; and

Y=bond or —CH_2;

wherein A is bonded to the polymer and is selected from the group consisting of



$$-\underset{\displaystyle R_2}{\overset{\displaystyle R_1}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}O-,\ -\overset{\displaystyle O}{\overset{\|}{C}}O-,\ -\overset{\displaystyle O}{\overset{\|}{C}}\underset{\displaystyle R_3}{N}-,\ \text{one or more}\ -\underset{\displaystyle R_2}{\overset{\displaystyle R_1}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}\underset{\displaystyle R_3}{N}-,$$



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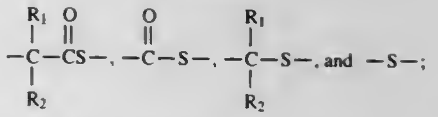
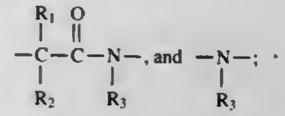


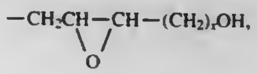
$$-\underset{\displaystyle R_2}{\overset{\displaystyle R_1}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}S-,\ -\overset{\displaystyle O}{\overset{\|}{C}}-S-,\ -\underset{\displaystyle R_2}{\overset{\displaystyle R_1}{C}}-S-,\ \text{and}\ -S-;$$

B is bonded to the antibody and is selected from the group consisting of

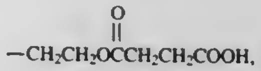


$$-\underset{\displaystyle R_2}{\overset{\displaystyle R_1}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-\underset{\displaystyle R_3}{N}-,\ \text{and}\ -\underset{\displaystyle R_3}{N}-;$$

wherein R_1 and R_2 are each selected from the group consisting of H, OH, acetoxy, alkoxy, phenylene, straight chain alkyl or branched chain alkyl having 1 to 12 carbons,



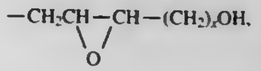
wherein x=2 to 7,



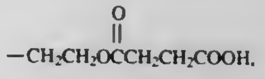
$$-CH_2CH_2O\overset{\displaystyle O}{\overset{\|}{C}}CH_2CH_2COOH,$$

2-hydroxy ethyl, 3-chloro-2-hydroxypropyl, 2-hydroxy-1-methylethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2,3-dihydroxypropyl, 2 hydroxybutyl, 4 -hydroxybutyl, diethylene-glycol, 5-hydroxypentryl, 6-hydroxyhexyl, triethyleneglycol, 7-hydroxyheptyl, 3,4-dihydroxybutyl, 5-hydroxypentyl, 6-hydroxyhexyl, 2,3-dimethyl-3-hydroxybutyl, 5,6-dihydroxyhexyl, 7-hydroxyheptyl, a residue of a mono-, di-, and trisaccharide;

wherein R_3 selected from the group consisting of H, straight chain alkyl or branched chain alkyl having 1 to 12 carbons,



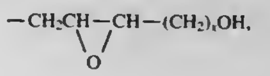
wherein x=2 to 7,



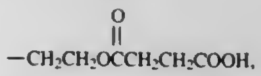
$$-CH_2CH_2O\overset{\displaystyle O}{\overset{\|}{C}}CH_2CH_2COOH,$$

2-hydroxy ethyl, 3-chloro-2-hydroxypropyl, 2-hydroxy-1-methylethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2,3-dihydroxypropyl, 2 hydroxybutyl, 4-hydroxybutyl, diethylene-glycol, 5-hydroxypentryl, 6-hydroxyhexyl, triethyleneglycol, 7-hydroxyheptyl, 3,4-dihydroxybutyl, 5-hydroxypentyl, 6-hydroxyhexyl, 2,3-dimethyl-3-hydroxybutyl, 5,6-dihydroxyhexyl, 7-hydroxyheptyl, a residue of a mono-, di-, and trisaccharide; and

R'_1, R'_2, R'_3, R'_4, R'_5, R'_6, R'_7, R'_8, and R'_9 each selected from the group consisting of H, OH, acetoxy, alkoxy, halogen and phosphate, straight chain alkyl or branched chain alkyl having 1 to 12 carbons,



wherein x=2 to 7,



$$-CH_2CH_2O\overset{\displaystyle O}{\overset{\|}{C}}CH_2CH_2COOH,$$

2-hydroxy ethyl, 3-chloro-2-hydroxypropyl, 2-hydroxy-1-methylethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2,3-

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dihydroxypropyl, 2 hydroxybutyl, 4-hydroxybutyl, diethylene-glycol, 5-hydroxypentryl, 6-hydroxyhexyl, triethyleneglycol, 7-hydroxyheptyl, 3,4-dihydroxybutyl, 5-hydroxypentyl, 6-hydroxyhexyl, 2,3-dimethyl-3-hydroxybutyl, 5,6-dihydroxyhexyl, 7-hydroxyheptyl, a residue of a mono-, di-, and trisaccharide.

5,691,155

NUCLEOTIDE SEQUENCES ENCODING THE MURINE β3-ADRENERGIC RECEPTOR AND THEIR APPLICATIONS

Clara Nahmias; Laurent Jean Emorine, and Arthur Donny Strosberg, all of Paris, France, assignors to Centre National De La Recherche Scientifigue, Paris, France

PCT No. PCT/FR92/00023, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO92/12246, PCT Pub. Date Jul. 23, 1992

PCT Filed Jan. 14, 1992, Ser. No. 87,772

Claims priority, application France, Jan. 14, 1991, 91 00320

Int. Cl.^{6} C12N *15/12;* **C07K** *14/435;* **C12Q** *1/00*

U.S. Cl. 435—7.21 **22 Claims**

1. An isolated DNA molecule consisting of the nucleotide sequence of SEQ ID NO:1 and encoding the murine β3-adrenergic receptor protein.

18. A process for studying the binding affinity of a compound for a polypeptide having a β3-adrenergic receptor activity, which process comprises:

transforming a host cell by an expression vector comprising a nucleotide sequence of SEQ ID NO:1;

culturing said transformed host cell under conditions which permit the expression of the β3-adrenergic receptor protein encoded by said nucleotide sequence, and the transfer of the expressed β3-adrenergic receptor protein to the membrane of the said transformed host cell so that transmembrane sequences of the β3 receptor-adrenergic protein are embedded in the cell membranes of the transformed host cell;

placing said transformed host cell in contact with said compound; and

measuring the quantity of said compound bound to said β3-adrenergic receptor protein.

5,691,156

METHOD OF INHIBITING CELL GROWTH WITH THE P_{2U} RECEPTOR

Richard C. Boucher, Chapel Hill, N.C.; Gary A. Weisman, Columbia; John T. Turner, Ashland, both of Mo.; Thomas K. Harden; Claude E. Parr, both of Chapel Hill, N.C.; Daniel M. Sullivan; Laura J. Erb, both of Columbia, Mo., and Kevin D. Lustig, Cambridge, Mass., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C., and The Curators of the University of Missouri, Columbia, Mo.

Division of Ser. No. 138,137, Oct. 15, 1993, abandoned. This application May 19, 1995, Ser. No. 446,088

Int. Cl.^{6} C12Q *1/00;* **C12N** *15/12*

U.S. Cl. 435—7.21 **1 Claim**

1. A method of inhibiting the growth, of a cell in culture comprising:

transforming a mammalian cell in culture with a vector that expresses a P_{2U} receptor in said cell in an amount sufficient to inhibit cell growth by autostimulation of said P_{2U} receptor,

wherein said vector contains and expresses DNA encoding a human P_{2U} receptor selected from the group consisting of;

(a) isolated DNA having SEQ ID NO:1; and

(b) isolated DNA differing from the isolated DNA of (a) above in nucleotide sequence due to the degeneracy of the genetic code;

wherein said cell secretes ATP or UTP, and wherein cell growth is inhibited by stimulation of said P_{2U} receptor with ATP or UTP.

5,691,157

METHOD FOR DETECTING A MAMMAL'S PRIOR EXPOSURE TO RADIATION OR RADIOMIMETIC CHEMICALS

Joseph K. Gong, Williamsville, and Chester A. Glomski, Buffalo, both of N.Y., assignors to The Research Foundation of State University of New York, Amherst, N.Y.

Filed Oct. 24, 1995, Ser. No. 547,197

Int. Cl.^{6} C01N *33/532*

U.S. Cl. 435—7.25 **21 Claims**

1. A method for detecting a mammal's prior exposure to radiation or radiomimetic agents comprising:

providing a sample of red blood cells from a mammal, wherein the red blood cells comprise a transferrin receptor on the surface thereof whose quantity increases with increasing exposure of the mammal to radiation or radiomimetic agents beyond a baseline quantity of transferrin receptor on the surface of red blood cells that have not been exposed to radiation or radiomimetic agents;

detecting the quantity of the transferrin receptor on the red blood cells; and

correlating the quantity of the transferrin receptor on the red blood cells to the mammal's prior exposure to radiation or radiomimetic agents.

5,691,158

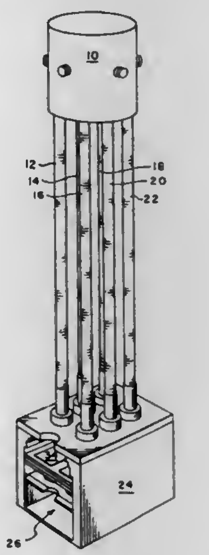
SYSTEM AND METHOD FOR DETERMINING EFFICACY OF SUNSCREEN FORMULATIONS

Barry T. Reece, London, England; Michael G. Rozen, Irving, Tex.; David A. Deeds, Dallas, Tex., and Dale K. Roberts, Sanger, Tex., assignors to Mary Kay Cosmetics, Inc., Dallas, Tex.

Filed Oct. 15, 1993, Ser. No. 137,822

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.92 **33 Claims**



1. A system for testing efficacy of a sunscreen formulation comprising:

(a) means for generating ultraviolet radiation;

(b) means, coupled to the means for generating ultraviolet radiation, for containing at least one artificial skin culture;

(c) means, interposed between the means for generating ultraviolet radiation and the means for containing the at least one artificial skin culture, for holding a sunscreen formulation under test;

(d) means for incubating the at least one artificial skin culture after exposure to the means for generating ultraviolet radiation; and

(e) means for assaying the at least one artificial skin culture for an inflammatory mediator.

5,691,159

METHOD OF DETERMINING THE AMOUNT OF CHOLESTEROL IN A HIGH-DENSITY LIPOPROTEIN

Kazuhito Miyauchi; Akira Miike, both of Shizuoka; Eiko Shutoh, Ohita; Hiroyuki Sugiuchi, Kumamoto; Tetsumi Irie, Kumamoto; Kaneto Uekama, Kumamoto, and Susumu Ohsawa, Yotsukaido, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/00378, § 371 Date Nov. 2, 1995, § 102(e) Date Nov. 2, 1995, PCT Pub. No. WO95/24502, PCT Pub. Date Sep. 14, 1995

PCT Filed Mar. 8, 1995, Ser. No. 545,722

Claims priority, application Japan, Mar. 8, 1994, 6-037328; Sep. 12, 1994, 6-217224; Nov. 30, 1994, 6-296137

Int. Cl.^{6} C12Q *1/60;1/44;1/26;1/00*

U.S. Cl. 435—11 **3 Claims**

1. A method of determining the amount of cholesterol in high-density lipoprotein (HDL), which comprises reacting an HDL-containing sample with cholesterol esterase and cholesterol oxidase or cholesterol dehydrogenase in the presence of a reagent for aggregating lipoproteins except HDL, and determining the amount of hydrogen peroxide or reductive co-enzyme formed therein without separating aggregated lipoproteins from the HDL-containing sample.

5,691,160

EFFECTS OF ACTIN FILAMENTS OF FIBRIN CLOT STRUCTURE AND LYSIS

Paul A. Janmey, Arlington, Mass.; Jennifer A. Lamb, Chicago, Ill.; Stuart E. Lind, and Thomas P. Stossel, both of Belmont, Mass., assignors to Biogen, Inc., Cambridge, Mass.

Filed Aug. 14, 1992, Ser. No. 929,203

Int. Cl.^{6} C12Q *1/56;1/06;* **G01N** *33/86*

U.S. Cl. 435—13 **16 Claims**

1. A method for eluting and quantitating the actin in an actin-containing clot, comprising the steps of (1) removing plasma from a subject with tissue injury, (2) allowing said plasma to form a clot in vitro, (3) isolating said clot formed in step (2), (4) incubating said clot in liquid medium with at least one actin-binding protein, and (5) quantitating the amount of actin in said medium.

5,691,161

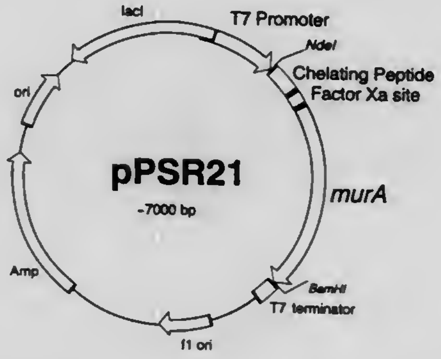
PEPTIDOGLYCAN BIOSYNTHETIC MURA PROTEIN FROM *STREPTOCOCCUS PNEUMONIAE*

Paul L. Skatrud, Indianapolis, and Robert B. Peery, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 1, 1996, Ser. No. 691,129

Int. Cl.^{6} C12N *9/10*

U.S. Cl. 435—15 **5 Claims**



1. A substantially pure MurA protein from *Streptococcus pneumoniae* having the amino acid sequence which is SEQ ID NO: 2.

5,691,162

METALLOPROTEASE HAVING INCREASED ACTIVITY

Jeffrey R. Shuster, Davis; Mark Madden, Pleasant Hill; Donna L. Moyer, Davis, all of Calif.; Claus Fuglsang, Copenhagen, and Sven Branner, Lyngby, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark, and Novo Nordisk Biotech, Inc., Davis, Calif.

Division of Ser. No. 398,489, Mar. 3, 1995, which is a continuation-in-part of Ser. No. 238,108, May 4, 1994, abandoned. This application May 17, 1995, Ser. No. 443,104

Int. Cl.^{6} C12Q *1/37*

U.S. Cl. 435—23 **9 Claims**

1. A method for determining the amount of activatable proenzyme in a sample comprising

(a) incubating said sample for about 30 minutes to 1 hour at room temperature with a substantially pure metalloprotease obtained from Fusarium having the following characteristics: (i) a molecular weight from about 45,000 daltons to about 50,000 daltons as determined by SDS polyacrylamide gel electrophoresis; (ii) functions optimally at a pH between about 8.0 and 11.0; (iii) is at least about 10 times more effective than a metalloprotease obtained from *Bacillus stearothermophilus* in converting a proenzyme to an active trypsin-like protease obtained from a strain of *F. oxysporum* deposited at the Deutsche Sammlung von Mikroorganismen, Gottingen, Germany under the number DSM 2672 at a pH between about 6.0 and 7.5 at about 25°–30° C. for about 30–60 minutes; and (iv) is less effective than a metalloprotease obtained from *Bacillus stearothermophilus* in cleaving the primary amino groups from casein;

(b) adding a substrate for activated proenzyme to mixture (a); and

(c) determining the amount of substrate added in (b) cleaved.

5,691,163

CELLS WITH ALTERED BETAINE CATABOLISM AND THEIR USE IN PRODUCING METABOLITES OR ENZYMES

Béatrice Cameron, and Joël Crouzet, both of Paris, France, assignors to Rhone-Poulenc Rorer SA, Antony, France

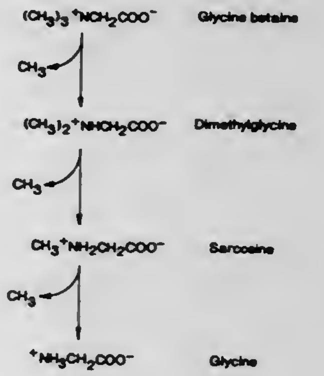
PCT No. PCT/FR93/01202, § 371 Date May 18, 1995, § 102(e) Date May 18, 1995, PCT Pub. No. WO94/13813, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 7, 1993, Ser. No. 436,393

Claims priority, application France, Dec. 9, 1992, 92 14814

Int. Cl.^{6} C12P *1/04;19/42;* **C12N** *9/00;1/21*

U.S. Cl. 435—41 **20 Claims**



1. A process for the production of metabolites or enzymes or both comprising

a) genetically modifying a cell by gene disruption, wherein said disruption causes at least one stable or nonreversible modification in a gene encoding a protein involved in the catabolism of glycine-betaine; and

b) culturing said cell under production conditions.

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5,691,164

TISSUE FIXATIVE COMPRISING AN AQUEOUS SOLUTION OF ETHANOL, ETHANDIOL, METHANAL, NACL AND ZNCL$_2$

Eric N. Speiser, St. Petersburg, Fla., assignor to Aaron Medical Industries, Inc., St. Petersburg, Fla.

Filed Nov. 27, 1995, Ser. No. 563,192

Int. Cl.^{6} C12Q *1/08;* **A01N** *1/00;3/00*

U.S. Cl. 435—40.52 **1 Claim**

1. A tissue fixative comprising about 14 ml ethanol, about 14 ml ethandiol, about 2.43 ml of a 37% solution of methanal, about 0.375 g NaCl, about 0.0375 g ZnCl$_2$ and about 69.57 mls water and proportional relationships thereof.

5,691,165

METHOD FOR PRODUCTION OF A WHEY PROTEIN HYDROLYZATE

Per Munk Nielsen, Hillerød; Svend Eriksen, Allerød, and Ole Regnar Hansen, Herlev, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK92/00170, § 371 Date Nov. 30, 1993, § 102(e) Date Nov. 30, 1993, PCT Pub. No. WO92/21248, PCT Pub. Date Dec. 10, 1992

PCT Filed May 27, 1992, Ser. No. 157,074

Claims priority, application European Pat. Off., May 31, 1991, 91610049

Int. Cl.^{6} C12P *21/06;21/04;* **C12N** *9/56;* **A23C** *21/02*

U.S. Cl. 435—68.1 **13 Claims**

1. A method for production of a whey protein hydrolyzate, comprising

(a) mixing a material containing at least 65% whey protein calculated as dry matter and water to form a slurry containing a whey protein content of about 7–20%;

(b) heating the slurry to a temperature above 60° C.;

(c) adjusting the pH of the slurry to about 8;

(d) hydrolyzing the slurry by means of at least two different proteases, to a degree of hydrolysis of between 15 and 35% wherein the pH is not adjusted during the hydrolysis;

(e) inactivating said proteases; and

(f) separating the hydrolyzed slurry on an ultrafiltration unit with a cut-off value above 10,000, to form a permeate comprising the whey protein hydrolyzate.

5,691,166

GENES WHICH INFLUENCE PICHIA PROTEOLYTIC ACTIVITY, AND USES THEREFOR

Martin A. Gleeson, and Bradley D. Howard, both of San Diego, Calif., assignors to Sibia Neurosciences, Inc., La Jolla, Calif.

Continuation of Ser. No. 245,756, May 16, 1994, Pat. No. 5,541,112, which is a division of Ser. No. 88,633, Jul. 6, 1993, Pat. No. 5,324,660, which is a continuation of Ser. No. 678,916, Apr. 1, 1991, abandoned. This application May 16, 1995, Ser. No. 441,750

Int. Cl.^{6} C12P *21/06;* **C12N** *9/88;1/19*

U.S. Cl. 435—69.1 **8 Claims**

1. A method for expression of proteolytically sensitive recombinant product(s), comprising recombinantly producing the proteolytically sensitive product(s) in a Pichia host, wherein the host is a strain of Pichia that is deficient in proteolytic activity that has a modified form of a gene selected from the group consisting of the Pichia PEP4 gene and the Pichia PRB-1 gene.

5,691,167

DNA ENCODING ALLERGENIC PROTEINS AND PEPTIDES FROM JOHNSON GRASS POLLEN

Asil Avjioglu, Towson, Md.; Mohan Bir Singh, and Robert Bruce Knox, both of Victoria, Australia, assignors to The University of Melbourne, Parkville, Australia, and ImmuLogic Pharmaceutical Corporation, Waltham, Mass.

Division of Ser. No. 971,096, Oct. 30, 1992, Pat. No. 5,480,972. This application Dec. 29, 1993, Ser. No. 175,096

Int. Cl.^{6} C12P *21/02;* **C12N** *1/21;15/63;* **C07H** *21/04*

U.S. Cl. 435—69.3 **13 Claims**

1. An isolated nucleic acid comprising a nucleotide sequence coding for a Johnson grass pollen allergen Sor h I, wherein said nucleotide sequence is selected from the group consisting of the nucleotide sequence shown in FIG. 5 (SEQ ID NO: 1) and the coding region of the nucleotide sequence shown in FIG. 5 (SEQ ID NO: 1).

5,691,168

DNA SEQUENCES ENCODING ALAGLU-IGF-1 AND VECTORS AND MICROORGANISMS COMPRISING SAID SEQUENCES

Lars Skriver, Vedbæk; Kim Ry Hejnæs, Lyngby, and Henrik Dalbøge, Virum, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Division of Ser. No. 87,477, Jul. 2, 1993, Pat. No. 5,459,052, which is a continuation of Ser. No. 746,827, Aug. 19, 1991, abandoned. This application May 18, 1995, Ser. No. 444,142

Claims priority, application Denmark, Aug. 20, 1990, 1989/90; Oct. 16, 1990, 2497/90

Int. Cl.^{6} C12N *15/18;15/63;5/10;1/21*

U.S. Cl. 435—69.4 **6 Claims**

1. An isolated DNA sequence coding for IGF-1 having the amino terminal extension AlaGlu.

5,691,169

PROCESS FOR PREPARING A DESIRED PROTEIN

Henrik Dalbøge, Virum; John Pedersen, Kokkedal; Thorkild Christensen, Allerød; Jørli Winnie Ringsted, Brøndby, and Torben Ehlern Jessen, Holbaek, all of Denmark, assignors to Novo Nordisk A/S, Denmark

Continuation of Ser. No. 372,692, Jan. 13, 1995, Pat. No. 5,618,597, which is a continuation of Ser. No. 959,856, Nov. 12, 1992, abandoned, which is a continuation of Ser. No. 759,106, Sep. 6, 1991, abandoned, which is a continuation of Ser. No. 215,602, Jul. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 910,230, Oct. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 640,081, Aug. 8, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 402,455

Claims priority, application Denmark, Dec. 10, 1982, 5493/82; Feb. 7, 1985, 556/85

Int. Cl.^{6} C12P *21/06;19/56;* **C12N** *1/20;* **C07K** *14/61*

U.S. Cl. 435—69.7 **44 Claims**

44. A process for producing ripe human growth hormone comprising

(a) introducing into bacteria a recombinant DNA vector comprising a DNA sequence encoding an amino-terminal extended human growth hormone having the formula

X-human growth hormone

in which X is an amino acid sequence in which the N-terminal amino acid of X is different from Lys and Arg, all other uneven amino acids are different from Pro, Lys and Arg, and all even amino acids are different from Pro and in which at least one amino acid in the amino acid sequence X is a charged amino acid;

(b) growing the bacteria such that the amino-terminal extended human growth hormone is expressed;

(c) separating the amino-terminal extended human growth hormone in step (b) from contaminants;

(d) cleaving the amino-terminal extension of the amino-terminal extended human growth hormone of step (c) with dipeptidyl aminopeptidase I to obtain ripe human growth hormone; and

(e) isolating ripe human growth hormone from step (d).

5,691,170

GENERATION OF HYBRID GENES AND PROTEINS BY VIRUS-MEDIATED RECOMBINATION

Linda R. Gritz, Somerville, and Dennis L. Panicali, Acton, both of Mass., assignors to Therion Biologics, Cambridge, Mass.

Continuation of Ser. No. 929,698, Aug. 12, 1992, abandoned, which is a continuation of Ser. No. 526,248, May 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 510,125, Apr. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 340,052, Apr. 18, 1989, abandoned. This application Mar. 29, 1995, Ser. No. 412,609

Int. Cl.^{6} C12N *15/62*

U.S. Cl. 435—69.7 **9 Claims**

1. A method of generating a family of hybrid genes, comprising the steps of:

(a) introducing a virus into a eukaryotic host cell, wherein the virus comprises at least two tandemly arranged DNA sequences, wherein at least one of the tandemly arranged DNA sequences is not in its native position with respect to the other sequence, wherein the tandemly arranged DNA sequences contain encoding regions and wherein the sequences are non-identical but share a region of sequence identity in an encoding region of the sequence of at least 10 nucleotides, and wherein a gene encoding a selectable marker is interposed between the tandemly arranged sequences; and

(b) allowing the virus to replicate in the eukaryotic host cell under conditions which permit intramolecular recombination between the regions of sequence identity in the two tandemly arranged DNA sequences to produce the family of hybrid genes.

5,691,171

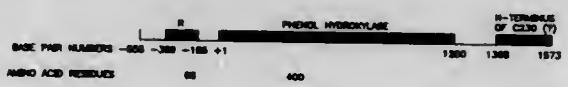
METHOD FOR PRODUCTION OF INDIGO AND INDIRUBIN DYES

Patrick J. Oriel, Midland, Mich., and In Cheol Kim, Taejeon, Rep. of Korea, assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Oct. 23, 1995, Ser. No. 546,829

Int. Cl.^{6} C09B *7/08;* **C12N** *15/31;15/52*

U.S. Cl. 435—118 **9 Claims**



1. A process for preparation of indigo and indirubin dyes which comprises:

growing a recombinant *Escherichia coli* containing a gene from *Bacillus stearothermophilus* encoding phenol hydroxylase in an aqueous growth medium so that indigo and indirubin are produced.

5,691,172

COSMETIC COMPOSITION CONTAINING AS COLORANT AT LEAST ONE 5-METHOXY-8-METHYL-2-PHENYL-7H-1-BENZOPYRAN-7-ONE DERIVATIVE

Béatrice Belcour, Tours; Richard Martin, Vouvray, and Georges Hussler, Aulnay-Sous-Bois, all of France, assignors to L'Oreal, Paris, France

PCT No. PCT/FR94/00695, § 371 Date Aug. 31, 1995, § 102(e) Date Aug. 31, 1995, PCT Pub. No. WO94/29388, PCT Pub. Date Dec. 22, 1994

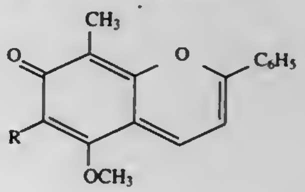
PCT Filed Jun. 10, 1994, Ser. No. 379,654

Claims priority, application France, Jun. 10, 1993, 93 07002

Int. Cl.^{6} A61K *7/00;* **C09B** *61/00;* **C12P** *17/06;* **C07D** *311/60*

U.S. Cl. 435—125 **21 Claims**

1. A cosmetic composition, comprising a colorant, in a suitable cosmetic excipient, said colorant being at least one compound corresponding to the following formula:



(I)

in which:

R represents a methyl, hydroxymethyl or methoxymethyl radical.

5,691,173

FERMENTATION PROCESS FOR PREPARATION OF COMPACTIN

Scott Primrose; David King; Ed Yaworski; Jayaramaiyer Radhakrishnan; David He, and Xinfa Xiao, all of Winnipeg, Canada, assignors to Apotex, Inc., Ontario, Canada

Filed Sep. 19, 1996, Ser. No. 715,771

Claims priority, application New Zealand, Sep. 21, 1995, 280074

Int. Cl.^{6} C12P *17/06*

U.S. Cl. 435—125 **5 Claims**

1. A process for the production of compactin having the structure (I) which comprises cultivating compactin-producing microorganism *penicillium adametzioides* G. Smith, in a nutrient medium and recovering compactin from the cultured broth.

5,691,174

PRODUCTION OF PLASTICS MATERIALS FROM MICROORGANISMS

John Macdonald Liddell, Stockton on Tees, and Timothy John Locke, Middlesbrough, both of United Kingdom, assignors to Zeneca Limited, London, England

PCT No. PCT/GB94/00741, § 371 Date Oct. 10, 1995, § 102(e) Date Oct. 10, 1995, PCT Pub. No. WO94/24302, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 7, 1994, Ser. No. 530,332

Claims priority, application United Kingdom, Apr. 14, 1993, 9307674

Int. Cl.^{6} C12P *7/62;7/48;* **C12N** *1/08*

U.S. Cl. 435—135 **12 Claims**

1. A process of recovering a plastic from a plastic producing microorganism in which non plastic material is removed from the plastic by a process which comprises a stage of chemically reacting non plastic material of the microorganisms with an oxidising agent in the presence of a chelating agent.

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5,691,175

IMMORTALIZED HUMAN FETAL OSTEOBLASTIC CELLS

Steven A. Harris, and Thomas C. Speisberg, both of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Filed Jul. 12, 1993, Ser. No. 89,848

Int. Cl.^{6} C12N *15/64;5/10*

U.S. Cl. 435—172.3 **15 Claims**

1. An immortalized normal human fetal osteoblastic cell which expresses a temperature sensitive mutant of simian virus 40 large T protein antigen.

5,691,176

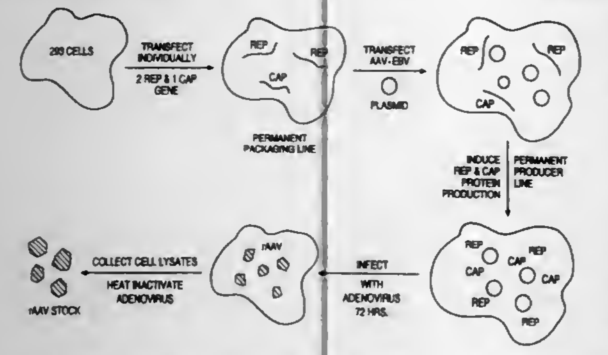
RECOMBINANT ADENO-ASSOCIATED VIRUS VECTOR PACKAGING CELLS AND METHODS FOR USE

Jane S. Lebkowski, Portola Valley; Maureen A. McNally, and Thomas B. Okarma, both of Palo Alto, all of Calif., assignors to Applied Immune Sciences, Inc., Menlo Park, Calif.

Division of Ser. No. 236,642, May 2, 1994, abandoned, which is a division of Ser. No. 993,776, Dec. 21, 1992, Pat. No. 5,354,678, which is a continuation-in-part of Ser. No. 605,775, Oct. 30, 1990, Pat. No. 5,173,414. This application Jun. 2, 1995, Ser. No. 459,091

Int. Cl.^{6} C12N *15/00;7/01;15/35;5/06*

U.S. Cl. 435—172.3 **14 Claims**



1. A cell line having incorporated in its genome one or more DNA sequences, said sequences comprising:

an adeno-associated virus rep gene and

an adeno-associated virus cap gene;

wherein said cell line further comprises an AAV/EBV vector, said vector comprising: an Epstein Barr nuclear antigen gene; an Epstein Barr virus latent origin of replication; and an adeno-associated virus transducing vector comprising exogenous genetic material.

5,691,177

RECOMBINANT RETROVIRUSES EXPRESSING A PROTEIN THAT CONVERTS A PRO-DRUG INTO A CYTOTOXIC AGENT

Harry E. Guber, 13083 Maritime Pl., San Diego, Calif. 92130; Douglas J. Jolly, 3050 Via Alicante Dr., La Jolla, Calif. 92037; James G. Respess, 4966 Lamont St., San Diego, Calif. 92109, and Paul K. Laikind, 12433 Caminito Mira Del Mar, San Diego, Calif. 92130

Division of Ser. No. 136,739, Oct. 12, 1993, which is a continuation of Ser. No. 395,932, Aug. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 170,515, Mar. 21, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 460,996

Int. Cl.^{6} C12N *5/08;5/10*

U.S. Cl. 435—172.3 **24 Claims**

1. A method for treating human lymphocytes ex vivo to render said lymphocytes susceptible to being diminished or eliminated, comprising:

a) removing human lymphocytes from the peripheral blood of a human; and

b) infecting the lymphocytes ex vivo with a replication defective recombinant retrovirus to produce infected lymphocytes, said recombinant retrovirus comprising a recombinant gene operably linked to a promoter for expression in said lymphocytes, said gene encoding a protein which is not normally expressed in said lymphocytes and which converts a prodrug into a cytotoxic agent, whereby when said infected lymphocytes are exposed to said prodrug, said protein expressed therein converts said prodrug to a cytotoxic agent, killing said lymphocytes.

5,691,178

FUNGAL CELLULASE COMPOSITION CONTAINING ALKALINE CMC-ENDOGLUCANASE AND ESSENTIALLY NO CELLOBIOHYDROLASE

Martin Schülein, Copenhagen, and Kirsten Bøegh Levring, Lyngby, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 295,364, Aug. 24, 1994, abandoned, which is a continuation of Ser. No. 409,498, Sep. 13, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 487,917

Claims priority, application WIPO, Mar. 22, 1988, PCT/DK89/00069; Denmark, Mar. 24, 1988, 1634/88; Mar. 24, 1988, 1635/88

Int. Cl.^{6} C12N *9/42;* **C11D** *7/42*

U.S. Cl. 435—209 **19 Claims**

1. A cellulase preparation which comprises a substantially homogeneous endoglucanase component having

(a) a pH optimum of about 7.5–10.0;

(b) a carboxymethyl cellulose (CMC) endoase activity of at least about 10 CMC-endoase units per mg of total protein;

(c) a cellulose affinity viscosity unit (CAVU) activity of at least about 50% at a pH of 9.0; and

(d) essentially no cellobiohydrolase activity;

wherein the cellulase preparation is endogenous to a strain of Humicola, Myceliophthora, or Fusarium and wherein the endoglucanase component is present in an mount of at least about 50% by weight of the total cellulase content of the cellulase preparation.

5,691,179

CELL DEATH REGULATORS

Stanley J. Korsmeyer, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Filed Aug. 26, 1993, Ser. No. 112,208

Int. Cl.^{6} C12N *15/12;15/63;5/10;1/00*

U.S. Cl. 435—240.1 **20 Claims**

1. A DNA isolate comprising a DNA sequence encoding Bax and free of homologous chromosomal DNA.

5,691,180

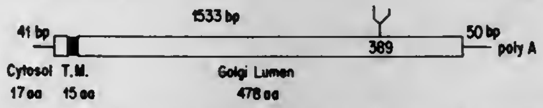
DNA SEQUENCE ENCODING N-ACETYL-GALACTOSAMINE-TRANSFERASE

John B. Lowe, and Peter L. Smith, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jun. 9, 1994, Ser. No. 255,670

Int. Cl.^{6} C12N *5/00;* **C07H** *21/02;* **C12Q** *1/00;* **C07K** *1/00*

U.S. Cl. 435—240.1 **18 Claims**



1. An isolated sequence of DNA which encodes a polypeptide having an amino acid sequence selected from the group consisting of:

(a) from position 35 to position 510 of the amino acid sequence of SEQ ID NO: 2; and

(b) from position 1 to position 510 of the amino acid sequence of SEQ ID NO: 2.

5,691,181

DNA ENCODING LIPASE FROM HUMAN GASTRIC MUCOSAL TISSUE

Peter Anthony Lowe, Reading, United Kingdom, assignor to Celltech Limited, Berkshire, United Kingdom

Division of Ser. No. 97,619, Jul. 27, 1993, abandoned, which is a continuation of Ser. No. 996,488, Dec. 28, 1992, abandoned, which is a continuation of Ser. No. 750,704, Aug. 20, 1991, abandoned, which is a continuation of Ser. No. 554,062, Jun. 26, 1990, abandoned, which is a continuation of Ser. No. 865,564, Apr. 21, 1986, abandoned. This application Nov. 15, 1994, Ser. No. 340,123

Claims priority, application United Kingdom, Aug. 21, 1984, 8421210

Int. Cl.^{6} C12N *9/20;15/55;15/85*

U.S. Cl. 435—240.1 **22 Claims**

2. A process for the production of a gastric lipase protein from human gastric mucosal tissue comprising the steps:

providing an expression vector comprising a DNA sequence encoding a gastric lipase precursor protein from human gastric mucosal tissue operably linked to transcriptional and translational control signals;

transforming a host cell with said expression vector;

culturing the transformed host under conditions such that the gastric lipase precursor protein is produced;

cleaving said gastric lipase precursor protein to produce gastric lipase protein; and

isolating said gastric lipase protein.

5,691,182

USE OF ISOLATED DOMAINS OF TYPE IV COLLAGEN TO MODIFY CELL AND TISSUE INTERACTIONS

Michael P. Sarras, Jr., Kansas City, and Billy G. Hudson, Lenexa, both of Kans., assignors to University of Kansas Medical Center, Kansas City, Kans.

Continuation-in-part of Ser. No. 268,969, Jun. 30, 1994. This application Jun. 30, 1995, Ser. No. 497,206

Int. Cl.^{6} C12N *5/00;* **A61K** *38/00*

U.S. Cl. 435—240.1 **4 Claims**

1. A method for inhibiting basal lamina membrane formation by animal cell or tissue comprising contacting said animal cell or tissue with a polypeptide composition in an amount effective to inhibit basal lamina formation, said composition comprising one or more domains of type IV collagen selected from the group consisting of NC1 domain and 7S domain.

5,691,183

CD4+ T-LYMPHOCTYE PROTEASES AND GENES ENCODING SAID PROTEASES

Alex Franzusoff, Boulder, and Luis R. Miranda, Denver, both of Colo., assignors to University Technology Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 88,322, Jul. 7, 1993, Pat. No. 5,413,914, and Ser. No. 340,185, Nov. 15, 1994, which is a continuation-in-part of Ser. No. 88,322. This application Jan. 5, 1995, Ser. No. 368,852

Int. Cl.^{6} C12N *15/57;15/74;15/81*

U.S. Cl. 435—252.3 **27 Claims**

1. An isolated nucleic acid molecule comprising a dibasic amino acid processing endoprotease gene nhTCP and nucleic acid molecules comprising fragments thereof that encode a dibasic amino acid processing endoprotease having proteolytic activity.

5,691,184

Patent Not Issued For This Number

5,691,185

LACTIC ACID BACTERIAL SUPPRESSOR MUTANTS AND THEIR USE AS SELECTIVE MARKERS AND AS MEANS OF CONTAINMENT IN LACTIC ACID BACTERIA

Françoise Dickely, Obernai, France; Eric Johansen, Hørsholm, Denmark; Dan Nilsson, Copenhagen, Denmark; Egon Bech Hansen, Brønshøj, Denmark, and Per Strøman, Naerum, Denmark, assignors to CHR. Hansen A/S, Horsholm, Denmark

Continuation-in-part of Ser. No. 133,390, Oct. 8, 1993, abandoned. This application May 13, 1994, Ser. No. 242,098

Int. Cl.^{6} C12N *1/20;15/74;15/00*

U.S. Cl. 435—252.3 **26 Claims**

1. An isolated pure culture of a lactic acid bacterium comprising a nucleotide sequence comprising a gene encoding a nonsense suppressor, said nucleotide sequence being selected from the group consisting of SEQ ID NO:1, SEQ ID NO:10, SEQ ID NO:11, and SEQ ID NO:32.

5,691,186

FILARIID CYSTEINE PROTEASE GENES

Cynthia Ann Tripp; Glenn R. Frank, both of Ft. Collins, and Robert B. Grieve, Windsor, all of Colo., assignors to Heska Corporation, Ft. Collins, Colo.

Continuation of Ser. No. 249,552, May 26, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 463,262

Int. Cl.^{6} C12N *1/21;15/63;5/10;* **C07H** *21/04*

U.S. Cl. 435—252.3 **10 Claims**

1. An isolated nucleic acid molecule having a nucleic acid sequence encoding an adult filariid nematode cathepsin L cysteine protease protein.

5,691,187

ANTI-FUNGAL AGENTS AND METHODS OF IDENTIFYING AND USING THE SAME

Eric B. Kmiec, Malvern; David L. Gerhold, Huntingdon Valley, and Allyson Cole Strauss, Philadelphia, all of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Filed Jun. 7, 1995, Ser. No. 485,621

Int. Cl.^{6} C12N *15/61;15/63;1/14;1/16;1/18;5/10;1/21*

U.S. Cl. 435—252.3 **9 Claims**

1. A recombinant expression vector comprising a nucleic acid sequence that encodes the protein of SEQ ID NO:2.

5,691,188

TRANSFORMED YEAST CELLS EXPRESSING HETEROLOGOUS G-PROTEIN COUPLED RECEPTOR

Mark Henry Pausch, Robbinsville, N.J.; Bradley A. Ozenberger, Yardley, Pa.; John Richard Hadcock, Mount Holly, N.J.; Laura Alicia Price, Langhorne, Pa.; Eileen Marie Kajkowski, Ringoes, N.J.; Donald Richard Kirsch, Princeton, N.J., and Deborah Tardy Chaleff, Pennington, N.J., assignors to American Cyanamid Company, Madison, N.J.

Filed Feb. 14, 1994, Ser. No. 195,729

Int. Cl.^{6} C12N *15/81*

U.S. Cl. 435—254.2 **31 Claims**

1. A transformed yeast cell comprising a reporter gene under control of a pheromone-responsive promoter, a heterologous protein-coupled receptor gene, each said gene being under the

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control of a separate promoter, and a gene mutation causing increased sensitivity to receptor activation selected from the group consisting of: sst2, STE50, sgv1, ste2, ste3, pik1, and afr1.

5,691,189

SACCHAROMYCES CEREVISIAE EXPRESSING M_2 PROTEIN OF INFLUENZA A VIRUS

Stephen E. Kurtz, Princeton, and Mark Krystal, Cranbury, both of N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation of Ser. No. 183,545, Jan. 19, 1994, abandoned. This application Nov. 9, 1995, Ser. No. 556,124

Int. Cl.^{6} C12N *1/15;1/19*

U.S. Cl. 435—254.21 **10 Claims**

1. A *Saccharomyces cerevisiae* cell comprising multiple copies of a plasmid that expresses a nucleic acid sequence for a M_2 protein or a functional mutant or derivative thereof, wherein the M_2 protein or functional mutant or derivative thereof is expressed at a level such that growth of a culture of the cells is impaired.

5,691,190

PHAFFIA RHODOZYMA MUTANTS, PROCESS FOR PRODUCING β-CAROTENE AND USE OF β-CAROTENE RICH BIOMASS

Patrick Girard, Les Ulis; Catherine Eliane Jeannie Javelot, Maisons Alfort, and Barbu Dinu Vladimir Vladescu, Paris, all of France, assignors to Pernod Ricard, Paris, France

Continuation of Ser. No. 183,305, Jan. 19, 1994, abandoned. This application Oct. 13, 1995, Ser. No. 542,796

Claims priority, application France, Jan. 19, 1993, 93 00463

Int. Cl.^{6} C12N *1/16;1/14;* **C12P** *23/00*

U.S. Cl. 435—255.1 **8 Claims**

1. *Phaffia rhodozyma* mutant blocked in the step of conversion of β-carotene in the pathway of biosynthesis of astaxanthin characterized by being obtained by a process comprising the steps of:

(1) treating with a physical or chemical mutagenic agent of a wild type *Phaffia rhodozyma* CBS 6938 strain in culture; and
(2) selecting the yellow-colored clones obtained after step 1.

5,691,191

MEDIUM FOR THE CULTIVATION OF LAGENIDIUM GIGANTEUM

Sherry Darlene Heins, Davis; Duane Douglas Ewing, Woodland, and Pamela Gail Marrone, Davis, all of Calif., assignors to AgraQuest, Inc., Davis, Calif.

Filed Mar. 15, 1996, Ser. No. 616,738

Int. Cl.^{6} C12N *1/14*

U.S. Cl. 435—256.8 **4 Claims**

1. A medium for use in fermentation, consisting essentially of:

(a) 3.6 g per liter peptone;
(b) 1.5 to 3 g per liter autolyzed yeast extract;
(c) 1.6 g per liter Proflo® cottonseed flour;
(d) 2.0 to 7.75 g per liter dextrose;
(e) 2.5 g per liter palm oil;
(f) 0.2 g per liter cholesterol;
(g) 0.6 g per liter $CaCl_2 \cdot 2H_2O$; and
(h) 0.2 g per liter $MgCl_2 \cdot 6H_2O$.

5,691,192

BIOLOGICAL FILTER FOR REMOVING VOLATILE HYDROPHOBIC COMPOUNDS FROM GAS EMISSIONS

Hubertus Henricus Jacobus Cox, Nootdorp, and Harmannus Johannes Doddema, Delft, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek - TNO, Delft, Netherlands

PCT No. PCT/EP94/01927, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO95/03116, PCT Pub. Date Feb. 2, 1995

PCT Filed Jun. 13, 1994, Ser. No. 586,729

Claims priority, application Netherlands, Jul. 22, 1993, 9301289

Int. Cl.^{6} C12M *1/14;* **C12S** *5/00*

U.S. Cl. 435—282.5 **8 Claims**

1. Device for the removal of volatile, hydrophobic compounds from gas emissions comprising a biological filter consisting of a carrier material provided with a biologically active material, wherein the carrier material consists of porous particles of a hydrophilic material, the biologically active material comprises a fungus covering the porous particles, the particles encase pores which provide a passage to said gas emissions and an acid environment resides in said filter.

8. Method of removing volatile hydrophobic compounds from a gas emission, which comprises:

providing a biological reactor containing a biological filter consisting of porous particles of hydrophobic material, said porous particles being covered by a biologically active fungus, and

passing the gas emission through the biological reactor so as to remove the volatile hydrophobic compounds from the gas emission.

5,691,193

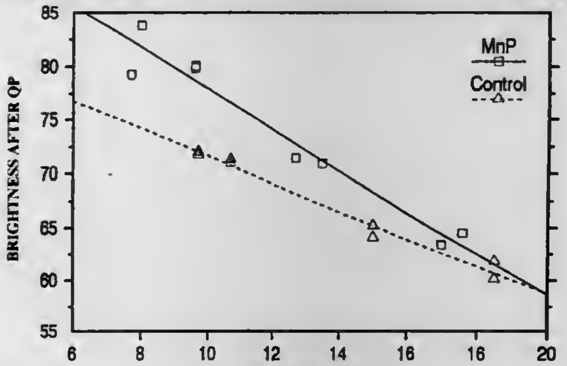
NON-CHLORINE BLEACHING OF KRAFT PULP

Michael Geoffrey Paice, Pointe Claire, and Robert Ernest Bourbonnais, Ville St-Laurent, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Continuation-in-part of Ser. No. 22,299, Feb. 25, 1993, abandoned. This application Jun. 23, 1994, Ser. No. 264,304

Int. Cl.^{6} D21C *3/00*

U.S. Cl. 435—278 **4 Claims**



1. A process for the non-chlorine bleaching of kraft pulps, which comprises the steps of:

a) oxidizing the pulp at an acid pH and at a temperature between 25 degree C. and 60 degree C. for a period of time between 30 to 240 minutes with suitable amounts of manganese peroxidase enzyme, hydrogen peroxide and Mn(II) ions, or with laccase enzyme or with *Trametes versicolor* ATCC 20869 strain solution;
b) removing metal ions from the oxidized pulp of step a) with a chelator selected from the group consisting of EDTA(ethylenediaminetetraacetic acid), DTPA(diethylenetriaminepentaacetic aicd), lactate, oxalate and malonate at acid pH; and
c) treating the pulp of step b) with alkaline hydrogen peroxide in an amount and under conditions effective to brighten the pulp.

5,691,194

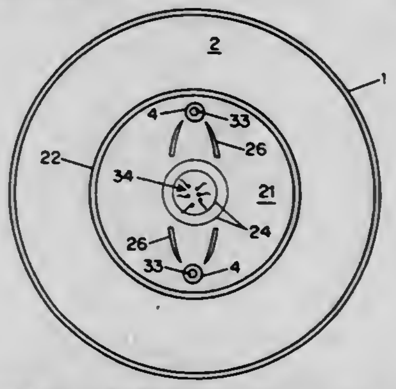
METHOD AND APPARATUS FOR IN VITRO FERTILIZATION

Jon W. Gordon, New York, N.Y., assignor to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Division of Ser. No. 414,739, Mar. 31, 1995, Pat. No. 5,627,066, which is a continuation-in-part of Ser. No. 125,084, Sep. 22, 1993, Pat. No. 5,512,476, which is a continuation of Ser. No. 699,745, May 14, 1991. This application Sep. 24, 1996, Ser. No. 718,902

Int. Cl.^{6} C12M *3/00*

U.S. Cl. 435—287.1 **25 Claims**



1. A container for concentrating motile sperm in a microchamber, said container comprising a base, said base comprising at least one microchamber and shaped such that fertilization medium, when placed in the container, fills said at least one microchamber and a portion of the container outside of said at least one microchamber, and further such that the medium extends from said portion to said at least one microchamber said at least one microchamber being formed and positioned in relation to the remainder of said container such that sperm of normal motility, when placed in said portion outside and remote from the microchamber, will tend to swim into the microchamber, said microchamber being shaped such that motile sperm which swim from said portion into said microchamber tend to be retained in said microchamber.

5,691,195

APPLICATOR DEVICE FOR A FLAT ELEMENT FOR SAMPLING OF MICROORGANISMS, SUCH AS A PETRI DISH

Francis Doleans, Lyons; Alain Bonnet, Craponne, and Sylvain Baeyaert, Saint-Genis-les-Ollieres, all of France, assignors to Bio Merieux, Marcy l'Etoile, France

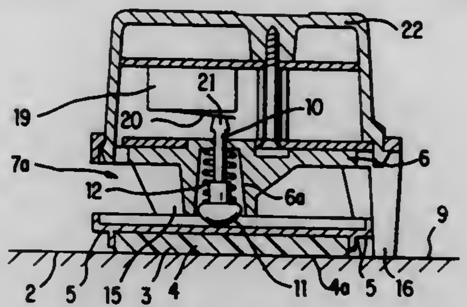
PCT No. PCT/FR95/00285, § 371 Date Nov. 7, 1995, § 102(e) Date Nov. 7, 1995, PCT Pub. No. WO95/24463, PCT Pub. Date Sep. 14, 1995

PCT Filed Mar. 10, 1995, Ser. No. 532,653

Claims priority, application France, Mar. 10, 1994, 94 03027

Int. Cl.^{6} C12M *1/26;1/28*

U.S. Cl. 435—309.1 **11 Claims**



1. A portable hand-operated and passive applicator device, which is set on a surface (2) from which a sample is to be taken, said applicator device comprising:

a frame (6,7) comprising a base (7) defining a support surface (9) on said surface (2), and a side opening (7*a*) for introducing and extracting laterally a replaceable flat sampling element (1) in a reverse upright position for sampling a microorganism on the surface (2), and complementary retaining means (13) located inside said base, arranged for slidably engaging an external border (5) of said sampling element (1);

a pusher (10) slidably mounted on a plate (6) in said frame (6,7) in a direction perpendicular to said support surface (9), wherein said pusher comprises a bearing head (11) for slidably engaging the back of said sampling element when said sampling element is in its reverse position, in order to contact the sampling element with the surface (2); and

biasing means (12) mounted between said pusher (10) and said frame, for returning said pusher towards the support surface (9),

wherein said sampling element comprises a disk defining an internal recess (3) and the external border (5), and a layer of a culture medium (4) contained in said internal recess which defines a sampling surface (4*a*) above said border, when said sampling element is in a normal upright position for culturing the sampled microorganism.

5,691,196

RECOMBINANT NUCLEIC ACID CONTAINING A RESPONSE ELEMENT

Paul Mak, East Windsor, N.J., and Sotirios K. Karathanasis, Rockland, N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Dec. 31, 1992, Ser. No. 999,071

Int. Cl.^{6} C12N *15/63;15/11*

U.S. Cl. 435—320.1 **6 Claims**

1. A recombinant nucleic acid comprising the nucleotide sequence ACTGACCCCTTGACCCTG in a forward orientation, identified as SEQ. I.D. NO:9.

5,691,197

ISOLATED DNA SEQUENCE FOR A NOVEL MACROPHAGE RECEPTOR WITH A COLLAGENOUS DOMAIN

Karl Tryggvason, Fyysinkontie 8, SF-90570 Oulu; Outi Elomaa, Asemakatu 41, 90100 Oulu, and Maarit Kangas, Sipolankuja 4, 90800 Oulu, all of Finland

Filed Feb. 21, 1995, Ser. No. 392,367

Int. Cl.^{6} C12N *15/85;15/12*

U.S. Cl. 435—320.1 **3 Claims**

1. An isolated murine DNA sequence which codes for a macrophage receptor with a collagenous domain comprising SEQ ID NO. 1.

5,691,198

P16 EXPRESSION CONSTRUCTS AND THEIR APPLICATION IN CANCER THERAPY

Xiaomei Jin, and Jack A. Roth, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jul. 17, 1995, Ser. No. 502,881

Int. Cl.^{6} A61K *48/00;* **C12N** *5/00;15/00*

U.S. Cl. 435—320.1 **10 Claims**

1. An expression construct comprising a promoter functional in eukaryotic cells and a nucleic acid encoding p16, wherein said expression construct is a replication deficient adenovirus and further, wherein said nucleic acid is under transcriptional control of said promoter.

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5,691,199
DNA ENCODING BIOCIDAL PROTEINS

Willem Frans Broekaert, Dilbeek; Bruno Philippe Angelo Cammue, Alsemberg, both of Belgium; Sarah Bronwen Rees, Berkshire, England, and Jozef Vanderleyden, Heverlee, Belgium, assignors to Zeneca Limited, London, England

Division of Ser. No. 149,839, Nov. 10, 1993, Pat. No. 5,514,779, which is a continuation-in-part of Ser. No. 2,842, Jan. 14, 1993, abandoned. This application May 26, 1995, Ser. No. 451,566

Claims priority, application United Kingdom, Jun. 7, 1991, 9112300; Nov. 12, 1992, 9223708; Feb. 23, 1993, 9303564

Int. Cl.^{6} C07K *14/415;* **C12N** *15/29*

U.S. Cl. 435—325 **60 Claims**

1. An isolated DNA sequence encoding an antimicrobial protein having the amino acid sequence as represented by any one of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:15 or SEQ ID NO:16.

5,691,200
METHOD TO PRODUCE GRANULOCYTE COLONY STIMULATING FACTOR FROM IMMORTALIZED AVIAN T LYMPHOCYTES AND METHOD TO PRODUCE IMMORTALIZED CELLS

Michael H. Kogut, College Station, Tex.; John R. DeLoach, Lenoir, Tenn.; Larry H. Stanker, College Station, Tex.; Rita B. Moyes, College Station, Tex., and Billy M. Hargis, College Station, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C., and The Texas A&M University System, College Station, Tex.

Filed Jul. 3, 1996, Ser. No. 675,749

Int. Cl.^{6} C12N *5/06;5/02;* **C07K** *14/52*

U.S. Cl. 435—349 **2 Claims**

1. An immortal cell line wherein said cell line is selected from the group consisting of ConA-C1 having the ATCC accession number CRL-12135 and ConA-B1 having the ATCC accession number CRL-12357.

5,691,201
USE OF SABELUZOLE IN CHRONIC NEURODEGENERATIVE DISEASES

Gilbert Henri Camiel Clincke, Vosselaar; Luc Remi Mathilde Tritsmans, Vlimmeren, and Hugo Alfons Gabriel Geerts, Berchem, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

PCT No. PCT/EP94/01177, § 371 Date Oct. 11, 1995, § 102(e) Date Oct. 11, 1995, PCT Pub. No. WO94/25029, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 13, 1994, Ser. No. 537,704

Claims priority, application European Pat. Off., Apr. 26, 1993, 93 201 193; May 18, 1993, 93 201 411

Int. Cl.^{6} C12N *5/00*

U.S. Cl. 435—368 **1 Claim**

1. A process of inducing in neuronal cells the expression of epitopes associated with aberrantly phosphorylated tau-protein, which method comprises contacting said cells with a medium conditioned from serum-starved cells for several days and having acquired cytotoxic activity.

5,691,202
SERUM-FREE MEDIUM SUPPLEMENT

Nick C. Wan, Newton, and Jason C. Goodrick, Cambridge, both of Mass., assignors to Genzyme Corporation, Framingham, Mass.

Continuation of Ser. No. 410,657, Mar. 24, 1995, Pat. No. 5,512,477, which is a continuation of Ser. No. 230,933, Apr. 21, 1994, abandoned. This application Apr. 26, 1996, Ser. No. 591,688

Int. Cl.^{6} C12N *5/00*

U.S. Cl. 435—391 **1 Claim**

1. A method of culturing a eukaryotic cell line, comprising adding a medium supplement comprising:

a. carbon sources consisting of about 7.3 grams/liter (g/L) of glutamine and about 25 grams/liter (g/L) of glucose;

b. vitamins consisting of about 0.005 g/L of biotin, about 0.075 g/L of choline chloride, about 0.025 g/L of folic acid, about 0.875 g/L of inositol, about 0.025 g/L of niacinamide, about 0.025 g/L of benzoic acid, about 0.00625 g/L of pantothenic acid, about 0.025 g/L of pyridoxine HCl, about 0.005 g/L of riboflavin, about 0.025 g/L of thiamine HCl, and about 0.000125 g/L of vitamin B12;

c. inorganic salts consisting of about 0.05 g/L of potassium chloride, about 0.05 g/L of potassium phosphate, about 2.0 g/L of sodium chloride, and about 0.2875 g/L of sodium phosphate;

d. amino acids consisting of about 2.5 g/L of arginine, about 0.625 g/L of asparagine, about 0.25 g/L of aspartic acid, cystine, about 0.25 g/L of glutamic acid, about 0.125 g/L of glycine, about 0.1875 g/L of histidine, about 0.25 g/L of proline, about 0.625 g/L of isoluecine, about 0.5 g/L of lysine, about 0.1875 g/L of methionine, about 0.1875 g/L of phenylalanine, about 0.375 g/L of serine, about 0.25 g/L of threonine, about 0.0625 g/L of trytophan, about 0.3604 g/L of tyrosine and about 0.25 g/L of valine; and

e. 25 g/L of a meat digest,

wherein the supplement maintains eukaryotic cell viability when added to the culture medium.

5,691,203
METHOD FOR SERUM-FREE CULTURE OF HUMAN VASCULAR ENDOTHELIAL CELLS

Susumu Katsuen; Kunihiro Ohshima, both of Osaka; Ryohei Yamamoto, Takatsuki, and Toyokazu Nishino, Ibaraki, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Sep. 29, 1993, Ser. No. 128,225

Claims priority, application Japan, Jun. 14, 1993, 5-141984

Int. Cl.^{6} C12N *5/00;11/00;11/02;11/08*

U.S. Cl. 435—402 **5 Claims**

1. A method for culturing human vascular endothelial cells in serum free condition comprising 1) coating at least one polymer having cell adhesive activity to adhere cells to a surface on at least a part of an inner surface of a culture vessel of surface of a carrier for cell culture, wherein said at least one polymer is a synthetic polymer modified with a peptide having cell adhesive activity, or a natural polymer having cell adhesive activity, or a combination thereof, and 2) culturing the human vascular endothelial cells in the coated vessel or with the coated carrier using a serum-free medium for human vascular endothelial cell culture containing at least (i) serum albumin isolated from serum, (ii) transferrin, (iii) hydrocortisone, and (iv) epithelial growth factor whereby initial adhesion of said cells to said polymer coating and viability of said cells are increased.

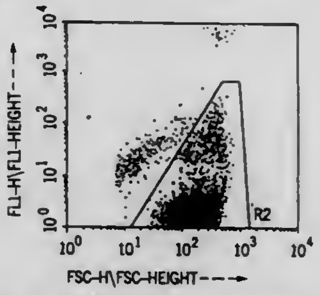
5,691,204
COMPOSITIONS AND METHODS FOR THE RAPID ANALYSIS OF RETICULOCYTES

Young Ran Kim, Sunnyvale, and Johanna Kantor, Palo Alto, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 21, 1995, Ser. No. 426,408

Int. Cl.^{6} G01N *33/48*

U.S. Cl. 436—63 **15 Claims**



13. An aqueous, nucleic acid staining reagent comprising: from about 0.1 μg/ml to about 0.3 μg/ml of a dye selected from the group consisting of 2-butyl-4-(2,3-dihydro-3-methyl-(benzo- 1,3-thiazol-2-yl)-methylidene)-1-phenylquinolinium iodide, 2-diethylamino- 4-(2,3-dihydro-3-methyl-(benzo-1,3-thiazol-2-yl)-methylidene)-1-phenylquinolinium iodide, and 2-methylthio-4-(2,3-dihydro-3-methyl-(benzo- 1,3-thiazol-2-yl)-methylidene)-1-phenylquinolinium iodide;

from about 40 mM to about 60 mM of a buffer selected from the group consisting of imidazole, Tris and Bis-Tris buffer; and

a dye stabilizing amount of a non-ionic surfactant selected from the group consisting of N,N-bischolamide and a polyoxypropylene-polyoxyethylene block copolymer,

wherein said reagent has a pH from about 6.8 to about 7.2 and an osmolarity adjusted to about 280 to about 3 10 mOsm/l with a mono-, or di-, valent alkali salt selected from the group consisting of NaCl, KCl, LiCl, $CaCl_2$, $MgCl_2$ and $ZnCl_2$.

5,691,205
FLUOROMETRIC ANALYSIS OF CHLORIDE ION AND CHEMICAL SENSOR THEREFOR

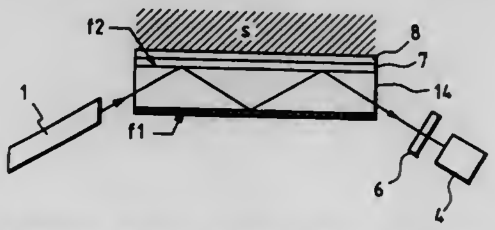
Yuji Kawabata, Isehara, and Yoshiyuki Toge, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1995, Ser. No. 493,346

Claims priority, application Japan, Jun. 23, 1994, 6-141370; Sep. 7, 1994, 6-213768; Apr. 7, 1995, 7-082422; May 1, 1995, 7-107455

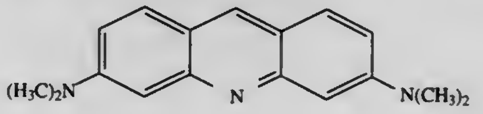
Int. Cl.^{6} G01N *33/00;21/76*

U.S. Cl. 436—125 **23 Claims**



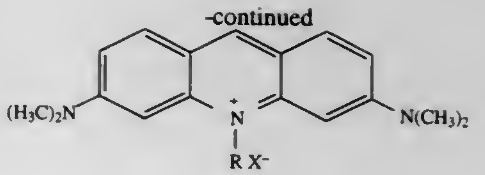
1. A fluorometric analytical method for detecting a chloride ion concentration in a sample liquid comprising the steps of:

providing a fluorescent dye represented by the following formula (1) or (2) in an aqueous form



(1)

-continued



(2)

wherein R is alkyl having 1 to 30 carbon atoms, and X^- is a halogen ion;

bringing said aqueous fluorescent dye into contact with chloride ions in a sample liquid; and

measuring the amount of fluorescence of said fluorescent dye that is quenched by the chloride ions wherein said method is substantially free from interference from other halide anions.

5,691,206
METHOD AND DEVICE FOR SOLID PHASE MICROEXTRACTION AND DESORPTION

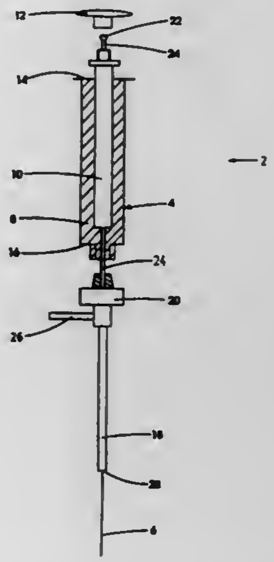
Janusz B. Pawliszyn, 383 Dunvegan Drive, Waterloo, Ontario, Canada, N2K 1W7

Continuation-in-part of Ser. No. 934,736, Oct. 20, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 306,435

Claims priority, application United Kingdom, Apr. 2, 1990, 9007356

Int. Cl.^{6} G01N *1/18*

U.S. Cl. 436—178 **32 Claims**



1. A device for carrying out solid phase microextraction of components contained in a fluid carrier, said device being characterized by, in combination, a fiber and a housing surrounding said fiber, said fiber baving means for selectively extracting at least one component in said fluid carrier, said fiber being mounted to a movable part in said housing so that said fiber is movable longitudinally within said housing, said movable part being able to successively expose a length of said fiber outside of said housing to said carrier and retract said fiber into said bousing out of contact with said carrier.

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5,691,207
ANALYTE ASSAY USING SUPERAGGREGATED COMPLEX AS LABELLED REAGENT

Jostein Holtlund, Høvik, and Geir Olav Gogstad, Oslo, both of Norway, assignors to Nycomed Pharma AS, Oslo, Norway
PCT No. PCT/EP91/02519, § 371 Date Apr. 29, 1993, § 102(e) Date Apr. 29, 1993, PCT Pub. No. WO92/11537, PCT Pub. Date Jul. 9, 1992
PCT Filed Dec. 21, 1991, Ser. No. 39,426
Claims priority, application United Kingdom, Dec. 24, 1990, 9028038
Int. Cl.^{6} G01N *33/553*
U.S. Cl. 436—525 **26 Claims**

1. In a method for the qualitative or quantitative determination of an analyte in a test sample comprising:

immobilizing a labelled reagent comprising a gold sol bound to a protein or fragment thereof specifically binding to said analyte, or a gold sol bound to a protein or fragment thereof which is a specific binding partner for a substance which specifically binds to said analyte, in bound form on a solid phase; and

detecting the presence or absence of said labelled reagent thereby providing an indication of the presence or quantity of the analyte in the sample;

wherein the improvement comprises as the labelled reagent a superaggregated complex of a plurality of molecules of said protein or fragment and a plurality of particles of said gold sol wherein the superaggregated complex has a mean diameter of 50–5000 nm and wherein at least 75% by weight of the gold particles of the gold sol have a mean diameter of less than 20 nanometers,

wherein the superaggregated complex is obtained by the process of:

(i) mixing said protein or fragment thereof and gold sol at a pH of 1–5, or at neutral pH provided that the gold sol is used in molar excess relative to the protein and the protein molecule exhibits at least two positively charged groups at the pH used, so as to form macroscopic aggregates;

(ii) collecting the macroscopic aggregates so formed;

(iii) resuspending the macroscopic aggregates in a pH-neutral medium, optionally with ultrasonic treatment, to form a suspension of stable superaggregated complexes.

5,691,208
MAGNETIC SEPARATION APPARATUS AND METHOD

Stefan Miltenyi, Bergisch Gladbach, Germany; Douglas Bryan Dority, Mill Valley, and Janette Phi-Wilson, Los Altos Hills, both of Calif., assignors to AmCell Corporation, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 394,834, Feb. 27, 1995. This application Jun. 7, 1995, Ser. No. 478,512
Int. Cl.^{6} C12N *1/00;* **C12Q** *1/68;* **G01N** *33/543*
U.S. Cl. 436—526 **14 Claims**

1. A method for separating a sample into labeled and unlabeled sample components, comprising the steps of:

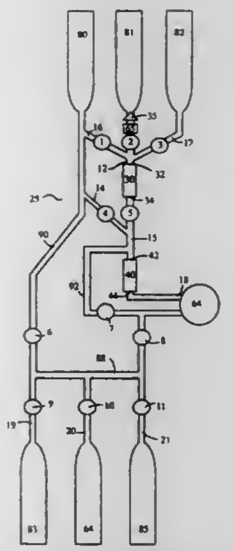
(a) labeling a component of the sample with a magnetically responsive material;

(b) transferring the sample from a sample container through a fluid pathway to a separation column;

(c) passing said sample through said separation column wherein said separation column comprises a ferromagnetic matrix in the presence of a magnetic field thereby providing a magnetic field gradient whereby the labeled sample component is retained within said separation column while unlabeled sample component passes through said separation column;

(d) transferring the unlabeled component from said separation column to an unlabeled component container by means of a distribution channel that interconnects said separation column and said unlabeled component container;

(e) removing the magnetic field, thereby releasing the labeled component from said separation column;



(f) redirecting the released labeled component, via a recirculation loop, into said separation column in the presence of a magnetic field thereby performing a second separation of labeled component from the sample, wherein said recirculated labeled component is redirected to said separation column without passage through said sample container;

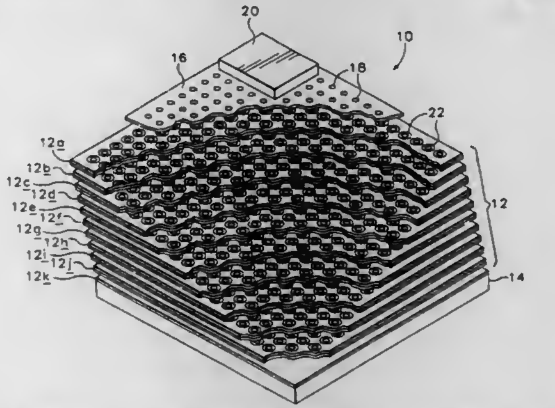
(g) transferring further unlabeled sample component from said separation column to said unlabeled component container via said distribution channel;

(h) removing the magnetic field, thereby again releasing the labeled component from said separation column; and

(i) transferring the released labeled component from said separation column to a product collection container via said distribution channel.

5,691,209
LATTICE INTERCONNECT METHOD AND APPARATUS FOR MANUFACTURING MULTI-CHIP MODULES

Janusz B. Liberkowski, 5884 Macadam Ct., San Jose, Calif. 95123
Division of Ser. No. 527,959, Sep. 14, 1995, Pat. No. 5,623,160. This application Oct. 15, 1996, Ser. No. 731,470
Int. Cl.^{6} H01L *21/00*
U.S. Cl. 437—7 **6 Claims**



1. A method of fabricating an interconnect structure for mounting circuit modules, the method comprising:

stacking plural generally planar expanses to produce a laminate, each expanse having a substantially coextensive conductor electrically isolated from an adjacent stacked expanse by an interposing insulator;

first forming a first set of plural holes in the laminate, with the holes of the first set extending generally normal to the plane of said expanses;

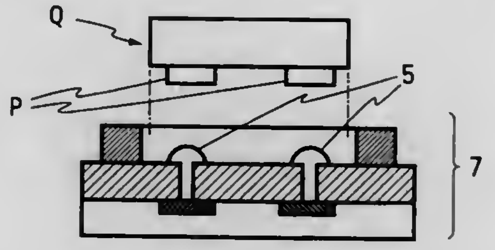
substantially filling the holes of the first set with a conductive material;

second forming a second set of plural holes in the laminate, with a plurality of holes of the second set being positioned in a cluster substantially surrounding each of the holes in the first set, said second forming leaving plural conductive isthmuses between each of the holes of the first set and each of the corresponding holes of the second set of holes; and

applying a voltage between the conductor within a filled hole and a conductor of said expanse, the voltage being sufficient to open the plural isthmuses thus to electrically isolate the selected hole from the selected expanse but the voltage being insufficient to open the plural isthmuses associated with the remaining holes and the remaining expanses.

5,691,210
METHOD FOR FABRICATION OF PROBE STRUCTURE AND CIRCUIT SUBSTRATE THEREFOR

Yoshihisa Mori; Atsushi Hino, and Hitoshi Ishizaka, all of Ibaraki, Japan, assignors to Nitto Denko Corporation, Osaka, Japan
Filed Oct. 9, 1996, Ser. No. 728,076
Claims priority, application Japan, Oct. 9, 1995, 7-261706
Int. Cl.^{6} H01L *21/66*
U.S. Cl. 437—8 **11 Claims**



1. A method for fabrication of a probe structure comprising a circuit substrate comprising a circuit pattern formed on one side or inside of an insulating substrate and a positioning member formed on either side of said insulating substrate, said positioning member being capable of positioning and retaining a test target at a testing position of the probe structure, and the circuit pattern and the positioning member being in a positional relationship which establishes a continuity between the circuit pattern and a bump contact, which method comprises determining, on the same side of the substrate on which the positioning member has been formed, the position of the bump contact according to the position of the positioning member as a reference position, and forming the bump contact capable of establishing continuity with the circuit pattern.

5,691,211
METHOD FOR GETTERING NOBLE METALS FROM MINERAL ACID SOLUTION

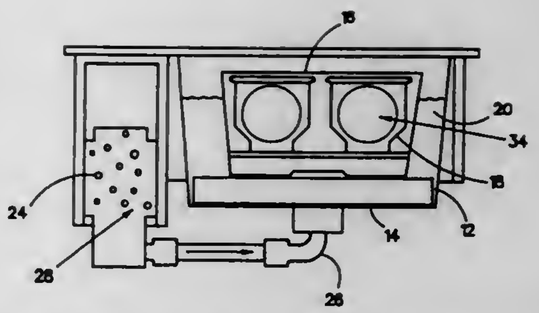
Troy Sorensen, and Eric Grieger, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Continuation of Ser. No. 975,789, Nov. 13, 1992, Pat. No. 5,501,767. This application Mar. 11, 1996, Ser. No. 613,831
Int. Cl.^{6} H01L *21/00*
U.S. Cl. 437—10 **8 Claims**

1. A method for removing a radioactive contaminant from a fluid, comprising the following steps:

a) providing contact between silicon and the fluid;

b) allowing sufficient time for the radioactive contaminant to adhere to the silicon;

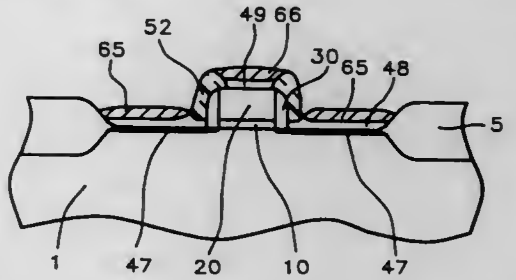
c) maintaining a temperature of the fluid within a range of temperatures between 145 and 150 degrees centigrade during said time defined by said step of allowing; and



d) separating the fluid and the silicon having the adhered radioactive contaminant.

5,691,212
MOS DEVICE STRUCTURE AND INTEGRATION METHOD

Chaochieh Tsai, Taichung, and Shun-Liang Hsu, Hsin-Chu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan
Filed Sep. 27, 1996, Ser. No. 721,665
Int. Cl.^{6} H01L *21/265*
U.S. Cl. 437—24 **15 Claims**



1. A method of making MOS devices with salicided gate and source and drain, comprising the steps of

a. forming a pattern of field oxide on a silicon substrate using LOCOS;

b. thermally growing a gate oxide layer on the silicon substrate in the active area defined by the field oxide window;

c. depositing a layer of polysilicon over the substrate;

d. depositing a layer of photoresist over the polysilicon, exposing the photoresist through a gate definition mask, developing the photoresist;

e. anisotropically reactive-ion etching the polysilicon and the gate oxide to form the polysilicon gate and the gate oxide, followed by the removal of the photoresist;

f. covering the substrate with a layer of silicon nitride by chemical vapor deposition;

g. anisotropically reactive-ion etching the silicon nitride to the end point defined by the exposure of the silicon substrate, thus forming the gate's first sidewall spacer of silicon nitride;

h. then conformally depositing a layer of amorphous silicon over the topography of the silicon substrate, and defining the pattern using an active region definition mask;

i. implanting nitrogen into the amorphous silicon layer whereby as a result, nitrogen piles up at the interface between the native oxide layer on the amorphous silicon layer and the amorphous silicon layer in the gate and the source and drain areas where the surface of the amorphous silicon layer is perpendicular to the nitrogen ion beam;

j. thermally oxidizing the amorphous silicon in the sidewall areas not implanted with nitrogen to form the gate's second sidewall of silicon dioxide;

k. implanting dopant into the amorphous silicon layer;

l. converting the amorphous silicon into polysilicon layer by annealing;

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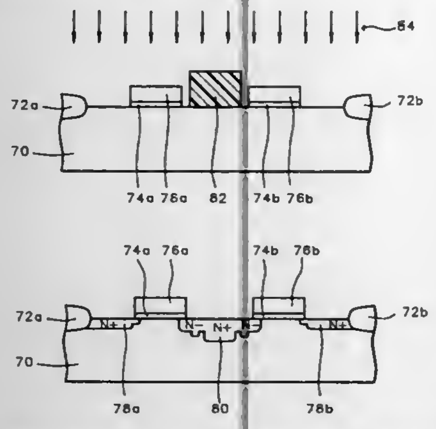
m. annealing to drive some implanted dopant into the single silicon substrate in the source and drain area to form shallow junctions, as well as into the polysilicon gate;
n. depositing a layer of refractory metal on polysilicon layer, followed by a first rapid thermal annealing to form silicide of the refractory metal;
o. removing the unsilicided metal covering the areas of field oxide and gate sidewall oxide; and
p. a second rapid thermal annealing to improve the conductivity of the silicide.

5,691,213

LOW CAPACITANCE INPUT/OUTPUT INTEGRATED CIRCUIT

Ming-Chien Chang, and Hong-Hsiang Tsai, both of Hsinchu, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Sep. 15, 1995, Ser. No. 529,002
Int. Cl.⁶ H01L *21/265*
U.S. Cl. 437—27 **11 Claims**



1. A method for forming a low capacitance input/output integrated circuit upon a semiconductor substrate comprising:
forming upon a semiconductor substrate an input/output integrated circuit, the input/output integrated circuit having contained therein at least one integrated circuit device, the integrated circuit device having at minimum a source electrode region and a drain electrode region into which are normally implanted dopant ions of polarity opposite to the source electrode and the drain electrode of the integrated circuit device;
masking at least a portion of the drain electrode region of the integrated circuit device; and
implanting into areas other than the masked portion of the drain electrode region of the integrated circuit device dopant ions of polarity opposite to the polarity of the source electrode and the drain electrode of the integrated circuit device.

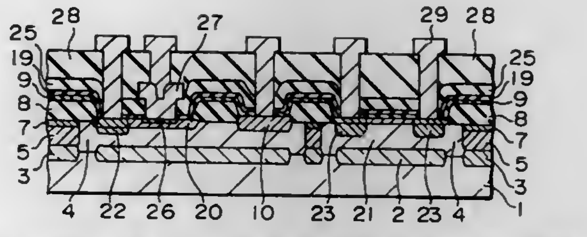
5,691,214

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Masaru Wakabayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 4, 1996, Ser. No. 725,760
Claims priority, application Japan, Oct. 5, 1995, 7-258931
Int. Cl.⁶ H01L *21/265*
U.S. Cl. 437—31 **4 Claims**

1. A method of manufacturing a semiconductor device furnished on a silicon substrate, said device having component elements formed on the silicon substrate, said component elements including a bipolar element part having a base region and a collector region and a resistance element part formed of an impurity diffusion layer, comprising the steps of:



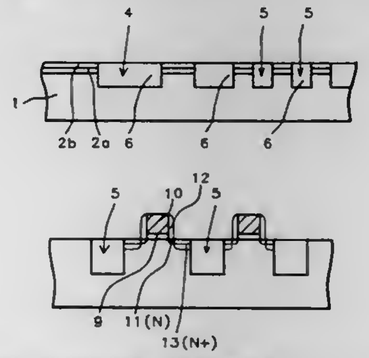
(a) forming a first oxide film on the entire surface of said silicon substrate and on the entire surface of said component elements.
(b) selectively removing part of said first oxide film corresponding to said base region of said bipolar element part and, thereafter, a surface of said silicon substrate directly underlying said part of said first oxide film to form an exposed surface,
(c) forming a second oxide film on said silicon substrate, said remaining first oxide film, and said component elements throughout the entire surface thereof thereby differentiating thickness of the oxide film formed on said base region and thickness of the oxide film formed on said resistance element part, and
(d) selectively and simultaneously implanting ions into said bipolar element part and said resistance element part.

5,691,215

METHOD FOR FABRICATING A SUB-HALF MICRON MOSFET DEVICE WITH INSULATOR FILLED SHALLOW TRENCHES PLANARIZED VIA USE OF NEGATIVE PHOTORESIST AND DE-FOCUS EXPOSURE

Chang-Ming Dai; Hong-Chang Dai, and Shih-Chang Tai, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Aug. 26, 1996, Ser. No. 703,084
Int. Cl.⁶ H01L *21/762*
U.S. Cl. 437—44 **20 Claims**



1. A method of fabricating a MOSFET device, on a semiconductor substrate, with silicon oxide filled shallow trenches, comprising the steps of:
growing a first silicon oxide layer on said semiconductor substrate;
depositing a silicon nitride layer on said first silicon oxide layer;
applying a first positive photoresist layer on said silicon nitride layer;
developing narrow and wide features in said first positive photoresist layer using a first exposure mask;
anisotropic dry etching, using said narrow and said wide features, in said first photoresist layer as a mask, to create said narrow and wide features in said silicon nitride layer, in said first silicon oxide layer, and continuing said anisotropic dry etching to create narrow and wide shallow trenches in said semiconductor substrate;
removal of said first positive photoresist layer;
depositing a second silicon oxide layer, completely filling said narrow shallow trenches, and completely filling said wide shallow trenches, and creating an uneven topography, comprised of a thick layer of said second silicon oxide, overlying silicon oxide filled, narrow shallow trenches, and overlying spaces between said silicon oxide filled, narrow shallow trenches, and of a thin layer of said second silicon oxide, overlying said silicon oxide wide shallow trenches;

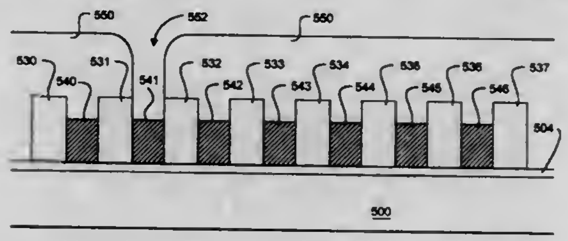
application of a negative photoresist layer on said second silicon oxide layer;
developing wide negative photoresist plugs, using said first exposure mask, in areas directly overlying said wide shallow trenches;
applying a second positive photoresist layer on said negative photoresist plugs, and on said thick second silicon oxide layer, overlying said silicon oxide filled, narrow shallow trenches, and the spaces between said silicon oxide filled, narrow shallow trenches;
baking of said second positive photoresist layer to create a level surface topography;
planarizing via dry etching to remove said second positive photoresist layer and said negative photoresist plugs, exposing top surface of said silicon oxide filled, wide shallow trenches, and dry etching removal of said second positive photoresist layer, and said thick second silicon oxide layer, exposing the top surface of said silicon oxide filled, narrow shallow trenches, and exposing the top surface of said silicon nitride layer, in areas between said silicon oxide filled, narrow shallow trenches;
removal of said silicon nitride layer;
removal of said first silicon oxide layer;
growing a third silicon oxide layer, to be used as the gate insulator layer;
depositing a polysilicon layer;
patterning of said polysilicon layer to create a polysilicon gate structure, on said gate insulator layer, in the space between said silicon oxide filled, narrow shallow trenches;
ion implanting a first conductivity imparting dopant into said semiconductor substrate, in the space between said silicon oxide filled, narrow shallow trenches, and not covered by said polysilicon gate structure, to create lightly doped source and drain region;
depositing a fourth silicon oxide layer;
anisotropic dry etching of said fourth silicon oxide layer, to create an insulator spacer on the sides of said polysilicon gate structure; and
ion implanting a second conductivity imparting dopant into said semiconductor substrate, in the space between said silicon oxide filled, narrow shallow trenches, and not covered by said polysilicon gate structure, and not covered by said insulator spacer, to create heavily doped source and drain regions.

5,691,216

INTEGRATED CIRCUIT SELF-ALIGNING PROCESS AND APPARATUS

Lee-Wei Yen, Taipei, and Wu-An Weng, Hsinchu, both of Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed May 30, 1995, Ser. No. 452,999
Int. Cl.⁶ H01L *21/265*
U.S. Cl. 437—45 **15 Claims**



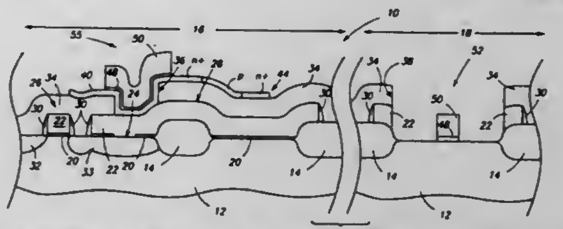
1. A method of forming a read-only-memory (ROM) array in preparation for code programming the ROM array with a mask, comprising:
forming a plurality of bitlines on a substrate;
forming a plurality of wordlines orthogonal to the plurality of bitlines;
forming a plurality of ion barrier elements between the plurality of wordlines in the ROM array, the ion barrier elements inhibiting ions from penetrating through and into the substrate between the plurality of wordlines during code programming; and
applying a code programming mask over the plurality of ion barrier elements in the ROM array after the plurality of ion barrier elements is formed.

5,691,217

SEMICONDUCTOR PROCESSING METHOD OF FORMING A PAIR OF FIELD EFFECT TRANSISTORS HAVING DIFFERENT THICKNESS GATE DIELECTRIC LAYERS

Jeffrey W. Honeycutt, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 3, 1996, Ser. No. 582,446
Int. Cl.⁶ H01L *21/8244*
U.S. Cl. 437—47 **17 Claims**



1. A method of forming a pair of field effect transistors having different thickness gate dielectric layers comprising the following steps:
providing a first region on a substrate for formation of a first field effect transistor having a first gate dielectric layer of a first thickness and providing a second region on the substrate for formation of a second field effect transistor having a second gate dielectric layer of a second thickness;
providing the first gate dielectric layer and a first conductive gate layer over the first and second regions;
patterning the first conductive layer to define a first gate of the first field effect transistor in the first region while leaving the first conductive layer not patterned for gate formation for the second field effect transistor in the second region;
after defining the first gate, stripping the first conductive layer and the first gate dielectric layer from the second region;
after stripping the first conductive layer and the first gate dielectric layer from the second region, providing the second gate dielectric layer and a second conductive gate layer over the second region; and
patterning the second conductive layer in the second region to define a second gate of the second field effect transistor in the second region.

5,691,218

METHOD OF FABRICATING A PROGRAMMABLE POLYSILICON GATE ARRAY BASE CELL STRUCTURE

Michael J. Colwell, Livermore; Teh-Kuin Lee, San Jose; Jane C.T. Chiu, Sunnyvale; Abraham F. Yee, Cupertino; Stanley Yeh, Fremont, and Gobi R. Padmanabhan, Sunnyvale, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 254,819, Jun. 6, 1994, abandoned, which is a division of Ser. No. 86,487, Jul. 1, 1993, Pat. No. 5,358,886. This application Mar. 8, 1996, Ser. No. 613,038
Int. Cl.⁶ H01L *21/265*
U.S. Cl. 437—48 **8 Claims**

1. A method of fabricating a gate array structure on a semiconductor substrate, the method comprising the following steps:

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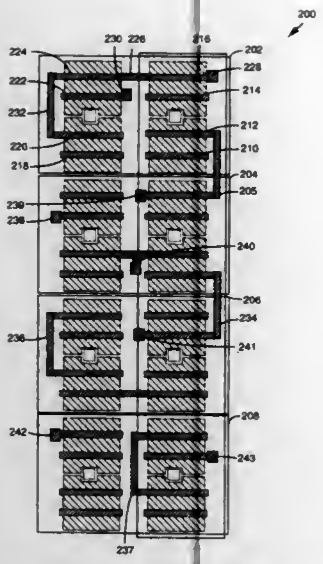


forming an array of identical base cells in a core region of the structure, each such base cell having

(a) a plurality of transistors, with each such transistor including a gate electrode, and

(b) one or more gate connection strips electrically formed on said substrate and connecting selected gate electrodes of two or more of said transistors; and

patterning the gate connection strips to maintain electrical connection between at least two of the selected gate electrodes, wherein said plurality of transistors includes (i) a first group of transistors of a first conductivity type, each having a first gate width, (ii) a second group of transistors of a second conductivity type, opposite said first conductivity type, each transistor of said second group having a second gate width that is substantially equal to the first gate width, and (iii) a third group of transistors of said first conductivity type, each having a third gate width which is smaller than the first and second gate widths, wherein the transistors of the first and second groups all have gates that are aligned in parallel with a first axis, and the transistors of the third group all have gates that are aligned in parallel with a second axis that is substantially perpendicular to the first axis.

5,691,219
METHOD OF MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE

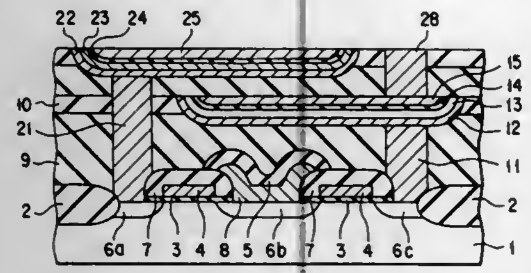
Takashi Kawakubo; Kazuhiro Eguchi; Shuichi Komatsu, all of Yokohama, and Kazuhide Abe, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1995, Ser. No. 527,581

Claims priority, application Japan, Sep. 17, 1994, 6-248444

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—52 **45 Claims**



1. A method of manufacturing a semiconductor memory device, comprising the steps of:

forming a switching transistor in a semiconductor substrate;

forming an insulating layer on the substrate so as to form a flat upper surface;

forming a trench in the insulating layer;

forming a first conductive layer made of a material selected from the group consisting of a noble metal, a noble metal oxide, a noble metal alloy, and an electrically conductive oxide, on an inner surface of the trench and on the insulating layer; and

polishing the first conductive layer to remove that portion of said first conductive layer which is provided on the insulating layer, thereby forming a bottom electrode of a charge storage element.

5,691,220
PROCESS OF FABRICATING SEMICONDUCTOR DEVICE HAVING CAPACITOR ELECTRODE IMPLANTED WITH BORON DIFLUORIDE

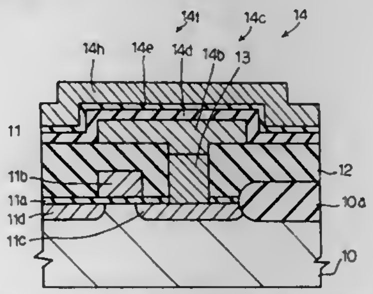
Sadayuki Ohnishi, and Koichi Ando, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 6, 1996, Ser. No. 611,901

Claims priority, application Japan, Mar. 6, 1995, 7-045604

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 437—52 **12 Claims**



1. A process of fabricating a semiconductor device, comprising the steps of:

a) forming a first electrode having a first semiconductor layer doped with a p-type impurity;

b) covering a surface of said first semiconductor layer with a dielectric layer;

c) covering said dielectric layer with a second semiconductor layer; and

d) implanting boron difluoride into said second semiconductor layer for forming a second electrode held in contact with said dielectric layer, said first electrode, said dielectric layer and said second electrode form in combination a capacitor.

5,691,221
METHOD FOR MANUFACTURING SEMICONDUCTOR MEMORY DEVICE HAVING A STACKED CAPACITOR

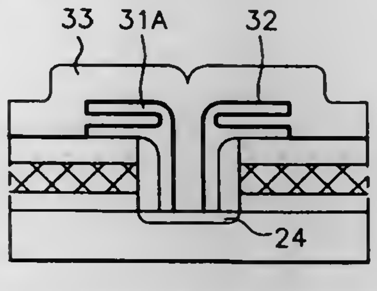
Young Kwon Jun, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Aug. 15, 1996, Ser. No. 698,145

Claims priority, application Rep. of Korea, Sep. 5, 1995, 28972/1995

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 437—52 **21 Claims**



1. A method for manufacturing a semiconductor memory device, comprising the steps of:

forming a switching transistor including a gate insulating film, a gate electrode, and source and drain regions on a semiconductor substrate;

forming a first insulating film on the substrate including the switching transistor;

selectively etching the first insulating film to form a contact hole exposing the source or drain region of the switching transistor;

forming a second insulating film on the substrate to fill the contact hole;

patterning the second insulating film and the first insulating film to a pattern to thereby form a second insulating film pattern and a first insulating film pattern;

selectively removing the first insulating film pattern;

forming a conductive layer on an entire surface of the second insulating film pattern;

selectively etching the conductive layer by using the second insulating film pattern as a mask, to thereby form a capacitor storage electrode;

removing the second insulating film pattern;

forming a capacitor dielectric film on an entire surface of the capacitor storage electrode; and

forming a capacitor plate electrode on an entire surface of the capacitor dielectric film.

5,691,222
METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A CAPACITOR ELECTRODE

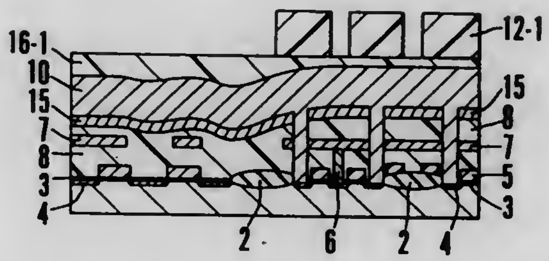
Tadashi Fukase, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 745,849

Claims priority, application Japan, Nov. 10, 1996, 8-292363

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 437—52 **7 Claims**



1. A method of manufacturing a semiconductor integrated circuit device which stores information by storing charges in a capacitor portion formed on a semiconductor substrate, comprising the steps of depositing a conductive film for forming a lower electrode of a storage node capacitor portion on an insulating interlayer film formed with a contact hole for forming a contact that connects said capacitor portion with said substrate, depositing a cap oxide film on said conductive film and planarizing said cap oxide film, applying a resist on said planarized cap oxide film to a uniform thickness and forming a pattern mask of said storage node capacitor portion from said resist, etching said cap oxide film and said conductive film by using said pattern mask as a mask, and forming a lower electrode of said storage node capacitor portion by removing said cap oxide film.

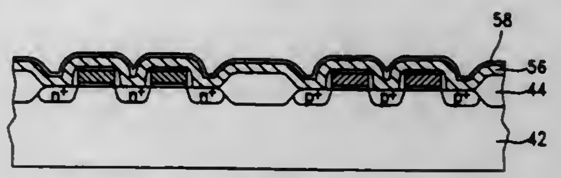
5,691,223
METHOD OF FABRICATING A CAPACITOR OVER A BIT LINE DRAM PROCESS

Saysamone Pittikoun, and Min-Liang Chen, both of Hsinchu, Taiwan, assignors to Mosel Vitelic Inc., Taiwan

Filed Dec. 20, 1996, Ser. No. 772,210

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 437—52 **33 Claims**



1. A method of fabricating a MOS transistor on a substrate, said substrate has an isolation region for isolating, said method comprising the steps of:

forming a gate oxide layer on said substrate;

forming a first polysilicon layer on said gate oxide layer;

forming a silicon nitride layer on said first polysilicon layer for serving as a capped layer;

etching said gate oxide layer, said first polysilicon layer and said silicon nitride layer to form a gate structure;

forming sidewall spacers on the sidewall of said gate structure;

forming a second polysilicon layer on said gate structure, said substrate and said isolation region;

patterning a mask on said second polysilicon layer to define source/drain regions;

forming said source/drain regions using ion implantation through said second polysilicon layer;

forming a tungsten silicon layer on said second polysilicon layer for increasing the conductivity of said second polysilicon;

patterning a first photoresist on said tungsten silicon layer;

etching said tungsten silicon layer and said second polysilicon layer to form a bit line; and

stripping said first photoresist.

5,691,224
METHOD OF MAKING BICMOS CIRCUIT

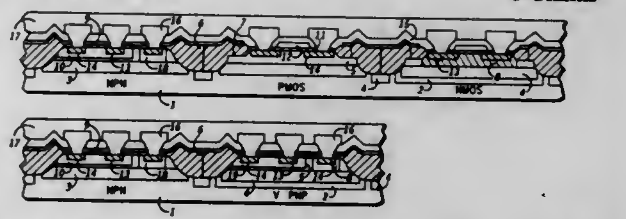
Juergen Foerstner, Mesa, Ariz.; Myriam Combes, Plaisance-du-Touch, France; Ariette Marty-Blavier, Fouzins, France, and Guy Hautekiet, Plaisance-du-Touch, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 25, 1996, Ser. No. 668,655

Claims priority, application France, Jun. 30, 1995, 95 07905

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—56 **8 Claims**



1. A method of manufacturing an integrated circuit having at least one lightly doped buried layer of one of a first conductivity type or a second conductivity type and at least one heavily doped buried layer of the one of the first conductivity type or the second conductivity type, the method comprising the steps of:

providing a substrate;

forming a first doping mask on the substrate, wherein the first doping mask defines at least first and second openings on the substrate where the at least one lightly doped buried layer and the at least one heavily doped buried layer are to be formed;

doping a first portion of the substrate through the first opening with a dopant of a low concentration to form the lightly doped buried layer;

forming a second doping mask on the first opening;

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doping a second portion of the substrate through the second opening with a high concentration of the dopant, whereby the heavily doped buried layer is formed; and

removing the first and second doping masks from the substrate.

5,691,225

METHOD FOR FABRICATING SEMICONDUCTOR DEVICE HAVING CMOS STRUCTURE

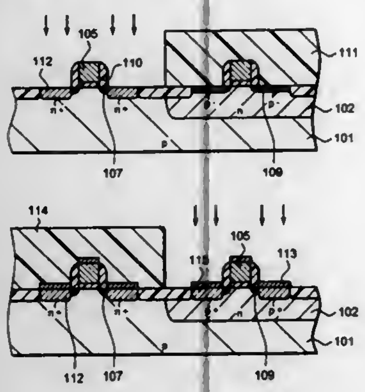
Hitoshi Abiko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 30, 1996, Ser. No. 739,781

Claims priority, application Japan, Oct. 31, 1995, 7-308355

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—57 **15 Claims**



1. A method for fabricating a semiconductor device which has a p-type MOS transistor and an n-type MOS transistor and also has a high melting point metal silicide layer formed at least on a source/drain region of each MOS transistor, said method comprising the steps of:

forming the source/drain region of said n-type MOS transistor through impurity introduction after forming a gate insulating film and a gate electrode of each of the MOS transistors on a silicon substrate;

forming a silicon layer on each of the source/drain regions of said n- and p-type MOS transistors;

forming the source/drain region of said p-type MOS transistor through said silicon layer; and

forming said high melting point metal silicide layer by depositing a high melting point metal over an entire surface and causing a reaction of said high melting point metal with said silicon layer.

5,691,226

METHOD OF MANUFACTURING BICMOS INTEGRATED CIRCUITS

Juergen Foerstner, Mesa, Ariz.; Myriam Combes, Plaisance-du-Touch, France; Arlette Marty-Blavier, Frouzins, France, and Guy Hautekiet, Plaisance-du-Touch, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 25, 1996, Ser. No. 672,522

Claims priority, application France, Jun. 30, 1995, 95 07904

Int. Cl.^{6} H01L *21/8249*

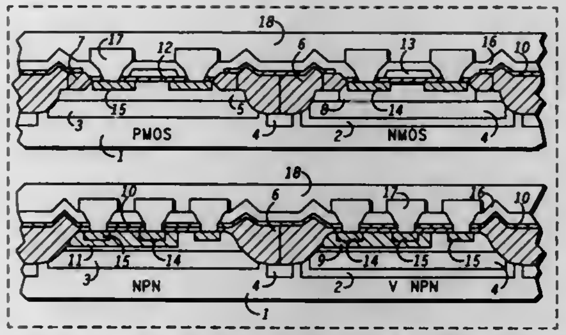
U.S. Cl. 437—59 **4 Claims**

1. A method of manufacturing integrated circuits having both bipolar and CMOS devices on the same chip, the method comprising the steps of:

providing a P– silicon substrate appropriately doped to provide an N– buried layer region for at least one vertical PNP device and to provide N+ buried layer regions for at least one PMOS device and at least one vertical NPN device;

providing a P+ region in the N– buried layer region and in the P-substrate for at least one NMOS device;

providing an N– epitaxial layer over the P+, N+ and N– regions;



providing a P well region in the N– epitaxial layer of the NMOS device extending to the P+ region and in a first part of the N– epitaxial layer of the vertical PNP device extending to the P+ region;

providing an N base region in a second part of the N– epitaxial layer of the vertical PNP device;

providing a P base region in a first part of the N– epitaxial layer of the vertical NPN device;

simultaneously providing:

an N+ region on part of the P base region of the vertical NPN device to form the emitter thereof,

an N+ region on a second part of the N– epitaxial layer of the vertical NPN device to form the collector contact thereof,

N+ regions on first and second parts of the P well region of the NMOS device to form the source and drain thereof, and

an N+ region on the N base region of the vertical PNP device to form the base contact thereof; and

simultaneously providing:

P+ regions on the P well and N base regions of the vertical PNP device to form the collector and emitter contacts thereof,

P+ regions on first and second parts of the N– epitaxial layer of the PMOS device to form the source and drain thereof, and

a P+ region on part of the P base region of the vertical NPN device to form the base contact thereof.

5,691,227

METHOD FOR FORMING CHARGE STORAGE ELECTRODES OF SEMICONDUCTOR DEVICE

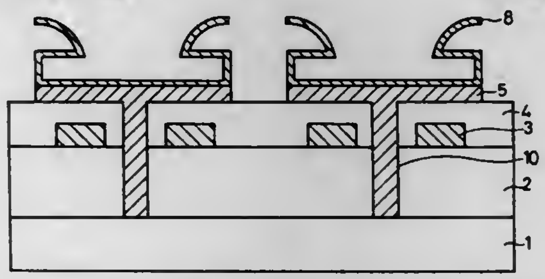
Jeong Kim, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Aug. 9, 1995, Ser. No. 512,772

Claims priority, application Rep. of Korea, Aug. 10, 1994, 94-19688

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 437—60 **2 Claims**



1. A method for forming charge storage electrodes of a semiconductor device, comprising the steps of:

forming an interlayer insulating film over a semiconductor substrate;

removing portions of the interlayer insulating film disposed above portions of the semiconductor substrate, each defined as a charge storage electrode contact, thereby forming charge storage electrode contact holes;

forming a first polysilicon layer over the resulting structure obtained after the formation of the charge storage electrode contact holes such that the first polysilicon layer is in contact with the semiconductor substrate through the charge storage electrode contact holes;

forming a charge storage electrode mask on the first polysilicon layer, thereby protecting portions of the first polysilicon layer respectively filling the charge storage electrode contact holes;

removing portions of the first polysilicon layer not covered with the charge stolage electrode mask, thereby partially exposing the interlayer insulating film;

selectively growing an oxide film over each exposed portion of the interlayer insulating film such that the selectively-grown oxide film is upwardly protruded beyond the upper surface of the charge storage electrode mask;

removing the charge storage electrode mask;

forming a second polysilicon layer over the resulting structure obtained after the removal of the charge storage electrode;

anisotropically full-etching the second polysilicon layer such that the second polysilicon layer has portions separated flom one another, thereby forming charge storage electrodes each constituted by the first polysilicon layer pattern in contact with the semiconductor substrate through each corresponding charge storage electrode contact hole and the second polysilicon layer pattern disposed above the first polysilicon layer pattern while being in contact with the first polysilicon layer pattern, the second polysilicon layer pattern having bent portions.

5,691,228

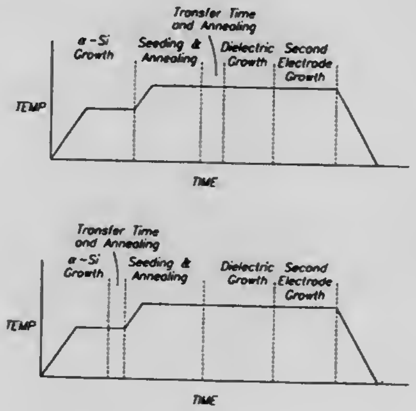
SEMICONDUCTOR PROCESSING METHOD OF MAKING A HEMISPHERICAL GRAIN (HSG) POLYSILICON LAYER

Er-Xang Ping, and Randhir P. S. Thakur, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 18, 1996, Ser. No. 591,227

Int. Cl.^{6} H01L *21/70;27/00*

U.S. Cl. 437—60 **36 Claims**



1. A semiconductor processing method of providing a hemispherical grain polysilicon layer atop a substrate comprising the following steps:

providing a substantially amorphous layer of silicon over a substrate at a selected temperature;

raising the temperature of the substantially amorphous silicon layer to a higher dielectric layer deposition temperature, the temperature raising being effective to transform the amorphous silicon layer into hemispherical grain polysilicon; and

depositing a dielectric layer over the silicon layer at the higher dielectric deposition temperature.

5,691,229

PROCESS OF FABRICATING DYNAMIC RANDOM ACCESS MEMORY CELL HAVING INTER-LEVEL INSULATING STRUCTURE WITHOUT SILICON NITRIDE LAYER BETWEEN ACCESS TRANSISTOR AND STORAGE NODE

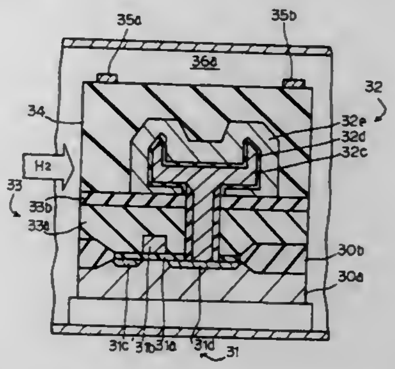
Kenji Okamura, and Masanobu Zenke, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 16, 1997, Ser. No. 784,774

Claims priority, application Japan, Jan. 17, 1996, 8-005498

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—60 **11 Claims**



1. A process of fabricating a semiconductor memory cell, comprising the steps of:

a) fabricating an access transistor on a semiconductor substrate;

b) covering said access transistor with a first insulating layer of a first insulating material;

c) covering said first insulating layer with a second insulating layer of silicon nitride;

d) forming a contact hole in said first and second insulating layers so as to expose an impurity region of said access transistor thereto;

e) forming a column portion of a conductive material on said second insulating layer held in contact through said contact hole to said impurity region and covered with a third insulating layer of a second insulating material;

f) forming a cylindrical portion of said conductive material held in contact with a side surface of said column portion by using a first etchant having a selectivity between said silicon nitride/said second insulating material and said conductive material;

g) etching said second and third insulating layers by using a second etchant having a selectivity between said first insulating material/said conductive material and said second insulating material/silicon nitride for exposing a top surface of said column portion and a lower surface of said column portion;

h) covering exposed surfaces of said column portion and exposed surfaces of said cylindrical portion with a dielectric film structure;

i) covering said dielectric film structure with a cell plate electrode for completing a storage capacitor; and

j) treating said semiconductor memory cell having said access transistor and said storage capacitor with hydrogen for curing crystal defects.

5,691,230

TECHNIQUE FOR PRODUCING SMALL ISLANDS OF SILICON ON INSULATOR

Leonard Forbes, Corvallis, Oreg., assignor to Micron Technology, Inc., Boise, Id.

Filed Sep. 4, 1996, Ser. No. 706,230

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—62 **10 Claims**

1. A method for manufacturing a silicon on insulator substrate, comprising the steps of:

directionally etching a silicon substrate, to form a plurality of trenches between protruding silicon rows;

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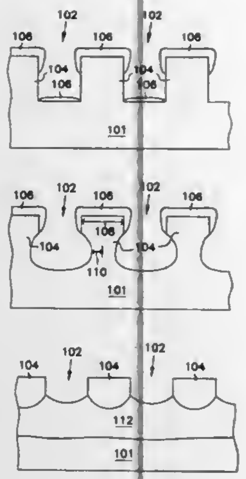


forming a silicon nitride cap on the silicon rows, extending partway down the sides of the trenches;

isotropically etching the trenches, to partially undercut the silicon rows; and

oxidizing the substrate, to fully undercut the silicon rows.

5,691,231
METHOD OF MANUFACTURING SILICON ON INSULATING SUBSTRATE

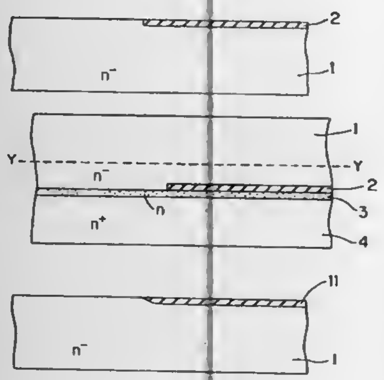
Kenya Kobayashi; Tomohiro Hamajima, and Kensuke Okonogi, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Division of Ser. No. 490,351, Jun. 14, 1995. This application Jan. 7, 1997, Ser. No. 779,226

Claims priority, application Japan, Jun. 16, 1994, 6-156451

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—62 **3 Claims**



1. A Silicon On Insulating substrate manufacturing method comprising:

a first step in which a buried insulation film is formed in portions of one main surface of a first or second silicon single crystal substrate;

a second step in which the surface of the insulation film and the surface of silicon single crystal on the main surface of the silicon single crystal substrate into which said insulation film is buried are made a level surface along the same plane;

a third step in which a polycrystal silicon layer is formed on said leveled surface;

a fourth step in which the surface of said polycrystal silicon layer is leveled by grinding and polishing;

a fifth step in which the leveled surface of said polycrystal silicon layer is bonded together with one main surface of the first or second silicon single crystal substrate into which an insulation film is not buried, and the two substrates are subjected to a heat treatment to unify the two substrates;

and a sixth step in which the other main surface of said first silicon single crystal substrate is ground and polished to a thickness necessary for an SOI layer.

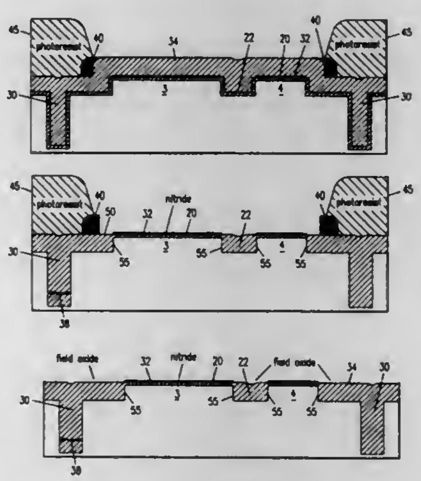
5,691,232
PLANARIZED TRENCH AND FIELD OXIDE ISOLATION SCHEME

Rashid Bashir, Santa Clara; Francois Hebert, Sunnyvale, and Datong Chen, Fremont, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 212,967, Mar. 15, 1994, abandoned. This application Nov. 29, 1995, Ser. No. 563,862

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—67 **15 Claims**



1. An isolation method for separating active regions on a silicon substrate by combining field oxide formation with trench isolation, the isolation method comprising the steps of:

depositing a layer of pad oxide on the substrate;

depositing a layer of nitride on the pad oxide;

defining active and non-active regions on the substrate by using a first photoresist mask;

removing the layer of pad oxide and the layer of nitride from the non-active regions of the substrate;

etching the substrate to a defined depth in the non-active regions;

patterning a low temperature oxide (LTO) hard mask to define one or more trench regions in the non-active regions;

etching the one or more trenches as defined;

removing the LTO layer from the substrate;

depositing an oxide layer, of a defined thickness, over the substrate such that the oxide layer fills the one or more trenches and forms steps as a result of the etching the substrate step;

depositing a layer of polysilicon over the oxide layer;

etching the polysilicon layer to form spacers on the sides of the steps; and

aligning a second photoresist mask on top of the oxide layer having edges over the polysilicon spacers such that a portion of the oxide layer overlying the active area may be etched.

5,691,233
PROCESS OF FORMING CHANNEL STOPPER EXACTLY NESTED IN AREA ASSIGNED TO THICK FIELD OXIDE LAYER

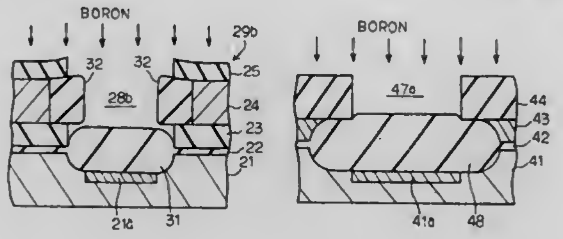
Shigeharu Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 22, 1996, Ser. No. 635,731

Claims priority, application Japan, Apr. 28, 1995, 7-129312

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—69 **10 Claims**



1. A process of forming an electrical isolation in a semiconductor layer of a first oxidizable material, comprising the steps of:

a) forming a laminated structure including at least a first layer of a second oxidizable material and a second layer of an oxygen non-diffusable material over said semiconductor layer;

b) patterning said laminated structure into a protection mask against an oxidation atmosphere having a first opening over a first area of said semiconductor layer assigned to a field oxide layer;

c) exposing said semiconductor layer covered with said protection mask to an oxidation atmosphere so as to grow said field oxide layer on said first area and an obstacle layer on an inner surface of said first layer, said obstacle layer defining a second opening over a second area nested in said first area;

d) ion implanting a dopant impurity through said field oxide layer into said second area by using said protection mask and said obstacle layer as an ion-implantation mask so as to form a channel stopper beneath said field oxide layer; and

e) removing said ion-implantation mask from said semiconductor layer so as to leave said field oxide layer and said channel stopper in said semiconductor layer.

7. A process of forming an electrical isolation in a semiconductor layer of an oxidizable material, comprising the steps of:

a) forming a laminated structure including a first layer of an oxygen non-diffusable material and a second layer of a material different from said oxygen non-diffusable material between said semiconductor layer and said first layer;

b) patterning said laminated structure into an ion-implantation mask having a first opening over a first area of said semiconductor layer assigned to a channel stopper;

c) etching an inner peripheral portion of said second layer exposed to said first opening so as to expand a part of said first opening to a second opening over a second area of said semiconductor layer assigned to a field oxide layer, said first area being nested in said second area;

d) growing said field oxide layer on said second area by exposing said semiconductor layer covered with said ion-implantation mask to an oxidizing atmosphere;

e) ion implanting a dopant impurity through said field oxide layer into said first area so as to form said channel stopper beneath said field oxide layer; and

f) removing said ion-implantation mask from said semiconductor layer so as to leave said field oxide layer and said channel stopper in said semiconductor layer.

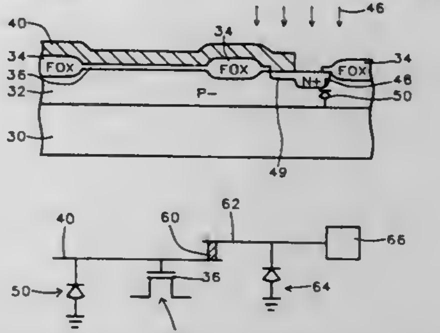
5,691,234
BURIED CONTACT METHOD TO RELEASE PLASMA-INDUCED CHARGING DAMAGE ON DEVICE

Kuan-Cheng Su, Taipei, and Shing-Ren Sheu, Tao-Yuan, both of Taiwan, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Aug. 3, 1995, Ser. No. 511,065

Int. Cl.^{6} H01L *21/28*

U.S. Cl. 437—186 **21 Claims**



1. A method of preventing plasma-induced charging damage during manufacture of an integrated circuit, comprising the steps of:

providing a semiconductor substrate having a first conductivity type;

forming an oxide layer on said semiconductor substrate;

forming a first opening in said oxide layer;

forming a polysilicon layer over said oxide layer and in said first opening;

patterning said polysilicon layer to form a second opening at least partially over said first opening;

forming a diffusion region in said semiconductor substrate, connected to said polysilicon layer through said first opening, having a second conductivity type opposite to said first conductivity type, whereby a buried contact is formed;

connecting said buried contact, through said substrate, to a ground reference; and

further processing in a plasma environment that would normally produce charging damage to said integrated circuit, but whereby said buried contact prevents said charging damage.

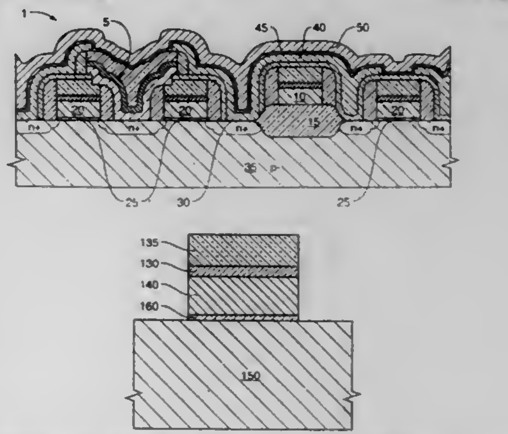
5,691,235
METHOD OF DEPOSITING TUNGSTEN NITRIDE USING A SOURCE GAS COMPRISING SILICON

Scott Meikle, and Trung Doan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 348,646, Nov. 30, 1994, abandoned. This application Jun. 12, 1996, Ser. No. 667,907

Int. Cl.^{6} H01L *21/28*

U.S. Cl. 437—190 **14 Claims**



1. A method for forming a layer overlying a substrate, comprising the following steps:

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- providing the substrate in a chamber;
- introducing a gas comprising nitride into the chamber;
- introducing a gas comprising tungsten into the chamber;
- introducing a gas comprising silicon into the chamber;
- providing conditions sufficient to deposit tungsten nitride; and
- depositing a layer of tungsten nitride comprising silicon to overly the substrate.

5,691,236
METHOD AND APPARATUS FOR PERFORMING CHEMICAL VAPOR DEPOSITION

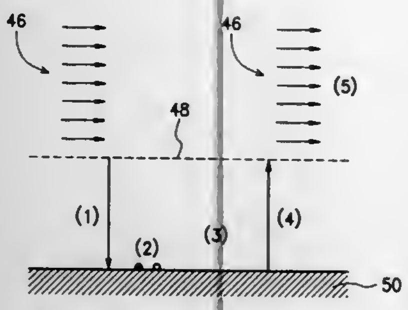
Hsin-Kun Chu, Hsinchu Hsien, Taiwan, assignor to United Microelectronics Corporation, Taiwan

Filed Sep. 6, 1996, Ser. No. 706,699

Claims priority, application Taiwan, Jun. 29, 1996, 85107902

Int. Cl.^{6} H01L *21/443*

U.S. Cl. 437—194 **7 Claims**



1. A method for performing a chemical vapor deposition procedure to deposit an insulating layer over a surface of a silicon wafer having components for integrated circuit devices located thereon, the method comprising the steps of:
- forming a passivation layer over the surface of the silicon wafer and the components located thereon;
- forming a plurality of conductor segments over a surface of the passivation layer;
- heating the silicon wafer, so as to raise the temperature of the conductor segments higher than the temperature of the passivation layer; and
- after said step of heating, performing a chemical vapor deposition on the silicon wafer while the temperature of the conductor segments is higher than the temperature of the passivation layer, to form a substantially flat insulating layer over surfaces of both the conductor segments and the passivation layer.

5,691,237
METHOD FOR FABRICATING SEMICONDUCTOR DEVICE

Yoshiyuki Ohkura; Hideki Harada, and Tadasi Oshima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

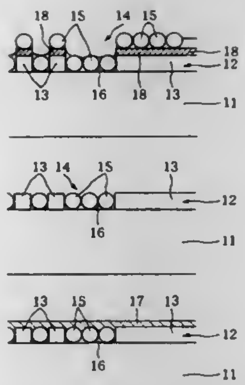
Division of Ser. No. 278,953, Jul. 22, 1994, Pat. No. 5,448,111. This application May 31, 1995, Ser. No. 455,521

Claims priority, application Japan, Sep. 20, 1993, 05-233947

Int. Cl.^{6} H01L *21/3105*

U.S. Cl. 437—195 **13 Claims**

1. A method for fabricating a semiconductor device comprising:
- a granular insulators laying step of laying granular insulators over an upper surface of a semiconductor substrate to provide the granular insulators in concavities in the upper surface of the semiconductor substrate; and
- a granular insulators removing step of removing the granular insulators provided on convexities on the upper surface of the semiconductor substrate;



- the granular insulators having a particle size between 0.3 to 1.5 times the height of the concavities.

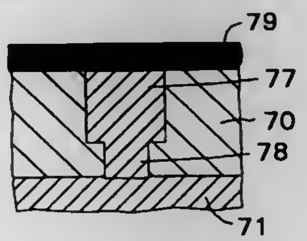
5,691,238
SUBTRACTIVE DUAL DAMASCENE

Steven Avanzino, Cupertino; Subhash Gupta, San Jose; Rich Klein, Mountain View; Scott D. Luning, Menlo Park, and Ming-Ren Lin, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 478,321

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—195 **19 Claims**



1. The method of fabricating an interconnecting conductive line and at least one conductive via in a layer of insulating material having an upper surface and an upper portion comprising the steps of:
- forming a conductive line opening in and below said upper portion;
- filling said conductive line opening with a conductive metal to provide an upper surface of the conductive metal in essentially the same plane as the upper surface of the insulating material;
- forming a via mask pattern over said metal filled conductive line and on the upper surface of the insulating material to leave the via mask pattern covering the width of the upper surface of said conductive material;
- removing the upper portion of said conductive metal in the upper portion of the insulating material not covered with the via mask pattern to form an opening in the insulating material;
- filling said opening in the upper portion of said insulating material with an insulating material.

5,691,239
METHOD FOR FABRICATING AN ELECTRICAL CONNECT ABOVE AN INTEGRATED CIRCUIT

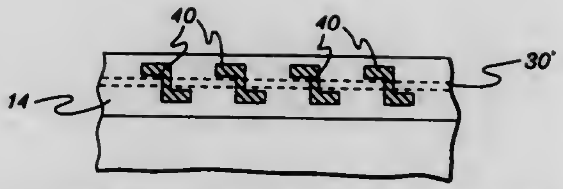
Mark Charles Hakey, Milton; Steven John Holmes, Burlington, and John Michael Wursthorn, Underhill Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 344,315, Nov. 22, 1994, Pat. No. 5,532,518. This application Feb. 13, 1996, Ser. No. 600,620

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—195 **7 Claims**

1. A method for fabricating an electrical connect above an integrated circuit, said method comprising the steps of:



- (a) forming an insulator layer above said integrated circuit;
- (b) forming an elongate opening in said insulator layer, said elongate opening having a first portion with a first transverse cross-sectional configuration and a second portion with a second transverse cross-sectional configuration, said first portion residing above an active region of said integrated circuit and said second portion residing above a kerf region of said integrated circuit; and
- (c) forming a unitary, elongate conductor within said elongate opening in said insulator layer, said unitary, elongate conductor being formed of a single material comprising a conductive material of substantially constant thickness and having a first conductor portion formed in said first portion of said elongate channel over said active region of said integrated circuit and a second conductor portion formed in said second portion of said elongate channel over said kerf region of the integrated circuit, said first conductor portion having said first transverse cross-sectional configuration of said first portion of said elongate channel, said second conductor portion having a third transverse cross-sectional configuration formed from a part of said second transverse cross-sectional configuration of said second portion of said elongate channel, wherein said unitary, elongate conductor comprises said electrical connect and said second conductor portion comprises a vertically-enhanced portion having a transverse cross-sectional configuration with a vertical height greater than a vertical height of the first transverse cross-sectional configuration of the first conductor portion to facilitate electrical connection to said first conductor portion through said second conductor portion.

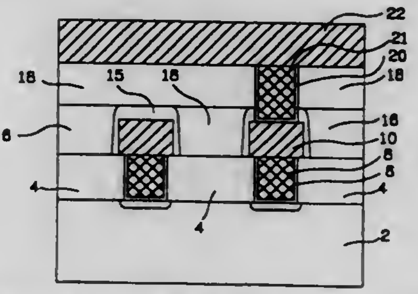
5,691,240
METHOD FOR FORMING BLANKET PLANARIZATION OF THE MULTILEVEL INTERCONNECTION

Ching-Nan Yang, Hsinchu, Taiwan, assignor to Mosel Vitelic Inc., Hsinchu, Taiwan

Filed Nov. 20, 1996, Ser. No. 754,602

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—195 **13 Claims**



1. A method for forming blanket planarization of a multilevel interconnected device, comprising the steps of:
- forming a first dielectric layer on a MOS device in a semiconductor substrate;
- forming a first connect window by etching a portion of said first dielectric layer;
- forming a first metal nitride as an adhesion layer on said first dielectric layer and coating on the surface of said first connect window;
- forming a first tungsten layer on said first metal nitride;
- back-etching said first tungsten layer to form a first tungsten plug;
- forming a first interconnection layer on said first dielectric layer and said first tungsten plug;
- forming a first silicon nitride layer on said first interconnection layer;
- forming a metal pattern by etching said first silicon nitride layer and said first interconnection layer;
- forming a second silicon nitride layer on said metal pattern and said first dielectric layer;
- forming a spacer by anisotropically etching said second silicon nitride layer to enclose said metal pattern;
- forming a silicon dioxide layer on said first dielectric layer by LPD-SiO_2 selective deposition technique, said LPD-SiO_2 being not deposited on silicon nitride to achieve multilevel interconnection;
- forming a second dielectric layer on said silicon dioxide layer and said metal pattern;
- forming a second connect window by etching a portion of said second dielectric layer;
- forming a second metal nitride as an adhesion layer on said second dielectric layer, thereby coating on the surface of said second connect window;
- forming a second tungsten layer on said second metal nitride;
- back-etching said second tungsten layer to form a second tungsten plug; and
- forming a second interconnection layer on said second dielectric layer and said second tungsten plug.

5,691,241
METHOD FOR MAKING PLURALITY OF LEADFRAMES HAVING GROOVES CONTAINING ISLAND AND INNER LEADS

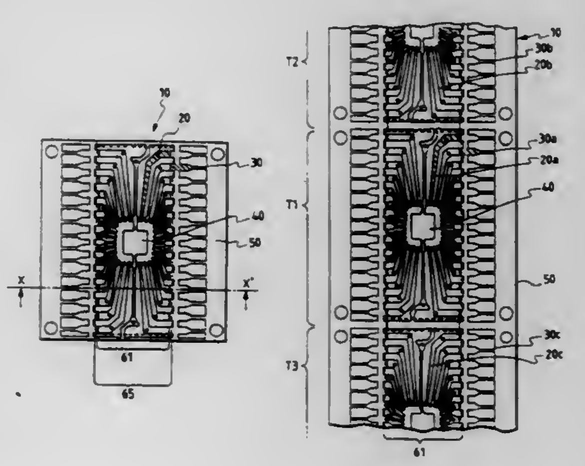
Shibata Kazutaka, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Division of Ser. No. 208,781, Mar. 9, 1994, Pat. No. 5,451,813, which is a continuation of Ser. No. 902,714, Jun. 23, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 383,573

Claims priority, application Japan, Sep. 5, 1991, 3-254595; Sep. 7, 1991, 3-255691

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 437—206 **6 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:
- forming a plurality of lead frames, each having an island portion, inner lead portions and outer lead portions, the outer lead portions of each lead frame adjoining and being directly connected to corresponding outer lead portions of an adjacent lead frame; and
- forming a groove within each lead frame containing said island portion and inner lead portions of the lead frame.

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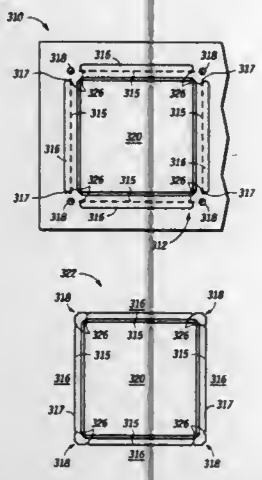
5,691,242
METHOD FOR MAKING AN ELECTRONIC COMPONENT HAVING AN ORGANIC SUBSTRATE

Victor K. Nomi, Round Rock; John R. Pastore, Leander, and Charles G. Bigler, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1996, Ser. No. 606,981
Int. Cl.^{6} H01L *21/60*
U.S. Cl. 437—206 **28 Claims**



1. A method for making an electronic component comprising the steps of:

providing an organic substrate having a device site, the device site having a plurality of conductive traces and having a slot formed along each of four sides, wherein an inner edge of each slot defines an outer dimension of a final package body, wherein each slot has two ends, and wherein a feature is formed in the organic substrate and positioned along the inner edge near each of the two ends of each slot;

mounting an electronic device within the device site;

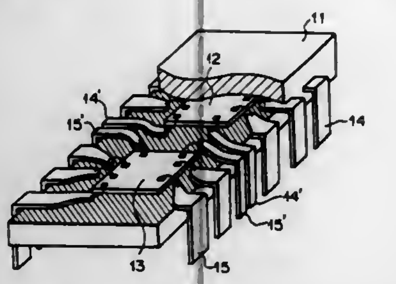
electrically coupling the electronic device to the plurality of conductive traces; and

excising the final package body from the organic substrate, wherein the feature prevents damage to an outer edge of the final package body during excising.

5,691,243
PROCESS FOR MANUFACTURING COMPOSITE SEMICONDUCTOR DEVICE

Kazunori Kishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 15, 1996, Ser. No. 647,725
Claims priority, application Japan, May 15, 1996, 7-139892
Int. Cl.^{6} H01L *21/60*
U.S. Cl. 437—209 **6 Claims**



1. A process for manufacturing a composite semiconductor device having a plurality of semiconductor chips, a package receiving said semiconductor chips and a plurality of leads, each of said leads comprising an inner portion positioned within said package and an outer portion extending outside said package, each of said semiconductor chips having an upper surface on which a plurality of electrodes are formed, the process comprising:

a first step of arranging said plurality of semiconductor chips horizontally and arranging said leads for each of said semiconductor chips such that a gap is formed between a lead of a first of said semiconductor chips and a lead of a second of said semiconductor chips;

a second step of electrically connecting each of said electrodes to an inner portion of each of said leads;

a third step of packaging said semiconductor chips and said inner portions of said leads within said package; and

a fourth step of filling said gap with an electrically conductive member to form a composite lead which comprises said lead of said first semiconductor chip, said lead of said second semiconductor chip and said electrically conductive member.

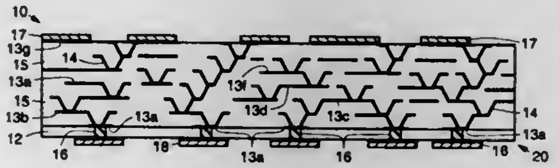
5,691,244

Patent Not Issued For This Number

5,691,245
METHODS OF FORMING TWO-SIDED HDMI INTERCONNECT STRUCTURES

Gabriel G. Bakhit, Huntington Beach; Vincent A. Pillai, Irvine; George Averkiou, Upland, and Philip A. Trask, Laguna Hills, all of Calif., assignors to HE Holdings, Inc., Los Angeles, Calif.

Filed Oct. 28, 1996, Ser. No. 738,558
Int. Cl.^{6} H01L *21/60*
U.S. Cl. 437—209 **21 Claims**



1. A method of forming a two-sided high density multichip interconnect structure, said method comprising the steps of:

providing a carrier;

forming a release layer on the carrier;

fabricating a two-sided flexible high density multilayer interconnect structure on the release layer that has a bottom set of bond pads;

temporarily bonding the top surface of the two-sided flexible HDMI structure to an inert flat plate;

releasing the two-sided flexible high density multilayer interconnect structure from the carrier;

forming vias through the release layer to expose the bottom set of bond pads; and

depositing additional metal in the vias and on the exposed bottom surface of the carrier to form a bottom set of contact pads for the two-sided flexible HDMI structure that contact the bottom set of bond pads.

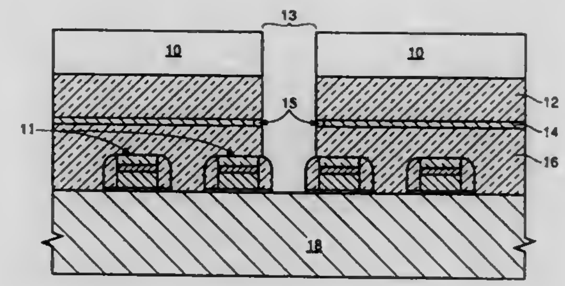
5,691,246
IN SITU ETCH PROCESS FOR INSULATING AND CONDUCTIVE MATERIALS

David S. Becker, and Guy T. Blalock, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed May 13, 1993, Ser. No. 60,902
Int. Cl.^{6} H01L *21/70*
U.S. Cl. 437—225 **7 Claims**

1. A method for etching an insulator/conductor/insulator layered sandwich structure in a single chamber, said method comprising steps of:

disposing said layered sandwich structure in a reactor chamber;



establishing a first atmosphere in said reactor chamber to etch said first insulator and form a profile therein;

establishing a second atmosphere in said reactor chamber, said second atmosphere including provision of an isotropic etch component, to etch said conductor and remove portions of the conductor to form an undercut relative said profile of said first insulator; and

establishing a third atmosphere in said reactor chamber to etch said second insulator and form a profile therein;

wherein said method further comprises a step of establishing another atmosphere in said reactor chamber for providing a substantially anistropic etch, and anisotropically etching a preliminary portion of said conductive layer before the establishment of said second atmosphere.

5,691,247
METHOD FOR DEPOSITING A FLOW FILL LAYER ON AN INTEGRATED CIRCUIT WAFER

Zmira Lavie, Zichron Yaakov; Aviad Roth, Yishuv Adi; Jeff Levy, Moshav Netofah, and Itzhak Edrei, Haifa, all of Israel, assignors to Tower Semiconductor Ltd., Migdal Haemek, Israel

Filed Dec. 19, 1996, Ser. No. 769,853
Int. Cl.^{6} A01L *21/316*
U.S. Cl. 437—225 **5 Claims**

1. In a process for depositing a flow fill layer on an integrated circuit wafer, the flow fill layer including a cap layer for preventing crack formation during the evaporation of water, an improved method for depositing the cap layer to a final thickness, comprising the steps of:

(a) depositing a first thickness of the cap layer on the wafer;

(b) evaporating at least a portion of the water via said first thickness of the cap layer subsequent to depositing said first thickness; and

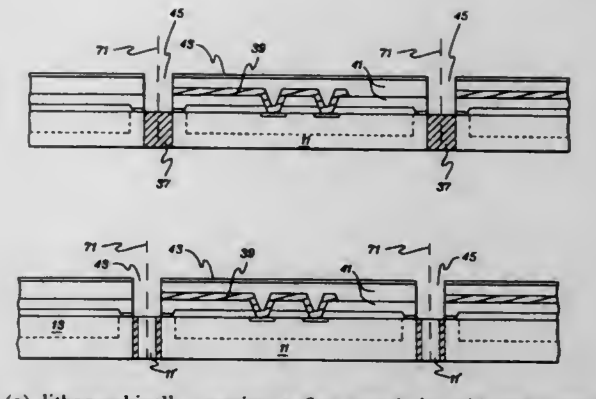
(c) subsequent to said evaporation, depositing a second thickness of the cap layer on the wafer, wherein said first and second thicknesses combined equal said final thickness.

5,691,248
METHODS FOR PRECISE DEFINITION OF INTEGRATED CIRCUIT CHIP EDGES

John Edward Cronin, Milton; Wayne John Howell, Williston; Howard Leo Kalter; Patricia Ellen Marmillion, both of Colchester; Anthony Palagonia, Underhill; Bernadette Ann Pierson, South Hero, and Dennis Arthur Schmidt, South Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 26, 1995, Ser. No. 507,186
Int. Cl.^{6} H01L *21/302*
U.S. Cl. 437—227 **23 Claims**

1. A method for use in defining at least one edge of an integrated circuit ("IC") chip, said IC chip comprising part of a wafer having a first planar main surface and a second planar main surface, a portion of said second planar main surface of said wafer being parallel to a planar main surface of said IC chip, said method comprising the steps of:



(a) lithographically creating a first trench in said wafer that intersects said first planar main surface of said wafer, said first trench having a bottom;

(b) filling said first trench with an insulating material;

(c) forming a transfer metal layer above said first planar main surface of said wafer, said transfer metal layer being mechanically and electrically coupled to said IC chip, said transfer metal layer extending over said trench;

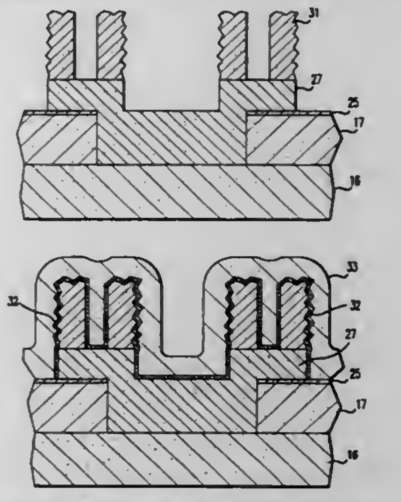
(d) forming a second trench through said transfer metal layer and coincident with said first trench; and

(e) polishing said planar main surface of said IC chip toward said bottom of said first trench and toward said first planar main surface of said wafer to thin said IC chip such that said first trench and said second trench define the at least one edge of the IC chip and such that an end of a transfer metal lead of the transfer metal layer is aligned with the at least one edge of the IC chip.

5,691,249
METHOD FOR FABRICATING POLYCRYSTALLINE SILICON HAVING MICRO ROUGHNESS ON THE SURFACE

Hirohito Watanabe, and Toru Tatsumi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 177,995, Jan. 6, 1994, which is a division of Ser. No. 672,073, Mar. 19, 1991, Pat. No. 5,366,917. This application May 23, 1995, Ser. No. 447,561
Claims priority, application Japan, Mar. 20, 1990, 2-72462; Sep. 19, 1990, 2-249154; Nov. 28, 1990, 2-327069
Int. Cl.^{6} H01L *21/205*
U.S. Cl. 437—233 **20 Claims**



1. A method for fabricating a semiconductor device having a memory cell which includes a capacitor, said capacitor having a first electrode, a second electrode and a dielectric layer intervening between said first and second electrodes, said method comprising the steps of:

depositing an amorphous silicon layer on a substrate;

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performing an annealing process to form a plurality of crystalline nuclei on said amorphous silicon layer and grow said crystalline nuclei to thereby form a plurality of polycrystalline silicon grains, said amorphous silicon layer being thereby converted into a silicon layer having an uneven surface and serving said first electrode of said capacitor;
forming a dielectric film on the uneven surface of said silicon layer, said dielectric film serving as said dielectric layer of said capacitor; and
forming a conductive layer on said dielectric film, said conductive layer serving as said second electrode of said capacitor.

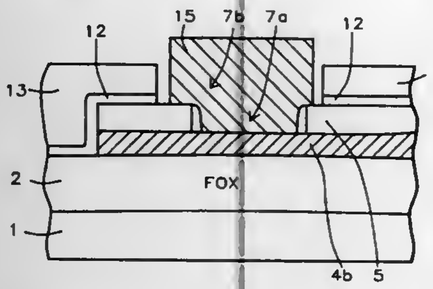
5,691,250
METHOD OF FORMING A METAL CONTACT TO A NOVEL POLYSILICON CONTACT EXTENSION

Bo-Jeih Cheng; Chang Fu, both of Hsin-Chu, and Jen Song Liu, Taipei, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd, Hsin-Chu, Taiwan

Filed Aug. 29, 1996, Ser. No. 705,452

Int. Cl.^{6} H01L *21/324*

U.S. Cl. 437—247 **18 Claims**



1. A method of forming a metal contact structure, to a polysilicon contact extension structure, for a MOSFET device, on a semiconductor substrate, comprising the steps of:
growing a thick insulator layer on said semiconductor substrate;
patterning said thick insulator layer, to form field oxide regions, on said semiconductor substrate;
depositing a polysilicon layer on said semiconductor substrate, including deposition on said field oxide regions;
doping of said polysilicon layer;
deposition of a first dielectric layer on said polysilicon layer;
patterning to form a first hole opening in said first dielectric layer, to underlying said polysilicon layer;
patterning of said polysilicon layer to form a polysilicon contact extension structure, on said field oxide region;
depositing a second dielectric layer on top surface of said first dielectric layer, on sides of said first hole opening, in said first dielectric layer, and on top surface of said polysilicon contact extension structure, in said first hole opening;
depositing a third dielectric layer on said second dielectric layer;
annealing to reflow said third dielectric layer;
forming a second hole opening, in said third dielectric layer, and in said second dielectric layer, larger in diameter then said first hole opening, exposing said first hole opening, and top surface of said polysilicon contact extension structure, in said first hole opening;
deposition of a metal layer; and
patterning of said metal layer to form a metal contact structure, larger in diameter then said first hole opening, and completely covering top surface of underlying said polysilicon contact extension structure, exposed in said first hole opening.

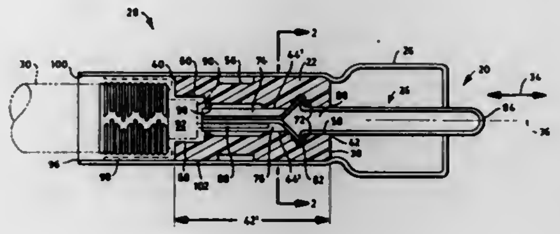
5,691,251
CONNECTOR KIT, AND CONNECTOR ASSEMBLY

Albert D. Skopic, York, Pa., assignor to Osram Sylvania Inc., Danvers, Mass.

Filed Mar. 13, 1996, Ser. No. 615,666

Int. Cl.^{6} H01R *13/00*

U.S. Cl. 439—578 **14 Claims**



1. A connector assembly, comprising:
an insulative bushing, said bushing comprising a first bushing half and a separable second bushing half and extending in a longitudinal direction relative to a longitudinal axis of said insulative bushing from a first bushing end to a second bushing end, said insulative bushing comprising a bore extending in said longitudinal direction from said first bushing end to said second bushing end, said bore comprising a bore surface, said bore surface comprising at least one first abutment region, each of said bushing halves comprising a base, a first semi-circular recess extending into said base at said first bushing end, a second semi-circular recess extending into said base at said second bushing end, and a semi-circular abutment recess extending into said base at a position between said first semi-circular recess and said second semi-circular recess, a base of said first bushing half being contiguous with a base of said second bushing half, each recess of said first bushing half being aligned with a similar recess of said second bushing half to form a respective length of said bore, said at least one first abutment region being positioned in said respective length of said bore formed by aligned semi-circular abutment recesses, each of said bushing halves further comprising a third semi-circular recess extending into said base between said first semi-circular recess and said semi-circular abutment recess, said third semi-circular recess of said first bushing half being aligned with said third semi-circular recess of said second bushing half to form a respective length of said bore;
a contact extending into said bore from said first bushing end towards said second bushing end, said contact comprising at least one second abutment region positioned at an outer surface of said contact, said at least one second abutment region being positioned adjacent said at least one first abutment region to prevent turning of said contact around a longitudinal axis of said contact, said contact comprising a flange extending from said outer surface of said contact, said flange being positioned between said at least one second abutment region and an end of said contact extending out of said bore, a segment of said contact extending into said respective length of said bore formed by aligned first semi-circular recesses, said flange extending into length of said bore formed by aligned third semi-circular recesses, and said at least one second abutment region extending into said respective length of said bore formed by aligned abutment recesses;
a coaxial cable having a length of central conductor extending from an end of said coaxial cable, said length of central conductor extending into said bore from said second bushing end towards said first bushing end being electrically and mechanically connected to said contact; and
a conductive connector shell extending in said longitudinal direction, said insulative bushing extending into said conductive connector shell.

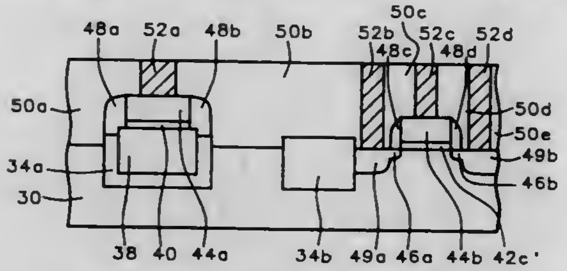
5,691,252
METHOD OF MAKING LOW PROFILE SHALLOW TRENCH DOUBLE POLYSILICON CAPACITOR

Yang Pan, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing PTE LTD, Singapore, Singapore

Continuation of Ser. No. 523,340, Sep. 5, 1995, abandoned. This application May 19, 1997, Ser. No. 858,290

Int. Cl.^{6} H01L *21/256*

U.S. Cl. 437—919 **14 Claims**



1. A method for forming a planar polysilicon capacitor for use within an integrated circuit comprising:
providing a semiconductor substrate having a planar surface;
forming within the planar surface of the semiconductor substrate a deep trench;
forming within the deep trench a dielectric material;
forming within the dielectric material within the deep trench a shallow trench;
forming within the shallow trench a first polysilicon capacitor plate, the first polysilicon capacitor plate having an upper surface opposite the shallow trench;
forming upon the first polysilicon capacitor plate a polysilicon capacitor dielectric layer; and
forming upon the polysilicon capacitor dielectric layer a second polysilicon capacitor plate, the second polysilicon capacitor plate having an upper surface opposite the polysilicon capacitor dielectric layer where the upper surface of the first polysilicon capacitor plate is substantially planar with the planar surface of the semiconductor substrate and where the upper surface of the second polysilicon capacitor plate is above the planar surface of the semiconductor substrate.

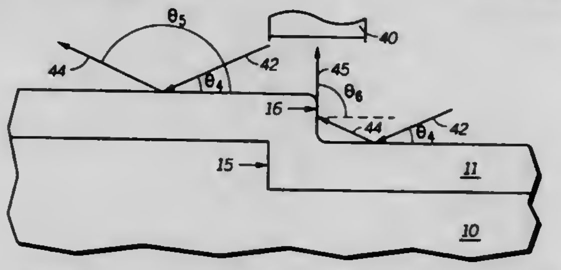
5,691,253
PROCESS FOR POLISHING AND ANALYZING AN EXPOSED SURFACE OF A PATTERNED SEMICONDUCTOR

Thomas S. Kobayashi, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 253,013, Jun. 2, 1994, Pat. No. 5,461,007. This application Jun. 5, 1995, Ser. No. 462,477

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 438—690 **25 Claims**



1. A process for polishing a layer over a patterned semiconductor substrate comprising the steps of:
forming the layer over the patterned semiconductor substrate, wherein the layer has a first exposed surface that lies at a first elevation and a second elevation that is different from the first elevation and has a first edge that lies between the first and second elevations;
polishing the layer to form a second exposed surface; and
analyzing the second exposed surface with a radiation beam wherein the step of polishing is repeated if the radiation beam is reflected by the first edge.

5,691,254
ENAMEL FRIT COMPOSITION FOR A LOW-EXPANSION CRYSTALLIZED GLASS AND ENAMEL-COATED LOW-EXPANSION CRYSTALLIZED GLASS PLATE USING THE SAME

Akihiko Sakamoto; Kiyoshi Katagi, and Masayuki Ninomiya, all of c/o Nippon Electric Glass Co., Ltd., 7-1, Seiran 2-chome, Otsu-shi, Shiga-ken, Japan

Filed Nov. 26, 1996, Ser. No. 757,065

Claims priority, application Japan, Nov. 30, 1995, 7-337742; Feb. 27, 1996, 8-067289

Int. Cl.^{6} C03C *8/00;8/06;8/14*

U.S. Cl. 501—17 **5 Claims**

1. An enamel-coated crystallized glass plate comprising:
a crystallized glass plate coated with an enamel coating consisting essentially of 40–98 wt. % glass, 1–55 wt. % coloring pigment, and 0–54% filler;
said glass consisting essentially of, by weight, 55–72% SiO_2, 4–8% Al_2O_3, 14–22% B_2O_3, 2–4% BaO, 5.1–15% Na_2O, 0–2% Li_2O, 0–2.8% K_2O, and 0–2% F_2, and said glass plate consisting essentially of, by weight, 60–75% SiO_2, 15–25% Al_2O_3, 2.5–5% Li_2O, 0–3% MgO, 0–3% ZnO, 0–3% BaO, 1–7% TiO_2, 0–3% ZrO_2, 0–3% P_2O_5, 0–2% Na_2O, 0–1% K_2O, 0–0.5% V_2O_5, 0–0.5% Fe_2O_3, 0–0.5% NiO, and 0–0.2% CoO, and contains precipitated solid solution crystals of β-quartz.

5,691,255
MAN-MADE VITREOUS FIBER WOOL

Soren Lund Jensen, Holte, and Vermund Rust Christensen, Roskilde, both of Denmark, assignors to Rockwool International, Denmark

PCT No. PCT/EP95/01414, § 371 Date Apr. 8, 1996, § 102(e) Date Apr. 8, 1996, PCT Pub. No. WO95/29135, PCT Pub. Date Nov. 2, 1995

Continuation-in-part of Ser. No. 525,590, Sep. 8, 1995, Pat. No. 5,614,452. This PCT application Apr. 12, 1995, Ser. No. 569,144

Claims priority, application WIPO, Apr. 19, 1994, PCT/EP94/01215; United Kingdom, Dec. 30, 1994, 9426429

Int. Cl.^{6} C03C *13/06;* **C03B** *37/04*

U.S. Cl. 501—36 **16 Claims**

1. Mineral wool formed of MMV fibres having a composition, expressed as oxides by weight of total composition, which comprises

SiO_2 45 to 60%
Al_2O_3 0.5 to 4%
CaO 10 to 30%
MgO 7 to 20%
FeO 1 to 9%
Na_2O+K20 0 to 6%
Na_2O 0 to 4%
K_2O 0 to 2%
TiO_2 0.1 to 2%

and which comprises both P_2O_5 and B_2O_3.

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5,691,256

GLASS COMPOSITION FOR MAGNETIC DISK SUBSTRATES AND MAGNETIC DISK SUBSTRATE

Tomoyuki Taguchi; Hideki Kawai; Tohru Ohara; Ikuo Kuriyama, and Hajimu Wakabayashi, all of Hyogo, Japan, assignors to Yamamura Glass Co., Ltd., Hyogo, Japan

Filed Dec. 23, 1996, Ser. No. 773,260

Claims priority, application Japan, Dec. 28, 1995, 7-353194; Dec. 10, 1996, 8-346787

Int. Cl.^{6} C03C *3/097;10/12;10/04*

U.S. Cl. 501—63 **6 Claims**

1. A glass composition for magnetic disk substrates comprising, expressed in terms of weight percent on the oxide basis:

from 66 to 80% SiO_2,
from 5 to 15% Al_2O_3,
from 3 to 8.5% Li_2O,
from 0 to 3% Na_2O,
from 0 to 3% K_2O,
from 0.5 to 8% TiO_2,
from 3.5 to 8% ZrO_2,
from 0.5 to 3% P_2O_5,
from 0 to 2% Sb_2O_3, and
from 0 to 2% As_2O_3,

wherein the total of the contents of Li_2O, Na_2O and K_2O is from 3 to 10%, and having a theoretical optical basicity of 0.548 or less.

5,691,257

LOW DENSITY CELLULATED BODY AND METHOD

Hermann L. Rittler, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jun. 13, 1996, Ser. No. 663,432

Int. Cl.^{6} C04B *38/02;38/10*

U.S. Cl. 501—84 **16 Claims**

1. A cellulated inorganic body having a bulk density less than 0.1 gm/cc and being resistant to aqueous and chemical attack, the cells being gas- or vacuum-filled, predominantly closed, and dispersed in a crystalline matrix.

5,691,258

TWO PHASE HFB_2-SIB_4 MATERIAL

Eric J. Wuchina, Wheaton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Wasington, D.C.

Filed Jun. 24, 1996, Ser. No. 669,673

Int. Cl.^{6} C04B *35/58*

U.S. Cl. 501—96 **20 Claims**

1. A two phase HfB_2—SiB_4 ceramic material comprising a HfB_2 phase and a SiB_4 phase wherein the material comprises from more than zero to less than 100 mole percent HfB_2 with the remainder of the material being SiB_4.

5,691,259

PROCESS OF MAKING A SELF SINTERING CERAMIC COMPOSITION

Clifford E. Couture; Paul A. Schumacher, both of St. Francis, and Orville C. Clemmons, Sussex, all of Wis., assignors to Fiber Ceramics, Inc., Cudahy, Wis.

Filed Nov. 8, 1996, Ser. No. 745,783

Int. Cl.^{6} C04B *35/80*

U.S. Cl. 501—95 **9 Claims**

1. A process for providing gating systems for molten metal casting comprising

- forming an aqueous slurry which comprises a mixture of inorganic fibers, particles of a ceramic material stable to temperatures exceeding 2000° F., particles of a ceramic material which sinter at temperatures below 2000° F., and a clay-containing binder,
- vacuum forming said slurry into a selected shape,
- hardening said shape by drying at a temperature approximately 300° to 600° F.,
- cutting said shape to form a constituent of a gating system in a metal casting mold, and,
- pouring molten metal through said gating system in direct contact with said shape, thereby causing said shape to be sintered into a hardened ceramic material.

5,691,260

CUBIC SYSTEM BORON NITRIDE SINTERED BODY FOR A CUTTING TOOL

Masaharu Suzuki, Machida, and Teruyoshi Tanase, Gifu-ken, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, and Mitsubishi Materials Corporation, both of Tokyo, Japan

Continuation of Ser. No. 366,454, Dec. 30, 1994, abandoned. This application Jul. 30, 1996, Ser. No. 689,007

Int. Cl.^{6} C04B *35/5831;* **B24D** *3/02*

U.S. Cl. 501—96 **13 Claims**

1. A sintered body, comprising a cubic system boron nitride sintered body having a purity of at least 99 wt % prepared by a direct conversion method, wherein the average size of primary crystal grains constructing the sintered body is 0.1 μm to 3.0 μm,

- said purity is the purity determined by X-ray diffraction, and chemical analyses or fluorescence X-ray analyses, and
- a chip blank cut from said sintered body has a wear width of at most 0.205 mm without chipping, cracking or breaking, after a cutting test using FC25 cast iron, TNGN332 chip shape, a cutting speed of 700 m/min, a feeding of 0.1 mm/rev, a cutting depth of 0.1 mm and a cutting time of 60 min.

5,691,261

SILICON NITRIDE CERAMIC

Akira Takahashi; Masaaki Masuda, both of Nagoya, and Keiichiro Watanabe, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 437,216, May 8, 1995, abandoned, which is a continuation of Ser. No. 179,685, Jan. 11, 1994, abandoned. This application Jan. 22, 1996, Ser. No. 589,171

Claims priority, application Japan, Jan. 22, 1993, 5-009481

Int. Cl.^{6} C04B *35/587*

U.S. Cl. 501—97 **7 Claims**

1. A silicon nitride ceramic comprising silicon nitride and a rare earth compound, wherein the ratio of (1) the transverse rupture strength, at room temperature, of a fired surface used as a tensile surface to (2) the transverse rupture strength, at room temperature, of a worked surface used as a tensile surface subjected to working so as to have a surface roughness of R_{max} 0.8 μm or less is 0.83 or more and wherein pores on the fired surface each have a size of 50 μm×50 μm or smaller.

5,691,262

REGENERATION OF CATALYSTS USED IN OXIDATIVE DEHYDROGENATION OF ALKYLAROMATICS AND PARAFFINS

Alfred Hagemeyer; Otto Watzenberger, both of Ludwigshafen, and Axel Deimling, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 12, 1995, Ser. No. 542,185

Claims priority, application Germany, Oct. 18, 1994, 44 37 252.3

Int. Cl.^{6} B01J *38/12;38/32*

U.S. Cl. 502—38 **6 Claims**

1. A regenerative process for the preparation of olefinically unsaturated compounds by oxidation of selectively oxidizable hydrocarbons at a temperature T_{react} over oxygen carrier acting as catalyst, in the absence of molecular oxygen, alternating (in repeated cycles) with regeneration of the spent oxygen carrier with a gaseous molecular oxidizing agent, characterized by the following steps:

- the spent (reduced) catalyst is cooled, prior to the introduction of the regenerative gas either still in the presence of the reaction mixture having a reducing action, or under a blanket of inert gas, to a temperature T_{reg}, which is below the temperature of the reaction T_{react};
- regeneration is started at temperature T_{reg} by the introduction of the oxidizing agents, regeneration being controlled in such a manner that the highest temperature occurring during regeneration does not exceed the temperature of reaction $T_{react,0}$ at which oxidation/dehydrogenation is commenced; and
- following the removal of the oxidizing environment, the regenerated catalyst is heated to the initial reaction temperature $T_{react,0}$ and only then is the hydrocarbon (educt) to be oxidized introduced.

5,691,263

AMORPHOUS PEROVSKITE CATALYSTS FOR NITROGEN OXIDE REDUCTION AND METHODS OF PREPARING THE SAME

Sang Un Park; Sang Ho Lee; Kyung Mi Kim; Jong San Jang, all of Taejun, and Jong Hae Lee, Seoul, all of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Taejun, Rep. of Korea

Filed Aug. 28, 1996, Ser. No. 702,249

Claims priority, application Rep. of Korea, Sep. 5, 1995, 95-28862

Int. Cl.^{6} B01J *29/068*

U.S. Cl. 502—66 **16 Claims**

1. A process of preparing an amorphous perovskite structure catalyst that is represented by the following formula:

$$(M^1_aO_x.M^2_{1-a}O_y)(M^3_bO_z.M^4_{1-b}O_w)/Sup$$

wherein M^1 and M^2, independently of each other, are selected from the group consisting of the lanthanide metals, the alkali metals, and the alkaline earth metals, M_3 and M_4, independently of each other, are selected from the group consisting of the transition metals and the platinum metals, a and b are from 0 to 1, x, y, z and w are determined stoichiometrically on the values of a and b, the ratio of $[M^1+M^2]$ to $[M^3+M^4]$ is 0.1~3.0:1.0, and Sup is a carrier material,

said process comprising the steps of:

- dissolving completely at least two metal salt solutions of metals, M^1, M^2, M^3 and M^4, and an acid in an organic acid;
- preparing a resin intermediate having an ester group by adding a hydroxy alcohol to the solution;
- mixing the solution while adding a carrier material;
- distilling the mixed solution at a pressure below 1.0 atmosphere so as to concentrate the solution;
- drying the concentrated solution using a microwave into a gel catalyst precursor; and
- calcining the precursor stepwise at a temperature of 300°~700° C.

5,691,264

COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Mario Sacchetti, Ferrara; Stefano Pasquali, Fossanova San Marco, and Gabriele Govoni, Renazzo, all of Italy, assignors to Spherilene S.p.A., Milan, Italy

Filed Jun. 6, 1995, Ser. No. 470,624

Claims priority, application Italy, Jul. 8, 1994, MI94A1421

Int. Cl.^{6} B01J *31/36;31/38*

U.S. Cl. 502—134 **23 Claims**

1. Components of catalysts for the polymerization of olefins comprising the product obtained by contacting:

(a) a compound of a transition metal M selected among Ti, V, Zr and Hf containing at least one M-π bond with a solid component comprising a compound of Ti or V not containing M-π bonds and optionally an electron-donor compound supported on an Mg halide, or

(b) a compound of Ti or V not containing M-π bonds with a solid component comprising a compound of V, Ti, Zr or Hf containing at least one M-π bond supported on a Mg halide, or

(c) a compound of Ti or V not containing M-π bonds and a compound of V, Ti, Zr or Hf having at least one M-π bond with a support comprising a Mg halide, the component as in (a) and (b) and the support as in (c) being characterized in that they have a porosity (due to pores with radius up to 10000 Å, determined with a mercury porosimeter) greater than 0.3 cm^3/g.

5,691,265

Patent Not Issued For This Number

5,691,266

METHOD OF MAKING A TITANOSILICATE CATALYST

Takashi Onozawa, and Osamu Kondo, both of Ibaraki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 289,219, Aug. 11, 1994, abandoned. This application Sep. 25, 1996, Ser. No. 719,881

Claims priority, application Japan, Aug. 11, 1993, 5-199660

Int. Cl.^{6} B01J *21/06;* **C01B** *39/06*

U.S. Cl. 502—242 **9 Claims**

1. A method for preparing a titanosilicate catalyst, comprising:

- reacting silicon oxide, titanium oxide and tetraalkylammonium hydroxide in the presence of water or steam to form primary titanosilicate particles;
- decreasing the pH of the reaction mixture to form a secondary particle comprising a combination of the primary particles with one another; and
- calcining the secondary particle.

5,691,267

TWO STEP GOLD ADDITION METHOD FOR PREPARING A VINYL ACETATE CATALYST

Ioan Nicolau, and Azael T. Flores, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 633,275, Apr. 16, 1996, abandoned. This application Aug. 13, 1996, Ser. No. 696,413

Int. Cl.^{6} B01J *23/52*

U.S. Cl. 502—330 **29 Claims**

1. In a process for preparing a catalyst for synthesizing unsaturated esters, wherein a catalyst carrier is impregnated with a water soluble palladium compound and a water soluble gold compound, fixing the water soluble palladium compound and the water soluble gold compound to the carrier as a water insoluble palladium compound and a water insoluble gold compound and reducing the water insoluble palladium compound to palladium metal and the water insoluble gold compound to gold metal, the improvement comprising impregnating and fixing the water soluble gold compound in two steps, wherein a first amount of the water soluble gold compound is impregnated on the carrier and then fixed to the carrier as a first amount of the water insoluble gold compound followed by impregnating the carrier with a second amount consisting essentially of the water soluble gold compound and fixing the second amount of the water soluble gold compound as a second amount of the water insoluble gold compound.

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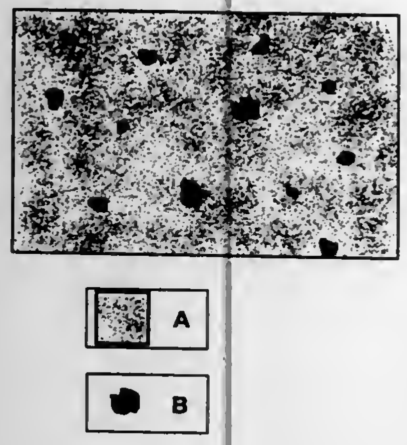
5,691,268
ISOALCOHOL SYNTHESIS CATALYST

Russell John Koveal, Baton Rouge, La., and Thomas Henry Vanderspurt, Deleware Township, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 8, 1995, Ser. No. 569,531

Int. Cl.^{6} B01J *23/72*

U.S. Cl. 502—345 **4 Claims**



1. A syngas-to-alcohol catalyst, comprising: highly dispersed, alkali promoted, La stabilized, microcrystalline Cu_2O having a particle size of ≦6 nm in the presence of an alumina structural promoter, wherein on a mole % alkali free metals-only basis Cu is present in from 45% to 55%, Zn from 10% to 20%, Al from 10% to 25%, La from 5% to 15%, and wherein the alkali is from 0.01% to 0.91% K and from 3% to 6.5% Cs.

5,691,269
PROCESS FOR PREPARING SILVER CATALYST

Nabil Rizkalla, River Vale, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Continuation of Ser. No. 24,247, Mar. 1, 1993, Pat. No. 5,525,740. This application Sep. 5, 1995, Ser. No. 523,441

Int. Cl.^{6} B01J *23/04;23/50*

U.S. Cl. 502—347 **12 Claims**

1. A catalyst for the vapor-phase oxidation of ethylene to ethylene oxide comprising:

a porous support having a surface area of about 0.1 to 2.0 m^2/g and a porosity of about 0.1 to 1.0 cc/g; and

3–20 wt % silver dispersed on said support such that there are from 10 to 70 particles of silver per square micron on the fresh catalyst.

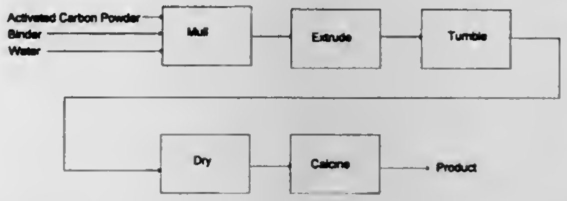
5,691,270
SHAPED LIGNOCELLULOSIC-BASED ACTIVATED CARBON

James R. Miller, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 8, 1996, Ser. No. 613,270

Int. Cl.^{6} B01J *20/02*

U.S. Cl. 502—416 **8 Claims**



1. A composition of an active carbon pellet prepared by sequentially extruding activated lignocellulosic-based carbon particles with an inorganic binder material in the presence of water and subjecting the extruded pellet to a mechanical tumbling treatment prior to calcination temperatures, said carbon pellet exhibiting a butane working capacity of from about 10 to about 17 g/100 cc, an apparent density from about 0.25 to about 0.40 g/cc, a pellet void fraction of less than 0.19, and a dust attrition value of less than 1.2 mg/100 cc/minute, in the absence of an applied coating on the pellet.

8. An improved active carbon pellet composition comprising active wood-based carbon particles and, as a binder therefor, a bentonite clay in an amount of from 5% to 75% by weight, based on the carbon, selected from the group consisting of sodium bentonite and calcium bentonite, wherein the clay is characterized by having been subjected to a calcination treatment conducted at from about 700° F. to about 1,800° F. in an oxygen-free atmosphere subsequent to its pellet formation with the carbon in the presence of water wherein said composition is characterized by a higher apparent density over that of the carbon alone, and wherein the improvement comprises subjecting the pellets, prior to said calcination treatment, to a mechanical tumbling treatment for a time sufficient such that the calcined pellet composition exhibits a butane working capacity from about 10 to about 17 g/100 cc, an apparent density from about 0.25 to about 0.40 g/cc, a pellet void fraction of less than 0.19, and a dust attrition rate of less than 1.2 mg/100.

5,691,271
INDOLYLAZAPHTHALIDES AND RECORDING MATERIALS CONTAINING THE SAME

Naoto Yanagihara, Shizuoka; Kiyoshi Takeuchi, Kanagawa; Toyohisa Oya, Kanagawa; Naoki Asanuma, Kanagawa; Masanobu Takashima, and Syunsaku Higashi, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

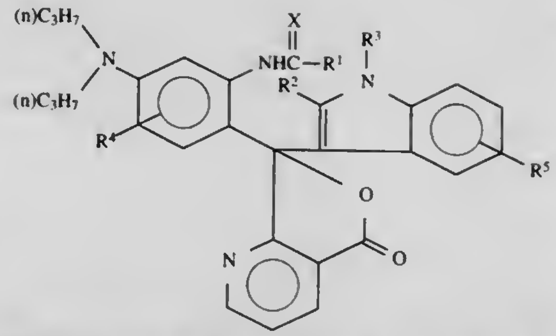
Filed May 16, 1996, Ser. No. 648,830

Claims priority, application Japan, May 17, 1995, 7-118782; Oct. 11, 1995, 7-263052

Int. Cl.^{6} B41M *5/136;5/30;5/34*

U.S. Cl. 503—204 **11 Claims**

1. A recording material formed of a substrate having thereon an electron donative colorless dye and an electron accepting compound, comprising at least one indolylazaphthalide represented by the following formula (I) as the electron donative colorless dye:



(I)

wherein R^1 represents an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, or a heterocyclic group; each of R^2 and R^3 represents a hydrogen atom, an alkyl group, or an aryl group; each of R^4 and R^5 represents a hydrogen atom, an alkyl group, an alkoxy group, or a halogen atom; and X represents an oxygen atom or a sulfur atom.

5,691,272
CARBOXYLATE AND HEAT-SENSITIVE RECORDING MATERIAL USING SAME

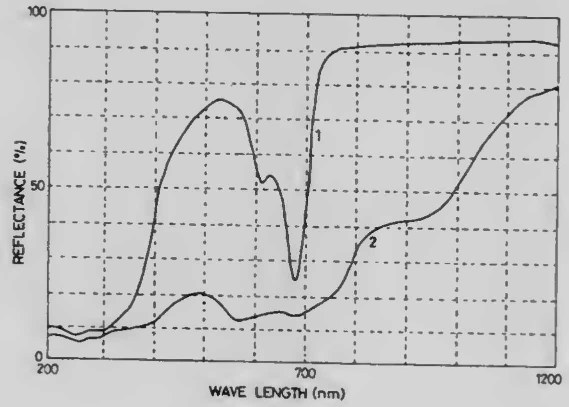
Mansuke Matsumoto, Kawanishi; Nobuaki Sasaki, Souraku-gun; Bunji Sawano, Minamikawachi-gun; Kiyoharu Hasegawa, Yokohama, and Kazuyoshi Kikkawa, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, and Yamamoto Chemicals, Inc., Yao, both of Japan

Division of Ser. No. 422,033, Apr. 14, 1995, Pat. No. 5,559,247. This application Aug. 14, 1996, Ser. No. 696,464

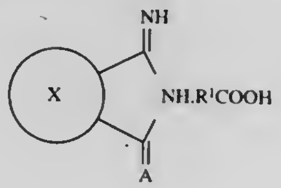
Claims priority, application Japan, Apr. 26, 1994, 6-088426; Jun. 2, 1994, 6-121082; Aug. 9, 1994, 6-187280; Aug. 25, 1994, 6-200774

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 503—217 **16 Claims**



1. A heat-sensitive recording material which comprises a support and a heat-sensitive recording layer on the support, said heat-sensitive recording layer containing at least one carboxylate represented by formula (1) or (2)



(1)

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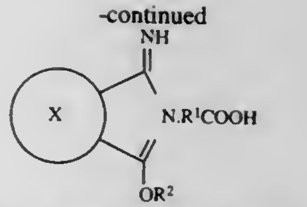

(2)

wherein a ring X is an unsubstituted aromatic residue or an aromatic residue substituted with a halogen atom, alkyl group, alkoxy group, aryloxy group, alkylcarbonyl group, arylcarbonyl group, alkylthio group, arylthio group, nitro group, dialkylamino group, amino group, alkylsilyl group, alkylsilyloxy group or trifluoromethyl group; A is =NH or (—OR^3 and —OR^4)(wherein each of R^3 and R^4 is independently an alkyl group having 1 to 8 carbon atoms which is unsubstituted or substituted with an allyloxy group or hydroxy group, and R^3 and R^4 may bond to each other to form a ring); R^1 is a hydrogen atom, an alkyl group having 1 to 20 carbon atoms which is unsubstituted or substituted with a halogen atom, hydroxy group, alkoxy group having 1 to 4 carbon atoms, aryloxy group, alkylthio group having 1 to 4 carbon atoms, alkoxycarbonyl group having 2 to 20 carbon atoms, amino group or amide group, an aralkyl group which is unsubstituted or substituted with a halogen atom, hydroxy group, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, alkylthio group having 1 to 4 carbon atoms, amino group, carboxyl group, acyl group or nitro group, or an aryl group which is unsubstituted or substituted with a halogen atom, hydroxy group, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, alkylthio group having 1 to 4 carbon atoms, amino group, carboxyl group, acyl group or nitro group, but when A is =NH, R^1 is a residue of benzoic acid, chlorobenzoic acid, hydroxybenzoic acid, anisic acid, toluic acid or nitrobenzoic acid; and R^2 is an alkyl group having 1 to 8 carbon atoms which is unsubstituted or substituted with an allyloxy group or hydroxy group.

5,691,273
THERMAL TRANSFER PRINTING DYE SHEET

Andrew Trevithick Slark, and Richard Anthony Hann, both of Ipswich, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

PCT No. PCT/GB94/02166, § 371 Date Jul. 16, 1996, § 102(e) Date Jul. 16, 1996, PCT Pub. No. WO95/09732, PCT Pub. Date Apr. 13, 1995

PCT Filed Oct. 5, 1994, Ser. No. 624,439

Claims priority, application United Kingdom, Oct. 6, 1993, 9320592

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **11 Claims**

1. A dye sheet for thermal transfer priming comprising a substrate having on one surface thereof a dye coat which comprises a dye capable of thermal transfer dispersed in a polymer binder, characterized in that R−1 is a minimum where

$R=K_{sl}/K_{tt}$, wherein

$K_{sl}=AD_{sl}/AP_{sl}$ where AD_{sl} is the absorption due to the dye and AP_{sl} is the absorption due to the polymer over the surface layer;

$K_{tt}=AD_{tt}/AP_{tt}$ where AD_{tt} is the absorption due to the dye and AP_{tt} is the absorption due to the polymer for the total thickness of the coating; and the values for AD_{sl}, AP_{sl}, AD_{tt} and AP_{tt} being measured by Attenuated Total Reflection Spectroscopy.

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5,691,274

ANTIDOTING HERBICIDAL 3-ISOXAZOLIDINONE COMPOUNDS

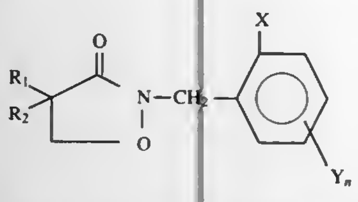
Michael P. Ensminger, Petaluma, Calif., assignor to Zeneca Limited, London, England

Continuation of Ser. No. 278,485, Jul. 20, 1994, Pat. No. 5,527,761, and a continuation of Ser. No. 231,525, Apr. 22, 1994, Pat. No. 5,527,762, which is a continuation of Ser. No. 795,402, Nov. 26, 1991, Pat. No. 5,395,816, which is a continuation-in-part of Ser. No. 626,502, Dec. 12, 1990, abandoned. This application Apr. 26, 1996, Ser. No. 638,253

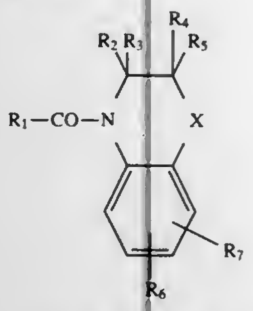
Int. Cl.⁶ A01N *25/32*

U.S. Cl. 504—105 **38 Claims**

1. An herbicidal composition comprising: a) an herbicidally effective amount of a 3-isoxazolidinone herbicide having the formula



in which R1 and R2 are independently methyl or ethyl; X is hydrogen, methyl, chlorine, bromine or fluorine; Y is chlorine, bromine or fluorine, and n is 0, 1 or 2; b) a non-phytotoxic antidotally-effective amount, with respect to a corn crop, of an antidote compound of the formula



in which R1 is C1–C6 haloalkyl, R2–R5 are independently hydrogen or C1–C4 alkyl, R6 and R7 are hydrogen or halogen, and X is oxygen; and c) a herbicidally effective amount of one or more co-herbicides selected from acetamide herbicides, S-triazine herbicides, p-toluidine herbicides and sulfonylurea herbicides.

5,691,275

ALKALI METAL FORMONONETIN AND METHOD OF MYCORRHIZAL STIMULATION

Muraleedharan G. Nair, Okemos; Gene R. Safir, East Lansing; Robert E. Schutzki, Eaton Rapids, and Brendan A. Niemira, East Lansing, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jan. 29, 1996, Ser. No. 593,265

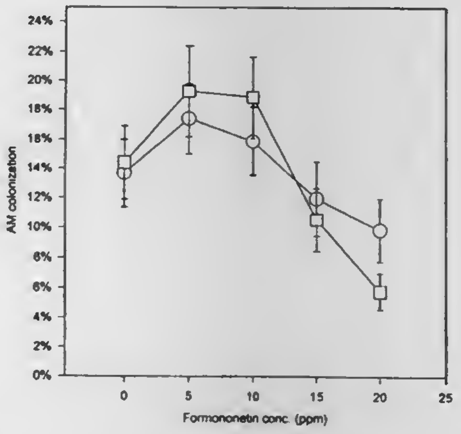
Int. Cl.⁶ A01N *43/16;63/04;* **C07D** *311/36;* **C12N** *1/14*

U.S. Cl. 504—108 **30 Claims**

1. A composition useful for stimulating the growth of VAM fungi in the presence of a plant which comprises:

(a) an alkali metal formononetinate; and

(b) a plant material as a seed or propagule containing the compound as an additive in an amount which stimulates the growth of the VAM fungi which in turn stimulate growth of the plant material to a mature plant when the plant material is grown in a soil or a planting material in the presence of the VAM fungi.



5,691,276

HERBICIDAL COMPOSITION COMPRISING A FLUOROPROPYLTHIAZOLINE SULFONYLUREA DERIVATIVE AND ANOTHER HERBICIDE

Yoichi Ito; Kazuhisa Sudo; Tsutomu Nawamaki, all of Shiraoka-machi, and Kenzi Makino, Funabashi, all of Japan, assignors to Nissan Chemical Corporation, Tokyo, Japan

PCT No. PCT/JP95/01251, § 371 Date Dec. 20, 1996, § 102(e) Date Dec. 20, 1996, PCT Pub. No. WO91/00009, PCT Pub. Date Jan. 4, 1996

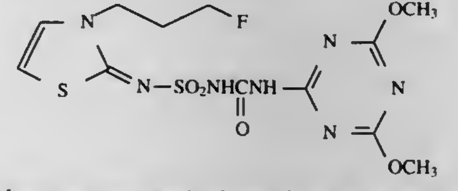
PCT Filed Jun. 22, 1995, Ser. No. 750,782

Claims priority, application Japan, Jun. 23, 1994, 6-141445

Int. Cl.⁶ A01N *43/66;43/78;47/36*

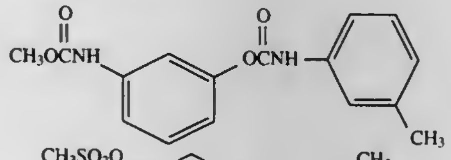
U.S. Cl. 504—134 **6 Claims**

1. A herbicidal composition containing a fluoropropylthiazoline derivative represented by the formula (1):

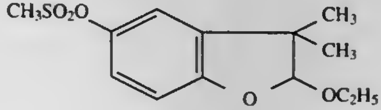


(1)

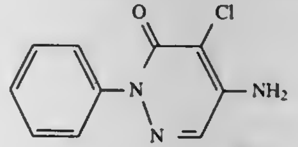
and at least one compound selected from the group consisting of compounds represented by the following formulae (2), (3), (4), (5) and (6) as active ingredients:



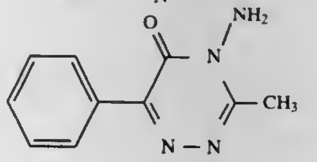
(2)



(3)



(4)



(5)

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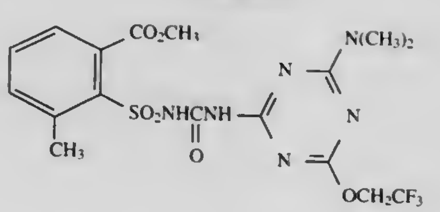


(6)

5,691,277

2-(UNSUBSTITUTED OR SUBSTITUTED) (BENZYLOXY OR PHENOXY)-4-SUBSTITUTED-6-(META-SUBSTITUTED PHENOXY)PYRIDINE, PROCESS FOR PRODUCING THE SAME, AND HERBICIDAL COMPOSITION

Hisashi Kanno; Youichi Kanda; Susumu Shimizu; Yoshikazu Kubota; Tsutomu Sato, and Masato Arahira, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

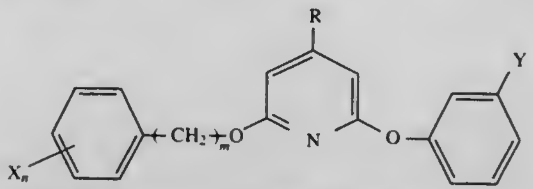
Filed Jul. 13, 1995, Ser. No. 501,842

Claims priority, application Japan, Jul. 14, 1994, 6-185367; Jul. 20, 1994, 6-190085; Feb. 4, 1995, 7-039080; Feb. 4, 1995, 7-039081

Int. Cl.⁶ C07D *213/69;* **A01N** *43/40*

U.S. Cl. 504—244 **6 Claims**

1. A 2-(unsubstituted or substituted) (benzyloxy or phenoxy)-4-substituted-6-(meta-substituted phenoxy)pyridine represented by the formula (1):



(1)

wherein R represents C_1–C_4 alkoxy or cyano;

each X, which may be identical or different if n is greater than 1, represents a halogen, C_1–C_4alkoxy, C_1–C_4 alkyl, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkythio, C_3–C_5 alkenyloxy, or C_3–C_5 alkynyloxy;

Y represents trifluoromethyl, difluoromethoxy, trifluoromethoxy, or trifluoromethylthio;

m represents an integer of 0 or 1; and

n represents an integer of 0 to 5.

5,691,278

OXAZOLINONE DERIVATIVES, PROCESS FOR PREPARING THE SAME, AND USE OF THE SAME

Sang Woo Park; Kye Jung Shin, and Dong Chan Kim, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

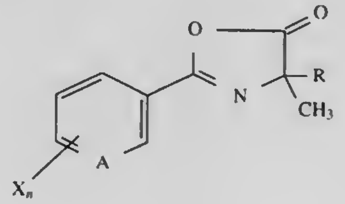
Filed Aug. 16, 1995, Ser. No. 515,608

Claims priority, application Rep. of Korea, Aug. 17, 1994, 20300/1994

Int. Cl.⁶ C07D *263/22*

U.S. Cl. 504—252 **6 Claims**

1. An oxazolinone derivative compound represented by the following formula I:



I

wherein, R represents a lower alkyl group or a phenyl group containing halogen, lower alkyl or trifluoromethyl group;

X represents halogen atom, carbomethoxy group, nitro group, or halogen or trifluoromethyl-substituted phenoxy group, being the same or different from one another;

A represents nitrogen or carbon atom; and

n is an integer of 1 to 3, with the proviso that when n is 1, R is methyl, and A is carbon, that X is other than a bromine atom.

5,691,279

C-AXIS ORIENTED HIGH TEMPERATURE SUPERCONDUCTORS DEPOSITED ONTO NEW COMPOSITIONS OF GARNET

Arthur Tauber, Elberon, and Steven C. Tidrow, Eatontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 228,788, Apr. 12, 1994, Pat. No. 5,418,215, which is a continuation-in-part of Ser. No. 83,406, Jun. 22, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 423,173

Int. Cl.⁶ H01L *39/02*

U.S. Cl. 505—239 **1 Claim**

1. A composite comprising a layer of a c-axis oriented copper oxide superconductor grown on a garnet substrate, wherein said substrate is chemically compatible with said copper oxide superconductor and has an orientation selected from the group consisting of (211)(422), (220)(440) and (420)(210), further wherein said substrate's thermal expansion coefficient substantially matches the copper oxide superconductor's thermal expansion coefficient, and further wherein the substrate has a mismatch of less than 4 percent with the a and b lattice parameters of the copper oxide superconductor, and wherein the substrate has a low defect density and is mechanically strong, the garnet substrate is selected from the group consisting of $RE_3M_2N_3O_{12}$ where RE is Gd, Lu, or Y and where M is Sc or In, and N is Ga or Al; $Ca_3MNGe_3O_{12}$ where M is Ti, Zr, or Ge and where N is Mg or Ca; $Na_2CaZr_2Ge_3O_{12}$; $Ca_3MNGa_3O_{12}$ where M is Nb, N is Zr, Hf or Sn; $Ca_3Sn_3Ga_2O_{12}$; $NaCa_2Sb_2Ga_3O_{12}$; $Ca_2LaZr_2Ga_3O_{12}$; $(Ca_{2.5}M_{0.5})M_2Ga_3O_{12}$ where M is Zr or Hf; $Y_{3-x}Ca_x\ Ti_xGa_{5-x}O_{12}$ where $O \leqq x \leqq 3$; $(Y_{3-x-y}Ca_{x+y})Zr_yTi_xGa_{5-x-y}O_{12}$ where $O \leqq x+y+ \leqq 3$; $Y_3(Y_{0.505}Ga_{1.495})\ Ga_3O_{12}$; $Y_3(In_{0.6}Ga_{1.4})\ Ga_3O_{12}$; and $(Y_{1.05}Ca_{1.95})\ Ti_{1.95}Ga_{3.05}O_{12}$.

5,691,280

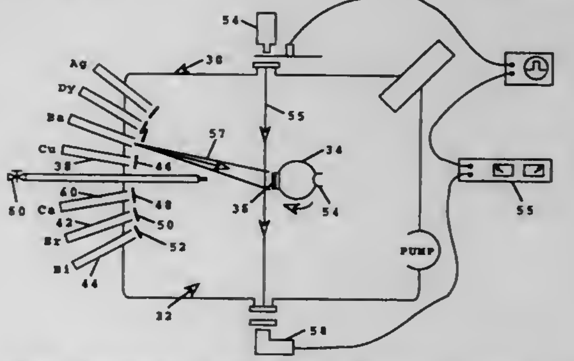
METHOD OF PRODUCING A HIGH T_C SUPERCONDUCTING FILM FREE OF SECOND PHASE DEFECTS

James N. Eckstein, Cupertino, and Ivan Bozovic, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 405,419, Mar. 15, 1995, abandoned, which is a continuation of Ser. No. 97,703, Jul. 27, 1993, abandoned. This application May 14, 1996, Ser. No. 648,780

Int. Cl.⁶ H01L *39/24*

U.S. Cl. 505—329 **13 Claims**



1. In the production of a thin film having selected magnetic or conductive properties, by deposition of successive molecular layers of a first high T_c metal oxide which has a relatively narrow

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temperature-pressure-stoichimetry phase acceptance window, such that second-phase imperfections form during successive layer deposition, the improvement method comprising

interspersing among said layers at multilayer intervals, a molecular layer of a second metal oxide which has a wider temperature-pressure-stoichiometry phase acceptance window than said first metal oxide, whereby the second-metal oxide layer absorbs the second-phase imperfections formed in the first metal-oxide layers;

said interspersing preserving the selected magnetic or conduction properties of said thin film while preventing nucleation of second-phase imperfections in the film wherein the ratio of the number of layers of said first high T_c metal oxide to said layer of second metal oxide is R, where $R \geqq 3$;

where said first high T_c metal oxide layers are selected from a family of cuprate oxide polytype metal oxides including
- (i) $M_1Ba_2Cu_3O_7$ where M_1 is Y, Nd, La, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb, or Lu;
- (ii) $Bi_2Sr_2Ca_{n-1}Cu_nO_{2n+4}$ where n=2 to 5;
- (iii) $Tl_xBa_2Ca_{n-1}Cu_nO_{2n+2x+2}$ where x=1 or 2 and n=1 to 5 or
- (iv) $La_{2-x}(Sr, Ca, Ba)_xCuO_4$ where x=0 to 0.3; and wherein said second metal oxide is selected from the same polytype family as the first metal oxide and wherein said second metal oxide has simpler stoichiometry than said first metal oxide.

5,691,281

WELL FLUIDS BASED ON LOW VISCOSITY SYNTHETIC HYDROCARBONS

Henry Ashjian, E. Brunswick, N.J.; Suzzy C. Ho, Dayton, Ohio, and Margaret M. Wu, Skillman, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 6, 1994, Ser. No. 321,006

Int. Cl.^{6} C09K *7/02;7/06*

U.S. Cl. 507—103 **23 Claims**

1. A well fluid which comprises a hydrocarbon oil comprising:
- (i) a liquid olefin isomer component produced by the double bond isomerization of a waxy C_{20}+ 1-olefin, and
- (ii) a low viscosity hydrocarbon which comprises an n-paraffin hydrocarbon component of petroleum origin in the C_{10}–C_{32} range, and an olefinic hydrocarbon component in the C_{10}–C_{32} range, the oil having the following properties:

Viscosity at 100° C. 0.5 to 4 cS
Viscosity at 40° C. 1.0 to 30 cS
Pour point not above +5° C.
Flash point not less than 70° C.

5,691,282

LUBRICANT COMPOSITION FOR USE ON WORKPIECES IN THE HOT FORMING OF METALS

Jacques Perlard, Sins, and Hans-Rudolf Staub, Ottenbach, both of Switzerland, assignors to Timcal Ltd., Bodio, Switzerland

Filed May 16, 1996, Ser. No. 648,958

Claims priority, application Switzerland, May 16, 1995, 1416/95

Int. Cl.^{6} C10M *125/28;125/02;173/02*

U.S. Cl. 508—113 **26 Claims**

1. Lubricant composition for use on workpieces in the hot forming of metals, which comprises:
- (a_1) 0 to 80 percent by weight of a glass powder
- (a_2) 0 to 50 percent by weight of a glass frit whereby the content of at least one component (a_1) or (a_2) in the lubricant composition is not 0 percent by weight,
- (b) 10 to 25 percent by weight of natural or synthetic graphite,
- (c) 5 to 20 percent by weight of one or more alkali metal silicates of the general formula $Me_2O.n\ SiO_2$, where Me is lithium, potassium or sodium and n is a number between 1 and 4,
- (d) 1 to 6 percent by weight of a water-soluble sodium polymetaphosphate,
- (e) 0 to 3 percent by weight of a water-insoluble sodium polymetaphosphate,
- (f) 0.5 to 4 percent by weight of a thickener, and
- (g) 0 to 1 percent by weight of borax.

5,691,283

USE OF TRANSMISSION AND GEAR OIL LUBRICANTS HAVING ENHANCED FRICTION PROPERTIES

Julia C. Poat, Bracknell; Graeme M. Wallace, Wokingham; David Kenvyn Walters, Camberley, all of England, and Ian Macpherson, Richmond, Va., assignors to Ethyl Petroleum Additives Limited, Bracknell, England

Continuation-in-part of Ser. No. 203,817, Mar. 1, 1994, Pat. No. 5,492,638. This application Jun. 7, 1995, Ser. No. 483,354

Int. Cl.^{6} C10M *137/10;135/10*

U.S. Cl. 508—186 **38 Claims**

1. A method of operating a motor vehicle having (A) a manual transmission equipped with at least one cone-type synchronizer and (B) differential axle gearing, which comprises employing the same lubricant composition to lubricate both said mechanisms (A) and (B), said lubricant composition having a viscosity grade level of from SAE 75W90 to SAE 85W140 and comprising base oil, and minor amounts of at least the following components: (i) at least one Mannich base ashless dispersant; (ii) at least one metal-free, sulphur-containing antiwear and/or extreme pressure agent; (iii) at least one metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent; and (iv) at least one overbased alkali or alkaline earth metal carboxylate, sulphonate or sulphurized phenate having a TBN of at least 145; said lubricant composition containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said component (iv).

5,691,284

SYNTHETIC OLIGOMERIC OILS

Claudia Beyer, Seeheim-Jugenheim; Ruediger Jelitte, Rossdorf; Horst Pennewiss, Darmstadt, and Heinz Jost, Modautal-Brandau, all of Germany, assignors to Röhm GmbH, Darmstadt, Germany

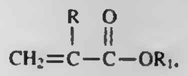
Continuation-in-part of Ser. No. 587,041, Jan. 16, 1996, abandoned, which is a continuation of Ser. No. 455,634, May 31, 1995, abandoned, which is a continuation of Ser. No. 271,242, Jul. 6, 1994, abandoned, which is a continuation of Ser. No. 123,186, Sep. 16, 1993, abandoned, which is a continuation of Ser. No. 987,066, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 741,132, Aug. 7, 1991, abandoned. This application Dec. 24, 1996, Ser. No. 773,032

Claims priority, application Germany, Aug. 11, 1990, 40 25 494.1

Int. Cl.^{6} C10M *145/14*

U.S. Cl. 508—472 **6 Claims**

1. A co-oligomer adaptable to use as a synthetic oil, or a mixture of such a co-oligomer with up to 95 percent by weight of a conventional synthetic oil, said co-oligomer consisting of
- A) 10–70 percent by weight of at least one 1-alkene have 8 to 14 carbon atoms in the molecule,
- B) the balance being at least one (meth)acrylic acid ester of the formula



$$CH_2{=}\overset{\displaystyle R}{\overset{|}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-OR_1.$$

where R is hydrogen or methyl and R_1 is alkyl or cycloalkyl having 8 to 20 carbon atoms.

5,691,285

NONTOXIC LUBRICANT COMPOSITION

Gary L. Coffey, Glendale, and B. Howard Coffey, LaGrange, both of Ky., assignors to Coffey Marketing Corporation, Buckner, Ky.

Filed Sep. 29, 1995, Ser. No. 536,669

Int. Cl.^{6} C10M *101/04*

U.S. Cl. 508—491 **7 Claims**

1. A nontoxic, biodegradable lubricant, comprising:

from about 40 to about 98 percent vegetable oil, end about 2 to about 60 of a solvent, wherein said solvent is selected from the group consisting of ethanol, a citrus solvent, and mixtures thereof.

5,691,286

ENVIRONMENTALLY FRIENDLY SUGAR MILL BEARING LUBRICANT

Robert J. Stepan, Strongsville, Ohio, assignor to Dylon Industries Inc., Cleveland, Ohio

Filed Oct. 15, 1996, Ser. No. 730,098

Int. Cl.^{6} C10M *129/68;159/02*

U.S. Cl. 508—491 **25 Claims**

1. An environmentally safe journal bearing lubricant suitable for lubricating a sugar mill journal bearing comprising:
- 10 to 92 percent by weight of a synthetic or natural gum or a natural coagulated or concentrated lattice of a vegetable origin which functions as a biodegradable lubricant to prevent bearing to journal contact; and
- 2 to 15 percent by weight of a triglyceride oil made from a natural vegetable oil, animal oil for increasing the film strength and boundary lubrication.

5,691,287

LOW IRRITATION CLEANSING BAR

William A. Villars, Racine, and David H. Leifheit, Mount Pleasant, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 21, 1995, Ser. No. 576,654

Int. Cl.^{6} C11D *7/48;9/48;10/04;* **A61K** *7/50*

U.S. Cl. 510—151 **32 Claims**

1. A cleansing bar consisting essentially of:
- (a) from about 20% to about 35%, by weight of all ingredients of said cleansing bar, of a synthetic detergent, sodium cocoyl isethionate;
- (b) from about 6% to about 11%, by weight of all ingredients of said cleansing bar, of cetyl alcohol, wherein a mole to mole ratio of (a) to (b) is at least about 2.2:1;
- (c) at least about 30%, by weight of all ingredients of said cleansing bar, of processed grain;
- (d) a buffer for adjusting the pH of said cleansing bar to be in a pH range from about 4.0 to about 5.5; and
- (e) from about 9% to about 20%, by weight of all ingredients of said cleansing bar, of water,

wherein the ingredients in (a) through (e) are combined into said cleansing bar.

5,691,288

FINISHER-PRESERVER-CLEANER COMPOSITION FOR LITHOGRAPHIC PRINTING PLATES

Major S. Dhillon, Belle Mead, N.J., assignor to Bayer Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1996, Ser. No. 620,197

Int. Cl.^{6} C11D *3/30;3/44*

U.S. Cl. 510—171 **20 Claims**

1. A composition for finishing, preserving and cleaning lithographic printing plates consisting essentially of a stable emulsion of:
- (a) from about 0.1% to about 7.0% by weight of the composition of a polyol selected from the group consisting of ethylene glycol, propylene glycol, sorbitol and glycerin having a molecular weight in the range of from about 50 to about 3,000;
- (b) from about 1.0% to about 15.0% by weight of the composition of a hydrophilic film former selected from the group consisting of starches and dextrins;
- (c) from about 0.5% to about 2.0% by weight of the composition of an alkyl benzene sulfonate amine salt;
- (d) from about 1.0% to about 20.0% by weight of the composition of a composition of hydrocarbons having a boiling point in the range of from about 175° F. to about 500° F., and a flash point of above about 100° F., said composition of hydrocarbons containing less than about 10% aromatic components; and
- (e) from about 0.1% to about 5.0% by weight of the composition of a substituted phenoxypoly(oxyethylene)ethanol wherein the substitution is H, isooctyl, nonyl, decy or dodecyl, having a hydrophile/lipophile balance of from about 8 to about 15; and
- (f) from about 0.1% to about 2.0% of a C_{12} to C_{20} alcohol;
- (g) from about 0.01% to about 1.0% by weight of the composition of a mono-, di- or tri- ethanolamine; and
- (h) a sufficient amount of an organic or inorganic acid to impart a pH to the composition of from about 2.5 to about 6.5; and
- (i) sufficient water to formulate an effective finishing, preserving and cleaning composition for lithographic printing plates.

5,691,289

CLEANING COMPOSITIONS AND METHODS OF USING THE SAME

Karen Purcell, Greensboro, N.C.; Charles L. Hawes, Summerville, S.C.; David R. Harry, Jr., Oak Ridge, and Gerald E. La Cosse, Greensboro, both of N.C., assignors to Kay Chemical Company, Greensboro, N.C.

Filed Nov. 17, 1994, Ser. No. 342,037

Int. Cl.^{6} C11D *3/44;* **B08B** *7/00*

U.S. Cl. 510—174 **15 Claims**

1. A microemulsion cleaning composition comprising:
- a. about 1% to about 60% by weight of a terpene compound;
- b. about 1% to about 60% by weight of a pyrrolidone compound;
- c. about 1% to about 35% by weight of a surfactant effective to form a microemulsion;
- d. 9.5% to about 20% by weight of a solvent extender selected from the group consisting of small chain alcohols, alkylene carbonates, ethylene glycol, propylene glycol, butylene glycol, hexylene glycol, diethyleneglycolmonobutylether, diethyleneglycolmonoethylether, diethyleneglycolmonohexylether, diethyleneglycolmonomethylether, diethyleneglycolmonopropylether, dipropyleneglycolmonobutylether, dipropyleneglycolmonomethylether, dipropyleneglycolmonopropylether, ethoxypropyleneglycolmonobutylether, ethyleneglycolmonoethylether, ethyleneglycolmonohexylether, ethyleneglycolmonomethylether, ethyleneglycolmonopropylether, propyleneglycolmonobutylether, propyleneglycolmonomethylether, propyleneglycolmonopropylether, propyleneglycolmono-t-butylether, triethyleneglycolmonoethylether, triethyleneglycolmonomethylether, triethyleneglycolmonopropylether, and tripropyleneglycolmonomethylether; and
- e. at least about 20% by weight water; said composition being in the form of a microemulsion.

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5,691,290

CLEANING COMPOSITION

Pieter Vonk, Gouda, and Anette Heymann, Frederiksberg, both of Netherlands, assignors to Unichema Chemie B.V., Gouda, Netherlands

PCT No. PCT/EP94/00018, § 371 Date Sep. 21, 1995, § 102(e) Date Sep. 21, 1995, PCT Pub. No. WO94/17143, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 4, 1994, Ser. No. 492,013

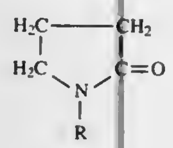
Claims priority, application European Pat. Off., Jan. 19, 1993, 93200122.5

Int. Cl.^{6} C11D *3/32;3/44;7/50;* **B08B** *3/08*

U.S. Cl. 510—212 **12 Claims**

1. A cleaning composition to remove unwanted paint, graffiti or other coatings from a substrate which consists essentially of:

(1) from 40% to 90% by weight of the total composition of a five-membered ring lactam of the general formula



in which R represents a hydrogen atom, or a methyl, an ethyl, a propyl, an isopropyl or a vinyl group, and

(2) from 10% to 60% by weight of the total composition of a glycerol triester of an aliphatic saturated monocarboxylic acid having from 1 to 4 carbon atoms; and

(3) an effective amount of up to 25 wt. % of the total composition of a member of the group consisting of diethyl phthalate, diisopropyl adipate and esters of lactic acid and a saturated aliphatic monohydric alcohol having from 1 to 4 carbon atoms.

5,691,291

HARD SURFACE CLEANING COMPOSITIONS COMPRISING PROTONATED AMINES AND AMINE OXIDE SURFACTANTS

Thomas James Wierenga, Cincinnati, and Bruce Barger, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 330,633, Oct. 28, 1994, abandoned. This application May 10, 1995, Ser. No. 438,939

Int. Cl.^{6} C11D *1/75;1/40*

U.S. Cl. 510—214 **8 Claims**

1. A hard surface cleaning composition, consisting essentially of:

a) from about 1% to about 60% of an amine oxide detergent surfactant having the formula $R^1R^2R^3NO$, wherein R^1 has from about 8 to about 30 carbon atoms, and R^2 and R^3 each individually has from about 1 to about 18 carbon atoms,

b) an aqueous carrier liquid;

c) a protonated amine; and

a suds suppressor; and

wherein the protonated amine has a pK_a of about 1.5 units above the pH of the composition and the molar ratio of protonated amine to amine oxide is at least 0.1:1.

5,691,292

THIXOTROPIC LIQUID AUTOMATIC DISHWASHING COMPOSITION WITH ENZYME

Janet Layne Marshall, Wyoming, Ohio; David Lee Hall, Covington, Ky.; Hal Ambuter, Medina, and Edward Paul Fitch, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 149,172, Nov. 8, 1993, abandoned, which is a continuation of Ser. No. 867,575, Apr. 13, 1992, abandoned. This application Aug. 22, 1995, Ser. No. 518,064

Int. Cl.^{6} C11D *3/386;3/37*

U.S. Cl. 510—221 **20 Claims**

1. A viscoelastic, thixotropic aqueous, liquid automatic dishwashing detergent composition comprising, by weight:

(a) from about 0.001% to about 5% of an active detersive enzyme or enzymes;

(b) from about 0.1% to about 10% of a viscoelastic thixotropic thickener which is a cross-linked polycarboxylate polymer having a molecular weight of 750,000 to 4,000,00 and which provides an apparent viscosity at high shear of greater than about 250 centipoise and an apparent yield value of from about 40 to about 800 dynes/cm^2 to said composition;

(c) from about 0.001% to about 10% of an enzyme stabilizing system selected from the group consisting of calcium ion, propylene glycol, short chain carboxylic acid, polyhydroxyl compounds, boric acid, boronic acid and mixtures thereof;

(d) from about 0.01% to about 40% of a detergent surfactant or a detergent builder or mixtures thereof;

(e) from about 0.001% to about 25% of pH adjusting agent to provide said composition with a product pH between about 7 and about 11 and

(f) 0.01% to 0.06% of a chlorine scavenge;

wherein said composition is low foaming and free of chlorine bleach and silicate and wherein said composition is free of clay thickening agents.

5,691,293

STABLE, DUAL-FUNCTION, PHOSPHATE-, METASILICATE- AND POLYMER-FREE LOW-ALKALI DETERGENT TABLETS FOR DISHWASHING MACHINES AND A PROCESS FOR THEIR PRODUCTION

Hans Kruse, Korschenbroich; Hans-Josef Beaujean, Dormagen; Norbert Schaefer, and Juergen Haerer, both of Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/00932, § 371 Date Oct. 2, 1995, § 102(e) Date Oct. 2, 1995, PCT Pub. No. WO94/23011, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 23, 1994, Ser. No. 530,114

Claims priority, application Germany, Apr. 1, 1993, 43 15 048.9

Int. Cl.^{6} C11D *7/10;7/12;7/42;7/54*

U.S. Cl. 510—224 **18 Claims**

1. A stable, dual-function, phosphate-, metasilicate- and polymer-free low alkali detergent tablet consisting essentially of:

(a) from 5 to 50% by weight of a trisodium citrate;

(b) from 1 to 60% by weight of anhydrous sodium carbonate;

(c) from 1 to 60% by weight of sodium hydrogen carbonate;

(d) up to 20% by weight of a bleaching agent selected from the group consisting of sodium perborate monohydrate, sodium percarbonate and mixtures thereof;

(e) from 0.5 to 4% by weight of a tetraacetyl ethylenediamine;

(f) from 0.1 to 2% by weight of a protease;

(g) from 0.1 to 2% by weight of an amylase;

(h) 1 to 4% by weight of glycerides; and

(i) from 3 to 10% by weight of water, all weights being based on the weight of said detergent tablet.

5,691,294

FLOW AIDS FOR DETERGENT POWDERS COMPRISING SODIUM ALUMINOSILICATE AND HYDROPHOBIC SILICA

Paul Amaat Raymond Gerard France, Kessel-Lo, and Paul Irma Albertus Van Dijk, Putte, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/01915, § 371 Date Dec. 11, 1995, § 102(e) Date Dec. 11, 1995, PCT Pub. No. WO94/23001, PCT Pub. Date Oct. 13, 1994

PCT Filed Feb. 23, 1994, Ser. No. 532,554

Claims priority, application European Pat. Off., Mar. 30, 1993, 93870059

Int. Cl.^{6} C11D *17/06;3/12;3/32;11/00*

U.S. Cl. 510—349 **14 Claims**

1. A granular detergent component or composition having a bulk density of at least 700 g/l which comprises:

i) a detergent powder which comprises a nonionic surfactant mixture comprising at least one nonionic surfactant selected from the group consisting of ethoxylated alcohols, and at least one nonionic surfactant selected from the group consisting of polyhydroxy fatty acid amides, and

ii) from 0.5% to 15% by weight of a powdery flow aid characterised in that the flow aid comprises sodium aluminosilicate and hydrophobic silica wherein the weight ratio of the sodium aluminosilicate to hydrophobic silica is from 100:1 to 5:1.

9. A process for making a free-flowing detergent powder having a bulk density of at least 700 g/l which comprises the steps of:

i) providing a nonionic surfactant system comprising at least one nonionic surfactant which is a liquid at temperatures below 40° C.;

ii) providing a granular detergent powder having a bulk density of at least 650 g/l;

iii) spraying the nonionic surfactant system onto the granular detergent powder;

iv) mixing the product of step iii) with a premixed powder comprising sodium aluminosilicate and hydrophobic silica in a weight ratio of from 100:1 to 5:1, wherein the flee-flowing detergent powder comprises from 3% to 15% by weight of the premixed powder.

5,691,295

DETERGENT COMPOSITIONS

Karl-Heinz Maurer, Erkrath; Winfried Pochandke, Monheim; Beatrix Kottwitz; Jorg Poethkow, both of Duesseldorf; Albrecht Weiss, Langenfold; Irmgard Schmidt, Solingen, and Horst Upadek, Ratingen, all of Germany, assignors to Cognis Gesellschaft fuer Biotechnologie mbH, Duesseldorf, Germany

Filed Jan. 17, 1995, Ser. No. 373,818

Int. Cl.^{6} C11D *3/386*

U.S. Cl. 510—392 **27 Claims**

15. A detergent composition for washing fabrics composed of proteinogenic fibers comprising from about 20% to about 55% by weight of an inorganic builder; up to about 15% by weight of a water-soluble organic builder; from about 2.5% to about 20% by weight of an anionic surfactant; from about 1% to about 20% by weight of a nonionic surfactant; up to about 25% by weight of a bleaching agent; up to about 8% by weight of a bleach activator; up to about 20% by weight of an inorganic salt; from about 0.4% to about 1.2% by weight of a lipase, cutinase, amylase, cellulase, pullulanase, oxidase or peroxidase and a proteolytically aistive amount of a *Bacillus lentus* protease selected from the group consisting of F49 variant having S3T+V4I+A188P+V193M+V199I+L211D mutations, F46 variant having S3T+V4I+ S154E+A188P+V193M+V199I mutations, or combinations thereof having a keratinase/caseinase activity ratio of less than about 0.80.

5,691,296

PERCARBONATE BLEACH PARTICLES COATED WITH A PARTIALLY HYDRATED CRYSTALLINE ALUMINOSILICATE FLOW AID

Joseph Thomas Henry Agar, Lincoln, United Kingdom; Paul Amaat Raymond G. France, Bertem, and Carole Patricia D. Wilkinson, Bruxelles, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/07876, § 371 Date Jan. 16, 1996, § 102(e) Date Jan. 16, 1996, PCT Pub. No. WO95/02672, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 13, 1994, Ser. No. 581,553

Claims priority, application European Pat. Off., Jul. 14, 1993, 93870140

Int. Cl.^{6} C11D *3/395*

U.S. Cl. 510—441 **17 Claims**

1. A process for making a granular detergent composition having a bulk density of at least 650 g/l, which process comprises the steps of:

a) providing a detergent powder wherein from 1% to 40% by weight of the detergent powder comprises percarbonate particles having a particle size in the range of 250 to 900 μm;

b) spraying onto said detergent powder a nonionic surfactant; and

c) mixing the product of step b) with a partially hydrated crystalline zeolite having a moisture content of less than 15% by weight of the crystalline zeolite, the crystalline zeolite being employed in an amount sufficient to improve the storage life of the percarbonate particles.

5,691,297

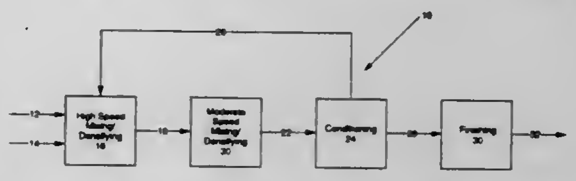
PROCESS FOR MAKING A HIGH DENSITY DETERGENT COMPOSITION BY CONTROLLING AGGLOMERATION WITHIN A DISPERSION INDEX

David Robert Nassano, Cold Springs, Ky., and Scott William Capeci, North Bend, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 309,215, Sep. 20, 1994, Pat. No. 5,489,392. This application Sep. 19, 1995, Ser. No. 530,545

Int. Cl.^{6} C11D *11/00*

U.S. Cl. 510—444 **15 Claims**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14
High Speed Mixing/ Densifying
18
Moderate Speed Mixing/ Densifying
22
Conditioning

1. A process for preparing high density detergent composition comprising the steps of:

(a) agglomerating a detergent surfactant paste and dry starting detergent material in a high speed mixer/densifier to obtain agglomerates, wherein said dry starting detergent material comprises a builder selected from the group consisting of aluminosilicates, crystalline layered silicates, sodium carbonate, $Na_2Ca(CO_3)_2$, $K_2Ca(CO_3)_2$, $Na_2Ca_2(CO_3)_3$, $NaKCa(CO_3)_2$, $NaKCa_2(CO_3)_3$, $K_2Ca_2(CO_3)_3$, and mixtures thereof;

(b) controlling the flow rate and temperature of said surfactant paste and said dry starting material and the residence time, speed, and mixing tool and shovel configuration of said high speed mixer/densifier such that said agglomerates have a Dispersion Index in a range of from about 1 to about 6, wherein

Dispersion Index=A/P

A is the surfactant level in said agglomerates having a particle size of at least 1100 microns, and B is the surfactant level in said agglomerates having a particle size less than about 150 microns;

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(c) mixing said agglomerates in a moderate speed mixer/densifier to further densify, build-up and agglomerate said agglomerates; and

(d) conditioning said agglomerates such that the flow properties of said agglomerates are improved, thereby forming said high density detergent composition having a density of at least about 650 g/l.

5,691,298

ESTER OLIGOMERS SUITABLE AS SOIL RELEASE AGENTS IN DETERGENT COMPOSITIONS

Eugene Paul Gosselink, Cincinnati; James Albert Cleary; Robert Henry Rohrbaugh, both of Indian Springs; Margaret Robinson Tallmadge, Cincinnati, and Shulin Zhang, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 355,938, Dec. 14, 1994, abandoned. This application Nov. 22, 1995, Ser. No. 545,351

Int. Cl.⁶ C11D *1/28*

U.S. Cl. 510—475 **30 Claims**

1. Oligomeric esters which are effective as soil release agents comprising:

(1) a backbone comprising
  (a) at least one unit selected from the group consisting of dihydroxy or polyhydroxy sulfonate, a unit which is at least trifunctional whereby ester linkages are formed resulting in a branched oligomer backbone, and combinations thereof;
  (b) at least one unit which is a terephthaloyl moiety; and
  (c) at least one unsulfonated unit which is a 1,2-oxyalkleneoxy moiety; and
(2) one or more capping units selected from nonionic capping units, anionic capping units, and mixtures thereof.

5,691,299

ANIONIC DETERGENT MIXTURES

Bernd Fabry, Korschenbroich, Germany, assignor to Henkel Corporation, Plymouth Meeting, Pa.

Filed Dec. 8, 1995, Ser. No. 569,811

Claims priority, application Germany, Dec. 8, 1994, 44 43 643.2

Int. Cl.⁶ C11D *1/66;3/32*

U.S. Cl. 510—501 **20 Claims**

1. A process for the production of anionic detergent compositions comprising reacting a mixture containing
  (a) fatty acid-N-alkyl polyhydroxyalkylamides and
  (b) fatty alcohols or fatty alcohol alkoxylates
with gaseous sulfur trioxide or chlorosulfonic acid in the absence of inert solvents, and neutralizing the reaction product obtained with a base.

9. Anionic detergent compositions produced by the process of reacting
  (a) fatty acid-N-alkyl polyhydroxyalkylamides and
  (b) fatty alcohols or fatty alcohol alkoxylates
with gaseous sulfur trioxide or chlorosulfonic acid in the absence of inert solvents, and then neutralizing the reaction product with a base.

17. A surface-active composition comprising an anionic detergent mixture produced by the process of reacting a mixture containing
  (a) fatty acid-N-alkyl polyhydroxyalkylamides and
  (b) fatty alcohols or fatty alcohol alkoxylates
with gaseous sulfur trioxide or chlorosulfonic acid in the absence of inert solvents, and neutralizing the reaction product obtained with a base.

5,691,300

RINSE AIDS FOR THE MACHINE WASHING OF HARD SURFACES

Bernd Fabry, Korschenbroich; Juergen Haerer, Duesseldorf; Birgit Burg, Alpen; Marica Nejtek, Monheim; Peter Jeschke, Neuss, and Udo Hees, Mayen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/02187, § 371 Date Feb. 28, 1996, § 102(e) Date Feb. 28, 1996, PCT Pub. No. WO95/02666, PCT Pub. Date Jan. 26, 1995

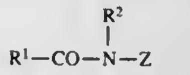
PCT Filed Jul. 4, 1994, Ser. No. 569,238

Claims priority, application Germany, Jul. 12, 1993, 43 23 253.1

Int. Cl.⁶ C11D *3/32;1/825;1/72;3/22*

U.S. Cl. 510—514 **13 Claims**

1. A process for rinsing hard surfaces comprising contacting the hard surfaces with a rinse aid composition consisting of from 0.5% to 20% by weight of fatty acid-N-alkyl polyhydroxyalkyl amides corresponding to formula I:



$$R^1-CO-\overset{\displaystyle R^2\atop |}{N}-Z \qquad (I)$$

wherein R^1CO is an aliphatic acyl radical containing 6 to 22 carbon atoms, R^2 is an alkyl or hydroxyalkyl radical containing 1 to 4 carbon atoms, and Z is a linear or branched polyhydroxyalkyl radical containing 3 to 10 carbon atoms and 3to 10 hydroxyl groups up to 20% by weight of a nonionic surfactant, 1% to 50% by weight of a carboxylic acid, and the balance being water, based on the weight of said composition.

5,691,301

NISIN COMPOSITIONS FOR USE AS ENHANCED, BROAD RANGE BACTERICIDES

Peter Blackburn; June Polak; Sara-Ann Gusik, and Stephen D Rubino, all of New York, N.Y., assignors to AMBI Inc., Tarrytown, N.Y.

Division of Ser. No. 870,803, Apr. 17, 1992, Pat. No. 5,260,271, which is a continuation of Ser. No. 317,626, Mar. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 209,861, Jun. 22, 1988, abandoned. This application Nov. 9, 1993, Ser. No. 149,439

Int. Cl.⁶ A61K *38/16;39/09*

U.S. Cl. 514—2 **11 Claims**

1. A bactericidal composition consisting essentially of a lanthionine-containing bacteriocin and a surfactant.

5,691,302

Patent Not Issued For This Number

5,691,303

PERFUME DELIVERY SYSTEM COMPRISING ZEOLITES

Robert Ya-Lin Pan, Cincinnati; Jing-Feng You, West Chester; Gregory Stephen Caravajal, Fairfield, all of Ohio; Sharon Anne Graves, and William Richard Mueller, both of Lawrenceburg, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 71,124, Jun. 2, 1993, abandoned. This application Feb. 27, 1995, Ser. No. 394,931

Int. Cl.⁶ A61K *7/46*

U.S. Cl. 512—4 **12 Claims**

1. A perfume delivery composition in the form of particles comprising:

a) a solid, water-insoluble, porous carrier which comprises a natural or synthetic zeolite having a nominal pore size of at least about 6 Angstroms;

b) a perfume which is releasably incorporated in the pores of said zeolite carrier to provide a perfumed zeolite; and

c) a matrix coated on said perfume zeolite which comprises a water-soluble composition in which the perfume is substantially insoluble, comprising from about 30% to about 50%, by weight, of at least one solid polyol containing more than 3 hydroxyl moieties and from about 50% to about 70% , by weight, of a fluid diol or polyol in which the perfume is substantially insoluble and in which the solid polyol is substantially soluble.

5,691,304

IMPROVED PROCESS FOR PREPARING POLYMYXIN B/DEXTRAN CONJUGATES

Prasad Kapa, Parsippany; Gleb Kardash, Rockaway; Andrew Kucerovy, Flanders; Philip Lake, Morris Plans; Paul G. Mattner, Piscataway; Russell C. Petter, Rockaway; Mahavir Prashad, Hopatcong, and Sushil Sharma, Budd Lake, all of N.J., assignors to Novartis AG, Basel, Switzerland

Filed May 25, 1995, Ser. No. 449,436

Int. Cl.⁶ A61K *38/10;* **C07K** *5/00*

U.S. Cl. 514—8 **23 Claims**

1. An improved process for producing a water-soluble conjugate of polymyxin B and dextran comprising the step of reacting polymyxin B or a pharmaceutically acceptable salt thereof with dextran in an aqueous media at a pH of 9.3 to 10.

5,691,305

BONE IMPLANT COMPOSITION COMPRISING A POROUS MATRIX, BONE GROWTH PROMOTER PROTEINS, AND PHOSPHOTYROSYL PROTEIN PHOSPHATASE INHIBITOR

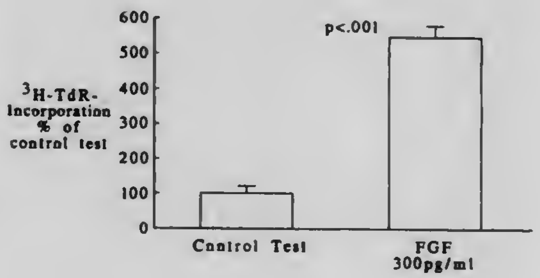
David J. Baylink, 1428 Serpentine Dr., Redlands, Calif. 92373; Rolf Ewers, 1160 Wien, Liebhardtstalstr. 28, Austria, and Axel Kirsch, 7024 Filderstadt, Talstrasse 23, Germany

Continuation of Ser. No. 387,137, Feb. 10, 1995, abandoned, which is a continuation of Ser. No. 50,405, Aug. 20, 1993, abandoned. This application Aug. 16, 1995, Ser. No. 515,700

Claims priority, application Germany, Sep. 13, 1991, 41 30 546.9

Int. Cl.⁶ A61K *38/18;38/22;33/24*

U.S. Cl. 514—8 **4 Claims**



1. A method for making a bone implant material comprising: providing a porous matrix material; and thereafter coating the matrix material with at least one bone growth promoter selected from the group consisting of FGF TGF-β, IGF-II, PDGF and BMP, and a phosphotyrosyl protein phosphatase inhibitor selected from the group consisting of vanadate and molybdate salts, with the proviso that when the bone growth promoter is IGF-II, the phosphotyrosyl protein phosphatase inhibitor is not ortho-vanadate.

5,691,306

METHODS OF DETECTION AND TREATMENT OF PROTEIN TRAFFICKING DISORDERS AND INCREASING SECRETORY PROTEIN PRODUCTION

John J. M. Bergeron, Pointe-Claire; David Y. Thomas, Montreal West, both of Canada, and Ikuo Wada, Sapporo, Japan, assignors to National Research Council of Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 112,395, Aug. 26, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 296,362

Int. Cl.⁶ A61K *38/00;* **C07K** *7/00*

U.S. Cl. 514—11 **8 Claims**

1. A method of increasing secretory protein production in an ex vivo biological preparation, comprising:

administering a calnexin suppressor agent to a biological preparation in an amount effective to increase secretory protein production.

5,691,307

O^6-SUBSTITUTED GUANINE COMPOSITIONS AND METHODS FOR DEPLETING O^6-ALKYLGUANINE-DNA ALKYLTRANSFERASE

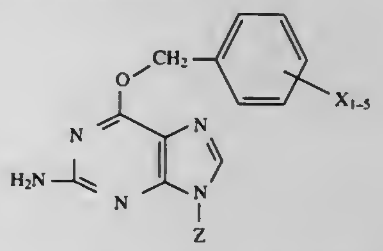
Robert C. Moschel, Frederick, Md.; M. Eileen Dolan, Oak Park, Ill.; Anthony E. Pegg, Hershey, Pa.; Mark G. McDougall, Cleveland, Ohio, and Mi-Young Chae, Frederick, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.; The Penn State Research Foundation, University Park, Pa., and Arch Development Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 875,438, Apr. 29, 1992, abandoned, Ser. No. 616,913, Nov. 21, 1990, Pat. No. 5,352,669, and Ser. No. 805,634, Dec. 12, 1991, Pat. No. 5,358,952, which is a division of Ser. No. 492,468, Mar. 13, 1990, Pat. No. 5,091,430. This application Jun. 7, 1994, Ser. No. 255,190

Int. Cl.⁶ A61K *31/54;31/535;31/52;31/70;* **C07D** *403/02;403/12;473/18;413/18*

U.S. Cl. 514—12 **76 Claims**

1. A compound of the formula:



wherein each of X_1–X_5 is selected from the group consisting of hydrogen, halogen, hydroxy, aryl, a C_1–C_8 alkyl substituted aryl, nitro, a polycyclic aromatic alkyl containing 2–4 aromatic rings wherein the alkyl is a C_1–C_6, a C_3–C_8 cycloalkyl, a C_2–C_6 alkenyl, a C_2–C_6 alkynyl, a C_1–C_6 hydroxyalkyl, a C_1–C_8 alkoxy, a C_2–C_8 alkoxyalkyl, aryloxy, acyloxy, an acyloxyalkyl wherein the alkyl is C_1–C_6, amino, a monoalkylamino wherein the alkyl is C_1–C_6, a dialkylamino wherein the alkyl is C_1–C_6, acylamino, ureido, thioureido, carboxy, a carboxyalkyl wherein the alkyl is C_1–C_6, cyano, a cyanoalkyl wherein the alkyl is C_1–C_6, C-formyl, C-acyl, a dialkoxymethyl wherein the alkoxy is C_1–C_6, an aminoalkyl wherein the alkyl is C_1–C_6, and SO_nR_1 wherein n=0, 1, 2 or 3, R_1 is H, a C_1–C_6 alkyl or aryl; and

wherein Z is selected from the group consisting of aryl, a substituted aryl wherein the aryl substituents are selected from the group consisting of C_1–C_6 alkyls, nitro and halo, a polycyclic aromatic alkyl containing 2–4 aromatic rings, C_2–C_6 alkenyl, C_6 alkynyl, halomethyl, C_1–C_3 hydroxyalkyl, C_1–C_6 halohydroxy alkyl, acyloxy, pivaloyloxymethyl, carboxy, the acid and salt forms of carboxyalkyl wherein the alkyl is C_1–C_6, C_1–C_8 alkoxy, carbonyl, carbamoyl, a carbamoylalkyl wherein the alkyl is C_1–C_6, hydrazinocarbonyl, chlorocarbonyl, cyano, C_2–C_9 cyanoalkyl, C-formyl, a dialkoxymethyl

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wherein the alkoxy is C_1–C_6, C_1-acyl, an alkoxy hydroxyalkyl wherein the alkyl and the alkoxy are C_1–C_4, carboxymethyl thio, a carboalkoxy alkyl wherein the alkoxy and alkyl are C_1–C_6, a monoalkylamino hydroxyalkyl wherein the alkyl is C_1–C_6, a dialkylamino hydroxyalkyl wherein the alkyl is C_1–C_6, amino hydroxyalkyl wherein the alkyl is C_1–C_6, a peptide, a monosaccharide selected from the group consisting of aldotetroses and aldohexoses, a polysaccharide selected from the group consisting of sucrose, lactose, maltose and cellobiose, a nucleic acid segment, asteroid selected from the group consisting of testosterone, nortestosterone, and dihydrotestosterone, and SO_nR_1 wherein n is 0, 1, 2, or 3 and R_1 is H, C_1–C_6 alkyl or aryl.

5,691,308

BACILLUS THURINGIENSIS ISOLATE ACTIVE AGAINST LEPIDOPTERAN PESTS

Jewel Payne, San Diego, and August J. Sick, Oceanside, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation of Ser. No. 210,110, Mar. 17, 1994, abandoned, which is a continuation of Ser. No. 865,168, Apr. 9, 1992, abandoned, which is a division of Ser. No. 451,261, Dec. 14, 1989, Pat. No. 5,188,960, which is a continuation-in-part of Ser. No. 371,955, Jun. 27, 1989, Pat. No. 5,126,133. This application Dec. 14, 1994, Ser. No. 356,034

Int. Cl.^{6} A61K *38/16;* **C07K** *14/325;* **C12N** *1/21*

U.S. Cl. 514—12 **2 Claims**

1. A purified toxin active against lepidopteran insects comprising the amino acid sequence shown in [SEQ ID NO. 2, SEQ ID NO. 4, SEQ ID NO. 6, and] SEQ ID NO. 8.

5,691,309

ANTI-OBESITY PROTEINS

Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffmann, Greenwood; Brigitte E. Schoner, Monrovia; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,451, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 383,650

Int. Cl.^{6} A61K *38/00;* **C07K** *1/00;7/00;5/00*

U.S. Cl. 514—12 **21 Claims**

1. A biologically active peptide of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,691,310

METHODS OF TREATMENT USING PROANF PEPTIDES

David L. Vesely, 5020 Londonderry Dr., Tampa, Fla. 33647

Continuation-in-part of Ser. No. 799,211, Nov. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 517,252, May 1, 1990, abandoned, which is a continuation of Ser. No. 102,477, Sep. 29, 1987, abandoned. This application Mar. 9, 1995, Ser. No. 401,246

Int. Cl.^{6} A61K *38/00;* **C07K** *5/00;7/00*

U.S. Cl. 514—12 **25 Claims**

1. A method of treating high blood pressure, congestive heart failure, pulmonary edema, toxemia of pregnancy, nephrotic syndrome, acute and chronic renal failure, hepatic cirrhosis with and without ascites; which method comprises administering to a mammal, including humans, a therapeutically effective amount of at least 95% pure synthetic peptide from the group of peptides consisting of amino acids 1–30 (i.e., proANF 1–30), amino acids 31–67 (i.e., proANF 31–67), and amino acids 79–98 (i.e., proANF 79–98) of the human sequence of the 126 amino acid atrial natriuretic factor prohormone; which have blood pressure lowering, water, sodium and/or potassium excreting properties in humans; and combinations thereof or a non-toxic salt thereof.

5,691,311

METHODS FOR COATING INVASIVE DEVICES WITH INHIBITORS OF THROMBIN

John M. Maraganore, Concord, Mass.; John W. Fenton, II, Malden Bridge, N.Y., and Toni Kline, Cambridge, Mass., assignors to Biogen, Inc., Cambridge, Mass.

Division of Ser. No. 834,259, Feb. 10, 1992, Pat. No. 5,433,940, which is a continuation-in-part of Ser. No. 549,388, Jul. 6, 1990, Pat. No. 5,196,404, which is a continuation-in-part of Ser. No. 395,482, Aug. 18, 1989, abandoned. This application May 11, 1995, Ser. No. 439,297

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—12 **15 Claims**

1. A method for coating the surface of an invasive device to be inserted into a patient, said method comprising the step of contacting said surface with a composition wherein said composition comprises

a) a thrombin inhibitor consisting of

i. a catalytic site-directed moiety that binds to and inhibits the active site of thrombin wherein said catalytic site-directed moiety is selected from general serine proteinase inhibitors, heterocyclic protease inhibitors, thrombin-specific inhibitors, transition state analogues, benzamidine, DAPA, NAPAP, argipidine, or moieties of the formulae:

$X\text{-}A_1\text{-}A_2\text{-}A_3Y$ or $X\text{-}C_1\text{-}C_2\text{-}A_3Y$.

wherein X is hydrogen or is characterized by a backbone chain consisting of from 1 to 35 atoms; A_1 is Arg, Lys or Orn; A_2 is a non-amide bond; A_3 is characterized by a backbone chain consisting of from 1 to 9 atoms; Y is a bond; C_1 is a derivative of Arg. Lys or Orn comprising a carboxylate moiety that is reduced, or displaced from the α-carbon by a structure characterized by a backbone chain of from 1 to 10 atoms; and C_2 is a non-cleavable bond;

ii. a linker moiety characterized by a backbone chain having a calculated length of between 18 Å and 42 Å; and

iii. an anion binding exosite associating moiety;

said catalytic site-directed moiety being bound to said linked moiety and said linker moiety being bound to said anion binding exosite moiety; and

b) a buffer suitable to promote the binding of said thrombin inhibitor to said invasive device.

5,691,312

PHARMACEUTICAL FOR SUBCUTANEOUS OR INTRAMUSCULAR ADMINISTRATION CONTAINING POLYPEPTIDES

Eric-Paul Paques, Marburg, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 273,621, Jul. 12, 1994, abandoned, which is a continuation of Ser. No. 47,617, Apr. 14, 1993, abandoned, which is a continuation of Ser. No. 742,557, Aug. 9, 1991, abandoned, which is a continuation of Ser. No. 606,312, Oct. 31, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 488,952

Claims priority, application Germany, Nov. 29, 1989, 39 39 346.1

Int. Cl.^{6} A61K *38/00;38/16*

U.S. Cl. 514—12 **1 Claim**

1. A pharmaceutical solution consisting essentially of erythropoietin and arginine or a salt thereof.

5,691,313

METHODS OF TREATING IMPOTENCY WITH CILIARY NEUROTROPHIC FACTOR

Deborah A. Russell, Thousand Oaks, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 298,442, Aug. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 735,538, Jul. 23, 1991, abandoned. This application Aug. 26, 1996, Ser. No. 704,479

Int. Cl.^{6} A61K *38/18*

U.S. Cl. 514—12 **5 Claims**

1. A method for inducing a penile erection in a male human comprising administering to said human a therapeutically effective amount of naturally occurring human CNTF, wherein the male human is responsive to treatment, and the CNTF is an erectogenic agent.

5,691,314

ADJUNCTIVE THERAPY

Gary D. Hodgen, Virginia Beach, Va., assignor to The Medical College of Hampton Roads, Norfolk, Va.

Filed Mar. 18, 1996, Ser. No. 617,048

Int. Cl.^{6} A61K *38/09*

U.S. Cl. 514—15 **14 Claims**

1. A method which comprises administering to an individual an effective amount of a gonadotropin releasing hormone antagonist or mime thereof and thereafter conducting an invasive procedure before the effect of the analog or mime thereof has dissipated.

5,691,315

ENDOTHELIN ANTAGONISTIC PEPTIDE DERIVATIVES

Kiyofumi Ishikawa; Takehiro Fukami; Takashi Hayama; Kenji Niiyama; Toshio Nagase; Toshiaki Mase; Kagari Fujita; Masaki Ihara; Fumihiko Ikemoto, and Mitsuo Yano, all of Tokyo, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

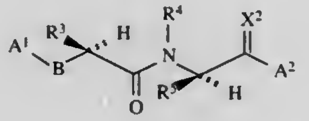
Division of Ser. No. 213,829, Mar. 14, 1994, Pat. No. 5,470,833, which is a continuation of Ser. No. 884,189, May 18, 1992, abandoned, which is a division of Ser. No. 712,095, Jun. 7, 1991, abandoned. This application Jun. 26, 1995, Ser. No. 494,818

Claims priority, application Japan, Jun. 7, 1990, 2-149105

Int. Cl.^{6} A61K *38/00;* **C07K** *7/06;5/08*

U.S. Cl. 514—18 **11 Claims**

1. A peptide of the formula:



(I)

wherein

A^1 is a group of the formula R^{11}—CO—, wherein R^{11} is a lower alkyl group, a cycloalkyl group, a cycloalkyl lower alkyl group, a group of the formula Ar^1—$(CH_2)_p$— wherein Ar^1 is a phenyl group, a furyl group or a thienyl group, and p is 0, 1 or 2, a 1,3 -dithiol-2-ylidenemethyl group, or a 1,3-dithiol-2-ylidene(lower alkoxycarbonyl)methyl group;

B is an oxygen atom or a group of the formula —NR^2— wherein R^2 is a hydrogen atom or a methyl group;

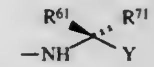
R^3 is a lower alkyl group having 3 to 5 carbon atoms;

R^4 is a hydrogen atom or a methyl group;

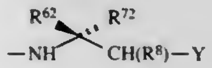
R^5 is a 3-indolylmethyl group, a (2,3-dihydro-2-oxo-3 -indolyl)methyl group, a 3-indolylmethyl group wherein the indole ring is substituted at the 1-position by a group of the formula R^{51}—CO—$(CH_2)_s$— wherein R^{51} is a hydrogen atom, a lower alkyl group, a hydroxyl group, a lower alkoxy group, a benzyloxy group, an amino group or a mono lower alkylamino group, s is an integer of from 0 to 6, provided that when s=0, R^{51} is other than a hydroxyl group, or a group of the formula $(R^{52}O)_2P(=O)$—$(CH_2)_t$— wherein R^{52} is a hydrogen atom, a lower alkyl group or a benzyl group, and t is an integer of from 0 to 6, a benzyl group wherein an optional hydrogen atom on the benzene ring may be replaced by a group of the formula $R^{53}O$—C—$(CH_2)_u$— wherein R^{53} is a hydrogen atom or a lower alkyl group, and u is an integer of from 0 to 6, a benzyl group wherein one or two optional hydrogen atoms on the benzene ring are replaced by a hydroxyl group(s), or two optional hydrogen atoms on the benzene ring are replaced by a hydroxyl group and a sulfo group, a 3-benzothienylmethyl group, a (1-oxo-3-benzothienyl)methyl group, or a (1,1-dioxo-3benzothienyl)methyl group;

X^2 is an oxygen atom or a sulfur atom;

A^2 is selected from the group consisting of the following formulas (III) and (IV)



(III)



(IV)

wherein Y is

(a) a group of the formula —CO_2R^{91} wherein R^{91} is a hydrogen atom, a lower alkyl group or a benzyl group, or

(b) a group of the formula —$CONR^{92}R^{93}$ wherein R^{92} is a hydrogen atom, a lower alkyl group, a lower alkylsulfonyl group, a phenylsulphonyl group wherein one to five optional hydrogen atoms on the benzene ring may independently be replaced by a lower alkyl group or a halogen atom, or a carboxymethyl group, and R^{93} is a hydrogen atom or a lower alkyl group, R^{61} is a hydrogen atom or a lower alkyl group, or together with R^{71} represents a methylene group, R^{71} is a hydrogen atom, a lower alkyl group which may be substituted by a hydroxyl group, a phenyl group, a thienyl group, a phenyl lower alkyl group wherein an optional hydrogen atom on the benzene ring may be replaced by a hydroxyl group or a benzyloxy group, a thienyl lower alkyl group, a thiazolyl lower alkyl group, a 4-imidazolylmethyl group, a (lower alkylsubstituted 4-imidazolyl)methylthiomethyl group, a 3indolylmethyl group, a carbamoyl lower alkyl group or an N-benzyloxycarbonyl-ω-amino lower linear alkyl group, or together with R^{61} represents a methylene group, provided that when R^{61} is a lower alkyl group R^{71} is a group other than a hydrogen atom, R^{62} is a hydrogen atom, a phenyl group, a benzyl group, a carboxy group, a carbamoyl group or an Nphenylcarbamoyl group, or together with R^8 represents a single bond, R^{72} is a hydrogen atom, a lower alkyl group, a phenyl group, a benzyl group, a 3 -indolylmethyl group, a carbamoyl group or an N-phenylcarbamoyl group, provided that when R^{62} is a group other than a hydrogen atom, R^{72} is a hydrogen atom or a lower alkyl group, R^8 is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a hydroxyl group, or together with R^{62} represents a single bond, or a pharmaceutically acceptable salt thereof.

5,691,316

CYCLODEXTRIN CELLULAR DELIVERY SYSTEM FOR OLIGONUCLEOTIDES

Sudhir Agrawal, Shrewsbury; Qiuyan Zhao, Worcester, and Ivan Habus, Shrewsbury, all of Mass., assignors to Hybridon, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 252,072, Jun. 1, 1994, abandoned. This application Nov. 17, 1994, Ser. No. 341,522

Int. Cl.^{6} A61K *48/00;* **C07H** *21/02;21/04;* **C08B** *37/16*

U.S. Cl. 514—44 **16 Claims**

1. A composition comprising adamantane which is covalently linked to an oligonucleotide phosphorothioate or oligonucleotide phosphodiester and noncovalently complexed with a cyclodextrin.

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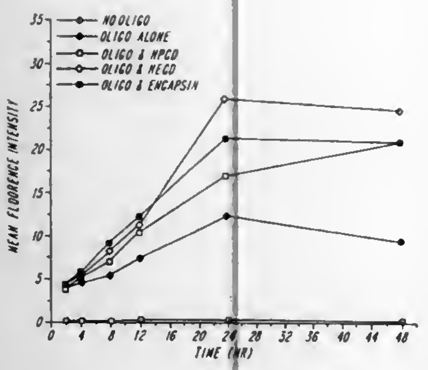


3. A composition comprising an oligonucleotide phosphorothioate or oligonucleotide phosphodiester noncovalently complexed with a cyclodextrin.

5,691,317

ANTISENSE OLIGONUCLEOTIDES OF HUMAN REGULATORY SUBUNIT RI-ALPHA OF CAMP DEPENDENT PROTEIN KINASES FOR THE TREATMENT OF CANCER

Yoon S. Cho-Chung, 7017 Kenhill Rd., Bethesda, Md. 20817

Continuation of Ser. No. 60,984, May 14, 1993, which is a division of Ser. No. 702,163, May 20, 1991, Pat. No. 5,271,941, which is a continuation-in-part of Ser. No. 680,198, Apr. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 607,113, Nov. 2, 1990, abandoned. This application Feb. 2, 1995, Ser. No. 383,742

Int. Cl.^{6} A61K *48/00;* **C12N** *5/10;* **C07H** *21/00;* **C12Q** *1/68*

U.S. Cl. 514—44 **6 Claims**

1. An oligonucleotide derivative of 15 to 30 nucleotides in length and complementary to a region in the nucleic acid encoding the first 100 N-terminal amino acids of RI_{α}, which nucleic acid consists of the nucleotide sequence shown as SEQ ID NO: 6.

5,691,318

METHOD OF TREATING HYPEREXCITED SENSORY NERVE FUNCTION

Alf Sollevi, Bromma, Sweden, assignor to Item Development AB

PCT No. PCT/SE95/00474, § 371 Date Oct. 31, 1996, § 102(e) Date Oct. 31, 1996, PCT Pub. No. WO95/29680, PCT Pub. Date Nov. 9, 1995

PCT Filed Apr. 28, 1995, Ser. No. 732,492

Claims priority, application Sweden, May 2, 1994, 9401499

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—46 **3 Claims**

1. A method of alleviation, normalization or diagnosis of a pathologically hyperexcited sensory nerve function in a human patient, comprising administration of an effective amount of an adenosine receptor agonist to said patient, wherein said hyperexcited sensory nerve function is at least one member of the group consisting of hyperestesia and dysestesia.

5,691,319

PYRIMIDINE NUCLEOSIDE DERIVATIVES HAVING ANTI-TUMOR ACTIVITY, THEIR PREPARATION AND USE

Masakatsu Kaneko; Hitoshi Hotoda; Tomoyuki Shibata; Tomowo Kobayashi; Yoshihiro Mitsuhashi, all of Tokyo; Akira Matsuda, Sapporo, and Takuma Sasaki, Kanazawa, all of Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

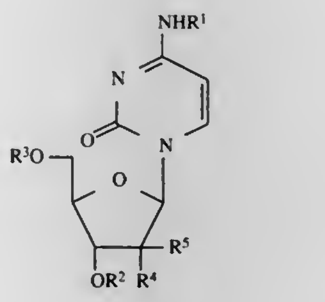
Continuation of Ser. No. 954,764, Sep. 30, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 465,127

Claims priority, application Japan, Sep. 30, 1991, 3-252015

Int. Cl.^{6} A61K *31/505;31/70;* **C07H** *19/09*

U.S. Cl. 514—49 **11 Claims**

1. A compound of formula (I):



(I)

wherein:

R^1 is an unsubstituted alkanoyl group having 14–20 carbon atoms;

$R^2=R^3$=hydrogen; and

one of R^4 and R^5 represents a hydrogen atom and the other represents a cyano group.

5,691,320

ACYLATED PYRIMIDINE NUCLEOSIDES FOR TREATMENT OF SYSTEMIC INFLAMMATION AND INFLAMMATORY HEPATITIS

Reid W. von Borstel; Michael K. Bamat, both of Potomac, and Bradley M. Hiltbrand, Columbia, all of Md., assignors to Pro-Neuron, Inc., Rockville, Md.

Division of Ser. No. 266,897, Jul. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 158,799, Dec. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 987,730, Dec. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 438,493, Jun. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 115,929, Oct. 28, 1987, abandoned. This application Jun. 5, 1995, Ser. No. 465,454

Int. Cl.^{6} A61K *31/70;* **C07H** *19/067*

U.S. Cl. 514—50 **20 Claims**

1. A method for treating tissue damage due to systemic inflammatory response syndrome comprising administering to an animal a therapeutically effective amount of uridine, cytidine, orotic acid, acylated uridine, acylated cytidine, or acylated orotic acid, or a pharmaceutically acceptable salt thereof.

5,691,321

HETEROCYCLYLAMINO-AND HETEROCYCLYLOXY-CYCLOALKYL DERIVATIVES, THEIR PREPARATION, AND THEIR USE AS PESTICIDES AND FUNGICIDES

Wolfgang Schaper, Diedorf; Rainer Preuss, Berlin; Peter Braun, Nieder-Olm; Werner Knauf, Eppstein; Burkhard Sachse, Kelkheim; Anna Waltersdorfer, Frankfurt; Manfred Kern, Lörzweiler; Peter Lümmen, Niedernhausen, and Werner Bonin, Kelkheim, all of Germany, assignors to Hoechst Schering AgrEvo GmbH, Berlin, Germany

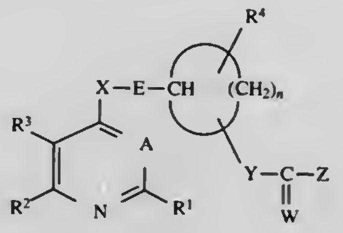
Filed May 15, 1995, Ser. No. 441,217

Claims priority, application Germany, May 17, 1994, 44 17 163.3

Int. Cl.^{6} C07D *239/34;239/38;239/42;* **A01N** *43/54*

U.S. Cl. 514—63 **16 Claims**

1. A compound of the formula I



in which

R^1 is hydrogen, halogen, $(C_1–C_4)$-alkyl or $(C_3–C_5)$-cycloalkyl;

R^2 and R^3 are identical or different and are in each case hydrogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-haloalkyl, $(C_2–C_4)$-alkenyl, $(C_2–C_4)$-haloalkenyl, $(C_2–C_4)$-alkynyl, $(C_2–C_4)$-haloalkynyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkoxy, $(C_1–C_4)$-alkoxy-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-haloalkoxy-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy-$(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-haloalkoxy-$(C_1–C_4)$-haloalkyl, halogen, hydroxyl, $(C_1–C_4)$-hydroxyalkayl, $(C_1–C_4)$-alkanoyl, $(C_1–C_4)$-alkanoyl-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-haloalkanoyl, $(C_3–C_5)$-cycloalkyl, $(C_3–C_5)$-halocycloalkyl, cyano, $(C_1–C_4)$-cyanoalkyl, nitro, $(C_1–C_4)$-nitroalkyl,1 thiocyano, $(C_1–C_4)$-alkoxycarbonyl, $(C_1–C_4)$-alkoxycarbonyl-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-haloalkoxycarbonyl, $(C_1–C_4)$-alkylthio, $(C_1–C_4)$-alkylthio-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-haloalkylthio, $(C_1–C_4)$-alkylsulfinyl, $(C_1–C_4)$-haloalkaylsulfinyl, $(C_1–C_4)$-alkylsulfonyl or $(C_1–C_4)$-haloalkylsulfony;

X is NH, oxygen or sulfur;

E is a direct bond or a straight-chain or branched $(C_1–C_4)$-alkanediyl group;

n is an integer from 2 to 7;

R^4 is hydrogen or $(C_1–C_4)$-alkyl;

Y is oxygen or a direct bond;

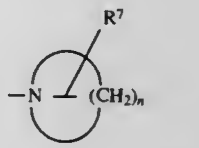
W is oxygen or sulfur;

Z is a radical DR^5 or NR^5R^6;

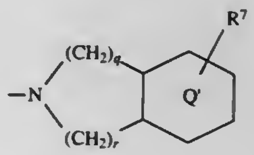
D is oxygen, sulfur or a direct bond;

R^5 and R^6 are identical or different and are hydrogen, hydroxyl, cyano, thiocyano, nito, halogen alkyl, alkenyl, alkynyl, aryl or heterocyclyl, it being possible for the aryl or heterocyclyl radicals mentioned to be unsubstituted or to have attached to them up to three, in the case of fluorine also up to the maximum number of, identical or different radicals and it being possible for one or more nonadjacent saturated carbon units in the abovementioned alkyl, alkenyl or alkynyl radicals to be replaced by a carbonyl group or by hetero atom units, $S(O)_x$, where x=0, 1 or 2, NR^9 or SiR^7R^8, R^9 being hydrogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy or $(C_1–C_4)$-alkanoyl and R^7 and R^8 being $(C_1–C_4)$-alkyl; and in which moreover 3 to 12 atoms of these hydrocarbon radicals which are optionally modified as above can form a cycle and it is possible for these hydrocarbon radicals, with or without the abovementioned variations, to be optionally substituted by one or more in the case of fluorine up to the maximum number of, identical or different radicals selected from the series consisting of halogen, aryl, aryloxy, arylthio, cycloalkoxy, cycloalkylthio, heterocyclyl, heterocyclyloxy, heterocyclythio, alkanoyl, cycloalkanoyl, haloalkanoyl, aroyl, arylalkanoyl, cycloalkylalkanoyl, heterocyclylalkanoyl, alkoxycarbonyl, haloalkoxycarbonyl, cycloalkoxycarbonyl, cycloalkylalkoxycarbonyl, arylalkoxycarbonyl, heterocyclylalkoxycarbonyl, aryloxycarbonyl, heterocyclyloxycarbonyl, alkanoyloxy, haloalkanoyloxy, cycloalkanoyloxy, cycloalkylalkanoqloxy, aroyloxy, arylakanoyloxy, heterocyclylalkanoyloxy, alkylsulfonyloxy, arylsulfonyloxy, hydroxyl, cyano, thiocyano or nitro, it being possible for the cycloaliphatic, aromatic or heterocyclic ring systems amongst the substituents which have just been mentioned to be unsubstituted or to have attached to them up to three, in the case of fluorine also up to the maximum number of, identical or different substituents,

R^5 and R^6 form a ring system of the formula II or III



II



III

in which

the six-membered ring Q' is saturated or aromatic;

m is an integer from 2 to 7;

q and r are zero or integers whose total is a number from 2 to 4 and in which one CH_2 unit is optionally replaced by oxygen, sulfur or a group NR^8, and

R^7 and R^8 are identical or different and are in each case hydrogen, alkyl, haloalkyl, alkoxy, alkylthio, phenylalkyl or phenyl and the phenyl groups can be unsubstituted or have attached to them up to three, in the case of fluorine also up to the maximum number of, identical or different substituents,

wherein a heterocyclyl is a heteroaromatic or heteroaliphatic ring system, a heteroaromatic ring system is a $(C_6–C_{14})$-aryl radical in which at least one CH group is replaced by N and/or at least two adjacent CH groups are replaced by S, NH or O, a heteroaliphatic ring system is $(C_3–C_8)$-cycloalkyl in which at least one carbon unit is replaced by O, S or NR^{11}, and

R^{11} is $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy or $(C_6–C_{14})$-aryl,

or salts thereof.

5,691,322

QUINOLINE AND PYRIDINE ANCHORS FOR HMG-COA REDUCTASE INHIBITORS

Jeffrey Adam Robl, Holland, Pa., assignor to E.R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 400,629, Mar. 7, 1995, Pat. No. 5,506,219, which is a continuation of Ser. No. 588,800, Sep. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 485,398, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 272,610, Nov. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 237,349, Aug. 29, 1988, abandoned. This application Oct. 31, 1995, Ser. No. 558,568

Int. Cl.^{6} C07F *9/60;9/62;* **A61K** *31/675*

U.S. Cl. 514—82 **14 Claims**

1. A compound of the formula

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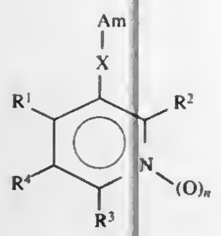
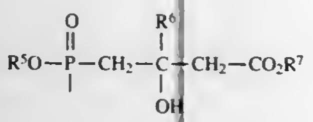
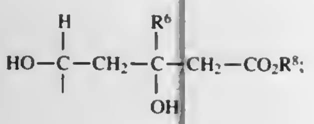


or a pharmaceutically acceptable salt thereof wherein:
Am is



$$R^5O-\underset{|}{\overset{\overset{O}{\|}}{P}}-CH_2-\underset{\underset{OH}{|}}{\overset{\overset{R^6}{|}}{C}}-CH_2-CO_2R^7$$

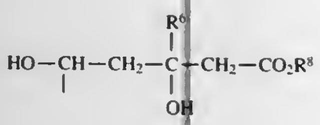
or



$$HO-\underset{|}{\overset{\overset{H}{|}}{C}}-CH_2-\underset{\underset{OH}{|}}{\overset{\overset{R^6}{|}}{C}}-CH_2-CO_2R^8;$$

X is —$(CH_2)_a$—, —CH═CH—, —C≡C— or —CH_2O—;
R^1 and R^2 are the same or different and are each independently selected from
- (i) hydrogen,
- (ii) alkyl,
- (iii) aryl,
- (iv) cycloalkyl,
- (v) aralkyl,
- (vi) aralkoxy,
- (vii) alkenyl, and
- (viii) cycloalkenyl;

R^3 and R^4 taken together are —$(CH_2)_p$— or $(CH{=}CH)_2$; but when Am is



$$HO-\underset{|}{CH}-CH_2-\underset{\underset{OH}{|}}{\overset{\overset{R^6}{|}}{C}}-CH_2-CO_2R^8$$

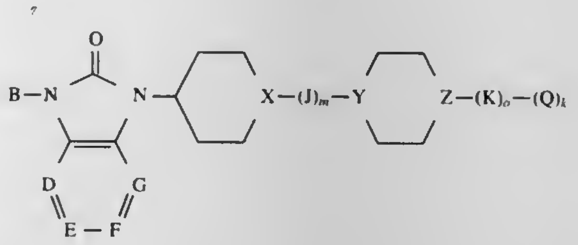
or a δ lactone thereof, R^3 and R^4 cannot be $(CH{=}CH)_2$;
p is 4;
R^5 and R^7 are each independently selected form hydrogen, lower alkyl, alkali metal salt ion and alkaline earth metal salt ion;
R^6 is hydrogen or lower alkyl;
R^8 is hydrogen or lower alkyl in the free acid form or in the form of a physiologically acceptable and hydrolyzable ester or δ-lactone thereof, or an alkali metal salt ion or alkaline earth metal salt ion;
n is 0 or 1; and
a is 1, 2 or 3 , and wherein "aryl" by itself or as part of another group is a monocyclic or bicyclic aromatic group containing 6 to 10 carbons in the ring portion;
"alkyl" or "lower alkyl" by itself or as part of another group contains 1 to 12 carbons;
"cycloalkyl" by itself or as part of another group contains 3 to 12 carbons;
"cycloalkenyl" by itself or as part of another group contains 3 to 12 carbons.

5,691,323
MUSCARINE ANTAGONISTS

Wayne J. Thompson, Lansdale; Michael F. Sugrue, Blue Bell; Richard W. Ransom, New Britian; Pierre J. Mallorga, Lansdale; Ian M. Bell, Harleysville, and Anthony M. Smith, Green Lane, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 12, 1995, Ser. No. 440,153
Int. Cl.^{6} A61K *31/38;31/34;* **C07D** *403/14;403/12*
U.S. Cl. 514—94 **9 Claims**

1. A compound of structural formula I:



wherein;
C is carbon;
H is hydrogen;
N is nitrogen;
O is oxygen;
S is sulfur;
P is phosphorus;
X and Y are independently N or CH;
Z is N;
J is NB or CB_2;
K is NB, CB_2, O, carbonyl, thiocarbonyl, sulfonyl, phosphonyl, NBCO, $NBCO_2$, $NBCB_2$, $COCB_2$, CONB, CO_2, CO_2B, NB_2, $NBCONB_2$, CB_2COCB_2, CB_2CONB, $NBCOCB_2$ or OB;
m and o are 0, 1 or 2;
k is 1 or 2;
B is H, Me, Et, Pr, iPr, CH_2OH, CO_2Me, CO_2Et, CH_2CH_2OH, $CONH_2$, OH, NH_2, NHMe, OMe, OEt, CONHMe or $CONMe_2$;
Q is phenyl or heterocycle ring unsubstituted or substituted with Me, Et, Pr, Bu, hydroxyl, alkoxy, F, Cl, Br, I alkylsulfonyl, phenyl or heterocyclic; and
D,E,F and G are chosen from:

<table>
<tr><th>D</th><th>E</th><th>F</th><th>G</th></tr>
<tr><td colspan="2">S</td><td>CR</td><td>CR</td></tr>
<tr><td>CR</td><td colspan="2">S</td><td>CR</td></tr>
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<tr><td>CR</td><td colspan="2">O</td><td>CR and</td></tr>
<tr><td>CR</td><td>CR</td><td colspan="2">O</td></tr>
</table>

wherein:
R is H, small alkyl, branched alkyl, halo, alkoxy, OH, amino, dialkylamino or alkylamino.

5,691,324
METHODS USEFUL FOR THE TREATMENT OF NEUROLOGICAL AND MENTAL DISORDERS RELATED TO DEFICIENT SEROTONIN NEUROTRANSMISSION AND IMPAIRED PINEAL MELATONIN FUNCTIONS

Reuven Sandyk, 7 Piper Ct., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 181,677, Jan. 14, 1994, Pat. No. 5,470,846. This application May 8, 1995, Ser. No. 437,273
Int. Cl.^{6} A61K *31/60;31/56;31/40;31/21*
U.S. Cl. 514—159 **23 Claims**

1. A method of treating neurological and mental disorders which are associated with and related pathogenetically to deficient serotonin transmission and impaired pineal melatonin functions in humans and for treating neurological and mental disorders which are associated with or related pathogenetically to deficient serotonin neurotransfussion and impaired pineal melatonin functions in humans which comprises administering to a human in need thereof an effective amount of a composition which increases serotonin neurotransmission to the human to be treated followed by the application to the brain of the human of a sufficient amount of an AC pulsed magnetic field of proper intensity and frequency alone or in combination with a sufficient amount of a DC magnetic field of proper intensity and frequency to treat the disorder.

5,691,325
METHOD FOR AMELIORATING AGE-RELATED DISEASE CONDITIONS

Reuven Sandyk, 7 Piper Ct., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 181,677, Jan. 14, 1994, Pat. No. 5,470,846. This application May 8, 1995, Ser. No. 437,283
Int. Cl.^{6} A61K *31/60;31/495;31/40;31/445*
U.S. Cl. 514—159 **39 Claims**

1. A method of ameliorating age-related disease conditions associated with or related pathogenetically to deficient serotonin neurotransmission and pineal functions in humans which comprises administering to a human in need thereof an effective amount of a composition which increases serotonin neurotransmission to said human followed by the application to the brain of the human of an effective amount of an AC pulsed magnetic field of proper intensity, frequency and waveform.

5,691,326

Patent Not Issued For This Number

5,691,327
USE OF SALICYCLIC ACID FOR REGULATING SKIN WRINKLES AND/OR SKIN ATROPHY

Roy Lonnie Blank, Spring Valley, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 641,296, Apr. 30, 1996, Pat. No. 5,616,572, which is a continuation of Ser. No. 434,250, May 3, 1995, which is a continuation of Ser. No. 28,756, Mar. 9, 1993, which is a continuation of Ser. No. 796,750, Nov. 25, 1991. This application Dec. 31, 1996, Ser. No. 775,487
Int. Cl.^{6} A61K *31/60;7/42;7/44*
U.S. Cl. 514—159 **6 Claims**

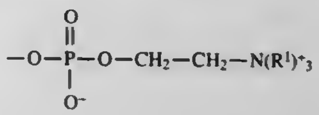
1. A method for preventing, retarding, arresting, or reversing wrinkles or atrophy in mammalian skin comprising treating the skin with a safe and effective amount of a composition comprising:
(a) a safe and effective amount of salicylic acid,
(b) an emollient, and
(c) a pharmaceutically-acceptable carrier.

5,691,328
PHOSPHOETHANOLAMINE CONJUGATES OF VITAMIN D COMPOUNDS

Andrew C. Peterson, and Parvin T. Yazdi, both of Madison, Wis., assignors to Clarion Pharmaceuticals Inc., Madison, Wis.

Filed Aug. 27, 1996, Ser. No. 703,447
Int. Cl.^{6} A61K *31/59;* **C07C** *401/00*
U.S. Cl. 514—167 **23 Claims**

1. A conjugate of a vitamin D moiety with a phosphoethanolamine moiety of formula



$$-O-\underset{\underset{O^-}{|}}{\overset{\overset{O}{\|}}{P}}-O-CH_2-CH_2-N(R^1)^+_3$$

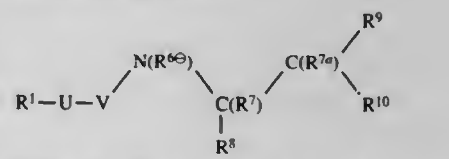
at the 3-position of the vitamin D moiety, wherein R^1 is hydrogen or methyl, provided that at least one R^1 is methyl, all isomeric forms of the conjugate, and pharmaceutically acceptable salts of the conjugate and all isomeric forms thereof.

5,691,329
COMPOUNDS CONTAINING BASIC AND ACIDIC TERMINI USEFUL AS FIBRINOGEN RECEPTOR ANTAGONISTS

William Frank DeGrado, Moylan, Pa., and Chu-Biao Xue, Hockessin, Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

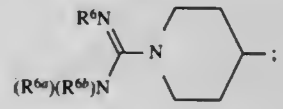
Division of Ser. No. 343,159, Nov. 22, 1994, Pat. No. 5,563,158, which is a continuation-in-part of Ser. No. 174,552, Dec. 28, 1993, abandoned. This application Aug. 8, 1996, Ser. No. 694,043
Int. Cl.^{6} C07D *401/02;* **A61K** *31/44;31/445*
U.S. Cl. 514—210 **10 Claims**

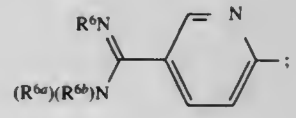
1. A compound of Formula I:

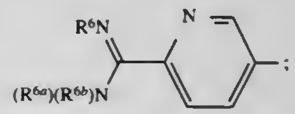


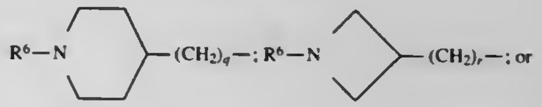
(I)

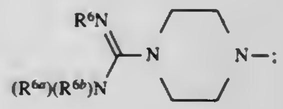
or a pharmaceutically acceptable salt form thereof wherein:
R^1 is selected from:











q is 1, 2, or 3;

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r is 2, 3, or 4;

R^6 and R^{6a} are independently selected from: H, C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{11} cycloalkylalkyl, aryl, aryl(C_1–C_6 alkyl)-, (C_1–C_7 alkyl)carbonyl, arylcarbonyl, (C_1–C_{10} alkoxy)carbonyl, C_4–C_{11} cycloalkoxycarbonyl, C_7–C_{11} bicycloalkoxycarbonyl, aryloxycarbonyl, aryl(C_1–C_{10} alkyl)carbonyl, or aryl(C_1–C_{10} alkoxy) carbonyl;

R^7 and $R^{7a}$are selected independently from: H or C_1–C_4 alkyl;

R^{6b} is selected from: H, C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{15} cycloalkylalkyl, aryl, aryl(C_1–C_{10} alkyl)-;

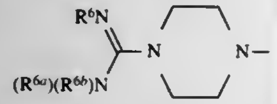
R^{6e} is selected from: H, C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{15} cycloalkylalkyl, aryl, aryl(C_1–C_{10} alkyl)-;

alternatively, R^{6e} and R^7 can be taken together with the nitrogen and carbon atom to which they are attached to form a 5–7-membered nitrogen heterocycle, said heterocycle optionally including one additional N, O or S atom;

U is selected from:
- —CH_2—CH_2—CH_2-substituted with 0–4 R^3,
- —X—CH_2—CH_2-substituted with 0–4 R^3,
- —CH_2—X—CH_2-substituted with 0–4 R^3,
- —CH_2—CH_2—X-substituted with 0–4 R^3,
- —CH_2—CH═CH-substituted with 0–4 R^3,
- —CH═CH—CH_2-substituted with 0–4 R^3,
- —CH_2—C≡C-substituted with 0–2 R^3,
- —C═C—CH_2-substituted with 0–2 R^3,
- —CH═CH-substituted with 0–2 R^3,
- —C═C—,
- —CH_2—CH_2-substituted with 0–4 R^3,
- —X—CH_2-substituted with 0–2 R^3,
- —CH_2—X-substituted with 0–2 R^3,
- —X—, or
- —CH_2-substituted with 0–2 R^3;

X is selected from: O, S, S(═O), SO_2, $SO_2N(R^{6c})$, $N(R^{6c})SO_2$, $N(R^{6c})$, $N(R^{12})$, $N(R^{6c})C({=}O)$;

with the proviso that when R^1 is



then X is not S, S(═O), or $SO_2N(R^{6c})$;

R^{12} and R^{13} are independently selected from: H, C_1–C_{10} alkyl, C_1– C_{10} alkoxycarbonyl, C_1–C_{10} alkylcarbonyl, C_1–C_{10} alkylsulfonyl, aryl(C_1–C_{10} alkyl)sulfonyl, arylsulfonyl, aryl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{15} cycloalkylalkyl, aryl(C_1–C_{10} alkyl), arylcarbonyl, C_4–C_{11} cycloalkoxycarbonyl, C_7–C_{11} bicycloalkoxycarbonyl, aryloxycarbonyl, or aryl(C_1–C_{10} alkoxy) carbonyl;

R^{6c} is selected from: H, C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{15} cycloalkylalkyl, aryl, aryl(C_1–C_{10} alkyl)-;

R^3 is independently selected from: H, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_4–C_{11} cycloalkylalkyl, aryl, aryl(C_1–C_6 alkyl)-;

vis-Q-Y-;

Q is a heterocyclic ring selected from oxazole, isoxazole, oxazoline, or isoxazoline, said heterocyclic ring being substituted with 0–2 R^5, wherein, the bonds between Q and Y and between Q and U are at 1 and 3 positions of Q;

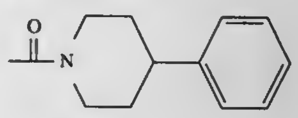
Y is selected from: C(═O) or $S(O)_2$;

R^5 is selected independently from: H, F, Cl, Br, I, CF_3, CN, CHO, CO_2R^{5a}, $C({=}O)R^{5a}$, $CONHR^{5a}$, $CON(R^{5a})_2$, $OC({=}O)R^{5a}$, OCO_2R^{5a}, OR^{5a}, OC(═O) $N(^{5a})_2$, $OCH_2CO_2R^{5a}$, $CO_2CH_2CO_2R^{5a}$, $N(R^{12})R^{5a}$, NO_2, $NR^{5a}C({=}O)R^{5a}$, $NR^{5a}C({=}O)$ OR^{5a}, $NR^{5a}SO_2N(R^{12})R^{5a}$, $NR^{5a}SO_2R^{5b}$, SR^{5a}, $S({=}O)R^{5b}$, SO_2R^{5b}, $SO_2N(R^{5a})_2$, C_1 to C_{10} alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkynyl, C_3 to C_{11} cycloalkyl, C_4 to C_{15} cycloalkylalkyl, aryl, aryl(C_1–C_{10} alkyl),
- C_1 to C_6 alkyl substituted with 0–4 R^{5c},
- C_2 to C_6 alkenyl substituted with 0–4 R^{5c},
- C_2 to C_6 alkynyl substituted with 0–4 R^{5c},
- C_3 to C_{11} cycloalkyl substituted with 0–3 R^{5c},
- C_4 to C_{15} cycloalkylalkyl substituted with 0–3 R^{5c},
- aryl substituted with 0–3 R^{5c},
- aryl(C_1–C_{10} alkyl) substituted with 0–3 R^{5c}; R^{5a} is selected from: H, C_1 to C_{10} alkyl, C_2 to C_6 alkenyl, C_3 to C_{11} cycloalkyl, C_4 to C_{15} cycloalkylalkyl, aryl, or aryl(C_1–C_{10} alkyl);

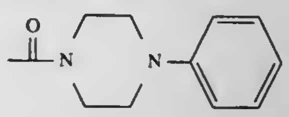
R^{5b} is selected from: C_1 to C_{10} alkyl, C_2 to C_6 alkenyl, C_3 to C_{15} cycloalkyl, C_4 to C_{11} cycloalkylalkyl, aryl, or aryl(C_1–C_{10} alkyl);

R^{5c} is selected from: H, halogen, C_1–C_4 alkyl, C_1–C_3 haloalkyl, CN, C_1–C_4 alkoxy, NO_2;

R^8 is selected from:
- H;
- C_1–C_6 alkyl substituted with 0–4 R^{3a};
- C_2–C_6 alkenyl substituted with 0–4 R^{3a};
- C_2–C_6 alkynyl substituted with 0–4 R^{3a};
- C_3–C_8 cycloalkyl substituted with 0–4 R^{3a};
- aryl substituted with 0–4 R^{3a};
- aryl(C_1–C_6 alkyl)-substituted with 0–4 R^{3a};
- a 5–10 membered heterocyclic ring system having 1–4 heteroatoms selected independently from O, S, and N, said heterocyclic ring being substituted with 0–3 R^{3a};
- C_1–C_6 alkyl substituted with a 5–10 membered heterocyclic ring system having 1–4 heteroatoms selected independently from O, S, and N, said heterocyclic ring being substituted with 0–4 R^{3a};
- (R^{12}) (R^{5a}) NC(═O)-;
- piperidyl-C(═O)-;



substituted with 0–4 R^{3a}; or



substituted with 0–4 R^{3a};

R^{3a} is selected from H, halogen, C_1–C_8 alkyl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{11} cycloalkylalkyl, aryl, aryl(C_1–C_6 alkyl)-;

R^9 is selected from:
- H,
- —R^{15},
- —$N(R^{6d})C({=}O)$-O-R^{15a},
- —$N(R^{6d})C({=}O)$-R^{15},
- —$N(R^{6d})C({=}O)$-NH-R^{15},
- —$N(R^{6d})$NH-C(═O)-O-R^{15a},
- —$N(R^{6d})$NH-C(═O)-R^{15},
- —$N(R^{6d})$NH-C(═O)-NH-R^{15},
- —$N(R^{6d})S({=}O)_2$-O-R^{15b},
- —$N(R^{6d})S({=}O)_2$-R^{15},
- —$N(R^{6d})C({=}S)NHR^{15}$,
- —$N(R^{6d})P({=}S)OR^{15a}$,
- —$N(R^{6d})P({=}O)OR^{15a}$,
- —$N(R^{6d})P({=}S)(R^{15a})_2$,
- —$N(R^{6d})P({=}O)(R^{15a})_2$,
- —$N(R^{12})(R^{5a})$,
- —CH═CH-R^{15}, or
- —C≡C—R^{15};

R^{6d} is selected from: H, C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_3–C_{11} cycloalkyl, C_4–C_{15} cycloalkylalkyl, aryl, aryl(C_1–C_{10} alkyl)-;

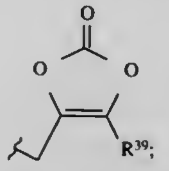
R^{15} is selected from:
- H,
- C_1–C_8 alkyl substituted with 0–4 R^{3a},
- C_2–C_8 alkenyl substituted with 0–4 R^{3a},
- C_2–C_8 alkynyl substituted with 0–4 R^{3a},
- C_3–C_8 cycloalkyl substituted with 0–4 R^{3a},
- aryl substituted with 0–4 R^{3a},
- aryl(C_1–C_6 alkyl)-substituted with 0–4 R^{3a},
- a 5–10 membered heterocyclic ring system having 1–4 heteroatoms selected independently from O, S, and N, said heterocyclic ring being substituted with 0–3 R^{3a},
- C_1–C_6 alkyl substituted with a 5–10 membered heterocyclic ring system having 1–4 heteroatoms selected independently from O, S, and N, said heterocyclic ring being substituted with 0–4 R^{3a};

R^{15a} is selected from:
- C_1–C_8 alkyl substituted with 0–4 R^{3a},
- C_2–C_8 alkenyl substituted with 0–4 R^{3a},
- C_2–C_8 alkynyl substituted with 0–4 R^{3a},
- C_3–C_8 cycloalkyl substituted with 0–4 R^{3a},
- aryl substituted with 0–4 R^{3a},
- aryl(C_1–C_6 alkyl)-substituted with 0–4 R^{3a},
- a 5–10 membered heterocyclic ring system having 1–4 heteroatoms selected independently from O, S, and N, said heterocyclic ring being substituted with 0–3 R^{3a},
- C_1–C_6 alkyl substituted with a 5–10 membered heterocyclic ring system having 1–4 heteroatoms selected independently from O, S, and N, said heterocyclic ring being substituted with 0–4 R^{3a};

R^{10} is selected from CO_2R^{16}, CO_2R^{13b}, SO_3H, tetrazolyl, or PO_3H;

R^{16} is selected from: H, C_1 to C_{10} alkyl, C_3 to C_{11} cycloalkyl, aryl, aryl(C_1 to C_6 alkyl)-, C_3 to C_{10} alkylcarbonyloxyalkyl, C_3 to C_{10} alkoxycarbonyloxyalkyl, C_2 to C_{10} alkoxycarbonyl, C_5 to C_{10} cycloalkylcarbonyloxyalkyl, C_5 to C_{10} cycloalkoxycarbonyloxyalkyl, C_5 to C_{10} cycloalkoxycarbonyl, aryloxycarbonyl, aryloxycarbonyloxy(C_1 to C_6 alkyl)-, arylcarbonyloxy(C_1 to C_6 alkyl)-, C_5 to C_{12} alkoxyalkylcarbonyloxyalkyl, (5-(C_1–C_5 alkyl)-1,3-dioxacyclopenten- 2-one-yl)methyl, (5-aryl-1,3-dioxa-cyclopenten- 2-one-yl)methyl, or $(R^{12})(R^5a)N$-(C_1–C_{10} alkyl)-;

R^{13b} is selected independently from:
- —$CH(R^{36})OC({=}O)R^{37}$;
- —$CH(R^{36})OC({=}O)OR^{38}$;



R^{36} is C_1–C_4 linear alkyl or H;

R^{37} is selected from:
- (a) H;
- (b) C_1–C_8 alkyl or C_3–C_8 cycloalkyl, said alkyl or cycloalkyl being substituted with 1–2 groups independently selected from:
  - (i) C_1–C_4 alkyl;
  - (ii) C_3–C_8 cycloalkyl;
  - (iii) C_1–C_5 alkoxy;
  - (iv) aryl substituted with 0–2 groups independently selected from: halogen, phenyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, NO_2, —S(C_1–C_5 alkyl), —S(═O) (C_1–C_5 alkyl), —SO_2(C_1–C_5 alkyl), —OH, —$N(R^{12})(R^{5a})$, —CO_2R^{5a}, —$C({=}O)N(R^{12})(R^{5a})$, or —C_vF_w where v=1 to 3 and w=1 to (2v+1);
- (c) aryl substituted with 0–2 groups independently selected from: halogen, phenyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, NO_2, —S(C_1–C_5 alkyl), —S(═O)(C_1–C_5 alkyl), —SO_2 (C_1–C_5 alkyl), —OH, —N $(R^{12})(R^{5a})$, —CO_2R^{5a}, —$C({=}O)N(R^{12})(R^{5a})$, or —C_vF_w where v=1 to 3 and w=1 to (2v+1);

R^{38} is selected from:
- (a) C_1–C_8 alkyl or C_3–C_8 cycloalkyl, said alkyl or cycloalkyl being substituted with 1–2 groups independently selected from:
  - (i) C_1–C_4 alkyl;
  - (ii) C_3–C_8 cycloalkyl;
  - (iii) C_1–C_5 alkoxy;
  - (iv) aryl substituted with 0–2 groups independently selected from: halogen, phenyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, NO_2, —S(C_1–C_5 alkyl), —S(═O) (C_1–C_5 alkyl), —SO_2(C_1–C_5 alkyl), —OH, —$N(R^{12})(R^{5a})$, —CO_2R^{5a}, —$C({=}O)N(R^{12})(R^{5a})$, or —C_vF_w where v=1 to 3 and w=1 to (2v+1);
- (b) aryl substituted with 0–2 groups independently selected from: halogen, phenyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, NO_2, —S(C_1–C_5 alkyl), —S(═O)(C_1–C_5 alkyl), —SO_2(C_1–C_5 alkyl), —OH, —$N(R^{12})(R^{5a})$, —CO_2R^{5a}, —$C({=}O)N(R^{12})(R^{5a})$, or —C_vF_w where v=1 to 3 and w=1 to (2v+1);

R^{39} is C_1–C_4 alkyl, benzyl, or phenyl.

5,691,330

CONDENSED THIOPHENE COMPOUND AND PHARMACEUTICAL USE THEREOF

Tobru Nakao; Yuji Ono; Masahiro Bougauchi, all of Fukuoka, and Yasuto Morimoto, Osaka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

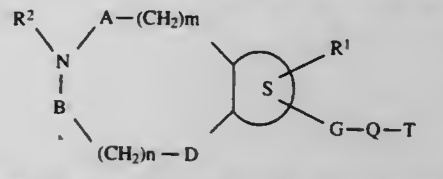
Division of Ser. No. 272,320, Jul. 8, 1994, Pat. No. 5,532,240, which is a continuation-in-part of Ser. No. 107,564, Aug. 18, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,843

Claims priority, application Japan, Dec. 26, 1991, HEI3-359547; Oct. 23, 1992, HEI4-309388

Int. Cl.^{6} A61K *31/55;* **C07D** *487/04;473/18*

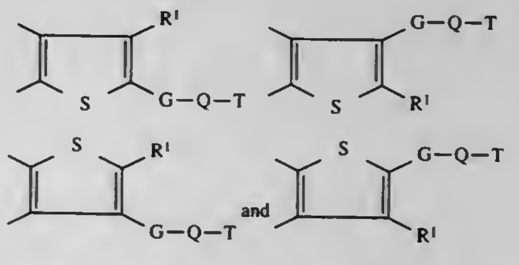
U.S. Cl. 514—215 **7 Claims**

1. A condensed thiophene compound represented by the following formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein the ring S is selected from the group consisting of the following fused thiophenes:



wherein R^1 represents a hydrogen atom, a halogen atom, an alkyl group, an acyl group or a hydroxyalkyl group;

R^2 represents a hydrogen atom, an alkyl group, an acyl group, a carbamoyl group, a substituted carbamoyl group, an aryl group or an arylalkyl group;

G represents a —CH_2— group, a —$CH(OR^3)$— group, a —CO— group or a —$S(O)_t$— group; wherein R^3 represents a hydrogen atom, an alkyl group or an acyl group and t is 0, 1, or 2;

Q represents a straight alkylene group or a branched chain alkylene group;

T represents a tertiary amino group;

D represents a —CH_2 group or a —$S(O)_u$— group; wherein u is 0, 1 or 2;

either (i) A is absent and B represents a carbonyl group or a thiocarbonyl group, or (ii) both A and B are absent;

when A is absent and B is a carbonyl group or a thiocarbonyl group, m is 0 and n is 0, 1 or 2; when both A and B are absent, m is 0 and n is 0 or an integer of 1 to 4.

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5,691,331

N-(2,4-DIOXO-2,3,4,5-TETRAHYDRO-1H-1,5-BENZODIAZEPIN-3YL)-3-AMIDES

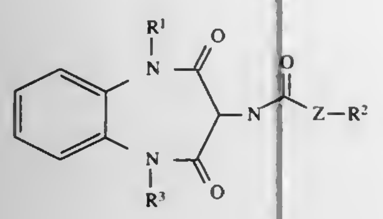
David A. Claremon, Maple Glen; Roger M. Freidinger, Lansdale; Nigel Liverton, Harleysville; Harold G. Selnick, Ambler, and Garry R. Smith, East Norriton, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 7, 1995, Ser. No. 474,801

Int. Cl.^{6} A61K *31/55*; **C07D** *243/12*

U.S. Cl. 514—221 **12 Claims**

1. A compound of the structural formula I



FORMULA I

where

R^1 and R^3 are independently C_{1-6} alkyl, either straight or branched chain; substituted C_{1-6} alkyl, either straight or branched chain wherein the substituents are selected from F, C_{3-8} cycloalkane, —OH, —CF_3, and

Z is

1) C_{1-6} alkyl, either straight or branched chain,

2) substituted C_{1-6} alkyl, either straight or branched chain, wherein the substituents are selected from F, OH, NO_2,

3) C_{2-4} alkenylene, either straight or branched chain,

4) C_{3-6} cycloalkane,

5) C_{3-6} cycloalkylene, or

6) single bond;

R^2 is

1) phenyl, either unsubstituted or substituted with one or two substituents selected from

a) —NO_2, —OH,

b) —Cl, Br, F, or I,

c) —CF_3,

d) —C_{1-3} alkyl,

e) —C_{1-3} alkoxy,

f) —CN,

g) -methylenedioxy,

2) C_{5-7} cycloalkyl, either unsubstituted or substituted with one or two substituents selected from

a) —NO_2,

b) —F,

c) —CF_3,

d) —C_{1-3} alkyl,

e) —C_{1-3} alkoxy,

f) —CN,

g) —methylenedioxy,

or pharmaceutically acceptable salts, hydrates and crystal forms thereof.

5,691,332

N-(2,4-DIOXO-2,3,4,5-TETRAHYDRO-1H-1,5-BENZODIAZEPIN-3-YL)-3-AMIDES

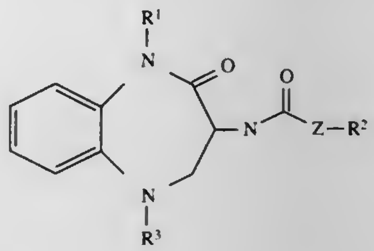
David A. Claremon, Maple Glen; Roger M. Freidinger, Lansdale; Nigel Liverton, Harleysville; Harold G. Selnick, Ambler, and Garry R. Smith, East Norriton, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 476,298, Jun. 7, 1995, abandoned. This application Aug. 19, 1996, Ser. No. 699,177

Int. Cl.^{6} A61K *31/55;* **C07D** *281/10*

U.S. Cl. 514—221 **21 Claims**

1. A compound of the structural formula I



FORMULA I

where

R^1 and R^3 are independently C_{1-6} alkyl branched chain; substituted C_{1-6}alkyl branched chain wherein the substitutents are selected from F, C_{3-8} cycloalkane, —OH, —CF_3, and

Z is

1) C_{1-6} alkyl, either straight or branch chain,

2) substituted C_{1-6} alkyl, either straight or branch chain, wherein the substitutents are selected from F, —OH, NO_2,

2) C_{2-4} alkenylene, either straight or branch chain,

3) —$(CH_2)_m$—W—$(CH_2)_n$— wherein m and n are independently 0, 1, 2, 3 or 4 and W is —O—, —S— or —NH,

4) C_{3-6} cycloalkane,

5) C_{3-6} cycloalkylene, or

6) single bond;

R^2 is

1) phenyl, either unsubstituted or substituted with one or two substituents selected from

a) —NO_2, —OH

b) —Cl, Br, F, or I,

c) —CF_3,

d) —C_{1-3} alkyl,

e) —C_{1-3} alkoxy,

f) —CN,

g) -methylenedioxy,

C_{5-7} cycloalkyl, either unsubstituted or substituted with one or two substitutents selected from

a) —NO_2, —OH,

b) F,

c) —CF_3,

d) —C_{1-3} alkyl,

e) —C_{1-3} alkoxy,

f) —CN,

g) -methylenedioxy,

or pharmaceutically acceptable salts, hydrates and crystal forms thereof, which are useful as antiarrhythmic agents.

18. A pharmaceutical formulation comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of the compound of claim **1** or a pharmaceutically acceptable salt, crystal form or hydrate thereof.

5,691,333

PESTICIDAL 1-ARYLPYRAZOLE-3-CARBOXIMIDOTHOIC ACID ESTERS

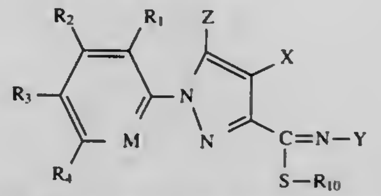
Tai-Teh Wu, Chapel Hill, and Michael Thomas Pilato, Cary, both of N.C., assignors to Rhone-Poulenc Inc., Research Triangle Park, N.C.

Division of Ser. No. 593,904, Jan. 30, 1996, Pat. No. 5,629,335, which is a continuation of Ser. No. 418,681, Apr. 7, 1995, abandoned. This application Feb. 6, 1997, Ser. No. 796,107

Int. Cl.^{6} A01N *43/78;43/86;* **C07D** *417/04*

U.S. Cl. 514—226.5 **29 Claims**

1. A compound having the formula:



(I)

or an agriculturally acceptable salt thereof, wherein:

R_1 is H or halogen;

R_2 is H, halogen or lower alkyl;

R_3 is halogen, haloalkyl, haloalkoxy, $R_{16}S(O)_n$ or SF_5;

R_4 is H, halogen or lower alkyl;

X is R_6 or —$S(O)_n$—R_5;

n is 0, 1 or 2;

R_5 is a lower hydrocarbyl or halohydrocarbyl radical which is saturated or is ethylenically or acetylenically unsaturated, or a C_3–C_5 cycloalkyl radical;

R_6 is one of the meanings given for R_5, or R_6 is thiocyanato, nitro, cyano or halogen;

Z is hydrogen; halogen; a lower alkyl radical which is unsubstituted or is substituted by one or more substituents selected from the group consisting of halogen, hydroxy, alkoxy, alkenyl and cyano; $R_{14}S(O)_n$; $R_{16}S(O)_n$alkyl; amino; R_{15}CO— in which R_{15} is H or an alkyl radical which is unsubstituted or is substituted by one or more halogen, hydroxy or alkoxy; cyano; nitro; trialkylsilyl; trialkylsilylmethyl; alkoxycarbonyl; alkylthiocarbonyl; hydrazino; —CH=NOH; —CH=NO—alkyl; C_2–C_4 alkenyl; C_2–C_4 alkynyl; alkoxy; alkylcarbonylthio; alkoxycarbonylthio; aroylthio; aryl—$S(O)_n$; azido; arylalkyl—$S(O)_n$; 1H-pyrrol-1-yl; 1H-pyrazol-1-yl; R_7NH—; or R_8R_9N—;

each of R_7, R_8 and R_9, which are identical or different, is lower alkyl, lower alkyl—$S(O)_n$, $P(=O)(R_5)(OR_5)$, aroyl, aryloxycarbonyl, formyl, alkenyl, alkynyl, alkoxycarbonyl, alkylthiocarbonyl or alkylcarbonyl, the alkyl portion of which radicals is unsubstituted or is substituted by one or more R_{17};

or R_8 and R_9 are joined so as together to form a divalent radical having 4 to 6 atoms in the chain, said divalent radical being alkylene, alkyleneoxyalkylene or alkyleneaminoalkylene;

the groups S—R_{10} and N—Y are joined together, with the —C= group to which they are attached, to form a heterocyclic ring having 5 to 8 ring atoms;

R_{14} is lower alkyl, lower alkenyl or lower alkynyl, optionally substituted with halogen;

R_{16} is lower alkyl or lower haloalkyl;

R_{17} is hydrogen, nitro, cyano, alkoxy, haloalkoxy, $R_{16}S(O)_n$, alkylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, hydroxycarbonyl, halogen, hydroxy, aminosulfonyl, alkylaminosulfonyl or dialkylaminosulfonyl;

M is C—halo, C—CN, C—CH_3, C—CH_2F, C—NO_2, C—CH_2Cl or N, provided that when R_1 is halogen, then M can also be CH.

5,691,334

PYRROLYDENEMETHYL-DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; AnnaMaria Isetta, Rho Milan; Marcellino Tibolla, Senago Milan; MariaChiara Fornasiero, Vigevano Pavia; Mario Ferrari, Milan, and Domenico Trizio, Cassina Rizzardi Como, all of Italy, assignors to Pharmacia & Upjohn S.p.A., Milan, Italy

PCT No. PCT/EP94/04006, § 371 Date Aug. 21, 1995, § 102(e) Date Aug. 21, 1995, PCT Pub. No. WO95/17381, PCT Pub. Date Jun. 29, 1995

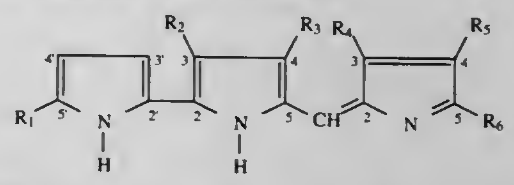
PCT Filed Dec. 2, 1994, Ser. No. 505,292

Claims priority, application United Kingdom, Dec. 23, 1993, 9326284

Int. Cl.^{6} A61K *31/40;31/535;* **C07D** *403/14;413/14*

U.S. Cl. 514—235.5 **40 Claims**

1. A 5-[2H-pyrrol-2-ylidene)methyl]-2,2'-bi-1H-pyrrole compound having the following formula (I)



(I)

wherein

R_1represents hydrogen, phenyl, C_1–C_{20} alkyl or C_2–C_{20} alkenyl, wherein the alkyl and alkenyl groups are unsubstituted or substituted by 1 to 3 substituents chosen independently from halogen, C_1–C_6 alkoxy, hydroxy, aryl and aryloxy;

R_2 represents hydrogen, C_1–C_6 alkyl, cyano, carboxy or (C_1–C_6 alkoxy)carbonyl;

R_3 represents halogen, hydroxy or C_1–C_{11} alkoxy unsubstituted or substituted by phenyl;

R_4 represents hydrogen, C_1–C_6 alkyl or phenyl;

each of R_5 and R_6 independently represents hydrogen, C_2–C_{20} alkanoyl, C_3–C_{20} alkenoyl, phenyl, C_1–C_{20} alkyl or C_2–C_{20} alkenyl, wherein the alkanoyl, alkenoyl, alkyl and the alkenyl groups are unsubstituted or substituted by 1 to 3 substituents chosen independently from halogen, C_1–C_6 alkoxy, hydroxy, aryl, aryloxy, cyano, carboxy, (C_1–C_6 alkoxy)carbonyl, (C_3–C_4 alkenyl)carbamoyl, aralkyl-carbamoyl, arylcarbamoyl and —$CONR_cR_d$ in which each of R_c and R_d independently is hydrogen or C_1–C_6 alkyl or R_c and R_d, taken together with the nitrogen atom to which they are linked, form a morpholino or piperidino ring;

or two of R_4, R_5 and R_6 taken together form a C_4–C_{12} polymethylene chain, which is unsubstituted or substituted by a C_{1-C12} alkyl, by a C_2–C_{12} alkenyl or by a C_1–C_{12} alkylidene group, wherein the alkyl, alkenyl and alkylidene groups are in turn unsubstituted or substituted by a substituent chosen from halogen, C_1–C_6 alkoxy, hydroxy, cyano, carboxy, (C_1–C_6 alkoxy)carbonyl, aryloxy and aryl; the remaining one being hydrogen or C_1–C_{12} alkyl;

or a pharmaceutically acceptable salt thereof; and wherein

when at the same time R_3 is methoxy and R_1, R_2, R_4 and R_5 are hydrogen, then R_6 is other than hydrogen, n-nonyl or n-undecyl; and wherein

when at the same time R_3 is methoxy and R_1, R_2, R_4 and R_6 are hydrogen, then R_5 is other than n-undecyl; and wherein

when at the same time R_3 is methoxy, and R_1 and R_2 are hydrogen, and R_4 and R_6 are methyl, then R_5 is other than hydrogen or ethyl; and wherein

when at the same time R_3 is methoxy and R_1, R_2 and R_5, are hydrogen, then R_4 and R_6, taken together, are other than an α-ethyl-nonamethylene or α-butyl-heptamethylene chain; and wherein

when at the same time R_3 is methoxy, R_6 is methyl and R_1, R_2 and R_4 are hydrogen, then R_5 is other than n-pentyl, n-hexyl, n-heptyl or n-undecyl; and wherein

when at the same time R_3 is methoxy and R_1, R_2 and R_4 are hydrogen, then R_5 and R_6, taken together, are other than

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α-butyl-heptamethylene chain; or R$_5$ being methyl, then R$_6$ is other than n-pentyl; or R$_5$ being ethyl, then R$_6$ is other than n-butyl; and wherein

when at the same time R$_3$ is hydroxy, R$_1$, R$_2$ and R$_4$ are hydrogen and R$_6$ is methyl, then R$_5$ is other than n-pentyl; and wherein

when at the same time R$_3$ is methoxy, R$_1$ and R$_2$ are hydrogen and R$_6$ is methyl, then R$_4$ and R$_5$, taken together, are other than an α-methyl-tetra-methylene or β-methyl-tetramethylene chain; or R$_4$ being n-propyl, then R$_5$ is other than n-heptyl.

5,691,335

IMIDAZOLIDINE DERIVATIVE AND USE THEREOF

Harukazu Fukami, Kyoto; Motoo Sumida, Uji; Shinjiro Niwata, Takatsuki; Saki Kakutani; Saitoh Masayuki, both of Ibaraki; Shibata Hiroshi, Takatsuki, and Kiso Yoshinobu, Ibaraki, all of Japan, assignors to Suntory Limited, Osaka, Japan

PCT No. PCT/JP95/01485, § 371 Date Mar. 28, 1996, § 102(e) Date Mar. 28, 1996, PCT Pub. No. WO96/04248, PCT Pub. Date Feb. 15, 1996

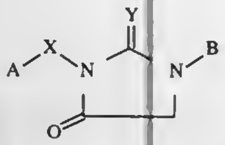
PCT Filed Jul. 26, 1995, Ser. No. 615,277

Claims priority, application Japan, Jul. 29, 1994, 6-207867; Dec. 7, 1994, 6-333706

Int. Cl.^{6} A61K *31/415;31/495;* **C07D** *233/80;233/86*

U.S. Cl. 514—235.8 **5 Claims**

1. An imidazolidine derivative represented by the following formula (1)



(1)

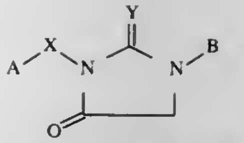
wherein A and B are identical with or different from each other and mean individually an unsubstituted aromatic hydrocarbon group, an aromatic hydrocarbon groups substituted by 1–3 substituents selected from the group consisting of halogen atoms, alkyl groups having 1–4 carbon atoms, alkoxy groups having 1–4 carbon atom, alkylenedioxy groups having 1–4 carbon atoms, a phenoxy group, a nitro group, a cyano group, a phenyl group, alkanoylamino groups having 2–5 carbon atoms, a carboxyl group, a carboxyl group esterified with an alkyl or alkenyl group having 1–4 carbon atoms, carboxyalkyl groups, carboxyalkyl groups esterified with an alkyl or alkenyl group having 1–4 carbon atoms, carboxyalkyloxy groups, carboxyalkyloxy groups esterified with an alkyl or alkenyl group having 1–4 carbon atoms, N-alkylpiperazinylcarbonyl groups, N-alkylpiperazinylcarbonylalkyl groups, N-alkylpiperazinylcarbonylalkyloxy groups, and a morpholinicarbonyl group;

X denotes a sulfonyl or carbonyl group; and

Y stands for an oxygen or sulfur atom, with the proviso that when A and B are identical they are not unsubstituted phenyl when X is a carbonyl group, and

when A and B are different from each other, A is not unsubstituted phenyl and chloro-substituted phenyl when B is dimethyl substituted phenyl, Y is a sulfur atom and X is a carbonyl group, and B is not chloro-substituted phenyl when A is dichloro-substituted phenyl, Y is an oxygen atom and X is a carbonyl group.

3. A method of preventing and treating a disease of the heart or circulatory system, which is caused by the abnormal acceleration of production of angiotensin II, comprising administering to a patient an effective amount of an imidazolidine derivative represented by the following formula (1)



(1)

wherein A and B are identical with or different from each other and mean individually an unsubstituted aromatic hydrocarbon group, an aromatic hydrocarbon group substituted by 1–3 substituents selected from the group consisting of halogen atoms, alkyl groups having 1–4 carbon atoms, alkoxy groups having 1–4 carbon atoms, alkylenedioxy groups having 1–4 carbon atoms, a phenoxy group, a nitro group, a cyano group, a phenyl group, alkanoylamino groups having 2–5 carbon atoms, a carboxyl group, a carboxyl group esterified with an alkyl or alkenyl group having 1–4 carbon atoms, carboxyalkyl groups, carboxyalkyl groups esterified with an alkyl or alkenyl group having 1–4 carbon atoms, carboxyalkyloxy groups, carboxyalkyloxy groups esterified with an alkyl or alkenyl group having 1–4 carbon atoms, N-alkylpiperazinylcarbonyl groups, N-alkylpiperazinylcarbonylalkyl groups, N-alkylpiperazinylcarbonylalkyloxy groups, and a morpholinicarbonyl group;

X denotes a sulfonyl or carbonyl group; and

Y stands for an oxygen or sulfur atom.

5,691,336

MORPHOLINE COMPOUNDS ARE PRODRUGS USEFUL AS TACHYKININ RECEPTOR ANTAGONISTS

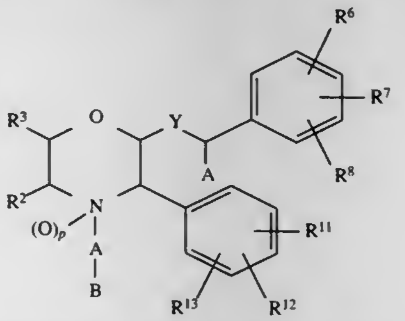
Conrad P. Dorn, Plainfield; Jeffrey J. Hale, Westfield; Malcolm Maccoss, Freehold, and Sander G. Mills, Woodbridge, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 206,771, Mar. 4, 1994, abandoned. This application Sep. 8, 1995, Ser. No. 525,870

Int. Cl.^{6} C07D *265/32;279/12;413/04;413/06;413/14*

U.S. Cl. 514—236.2 **25 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein:

R^2 and R^3 are independently selected from the group consisting of:
- (1) hydrogen,
- (2) C$_{1-6}$ alkyl, unsubstituted or substituted with one or more of the substituents selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C$_{1-6}$ alkoxy,
  - (d) phenyl-C$_{1-3}$ alkoxy,
  - (e) phenyl,
  - (f) —CN,
  - (g) halo,
  - (h) —NR^{9}R^{10}, wherein R^9 and R^{10} are independently selected from:
    - (i) hydrogen,
    - (ii) C$_{1-6}$ alkyl,
    - (iii) hydroxy-C$_{1-6}$ alkyl, and
    - (iv) phenyl,
  - (i) —NR^{9}COR^{10},
  - (j) —NR^{9}CO$_2$R^{10},
  - (k) —CONR^{9}R^{10},
  - (l) —COR^9, and
  - (m) —CO$_2$R^9,
- (3) C$_{2-6}$ alkenyl, unsubstituted or substituted with one or more of the substituent(s) selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C$_{1-6}$ alkoxy,
  - (d) phenyl-C$_{1-3}$ alkoxy,
  - (e) phenyl,
  - (f) —CN,
  - (g) halo,
  - (h) —CONR^{9}R^{10},
  - (i) —COR^9,
  - (j) —CO$_2$R^9;
- (4) C$_{2-6}$ alkynyl;
- (5) phenyl, unsubstituted or substituted with one or more of the substituent(s) selected from:
  - (a) hydroxy,
  - (b) C$_{1-6}$ alkoxy,
  - (c) C$_{1-6}$ alkyl,
  - (d) C$_{2-5}$ alkenyl,
  - (e) halo,
  - (f) —CN,
  - (g) —NO$_2$,
  - (h) —CF$_3$,
  - (i) —(CH$_2$)$_m$—NR^{9}R^{10}, wherein m is 0, 1 or 2,
  - (j) —NR^{9}COR^{10},
  - (k) —NR^{9}CO$_2$R^{10},
  - (l) —CONR^{9}R^{10},
  - (m) —CO$_2$NR^{9}R^{10},
  - (n) —COR^9, and
  - (o) —CO$_2$R^9;

or the groups R^2 and R^3 are joined together to form a carbocyclic ring selected from the group consisting of:
- (a) cyclopentyl,
- (b) cyclohexyl,
- (c) phenyl,

and wherein the carbocyclic ring is unsubstituted or substituted with one or more substituents selected from:
- (i) C$_{1-6}$alkyl,
- (ii) C$_{1-6}$alkoxy,
- (iii) —NR^{9}R^{10},
- (iv) halo, and
- v) trifluoromethyl;

or the groups R^2 and R^3 are joined together to form a heterocyclic ring selected from the group consisting of:
- (a) pyrrolidinyl,
- (b) piperidinyl,
- (c) pyrrolyl,
- (d) pyridinyl,
- (e) imidazolyl,
- (f) furanyl,
- (g) oxazolyl,
- (h) thienyl, and
- (i) thiazolyl,

and wherein the heterocyclic ring is unsubstituted or substituted with one or more substituent(s) selected from:
- (i) C$_{1-6}$alkyl,
- (ii) oxo,
- (iii) C$_{1-6}$alkoxy,
- (iv) —NR^{9}R^{10},
- (v) halo, and
- (vi) trifluoromethyl;

R^6, R^7 and R^8 are independently selected from the group consisting of:
- (1) hydrogen;
- (2) C$_{1-6}$ alkyl, unsubstituted or substituted with one or more of the substituents selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C$_{1-6}$ alkoxy,
  - (d) phenyl-C$_{1-3}$ alkoxy,
  - (e) phenyl,
  - (f) —CN,
  - (g) halo,
  - (h) —NR^{9}R^{10},
  - (i) —NR^{9}COR^{10},
  - (j) —NR^{9}CO$_2$R^{10},
  - (k) —CONR^{9}R^{10},
  - (l) —COR^9, and
  - (m) —CO$_2$R^9;
- (3) C$_{2-6}$ alkenyl, unsubstituted or substituted with one or more of the substituent(s) selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C$_{1-6}$ alkoxy,
  - (d) phenyl-C$_{1-3}$ alkoxy,
  - (e) phenyl,
  - (f) —CN,
  - (g) halo,
  - (h) —CONR^{9}R^{10},
  - (i) —COR^9, and
  - (j) —CO$_2$R^9;
- (4) C$_{2-6}$ alkynyl;
- (5) phenyl, unsubstituted or substituted with one or more of the substituent(s) selected from:
  - (a) hydroxy,
  - (b) C$_{1-6}$ alkoxy,
  - (c) C$_{1-6}$ alkyl,
  - (d) C$_{2-5}$ alkenyl,
  - (e) halo,
  - (f) —CN,
  - (g) —NO$_2$,
  - (h) —CF$_3$,
  - (i) —(CH$_2$)$_m$—NR^{9}R^{10},
  - (j) —NR^{9}COR^{10},
  - (k) —NR^{9}CO$_2$R^{10},
  - (l) —CONR^{9}R^{10},
  - (m) —CO$_2$NR^{9}R^{10},
  - (n) —COR^9, and
  - (o) —CO$_2$R^9;
- (6) halo,
- (7) —CN,
- (8) —CF$_3$,
- (9) —NO$_2$,
- (10) —SR^{14}, wherein R^{14} is hydrogen or C$_{1-5}$alkyl,
- (11) —SOR^{14},
- (12) —SO$_2$R^{14},
- (13) NR^{9}COR^{10},
- (14) CONR^{9}COR^{10},
- (15) NR^{9}R^{10},
- (16) NR^{9}CO$_2$R^{10},
- (17) hydroxy,
- (18) C$_{1-6}$alkoxy,
- (19) COR^9,
- (20) CO$_2$R^9,
- (21) 2-pyridyl,
- (22) 3-pyridyl,
- (23) 4-pyridyl,
- (24) 5-tetrazolyl,
- (25) 2-oxazolyl, and
- (26) 2-thiazolyl;

R^{11}, R^{12} and R^{13} are independently selected from the definitions of R^6, R^7 and R^8, or —OX;

A is selected from the group consisting of:
- (1) C$_{1-6}$ alkyl, unsubstituted or substituted with one or more of the substituents selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C$_{1-6}$ alkoxy,
  - (d) phenyl-C$_{1-3}$ alkoxy,
  - (e) phenyl,
  - (f) —CN,
  - (g) halo, wherein halo is fluoro, chloro, bromo or iodo,
  - (h) —NR^{9}R^{10},
  - (i) —NR^{9}COR^{10},
  - (j) —NR^{9}CO$_2$R^{10},

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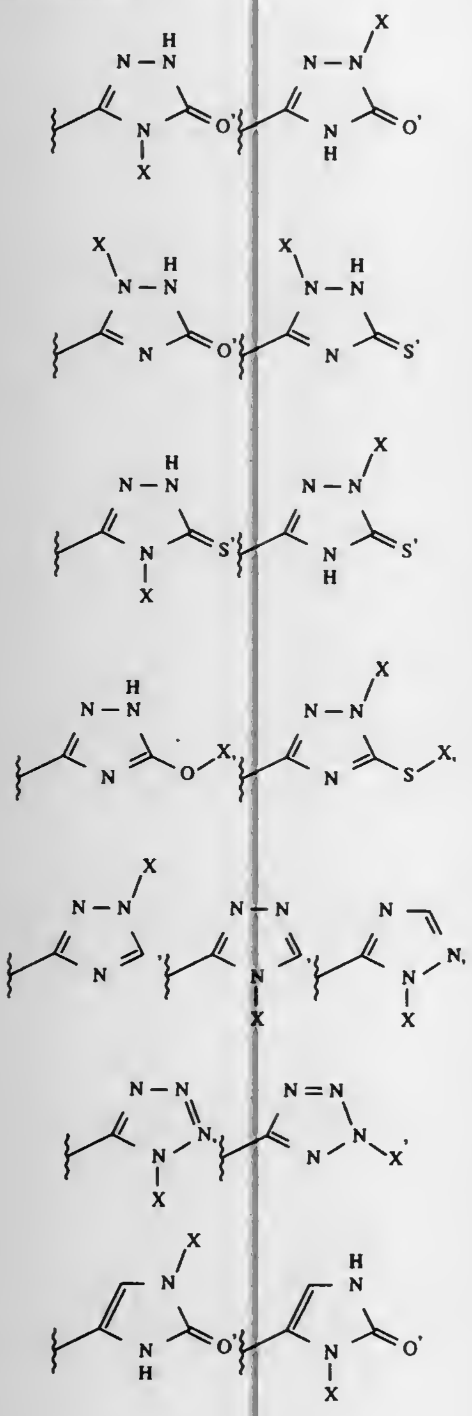
(k) —CONR^{9}R^{10},
(l) —COR^9, and
(m) —CO$_2$R^9;
(2) C$_{2-6}$ alkenyl, unsubstituted or substituted with one or more of the substituent(s) selected from:
(a) hydroxy,
(b) oxo,
(c) C$_{1-6}$ alkoxy,
(d) phenyl-C$_{1-3}$ alkoxy,
(e) phenyl,
(f) —CN,
(g) halo,
(h) —CONR^{9}R^{10},
(i) —COR^9, and
(j) —CO$_2$R^9; and
(3) C$_{2-6}$ alkynyl;

B is a heterocycle, wherein the heterocycle is selected from the group consisting of:



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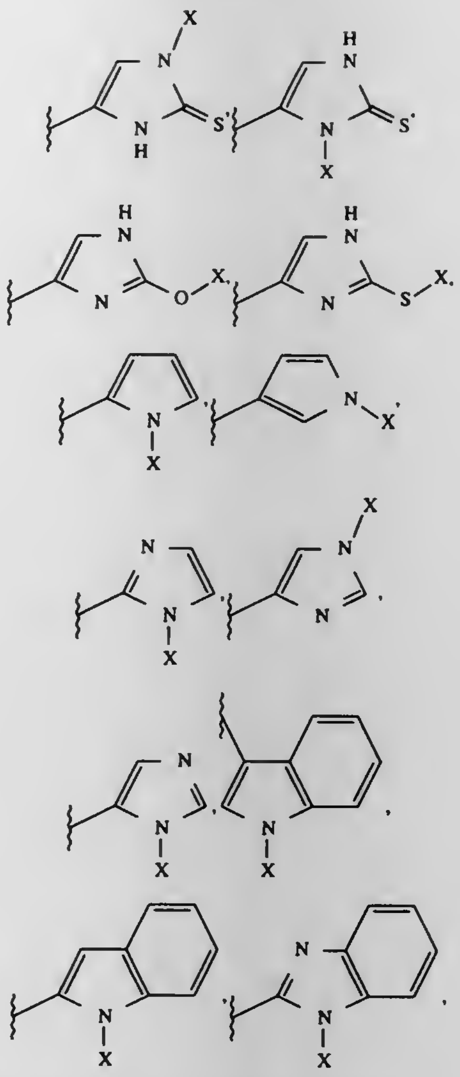
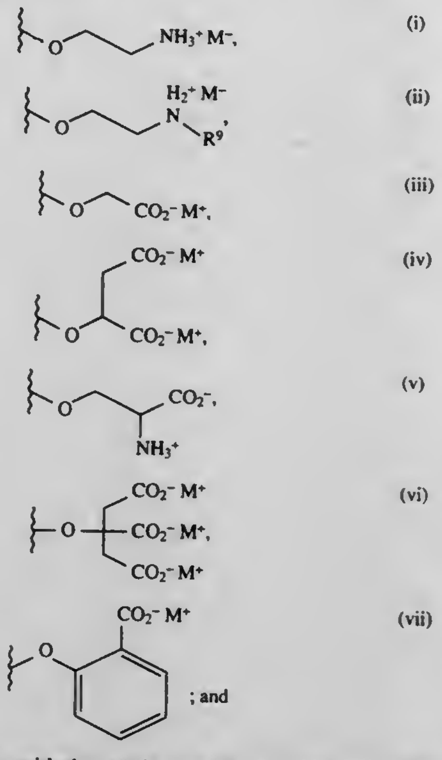


and wherein the heterocycle is substituted in addition to —X with one or more substituent(s) selected from:
(i) hydrogen;
(ii) C$_{1-6}$ alkyl, unsubstituted or substituted with halo, —CF$_3$, —OCH$_3$, or phenyl,
(iii) C$_{1-6}$ alkoxy,
(iv) oxo,
(v) hydroxy,
(vi) thioxo,
(vii) —SR^9,
(viii) halo,
(ix) cyano,
(x) phenyl,
(xi) trifluoromethyl,
(xii) —(CH$_2$)$_m$—NR^{9}R^{10},
(xiii) —NR^{9}COR^{10},
(xiv) —CONR^{9}R^{10},
(xv) —CO$_2$R^9, and
(xvi) —(CH$_2$)$_m$—OR^9;
p is 0 or 1;
X is selected from:
(a) —PO(OH)O$^-$•M$^+$, wherein M$^+$ is a pharmaceutically acceptable monovalent counterion,
(b) —PO(O$^-$)$_2$•2M$^+$,
(c) —PO(O$^-$)$_2$•D^{2+}, wherein D^{2+} is a pharmaceutically acceptable divalent counterion,
(d) —CH(R^4)—PO(OH)O$^-$•M$^+$, wherein R^4 is hydrogen or C$_{1-3}$ alkyl,
(e) —CH(R^4)—PO(O$^-$)$_2$•2M$^+$,
(f) —CH(R^4)—PO(O$^-$)$_2$•D^{2+},
(g) —SO$_3^-$•M+,

(h) —CH(R^4)—SO$_3^-$•M$^+$,
(i) —CO—CH$_2$CH$_2$—CO$_2^-$•M$^+$,
(j) —CH(CH$_3$)—O—CO—R^5, wherein R^5 is selected from the group consisting of:



; and

(k) hydrogen, with the proviso that if p is 0 and none of R^{11}, R^{12} or R^{13} are —OX, then X is other than hydrogen;

Y is selected from the group consisting of:
(1) a single bond,
(2) —O—,
(3) —S—,
(4) —CO—,
(5) —CH$_2$—,
(6) —CHR^{15}—, and
(7) —CR^{15}R^{16}—, wherein R^{15} and R^{16} are independently selected from the group consisting of:
(a) C$_{1-6}$ alkyl, unsubstituted or substituted with one or more of the substituents selected from:
(i) hydroxy,
(ii) oxo,
(iii) C$_{1-6}$ alkoxy,
(iv) phenyl-C$_{1-3}$ alkoxy,
(v) phenyl,
(vi) —CN,
(vii) halo,
(viii) —NR^{9}R^{10},
(ix) —NR^{9}COR^{10},
(x) —NR^{9}CO$_2$R^{10},
(xi) —CONR^{9}R^{10},
(xii) —COR^9, and
(xiii) —CO$_2$R^9;
(b) phenyl, unsubstituted or substituted with one or more of the substituent(s) selected from:
(i) hydroxy,
(ii) C$_{1-6}$ alkoxy,
(iii) C$_{1-6}$ alkyl,
(iv) C$_{2-5}$ alkenyl,
(v) halo,
(vi) —CN,
(vii) —NO$_2$,
(viii) —CF$_3$,
(ix) —(CH$_2$)$_m$—NR^{9}R^{10},
(x) —NR^{9}COR^{10},
(xi) —NR^{9}CO$_2$R^{10},
(xii) —CONR^{9}R^{10},
(xiii) —CO$_2$NR^{9}R^{10},
(xiv) —COR^9, and
(xv) —CO$_2$R^9;

Z is selected from:
(1) hydrogen,
(2) C$_{1-6}$ alkyl, and
(3) hydroxy, with the proviso that if Y is —O—, then Z is other than hydroxy, and with the further proviso that if Y is —CHR^{15}—, then Z and R^{15} may be joined together to form a double bond between the two carbon atoms.

24. A method for antagonizing the effect of substance P at its receptor site or for the blockade of neurokinin-1 receptors in a mammal which comprises the administration to the mammal of the compound of claim 1 in an amount that is effective for antagonizing the effect of substance P at its receptor site or for the blockade of neurokinin-1 receptors in the mammal.

5,691,337

OXY-PHENYL-(PHENYL)GLYCINOLAMIDES WITH HETEROCYCLIC SUBSTITUENTS

Ulrich Müller, Wuppertal, Germany; Richard Connell, Trumbull, Conn.; Siegfried Goldmann; Klaus-Helmut Mohrs, both of Wuppertal, Germany; Siegfried Raddatz, Köln, Germany; Michael Matzke, Wuppertal, Germany; Rudi Grützmann, Solingen, Germany; Martin Beuck, Milford, Conn.; Stefan Wohlfeil, Hilden, Germany; Hilmar Bischoff, Wuppertal, Germany, and Dirk Denzer, Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

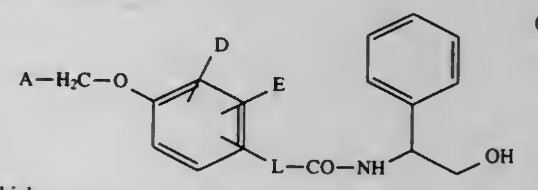
Division of Ser. No. 566,460, Dec. 1, 1995. This application Jan. 13, 1997, Ser. No. 785,146

Claims priority, application Germany, Dec. 9, 1994, 44 43 891.5

Int. Cl.^{6} A61K *31/495;* C07D *217/00*

U.S. Cl. 514—249 **5 Claims**

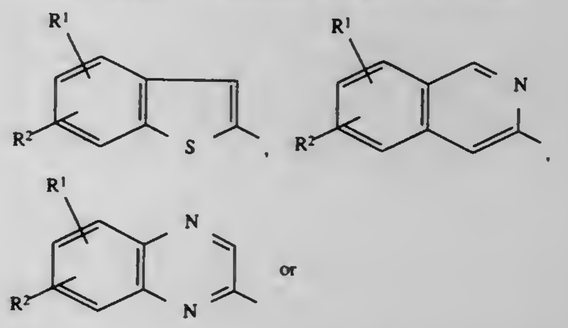
1. Oxy-phenyl-(phenyl)glycinolamides with heterocyclic substituents, of formula (I)



(I)

in which

A represents naphthyl, or represents a group of the formula



wherein

R^1 and R^2 are identical or different and denote hydrogen, halogen, hydroxyl or straight-chain or branched alkoxy having up to 4 carbon atoms,

D and E are identical or different and represent hydrogen, cycloalkyl having 3 to 8 carbon atoms, azido, hydroxyl, halogen, straight-chain or branched alkyl, alkoxy or alkenyl having in each case up to 6 carbon atoms, or a 5- to 6-membered unsaturated or saturated heterocyclic group having up to 3 hetero atoms from the series consisting of S, N and O, or represent a group of the formula —NR^{3}R^4 or —NR^{5}SO$_2$R^6, wherein

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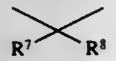
R^3, R^4 and R^5 are identical or different and denote hydrogen or straight-chain or branched alkyl having up to 4 carbon atoms or phenyl,

R^6 denotes straight-chain or branched alkyl having up to 4 carbon atoms, benzyl or phenyl, which is optionally substituted by straight-chain or branched alkyl having up to 4 carbon atoms,

L represents a bond, or represents a group of the formula



wherein

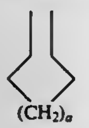
R^7 denotes hydrogen, hydroxyl, methoxy or hydrogen,

R^8 denotes hydrogen, hydroxyl, halogen, straight-chain or branched alkenyl or alkoxy having in each case up to 8 carbon atoms or cycloalkyl or cycloalkenyl having in each case 3 to 14 carbon atoms, or denotes straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted by cycloalkyl having 3 to 8 carbon atoms, phenyl or tetrahydropyranyl, which in their turn can be substituted by halogen, or denotes a group of the formula $—CH_2SIR^9R^{10}R^{11}$ or an indanyl group, wherein

R^9, R^{10} and R^{11} are identical or different and denote straight-chain or branched alkyl having up to 4 carbon atoms or

R^7 and R^8 together with the carbon atom form a saturated carbocyclic ring having 5 to 7 carbon atoms, which is optionally substituted up to mice in an identical or different manner by straight-chain or branched alkyl having up to 4 carbon atoms, or

R^7 and R^8 together form a group of the formula ═O or a double bond group of the formula



wherein

a denotes the number 2, 3, 4, 5 or 6, and salts thereof.

5,691,338

1,2-DITHIOLE-3 THIONES FOR THE TREATMENT OF REVERSE TRANSCRIPTASE-DEPENDENT VIRAL INFECTIONS

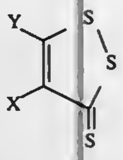
Hans J. Prochaska, and Bruce Polsky, both of New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 11,429, Jan. 29, 1993. This application Jun. 7, 1995, Ser. No. 485,658

Int. Cl.^{6} A61K *3/1495*

U.S. Cl. 514—252 **15 Claims**

1. A method of inhibiting the replication of a reverse transcriptase-dependent virus which comprises contacting cells infected with a reverse transcriptase-dependent virus with an amount effective to inhibit replication of the reverse transcriptase-dependent virus in the cells, of a 1,2-dithiole-3-thione having the structure:



wherein X is a C_1–C_5 alkyl group or is $—CH_2COOR$, R being a C_1–C_5 alkyl group, and wherein Y is a 5- or 6-membered heterocyclic aromatic ring, 1–3 ring atoms of which are nitrogen, oxygen, or sulphur, the remaining ring atoms being carbon.

5,691,339

CIRCULATORY DISORDER IMPROVING AGENT

Hiroshi Shinyama; Toru Kawamura; Minori Okita; Takeshi Uchida, and Masahiro Watanabe, all of Hirakata, Japan, assignors to The Green Cross Corporation, Osaka, Japan

PCT No. PCT/JP94/01412, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO95/05825, PCT Pub. Date Mar. 2, 1995

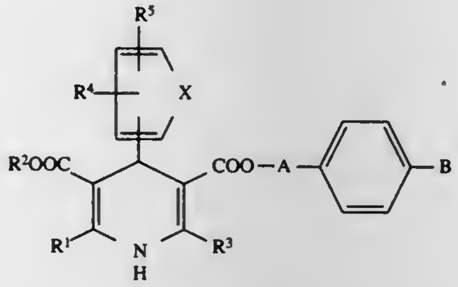
PCT Filed Aug. 25, 1994, Ser. No. 424,282

Claims priority, application Japan, Aug. 25, 1993, 5-210606; Aug. 25, 1993, 5-210668

Int. Cl.^{6} A61K *31/495;* **C07D** *401/00*

U.S. Cl. 514—253 **8 Claims**

1. A method for treating disease induced by an increase in blood viscosity or decrease in filterability of erythrocyte in peripheral circulation comprising administering a pharmaceutically effective amount of a dihydropyridine derivative of the formula (I)



(I)

wherein

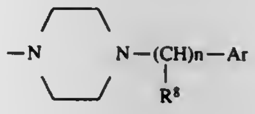
R^1, R^2 and R^3 are the same or different and each is an alkyl having 1–6 carbon atoms, a cycloalkyl having 3–6 carbon atoms or an alkoxyalkyl;

R^4 and R^5 are the same or different and each is a hydrogen atom, an alkyl having 1–6 carbon atoms, a cycloalkyl having 3–6 carbon atoms, a halogenated alkyl, an alkylsulfonyl, an alkylsulfinyl, an alkylthio, an alkoxy, a halogenated alkoxy, an alkoxycarbonyl, a cyano, a halogen or a nitro, provided that R^4 and R^5 are not hydrogen atoms at the same time;

X is a vinylene or —CH═N—;

A is a alkylene; and

B is a group of the formula —N(R^6) (R^7) or



wherein R^6, R^7 and R^8 are the same or different and each is a hydrogen atom, an alkyl having 1–6 carbon atoms, a cycloalkyl having 3–6 carbon atoms, a phenyl C_1–C_3 alkyl, a phenyl, a naphthyl, or a pyridyl, Ar is a phenyl, a naphthyl or a pyridyl and n is an integer of 0, 1 or 2 or an acid addition salt thereof; and a pharmaceutically acceptable carrier.

5,691,340

BENZOPYRAN DERIVATIVES

Geneviève Baziard-Mouysset; Sallouma Younes; Youssef Labssita, all of Toulouse; Marc Payard, Balma; Daniel-Henri Caignard, Paris; Pierre Renard, Versailles, and Marie-Claire Rettori, Courbevole, all of France, assignors to Adir et Compagnie, Courbevole, France

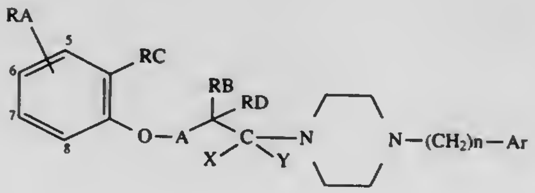
Filed Sep. 14, 1995, Ser. No. 528,251

Claims priority, application France, Sep. 15, 1994, 94 10987

Int. Cl.^{6} A61K *31/495;* **C07D** *405/06*

U.S. Cl. 514—253 **6 Claims**

1. A compound selected from those of formula (I):



(I)

in which

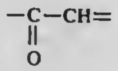
Ar represents phenyl, naphthyl, substituted phenyl or substituted naphthyl,

n represents an integer of 1 to 4 inclusive,

RB and RC together form a $—(CH_2)_q—$ bridge with q having the value 1 or 2 and, in this case, A represents a $—(CH_2)_p—$ bridge with p representing 0, or 1 and such that $p+q=2$, and in this case RA represents hydroxyl or alkoxy situated in the 5-position of the aromatic ring which carries it or RA represents hydrogen or halogen, in any position on the aromatic ring,

or RB and RC together form a —CH═ bridge, and the bond which bonds it to the aromatic ring is single, and in this case A represents CH_2 and RA represents hydrogen, hydroxyl or alkoxy situated in the 5-position of the aromatic ring which carries it,

or RB and RC together form a single bond and then A represents a group



$$-\underset{\underset{O}{\parallel}}{C}-CH=$$

the carbonyl being bonded to the oxygen and the bond connecting A to the carbon carrying the side chain is double, and in this case RA represents hydrogen, hydroxyl or alkoxy,

X and Y each represent hydrogen and RD, which only exists when all the bonds of the carbon which carries it are single, represents hydrogen,

it being understood that, except when otherwise mentioned,

the terms "alkyl" and "alkoxy" denote linear or branched saturated groups having 1 to 6 carbon atoms inclusive,

the term "substituted" concerning the phenyl and naphthyl substituents means that the latter can be substituted by one to three groups chosen from hydroxyl, alkyl, alkyl substituted by one or a number of halogens, alkoxy and halogen,

an optical isomer thereof in the pure form or in the form of a mixture, and an addition salt thereof with a pharmaceutically-acceptable acid or base.

5,691,341

APOPTOSIS REGULATING COMPOSITION

Satoru Nakai; Koutoku Aihara, both of Tokushima-ken; Hideo Tanaka, Tokushima; Hitomi Iba, Wakayama; Kazuyoshi Kawai, Tokushima-ken; Hiroyuki Ichikawa, Tokushima; Seiji Akamatsu, Naruto; Fumio Saito, Takasaki; Michiaki Tominaga, Tokushima-ken, and Masakazu Adachi, Takasaki, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 211,818, Apr. 19, 1994, Pat. No. 5,464,833. This application Aug. 29, 1995, Ser. No. 520,478

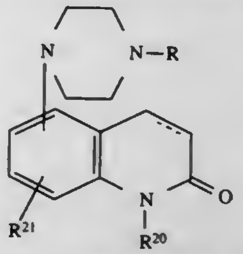
Claims priority, application Japan, Aug. 19, 1992, 5-220373

Int. Cl.^{6} A61K *31/495;31/50;31/525*

U.S. Cl. 514—254 **16 Claims**

9. A method for treatment of cancer which is sensitive to said treatment which method comprises administering to a host afflicted with such cancer an anti-cancer effective amount of at least one carbostyril derivative or a salt thereof selected from the group consisting of:

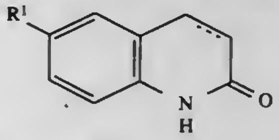
(1) a carbostyril derivative of the following general formula



(1)

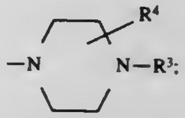
wherein R is a benzoyl group which may optionally have, on the phenyl ring thereof, one to three substituents each selected from the group consisting of a lower alkoxy group, a halogen atom, a lower alkyl group, a lower alkanoylamino group and a lower alkylthio group; a lower alkylenedioxybenzoyl group; a hydrogen atom; a pyridylcarbonyl group; a lower alkanesulfonyl group; a lower alkynyl group; or a phenyl-lower alkyl group which may optionally have, on the phenyl ring thereof, one to three substituents each selected from the group consisting of a lower alkoxy group, a halogen atom and a lower alkyl group; the carbon-carbon bond between the 3 and 4 positions of the carbostyril skeleton is a single bond or a double bond; R^{20} is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; and R^{21} is a hydrogen atom or a lower alkoxy group; provided that when both R^{20} and R^{21} are hydrogen atoms, R is not a benzoyl group having a lower alkoxy group as a phenyl ring substituent; and a salt thereof;

(2) a carbostyril derivative of the following general formula



(2)

wherein R^1 is a group of the formula



R^3 is a hydrogen atom or a benzoyl group; R^4 is an oxo group; and the carbon-carbon bond between the 3 and 4 positions of the carbostyril skeleton is a single bond or a double bond; and salts thereof;

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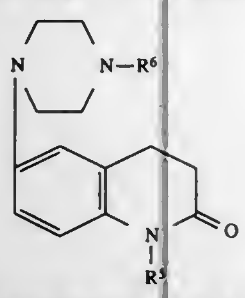
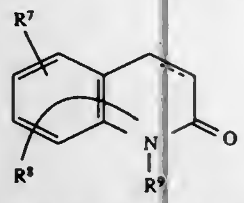
(3) a carbostyril derivative of the following general formula


(3)

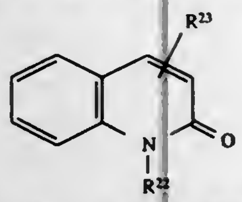
wherein R^5 is a lower alkanoyl group, a lower alkoxycarbonyl group, a lower alkoxycarbonyl-lower alkyl group, a phenyl-lower alkyl group having a lower alkanoyloxy group or a hydroxyl group on the phenyl ring thereof, or a benzoyl group which may optionally have, on the phenyl ring thereof, at least one substituent selected from the group consisting of a hydroxyl group and a amino group optionally having a lower alkyl group, or a naphthoyl group; and R^6 is a benzoyl group which may optionally have at least one lower alkoxy group on the phenyl ring thereof; and a salt thereof;

(4) a carbostyril derivative of the following general formula


(4)

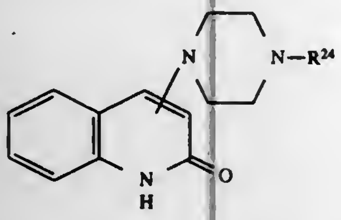
wherein R^7 is a piperazinyl group, R^8 is a hydrogen atom or a lower alkyl group; R^5 is a hydrogen atom or a phenyl-lower alkyl group; and the carbon-carbon bond between the 3 and 4 positions of the carbostyril skeleton is a single bond or a double bond; and a salt thereof;

(5) a carbostyril derivative of the following general formula


(5)

wherein R^{22} is a C_1–$_{16}$ alkyl group, a phenyl-lower alkoxycarbonyl-lower alkyl group, an amido-lower alkyl group which may optionally have at least one lower alkyl group, or a phenyl-lower alkyl group; and R^{23} is a piperazinyl group which may optionally have a lower alkyl group in the 4 position of the piperazine ring; and a salt thereof;

(6) a carbostyril derivative of the following general formula


(6)

wherein R^{24} is a hydrogen atom, a phenyl-lower alkyl group, a benzoyl-lower alkyl group, or a benzoyl group which may optionally have one to three of a lower alkoxy group or a lower alkylenedioxy group on the phenyl ring thereof; and a salt thereof; and

(7) 6-[4-(3,4-dimethoxybenzoyl)-1-1,2,3,4-tetrahydropirazyl]-3,4-dihydrocarbostyril and a salt thereof.

5,691,342

Patent Not Issued For This Number

5,691,343
USE OF TOPICAL AZATHIOPRINE TO TREAT INFLAMMATORY BOWEL DISORDERS

William J. Sandborn, Rochester, Minn., assignor to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Filed Mar. 30, 1995, Ser. No. 413,505
Int. Cl.^{6} A61K *31/52*
U.S. Cl. 514—262 5 Claims

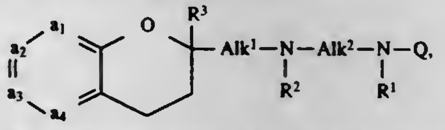
1. A therapeutic method of treating inflammatory bowel disease comprising topically administering to the colon of a patient in need of such treatment by rectal enema or by means of an orally ingested unit dosage form comprising an effective amount of enterically coated azathioprine which is released from the dosage form in the terminal portion of the ileum and in the colon of said patient, an amount of azathioprine effective to relieve the symptoms of said inflammatory bowel disease.

5,691,344
VASOCONSTRICTIVE SUBSTITUTED DIHYDROPYRANOPYRIDINES

Guy Rosalia Eugène Van Lommen, Berlaar, Belgium; Francisco Javier Fernández-Gadea, Toledo, Spain; José Ignacio Andrés-Gil, Madrid, Spain, and Maria Encarnacion Matesanz-Ballesteros, Toledo, Spain, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

PCT No. PCT/EP94/02700, § 371 Date Jan. 24, 1996, § 102(e) Date Jan. 24, 1996, PCT Pub. No. WO95/05381, PCT Pub. Date Feb. 23, 1995
PCT Filed Aug. 12, 1994, Ser. No. 586,851
Claims priority, application European Pat. Off., Aug. 19, 1993, 93202440
Int. Cl.^{6} C07D *471/02;409/14;311/96;* **A61K** *31/35*
U.S. Cl. 514—269 13 Claims

1. A compound having the formula:


(I)

a pharmaceutically acceptable acid addition salt thereof, an N-oxide thereof or a stereochemically isomeric form thereof, wherein:

$=a_1—a_2=a_3—a_4=$ is a bivalent radical of the formula:

$=N—CH=CH—CH=$ (a);

$=CH—N=CH—CH=$ (b);

$=CH—CH=N—CH=$ (c);

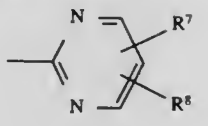
or

$=CH—CH=CH—N=$ (d),

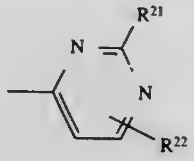
wherein in said bivalent radical one or two hydrogen atoms can be replaced with halo, hydroxy, C_{1-6}alkyl or C_{1-6}alkyloxy;

R^1 is hydrogen or C_{1-6}alkyl;
R^2 is hydrogen or C_{1-6}alkyl;
R^3 is hydrogen or C_{1-6}alkyl;
Alk^1 is C_{1-5}alkanediyl;
Alk^2 is C_{2-15}alkanediyl; and

Q is a radical of the formula:


(bb)

or


(ii)

wherein:

R^7 R^8 R^{21} and R^{22} each independently are hydrogen hydroxy, halo C_{1-6}alkyl, C_{1-6}alkyloxy, aryloxy, C_{1-6}alkylthio, cyano, amino, mono- or di (C_{1-6}alkyl) amino, mono- or di (C_{3-6}cycloalkyl) amino, aminocarbonyl, C_{1-6}alkyloxycarbonylamino, C_{1-6}alkylaminocarbonylamino, piperidinyl or pyrrolidinyl;

wherein in the foregoing, aryl is phenyl optionally substituted with halo, hydroxy, C_{1-6}alkyl or C_{1-6}alkyloxy.

5,691,345

Patent Not Issued For This Number

5,691,346
CASTANOSPERMINE AS AN ANTI-INFLAMMATORY AND IMMUNOSUPPRESSANT AGENT

David Otto Willenborg, Sterling; William Butler Cowden, Kambah, and Christopher Richard Parish, Campbell, all of Australia, assignors to The Australian National University, Australia

Continuation of Ser. No. 656,073, Mar. 6, 1991, abandoned. This application Mar. 29, 1993, Ser. No. 38,050
Claims priority, application Australia, Aug. 10, 1988, PI9759/88
Int. Cl.^{6} A61K *31/44*
U.S. Cl. 514—299 8 Claims

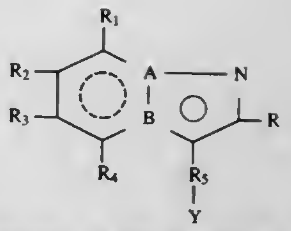
1. A method of immunosuppressive treatment of an animal or human patient which comprises blocking the passage of inflammatory cells from the blood stream into the tissues of said patient by the parenteral administration of an effective amount of Castanospermine to the patient in need thereof.

5,691,347
METHOD FOR INHIBITING VASOCONSTRICTION

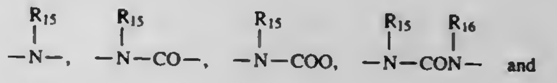
Alain Corbier, Verrieres le Buisson; Michel Fortin, Paris; Jacques Guillaume, Livry Gargan; Jean-Luc Haesslein, Courtry, and Jean-Paul Vevert, Pantin, all of France, assignors to Roussel Uclaf, France

Division of Ser. No. 399,723, Mar. 7, 1995, which is a division of Ser. No. 11,395, Jan. 29, 1993, Pat. No. 5,420,138. This application Apr. 20, 1995, Ser. No. 425,365
Claims priority, application France, Jan. 31, 1992, 92 01084
Int. Cl.^{6} A61K *31/435*
U.S. Cl. 514—300 4 Claims

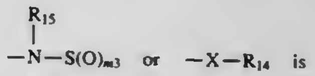
1. A method of inhibiting vasoconstrictive activity in warm-blooded animals comprising administering to warm-blooded animals a vasoconstrictively inhibiting effective amount of at least one compound selected from the group consisting of all possible racemic isomers, enantiomers and diastereoisomers of a compound of the formula



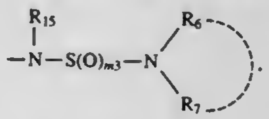
wherein one of A and B is nitrogen and the other is carbon, the dotted lines indicate that the pyridinyl ring is optionally unsaturated, R is butyl, R_1, R_2, R_3 and R_4 are individually selected from the group consisting of a) $—(CH_2)_{m1}—S(O)_{m2}—X—R_{14}$, m1 is an integer from 0 to 4, m2 is an integer from 0 to 2, when m1 is other than 0, $X—R_{14}$ is $—NH_2$ or mono or di-alkyl or alkenyl-amino of up to 6 carbon atoms or mono or di-phenyl amino, all optionally substituted with at least one member of the group consisting of halogen, —OH, alkyl and alkoxy of 1 to 4 carbon atoms, $—CF_3$, free, salified or esterified carboxy, —CN and tetrazolyl and whatever the value of m1, R_{14} is selected from the group consisting of optionally substituted alkyl and alkenyl of up to 6 carbon atoms and optionally substituted aryl with at least one member of the group consisting of —OH, halogen, alkyl and alkoxy of 1 to 4 carbon atoms, $—CF_3$, free, esterified, salified or amidified carboxy, —CN and tetrazolyl and X is selected from the group consisting of a single bond,



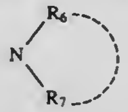
$-\overset{R_{15}}{\overset{|}{N}}-,\quad -\overset{R_{15}}{\overset{|}{N}}-CO-,\quad -\overset{R_{15}}{\overset{|}{N}}-COO,\quad -\overset{R_{15}}{\overset{|}{N}}-CO\overset{R_{16}}{\overset{|}{N}}-$ and



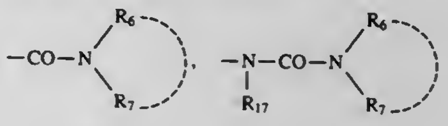
$-\overset{R_{15}}{\overset{|}{N}}-S(O)_{m3}$ or $-X-R_{14}$ is

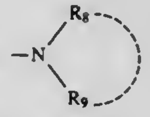


m3 is an integer: from 0 to 2, R_{15} and R_{16} are individually hydrogen or R_{14} and



is defined as e), b) hydrogen, halogen, —OH, —CN, $—NO_2$, formyl, benzoyl, acyl of up to 12 carbon atoms and free, salified esterified or amidified carboxy, c) alkyl, alkenyl, alkynyl, alkoxy, acyloxy, alkylthio, alkylsulfinyl and alkylsulfonyl, all having up to 6 carbon atoms and optionally substituted, d) cycloalkyl, aryl, arylalkenyl, aryloxy, aralkoxy, arylthio, arylsulfinyl and arylsulfonyl, the alkyl and alkenyl portion having up to 6 carbon atoms and the aryl is a monocyclic of 5 to 6 ring members or a condensed ring of 8 to 14 ring members optionally containing at least one heteroatom selected from the group consisting of oxygen, sulfur and nitrogen and optionally substituted,

e) 

or 

R_{17}, R_6, R_7, R_8 and R_9 are individually selected from the group consisting of hydrogen, alkyl and alkenyl of up to 6 carbon atoms optionally substituted with a member of the group consisting of halogen, —OH and alkoxy of 1 to 6 carbon atoms, $—(CH_2)_{m1}—$

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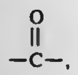
$S(O)_{m2}$—X—R_{14} and aryl and arylalkoxy of 1 to 6 alkyl carbon atoms and the aryl is monocyclic of 5 to 6 ring members or a condensed cycle of 8 to 14 ring members optionally containing at least one heteroatom selected from the group consisting of oxygen, sulfur and nitrogen and optionally substituted with at least one member of the group consisting of halogen, —OH, —NO_2, free, salified, esterified or amidified carboxy and alkyl, alkenyl, alkoxy and acyl of up to 6 carbon atoms of R_6 and R_7 or R_8 and R_9 taken with the nitrogen atom form a monocyclic of 5 to 6 ring members or a condensed cyclic of 8 to 14 ring members optionally containing at least one heteroatom selected from the group consisting of —O—, —S— and nitrogen and optionally substituted with at least one member of the group consisting of halogen, —O, —NO_2, free, salified, esterified or amidified carboxy and alkyl, alkenyl, alkynyl, alkoxy and acyl of up to 6 carbon atoms or R_8 and R_9 are individually acyl of a carboxylic acid of up to 6 carbon atoms, R_5 is



$$-\overset{\overset{\displaystyle O}{\|}}{C}-,$$

Y is Y_1B—Y_2, Y_1 is a monocyclic arylene of 5 to 6 ring members optionally substituted with at least one of the substituents of R_1, R_2, R_3 and R_4 and B is a single bond between Y_1 and Y_2 or B is a divalent member of the group consisting of —CO—, —NH—CO— and —O—$(CH_2)_n$— and when B is a single bond, Y_2 is a member of the group consisting of hydrogen, halogen, —CN, free salified, esterified or amidified carboxy, tetrazolyl and $(CH_2)_{m1}$—$S(O)_{m2}$—X—R_{14} as defined above or for any value of B other than a single bond, Y_2 is selected from the values defined for Y_1 and their non-toxic, pharmaceutically acceptable salts with bases and acids.

5,691,348

PYRIDYL IMIDAZOLE DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Sung-Eun Yoo; Kyu-Yang Yi; Sang-Hee Lee; Hye-Ryung Kim; Jee-Hee Suh; Nak-Jeong Kim; Seon-Ju Kim; Ok-Ja Cha; Young-Ah Shin; Wha-Sup Shin; Sung-Hou Lee; Yi-Sook Jung; Byung-Ho Lee; Ho-Won Seo, and Hye-Suk Lee, all of Daejeon, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

PCT No. PCT/KR95/00075, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO95/34564, PCT Pub. Date Dec. 21, 1995

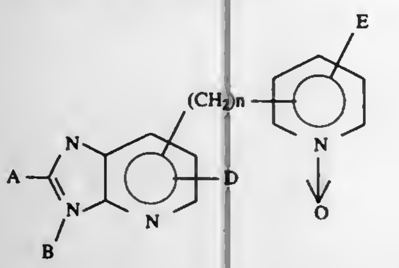
PCT Filed Jun. 7, 1995, Ser. No. 750,460

Claims priority, application Rep. of Korea, Jun. 11, 1994, 94-13163; May 8, 1995, 95-11100

Int. Cl.^{6} A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—300 **9 Claims**

1. A pyridyl imidazole compound, and pharmacologically acceptable salts thereof, of formula(I):

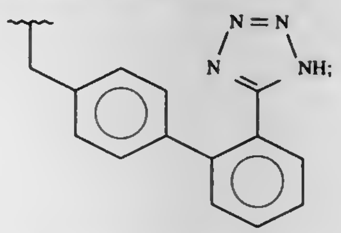


(I)

wherein:

A is a straight, branched or cyclic C_1–C_6 alkyl or alkenyl group, OR^1 (wherein R^1 is a hydrogen, or a straight, branched or cyclic C_1–C_6 alkyl or alkenyl radical), or NR^2R^3 (wherein R^2 and R^3 are independently a hydrogen, or a straight, branched or cyclic C_1–C_6 alkyl radical);

B is a group of the following formula



D is a hydrogen; a halogen; a straight, branched or cyclic C_1–C_6 alkyl, C_2–C_6 alkenyl or C_2–C_6 alkynyl group which is optionally substituted with OH, a C_1–C_4 alkoxy radical, CO_2R^1, COR^1, $CON(R^1)_2$ or $N(R^1)_2$, wherein R^1 is the same as defined above; tetrazol-5-yl; a perfluoro-C_1–C_4 alkyl group; or $N(R^1)_2$, OR^1, CO_2R^1 or $CON(R^1)_2$, wherein R^1 is the same as defined above;

E is a hydrogen; a halogen; a straight or branched C_1–C_6 alkyl, C_2–C_6 alkenyl or C_2–C_6 alkynyl group which is optionally substituted with OH, a C_1–C_4 alkoxy radical, CO_2R^1, COR^1, $CON(R^1)_2$ or $N(R^1)_2$, wherein R^1 is the same as defined above; a perfluoro-C_1–C_4 alkyl group; NO_2; or $N(R^1)_2$ or OR^1; wherein R^1 is the same as defined above; and n is 0 or an integer of 1 to 4.

5,691,349

QUINCLIDINE DERIVATIVES AS SQUALENE SYNTHASE INHIBITORS

Keith Blakeney Mallion, Knutsford; George Robert Brown, Wilmslow, and Paul Robert Owen, Macclesfield, all of United Kingdom, assignors to Zeneca Limited, London, United Kingdom

PCT No. PCT/GB93/01648, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO94/03451, PCT Pub. Date Feb. 17, 1994

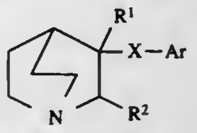
PCT Filed Aug. 4, 1993, Ser. No. 379,583

Claims priority, application United Kingdom, Aug. 6, 1992, 9216721

Int. Cl.^{6} A61K *31/46;* **C07D** *453/02*

U.S. Cl. 514—305 **19 Claims**

1. A compound of formula I:



(I)

or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2 are hydrogen, or R^1 and R^2 are joined together so that CR^1CR^2 is a double bond;

X is selected from —CH_2CH_2—, —CH=CH—, —C≡C—, —CH_2O—, —OCH_2—, —CH_2NH—, —$NHCH_2$—, —CH_2CO—, —$COCH_2$—, —$CH_2S(O)_n$— and —$S(O)_nCH_2$— wherein n is 0, 1 or 2; and

Ar is phenyl which may be optionally unsubstituted or substituted by one or more substituents independently selected from halogeno, hydroxy, amino, nitro, cyano, carboxy, carbamoyl, (1–6C)alkyl, (2–6C)alkenyl, (2–6C)alkynyl, (1–6C)alkoxy, (1–6C)alkylamino, di-[(1–6C)alkyl]amino, N-(1–6C)alkylcarbamoyl, N,N-di-[(1–6C)alkyl]carbamoyl, (1–6C)alkoxycarbonyl, (1–6C)alkylthio, (1–6C)alkylsulphinyl, (1–6C)alkylsulphonyl, halogeno(1–6C)alkyl, (1–6C)alkanoylamino, (1–4)alkylenedioxy, (1–6C)alkanoyl and oxime derivatives thereof and O-(1–6C)alkyl ethers of said oximes; but excluding those compounds in which:

X is —CH_2CO— and Ar is phenyl which is unsubstituted or substituted by one or more groups selected from trifluoromethyl, halogeno and (1–6C)alkoxy;

R^1 and R^2 are hydrogen and X is selected from —CH_2O—, —OCH_2—, —$CH_2S(O)_n$— and —$S(O)_nCH_2$—;

R^1 and R^2 are hydrogen and X is —$NHCH_2$—, and Ar is phenyl substituted by one or more groups selected from (1–6C)alkoxy and halogeno;

R^1 and R^2 are hydrogen, X is —CH=CH— and Ar is phenyl which is unsubstituted or substituted by one or more halogeno groups;

R^1 and R^2 are hydrogen, X is —CH_2NH— and Ar is unsubstituted phenyl; and

R^1 and R^2 are hydrogen, X is —CH_2CH_2— and Ar is phenyl which is unsubstituted or substituted by a halogeno, hydroxy, alkyl, alkoxy, amino, cyano, nitro, alkanoylamino carbamoyl, alkylsulphonyl or alkylcarbamoyl substituent.

5,691,350

USE OF LINOMIDE FOR TREATMENT OF RETROVIRUS INFECTIONS SPECIFICALLY HIV INFECTIONS

Bo Nilsson, Helsingborg, and Terje Kalland, Löddeköpinge, both of Sweden, assignors to Kabi Pharmacia AB, Helsingborg, Sweden

Continuation of Ser. No. 191,438, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 920,311, Aug. 12, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 462,050

Claims priority, application Sweden, Feb. 22, 1990, 9000624

Int. Cl.^{6} A61K *31/47*

U.S. Cl. 514—312 **11 Claims**

1. A method for treating a mammal infected with a retrovirus which comprises administering to a mammal in need of such treatment a therapeutically effective amount of N-phenyl-N-methyl-1,2-dihydro-4-hydroxy- 1-methyl-2-oxo-quinoline-3-carboxamide or a pharmaceutically acceptable salt thereof.

5,691,351

BIS-(HETEROARYLMETHOXYPHENYL)CYCLOALKYL CARBOXYLATES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

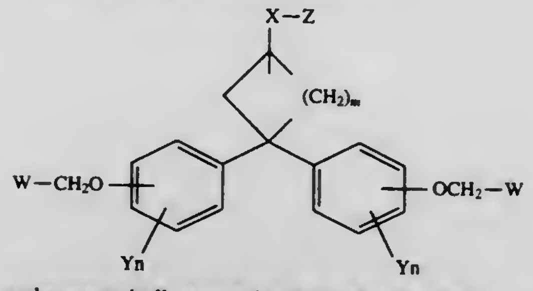
Teodozyj Kolasa, Lake Villa; David E. Gunn, Waukegan, and Clint D. W. Brooks, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Feb. 6, 1996, Ser. No. 596,058

Int. Cl.^{6} A61K *31/47;* **C07D** *401/12*

U.S. Cl. 514—314 **8 Claims**

1. A compound having the structural formula I:



I

or a pharmaceutically acceptable salt thereof wherein

m is an integer of 1 to 9, inclusive;

n is an integer of 1 to 4, inclusive;

W is the same at each occurrence and is selected from the group consisting of
- (a) unsubstituted quinolyl;
- (b) quinolyl substituted with one, two, or three substituents selected from the group consisting of
  halogen,
  $C_{1\text{-}6}$ alkyl, and
  $C_{1\text{-}6}$ alkoxy;
- (c) unsubstituted benzothiazoyl;
- (d) benzothiazoyl substituted with one, two, or three substituents selected from the group consisting of
  halogen,
  $C_{1\text{-}6}$ alkyl, and
  $C_{1\text{-}6}$ alkoxy;
- (e) unsubstituted quinoxalyl; and
- (f) quinoxalyl substituted with one, two, or three substituents selected from the group consisting of
  halogen,
  $C_{1\text{-}6}$ alkyl, and
  $C_{1\text{-}6}$ alkoxy;

Y is one to four substituents independently selected from
halogen,
$C_{1\text{-}6}$ alkyl, and
$C_{1\text{-}6}$ alkoxy;

X is absent or is selected from the group consisting of
- (a) $C_{1\text{-}6}$ alkylene;
- (b) $C_{1\text{-}6}$ alkenylene; and
- (c) $C_{1\text{-}6}$ alkynylene;

Z is selected from the group consisting of
- (a) COB;
- (b) $C(R^2)_2$—O—N=A—COB; and
- (c) $C(R^2)$=N—O—A—COB where
  - A is $C_{1\text{-}6}$ alkylene, and
  - B is selected from the group consisting of
    - (a) —OH,
    - (b) —O^-M^+ where M is a pharmaceutically acceptable cation;
    - (c) —OR^6 where R^6 is hydrogen or alkyl of one to six carbon atoms;
    - (d) —NR^6R^7 where R^6 is as previously defined and R^7 is selected from the group consisting of
      hydrogen,
      alkyl of one to six carbon atoms,
      hydroxy, and
      alkoxy or from one to six carbon atoms, or
      R^6 and R^7, together with the atom to which they are attached, form a ring of five to eight members containing one optional heteratom selected from N, and S; and
    - (e) —O—D where D is a metabolically cleavable group.

5,691,352

STABLE PHARMACEUTICAL COMPOSITION OF TERFENADINE AND IBUPROFEN

Keith D. Ertel, West Chester, Ohio, and David F. Long, Carmel, Ind., assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

PCT No. PCT/US94/10972, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO95/11677, PCT Pub. Date May 4, 1995

Continuation of Ser. No. 142,528, Oct. 25, 1993, abandoned. This PCT application Sep. 28, 1994, Ser. No. 624,362

Int. Cl.^{6} A61K *31/445*

U.S. Cl. 514—317 **3 Claims**

1. A chemically stable pharmaceutical composition comprising:
- (a) a therapeutically effective analgesic amount of ibuprofen or a pharmaceutically acceptable salt thereof;
- (b) a therapeutically effective antihistaminic amount of terfenadine or a pharmaceutically acceptable salt thereof; and,
- (c) a dicarboxylic acid.

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5,691,353
METHOD OF INHIBITING AORTAL SMOOTH MUSCLE CELL PROLIFERATION USING NAPHTHYL COMPOUNDS

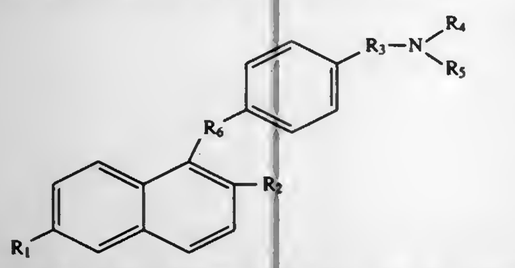
Henry U. Bryant, and Jeffrey A. Dodge, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 402,087, Mar. 10, 1995. This application Dec. 5, 1995, Ser. No. 567,635

Int. Cl.^{6} A61K *31/445;* **C07D** *211/14*

U.S. Cl. 514—319 **1 Claim**

1. A method for inhibiting aortal smooth muscle cell proliferation comprising administering to a human in need of such treatment an effective amount of a compound of formula 1



(I)

wherein R_1 is H, OH, halo, OCO(C_1–C_6 alkyl), OCO(aryl), OSO_2(C_4–C_6 alkyl), OCOO(C_1–C_6 alkyl), OCOO(aryl), OCONH(C_1– C_6 alkyl), or OCON(C_1–C_6 alkyl)$_2$;

R_2 is aryl, C_1–C_6 alkyl, C_3–C_6 cycloalky, or 4-cyclohexanol;

R_3 is O$(CH_2)_2$ or O$(CH_2)_3$;

R_4 and R_5 are optionally CO$(CH_2)_2CH_3$, CO$(CH_2)_3CH_3$, C_1–C_6 alkyl, or R_4 and R_5 combine to form, with the nitogen to which they are attached, piperidine, morpholine, pyrrolidine, 3-mythlprrolidine, 3,3-dimethylpyrrolidine, 3,4-dimethylpyrrolidine, azepine, or pipecoline;

R_6 is

>C═CH_2>CH(C_1–C_5 alkyl), >CH(C_2–C_5 alkenyl), >C═CH(C_1–C_5 alkyl), >CH(aryl), >C(OH)(C_1–C_5 alkyl), >C(OH)(C_2–C_5 alkenyl), >C(OH)aryl

or a pharmaceutically acceptable salt thereof.

5,691,354
N-[[1-[4-(4-FLUOROPHENOXY)BUTYL]-4-PIPERIDINYL]-N-METHYL-AMINO]-2-BENZOTHIAZOLOLS AS CLASS III ANTIARRHYTHMIC AGENTS

Jozef Jan Pieter Heykants, Vosselaar; Marcel Jan Maria Borgers, Oud-Turnhout, both of Belgium, and Doris Wilhelm, Neuss, Germany, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

PCT No. PCT/EP94/01849, § 371 Date Nov. 16, 1995, § 102(e) Date Nov. 16, 1995, PCT Pub. No. WO94/29305, PCT Pub. Date Dec. 22, 1994

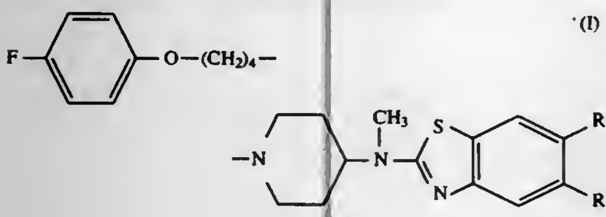
PCT Filed Jun. 6, 1994, Ser. No. 549,830

Claims priority, application European Pat. Off., Jun. 11, 1993, 93201685

Int. Cl.^{6} A61K *31/445;31/425;* **C07D** *417/12*

U.S. Cl. 514—321 **4 Claims**

1. A method of treating subjects suffering from arrhythmia which comprises administering to such subjects a therapeutically effective amount of a compound of the formula:



(I)

wherein one of the variables R^1 and R^2 is hydroxy, while the other is hydrogen, and the pharmaceutically acceptable acid addition salts thereof.

5,691,355
METHOD FOR MINIMIZING THE UTEROTROPHIC EFFECT OF TAMOXIFEN AND TAMOXIFEN ANALOGS

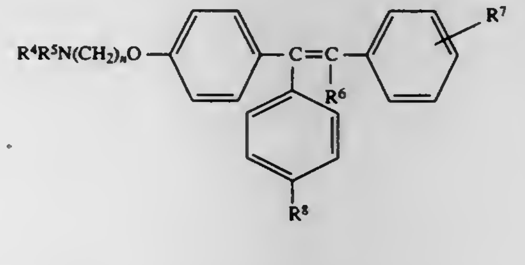
Henry U. Bryant, Indianapolis, and Robin S. Fuchs-Young, Trafalgar, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 239,093, May 5, 1994, Pat. No. 5,604,248. This application Sep. 24, 1996, Ser. No. 718,841

Int. Cl.^{6} A61K *31/445;31/135*

U.S. Cl. 514—324 **3 Claims**

1. A pharmaceutical composition comprising an effective amount of a first component which is a compound of formula II



II

wherein

either R^4 is H or a lower alkyl radical and R^5 is a lower alkyl radical, or R^4 and R^5 are joined together with the adjacent nitrogen atom to form a heterocyclic radical;

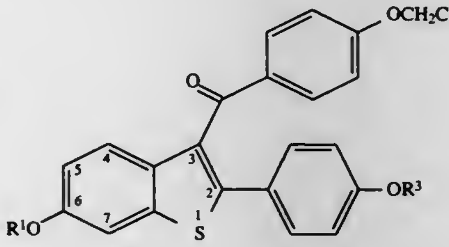
R^6 is H or a lower alkyl radical;

R^7 is H, halo, OH, a lower alkyl radical, or is a buta-1,3-dienyl radical which together with the adjacent benzene ring forms a naphthyl radical;

R^8 is H or OH; and

n is 2;

or a pharmaceutically acceptable salt thereof, and an effective amount of a second component, for minimizing the uterotrophic effect of said formula II compound, which is a compound of formula I



I

wherein R^1 and R^3 each are hydrogen; and

R^2 is piperidino;

or a pharmaceutically acceptable salt or solvate thereof, together with a pharmaceutically acceptable carrier, excipient or diluent.

5,691,356
DISUBSTITUTED HETEROCYCLIC THROMBIN INHIBITORS

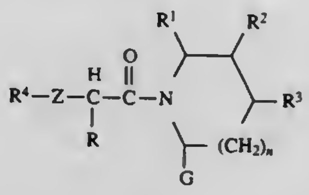
Jagabandhu Das, Mercerville; Spencer D. Kimball, E. Windsor, and Wan Fang Lau, Lawrenceville, all of N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation of Ser. No. 215,433, Mar. 21, 1994, abandoned. This application Sep. 4, 1996, Ser. No. 708,292

Int. Cl.^{6} A61K *31/445;31/40;31/495;31/535;31/54;* **C07D** *401/12;207/09;211/28*

U.S. Cl. 514—326 **11 Claims**

1. A compound having the structure



including all stereoisomers, wherein n is 0, 1 or 2;

Z is NR^7 or O, where R^7 is H, lower alkyl, aryl or arylalkyl;

G is an amido moiety which includes a cyclic member which is free of

$$\overset{O}{\overset{\|}{C}}$$

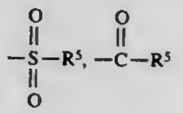
a group in the ring;

R is hydrogen, hydroxyalkyl, hydroxyalkyl(alkyl), aminoalkyl, lower alkyl, cycloalkyl, arylalkyl, alkenyl, alkynyl, amidoalkyl, arylalkoxyalkyl or an amino acid side chain, either protected or unprotected;

R^1 is lower alkyl exclusive of methyl, cycloalkyl, aryl, or arylalkyl; or R^1 and R^2 together with the carbons to which they are attached form a cycloalkyl, aryl or heteroaryl ring;

R^2 and R^3 are independently hydrogen, lower alkyl, cycloalkyl, aryl, arylalkyl, hydroxy, alkoxy, oxo, thioketal, thioalkyl, thioaryl, amino or alkylamino; or R^2 and R^3 together with the carbons to which they are attached form a cycloalkyl, aryl or heteroaryl ring;

R^4 is H, lower alkyl, arylalkyl, aryl,



$$-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-R^5,\ -\overset{\overset{O}{\|}}{C}-R^5$$

or —CO_2R^5, where R^5 is lower alkyl, aryl, arylalkyl, cycloheteroalkyl, heteroaryl, quinolinyl or tetrahydroquinolinyl; including pharmaceutically acceptable salts thereof.

5,691,357

Patent Not Issued For This Number

5,691,358
4-AMINO-N-(4-METHYL-4-PIPERIDINYL)-2-METHOXYBENZAMIDES

Josepha Eduarda Maria Francisca Leysen, Oud-Turnhout, and Georges Henri Paul Van Daele, Turnhout, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Division of Ser. No. 367,111, Jan. 6, 1995, Pat. No. 5,498,618, which is a continuation of Ser. No. 914,306, Jul. 17, 1992, abandoned. This application Oct. 27, 1995, Ser. No. 549,242

Int. Cl.^{6} A61K *31/445;* **C07D** *211/56*

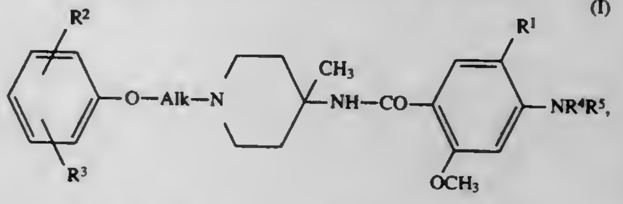
U.S. Cl. 514—329 **4 Claims**

1. A process of in vivo visualizing $5HT_2$ -receptor sites in an organ characterized by:

(a) administering an effective amount of a radiolabeled compound in an appropriate composition in an animal; and

(b) visualizing the emissions from said radiolabeled compound by radioactive imaging,

wherein said radiolabeled compound is of the formula:



(I)

a pharmaceutically acceptable acid addition salt thereof or a stereoisomeric form thereof, wherein:

R^1 represents hydrogen or halo;

R^2 represents halo;

R^3 represents hydrogen or halo;

R^4 and R^5 each independently represent hydrogen, C_{1-4}alkyl or haloC_{1-4}alkyl; and

Alk represents C_{2-4}alkanediyl.

5,691,359
HETEROCYCLYLCARBONYL SUBSTITUTED BENZOFURANYL- AND -THIOPHENYL-ALKANECARBOXYCLIC ACID DERIVATIVES

Rüdiger Fischer, Köln; Gabriele Bräunlich; Mazen Es-Sayed, both of Wuppertal; Rudolf Hanko, Düsseldorf, all of Germany; Stephen Tudhope, Windsor, Great Britain; Graham Sturton, Bray, Great Britain; Trevor Abram, Marlow, Great Britain, and Mary F. Fitzgerald, Begbroke, Great Britain, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

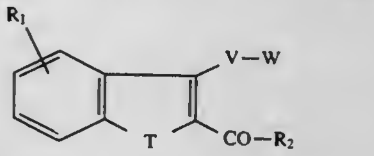
Filed May 23, 1995, Ser. No. 447,661

Claims priority, application United Kingdom, May 31, 1994, 9410877

Int. Cl.^{6} C07D *401/06;* **A61K** *31/44*

U.S. Cl. 514—337 **9 Claims**

1. A heterocyclylcarbonyl substituted benzofuranyl-alkanecarboxylic acid derivative of the formula



(I)

wherein

R^1 represents chlorine or a group of a formula —OR^3

in which

R^3 denotes hydrogen, tetrahydropyranyl, acetyl or denotes straight-chain or branched alkyl or alkenyl each having up to 8 carbon atoms, and each of which is substituted by alkoxycarbonyl having up to 6 carbon atoms,

or alkyl is substituted by a group of formula —CO—NH_2

V represents alkylene having 2 to 8 carbon atoms,

W represents a group of formula —CO—R^7

in which

R^7 denotes hydroxyl or straight-chain or branched alkoxy having up to 8 carbon atoms,

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and

R^2 represents pyridyl, thienyl, 1,3-thiazolyl or benzo[b]thiophenyl, which are optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, alkyl having up to 8 carbon atoms, NH_2 or SO_2—C_6H_5.

or a salt thereof.

5,691,360

COMPOUNDS HAVING BOTH POTENT CALCIUM ANTAGONIST AND ANTIOXIDANT ACTIVITY AND USE THEREOF AS CYTOPROTECTIVE AGENTS

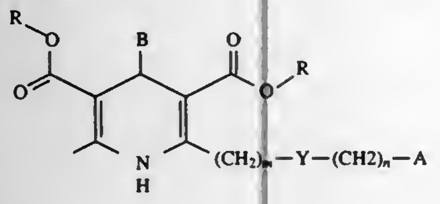
Mark R. Hellberg; George Barnes, and Robert J. Collier, Jr., all of Arlington, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 164,267, Dec. 8, 1993, Pat. No. 5,424,321. This application Jun. 6, 1995, Ser. No. 471,550

Int. Cl.^{6} A61K *31/44*

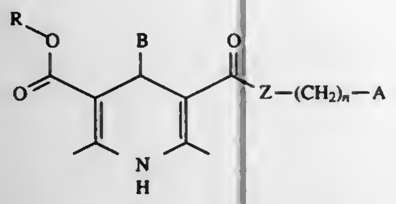
U.S. Cl. 514—337 **5 Claims**

1. A method of preventing or alleviating damage to mammalian ophthalmic tissues which comprises administering to a mammal a therapeutically effective amount of a composition comprising an amount of a compound of the following formula effective to decrease free radical or oxidative damage and control intracellular free calcium levels in said tissues:



(I)

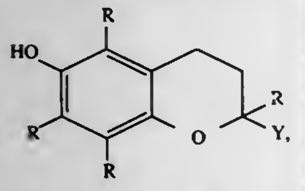
and

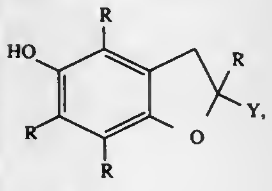


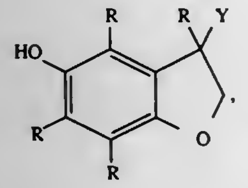
(II)

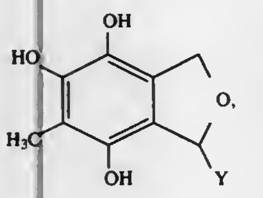
wherein:

A is an antioxidant selected from the group consisting of:

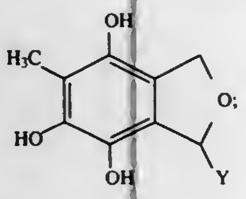








and



R is C_1 to C_6 alkyl;

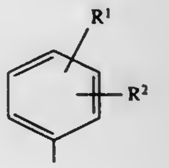
n is a whole number of from 1 to 6;

m is a whole number of from 1 to 6;

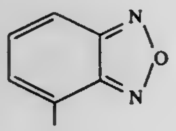
Z is O or NH;

Y, if present, is O or $S(O)_{n'}$, wherein n' is 0, 1 or 2; and

B is:



or



wherein:

R^1 and R^2 are the same or different and are selected from H,I,Br,Cl,F,CF_3,CN, NO_2 and $S(O)_{n'}$, and a pharmaceutically acceptable vehicle therefor.

5,691,361

1,4-DIHYDROPYRIDINE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR INFLUENCING THE BLOOD FLOW

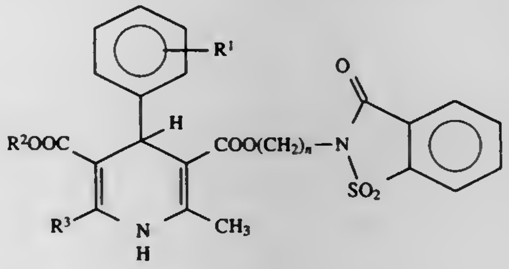
Carlos Sunkel, Almarza, 47, Madrid, Spain, 28033; Miguel Fau De Casa-Juana, Torquemada, 17, Madrid, Spain, 28043; Luis Santos, Conde de Pañalver, 32, Madrid, Spain, 28006; Salvador Alonso, Ramón Carrión 9, Madrid, Spain, 28002; Antonio Garcia, Nogales, 141, Madrid, Spain, 28043, and Jaime Priego, Avda. Moratalaz, 66, Madrid, Spain, 28030

Continuation of Ser. No. 287,944, Aug. 9, 1994, abandoned, which is a continuation of Ser. No. 194,205, Feb. 9, 1994, abandoned, which is a continuation of Ser. No. 104,213, Aug. 9, 1993, abandoned, which is a continuation of Ser. No. 014,428, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 926,127, Jun. 24, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 396,214

Int. Cl.^{6} A61K *31/44;* C07D *417/12*

U.S. Cl. 514—338 **7 Claims**

1. A 1,4-dihydropyridine compound of the formula



(I)

wherein

R^1 is nitro or trifluoromethyl, chlorine or two chlorines in 2 and 3 position,

R^2 is branchless or branched saturated C_1–C_8-alkyl or a group of the formula—W—O—Z, whereby W is branchless C_1–C_3-alkylene and Z is branchless $C_{1\text{-}3}$-alkyl,

R^3 is methyl or ethyl and

n is an integer of the value of 1, 2 or 3.

5,691,362

SUBSTITUTED BENZENE-FUSED HETERO- AND CARBOCYCLICS AS NUEROKININ ANTAGONISTS

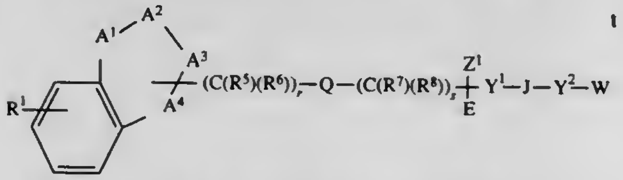
Kevin D. McCormick, Edison, and Andrew T. Lupo, Jr., Emerson, both of N.J., assignors to Schering-Plough Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 469,315, Jun. 6, 1996, abandoned. This application Jun. 5, 1996, Ser. No. 658,790

Int. Cl.^{6} A61K *31/40;* C07D *209/16;209/20;333/58*

U.S. Cl. 514—339 **20 Claims**

1. A compound represented by the structural formula



I

or a pharmaceutically acceptable salt thereof, wherein:

A^1, A^2, A^3 and A^4 are independently selected from the group consisting of —(C(R^2)(R^{10}))—, —(C(R^{2c})(R^{10}))—, —(C(R^2))=, —(C(R^{2c}))=, —NR^{16}—, —N=, —O—, —$S(O)_e$—, —C(O)— and a bond, wherein A^1, A^2, A^3 and A^4, together with the carbon atoms to which they are attached, form a 5- or 6-membered ring, and wherein two adjacent A groups are selected from the group consisting of the following combinations:

—(C(R^2)(R^{10}))—(C(R^2)(R^{10}))—;
—(C(R^2)(R^{10}))—(C(R^{2c}))=;
—(C(R^{2c})(R^{10}))—NR^{16}—;
—(C(R^{2c})(R^{10}))—N=;
—(C(R^{2c})(R^{10}))—O—;
—(C(R^{2c})(R^{10}))—$S(O)_e$—;
—(C(R^2)(R^{10})—C(O)—;
—(C(R^2))=(C(R^2))—;
—(C(R^2))=N—;
=(C(R^2))—(C(R^2))=;
=(C(R^2))—NR^{16}—;
=(C(R^2))—N=;
=(C(R^2))—O—;
=(C(R^2))—$S(O)_e$—;
=(C(R^2))—C(O)—;
—NR^{16}—N=;
—NR^{16}—$S(O)_e$—;
—NR^{16}—C(O)—;
—N=N—;
=N—N=;
=N—O—;
=N—$S(O)_e$—;
=N—C(O)—;
—O—$S(O)_e$—; and
—O—C(O)—;

provided that three adjacent A groups do not represent —C(O)—O—C(O)—, —S(O)—O—C(O)— or —S(O)—O—S(O)—, and provided that when an aromatic nitrogen is present in the ring formed by A^1, A^2, A^3 and A^4, the N-oxide can be formed;

E is R^3-aryl or R^3-heteroaryl;

W is R^4-cycloalkyl, R^4-aryl, R^4-heterocycloalkyl or R^4-heteroaryl;

R^1, R^3 and R^4 are independently 1–3 substituents independently selected from the group consisting of H, halogeno, C_1–C_6 alkyl, —CF_3, —C_2F_5, —OR^{11}, —COR^{11}, —CO_2R^{11}, —CON(R^{11})(R^{12}), —N(R^{11})(R^{12}), —N(R^{11})COR^{12}, —SH, —$S(O)_eR^{13}$, —OC(O)R^{11}, —OC(O)N(R^{11})(R^{12}), —$NR^{11}CO_2R^{13}$, —NR^{11}C(O)N(R^{12})(R^{14}), R^{15}-phenyl, R^{15}-benzyl, —NO_2, —$NR^{11}S(O)_2R^{13}$ and —$S(O)_2NR^{11}R^{12}$; or adjacent R^1, R^3 or R^4 substituents can form a —O—CH_2—O— group;

R^2 is independently selected from the group consisting of R^{2a}, R^{2b} or R^{10}; and R^{2c} is independently selected from the group consisting of R^{2a} and R^{10}; wherein R^{2a} is selected from the group consisting of —CF_3, —C_2F_5, —COR^{11}, —CO_2R^{11}, —CON(R^{11})(R^{12}), R^{15}-phenyl and R^{15}-benzyl; and R^{2b} is selected from the group consisting of halogeno, —OR^{11}, —NO_2, —N(R^{11})(R^{12}), —N(R^{11})COR^{12}, —SH, —$S(O)_eR^{13}$, —OC(O)R^{11}, —OC(O)N(R^{11})(R^{12}), —$NR^{11}CO_2R^{13}$, —NR^{11}C(O)N(R^{12})(R^{14}), —$NR^{11}S(O)_2R^{13}$ and —$S(O)_2NR^{11}R^{12}$; provided that from any combination of ring members A^1, A^2, A^3 and A^4 comprising R^2 and R^{2c}, no more than one substituent can be selected from R^{2a} and no more than one substituent can be selected from R^{2b};

R^5, R^7, R^9, R^{11}, R^{12} and R^{14} are independently selected from the group consisting of H, C_1–C_6 alkyl, R^{15}-phenyl, R^{15}-benzyl, —CF_3 and —C_2F_5;

R^6 and R^8 are independently selected from the group consisting of R^5, —(C(R^9)($R^{10)}$)$_n$—OR^{11}, —(C(R^9)(R^{10}))$_n$—$NR^{11}R^{12}$, —(C(R^9)(R^{10}))$_n$—SH, —(C(R^9)(R^{10}))$_n$—$S(O)_eR^{13}$, —(C(R^9)(R^{10}))$_n$—CO_2R^{11}, —(C(R^9)(R^{10}))$_n$—OC(O)R^{11}, —(C(R^9)(R^{10}))$_n$—$CONR^{11}R^{12}$, —(C(R^9)(R^{10}))$_n$—COR^{11} and —(C(R^9)(R^{10}))$_n$—NR^{11}C(O)R^{12}, provided that when Q is a heteroatom, R^6 and R^8 cannot be —OR^{11}, —OC(O)R^{11}, —N(R^{11})COR^{12}, —$NR^{11}R^{12}$, —SH or —$S(O)_eR^{13}$ on adjacent carbon atoms;

$R^{10}$is independently selected from the group consisting of hydrogen and C_1–C_6 alkyl;

R^{13} is independently selected form the group consisting of C_1–C_6 alkyl, R^{15}-phenyl, R^{15}-benzyl, —CF_3 and —C_2F_5;

R^{15} is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy or halogeno;

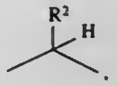
Q is a bond, —C(O)—, —NR^{17}—, —(C(R^9)(R^{10}))—, —O—, —$S(O)_e$—, —C(X)NR^{11}—, —N(R^{11})C(X)—, —N(R^{11})SO_2—, —SO_2N(R^{11})— or —N^+(R^{11})(R^{17})—;

R^{16} and R^{17} are independently selected from the group consisting of hydrogen, C_1–C_6 alkyl, —$S(O)_eR^{13}$, —COR^{11}, —$(CH_2)_m$—CO_2R^{13}, —$CONR^{11}R^{12}$, C_2–C_6 alkenyl, —R^{15}-phenyl and R^{15}-benzyl;

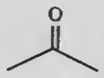
X is =O, =S or =N(R^{12});

Y^1 is —(C(R^9)(R^{10}))$_m$—, —G—(C(R^9)(R^{10}))$_m$— or —(C(R^9)(R^{10}))$_m$—G—;

G is



provided that when m is 0, R^2 is H, C_1–C_6 alkyl, —CF_3, —C_2F_5, —COR^{11}, —CO_2R^{11}, —CON(R^{11})(R^{12}), R^{15}-phenyl or R^{15}-benzyl;



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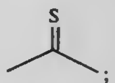

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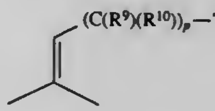

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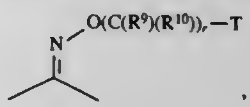
provided that when p is 0, T is not OH or —$NR^{11}R^{12}$;



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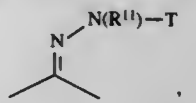
provided that when r is 1, T is not OR^{11} or —$NR^{11}R^{12}$; or



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provided T is not —OR^{11}, —N(R^{11})(R^{12}), —$S(O)_eR^{13}$, —$NR^{11}CO_2R^{13}$, —$NR^{11}COR^{12}$, —NR^{11}CON(R^{12})(R^{14}) or —OC(O)N(R^{11})(R^{12});

T is H, R^{15}-aryl, R^{15}-heterocycloalkyl, R^{15}-heteroaryl, R^{15}-cycloalkyl, —OR^{11}, —N(R^{11})(R^{12}), —COR^{11}, —CO_2R^{11}, —CON(R^{11})(R^{12}), —$S(O)_eR^{13}$, —$NR^{11}CO_2R^{13}$, —$NR^{11}COR^{12}$, —NR^{11}CON(R^{12})(R^{14}) or —OC(O)N(R^{11})(R^{12});

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J is a bond, —S(O)$_e$—, —O— or —N(Z^2)—, —N(Z^2)C(O)— or —N(Z^2)C(S)—; and when G is —C(R^2)H—, J can also be —N(Z^2)C(O)O— or —OC(O)N(Z^2)—;

Y^2 is —(C(R^9)(R^{10}))$_m$—;

Z^1 is H, C$_1$–C$_6$ alkyl, R^{15}-phenyl, R^{15}-benzyl, —CF$_3$, —C$_2$F$_5$, —NR^{11}R^{12}, —OR^{11} or SR^{11}; Z^2 is H, C$_1$–C$_6$ alkyl, R^{15}-phenyl, R^{15}-benzyl, —CF$_3$ or —C$_2$F$_5$; provided that when Y^1 is —(C(R^9)(R^{10}))$_m$— and m is 0, Z^1 is not —NR^{11}R^{12}, —OR^{11} or —SR^{11}; or Z^1 and Z^2 together are —(C(R^9)(R^{10}))$_u$—, wherein u is 1 to 4, and wherein with the atoms to which they are attached, form a 4 to 8 membered ring;

e and n are independently 0, 1 or 2;

m and p are independently 0, 1, 2 or 3; and

r and s are independently 1, 2, 3 or 4.

5,691,363

FUNGICIDAL AZOLE DERIVATIVES

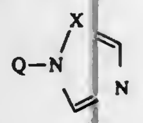
Shih-Yu Ma, and Robert Allan Davis, both of Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 464,439, Jun. 5, 1995, Pat. No. 5,574,056, which is a division of Ser. No. 234,856, Apr. 28, 1994, abandoned. This application Aug. 14, 1996, Ser. No. 702,427

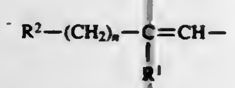
Int. Cl.^{6} A01N *43/653;* **C07D** *401/06;409/06;407/06*

U.S. Cl. 514—340 **13 Claims**

1. A compound having the formula



wherein Q is



$$\mathrm{R^2{-}(CH_2)_n{-}\underset{\underset{R^1}{|}}{C}{=}CH{-}}$$

R^1 is C$_1$–C$_8$ alkyl;

R^2 is pyridyl, pyridyl-N-oxide, quinolinyl, pyrryl, furyl, thienyl, benzodioxolyl, or benzodioxolanyl, unsubstituted or substituted with one or more C$_1$– C$_6$ alkyl, halo or nitro;

X is nitrogen; and

n is 2, 3 or 4,

or a stereoisomer thereof.

5,691,364

BENZAMIDINE DERIVATIVES AND THEIR USE AS ANTI-COAGULANTS

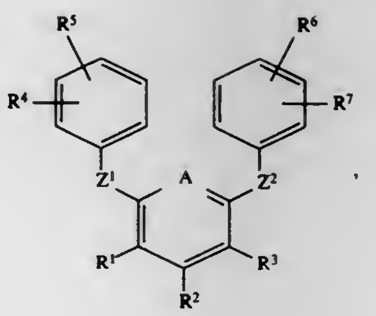
Brad O. Buckman, Oakland; David D. Davey, El Sobrante; William J. Guilford, San Leandro; Michael M. Morrissey, Danville; Howard P. Ng, El Sobrante; Gary B. Phillips, Pleasant Hill; Shung C. Wu, El Cerrito, and Wei Xu, Richmond, all of Calif., assignors to Berlex Laboratories, Inc., Richmond, Calif.

Continuation-in-part of Ser. No. 401,829, Mar. 10, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 473,385

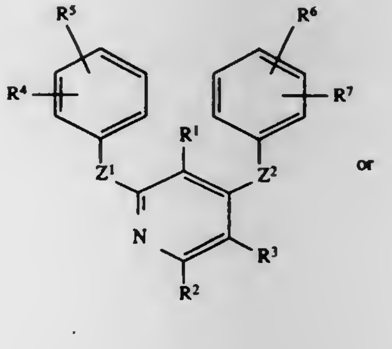
Int. Cl.^{6} A61K *31/44;* **C07D** *401/10;403/10*

U.S. Cl. 514—341 **11 Claims**

1. A compound selected from the group consisting of the following formulae:

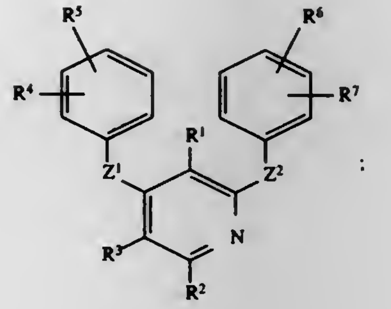


(I)



(VI)

or



(VII)

;

wherein

A is —N=;

Z^1 and Z^2 are independently —O— or —S—;

R^1 and R^3 are independently hydrogen, halo, alkyl, haloalkyl, alkoxy, haloalkoxy, nitro, —N(R^8)R^9, or —C(O)N(R^8)R^9;

R^2 is hydrogen, halo, alkyl, haloalkoxy, —OR^8, —N(R^8)R^9, or —N(R^8)(CH$_2$)$_n$C(O)OR^8 (where n is 1 to 3);

R^4 and R^7 are independently hydrogen, halo, alkyl, nitro, —OR^8, —C(O)OR^8, —C(O)N(R^8)R^9, —N(R^8)R^9, —N(H)C(O)R^8, or —N(H)S(O)$_2$R^8;

R^5 is —C(NH)NH$_2$, —C(NH)NHOR^8, —C(NH)N(H)C(O)OR^8, or —C(NH)N(H)C(O)R^8;

R^6 is (1,2)-imidazolyl (optionally substituted by alkyl) or (1,2)-imidazolinyl (optionally substituted by alkyl); and

each R^8 and R^9 are independently hydrogen, alkyl, aryl, or aralkyl; or a pharmaceutically acceptable salt thereof.

5,691,365

NICOTINIC RECEPTOR ANTAGONISTS IN THE TREATMENT OF NEUROPHARMACOLOGICAL DISORDERS

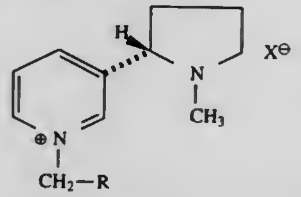
Peter A. Crooks; Linda P. Dwoskin, both of Lexington, Ky., and Alain Ravard, Petit-Couronne, France, assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Jul. 18, 1995, Ser. No. 503,904

Int. Cl.^{6} A61K *31/44;* **C07D** *401/04*

U.S. Cl. 514—343 **13 Claims**

1. A compound of the following formula:



wherein R=branched alkyl with 4–19 carbon atoms, cycloalkyl, N-alkenyl or alkenyl with 4–19 carbon atoms, and N-alkynyl or branched alkynyl with 4–19 carbon atoms; and X=Cl$^-$, I$^-$, HSO$_4$$^-$, ½SO$_4$2$^-$.

5,691,366

NITRO COMPOUNDS, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Masayuki Kato, Kyoto; Shigetaka Nishino; Mitsuko Hamano, both of Osaka, and Hisashi Takasugi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

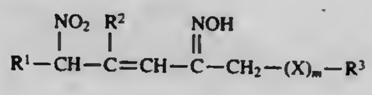
Division of Ser. No. 211,949, May 3, 1994, Pat. No. 5,495,023. This application Oct. 31, 1995, Ser. No. 550,735

Claims priority, application United Kingdom, Nov. 15, 1991, 9124324; Sep. 4, 1992, 9218741

Int. Cl.^{6} A61K *31/44;* **C07C** *271/12;251/40;* **C07D** *473/38*

U.S. Cl. 514—350 **18 Claims**

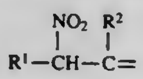
1. A compound of the formula:



$$\mathrm{R^1{-}\overset{\overset{NO_2}{|}}{CH}{-}\overset{\overset{R^2}{|}}{C}{=}CH{-}\overset{\overset{NOH}{\|}}{C}{-}CH_2{-}(X)_m{-}R^3}$$

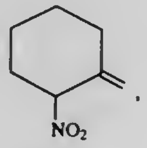
wherein

R^1 and R^2 are each lower alkyl or lower alkoxy(lower) alkyl, or



$$\mathrm{R^1{-}\overset{\overset{NO_2}{|}}{CH}{-}\overset{\overset{R^2}{|}}{C}{=}}$$

is cyclized to form

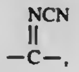


X is —O—, —S— or —NH—,

m is an integer 0 or 1, and

R^3 is carbamoyl, lower alkylcarbamoyl, di-lower alkylaminosulfonyl, lower alkylsulfonyl, oxamoyl or a group of the formula: —(Y)$_n$—R^4

wherein Y is —CO, —SO$_2$—, —COCH$_2$— or



$$\mathrm{{-}\overset{\overset{NCN}{\|}}{C}{-}},$$

n is an integer of 0 or 1, and

R^4 is a 3-pyridyl or 4-pyridyl group which is optionally substituted with one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, phenyl, carbamoyl, halogen, amino, lower alkylthio, hydroxy, lower alkylsulfonylamino and carbamoylmethyl, or a pharmaceutically acceptable salt thereof.

18. A compound selected from the group consisting of 4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl 3-pyridinecarboxylate, 4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl carbamate, 4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl ethylcarbamate, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-phthalimide, 1-acetylamino-4-ethyl-2-hydroxyimino-5-nitro-3-hexene, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexane-yl)-3-pyridinecarboxamide, N,N-dimethyl-N'-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)sulfamide, N-cyano-N'-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-3-pyridinecarboximidamide, 6-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-thiopurine, 1-phenyl-5-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)thiotetrazole, 1-methyl-2-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)thioimidazole, 1-methyl-5-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)thiotetrazole, 5-methyl-2-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)thio-1,3,4-thiadiazole, 2-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)thiobenzothiazole, 2-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-thiopyrimidine, N-(4-ethyl-2-hydroxyimino-6-methyl-5-nitro-3-hepten-1-yl)-3-pyridinecarboxamide, 1-acetylamino-4-ethyl-2-hydroxyimino-6-methyl-5-nitro-3-heptene, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-3-pyridinecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hexen-1-yl)-3-pyridinecarboxamide, N-(2-hydroxyimino-4-isopropyl-5-nitro-3-hexen-1-yl)-3-pyridinecarboxamide, N-(2-hydroxyimino-3-(2-nitrocyclohexylidene)propyl)-3-pyridinecarboxamide, N-(2-hydroxyimino-6-methoxy-4-methyl-5-nitro-3-hexen-1-yl)-4-pyridinecarboxamide, 1-acetylamino-2-hydroxyimino-4-methyl-5-nitro-3-heptene, 1-acetylamino-4-ethyl-2-hydroxyimino-5-nitro-3-heptene, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hepten-1-yl)-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)urea, 3-(N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-carbamoyl)-4-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-4-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2-methyl-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2-methylthio-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2-chloro-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2-hydroxy-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-3-quinolinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-6-methyl-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2-pyrazinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-methanesulfonamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-propionamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-3-pyridinesulfonamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-oxamate, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-4-pyrimidinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-3-pyridylacetamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2,4-dimethylthiazole-5-carboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-3,5-dimethylisoxazole-4-carboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-5-methyl-4-imidazolecarboxamide, 5-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-thiotetrazole-1-acetamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-5-methylimidazole-4-carboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-3-methylpyrazole-5-carboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-8-oxo-7H-pyrido(2,3-d)pyridazin-5-acetamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-6-amino-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-6-amino-3-pyridinecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-6-oxo-1,4,5,6-tetrahydropyridazine-3-carboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-6-methansulfonamido-3-pyridinecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-1H-1,2,4-triazole-3-carboxamide, N-(2-

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hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-4-imidazolecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-3-pyridylacetamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-2-oxoindoline-5-carboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-2-fluoro-3-pyridinecarboxamide, N-(4-ethyl-2-hydroxyimino-5-nitro-3-hexen-1-yl)-2-methoxy-3-pyridinecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-4-hydroxy-7-methyl-1,8-naphthyridine-3-carboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-2-ethyl-4-imidazolecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-3-aminopyrazine-2-carboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-3-amino-2-pyrazinecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-hepten-1-yl)-2,5-dimethylimidazole-4-carboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-octen-1-yl)-3-pyridinecarboxamide, N-(2-hydroxyimino-4-methyl-5-nitro-3-octen-1-yl)-3-pyridylacetamide.

5,691,367

ARYL-SUBSTITUTED RHODANINE DERIVATIVES

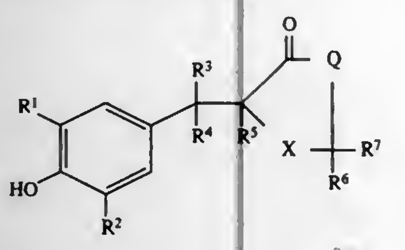
Jill A. Panetta, Zionsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 290,664, Aug. 15, 1994, which is a division of Ser. No. 111,226, Aug. 24, 1993, Pat. No. 5,356,917, which is a continuation of Ser. No. 839,693, Feb. 20, 1992, abandoned, which is a continuation of Ser. No. 504,147, Apr. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 335,063, Apr. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 304,919, Feb. 1, 1989, abandoned, which is a continuation of Ser. No. 114,278, Oct. 27, 1987, abandoned, which is a continuation of Ser. No. 869,488, Jun. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 764,160, Aug. 9, 1985, abandoned. This application Oct. 18, 1996, Ser. No. 733,909

Int. Cl.^{6} A61K *31/425;* **C07D** *277/14*

U.S. Cl. 514—369 **17 Claims**

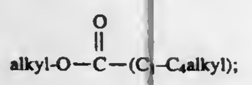
1. A compound of the formula (I):



(I)

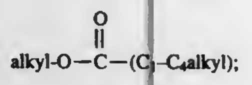
wherein:

R^1 is C_1–C_6 alkyl, C_1–C_6 alkoxy or C_1–C_4



$$\text{alkyl-O}-\overset{\displaystyle O}{\overset{\|}{C}}-(C_1\text{–}C_4\text{alkyl});$$

R^2 is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy or C_1–C_4



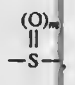
$$\text{alkyl-O}-\overset{\displaystyle O}{\overset{\|}{C}}-(C_1\text{–}C_4\text{alkyl});$$

R^3 is hydrogen or C_1–C_6 alkyl;

R^4 and R^5 are each hydrogen, or when taken together form a bond;

R^6 and R^7 when taken together are =S, or when one of R^6 or R^7 is hydrogen, the other is —OH or —SCH_3;

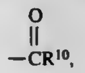
X is



$$-\overset{\displaystyle (O)_m}{\overset{\|}{S}}-,$$

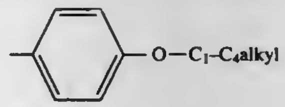
where m is 0, 1 or 2; and

Q is NR^8 where R^8 is C_2–C_6 alkenyl, C_3–C_8 cycloalkyl, —SO_2CH_3 or —$(CH_2)_n$—Y, where n is an integer from 0 to 3, both inclusive, and Y is cyano, OR^9,

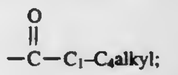


$$-\overset{\displaystyle O}{\overset{\|}{C}}R^{10},$$

tetrazolyl —$NR^{11}R^{12}$, —SH, —S(C_1–C_4 alkyl) or

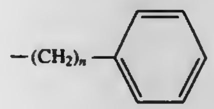


where R^9 is hydrogen, C_1–C_4 alkyl, tosyl, or



$$-\overset{\displaystyle O}{\overset{\|}{C}}-C_1\text{–}C_4\text{alkyl};$$

R^{10} is C_1–C_4 alkyl or —NH_2; R^{11} and R^{12} are each independently hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, —$(CH_2)_q$OH,— $(CH_2)_q$—N(C_1–C_4 alkyl)$_2$, —$(CH_2)_q$—S(C_1–C_4 alkyl) or



where q is an integer from 1 to 6, both inclusive, and n is as defined above; or R^{11} and R^{12} taken together form a morpholinyl, piperidinyl, piperazinyl or an N-methylpiperazinyl ring; with the proviso that when R^3 is hydrogen and R^4 and R^5 taken together form a bond and R^8 is hydrogen, R^6 and R^7 may not be =S.

5,691,368

SUBSTITUTED OXAZOLIDINE CALPAIN AND/OR CATHEPSIN B INHIBITORS

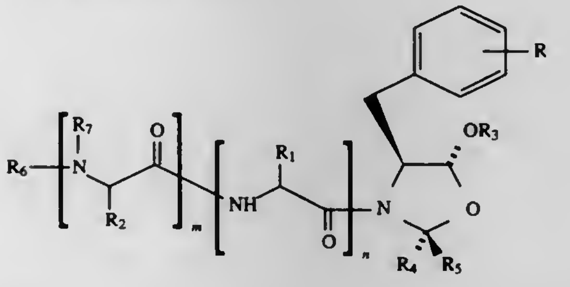
Norton P. Peet, Cincinnati; Shujaath Mehdi, West Chester; Matthew D. Linnik, Cincinnati; Michael R. Angelastro, Mason, all of Ohio, and Hwa-Ok Kim, Bellevue, Wash., assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 371,192, Jan. 11, 1995. This application Dec. 11, 1995, Ser. No. 552,139

Int. Cl.^{6} A61K *31/42*

U.S. Cl. 514—376 **16 Claims**

1. A compound of the formula:

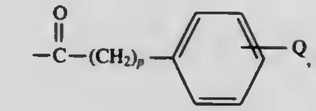


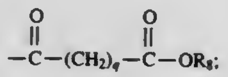
wherein

R and Q are each independently hydrogen, OH, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, NH_2 or halogen;

R_1 and R_2 are each independently C_1–C_4 alkyl;

R_3 is hydrogen, C_1–C_8 alkanoyl,





$$-\overset{\displaystyle O}{\overset{\|}{C}}-(CH_2)_q-\overset{\displaystyle O}{\overset{\|}{C}}-OR_8;$$

R_4 and R_5 are each independently hydrogen, C_1–C_4 alkyl or benzyl;

R_6 is t-butyloxycarbonyl or carbobenzyloxy;

R_7 is hydrogen or methyl;

R_8 is C_1–C_4 alkyl;

m is the integer zero or one;

n is the integer one;

p is the integer zero to three; and

q is the integer zero to three;

with the proviso that one of R_4 or R_5 is hydrogen when the other of R_4 or R_5 is not hydrogen, methyl or ethyl;

with the further proviso that one of m or n is one when the other of m or n is zero;

or a pharmaceutically acceptable salt thereof.

5,691,369

CYCLIC UREAS USEFUL AS ANTIARRHYTHMIC AND ANTIFIBRILLATORY AGENTS

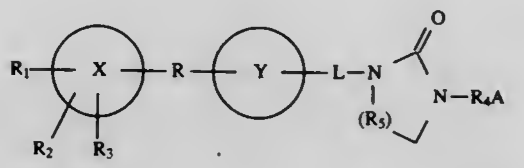
Stanford Salvatore Pelosi, Jr., and Chia-Nien Yu, both of Norwich, N.Y., assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 376,549, Jan. 23, 1995, abandoned, which is a continuation of Ser. No. 180,182, Jan. 11, 1994, abandoned, which is a continuation of Ser. No. 744,864, Aug. 14, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,256

Int. Cl.^{6} A61K *31/415;31/505;* **C07D** *233/02;241/04*

U.S. Cl. 514—392 **37 Claims**

1. A cyclic urea compound which has the structure:



wherein

a) X is a saturated or unsaturated, substituted or unsubstituted 6-membered carbocycle;

b) R is a covalent bond;

c) Y is a saturated or unsaturated, substituted or unsubstituted 5-membered heterocycle, wherein said heterocycle has one or two heteroatoms selected from O, S or N;

d) R_1, R_2, and R_3 are substituents on the X moiety and are independently selected from the group consisting of H, Cl, F, Br, NH_2, CF_3, OH, SO_3H, CH_3, SO_2, NH, COOH, alkoxy, alkoxycarbonyl, alkyl, hydroxyalkyl, carboxyalkyl, amino alkyl, acylamino, and acyloxy;

e) L is a linking moiety and is selected from the group consisting of alkylamino, alkenylamino, alkylimino, alkenylimino, and acylamino, wherein the carbon-containing end of L is bound, through R, at X; and wherein the nitrogen atom of L is bound to the nitrogen atom at the 3-position of the cyclic urethane ring moiety;

f) R_4 is selected from the group consisting of alkyl, alkenyl, alkynyl, alkylacyl, and heteroalkyl;

g) A is a substituted or unsubstituted; saturated or unsaturated, straight-chain or branched C_1–C_8 heteroalkyl; or a substituted or unsubstituted, saturated or unsaturated, heterocycle having 5-, 6- or 7-members and one or two heteroatoms selected from O, N or S; and heteroalkyl A and heterocycle A have at least one nitrogen atom, which nitrogen atom is adjacent to R_4; and

h) R_5 is a substituted or unsubstituted C_1 alkyl;

and the pharmaceutically-acceptable salts and esters thereof.

5,691,370

5-(2-IMIDAZOLINYLAMINO)BENZIMIDAZOLE COMPOUNDS USEFUL AS ALPHA-2-ADRENOCEPTOR AGONISTS

Thomas Lee Cupps, Oxford, and Sophie Eva Bogdan, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

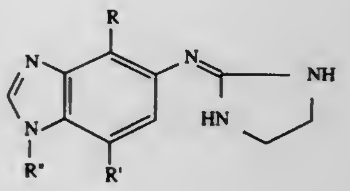
Continuation of Ser. No. 496,706, Jun. 29, 1995, Pat. No. 5,541,210, which is a continuation-in-part of Ser. No. 349,558, Dec. 8, 1994, Pat. No. 5,478,858, which is a continuation-in-part of Ser. No. 169,868, Dec. 17, 1993, abandoned. This application Jul. 3, 1996, Ser. No. 675,745

Int. Cl.^{6} A61K *31/415;* **C07D** *403/02*

U.S. Cl. 514—394 **2 Claims**

1. Pharmaceutical composition comprising:

(a) a safe and effective amount of a compound having the following structure:



wherein:

(1) R is unsubstituted alkanyl or alkenyl having from 1 to about 3 carbon atoms;

(2) R' is selected from the group consisting of hydrogen; unsubstituted alkanyl or alkenyl having from 1 to about 3 carbon atoms; unsubstituted alkylthio or alkoxy having from 1 to about 3 carbon atoms; hydroxy; thiol; cyano; and halo;

(3) R" is selected from the group consisting of hydrogen, methyl, ethyl and i-propyl; and

(b) a pharmaceutically-acceptable carrier; and

(c) an antihistamine chosen from the group comprising Loratadine, Cetirizine, Acrivastine; Astemizole; Terfenadine; Terfenadine Carboxylate; and Diphenhydramine.

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5,691,371
NITROBENZYL MUSTARD QUATERNARY SALTS AND THEIR USE AS HYPOXIA-SELECTIVE CYTOTOXIC AGENTS

William Alexander Denny; William Robert Wilson, and Moana Tercel, all of Auckland, New Zealand, assignors to Auckland UniServices Limited, Auckland, New Zealand

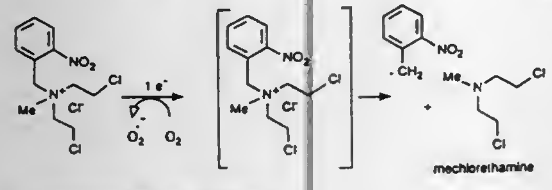
PCT No. PCT/NZ94/00046, § 371 Date Sep. 27, 1995, § 102(e) Date Sep. 27, 1995, PCT Pub. No. WO94/27954, PCT Pub. Date Dec. 8, 1994

PCT Filed May 24, 1994, Ser. No. 525,785

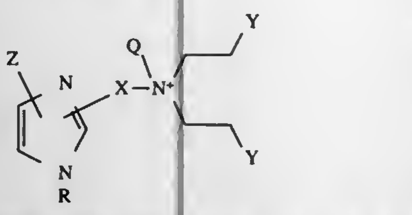
Claims priority, application New Zealand, May 25, 1993, 245270

Int. Cl.^{6} A61K *31/415*

U.S. Cl. 514—399 **7 Claims**



1. Compounds of the formula I



(I)

wherein X represents a linker chain —CR_1R_2— or —CR_1=CR_2— (where R_1 and R_2 are separately H, lower alkyl, phenyl or nitrophenyl); Y is halogen or OSO_2R; Q is lower alkyl (optionally substituted with alkyl and/or ether functions and containing up to 6 carbons) or nitrophenyl; R is lower alkyl optionally substituted with alkyl and/or ether groups, and may contain up to eight carbon atoms, Z represents one or more of the groups NO_2, SO_2R, CONHR, R, OR, SR, and CF_3, and the pharmaceutically acceptable salts thereof.

5,691,372
OXYGENATED-HETEROCYCLE CONTAINING SULFONAMIDE INHIBITORS OF ASPARTYL PROTEASE

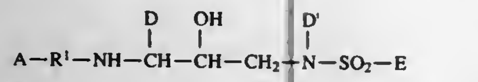
Roger D. Tung, Arlington, and Govinda Rao Bhisetti, Lexington, both of Mass., assignors to Vertex Pharmaceuticals Incorporated, Cambridge, Mass.

Filed Apr. 19, 1995, Ser. No. 424,810

Int. Cl.^{6} A61K *31/335;31/34;31/35;* **C07D** *319/06*

U.S. Cl. 514—452 **46 Claims**

1. A compound of formula I:



$$A-R^1-NH-\overset{D}{\overset{|}{CH}}-\overset{OH}{\overset{|}{CH}}-CH_2-\overset{D'}{\overset{|}{N}}-SO_2-E$$

(I)

wherein:

each R^1 is independently selected from the group consisting of —C(O)—, —$S(O)_2$—, —C(O)—C(O)—, —O—C(O)—, —O—$S(O)_2$, —NR^2—$S(O)_2$—, —NR^2—C(O)— and —NR^2—C(O)—C(O)—;

each A is a 6 membered non-aromatic monocyclic oxygenated heterocycle containing 2 endocyclic oxygens, optionally attached through a C_1–C_3 alkyl linker;

each Ht is independently selected from the group consisting of C_3–C_7 carbocycle; and C_6–C_{10} aryl; wherein any member of said Ht is optionally substituted with one or more substituents selected from the group consisting of oxo, —OR^2, —R^2, —$N(R^2)(R^2)$, —NHOH, —R^2—OH, —CN, —CO_2R^2, —C(O)—$N(R^2)(R^2)$, —$S(O)_2$—$N(R^2)(R^2)$, —$N(R^2)$—C(O)—R^2, —C(O)—R^2, —$S(O)_n$—R^2, —OCF_3, —$S(O)_n$—R^6, . —$N(R^2)$—$S(O)_2(R^2)$, halo, —CF_3, —NO_2, —R^6, —S—CH_3 and —O—R^6;

each R^2 is independently selected from the group consisting of H and C_1–C_3 alkyl optionally substituted with R^6;

each R^3 is independently selected from the group consisting of H, Ht, C_1–C_6 alkyl and C_2–C_6 alkenyl wherein any member of said R^3, except H, is optionally substituted with one or more substituents selected from the group consisting of —OR^2, —C(O)—NH—R^2, —$S(O)_n$—$N(R^2)(R^2)$, Ht, —CN, —SR^2, —CO_2R^2, and NR^2—C(O)—R^2;

each n is independently 1 or 2;

each D and D' is independently selected from the group consisting of R^6; C_1–C_5 alkyl, which is optionally substituted with one or more groups selected from —OR^2, —R^3, —S—R^6, —O—R^6 and R^6; C_2–C_4 alkenyl, which is optionally substituted with one or more groups selected from the group consisting of —OR^2, —R^3, —O—R^6 and R^6; and C_3–C_6 carbocycle, which is optionally substituted with or fused with R^6;

each E is independently selected from the group consisting of Ht; —O—Ht; Ht—Ht; —O—R^3; —NR^2R^3; C_1–C_6 alkyl, which is optionally substituted with one or more groups selected from the group consisting of R^4 and Ht; C_2–C_6 alkenyl, which is optionally substituted with one or more groups selected from the group consisting of R^4 and Ht; and phenyl fused with a 5–7 membered carbocycle;

each R^4 is independently selected from the group consisting of —OR^2, —C(O)—NHR^2, —$S(O)_2$—NHR^2, halo, —NR^2—C(O)—R^2 and —CN;

each R^5 is independently selected from the group consisting of H and C_1–C_4 alkyl optionally substituted with aryl; and

each R^6 is independently selected from the group consisting of aryl, and carbocycle, each optionally substituted with one or more groups selected from the group consisting of oxo, —OR^5, —R^5, —$N(R^5)(R^5)$, —$N(R^5)$—C(O)—R^5, —R^5—OH, —CN, —CO_2R^5, —C(O)—$N(R^5)(R^5)$, halo and —CF_3.

5,691,373
NONPEPTIDE ENDOTHELIN ANTAGONISTS I

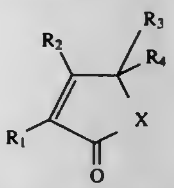
Kent Alan Berryman; Annette Marian Doherty, both of Ann Arbor; Jeremy John Edmunds, Ypsilanti; William Chester Patt, Chelsea; Mark Stephen Plummer, Dexter, and Joseph Thomas Repine, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 278,882, Jul. 26, 1994, abandoned, which is a continuation-in-part of Ser. No. 217,578, Mar. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 109,751, Aug. 19, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,083

Int. Cl.^{6} A61K *31/36;31/38;31/44;31/535*

U.S. Cl. 514—464 **10 Claims**

1. A compound of formula



t

or a tautomeric open chain keto-acid form thereof or a pharmaceutically acceptable salt thereof wherein

R_1 is cycloalkyl substituted or unsubstituted of from 3 to 12 carbon atoms,
phenyl substituted with from 1 to 5 substituents, naphthyl unsubstituted or substituted with from 1 to 5 substituents, or
heteroaryl unsubstituted or substituted with from 1 to 5 substituents;

R_2 is alkyl substituted or unsubstituted straight,
or branched of from 1 to 12 carbon atoms,
cycloalkyl substituted or unsubstituted of from 3 to 12 carbon atoms,
aryl which is unsubstituted or substituted with from 1 to 5 substituents,
heteroaryl which is unsubstituted or substituted with from 1 to 3 substituents;

R_3 is alkyl substituted or unsubstituted straight, or
branched, of from 1 to 12 carbon atoms,
cycloalkyl substituted or unsubstituted of from 3 to 12 carbon atoms,
aryl which is unsubstituted or substituted with from 1 to 5 substituents,
heteroaryl which is unsubstituted or substituted with from 1 to 3 substituents;

R_4 is hydroxy or OR_5,
SR_5, wherein R_5 is alkyl or substituted alkyl of from 1 to 7 carbon atoms, or
$(CH_2)_nOR_5$ wherein n is an integer of from 1 to 3;

X is O or S;

with the proviso that when R_1 is monosubstituted phenyl and the substituent is p-methoxy, R_3 is not unsubstituted phenyl, monosubstituted phenyl, or mesityl and with the further proviso when R_2 is alkyl substituted, the substituent is not oxygen at the α-position to the furanone ring; and with the proviso that any of R_1 through R_4 are heterocyclic containing.

5,691,374
DIARYL-5-OXYGENATED-2-(5H) -FURANONES AS COX-2 INHIBITORS

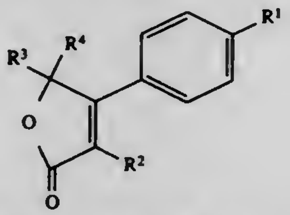
Cameron Black, Point Claire; Erich Grimm, Baie D'Urfe; Zhaoyin Wang, Pierrefonds, and Serge Leger, Dollard des Ormeaux, all of Canada, assignors to Merck Frosst Canada Inc., Kirkland, Canada

Filed May 18, 1995, Ser. No. 443,620

Int. Cl.^{6} A61K *31/365;* **C07D** *307/60*

U.S. Cl. 514—473 **18 Claims**

1. A compound of formula Ib



Ib

or a pharmaceutically acceptable salt thereof
wherein:

R^1 is selected from the group consisting of
- (a) $S(O)_2CH_3$,
- (b) $S(O)_2NH_2$,
- (c) $S(O)_2NHC(O)CF_3$,
- (d) $S(O)(NH)NH_2$,
- (e) $S(O)(NH)NHC(O)CF_3$,

R^2 is selected from the group consisting of
- (a) C_{3-6}cycloalkyl,
- (b) mono- or di- substituted C_3–C_6cycloalkenyl wherein the substituent is selected from the group consisting of
  - (1) halo,
  - (2) C_{1-4}alkoxy,
  - (3) C_{1-4}alkylthio,
  - (4) CN,
  - (5) CF_3,
  - (6) C_{1-6}alkyl,
  - (7) N_3,
  - (8) —CO_2H,
  - (9) —CO_2-C_{1-6}alkyl,
  - (10) —$C(R^5)(R^6)$-OH,
  - (11) —$C(R^5)(R^6)$-O-C_{1-4}alkyl,
- (c) unsubstituted or mono-, di- or tri-substituted phenyl or naphthyl wherein the substituent is selected from the group consisting of
  - (1) halo,
  - (2) C_{1-4}alkoxy,
  - (3) C_{1-4}alkylthio,
  - (4) CN,
  - (5) CF_3,
  - (6) C_{1-6}alkyl,
  - (7) N_3,
  - (8) —CO_2H,
  - (9) —CO_2-C_{1-4}alkyl,
  - (10) —$C(R^5)(R^6)$-OH,
  - (11) —$C(R^5)(R^6)$-O-C_{1-4}alkyl, and
  - (12) —C_{1-4}alkyl-CO_2-R^5;
  - (13) —O—(C_{1-4}alkyl)-CO_2R^5,
- (d) unsubstituted or mono-, di- or tri-substituted heteroaryl wherein the heteroaryl is a monocyclic aromatic ring of 5 atoms, said ring having one hetero atom which is S, O, or N, and optionally 1, 2, or 3 additional N atoms; or
  the heteroaryl is a monocyclic ring of 6 atoms, said ring having one hetero atom which is N, and optionally 1, 2 or 3 additional N atoms, said substituents are selected from the group consisting of
  - (1) halo,
  - (2) C_{1-4}alkyl,
  - (3) C_{1-4}alkoxy,
  - (4) C_{1-4}alkylthio,
  - (5) CN,
  - (6) CF_3,
  - (7) N_3,
  - (8) —$C(R^5)(R^6)$-OH, and
  - (9) —$C(R^5)(R^6)$-O-C_{1-4}alkyl;
- (e) an unsubstituted or a mono- or di-substituted benzoheterocycle in which the heterocycle is a 5, 6, or 7-membered ring which may contain 1 or 2 heteroatoms chosen independently from O, S, or N and which may contain a carbonyl group or a sulfonyl group; the said substituents are selected from the group consisting of
  - (1) halo,
  - (2) C_{1-4}alkyl,
  - (3) C_{1-4}alkoxy,
  - (4) C_{1-4}alkylthio,
  - (5) CN,
  - (6) CF_3,
  - (7) N_3,
  - (8) —$C(R^5)(R^6)$-OH, and
  - (9) —$C(R^5)(R^6)$-O-C_{1-4}alkyl;
- (f) a heterocycloalkyl group of 5, 6 or 7 members which contains 1 or 2 heteroatoms chosen from O, S, or N and optionally contains a carbonyl group or a sulfonyl group
- (g) an unsubstituted or a mono- or di-substituted benzocarbocycle in which the carbocycle is a 5, 6, or 7-membered ring which optionally contains a carbonyl group, the said substituents are selected from the group consisting of
  - (1) halo,
  - (2) C_{1-4}alkyl,
  - (3) C_{1-4}alkoxy,
  - (4) C_{1-4}alkylthio,
  - (5) CN,
  - (6) CF_3,
  - (7) N_3,
  - (8) —$C(R^5)(R^6)$-OH, and
  - (9) —$C(R^5)(R^6)$-O-C_{1-4}alkyl;

R^3 is hydrogen, C_{1-4}alkyl, CH_2OR^7, CN, CH_2CN, or C_{1-4}fluoroalkyl, F, $CONR^7_2$, unsubstituted or mono- or di-substituted phenyl, unsubstituted or mono or di-substituted benzyl, unsubstituted or mono- or di-substituted heteroaryl, unsubstituted or mono or di-substituted heteroarylmethyl, wherein the substituents are selected from the group consisting of
- (1) halo,
- (2) C_{1-4}alkyl,
- (3) C_{1-4}alkoxy,
- (4) C_{1-4}alkylthio,
- (5) CN,
- (6) CF_3,
- (7) N_3,
- (8)—$C(R^5)(R^6)$-OH, and

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(9) —$C(R^5)(R^6)$-O-C_{1-4}alkyl;

R^4 is

(a) C_{1-4}alkoxy,
(b) C_{1-4}alkylthio,
(c) —OH,
(d) —$OCOR^7$,
(e) —SH,
(f) —$SCOR^7$,
(g) —OCO_2R^8,
(h) —SCO_2R^8,
(i) $OCONR^7{}_2$, and
(j) $SCONR^7{}_2$;

each R^5 or R^6 is independently selected from the group consisting of

(a) hydrogen, and
(b) C_{1-4}alkyl,

each R^7 is independently selected from the group consisting of

(a) hydrogen and
(b) R^8;

each R^8 is independently selected from the group consisting of

(a) C_{1-6}alkyl,
(b) phenyl or monosubstituted phenyl wherein the substituents may be halo, C_{1-4}alkyl, C_{1-4}alkoxy, C_{1-4}alkylthio, CN, or CF_3,
(c) benzyl or monosubstituted benzyl wherein the substituents may be halo, C_{1-4}alkyl, C_{1-4}alkoxy, C_{1-4}alkylthio, CN, or CF_3.

5,691,375

METHOD FOR PREVENTING OR REDUCING RISK OF ONSET OF CARDIOVASCULAR EVENTS EMPLOYING AN HMG COA REDUCTASE INHIBITOR

Bruce D. Behounek, Yardley; Mark E. McGovern, Philadelphia, both of Pa., and Adeoye Y. Olukotun, Hopewell, N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Division of Ser. No. 182,471, Jan. 18, 1994. This application May 23, 1995, Ser. No. 448,211

Int. Cl.^{6} A61K *31/21*

U.S. Cl. 514—510 **6 Claims**

1. A method for preventing or reducing the risk of a cardiovascular event which is angina in a patient who has one or more risk factors for a cornary event, which comprises administering to a patient in need of such treatment a therapeutically effective amount of pravastatin.

5,691,376

SUBSTITUTED BIPHENYL DERIVATIVES

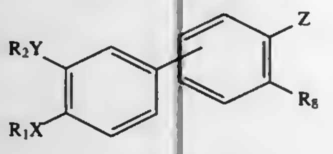
Thomas J. Caggiano, Morrisville, Pa., and Joseph Prol, Jr., West Chazy, N.Y., assignors to American Home Products Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 450,752, May 25, 1995, abandoned, which is a division of Ser. No. 198,031, Feb. 17, 1994, abandoned. This application Oct. 17, 1996, Ser. No. 732,185

Int. Cl.^{6} A61K *31/235;* **C07C** *69/76*

U.S. Cl. 514—532 **8 Claims**

1. A compound of the following structure:



wherein R_8= H:

R_1=alkyl, cycloalkyl, arylalkyl, aryl;
R_2=cycloalkyl, aryl, C_3–C_{10} alkyl;
X,Y=O, $S(O)_n$, NH;
Z=CO_2R_3, $C(O)CO_2R_3$, $CH(OH)CO_2R_3$, $CHFCO_2R_3$, $CF_2CO_2R_3$, $CONH_2$, $CONHOR_4$, $CONHNR_4R_5$, 5(1H)-tetrazole, $C(O)CONR_3R_4$, $CH(OH)CONR_3R_4$, $CF_2CONR_3R_4$;
R_3, R_4, R_5= hydrogen, alkyl, aryl, aryalkyl, cycloalkyl, or fluoroalkyl;
halo= Cl, Br, or I;
fluoroalkyl=CF_3, CHF_2, CH_2F, CH_2CF_3, C_2F_5;
cycloalkyl=C_3–C_6 cycloalkyl;
arylalkyl=C_1–C_4 alkyl aryl;
aryl= phenyl, furanyl, thienyl, or pyridyl; and
n=0–2;

or a pharmaceutically acceptable salt thereof.

5,691,377

USE OF N-METHYL-ASPARTIC ACID FOR ENHANCING GROWTH AND ALTERING BODY COMPOSITION

Mark Joseph Estienne; Jeannine Marie Harter-Dennis, both of Salisbury, Md.; Mark Newcombe, Ontario, Canada; Claude Richard Barb, Athens, Ga.; John Palmer McMurtry, Columbia, and Thomas Gray Hartsock, Damascus, both of Md., assignors to University of Maryland Eastern Shore and University of Maryland College Park, College Park, Md., and The United States of America as represented by the Secretary of Agriculture, Washington, D.C., a part interest

Continuation-in-part of Ser. No. 99,576, Jul. 30, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 274,880

Int. Cl.^{6} A61K *31/195;31/74;38/102*

U.S. Cl. 514—557 **13 Claims**

1. A method for increasing the growth rate, feed efficiency and/or for decreasing the amount of body fat of a chicken in need of some compared to a control, comprising injecting said animal on a periodic basis with an effective amount of a compound selected from the group consisting of N-methyl-d-aspartic acid, N-methyl-l-aspartic acid, and mixtures thereof.

5,691,378

METHOD FOR TREATING WRINKLES USING COMBINATIONS OF ALPHA HYDROXYACIDS AND/OR ALPHA KETOACIDS

Ruey J. Yu, Ambler, and Eugene J. Van Scott, Abington, both of Pa., assignors to Tristrata Technology, Inc., Wilmington, Del.

Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 487,684

Int. Cl.^{6} A61K *31/19;7/48*

U.S. Cl. 514—557 **12 Claims**

1. A method of visibly reducing a human skin wrinkle comprising topically applying to said wrinkle a composition comprising at least one member selected from hydroxycarboxylic acids, ketocarboxylic acids, or topically effective salts, esters and lactones thereof, in an amount and for a period of time sufficient to visibly reduce said wrinkle,

wherein said hydroxycarboxylic acid, ketocarboxylic acid, topically effective salt, ester or lactone thereof being at least one member selected from the group consisting of 2-hydroxyacetic acid; 2-hydroxypropanoic acid; 2-methyl 2-hydroxypropanoic acid; 2-hydroxybutanoic acid; phenyl 2-hydroxyacetic acid; phenyl 2-methyl 2-hydroxyacetic acid; 3-phenyl 2-hydroxypropanoic acid; 2,3-dihydroxypropanoic acid; 2,3,4-trihydroxybutanoic acid; 2,3,4,5-tetrahydroxypentanoic acid; 2,3,4,5,6-pentahydroxyhexanoic acid; 2-hydroxydodecanoic acid; 2,3,4,5,6,7-hexahydroxyheptanoic acid; diphenyl 2-hydroxyacetic acid; 4-hydroxymandelic acid; 4-chloromandelic acid;

3-hydroxybutanoic acid; 4-hydroxybutanoic acid; 2-hydroxyhexanoic acid; 5-hydroxydodecanoic acid; 12-hydroxydodecanoic acid; 10-hydroxydecanoic acid; 16-hydroxyhexadecanoic acid; 2-hydroxy-3-methylbutanoic acid; 2-hydroxy-4-methylpentanoic acid; 3-hydroxy-4-methoxymandelic acid; 4-hydroxy-3-methoxymandelic acid; 2-hydroxy-2-methylbutanoic acid; 3-(2-hydroxyphenyl) lactic acid; 3-(4-hydroxyphenyl) lactic acid; hexahydromandelic acid; 3-hydroxy-3-methylpentanoic acid; 4-hydroxydecanoic acid; 5-hydroxydecanoic acid; aleuritic acid; 2-hydroxypropanedioic acid; 2-hydroxybutanedioic acid; erythraric acid; threaric acid; arabiraric acid; ribaric acid; xylaric acid; lyxaric acid; glucaric acid; galactaric acid; mannaric acid; gularic acid; allaric acid; altraric acid; idaric acid; talaric acid; 2-hydroxy-2-methylbutanedioic acid; citric acid; isocitric acid; agaricic acid; quinic acid; glucuronic acid; glucuronolactone; galacturonic acid; galacturonolactone; uronic acids; uronolactones; dihydroascorbic acid; dihydroxytartaric acid; tropic acid; ribonolactone; gluconolactone; galactonolactone; gulonolactone; mannonolactone; ribonic acid; gluconic acid; citramalic acid; pyruvic acid; hydroxypyruvic acid; hydroxypyruvic acid phosphate; methyl pyruvate; ethyl pyruvate; propyl pyruvate; isopropyl pyruvate; phenyl pyruvic acid; methyl phenyl pyruvate; ethyl phenyl pymvate; propyl phenyl pyruvate; formyl formic acid; methyl formyl formate; ethyl formyl formate; propyl formyl formate; benzoyl formic acid; methyl benzoyl formate; ethyl benzoyl formate; propyl benzoyl formate; 4-hydroxybenzoyl formic acid; 4-hydroxyphenyl pyruvic acid; and 2-hydroxyphenyl pyruvic acid.

5,691,379

DIHYDROLIPOIC ACID AS AN OPHTHALMOLOGICAL AGENT TO SUPPRESS INTOLERANCE REACTIONS IN THE AREA BETWEEN IMPLANTS AND LIVING BODY TISSUE

Heinz Ulrich, Niedernberg, and Erich Franz Elstner, Grobenzell, both of Germany, assignors to ASTA Medica Aktiengesellschaft, Dresden, Germany

PCT No. PCT/EP94/01110, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO94/27592, PCT Pub. Date Dec. 8, 1994

PCT Filed Apr. 11, 1994, Ser. No. 557,187

Claims priority, application Germany, May 22, 1993, 43 17 173.7

Int. Cl.^{6} A61K *31/19;31/385*

U.S. Cl. 514—557 **8 Claims**

1. A method of suppressing or reducing an intolerance reaction resulting from an implant or endoprosthesis comprising

contacting an area of living tissue in contact with or near the implant or endoprosthesis with an effective amount of a pharmaceutical composition comprising dihydrolipoic acid, or a physiologically acceptable salt of dihydrolipoic acid, or mixture thereof such that the intolerance reaction is suppressed or reduced.

5,691,380

STABLE N-ACETYLCYSTEINE COMPOSITIONS AND METHODS FOR TREATING HUMAN SKIN THEREWITH

Brent William Mason, West Chester; Joseph Michael Zukowski, Cincinnati; Larry Richard Robinson, Lebanon, and Greg George Hillebrand, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 29, 1995, Ser. No. 496,749

Int. Cl.^{6} A61K *31/23*

U.S. Cl. 514—562 **13 Claims**

1. A two phase water-in-silicone topical emulsion composition comprising:

(a) from about 1% to about 60% of a silicone continuous phase comprising at least one liquid organopolysiloxane,
(b) from about 30% to about 90% of an aqueous discontinuous phase comprising a safe and effective amount of a compound selected from the group consisting of N-acetylcysteine; a derivative of N-acetylcysteine selected from the group consisting of an ester of N-acetylcysteine, an amide of N-acetylcysteine, an anhydride of N-acetylcysteine, a thioester of N-acetylcysteine, and a thio-ether of the sulfhydryl moiety of N-acetylcysteine; a pharmaceutically acceptable salt of N-acetylcysteine; a pharmaceutically-acceptable salt of said derivative of N-acetylcysteine; or a mixture thereof, and
(c) from about 0.1% to about 10% of an emulsifier for dispersing said discontinuous phase into said continuous phase.

5,691,381

HYDROXAMIC AND CARBOCYCLIC ACIDS AS METALLOPROTEASE INHIBITORS

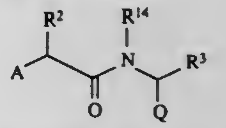
Irina Cipora Jacobson, Boothwyn, Pa.; Carl Peter Decicco, and Robert Joseph Cherney, both of Newark, Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Continuation-in-part of Ser. No. 423,192, Apr. 18, 1995, abandoned. This application Apr. 16, 1996, Ser. No. 632,973

Int. Cl.^{6} A61K *31/195;31/19;* **C07D** *211/72*

U.S. Cl. 514—562 **4 Claims**

1. A compound of the formula I:



or pharmaceutically acceptable salts or prodrug forms thereof, wherein:

A is —$C(R^1)(R^{1a})CONHOH$;
Q is $CONHR^{13}$, or $COOR^{21}$;
R^1 is selected from:
  C_1–C_4 alkyl;
R^{1a} is selected from: OR^{15} or NHR^{15};
R^2 is selected from:
  C_2–C_6 alkyl optionally substituted with R^{17b};
R^3 is selected from:
  hydrogen, or
  C_1–C_6 alkyl optionally substituted with R^4;
R^4 is selected from:
  C_1–C_4 alkyl,
  —NR^8R^{10}, or
  aryl substituted with 0–1 C_1–C_4 alkoxy;
R^8 is a substituent on nitrogen and is selected from:
  hydrogen,
  C_1–C_6 alkyl substituted with 0–3 R^{20},
  C_1–C_6alkylcarbonyl,
  alkoxycarbonyl,
  arylalkoxycarbonyl,
  alkylaminocarbonyl,
  arylsulfonyl,
  heteroarylalkoxycarbonyl,
  cycloalkoxycarbonyl,
  heteroarylsulfonyl,
  alkylsulfonyl, or
  cycloalkylsulfonyl;
R^{10} is selected from:
  hydrogen,
  C_1–C_4 alkoxy, or
  C_1–C_6 alkyl substituted with 0–4 R^4;
R^{10a} is selected from:
  hydrogen or C_1–C_4 alkyl or C_1–C_4 alkyl carbonyl;
R^{11} is selected from:
  H, or C_1–C_4 alkyl:
R^{13} is selected from:.
  C_1–C_6 alkyl or phenyl which are independently substituted with R^{13a};

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R^{13a} is selected from:
alkyl, alkoxy, phenyl:
R^{14} is selected from:.
hydrogen, methyl or ethyl:
R^{15} is selected from:
H, or
C_1–C_4 alkyl;
R^{17b} is selected from:
aryl substituted with 0–2 R^{18}, aryl substituted with halogen, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, or
C_3–C_8 cycloalkyl;
R^{18}, when a substituent on carbon, is selected from one or more of the following:
phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_1–C_4 alkoxy, —CO_2H, sulfonamide, C_1–C_4 alkyl substituted with —$NR^{10}R^{10a}$, —$NR^{10}R^{10a}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_{1-4} haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$S(O)_mR^{11}$, —$NHSO_2R^{11}$;
phenyl, optionally substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy or $NR^{10}R^{10a}$;
or R^{18} may be a 3- or 4-carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6-membered ring being optionally substituted with halogen, C_1–C_4 alkyl. C1–C_4 alkoxy, hydroxy, —$NR^{10}R^{10a}$, =O or =S when attached to a saturated carbon atom, or =O when attached to sulfur,
m=0–2;.
R^{18}, when a substituted on nitrogen, is selected from one or more of the following:
phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, —$CH_2NR^{10}R^{10a}$, —$NR^{10}R^{10a}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, —CO_2H, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl;
R^{20} is selected from:
aryl substituted with 0–5 R^{18};
R^{21} is selected from:
methyl, tert-butyl.

5,691,382

INHIBITION OF TNF PRODUCTION WITH MATRIX METALOPROTEINASE INHIBITORS

Michael John Crimmin; William Alan Galloway, and Andrew John Hubert Gearing, all of Cowley, Great Britain, assignors to British Biotech Pharmaceuticals Limited, Oxford, England

PCT No. PCT/GB93/02331, § 371 Date May 12, 1995, § 102(e) Date May 12, 1995, PCT Pub. No. WO94/10990, PCT Pub. Date May 26, 1994

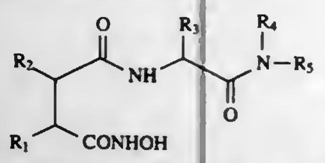
PCT Filed Nov. 12, 1993, Ser. No. 436,190

Claims priority, application United Kingdom, Nov. 13, 1992, 9223904

Int. Cl.^{6} A61K *31/19*

U.S. Cl. 514—575 **18 Claims**

1. A method for the inhibition of the release of and the effects of tumor necrosis factor (TNF) in a condition mediated by TNF in a mammal comprising administering to the mammal an effective amount of a matrix metalloproteinase (MMP) inhibitor derivative as defined by a compound of formula (I):



(I)

wherein the five substituents R_1–R_5 may vary as follows:
R_1 hydrogen, C_1–C_6 alkyl, phenyl, phenyl(C_1–C_6 alkyl);
R_2 hydrogen, phenyl, phenyl(C_1–C_6 alkyl), cycloalkyl, cycloalkyl(C_1–C_6 alkyl);
R_3 C_1–C_6 alkyl, benzyl, benzyloxybenzyl, (C_1–C_6 alkoxy)benzyl, benzyloxy(C_1–C_6alkyl);
R_4 C_1–C_6alkyl;
R_5 hydrogen.

5,691,383

USE OF HEXAFLUMURON AS A TERMITICIDE

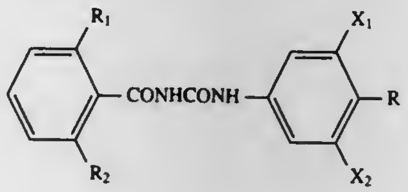
Ellen M. Thoms, Tampa, Fla., and Ronald J. Sbragia, Carmel, Ind., assignors to DowElanco, Indianapolis, Ind.

Continuation of Ser. No. 439,389, May 11, 1995, Pat. No. 5,556,883, which is a continuation of Ser. No. 214,067, Mar. 16, 1994, abandoned, which is a continuation of Ser. No. 891,610, Jun. 1, 1992, abandoned. This application Jun. 26, 1996, Ser. No. 670,481

Int. Cl.^{6} A01N *47/28*

U.S. Cl. 514—594 **10 Claims**

1. A method for treating timber for termites which comprises applying to timber an effective amount of a compound of the formula



wherein R_1 and R_2 are each independently hydrogen, C_1–C_3 alkyl, C_1– C_3 alkoxy, chloro, bromo or fluoro; X_1 and X_2 are each independently chloro, fluoro, bromo, hydrogen, or C_1–C_3 alkyl; and R is a fluorine containing C_1–C_4 haloalkoxy group.

5,691,384

METHOD OF USING TRIARYL-ETHYLENE DERIVATIVES IN THE TREATMENT AND PREVENTION OF OSTEOPOROSIS

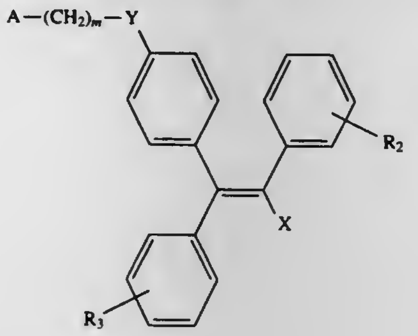
Alan J. Bitonti, Maineville, Ohio, assignor to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 346,111, Nov. 29, 1994, abandoned. This application Oct. 11, 1995, Ser. No. 531,885

Int. Cl.^{6} A61K *31/135*

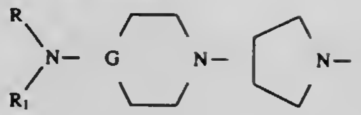
U.S. Cl. 514—648 **16 Claims**

1. A method of treating bone tissue loss or osteoporosis in a patient, comprising administering an effective antiosteoporosis amount of a compound of the formula

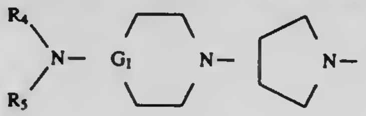


wherein

A is a radical of the formula



wherein
R and R_1 are each independently hydrogen or C_1–C_4 alkyl; and
G is HN, H_3CN, CH_2, or O;
m is an integer from 4 to 12;
R_2 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, or hydroxy;
R_3 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, hydroxy, or —$Y(CH_2)_pA_1$ in which A_1 is a radical of the formula



wherein
R_4 and R_5 are each independently hydrogen or C_1–C_4 alkyl;
G_1 is HN, H_3CN, CH_2, or O; and
p is an integer from 4 to 12;
X is chloro or bromo;
Y is O or NH;
or a pharmaceutically acceptable salt thereof.

5,691,385

GROWTH PROMOTION

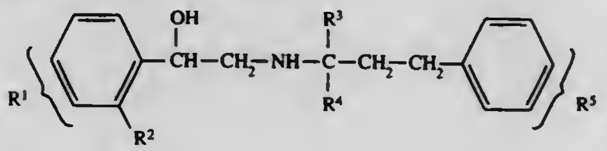
David B. Anderson, Greenfield; Klaus K. Schmiegel, Indianapolis, and Edward L. Veenhuizen, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 37,789, Mar. 18, 1993, which is a continuation of Ser. No. 606,670, Oct. 31, 1990, abandoned, which is a division of Ser. No. 328,996, Mar. 27, 1989, Pat. No. 4,992,473, which is a division of Ser. No. 153,640, Feb. 8, 1988, Pat. No. 4,849,453, which is a division of Ser. No. 860,719, May 7, 1986, Pat. No. 4,734,437, which is a continuation of Ser. No. 628,002, Jul. 5, 1984, abandoned, which is a continuation of Ser. No. 462,587, Jan. 31, 1983, abandoned. This application May 25, 1995, Ser. No. 450,052

Int. Cl.^{6} A61K *31/135;38/16;31/65;31/43*

U.S. Cl. 514—653 **8 Claims**

1. A method for treating a domesticated warm blooded animal to promote growth, improve feed efficiency, or improve leanness, which comprises administering to the animal both of (1) a first compound having the formula



wherein:
R^1 is hydrogen, hydroxy, or methoxy;.
R^2 is hydrogen or fluoro;
R^3 is hydrogen or C_1–C_2 alkyl;
R^4 is hydrogen or methyl;
R^5 is hydrogen, fluoro, nitro, hydroxy, SO_2CH_3 or $CONH_2$; provided that R^1 is hydrogen only when R^5 is nitro or SO_2CH_3, or an acid addition salt thereof; and (2) a second compound which is a tetracycline, tylosin, penicillin, cephalosporin, polyether, glycopeptide, or orthosomycin, in amounts which in combination are effective.

5,691,386

TRITERPENOID COMPOUND FOR THE TREATMENT OF DIABETES

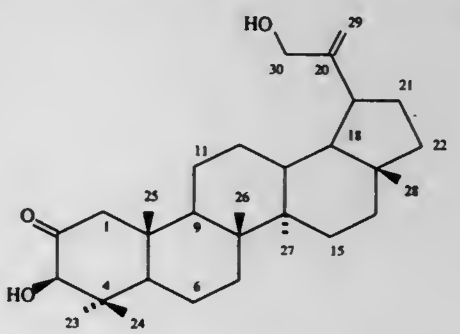
Wayne D. Inman, Belmont, and Michael John Reed, Menlo Park, both of Calif., assignors to Shaman Pharmaceuticals, Inc., South San Francisco, Calif.

Filed Apr. 16, 1996, Ser. No. 633,396

Int. Cl.^{6} A61K *31/12*

U.S. Cl. 514—691 **13 Claims**

1. A purified compound having the structure of formula I:



Formula I

and pharmaceutically acceptable salts thereof.

9. A method for reducing the blood glucose of a mammal, comprising administering to said mammal in need of such blood glucose reduction, a hypoglycemically effective amount of the composition of claim 1.

5,691,387

POLYOXYPROPYLENE/POLYOXYETHYLENE COPOLMERS WITH IMPROVED BIOLOGICAL ACTIVITY

R. Martin Emanuele, Alpharetta; Robert L. Hunter, Tucker, and Paula H. Culbreth, Loganville, all of Ga., assignors to CytRx Corporation, Norcross, Ga.

Division of Ser. No. 87,136, Jul. 2, 1993, Pat. No. 5,523,492, which is a continuation of Ser. No. 847,874, Mar. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 673,289, Mar. 19, 1991, abandoned. This application Jun. 3, 1996, Ser. No. 657,161

Int. Cl.^{6} A61K *31/08*

U.S. Cl. 514—723 **21 Claims**

1. A method for treating sickle cell anemia comprising administering to a human with sickle cell anemia a composition comprising a polyoxyethylene/polyoxypropylene block copolymer with the following general formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein "a" is an integer such that the molecular weight represented by the polyoxypropylene portion of the copolymer is between approximately 900 and 15000 daltons and "b" is an integer such that the molecular weight represented by the polyoxyethylene portion of the copolymer constitutes between approximately 5% and 90% of the copolymer and the polydispersity value is less than approximately 1.07.

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5,691,388

METHOD OF DECOMPOSING POLYCYANURATE-CONTAINING MATERIALS

Monika Bauer; Jörg Bauer, both of Berlin, and Karin Göcks, Zeuthen, all of Germany, assignors to Fraunhofer-Gesellschaft Zur Forderung der Angewandten Forschung e.v., Munich, Germany

PCT No. PCT/DE95/01236, § 371 Date Jun. 21, 1996, § 102(e) Date Jun. 21, 1996, PCT Pub. No. WO96/08530, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 7, 1995, Ser. No. 646,290

Claims priority, application Germany, Sep. 16, 1994, 44 32 965.2

Int. Cl.^{6} C08J *11/14*

U.S. Cl. 521—49.5 **12 Claims**

1. A method of decomposing polycyanurate-containing materials, comprising the steps of:

dissolving or finely grinding a material containing polycyanurate; and

subjecting said dissolved or finely ground polycyanurate-containing material to aminolysis with an agent consisting essentially of a compound containing at least one reactive NH_2 group.

5,691,389

RECYCLING OF FLEXIBLE FOAM

Giovanni Parrinello, Fort Collins, Colo.; David Thorpe; Gabriel Verhelst, both of Hereat, Belgium; Julian Francis George Hopper, Maassluis, Netherlands, and Mireille Berthine Albert De Witte, Merelbeke, Belgium, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 206,562, Mar. 3, 1994, Pat. No. 5,605,935. This application Nov. 27, 1996, Ser. No. 757,778

Claims priority, application United Kingdom, Oct. 11, 1993, 9320874

Int. Cl.^{6} C08J *11/04*

U.S. Cl. 521—49.5 **10 Claims**

1. Polyols obtained by a process comprising: (a) brining a flexible polyurethane foam in contact with an alcoholizing polyol, allowing the foam and the polyol to react, then allowing the mixture to separate into an upper and lower phase, subsequently collecting these two phases in different containers and (b) subjecting the upper phase to an extraction process by bringing it into contact with an extracting compound which is a polyol or a polyol mixture having a number average molecular weight of at most 500 and being immiscible with it, mixing the extracting compound and the upper phase, allowing the mixture to separate into an upper phase and a lower phase and collecting these two phases, the extraction process being conducted 2–10 times batchwise or continuously.

5,691,390

THERMOPLASTIC SYNTACTIC FOAMS AND THEIR PREPARATION

Edward S. Harrison, Encinitas; Edward J. Ruskowski, Carlsbad, and James Melquist, San Diego, all of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Division of Ser. No. 146,517, Nov. 1, 1993, Pat. No. 5,532,295. This application Mar. 20, 1996, Ser. No. 678,362

Int. Cl.^{6} C08J *9/32*

U.S. Cl. 521—54 **10 Claims**

1. A structural, low-density article, comprising:

a microballoon first component; and

a polyetherimide polymer second component which is wetted to the microballoons and binds the microballoons together in an array.

5,691,391

PROCESS FOR MAKING AN INJECTION MOLDED FAN BLADE

Steve P. Chen, Chandler; John E. Schibler, Fountain Hills, and Ramesh J. Patel, Mesa, all of Ariz., assignors to McDonnell Douglas Helicopter, Meza, Ariz.

Continuation of Ser. No. 120,059, Sep. 13, 1993, abandoned, which is a division of Ser. No. 933,115, Aug. 21, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 349,378

Int. Cl.^{6} C08J *5/08*

U.S. Cl. 521—99 **10 Claims**

1. A method of making an injection molded fan blade assembly, comprising the steps of:

a) blending together a molding material which includes a thermoplastic polymer, fibers, and a blowing agent;

b) heating the molding material to a viscous molten state;

c) injecting said molding material under high pressure into a mold, said mold having a spar insert in place therein about which the molding material is molded; and

d) cooling said molding material, such that it forms a blade which is attached to said spar insert to form said fan blade assembly.

5,691,392

STABLE PARTICULATE DISPERSIONS

Michael O. Okoroafor, Export; William H. McDonald, Cranberry Township, both of Pa., and Alan E. Wang, Hoffman Estates, Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 5, 1997, Ser. No. 795,736

Int. Cl.^{6} C08G *18/00*

U.S. Cl. 521—112 **11 Claims**

1. A polyurethane or polyisocyanurate foamed product comprising a network of cell walls surrounding interstitial spaces wherein said network is formed from the reaction of a polyisocyanate and polyol in the presence of a stable particulate dispersion of:

(a) from 50% to 98.9% by weight, based on the total weight of said composition of a siloxane-polyoxyalkylene copolymer surfactant;

(b) from 1% to 49.9% by weight, based on the total weight of said composition, of a nonionic organic surfactant other than the surfactant of (a); and

(c) from 0.1% to 25% by weight, based on the total weight of said composition, of a particulate material having a particle size of less than 20 microns.

5,691,393

VINYL CHLORIDE RESIN COMPOSITION

Mitsuo Yasuda, Ebina, and Kanji Yuyama, Yokohama, both of Japan, assignors to Zeon Kasei Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1997, Ser. No. 790,232

Claims priority, application Japan, Jan. 31, 1996, 8-037556

Int. Cl.^{6} C08J *9/00*

U.S. Cl. 521—134 **3 Claims**

1. A vinyl chloride resin composition, comprising 100 parts by weight of (A) a vinyl chloride resin, 0.5–30 parts by weight of (B) a methacrylic acid ester copolymer resin, 0.5–30 parts by weight of (C) a chlorinated polyethylene resin, 25–60 parts by weight of (D) talc, and (E) a blowing agent.

5,691,394

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING A SENSITIZING DYE AND A TITANOCENE COMPOUND

Syunichi Kondo, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

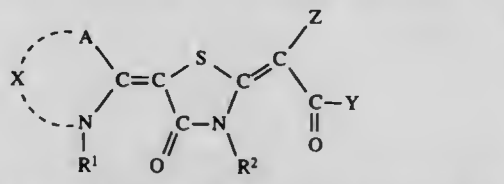
Filed Feb. 7, 1996, Ser. No. 598,005

Claims priority, application Japan, Feb. 9, 1995, 7-20852

Int. Cl.^{6} C08F *2/50*

U.S. Cl. 522—29 **16 Claims**

1. A photopolymerizable composition comprising: (a) an addition polymerizable compound having at least one ethylenically unsaturated double bond; (b) a sensitizing dye represented by the following formula (I); and (c) a titanocene compound:



(I)

wherein R^1 and R^2, which are the same or optionally are different, each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an alkenyl group, a substituted alkenyl group, an alkoxycarbonyl group, an aryl group, a substituted aryl group, an alkynyl group or a substituted alkynyl group;

A represents an oxygen atom, a sulfur atom, a carbon atom substituted by an alkyl group or an aryl group or a carbon atom substituted by two alkyl groups;

X represents a nonmetallic atom group necessary for forming a nitrogen-containing heterocyclic 5-membered ring;

Y represents a phenyl group, a substituted phenyl group or an unsubstituted or substituted heteroaromatic ring;

Z represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an alkoxy group, an alkylthio group, an arylthio group, a substituted amino group, an acyl group or an alkoxycarbonyl group; and

Z and Y optionally are combined with each other to form a ring.

5,691,395

PROCESS OF MAKING FLEXIBLE CIRCUITS AND IMAGED COATINGS

Philip D. Knudsen, Northboro; Charles R. Shipley, Newton, and Daniel Y. Pai, Millbury, all of Mass., assignors to Shipley Company Inc., Marlborough, Mass.

Division of Ser. No. 82,548, Jun. 28, 1993, Pat. No. 5,366,846, which is a division of Ser. No. 862,343, Apr. 2, 1992, Pat. No. 5,262,280. This application Jul. 12, 1994, Ser. No. 274,099

Int. Cl.^{6} B32B *3/10;* **C08J** *7/04;* **C08F** *2/50*

U.S. Cl. 522—31 **27 Claims**

1. A process for forming an imaged coating layer on a substrate comprising the steps of:

(a) applying a coating layer of a radiation sensitive composition on the substrate, the composition comprising an aqueous soluble resin binder, a polybutadiene having one or more internal epoxide groups and a radiation sensitive component selected from the group consisting of a photoacid generator and a photobase generator;

(b) exposing the coating layer to activating radiation to yield a latent image in the coating layer; and

(c) developing the exposed coating layer with an aqueous solution to yield a relief image.

5,691,396

POLYSILOXANE COMPOUNDS AND POSITIVE RESIST COMPOSITIONS

Katsuya Takemura; Junji Tsuchiya; Osamu Watanabe, and Toshinobu Ishihara, all of Nakakubiki-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

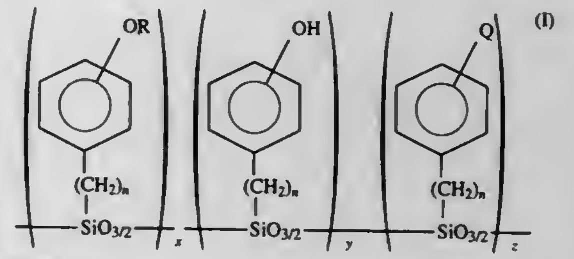
Filed Sep. 24, 1996, Ser. No. 719,011

Claims priority, application Japan, Sep. 25, 1995, 7-270580

Int. Cl.^{6} C08J *3/28*

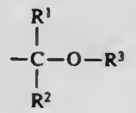
U.S. Cl. 522—62 **20 Claims**

1. A polysiloxane compound of the following general formula (I):



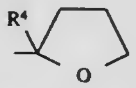
(I)

wherein R is



$$-\overset{\displaystyle R^1}{\underset{\displaystyle R^2}{\overset{|}{\underset{|}{C}}}}-O-R^3$$

or



wherein each of R^1 and R^2 is a hydrogen atom or a normal or branched allyl group having 1 to 6 carbon atoms, R^3 is a normal or branched allyl group having 1 to 6 carbon atoms, R^4 is a hydrogen atom or methyl group,

Q is an acid labile group,

letters x, y, and z are numbers satisfying $x+y+z=1$, x and y are not equal to 0, and

n is an integer of 1 to 3.

5,691,397

ISOLATION OF THE CALCIUM-PHOSPHATE CRYSTALS OF BONE

Melvin J. Glimcher, Boston, Mass.; Hyun-Man Kim, Seoul, Rep. of Korea, and Christian Rey, Castanet, France, assignors to Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 409,755, Mar. 24, 1995, Pat. No. 5,565,502, which is a continuation-in-part of Ser. No. 36,412, Mar. 24, 1993, Pat. No. 5,439,951. This application Oct. 10, 1996, Ser. No. 728,820

Int. Cl.^{6} C08K *3/32;3/36;* **A61F** *2/02;2/28*

U.S. Cl. 523—115 **17 Claims**

1. A composition of calcium-phosphate apatite crystals of essentially the same chemical composition, structure, short range order, and index of crystallinity as the calcium-phosphate crystals present

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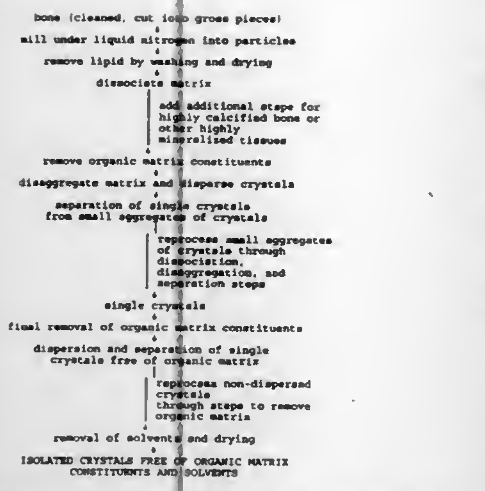

bone (cleaned, cut into gross pieces)
mill under liquid nitrogen into particles
remove lipid by washing and drying
dissociate matrix
add additional steps for highly calcified bone or other highly mineralized tissues
remove organic matrix constituents
disaggregate matrix and disperse crystals
separation of single crystals from small aggregates of crystals
reprocess small aggregates of crystals through dissociation, disaggregation, and separation steps
single crystals
final removal of organic matrix constituents
dispersion and separation of single crystals free of organic matrix
reprocess non-dispersed crystals through steps to remove organic matrix
removal of solvents and drying
ISOLATED CRYSTALS FREE OF ORGANIC MATRIX CONSTITUENTS AND SOLVENTS

in bone selected from the group consisting of bone, cartilage, cementum, dentin, and enamel, essentially free of collagen fibrils.

5,691,398
POLYLACTIC ACID COMPOSITION

Yoichi Tanifuji, and Yuji Tokushige, both of Ibaraki-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 484,476, Jun. 7, 1995. This application Oct. 19, 1995, Ser. No. 545,267

Int. Cl.^{6} C08K *5/54;5/11;* **C08L** *67/04*

U.S. Cl. 523—124 **2 Claims**

1. A composition comprising 100 parts by weight of polylactic acid and 0.05 to 5 parts by weight of silicone oil and 5 to 30 parts by weight of plasticizer, said silicone oil being selected from the group consisting of alkyl-modified silicone oil and methylstyryl-modified silicone oil, said silicone oil having an intrinsic viscosity at 25° C. of 100 to 10,000 cs.

5,691,399
SEALANT COMPOSITION AND SEALED ELECTRICAL CONNECTORS

Francis Frederick Koblitz, York; Thomas John Lynch, Mechanicsburg, and Ricky Charles Mellinger, Seven Valleys, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 297,574, Aug. 29, 1994, Pat. No. 5,580,265, which is a continuation of Ser. No. 878,807, May 5, 1992, Pat. No. 5,360,350, which is a continuation-in-part of Ser. No. 749,373, Aug. 23, 1991, Pat. No. 5,354,210. This application May 31, 1995, Ser. No. 455,333

Int. Cl.^{6} C08L *83/05;9/00;* **C08K** *5/01*

U.S. Cl. 523—173 **11 Claims**

1. A method for preparing a sealant composition comprising the steps of:

(a) heating a composition including an elastomeric thermoplastic polymer and an extender to the gelation initiation temperature of the composition, said elastomeric thermoplastic organic polymer being elastomeric at ambient temperatures and flowable yet thermally stable at elevated temperatures in its neat uncompounded state, said elastomeric thermoplastic organic polymer comprising at least one elastomeric block and one non-elastomeric block; and

(b) substantially subsequent to said heating step, adding to said composition precursors for a crosslinkable polymer, the crosslinkable polymer having inorganic elements making up at least a portion of the backbone of the polymer chain and reacting said precursors under conditions of time and temperature sufficient to cause chemical crosslinking of said precursors.

5,691,400
COMPOSITIONS

John Gerard Carey, Warrington; John Christopher Padget, Frodsham, and David Alan Pears, Chester, all of United Kingdom, assignors to Zeneca Limited, London, England

Filed May 12, 1995, Ser. No. 440,136

Claims priority, application United Kingdom, May 12, 1994, 9409543

Int. Cl.^{6} C08K *3/20;* **C08L** *63/02*

U.S. Cl. 523—404 **11 Claims**

1. A composition comprising water and the following components:

a) an epoxy compound comprising at least one epoxy group, at least one nitrogen atom selected from the group consisting of amino, amido and urea nitrogen atoms and at least one hydrolysable silyl group; and

(b) a hydroxy functional polymer having carboxy and/or sulpho groups.

5,691,401
CURABLE RESIN COMPOSITIONS CONTAINING SILICA-COATED MICROPARTICLES OF A CURED ORGANOSILOXANE COMPOSITION

Yoshitsugu Morita, and Atsushi Sasaki, both of Chiba, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed May 18, 1995, Ser. No. 444,178

Claims priority, application Japan, May 27, 1994, 6-138263

Int. Cl.^{6} C08K *9/00*

U.S. Cl. 523—435 **6 Claims**

1. A curable resin composition comprising

(I) 100 parts by weight of a curable resin, and

(II) 0.1 to 200 parts by weight of particles comprising

(A) particles of a cured organosiloxane composition having an average diameter of 0.1 to 200 micrometers, wherein said particles have immobilized on the surfaces thereof

(B) amorphous silica microparticles exhibiting a surface silanol group density of at least 2 per 100 square angstroms, an average particle diameter not exceeding 1 micrometer, and a BET specific surface area of at least 50 m^2/g.

5,691,402
COMPOSITE TOOLING MATERIAL HAVING VINYL ESTER RESINS AND FILLERS

Richard M. Anders, Cassopolis, Mich., assignor to Composite Technology Group, LLC, Cassopolis, Mich.

Filed Sep. 13, 1996, Ser. No. 713,930

Int. Cl.^{6} C08K *5/00;* **A01J** *21/00;* **B32B** *9/00*

U.S. Cl. 523—515 **21 Claims**

1. A durable, high temperature tooling composition comprising vinyl ester resin, from about 70% w/w to about 90% w/w tabular alumina, a promoter, and a catalyst.

5,691,403
BIODEGRADABLE COMPOSITIONS

Tetsuya Shitaohzono; Akira Muramatsu, both of Shizuoka, and Jiro Hino, Kanagawa, all of Japan, assignors to Nihon Shokuhin Kako Co., Ltd., Japan

Filed Sep. 21, 1995, Ser. No. 531,653

Claims priority, application Japan, Sep. 28, 1994, 6-231954; Apr. 20, 1995, 7-095168

Int. Cl.^{6} C08L *101/00;3/02;67/04*

U.S. Cl. 524—47 **12 Claims**

1. A biodegradable composition comprising fat or oil treated starch and a biodegradable resin selected from the group consisting of aliphatic polyesters, polyvinyl alcohols and acetylcelluloses.

5,691,404
FIRE RESISTANT POLYAMIDE COMPOSITIONS

Robert Valentine Kasowski, West Chester, Pa., and Marvin Michael Martens, Vienna, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 6, 1996, Ser. No. 659,603

Int. Cl.^{6} C08K *5/3492;5/3462;5/20;* **C07F** *11/00*

U.S. Cl. 524—100 **22 Claims**

1. A composition comprising:

(a) a synthetic, aliphatic polyamide;

(b) about 0.1 to about 6 weight percent of a metallic tungstic acid salt or a complex oxide acid of tungsten and a metalloid; and

(c) about 2 to about 6 percent by total weight of one or more coagents selected from the group consisting of melamine cyanurate, uracil, xanthine and oxamide;

and wherein all percents by weight are based on the total weight of (a)+(b)+(c);

and provided that (b) and (c) may be added as a preblended mixture or a preformed compound which is a reaction product of (b) and (c), so long as the final amounts of (b) and (c) in the claimed composition are within the ranges required of (b) and (c), respectively.

20. A composition comprising the product made by contacting in aqueous medium silicotungstic acid or phosphotungstic acid with melamine, wherein the molar ratio of said melamine to said silicotungstic acid or phosphotungstic acid is about 28:1 to about 1:1.

5,691,405
ROSIN-SUPPORTED UREA-AND URETHANE-MODIFIED EMULSION POLYMERS

G. Frederick Hutter, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 602,371, Feb. 16, 1996. This application Sep. 11, 1996, Ser. No. 712,281

Int. Cl.^{6} C08L *25/14;93/04*

U.S. Cl. 524—272 **18 Claims**

1. An emulsion polymer composition having a pH value in the range of 7.5 to 10.0, wherein said composition comprises the reaction products produced by:

(A) reacting in an esterification reaction:

(1) 60.0 to 98.0% by weight of the total composition of the esterification reaction of a member selected from the group consisting of fumarated rosin, maleated rosin, and combinations thereof; and

(2) 2.0 to 40.0% by weight of the total composition of the esterification reaction of a polyol selected from the group consisting of polyethylene glycols having a number average molecular weight in the range of 100–10,000, glycerol, sorbitol, pentaerythritol, neopentyl glycol, ethylene glycol, and combinations thereof,

to produce a rosin-based support resin having an acid number in the range of 120 to 250; and

(B) further reacting in a polymerization reaction:

(1) 5.0 to 40.0% by weight of the total composition of the polymerization reaction of said support resin,

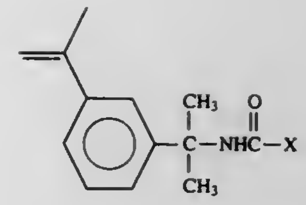
(2) 0.2 to 2.0% by weight of the total composition of the polymerization reaction of an initiator,

(3) 1.0 to 12.0% by weight of the total composition of the polymerization reaction of a surfactant,

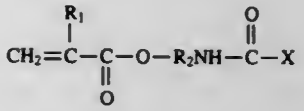
(4) 31.0 to 93.3% by weight of the total composition of the polymerization reaction of a member selected from the group consisting of acrylic and styrenic monomers which do not contain either urea or urethane functionalities, and

(5) 0.5 to 15.0% by weight of a urea or urethane-containing compound selected from the group consisting of monomers of the formula:

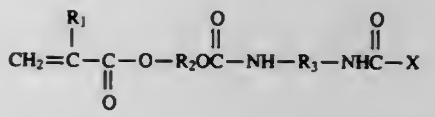
I.



II.



III.



where:

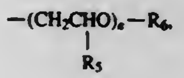
R_1 is a member selected from the group consisting of —H and —CH_3,

R_2 is a member selected from the group consisting of C_2 to C_4 alkylenes,

R_3 is a member selected from the group consisting of C_4 to C_{16} hydrocarbyl groups,

X is a member selected from the group consisting of —O—R_4 and —NR_4R_4,

R4 is a member selected from the group consisting of hydrogen, hydrocarbyl groups, keto-substituted hydrocarbyl groups, amino-substituted hydrocarbyl groups, amido-substituted hydrocarbyl groups, imido-substituted hydrocarbyl groups, ester-substituted hydrocarbyl groups, a carbocyclic or heterocyclic ring, polyether groups of the form



$$-(CH_2\underset{\displaystyle R_5}{\underset{|}{C}}HO)_n-R_6.$$

where

R_5 is a member selected from the group consisting of —H, —CH_3, and —CH_2CH_3,

R_6 is a member selected from the group consisting of hydrocarbyl groups containing from 1 to 24 carbon atoms, and

n is from 1 to 10, and combinations thereof, to produce the emulsion polymer composition.

5,691,406
UNIVERSAL EPDM/BUTYL COMPOUND FOR USE AS AN ELASTOMERIC BARRIER IN WATER STORAGE AND TREATMENT SYSTEMS AND THE LIKE

Joseph A. Lane, Taunton, Mass., and Julian Mitchel, North Haven, Conn., assignors to Amtrol Inc., West Warwick, R.I.

Filed Aug. 21, 1996, Ser. No. 701,[illegible]

Int. Cl.^{6} C08K *3/18*

U.S. Cl. 524—432 **27 Claims**

1. An elastomeric composition that exhibits low gas permeability and is chlorine compatible, comprising a mixture having a combination of the following compounds:

a terpolymer of ethylene-propylene-non-conjugated diene copolymer (EPDM); halogenated isobutylene; furnace or carbon black; paraffinic oil; organofunctional magnesium silicate; magnesium oxide; zinc oxide; stearic acid; tetramethylthiuram disulfide; zinc thiophosphate; and treated sulfur.

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5,691,407
SILICONE RUBBER COMPOSITIONS FOR HIGH-VOLTAGE ELECTRICAL INSULATORS

Syuuichi Azechi, and Takeo Yoshida, both of Usui-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1996, Ser. No. 615,089

Claims priority, application Japan, Mar. 24, 1995, 7-091866

Int. Cl.^{6} C08K *3/10*

U.S. Cl. 524—437 **12 Claims**

1. A silicone rubber composition for use as a high-voltage electrical insulator comprising

(A) 100 parts by weight of an organopolysiloxane of the following average compositional formula (1):

$$R^1{}_aR^2{}_bSiO_{(4-a-b)/2} \tag{1}$$

wherein R^1 is a halo-substituted or unsubstituted aliphatic unsaturated monovalent hydrocarbon group, R^2 is a halo-substituted or unsubstituted monovalent hydrocarbon group free of an aliphatic unsaturated bond, and letters a and b are positive numbers in the range: $0<a\leqq 1$, $1\leqq b<3$, and $1<a+b\leqq 3$, said organopolysiloxane having at least two aliphatic unsaturated hydrocarbon groups each attached to a silicon atom in a molecule,

(B) 1 to 100 parts by weight of finely divided silica based on 100 parts by weight of (A),

(C) 50 to 300 parts by weight of surface treated aluminum hydroxide based on 100 parts by weight of (A), wherein the aluminum hydroxide is of the formula Al_2O_{3hu} $3HO_2O$,

(D) an organohydrogenpolysiloxane of the following average compositional formula (2):

$$R^3{}_cH_dSiO_{(4-c-d)/2} \tag{2}$$

wherein R^3 is a halo-substituted or unsubstituted monovalent hydrocarbon group exclusive of an aliphatic unsaturated group, and letters c and d are positive numbers in the range: $1\leqq c<3$, $0<d\leqq 1$, and $1<c+d\leqq 3$, said organohydrogenpolysiloxane having at least two hydrogen atoms each attached to a silicon atom in a molecule, in a sufficient amount to provide 0.5 to 20 mol of the silicon atom-attached hydrogen atom per mol of the aliphatic unsaturated hydrocarbon group in component (A) , and

(E) a catalytic amount of a platinum group catalyst.

5,691,408
PROCESS FOR MANUFACTURING WATER BASED ADHESIVE

Robert J. Murray, Kent, Ohio, assignor to Akron Paint & Varnish, Akron, Ohio

Continuation-in-part of Ser. No. 595,929, Feb. 6, 1996, which is a continuation of Ser. No. 305,067, Sep. 13, 1994, abandoned. This application Mar. 7, 1996, Ser. No. 612,383

Int. Cl.^{6} C08K *3/00*

U.S. Cl. 524—495 **22 Claims**

1. A process for manufacturing a water based adhesive having essentially no organic solvents contained therein, said process comprising the steps of:

(1) supplying an elastomer emulsion, said elastomer emulsion having a measure pH within the range of 9.0 to 12.0;

(2) preparing a water solution comprising water and a pH adjuster, said pH adjuster being added to said water in an effective amount to adjust the pH of said water solution to within about ±10% of the measured pH of said elastomer emulsion;

(3) preparing a carbon black dispersion comprising carbon black, water, and surfactants, said carbon black dispersion having a pH within about ±10% of the measured pH of said elastomer emulsion;

(4) mixing said elastomer emulsion of Step (1) with said water solution of Step (2), and the carbon black dispersion of Step (3) to form said water based adhesive; and

wherein the water based adhesive of Step (4) comprises:

from about 25.0 to about 50.0%, by weight, of an elastomer selected from the group consisting of natural rubber, synthetic rubber, butadiene rubber, polybutadiene rubber and mixtures thereof;

from about 40.0 to about 60.0%, by weight, water; and

from about 0.5 to about 10.0%, by weight, carbon black.

5,691,409
PHENOLIC RESIN MOLDING MATERIAL

Tamotsu Ishida, and Masatoshi Yamoto, both of Fujieda, Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Jul. 9, 1996, Ser. No. 680,543

Claims priority, application Japan, Jul. 12, 1995, 7-176373; Jul. 12, 1995, 7-176374; Jul. 25, 1995, 7-189603; Dec. 25, 1995, 7-336543

Int. Cl.^{6} C08L *61/00*

U.S. Cl. 524—509 **20 Claims**

1. A phenolic resin molding material which contains (a) a high ortho-novolak type phenolic resin having a number-average molecular weight of 350–500 and an ortho-bond/para-bond ratio of 1.5–2.5, (b) hexamethylenetetramine, (c) a low-molecular weight polyolefin compound and (d) a filler.

5,691,410
WATER DISPERSIBLE LOW-REFLECTANCE CHEMICAL RESISTANCE COATING COMPOSTION

John A. Escarsega, Stafford, Va., and Kestutis G. Chesonis, Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1996, Ser. No. 669,258

Int. Cl.^{6} C08J *3/00;* **C08K** *3/20;* **C08L** *75/00*

U.S. Cl. 524—591 **9 Claims**

1. A water dispersible low-reflectance coating composition comprising:

a first component including, 33.33 weight percent polyester resin, 15.39 weight percent pigments, 10.82 weight percent polymeric beads, 0.2628 weight percent defoamer, 0.26 weight percent micro-milled calcium carbonate, 13.01 weight percent anti-settling agent, 0.3931 weight percent dispersing agent, 19.13 weight percent water solvent, 6.79 weight percent non-ionic high density polyethylene emulsion, 0.643 weight percent adhesion promoter;

a second component including, 75 to 85 weight percent polyisocyanate, 25 to 15 weight percent solvent;

a third component including 100 weight percent water solvent.

5,691,411
HIGH PERFORMANCE POLYMER COMPOSITIONS

Farid Fouad Khouri, and John Robert Campbell, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 402,298, Mar. 10, 1995, abandoned. This application Oct. 2, 1996, Ser. No. 720,854

Int. Cl.^{6} C08L *51/00*

U.S. Cl. 525—64 **4 Claims**

1. A method for making high performance compositions comprising the steps of:

(a) precompounding carboxylic acid, maleic anhydride, epoxide, trimellitic anhydride acid chloride or molecular oxygen functionalized polyphenylene ethers with orthoester or orthocarbonate functionalized olefin polymers; and

(b) subsequently adding polyamides thereto.

5,691,412
POLYAMIDE/ALIPHATIC POLYESTER BLOCK COPOLYMER, PROCESS FOR THE PRODUCTION THEREOF, AND BLEND CONTAINING THE SAME

Shunichi Matsumura; Takashi Ito, and Takanori Miyoshi, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 200,454, Feb. 23, 1994, Pat. No. 5,446,109. This application May 25, 1995, Ser. No. 449,939

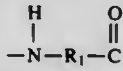
Claims priority, application Japan, Feb. 23, 1993, 5-33189; Apr. 20, 1993, 5-93028; Jul. 14, 1993, 5-174279; Aug. 26, 1993, 5-211368; Nov. 1, 1993, 5-273482

Int. Cl.^{6} C08L *77/00*

U.S. Cl. 525—66 **25 Claims**

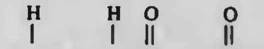
1. An intimate blend comprising a thermoplastic resin having no or poor compatibility with polyamide, a polyamide resin and a compatibilizing agent, said thermoplastic resin being selected from the group consisting of a polyester resin, a polycarbonate resin, a polyester carbonate resin, an acrylonitrile-butadiene-styrene resin, an acrylonitrile-styrene resin and a polyphenylene oxide resin, and said compatibilizing agent being a polyamide/aliphatic polyester block copolymer comprising

(A) (I) a polyamide block composed substantially of at least one recurring unit selected from the group consisting of a recurring unit of the formula (1),



$$-\overset{H}{\overset{|}{N}}-R_1-\overset{O}{\overset{\|}{C}}- \tag{1}$$

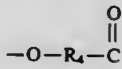
wherein R_1 is an alkylene group having 4 to 12 carbon atoms, a recurring unit of the formula (2)



$$-\overset{H}{\overset{|}{N}}-R_2-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-R_3-\overset{O}{\overset{\|}{C}}- \tag{2}$$

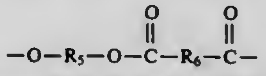
wherein R_2 is an alkylene group having 4 to 12 carbon atoms or an alkylene-arylene-alkylene group having 8 to 16 carbon atoms, and R_3 is an alkylene group having 4 to 12 carbon atoms or an arylene group having 6 to 12 carbon atoms, and mixtures of recurring units of formula (1) and formula (2);

and (II) an aliphatic polyester block composed substantially of at least one recurring unit selected from the group consisting of a recurring unit of the formula (3)



$$-O-R_4-\overset{O}{\overset{\|}{C}}- \tag{3}$$

wherein R_4 is an alkylene group having 1 to 12 carbon atoms, a recurring unit of the formula (4)



$$-O-R_5-O-\overset{O}{\overset{\|}{C}}-R_6-\overset{O}{\overset{\|}{C}}- \tag{4}$$

wherein R_5 is an alkylene group having 2 to 12 carbon atoms and R_6 is an alkylene group having 2 to 12 carbon atoms, and mixtures of recurring units of formula (3) and formula (4);

said block copolymer having the following properties (B), (C) and (D):

(B) satisfying the following expression (5),

$$T_1-T<100-C \tag{5}$$

wherein T is the melting point (°C.) of the above block copolymer, T_1 is the melting point (°C.) of a polyamide composed of the polyamide block and C is the content (wt. %) of the polyamide block,

(C) exhibiting the extraction amount which satisfies the expression (6), when extracted in tetrahydrofuran,

$$E<(100-C)\times 0.4 \tag{6}$$

wherein E is the extraction amount (wt. %) when the block copolymer is refluxed in tetrahydrofuran of which the weight is 100 times the weight of the block copolymer under heat for 2 hours, and C is the content (wt. %) of the polyamide block, and

(D) having an intrinsic viscosity, measured at 35° C., in the range of from 0.5 to 5.

5,691,413
ETHYLENE-α-OLEFIN-NON-CONJUGATED DIENE COPOLYMER RUBBER COMPOSITION

Akihiko Morikawa; Masayuki Motonari; Masashi Shimakage, and Katsumi Oka, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1995, Ser. No. 532,098

Claims priority, application Japan, Sep. 29, 1994, 6-259060

Int. Cl.^{6} C08J *9/06;* **C08L** *23/16*

U.S. Cl. 525—99 **15 Claims**

1. An ethylene-α-olefin-non-conjugated diene copolymer rubber composition which comprises:

(A) an ethylene-α-olefin-non-conjugated diene copolymer in which the ethylene/α-olefin weight ratio is 40/60 to 70/30; which contains as the non-conjugated dienes (a) ethylidenenorbornene and (b) either dicyclopentadiene or α,ω-diene having 8 to 20 carbon atoms in the main chain; and in which the content of the ethylidenenorbornene is 38 to 48 in terms of the iodine value of the ethylene-α-olefin-non-conjugated diene copolymer, the content of the dicyclopentadiene is 3 to 20 in terms of the iodine value of the ethylene-α-olefin-non-conjugated diene copolymer, the content of the α,ω-diene having 8 to 20 carbon atoms in the main chain is 0.05 to 5% by weight based on the total weight of the monomer components, and the Mooney viscosity (ML_{1+8}120° C.) is 20 to 65, and

(B) an ethylene-α-olefin-non-conjugated diene copolymer in which the ethylene/α-olefin weight ratio is 73/27 to 85/15; which contains as the non-conjugated dienes (c) ethylidenenorbornene; and in which the content of the ethylidenenorbornene is 3 to 25 in terms of the iodine value of the ethylene-α-olefin-non-conjugated diene copolymer, the Mooney viscosity (ML_{1+8}120° C.) is 65 to 300, and the melting point of the crystal portion consisting of ethylene chain as measured by DSC is at least 40° C.,

the weight ratio of the component (A) to the component (B) being 30/70 to 70/30,

and wherein the copolymer rubber (A) has a weight average molecular weight/number average molecular weight, Mw/Mn of 4 to 10, and the copolymer rubber (B) has a Mw/Mn of 2 to 4.

5,691,414
SOLVENT-FREE PROCESS FOR MAKING UV CURABLE ADHESIVES AND SEALANTS FROM EPOXIDIZED MONOHYDROXYLATED DIENE POLYMERS

Kathleen Suzanne Kiibler, Katy, and Jeffrey George Southwick, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 11, 1996, Ser. No. 665,071

Int. Cl.^{6} C08L *53/02*

U.S. Cl. 525—99 **10 Claims**

1. A solvent free process for producing a UV curable adhesive or sealant composition comprising a monohydroxylated epoxidized polydiene block polymer comprised of at least two polymerizable ethenically unsaturated hydrocarbon monomers wherein at least one is a diene monomer which yields unsaturation suitable for epoxidation, and wherein the polymer contains from 0.1 to 7.0 milliequivalents of epoxy per gram of polymer, a low molecular weight polydiene monool, an insoluble photoinitiator, and a tackifying resin which is incompatible with the photoinitiator, said process comprising predispersing the photoinitiator in the monool or the polymer or a mixture of the two, and then adding the tackifying resin to the predispersion.

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5,691,415

REINFORCED ELASTIC BODY AND PRODUCTION PROCESS THEREOF

Yasumichi Miyagawa, and Kenji Kuwata, both of Yamaguchi, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Continuation of Ser. No. 179,820, Jan. 11, 1994, abandoned, which is a continuation of Ser. No. 961,862, Oct. 15, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 457,301

Claims priority, application Japan, Mar. 16, 1992, 4-089316

Int. Cl.^{6} C08F *8/38*

U.S. Cl. 525—107 **6 Claims**

1. A reinforced elastic body consisting essentially of a chlorosulfonated polyolefin reinforced with polyester fibers having an adhesive containing an isocyanate compound and an adhesive composed of a mixture of a resorcin-formaldehyde resin and a 2,3-dichlorobutadiene-containing polymer latex, wherein the molar ratio of resorcin to formaldehyde is from 1:0.1 to 1:5, and the solid component weight ratio of the latex to the sum of resorcin and formaldehyde is from 1/100 to 1/1.

5,691,416

(METH)ACRYLATE POLYMER PARTICLES DISPERSED IN EPOXY RESIN

Masatoshi Yoshida, Nara; Kenji Minami, Otu; Ichiro Namura, Suita, and Masuji Izubayashi, Nishinomiya, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Continuation of Ser. No. 7,951, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 972,216, Nov. 5, 1992, abandoned. This application Nov. 2, 1995, Ser. No. 556,831

Int. Cl.^{6} C08K *5/04;* **C08L** *63/00;63/02*

U.S. Cl. 525—117 **4 Claims**

1. An epoxy resin composition, comprising:

an epoxy resin phase, and

(meth)acrylic acid ester polymer particles (Pb) homogeneously dispersed in the epoxy resin phase, the (meth)acrylic acid ester polymer particles (Pb) having a glass transition temperature of less than 20° C. and having attached to the surface thereof a reactive surface active agent which is a water soluble or water dispersible end alkyl group-containing polymer (Pa), optionally partially or entirely neutralized in the form of a salt, having an acid value of greater than 200 and a number average molecular weight of from 300 to 7,000,

the (meth)acrylic acid ester polymer particles (Pb) being obtained by emulsion polymerization of a (meth)acrylic acid ester monomer (c) using the reactive surface active agent as an emulsifier,

the water soluble or water dispersible end alkyl group-containing polymer (Pa) being obtained by polymerization of a polymerizable monomer ingredient (A) containing an unsaturated carboxylic acid as an essential ingredient in the presence of an alkyl mercaptan (B) of 6–18 carbon atoms, and the carboxylic acid groups of the reactive surface active agent being reactive with the epoxy groups of the epoxy resin phase.

5,691,417

COATING MEDIUM, THE USE THEREOF, AND A PROCESS FOR MULTILAYER COATING

Gerhard Bremer, Frechen; Hermann Kerber, Wuppertal; Manfred Krumme, Erftstadt; Olaf Ley, and Werner Stephan, both of Wuppertal, all of Germany, assignors to Herberts Gesellschaft mit Beschrankter Haftung, Germany

Filed Jun. 27, 1996, Ser. No. 672,131

Claims priority, application Germany, Jul. 7, 1995, 195 24 787.6

Int. Cl.^{6} C08G *18/62*

U.S. Cl. 525—123 **7 Claims**

1. A styrene-free coating medium, comprising;

A) one or more copolymers containing hydroxyl groups, comprising;
  a1) 8–12% by weight of one or more vinyl esters of alpha,alpha,dialkyl-substituted, branched, aliphatic saturated monocarboxylic acids,
  a2) 32–42% by weight of one or more hydroxyalkyl esters of (meth) acrylic acid,
  a3) 25–40% by weight of one or more alkyl esters of (meth-)acrylic acid,
  a4) 12–24% by weight of one or more unsubstituted or substituted cycloalkyl esters of (meth)acrylic acid, and
  a5) 2–4% by weight of (meth)acrylic acid,

with a hydroxyl number of 100–160 mg KOH/g, an acid number of 10–50 mg KOH/g, a number average molecular weight (Mn) of 1000 to 3000 g/mole and a glass transition temperature (Tg) of 30°–80° C.,

B) one or more polyisocyanates in a quantitative proportion such that 0.5 to 2 isocyanate groups are allotted to one hydroxyl group of component A), and

C) one or more solvents and optionally one or more members selected from the group consisting of pigments and extenders; wherein the styrene-free coating medium has a solids content of 50 to 65%, by weight.

5,691,418

SOFT IONOMER COMPOSITIONS AND BLENDS THEREOF AND USE THEREOF AS GOLF BALL STRUCTURAL MATERIALS

John Francis Hagman, Wilmington, Del., and Robert Joseph Statz, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 345,349, Nov. 21, 1994, abandoned, which is a continuation-in-part of Ser. No. 77,581, Jun. 18, 1993, abandoned. This application Jun. 30, 1995, Ser. No. 497,633

Int. Cl.^{6} A63B *37/06;37/02;* **C08L** *120/06*

U.S. Cl. 525—196 **5 Claims**

3. A one-piece golf ball, consisting essentially of;

A a polymer blend consisting essentially of
  (i) a first polymeric component, which is a soft, flexible ionomer having a neat-sphere PGA Compression of below about 155, prepared from a first acid copolymer of;
    a) ethylene,
    b) 3–40 weight percent of an alkyl acrylate or mix of alkyl acrylates, the alkyl groups having from 1 to 8 carbon atoms, and
    c) 5–15 weight percent of carboxylic acid which is methacrylic acid or acrylic acid, or a mix of methacrylic and acrylic acid,
  the ionomer being made by neutralizing 20 to 80 percent of the acid groups of the first acid copolymer with lithium or magnesium ions or both, and having a melt index of from 0.1 to 30 grams/10 minutes, and
  (ii) a second polymeric component which is a hard, stiff ionomer having a flexural modulus of from 40,000 to 110,000 psi, prepared from a second acid copolymer of;
    a) ethylene, and
    b) 5–25 weight percent of carboxylic acid which is methacrylic acid or acrylic acid or mix of methacrylic and acrylic acid,
  the ionomer made by neutralizing 20 to 80 percent of the acid groups of the second acid copolymer with sodium ions,
  with the proviso that the neat-sphere PGA Compression of the polymer blend does not exceed 155,
  the polymer blend of (i) and (ii) containing at least 50 weight percent of (i), and

B an inorganic particulate filler in sufficient amount to provide a ball with a density of from 1.115 to 1.135 g/cc.

5,691,419

CARBOXYL-CONTAINING ACRYLATE COPOLYMER AND EPOXY RESIN

Stephan Engelke, Wuppertal; Michael Brünnemann, Münster; Olaf Rotter, Everswinkel, and Andreas Holst, Neu Wulmstorf, all of Germany, assignors to BASF Lacke + Farben, AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP92/01100, § 371 Date Feb. 1, 1994, § 102(e) Date Feb. 1, 1994, PCT Pub. No. WO92/22615, PCT Pub. Date Dec. 23, 1992

PCT Filed May 19, 1992, Ser. No. 167,882

Claims priority, application Germany, Jun. 17, 1991, 41 19 857.3

Int. Cl.^{6} C08L *33/02;33/14;63/08;67/02*

U.S. Cl. 525—208 **20 Claims**

1. A coating agent which comprises, as the binding agent, at least one polymer containing carboxyl groups and, as the hardener, at least one epoxy resin having on average more than one epoxide group per molecule, wherein: the binding agent comprises at least one acrylate copolymer (A) which comprises carboxyl groups and is prepared by solution polymerization using from 0.4 to 2.5% by weight, based on the total weight of the monomers, of one or more polysiloxane macromonomers a_1 having a number average molecular weight of 1000 to 40,000 and on average 0.5 to 2.5 ethylenically unsaturated double bonds per molecule, wherein copolymer A has a number average molecular weight of between 5000 and 25,000.

5,691,420

PROCESS FOR MANUFACTURING MULTIARMED ASYMMETRICAL RADIAL BLOCK COPOLYMERS

Karel Hendrik Leffelaar, and Jeroen Van Westrenen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1995, Ser. No. 572,974

Claims priority, application European Pat. Off., Dec. 23, 1994, 94309737

Int. Cl.^{6} C08F *297/04*

U.S. Cl. 525—314 **9 Claims**

1. A process for the manufacture of six-armed radial asymmetric block copolymers, comprising the steps of:

polymerization of a conjugated diene and/or a monoalkenyl aromatic hydrocarbon by means of an anionic monofunctional organo alkali metal initiator to form first polymer arms having a single reactive metal end group on each polymer arm;

contacting the first polymer arms with a non-polymerizable coupling agent containing 6 functional groups which react with the reactive end groups, the amount of the first polymer arms being substantially stoichiometrically corresponding with 4 of the 6 functional groups on the coupling agent, in a way that the reaction between the first polymer arms and the coupling agent proceeds substantially to completion;

preparing second polymer arms, different from said first polymer arms living polymer either in the same reactor or a different reactor by polymerization of a conjugated diene which is 1,3-butadiene and/or a monoalkenyl aromatic hydrocarbon initiated by an anionic monofunctional organoalkali metal initiator;

adding a polar compound capable of increasing the reactivity of the residual functional groups of the coupling agent and reacting these residual functional groups with the second polymer arms until all residual functional groups of the coupling agents have completely reacted; and

recovering the six-armed asymmetric radial polymer.

5,691,421

HIGH MOISTURE ADSORPTIVE AND DESORPTIVE FINE PARTICLES AND PROCESS FOR PRODUCING THE SAME

Koji Tanaka, and Yoko Yamamoto, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Continuation of Ser. No. 559,152, Nov. 17, 1995, abandoned. This application Jan. 23, 1997, Ser. No. 787,878

Claims priority, application Japan, Dec. 13, 1994, 6-333141

Int. Cl.^{6} C08F *8/32;8/30*

U.S. Cl. 525—329.2 **2 Claims**

1. High moisture adsorptive and desorptive fine particles having a particle size of not larger than 10 μm, said particles being produced by copolymerizing acrylonitrile and sodium p-styrenesulfonate, crosslinking the thus produced copolymer with hydrazine to increase the nitrogen content in the acrylonitrile by 15% by weight, hydrolyzing nitrile groups in the copolymer to form carboxyl and amide groups and converting the carboxyl groups to salts thereof such that the finally produced copolymer fine particles have 1.0 mmole/g of salt carboxyl groups.

5,691,422

SATURATED POLYOLEFINS HAVING TERMINAL ALDEHYDE OR HYDROXY SUBSTITUENTS AND DERIVATIVES THEREOF

Jacob Emert, Brooklyn, N.Y.; Istvan T. Horvath, High Bridge, N.J.; Richard H. Schlosberg, Bridgewater, N.J.; Warren A. Thaler, Flemington, N.J.; David A. Young, Seattle, Wash., and Stephen Zushma, Clinton, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 206,993, Mar. 7, 1994, abandoned. This application Jun. 12, 1996, Ser. No. 662,835

Int. Cl.^{6} C08F *8/32*

U.S. Cl. 525—338 **2 Claims**

1. A process for preparing a polymer comprising the steps of: reacting a polyolefin having terminal unsaturation and an M_n of about 300 to about 10,000, the polyolefin being derived from a monomer of the formula $H_2C{=}CHR^4$, where R^4 is hydrogen or a straight or branched chain alkyl radical:

hydrogen; and;

carbon monoxide in the presence of a hydroformylation catalyst, under conditions effective to hydroformylate the polyolefin and wherein the polymer is further reductively aminated to form a nitrogen-containing polymeric product having an alkylamino substituent or wherein the polymer is further reduced, cyanoalkylated and hydrogenated to form an aminated polymer.

5,691,423

POLYSACCHARIDE-BOUND NITRIC OXIDE-NUCLEOPHILE ADDUCTS

Daniel J. Smith, Stow; Debashish Chakravarthy, Garrettsville, both of Ohio, and Larry K. Keefer, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 935,565, Aug. 24, 1992, Pat. No. 5,405,919. This application Apr. 10, 1995, Ser. No. 419,424

Int. Cl.^{6} A61K *31/785;* **C08B** *15/06;37/00*

U.S. Cl. 525—377 **4 Claims**

1. A polymeric composition capable of releasing nitric oxide, said composition comprising a polysaccharide including a nitric oxide-releasing $[N_2O_2]$ functional group selected from the group consisting of $X{-}[N(O)NO]$ and $[N(O)NO]{-}X$, wherein X is an amine-group-containing moiety bonded to said $-[N(O)NO]$ or $[N(O)NO]-$ and wherein the $[N_2O_2]$ group is bonded in said polysaccharide through said moiety X.

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5,691,424
HEAT-RESISTANT MOLDED ARTICLE OF LACTIC ACID-BASE POLYMER

Kazuhiko Suzuki; Takayuki Watanabe; Yasuhiro Kitahara, and Masanobu Ajioka, all of Kanagawa-ken, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed May 25, 1995, Ser. No. 450,927
Int. Cl.^{6} C08L *67/04*
U.S. Cl. 525—411 **11 Claims**

1. A process for preparing a heat-resistant molded article of a lactic acid-based polymer comprising mixing 75~95% by weight of a lactic acid-based polymer with 5~25% by weight of poly-ε-caprolactone so as to obtain a L-lactic acid ratio of 75% by weight or more, adding 0.1~15 parts by weight of a crystalline inorganic powder comprising 50% by weight or more of SiO_2 as a nucleating agent to 100 parts by weight of said polymer mixture, melt-kneading the resultant composition, filling the same into a mold of a molding machine at a mold temperature of 85°–125° C., and forming a shape while promoting crystallization.

5,691,425
POLYURETHANE DISPERSIONS

Heinz-Peter Klein, Mainz-Laubenheim; Gerd Walz, Wiesbaden, and Markus A. Schafheutle, Hochheim, all of Germany, assignors to Hoechst AG, Germany
Filed Jul. 2, 1992, Ser. No. 908,318
Claims priority, application Germany, Jul. 5, 1991, 41 22 265.2
Int. Cl.^{6} C08F *283/04*
U.S. Cl. 525—455 **12 Claims**

1. A polyurethane dispersion prepared by polymerization, initiated by free radicals, of polyurethane macromonomers containing carboxyl, phosphonic acid or sulfonic acid groups and lateral vinyl groups and optionally terminal vinyl, hydroxyl, urethane, thiourethane and/or urea groups.

5,691,426
RESIN COMPOSITION

William Floyd, Chester, S.C., assignor to Sequa Chemicals, Inc., Chester, S.C.
Continuation-in-part of Ser. No. 420,356, Apr. 11, 1995, abandoned, which is a continuation-in-part of Ser. No. 350,692, Dec. 7, 1994, Pat. No. 5,539,077. This application Feb. 28, 1997, Ser. No. 807,253
Int. Cl.^{6} C08F *283/00;8/28;* **C08L** *61/00*
U.S. Cl. 525—491 **24 Claims**

1. A resin composition comprising:

a mixture of a formaldehyde-based resin with a resin substitute comprising the reaction product of about 1 to 2 moles of a C_1 to C_8 dialkoxyethanal with an amine derivative chosen from the group consisting of melamine, glycolurile and their mixtures and a polyol having 2 or more hydroxyl groups.

5,691,427
PROCESS FOR THE SURFACE OXIDATION OF POLYARYLENE THIOETHERS

Helmut Scheckenbach, Langen; Andreas Schleicher, Beselich; Jörg von Eysmondt, Hofheim, and Georg Frank, Tübingen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany
Filed Dec. 13, 1995, Ser. No. 571,751
Claims priority, application Germany, Dec. 14, 1994, 44 44 442.7
Int. Cl.^{6} C08F *283/00*
U.S. Cl. 525—537 **16 Claims**

1. A process for surface oxidation of a material comprising a polyarylene thioether, which comprises bringing the surface of said material into contact with an ozone-containing fluid in which ozone is dissolved, and recovering, as the product of said process, a material comprising a polyarylene ether in which essentially only the surface of said material has been oxidized.

5,691,428
PROCESS FOR PRODUCING A POLYMER USING A QUINONE COMPOUND CONDENSATION PRODUCT POLYMER SCALE PREVENTIVE AGENT

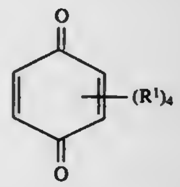
Toshihide Shimizu, Urayasu, and Mikio Watanabe, Kamisumachi, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 259,062, Jun. 13, 1994, abandoned. This application Sep. 11, 1995, Ser. No. 526,783
Claims priority, application Japan, Jun. 15, 1993, 5-168528; Dec. 24, 1993, 5-347433; Feb. 10, 1994, 6-037708; Feb. 15, 1994, 6-040472; Feb. 15, 1994, 6-040473
Int. Cl.^{6} C08F *2/16;2/02*
U.S. Cl. 526—62 **14 Claims**

1. A process for producing a polymer of a monomer having an ethylenically unsaturated double bond, which comprises polymerizing the monomer in a polymerization vessel having a coating on its inner wall surfaces, whereby polymer scale is prevented from being deposited,

wherein said coating has been formed by applying an alkaline solution containing:

(A) a condensation product having a molecular weight of 400 to 50,000 obtained by condensing a quinone compound, and drying said applied solution, wherein said quinone compound is a quinone compound selected from the group consisting of:

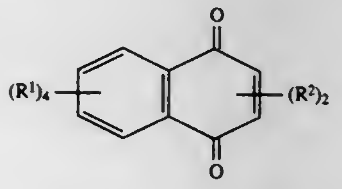
the compounds having the following general formula (1):



(1)

wherein (R^1)s may be the same or different and are each —H, —NH_2, —Cl, —Br, —OH, —NO_2, —$COCH_3$, —OCH_3, —$N(CH_3)_2$, —COOH, —SO_3H or an alkyl group having 1 to 3 carbon atoms; and

the compounds having the following general formula (3):



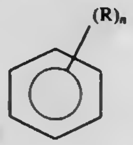
(3)

wherein (R^1)s may be same or different and are each as defined above, and (R^2)s may be the same or different and are each —H, —Cl, —Br, —OH, —$COCH_3$, —OCH_3, —CH_3, —COOH OR —SO_3H.

5,691,429
MANUFACTURING PROCESS FOR HIGH CIS POLY(BUTADIENE)

Johannes Cornelis Maria Van Der Arend; Marijke De Boer-Wildschut; Adriaan Albert Van Der Huizen, and Maria Johanna Elisabeth Kersten, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed Oct. 17, 1996, Ser. No. 733,709
Claims priority, application European Pat. Off., Oct. 18, 1995, 95307411
Int. Cl.^{6} C08F *4/70;136/06*
U.S. Cl. 526—92 **9 Claims**

1. A process for the manufacture of linear, substantially gel free, high cis 1,4-poly(butadiene) comprising polymerization of 1,3-butadiene in an organic solvent in the presence of (a) a catalyst comprising at least one cobalt compound, at least one organoaluminum compound, and water, and (b) a cycloalkane as the main solvent component, and (c) at least one substituted benzene polymerization regulator of the general formula



wherein n is an integer in the range of from 3 to 5, and
wherein each R represents a lower alkoxy group containing from 1 to 6 carbon atoms.

5,691,430
PROCESS FOR MAKING VINYL ETHER POLYMERS

James A. Dougherty, Pequannock; John G. Mc Kittrick, Jersey City, and Raymond Bret Clark, Bloomfield, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.
Filed Aug. 26, 1996, Ser. No. 697,463
Int. Cl.^{6} C08F *4/26*
U.S. Cl. 526—103 **9 Claims**

1. A process for polymerizing a vinyl ether monomer having the formula:

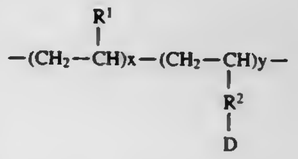
$H_2C{=}CH{-}OR$

wherein R is an alkyl, cycloalkyl or alkyl substituted cycloalkyl, aromatic or alkyl substituted aromatic and R contains 1 to 20 carbon atoms, to make a homopolymer having a weight average molecular weight of about 200 to about 100,000 and a polydispersity of less than about 5 which comprises contacting the vinyl ether with an initiator system consisting essentially of silicon dioxide and one or more metallic oxides selected from the group consisting of aluminum oxide, magnesium oxide, ferric oxide, and titanium dioxide.

5,691,431
CATIONIC POLYMERIZATION CATALYZED BY LEWIS ACID CATALYSTS SUPPORTED ON POROUS POLYMER SUBSTRATE

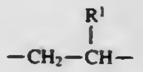
Frank Joung-Yei Chen, Edison, N.J.; Tze-Chiang Chung, State College, Pa.; Jon Edmond Stanat, Westfield, N.J., and Soon Hong Lee, State College, Pa., assignors to Exxon Chemical Patents Inc., Linden, N.J.
Division of Ser. No. 588,276, Jan. 18, 1996. This application Dec. 2, 1996, Ser. No. 758,511
Int. Cl.^{6} C08F *4/52;4/02;10/08*
U.S. Cl. 526—135 **28 Claims**

1. A process for polymerizing cationically polymerizable monomer comprising contacting said monomer with a catalytically effective amount of an immobilized Lewis Acid catalyst in a manner and under conditions sufficient to polymerize said monomer, wherein said immobilized catalyst comprises a porous polymer film substrate having at least one Lewis Acid immobilized on pore surfaces thereof, said polymer film substrate, prior to having said Lewis Acid immobilized thereon, comprising a porous film of functionalized polymer and, optionally, unfunctionalized polymer, said functionalized polymer having within its structure units represented by the formula



$$-(CH_2-\overset{\overset{\displaystyle R^1}{|}}{C}H)x-(CH_2-\underset{\underset{\underset{\displaystyle D}{|}}{\displaystyle R^2}}{\underset{|}{C}}H)y-$$

and said unfunctionalized polymer having within its structure repeating monomer units represented by the formula



$$-CH_2-\overset{\overset{\displaystyle R^1}{|}}{C}H-$$

wherein

D represents OH, halide, NH_2, NHR^3, OM', or OM";

R^1 represents hydrogen, C_1–C_{24} alkyl, C_3–C_{24} cycloalkyl, C_6–C_{18} aryl or C_7–C_{30} alkylaryl;

R^2 represents C_3–C_{24} alkyl, C_3–C_{24} cycloalkyl, C_6–C_{18} aryl or C_7–C_{30} alkaryl;

R^3 represents C_1–C_{24} alkyl, C_3–C_{24} cycloalkyl, C_6–C_{18} aryl or C_7–C_{30} alkaryl;

M' represents alkali metal;

M" represents alkaline-earth metal; and

x and y represent the mole % of each respective subunit, the sum of x+y being 100%.

5,691,432
THERMAL POLYMERIZATION OF DICYCLOPENTADIENE

Theodore Joseph Williams, Panama City, Fla., assignor to Arizona Chemical Company, Panama City, Fla.
Continuation of Ser. No. 353,729, Dec. 12, 1994, abandoned, which is a division of Ser. No. 185,057, Jan. 24, 1994, Pat. No. 5,410,004. This application Apr. 3, 1996, Ser. No. 626,828
Int. Cl.^{6} C08F *36/04*
U.S. Cl. 526—283 **23 Claims**

1. A dicyclopentadiene resin produced according to a thermal polymerization process which comprises heating a reaction material consisting essentially of a cyclopentadiene and/or dicyclopentadiene monomer, and optionally, a modifier selected from the group consisting of ethylene, propylene, 1-butene, isobutylene, butadiene, 1-pentene, 1-hexene, 2-methyl-2-butene, isoprene, 1,3-pentadiene, 1-octene, limonene, α-pinene, β-pinene, styrene, vinyl toluene, α-methyl styrene, indene and mixtures thereof, at a temperature in the range of from about 240° C. to about 320° C. in the presence of a Bronsted acid selected from the group consisting of hypophosphorous acid, p-toluenesulfonic acid, hydrochloric acid, hydroiodic acid, phosphoric acid methane sulfonic acid, and mixtures thereof for a time sufficient to produce a dicyclopentadiene oligomer resin exhibiting a weight average molecular weight ranging from about 260 to about 1000, a cloud point of less than about 100° C. and a saponification value of essentially 0.

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5,691,433

SILICON-CONTAINING POLYMER, PROCESS FOR PREPARING THE SAME AND MONOMER THEREOF

Jun Kotani; Manabu Tsumura; Takahisa Iwahara, and Toshifumi Hirose, all of Hyogo, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

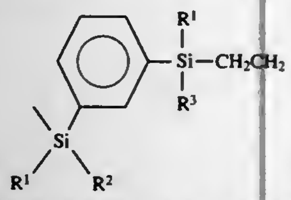
Continuation of Ser. No. 365,131, Dec. 28, 1994, abandoned. This application Mar. 28, 1996, Ser. No. 623,515

Claims priority, application Japan, Dec. 28, 1993, 5-355128; Mar. 24, 1994, 6-053775

Int. Cl.^{6} C08G *77/60*

U.S. Cl. 528—15 **5 Claims**

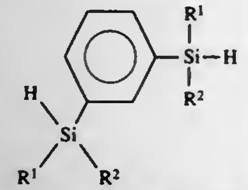
1. A silicon-containing polymer comprising a structural unit of the formula (2):



(2)

wherein R^1 and R^2 are the same or different and represent a methyl group or a phenyl group, which is obtained by hydro-silylation polymerizing at least one monomer combination selected from the group consisting of

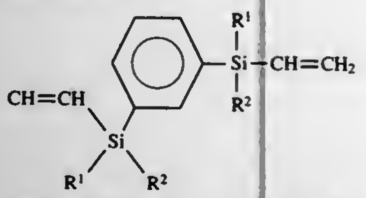
a combination of a silicon-containing compound of the formula (3):



(3)

wherein R^1 and R^2 are the same as defined above and a compound having at least two unsaturated groups, and

a monomer combination of a silicon-containing compound of the formula (4):



(4)

wherein R^1 and R^2 are the same as defined above and a compound having at least two hydrosilyl groups,

wherein the content of said structural unit of the formula (2) is at least 50% by weight of the silicon-containing polymer.

5,691,434

CURABLE ORGANOPOLYSILOXANE COMPOSITION

Masahiko Ogawa, Takasaki; Takamasa Toyoda, and Kenichi Isobe, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1996, Ser. No. 756,917

Claims priority, application Japan, Nov. 30, 1995, 7-336141

Int. Cl.^{6} C08G *77/08*

U.S. Cl. 528—15 **7 Claims**

1. A curable organopolysiloxane composition comprising:

(A) an organopolysiloxane containing, in its molecule, at least two groups represented by the following general formula (1) directly attached to Si:

$$CH_2{=}CH{-}(CH_2)_a{-}(OC_bH_{2b})_c{-}O{-} \qquad (1)$$

wherein a is an integer of 1 to 8, b is an integer of 2 to 4, and c is an integer of 0 to 3;

(B) an organohydrogenpolysiloxane containing, in its molecule, at least two hydrogen atoms each bonded to a silicon atom;

(C) an addition-reaction retarder; and

(D) a platinum family metal catalyst.

5,691,435

CROSSLINKABLE COMPOSITIONS

Christian Herzig, Waging am See; Bernward Deubzer, Burghausen; Martina Bloechl, Tann, and Robert Banfic, Burgkirchen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 14, 1997, Ser. No. 782,871

Claims priority, application Germany, Jan. 25, 1996, 196 02 663.6; Aug. 8, 1996, 196 31 936.6

Int. Cl.^{6} C08G *77/08*

U.S. Cl. 528—15 **7 Claims**

1. A crosslinkable composition comprising –

(A) an organosilicon compound having radicals containing aliphatic carbon-carbon multiple bonds,

(B) an organosilicon compound having Si-bonded hydrogen atoms,

(C) a catalyst which promotes the addition of Si-bonded hydrogen onto aliphatic multiple bond, and, optionally,

(D) an agent which retards the addition of Si-bonded hydrogen onto aliphatic multiple bond at room temperature,

wherein at least one (B) organosilicon compound having Si-bonded hydrogen atoms is an organosilicon compound (B^1) comprising

(a) terminal units of the formula

$$H_aR_{3-a}SiO_{1/2} \qquad (I)$$

and, optionally, terminal units of the formula

$$R_3SiO_{1/2} \qquad (I')$$

in which

R is an identical or different monovalent, optionally halogenated hydrocarbon radical having 1 to 8 carbon atoms per radical and is free from aliphatic multiple bonds, and

a is 1, 2 or 3,

with the proviso that at least 50 mole % of the terminal units are those of formula (I),

(b) carbo-structural units G (II)

in which

G is an identical or different divalent to decavalent aliphatic hydrocarbon radical having 2 to 30 carbon atoms per radical optionally containing one or more heteroatoms selected from the group consisting of oxygen, boron, silicon, tin and titanium,

with the proviso that at least two Si atoms are connected to one another via G,

(c) units of the formulae

$$\overset{|}{R_bSi}O_{\frac{3-b}{2}}, \qquad (III)$$

or

$$\underset{|}{\overset{|}{R_bSi}}O_{\frac{2-b}{2}} \qquad (III')$$

or mixtures thereof, in which

R is as defined above, and

b is 0, 1 or 2,

with the provisos that b in formula (III') is not 2 and the units of formula (III) or (III') are connected via the Si atoms to the carbo-structural units G,

and, optionally,

(d) units of the formula

$$H_cR_dSiO_{\frac{4-c-d}{2}} \qquad (IV)$$

in which

R is as defined above,

c is 0 or 1 and

d is 1 or 2 and the sum c+d is 1 or 2,

with the proviso that the units of formula (IV) are located between the units of formula (III) or (III') and the terminal units of formulae (I) or (I'), and

with the proviso that the organosilicon compounds (B^1) on average contain 8 to 50 Si-bonded hydrogen atoms per molecule.

5,691,436

PRODUCTION OF SILICON-PHOSPHORUS CONTAINING COMPOSITIONS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 680,651, Jul. 16, 1996, Pat. No. 5,693,840. This application Dec. 16, 1996, Ser. No. 767,416

Int. Cl.^{6} C07F *7/08;7/10*

U.S. Cl. 528—26 **21 Claims**

1. An organic silicon-phosphorus containing resinous composition prepared by the process steps of:

A. mixing and heating the following compounds:
  a) silicon compound
  b) phosphorus compound; then

B. admixing and reacting with:
  a) halide;
  thereby producing a mixture of silicon-phosphorus halides, silicon halides and phosphorus halides; then

C. admixing and reacting with the following components:
  a) organic compound that will react with a silicon halides, silicon-phosphorus halides and/or phosphorus halides in an amount to where there are halides and/or organic radicals with active hydrogens and/or metal radicals remaining thereby producing an organic silicon-phosphorus containing compound; then

D. admixing and reacting with the following components:
  a) saturated or unsaturated organic compound and/or organometallic compound that will react with an organic silicon-phosphorus containing compound by the process of condensation or addition to form a resinous composition;
  b) basic salt forming compound; 0 to 300 parts by weight; then with
  c) water; 0 to 400 parts by weight;

E. polymerize by means that will complete the condensation and/or addition process thereby producing an organic silicon-phosphorus containing resinous composition.

5,691,437

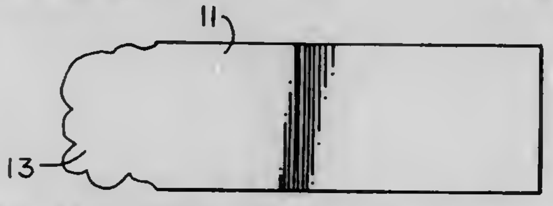
ADHESIVE LABEL ASSEMBLY HAVING A SPECIFIC INTERNAL ADHESIVE PATTERN

George W. Main, Essex Junction, Vt., assignor to KoBel, Inc., Milton, Vt.

Filed Jan. 2, 1996, Ser. No. 582,099

Int. Cl.^{6} G09F *3/00*

U.S. Cl. 428—42.1 **6 Claims**



1. An adhesive label assembly having a specific internal adhesive patterns, for use in applications that require the banding together of labels or wrapping of the labels around the product, comprising:

a label having a plurality of strips;

each of said strips having an outer side for allowing printing of labeling information to be printed thereon; each of said strips having an inner side;

said plurality of strips of said label having means for connecting each of said strips together positioned at the inner side top portion of each of said strips forming a die cutable tab thereon;

only one of said inner sides of said strips having a pattern with a plurality of bands of adhesive coating;

said patterns comprising first means of a band of adhesive coating and second means of a plain band having a lack of adhesive coating, said first means and said second means comprising an alternating pattern of adhesive coating and plain material;

said inner side further having a base section of adhesive coating for insuring removable closure of said strips; and

the other of said inner sides comprising a plain strip.

5,691,438

BLOCKED POLYISOCYANATES AND THEIR USE IN STOVING LACQUERS

Eberhard König, Leverkusen, and Theodor Engbert, Köln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 17, 1996, Ser. No. 633,940

Claims priority, application Germany, May 4, 1995, 19516400.8

Int. Cl.^{6} C08G *18/80*

U.S. Cl. 528—45 **3 Claims**

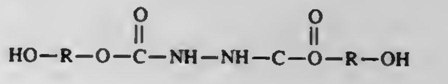
1. A polyisocyanate which has 1,2,4,-triazole-blocked isocyanate groups, a viscosity as a 60 wt. % solution in diethylene glycol mono-n-butyl ether acetate of at most 10,000 mPa·s at 23° C., and a blocked isocyanate group content (calculated as NCO, molecular weight 42), based on solids, of 7 to 14 wt. %, and which is the reaction product of

A) a polyisocyanate component having an NCO content of 12 to 24 wt. % selected from (i) lacquer polyisocyanates prepared from (cyclo)aliphatic diisocyanates and containing allophanate, biuret, isocyanurate, uretidione and/or urethane groups or (ii) mixtures of (i) with cycloaliphatic diisocyanates having a maximum molecular weight of 300, wherein at least 30 wt. % of the (cyclo)aliphatic diisocyanates present in component A) as lacquer polyisocyanates (i) or as mixtures (ii) are cycloaliphatic diisocyanates having methyl substituents and a maximum molecular weight of 222, with

B) 50 to 80 equivalent-%, based on the isocyanate groups of component A), of a monofunctional blocking agent for isocyanate groups containing at least 90 wt. % of 1,2,4-triazole,

C) 10 to 30 equivalent-%, based on the isocyanate groups of component A), of a polyester component having an OH number of 56 to 250 and containing at least one linear polyester diol and

D) 0 to 20 equivalent-%, based on the isocyanate groups of component A), of a hydrazine derivative corresponding to the formula



$$HO{-}R{-}O{-}\overset{\overset{O}{\|}}{C}{-}NH{-}NH{-}\overset{\overset{O}{\|}}{C}{-}O{-}R{-}OH$$

and/or

$$H_2N{-}NH{-}CO{-}O{-}R{-}OH$$

wherein

R represents a saturated hydrocarbon residue having 2 to 5 carbon atoms in which at least 2 carbon atoms are arranged between the two oxygen atoms.

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5,691,439
LOW SURFACE ENERGY POLYISOCYANATES AND THEIR USE IN ONE- OR TWO-COMPONENT COATING COMPOSITIONS

William E. Slack, Moundsville, W. Va.; Philip E. Yeske, Köln, Germany, and Edward P. Squiller, Pittsburgh, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1996, Ser. No. 767,056
Int. Cl.^{6} C08G *18/61*

U.S. Cl. 528—49 **18 Claims**

1. A polyisocyanate adduct containing allophanate groups, siloxane groups and optionally isocyanurate groups that is prepared by reacting a compound a) which

i) is substantially free of hydroxyl groups and isocyanate groups,
ii) has an average of at least two urethane groups per molecule and
iii) contains 0 to 50% by weight of siloxane groups (calculated as SiO, MW 44), based on the weight of the polyisocyanate adduct, with an excess quantity, based on the equivalents of urethane groups, of a polyisocyanate b), which optionally contains siloxane groups, to form a polyisocyanate adduct and optionally removing at least a portion of the unreacted excess polyisocyanate b), provided that compound a) and polyisocyanate b) contain a total of at least 0.001% by weight, of siloxane groups, based on the weight of the polyisocyanate adduct.

5,691,440
CATALYST AND PROCESS FOR PRODUCING ISOCYANATE TRIMERS

Lawrence E. Katz, Orange; Edward A. Barsa, Cheshire; Benjamin W. Tucker, Bethany, all of Conn., and Paul V. Grosso, Eagan, Minn., assignors to Arco Chemical Technonogy, L.P., Greenville, Del.

Filed Oct. 5, 1995, Ser. No. 539,572
Int. Cl.^{6} C08G *18/16*

U.S. Cl. 528—52 **2 Claims**

1. A product mixture produced by a process which comprises contacting isophorone diisocyanate with a catalytically effective amount of between 10 ppm and 100 ppm of a quaternary ammonium carboxylate catalyst selected from the group consisting of tetramethylammonium pivalate, tetraethylammonium pivalate, tetrabutylammonium pivalate, tetraoctylammonium pivalate, mixtures of polyoctyl and polydecyl-substituted methylammonium pivalate, methyltrioctylammonium pivalate, tetramethylammonium 2-ethylhexanoate, tetraethylammonium 2-ethylhexanoate, tetrabutylammonium 2-ethylhexanoate, tetraoctylammonium 2-ethylhexanoate, mixtures of polyoctyl and polydecyl-substituted methylammonium 2-ethylhexanoate, trioctylmethylammonium 2-ethylhexanoate, and combinations thereof, at a reaction temperature of between about 60° C. and about 130° C. for a reaction time of between about five seconds and about two hours, to produce isophorone diisocyanate trimer in said product mixture containing higher oligomers of isophorone diisocyanate, said product mixture being characterized by a monomeric trimer content of at least 70% based upon the weight of the product mixture and a Brookfield viscosity not exceeding 800 Centipoise at 25° C. as determined by diluting the product mixture with IPDI monomer to an NCO concentration of 29.6%.

5,691,441
SPANDEX ELASTOMERS

Stephen D. Seneker, Sissonville, and Bruce D. Lawrey, Charlestown, both of W. Va., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Filed Oct. 11, 1996, Ser. No. 728,922
Int. Cl.^{6} C08G *18/12; 18/48;* **C07C** *269/02*

U.S. Cl. 528—61 **19 Claims**

1. A segmented polyurethane/urea spandex elastomer prepared by reacting in solution:

a) an isocyanate-terminated prepolymer prepared by reacting a stoichiometric excess of one or more di- or polyisocyanates, so as to provide a free NCO group content of said prepolymer of from about 0.5% by weight to about 10% by weight based on prepolymer weight, with a polyol component comprising in most major part a diol component, said diol component comprising from about 5 equivalent percent to about 50 equivalent percent of one or more ultra-low unsaturation polyoxypropylene diols having a molecular weight in excess of about 1500 Da and an average unsaturation of less than about 0.010 meq/g, and from about 95 equivalent percent to about 50 equivalent percent of one or more polytetramethylene ether glycols having a molecular weight of from about 600 Da to about 6000 Da; with
b) a diamine chain extender comprising one or more aliphatic diamines, cycloaliphatic diamines, or their admixture.

5,691,442
TRANSPARENT POLY(ARYLENE ETHER) COMPOSITIONS

Marilyn R. Unroe, Dayton; Rakesh K. Gupta, Beavercreek; Ram B. Sharma, Miamisburg, and Neil C. Thiesing, Beavercreek, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 17, 1996, Ser. No. 715,135
Int. Cl.^{6} C08G *8/02*

U.S. Cl. 528—125 **7 Claims**

1. A method for increasing the transparency of poly(arylene ether) homopolymers and copolymers which comprises endcapping the polymeric chain with about 0.5–4 mol % 4-phenylphenol, based on the total dihydric phenolic moieties present.

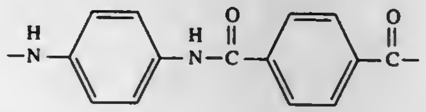
5,691,443
DRAWABLE HIGH TENSILE STRENGTH ARAMIDS

Robert Samuel Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

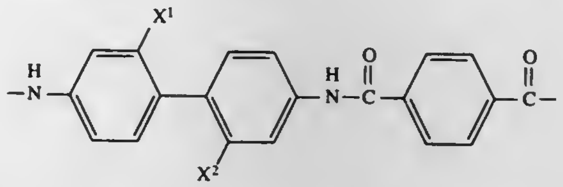
Division of Ser. No. 662,197, Feb. 27, 1991, Pat. No. 5,459,231, which is a continuation-in-part of Ser. No. 540,889, Jun. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 502,598, Mar. 30, 1990, abandoned. This application Sep. 8, 1995, Ser. No. 525,242
Int. Cl.^{6} C08G *69/08;* **B29C** *51/00;* **D01D** *5/00*

U.S. Cl. 528—331 **36 Claims**

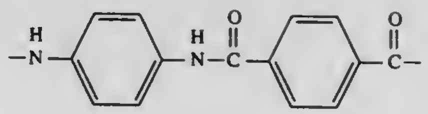
1. A process for drawing aramids, comprising,
heating an aramid selected from the group consisting of:
aramid A consisting essentially of about 70 to about 95 mole percent of a first unit of the formula



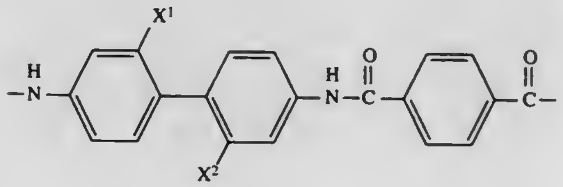
and about 30 to about 5 mole percent of a second unit of the formula



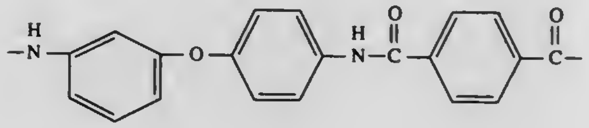
wherein X^1 and X^2 are independently selected from the group consisting of chlorine, bromine and methyl; and
aramid B consist essentially of about up to 7 mole percent of a first unit of the formula



about 30 to about 70 mole percent of a second unit of the formula



and about 70 to about 30 mole percent of a third unit of the formula



wherein
X^1 and X^2 are independently selected from the group consisting of chlorine, bromine and methyl
to a temperature at which said aramid can be drawn;
drawing said aramid at said temperature by applying sufficient force to draw said aramid;
provided that:
said aramid is drawn at least 1.5%;
said drawn aramid has an apparent crystallite size of about 35 Angstroms or larger;
said drawn aramid has an orientation angle of 12° or less;
said drawn aramid has a tensile strength of about 20 grams per denier or more; and
the tensile strength of said drawn aramid is at least 1.15 times that of said undrawn aramid.

5,691,444
FUNCTIONALIZED CRYSTALLINE POLYLACTONES AS TOUGHENERS FOR THERMOSETTING RESINS

Shalaby W. Shalaby, Anderson, S.C., and Lance A. Monroe, Boynton Beach, Fla., assignors to Clemson University, Clemson, S.C.

Filed Dec. 6, 1995, Ser. No. 567,843
Int. Cl.^{6} C08G *63/82*

U.S. Cl. 528—357 **12 Claims**

1. A toughener for use with a thermosetting resin capable of undergoing addition polymerization comprising a crystalline polylactone having a functional acrylate end group, said functionalized polylactone having an average molecular weight of at least about 10,000.

5,691,445
DEVOLATILIZATION

Steven M. Krupinski, West Boylston, Mass., and James T. McQueen, Jaffrey, N.H., assignors to Novacor Chemicals (International) S.A., Villars-Sur-Glane, Switzerland

Filed Mar. 28, 1996, Ser. No. 623,228
Int. Cl.^{6} C08F *6/00*

U.S. Cl. 528—483 **23 Claims**

1. A process for reducing the amount of residual monomer, and solvent to less than 300 parts per million in a polymer or polymer blend containing less than 5 weight % of such residual monomer, and solvent which process comprises:

(i) heating and maintaining said polymer or polymer blend as a melt at a temperature from 200°–270° C.;
(ii) injecting into said melt an amount of a non-oxidizing super critical fluid greater than the amount of residual monomer, and solvent but less than 5 weight %, said injection being at temperatures of from 200° to 270° C. and pressures to dissolve the super critical fluid in said melt; and
(iii) maintaining said melt at a temperature from 200°–270° C. while exposing said polymer to a pressure maintained at less than 8 Torr.

5,691,446
METHODS FOR REDUCING ALLERGENICITY OF NATURAL RUBBER LATEX ARTICLES AND ARTICLES SO PRODUCED

Jeffrey S. Dove, 19342 Gateway, Santa Ana, Calif. 92705

Filed Aug. 25, 1995, Ser. No. 519,371
Int. Cl.^{6} C08F *34/00; 134/00*

U.S. Cl. 528—935 **20 Claims**

1. A method for the production of a hypoallergenic natural rubber latex article having normal physical, mechanical, and chemical properties and at least one tissue contacting surface exhibiting reduced allergenicity, said method comprising the steps of:

providing a natural rubber latex emulsion including antigenic components;
forming a latex article from said emulsion, said article having at least one surface intended to contact tissue and having at least one exposed surface;
inducing the blooming of said antigenic components onto and adjacent to said at least one surface by coagulating the latex emulsion into a gel on the surface of the dipped article and displacing said antigenic components of said gelled latex emulsion toward the exposed surface of said gel; and
chemically treating said bloomed antigenic components with at least one screening reagent to sequester the antigenic regions of the said bloomed antigenic components by dipping said bloomed gelled latex emulsion into a treating bath containing an effective concentration of said at least one screening reagent under mild conditions of temperature and pH for a sufficient period of time to react said at least one screening reagent with said bloomed antigenic components, whereby said screening reagent selectively chemically interacts in a linking reaction with the antigenic regions of said bloomed antigenic components.

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5,691,447
GC1Q RECEPTOR, HIV-1 GP120 REGION BINDING THERETO, AND RELATED PEPTIDES AND TARGETING ANTIBODIES

Michael S. C. Fung, Houston; Bill N. C. Sun; Cecily R. Y. Sun, both of Bellaire, all of Tex.; Young Woo Kim, Plainsboro, N.J., and Liming Yu, Houston, Tex., assignors to Tanox Biosystems, Inc., Houston, Tex.

Filed Mar. 24, 1995, Ser. No. 410,360
Int. Cl.^{6} C07K *7/08;* **A61K** *38/10*

U.S. Cl. 530—327 **3 Claims**

1. A peptide consisting of the sequence of SEQ ID NO:2.

5,691,448
REAGENTS AND METHODS FOR THE DIAGNOSIS AND TREATMENT OF DIABETES AND STIFF MAN SYNDROME

Steinunn Baekkeskov, 285 Beacon St., San Francisco, Calif. 94131; Wiltrud Richter, Alfred-Mendler Weg 26, Ulm, Germany, 89075; Yuguang Shi, 1234 6th Ave., San Francisco, Calif. 94122; Mark Namchuk, 1015 Lincoln Ave., Apt. #1, San Francisco, Calif. 94122, and John Kim, 2572 Virginia St., Berkeley, Calif. 94709

Continuation-in-part of Ser. No. 984,935, Dec. 3, 1992, abandoned. This application Dec. 2, 1993, Ser. No. 161,290
Int. Cl.^{6} C07K *1/00;14/00;* **A61K** *39/395;38/43*

U.S. Cl. 530—350 **16 Claims**

1. A soluble fragment of a GAD65 (glutamic acid decarboxylase) protein that is specifically reactive with a GAD_{65} autoantibody, wherein the fragment is at least 99% pure and the autoantibody binds to a conformational epitope of the fragment.

5,691,449
RESPIRATORY SYNCYTIAL VIRUS VACCINES

Peter R. Paradiso, Pittsford; Stephen W. Hildreth, Rochester; Branda T. Hu, Pittsford, all of N.Y.; Antonia Martin-Gallardo, Sliver Spring, Md.; Rasappa Arumugham, West Henrietta, and Edward E. Walsh, Pittsford, both of N.Y., assignors to Praxis Biologics, Inc., Rochester, N.Y.

Continuation of Ser. No. 409,915, Sep. 20, 1989, which is a continuation-in-part of Ser. No. 247,017, Sep. 20, 1988, Pat. No. 5,223,254, which is a continuation of Ser. No. 102,180, Sep. 29, 1987, abandoned. This application May 25, 1995, Ser. No. 450,070
Int. Cl.^{6} C07K *1/00;14/00;17/00;* **A61K** *39/155*

U.S. Cl. 530—350 **1 Claim**

1. An isolated and substantially pure unglycosylated Respiratory Syncytial Virus G protein having a purity of greater than 75% by weight which binds to a monoclonal antibody, where said monoclonal antibody binds to a neutralizing epitope of Respiratory Syncytial Virus G protein.

5,691,450

Patent Not Issued For This Number

5,691,451
METHOD FOR STERILIZING RECOMBINANT HUMAN SERUM ALBUMIN PHARMACEUTICAL PREPARATION

Tomoshi Ohya; Toyoo Ohda; Shinobu Kuwae; Kenji Tomomitsu; Kaoru Kobayashi, and Takao Ohmura, all of Osaka, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Oct. 26, 1994, Ser. No. 329,176
Claims priority, application Japan, Oct. 27, 1993, 5-269168
Int. Cl.^{6} C07K *1/00;* **C12P** *21/06*

U.S. Cl. 530—363 **6 Claims**

1. A method for preparing a sterilized recombinant human serum albumin pharmaceutical preparation, comprising subjecting a pharmaceutical preparation of recombinant human serum albumin, which is packed in a container in an administration unit, to heat treatment at 50° to 80° C. for 30 minutes to 2 hours.

5,691,452
METHOD FOR PRESERVING A HEMOGLOBIN BLOOD SUBSTITUTE

Maria S. Gawryl, Charlestown; Robert A. Houtchens, Milford, and William R. Light, Natick, all of Mass., assignors to Biopure Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 458,916, Jun. 2, 1995, which is a continuation of Ser. No. 409,337, Mar. 23, 1995. This application Jun. 7, 1995, Ser. No. 471,583
Int. Cl.^{6} C07K *14/805*

U.S. Cl. 530—385 **15 Claims**

1. A method for preserving a deoxygenated hemoglobin blood substitute comprising maintaining the deoxygenated hemoglobin blood substitute in an oxygen barrier film overwrap that includes a foil laminate material having a thickness of between about 0.0001 and about 0.001 inches, said oxygen barrier film overwrap having an oxygen permeability of less than about 1.0 cc per 100 square inches per 24 hours per atmosphere at room temperature.

5,691,453
SEPARATION OF POLYMERIZED HEMOGLOBIN FROM UNPOLYMERIZED HEMOGLOBIN ON HYDROXYAPATITE USING HPLC

Curtis E. Wertz, Weymouth, and Maria S. Gawryl, Charlestown, both of Mass., assignors to Biopure Corporation, Cambridge, Mass.

Filed Jun. 7, 1995, Ser. No. 475,899
Int. Cl.^{6} C07K *14/805;1/14;1/18;1/34*

U.S. Cl. 530—385 **18 Claims**

1. A method for separating a polymerized hemoglobin from a polymerized hemoglobin solution containing polymerized hemoglobin and non-polymerized hemoglobin, comprising subjecting the solution to a hydroxyapatite packed chromatography column, and recovering the polymerized hemoglobin.

5,691,454
APC ANTIBODIES

Hans Albertsen, Salt Lake City, Utah; Rakesh Anand, Sandbach, England; Mary Carlson; Joanna Groden, both of Salt Lake City, Utah; Philip John Hedge, Winsford, England; Geoff Joslyn, Salt Lake City, Utah; Kenneth Kinzler, Baltimore, Md.; Alexander Fred Markham, Crewe, England; Yusuke Nakamura, Tokyo, Japan; Andrew Thliveris, Salt Lake City, Utah; Bert Vogelstein, Baltimore, Md., and Raymond L. White, Salt Lake City, Utah, assignors to The Johns Hopkins University, Baltimore, Md.; University of Utah, Salt Lake City, Utah; the Cancer Institute, London, England, and Imperial Chemical Industries PLC, Tokyo, Japan

Division of Ser. No. 289,548, Aug. 12, 1994, which is a division of Ser. No. 741,940, Aug. 8, 1991, Pat. No. 5,352,775.
This application May 25, 1995, Ser. No. 452,654
Claims priority, application United Kingdom, Jan. 16, 1991, 9100962; Jan. 16, 1991, 9100963; Jan. 16, 1991, 9100974; Jan. 16, 1991, 9100975
Int. Cl.^{6} C07K *16/32;* **C12N** *5/12;15/12*

U.S. Cl. 530—387.7 **8 Claims**

1. A preparation of antibodies which specifically binds to a human APC (adenomatous polyposis coli) protein having an amino acid sequence as shown in SEQ ID NO:1, 2, or 7, and does not specifically bind to other human proteins.

5,691,455
GONADOTROPINS WITH NON-NATIVE DISULFIDE BRIDGES

Pieter Diederik Jan Grootenhuis, and Judith Christina Heikoop, both of Oss, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Filed Nov. 9, 1995, Ser. No. 556,114
Claims priority, application European Pat. Off., Oct. 24, 1995, 95202876
Int. Cl.^{6} A61K *38/24;38/00;* **C07K** *14/59;14/00*

U.S. Cl. 530—398 **20 Claims**

1. A gonadotropin consisting of an α subunit and a β subunit, wherein said gonadotropin comprises one or more non-native disulfide bridges.

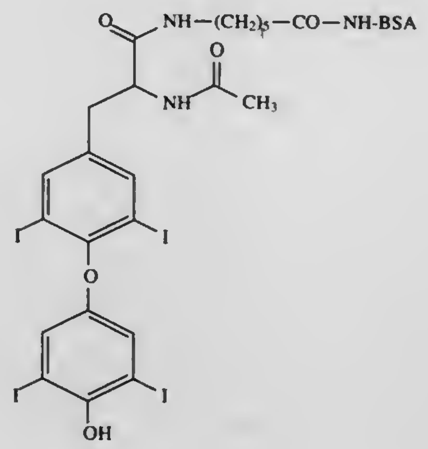
5,691,456
REAGENTS AND METHODS FOR THE DETECTION AND QUANTIFICATION OF THYROXINE IN FLUID SAMPLES

Maciej Adamczyk, Gurnee; Donald D. Johnson, Lindenhurst; Phillip G. Mattingly, Grayslake; Diana E. Clarisse, Naperville; Joan D. Tyner, Beach Park, and Mary M. Perkowitz, Lake Zurich, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

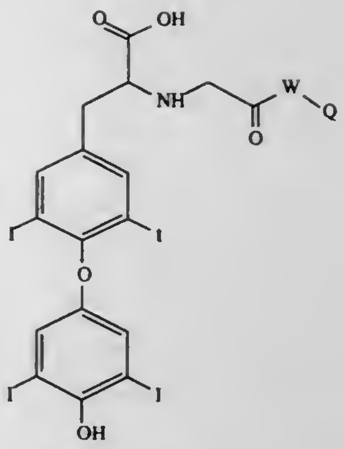
Division of Ser. No. 275,064, Jul. 13, 1994, Pat. No. 5,593,896, which is a continuation-in-part of Ser. No. 859,775, Mar. 30, 1992, Pat. No. 5,352,803. This application May 18, 1995, Ser. No. 444,128
Int. Cl.^{6} C07K *17/00*

U.S. Cl. 530—405 **1 Claim**

1. A method of making an immunogen of the formula:



wherein BSA denotes bovine serum albumin, the degree of substitution of BSA by the thyroxine derivative is between 1% to 100%, the thyroxine is an L-isomer, and antibodies directed against the immunogen immunoreact with an L-thyroxine conjugate of the formula:



where Q is a detectable moiety and W is a linking moiety, the method comprising the steps of:

(a) N-acetylating L-thyroxine to form α-N-acetyl L-thyroxine;
(b) conjugating the αN-acetyl L-thyroxine to 6-aminocaproic acid to form a L-thyroxine conjugate; and
(c) conjugating the L-thyroxine conjugate of step (b) to bovine serum albumin.

5,691,457

Patent Not Issued For This Number

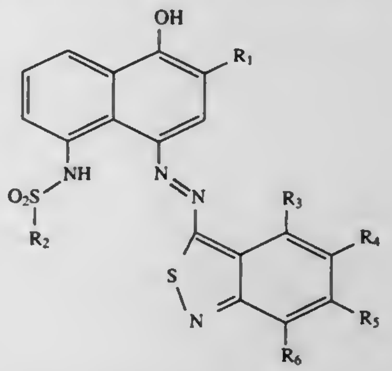
5,691,458
BENZOISOTHIAZOLE AZO DYES

Michael J. Arnost, Andover; Peter Viski; David P. Waller, both of Lexington, and David C. Whritenour, Franklin, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 18, 1996, Ser. No. 715,454
Int. Cl.^{6} C09B *29/042;29/28;29/36;* **D06P** *1/18*

U.S. Cl. 534—774 **7 Claims**

1. A compound represented by the formula



(I)

wherein:

R_1 is:

(1) $SO_2NR_7R_8$ wherein R_7 and R_8 are independently hydrogen; linear or branched alkyl (C_nH_{2n+1}) wherein n is an integer from 1 to 6; alkyl substituted with hydroxy, alkoxy having from 1 to 6 carbon atoms, halogen, sulfamoyl, sulfonamido, carboxy, carbamoyl, carboxamido, $—COOCH_3$, $—COOC_6H_5$ or sulfo; cycloalkyl; benzyl; phenyl; phenyl substituted with hydroxy, alkoxy having from 1 to 6 carbon atoms, halogen, sulfamoyl, carboxy, carbamoyl, carboxamido, $—COOCH_3$, $—COOC_6H_5$ or sulfo; furan; pyridine; triazine; a heterocyclic group substituted with sulfamoyl, carboxy, carbamoyl, $—COOCH_3$, $—COOC_6H_5$, sulfo or alkyl having from 1 to 6 carbon atoms; or, taken together, along with the nitrogen atom to which they are attached, form morpholino or piperidino; or

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(2) R_9NCOR_{10} wherein R_9 is hydrogen; alkyl having from 1 to 6 carbon atoms; or, alkyl substituted with hydroxy or alkoxy having from 1 to 4 carbon atoms; and R_{10} is hydrogen; alkyl having from 1 to 6 carbon atoms; alkyl substituted with hydroxy, alkoxy having from 1 to 6 carbon atoms, halogen, sulfamoyl, sulfonamido, carboxy, carbamoyl, carboxamido, $—COOCH_3$, $—COOC_6H_5$ or sulfo; cycloalkyl; benzyl; phenyl; phenyl substituted with hydroxy, alkoxy having from 1 to 6 carbon atoms, halogen, sulfamoyl, carboxy, carbamoyl, carboxamido, $—COOCH_3$, $—COOC_6H_5$ or sulfo; furan; pyridine; triazine; or, a heterocyclic group substituted with sulfamoyl, carboxy, carbamoyl, $—COOCH_3$, $—COOC_6H_5$, sulfo or alkyl having from 1 to 6 carbon atoms; and

R_2 is alkyl having from 1 to 6 carbon atoms; alkyl substituted with hydroxy, alkoxy having from 1 to 6 carbon atoms, halogen, sulfamoyl, sulfonamido, carboxy, carbamoyl, carboxamido, $—COOCH_3$, $—COOC_6H_5$ or sulfo; benzyl; phenyl; or, phenyl substituted with hydroxy, alkoxy having from 1 to 6 carbon atoms, halogen, sulfamoyl, carboxy, carbamoyl, carboxamido, $—COOCH_3$, $—COOC_6H_5$ or sulfo; and

R_3, R_5 and R_6 are independently hydrogen; halogen; or, alkyl having from 1 to 4 carbon atoms; and

R_4 is hydrogen; halogen; alkyl having from 1 to 4 carbon atoms; sulfamoyl; carboxy; carbamoyl; $—COOCH_3$; $—COOC_6H_5$; sulfo; alkylsulfonyl; or, phenylsulfonyl.

5,691,459

DISAZO DYES CONTAINING TWO CARBONYLAMINO GROUPS PROCESSES FOR THEIR PREPARATION AND THEIR USE

Jean-Marie Adam, Rosenau, France, and Peter Sutter, Muttenz, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

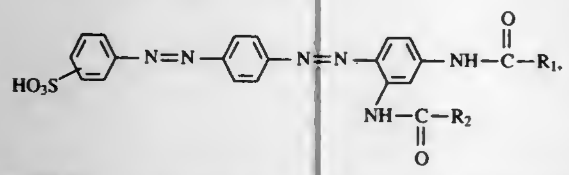
Filed Jul. 15, 1996, Ser. No. 679,785

Claims priority, application Switzerland, Jul. 21, 1995, 2159/95

Int. Cl.^{6} C09B *31/047;* **D06P** *3/24*

U.S. Cl. 534—829 **14 Claims**

1. An azo dye of the formula



$$HO_3S-C_6H_4-N{=}N-C_6H_4-N{=}N-C_6H_3(NH-\overset{O}{\overset{\|}{C}}-R_2)-NH-\overset{O}{\overset{\|}{C}}-R_1, \quad (1)$$

in which

R_1 and R_2 independently of one another are unsubstituted or hydroxy-, C_1–C_4-alkoxy- or halogen-substituted C_1–C_4-alkyl or C_1–C_4-alkoxy;

unsubstituted or C_1–C_4-alkyl-, C_1–C_4-alkoxy- or halogen-substituted phenyl or phenoxy; or

a radical of the formula $—N(R_3)R_4$, in which R_3 und R_4 independently of one another are hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkanoyl which is unsubstituted or further substituted in the alkyl part by hydroxyl or C_1–C_4-alkoxy,

with the proviso that R_1 and R_2 are not simultaneously methyl.

5,691,460

EPIDERMAL SURFACE ANTIGEN GENE

Madeleine Duvic, and Wanda T. Schroeder, both of Houston, Tex., assignors to The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 956,841, Oct. 1, 1992, abandoned. This application Jul. 22, 1994, Ser. No. 279,270

Int. Cl.^{6} C07H *21/02;21/04*

U.S. Cl. 536—23.2 **17 Claims**

1. An isolated nucleic acid segment encoding an epidermal surface antigen nucleic acid segment having a sequence as defined in SEQ ID NO:2.

5,691,461

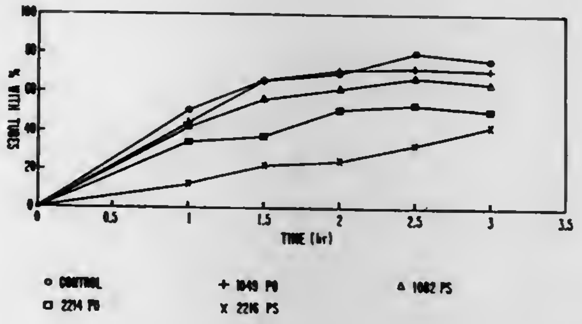
OLIGONUCLEOTIDES INHIBITING CANDIDA GERM TUBE FORMATION

David J. Ecker, Leucadia, Calif., and Glenn D. Hoke, Mount Airy, Md., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation of Ser. No. 958,131, Oct. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 568,672, Aug. 16, 1990, abandoned. This application Apr. 18, 1994, Ser. No. 229,145

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—24.32 **7 Claims**



1. A synthetic oligonucleotide comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 and SEQ ID NO:7.

5,691,462

STABILIZED VINYL ETHER COMPOSITION

Mark M. Miller, Ridgewood; James A. Dougherty, Pequannock, and M. J. Rhonheimer, East Hanover, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Sep. 10, 1996, Ser. No. 711,771

Int. Cl.^{6} C07C *41/00*

U.S. Cl. 568—580 **5 Claims**

1. A stabilized C_3 to C_{20} hydrocarbon vinyl ether optionally substituted with 1–3 hydroxy radicals which contains between about 0.005 and about 0.75 weight of an alkali metal salt of a C_1 to C_{14} saturated hydrocarbon ester.

5,691,463

ALKYLATION PROCESS USING ZEOLITE SSZ-25

Stacey I. Zones, San Francisco; Dennis L. Holtermann, Crockett; Robert A. Innes, San Rafael; Theresa A. Pecoraro, Blackhawk; Donald S. Santilli, Larkspur, and James N. Ziemer, Hercules, all of Calif., assignors to Chevron U.S.A. Inc., San Francisco, Calif.

Continuation of Ser. No. 486,478, Jun. 7, 1995, Pat. No. 5,591,322, which is a division of Ser. No. 897,222, Jun. 11, 1992, Pat. No. 5,421,992, which is a continuation of Ser. No. 788,656, Nov. 6, 1991, Pat. No. 5,202,014, which is a continuation of Ser. No. 333,666, Apr. 5, 1989, abandoned, which is a division of Ser. No. 14,958, Feb. 17, 1987, Pat. No. 4,826,667, which is a continuation-in-part of Ser. No. 823,698, Jan. 29, 1986, abandoned. This application Jul. 16, 1996, Ser. No. 682,949

Int. Cl.^{6} C07C *2/66*

U.S. Cl. 585—467 **4 Claims**

1. A hydrocarbon conversion process comprising using calcined SSZ-25 zeolite under hydrocarbon conversion conditions in the reaction of alkylating aliphatics wherein said zeolite has the X-ray diffraction lines of Table 2.

5,691,464

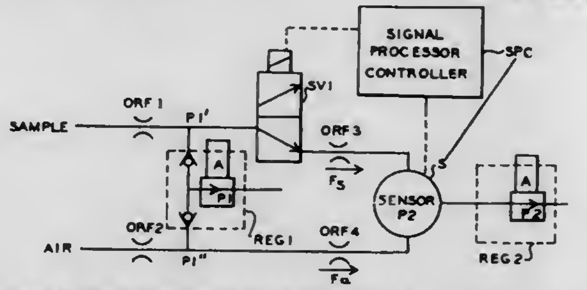
APPARATUS FOR HIGH OXYGEN CONCENTRATION MEASUREMENT USING LIMITING CURRENT OXYGEN SENSOR

Tuan Quoc Cao, Davenport, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Filed Feb. 5, 1997, Ser. No. 796,084

Int. Cl.^{6} G01N *27/00;1/22;* **G01M** *15/00*

U.S. Cl. 73—23.31 **8 Claims**



7. A gas analyser method for measuring high oxygen concentrations of up to 100% in a sample gas, using a limiting current oxygen sensor, comprising the steps of:

applying a with mixture known proportions of calibration gas having a known oxygen concentration (Cc) and ambient air having a known oxygen concentration (Ca) to said limiting current oxygen sensor which, in response generates a calibration reading (Cr) indicating oxygen content in said mixture of calibration gas and air;

storing said known oxygen concentrations (Cc and Ca) and said calibration reading (Cr);

applying a diluted oxygen mixture of said sample gas and ambient air in a known proportion to said limiting current oxygen sensor which, in response generates a mixture concentration reading (Cm) indicating oxygen content in said mixture of sample gas and air;

storing said mixture concentration reading (Cm);

retrieving said known oxygen concentrations (Cc and Ca), said calibration reading (Cr) and said mixture concentration reading (Cm); and

calculating oxygen concentration (Cs) in said sample gas as follows:

$$Cs = \frac{(Cm - Ca)^*(Cc - Ca)}{Cr - Ca} + Ca.$$

5,691,465

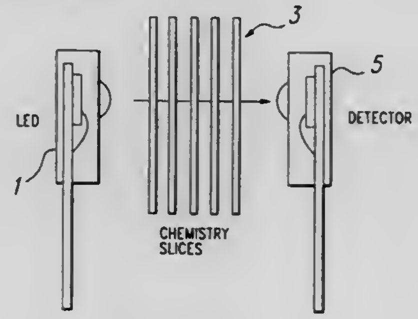
MULTI-PLATE THIN FILM CARBON MONOXIDE SENSOR

Richard A. Carr, Rowlett, and Kirk S. Laney, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 7, 1996, Ser. No. 693,766

Int. Cl.^{6} G01N *21/59*

U.S. Cl. 73—24.02 **7 Claims**



1. A gas detector which comprises:

(a) a light detector;

(b) a light source for providing a light beam which travels along a light path to said detector; and

(c) detection means disposed in said light path for altering said light beam responsive to the impingement of a predetermined gas thereon, said detection means including:

  (i) a plurality of spaced apart members, each of said members disposed in said light path;

  (ii) each of said members including a chemistry responsive to said impingement of said predetermined gas thereon for reversibly altering the light transmissive properties of said chemistry, said chemistry of one of said members differs from the chemistry of a second of said members.

5,691,466

LIQUID-SENSING APPARATUS AND METHOD

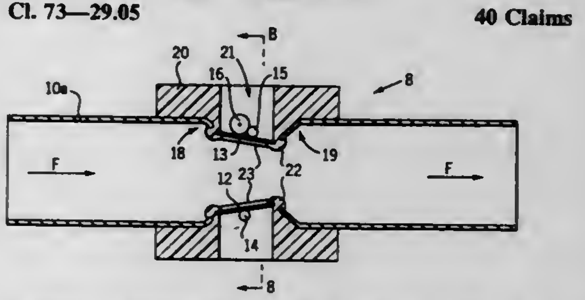
John Michael Walmsley Lawrence, and John Frederick Harkness, both of Newbury, Great Britain, assignors to J.T.L. Systems Ltd., Great Britain

Filed Jun. 26, 1996, Ser. No. 673,723

Claims priority, application United Kingdom, Jun. 28, 1995, 9513191; Dec. 14, 1995, 9525488

Int. Cl.^{6} G01N *25/56*

U.S. Cl. 73—29.05 **40 Claims**



1. A method of sensing the presence of liquid in a flow of gas which is contained by a wall having a thermally conductive portion, the method comprising disposing first and second temperature sensors in thermal contact with respective first and second thermally conductive members in contact with the gas flow and mounted on said wall, the first temperature sensor having a heating means associated therewith, the first thermally conductive member being substantially thermally isolated from said thermally conductive portion of said wall and from the second thermally conductive member and monitoring a difference in the temperatures sensed by the two temperature sensors.

5,691,467

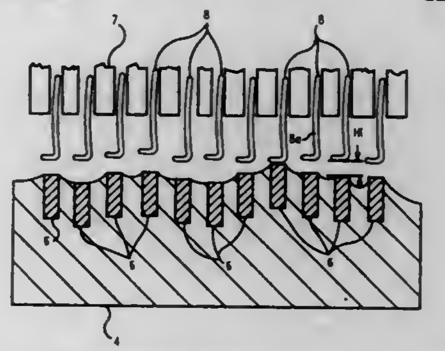
METHOD FOR MAPPING SURFACES ADAPTED FOR RECEIVING ELECTRICAL COMPONENTS

Lewis S. Goldmann, Bedford, and Emanuele F. Lopergolo, Marlboro, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1996, Ser. No. 672,881

Int. Cl.^{6} G01B *7/28*

U.S. Cl. 73—105 **22 Claims**



1. A method for mapping a surface adapted for receiving electrical components, comprising the steps of:

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a) providing a probe having a plurality of contacts;
b) moving the probe toward the surface at a predetermined rate of speed;
c) recording the time of all occurrences of contact between each of the probe contacts and the surface;
d) determining the height of each portion of the surface contacted by one of the probe contacts; and
e) correcting the height determined in step (d) to account for non-planarity of the probe contacts.

5,691,468

Patent Not Issued For This Number

5,691,469
METHOD OF DETECTING COMBUSTION MISFIRES

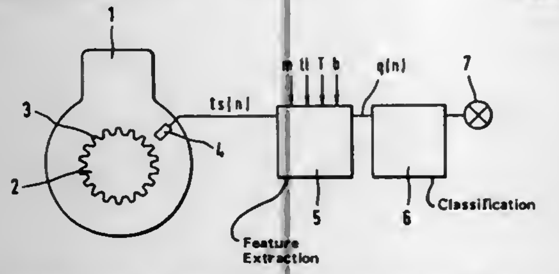
Manfred Mezger, Markgröningen; Andrea Lohmann, Stuttgart; Klaus Ries-Müller, Bad Rappenau, and Jürgen Förster, Chemnitz, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 29, 1996, Ser. No. 705,146

Claims priority, application Germany, Aug. 29, 1995, 195 31 845.5

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—117.3 **5 Claims**



1. A method for detecting combustion misfires in an internal combustion engine on the basis of a discrete first signal wherein the nonuniformity of the rotational movement of the crankshaft of the engine is imaged, the method comprising the steps of:
generating a second signal which is periodic and has a period duration corresponding to one of the following: the cycle duration of a complete work cycle of said engine or said cycle duration divided by a whole number and said second signal having a fixed phase relationship to the rotational movement of said crankshaft;
providing an ancillary signal based on said discrete first signal;
modulating said second signal with said ancillary signal and filtering said second signal to form a third signal; and,
utilizing said third signal for detecting the presence of misfires and for identifying the cylinder affected by said misfires.

5,691,470
PENDULOUS OSCILLATING GYROSCOPIC ACCELEROMETER

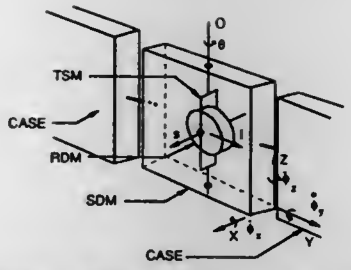
Michele S. Sapuppo, Andover, and Donato Cardarelli, Medfield, both of Mass., assignors to Milli Sensor Systems and Actuators, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 101,392, Aug. 3, 1993, Pat. No. 5,457,993. This application Oct. 16, 1995, Ser. No. 543,776

Int. Cl.^{6} G01C *19/02;* **G01P** *9/02*

U.S. Cl. 73—504.02 **33 Claims**

1. A pendulous oscillating gyroscopic accelerometer having an accelerometer input axis, comprising:
a fixed case;
a servo driven member mounted to said case for sinusoidal oscillation about a servo axis;



a torque summing member mounted to said servo driven member to allow rotational motion about an output axis transverse to said servo axis;
a rotor driven member mounted to said torque summing member for sinusoidal oscillation about a reference axis transverse to both said output axis and said servo axis;
a pendulosity carried by at least one of said torque summing member and said rotor driven member to create a mass imbalance about said output axis in which pendulosity torque due to acceleration along the accelerometer input axis causes a DC rotation of said torque summing member about said output axis;
first oscillation means for sinusoidally oscillating said rotor driven member about said reference axis, the oscillation having a first amplitude, a first frequency and a first phase;
second oscillation means for sinusoidally oscillating said servo driven member about said servo axis, the oscillation having a second amplitude, a second frequency and a second phase;
wherein the oscillations of said rotor driven member and of said servo driven member create a gyroscopic torque, which causes DC rotation of said torque summing member about said output axis;
measurement means for determining the rotational motion of said torque summing member about said output axis;
control means, responsive to said measurement means, for altering the oscillation of at least one of said first and second oscillation means to create a change in said gyroscopic torque to counterbalance pendulosity torque; and
means, responsive to said control means, for determining acceleration of said accelerometer along said input axis.

5,691,471
ACCELERATION AND ANGULAR VELOCITY DETECTOR

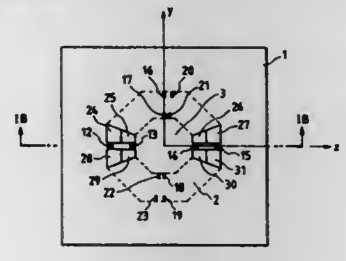
Mitsuhiro Okazaki, Kawasaki, and Jun Iwasaki, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

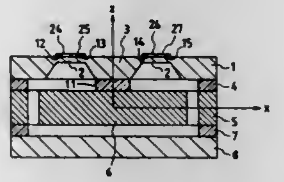
Filed Nov. 13, 1995, Ser. No. 557,422

Claims priority, application Japan, Nov. 16, 1994, 6-281032

Int. Cl.^{6} G01P *9/04*

U.S. Cl. 73—504.041 **30 Claims**





1. An acceleration and angular velocity detector comprising:
a body mass;
a flexible portion, which is connected to said body mass, that deforms in consonance with displacement of said body mass;
a peripheral support member for supporting said flexible portion;
vibration means for vibrating said body mass circularly;
displacement detection means for independently detecting displacements of said body mass in directions of three axes and for outputting a signal; and
calculation means for detecting accelerations in said three directions and angular velocities around said three axes by employing said signal output by said displacement detection means.

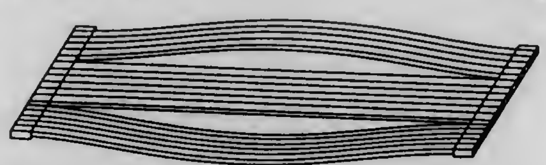
5,691,472
NON-GIMBALLED ANGULAR RATE SENSOR

Fred J. Petri, Snohomish, Wash., assignor to AlliedSignal, Inc., Morristown, N.J.

Filed May 30, 1995, Ser. No. 453,026

Int. Cl.^{6} C21C *7/10*

U.S. Cl. 73—514.02 **11 Claims**



1. An angular rate sensor for measuring the angular rate relative to a predetermined axis, the angular rate sensor comprising:
a substantially planar substrate comprised of a predetermined material;
four vibrating beams formed from said substrate, said four beams spaced apart and connected together at opposing ends defining an inner pair of vibrating beams and an outer pair of vibrating beams;
an interconnecting member mechanically coupling eacb outer beam to an adjacent inner beam;
means for exciting one or the other of said pair of inner vibrating beams or said outer pair of vibrating beams in the plane of said substrate; and
means for sensing one or more of said vibrating beams.

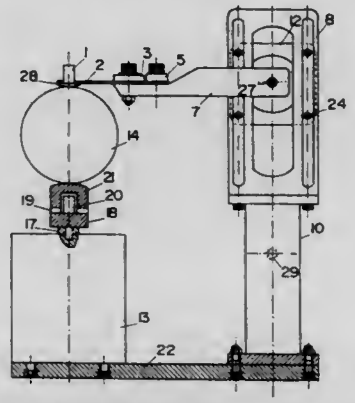
5,691,473
METHOD AND EQUIPMENT FOR MEASURING FIRMNESS OF FRUITS AND VEGETABLES

Kalman Peleg, 311 Spinnaker Str., Foster City, Calif. 94404

Continuation-in-part of Ser. No. 503,689, Apr. 3, 1991, abandoned. This application Jun. 15, 1992, Ser. No. 898,446

Int. Cl.^{6} G01N *33/02*

U.S. Cl. 73—573 **24 Claims**



1. A method of measuring and testing the firmness of a fruit or a vegetable in order to determine its ripeness stage comprises the steps of:
gripping said fruit or vegetable in two substantially opposite points between two bodies at a force or pressure not liable to cause damage to said fruit or vegetable;
applying a vibrational excitation onto said fruit or vegetable at one of said two opposite points by means of a vibration actuator using a narrow band random signal or a composite signal with predetermined frequency content, composed of a sum of sinusoids with frequencies, amplitudes and phase shifts specialized for the kind of fruit or vegetable to be tested;
measuring the input acceleration signal by means of a first acceleration transducer attached to said vibration actuator;
measuring the output acceleration signal by means of a second acceleration transducer at the opposite point of said fruit or vegetable;
passing the input and output acceleration signals through a difference amplifier to effect deduction of said output signal from said input signal to obtain a relative acceleration signal in real time;
feeding the obtained relative acceleration signal as well as the output acceleration signal to analog or digital computer means programmed to compute, store, indicate or display a firmness index value by dividing the root mean square of the output acceleration signal by the root means square of the relative acceleration signal.

5,691,474
METHOD AND APPARATUS FOR DYNAMIC DETERMINATION OF THE THICKNESS AND/OR BASIS WEIGHT OF MOVING MATERIAL UNDER TEST

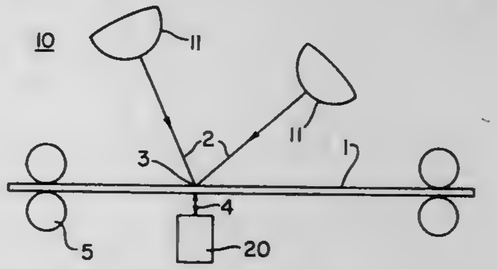
Christoph Gerz, Ottering, Germany, assignor to Giesecke & Devrient GmbH, Munich, Germany

Filed Dec. 20, 1995, Ser. No. 575,366

Claims priority, application Germany, Dec. 23, 1994, 44 46 367.7

Int. Cl.^{6} G01N *29/00*

U.S. Cl. 73—580 **9 Claims**



1. A method for dynamic noncontacting determination of the thickness and/or basis weight of a material under test using ultrasound, the material under test being transported in a defined direction characterized in that a plurality of transmitters each with the same radiation characteristics radiate ultrasonic waves in phase toward a defined area of the material under test perpendicular to the transport direction, so that a focused sound field with high sound intensity is produced in the defined area of the material under test, a portion of the ultrasonic waves coming through the material under test being detected at a distance smaller than or equal to an acoustic wavelength of the ultrasonic waves, and the detected portion of the ultrasonic waves being evaluated for determining the thickness and/or basis weight.

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METHOD FOR MEASURING THE PROPAGATION VELOCITY OF ULTRASONIC ACOUSTIC WAVES THROUGH ROCK FRAGMENTS

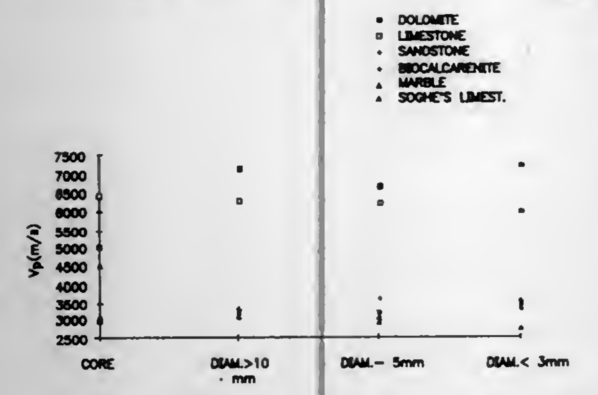
Alberto Marsala, Bergamo; Fabrizio Zausa, Calvignasco, and Santarelli Frederic, S. Donato Mil.se, all of Italy, assignors to Agip S.p.A., Milan, Italy

Filed Dec. 1, 1995, Ser. No. 565,823

Claims priority, application Italy, Dec. 15, 1994, MI94A2526

Int. Cl.⁶ G01N *29/18*

U.S. Cl. 73—597 **7 Claims**



1. Method for measuring the propagation velocities of ultrasonic acoustic waves through rock fragments, said method comprising:

(a) introducing each fragment into a pair of piezoelectric transducers with a coupling fluid between the fragment itself and such transducers, said transducers being capable of generating highly damped ultrasonic acoustic waves;

(b) passing highly damped ultrasonic acoustic waves through the fragment of interest, said waves being generated by a pulse generator with a pulse width varying from 0.1 μs to 20 μs;

(c) visualizing the obtained electric signals by an oscilloscope with a resolution of at least 10^{-2} μs;

(d) measuring the transit time of the waves themselves.

5,691,476

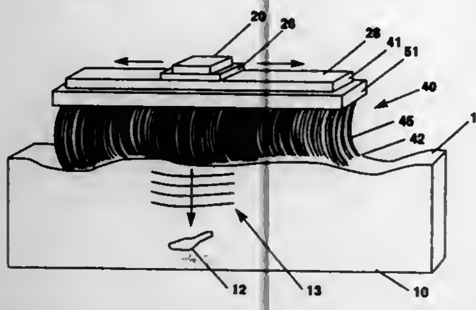
METHOD FOR ULTRASONIC IMAGING AND DEVICE FOR PERFORMING THE METHOD

Eric I. Madaras, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 118,466, Sep. 7, 1993, abandoned. This application Jan. 12, 1996, Ser. No. 585,087

Int. Cl.⁶ G01N *29/04*

U.S. Cl. 73—644 **12 Claims**



1. A method for non-destructive evaluation of interior structures and flaws in a test specimen, comprising the steps of:

(a) providing an ultrasonic transducer with a smooth surface;

(b) providing a plurality of flexible ultrasonic wave guides having equal delay times;

(c) arranging said wave guides in parallel between said ultrasonic transducer and a surface of the test specimen;

(d) coupling one end of each of said wave guides ultrasonically to said ultrasonic transducer; and

(e) coupling the other end of each of said wave guides ultrasonically to said surface of the test specimen, the end coupled to said surface of the test specimen being free to engage said surface of the test specimen regardless of test specimen geometry.

5,691,477

TORSIONAL VIBRATOR

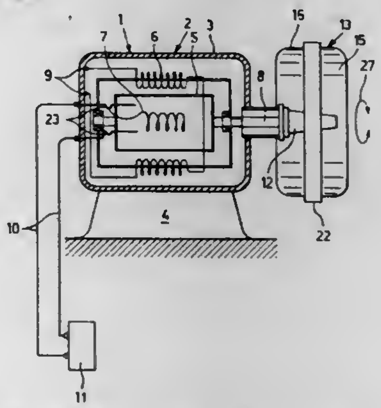
Carlo Di Bernardo, Milan, and Giuseppe Matrascia, Seregno, both of Italy, assignors to Pirelli Coordinamento Pneumatici, S.p.A., Milan, Italy

Filed Nov. 18, 1996, Ser. No. 752,260

Claims priority, application Italy, Nov. 21, 1995, MI95A2400

Int. Cl.⁶ G01M *3/32*

U.S. Cl. 73—662 **6 Claims**



1. A torsional vibrator comprising a direct-current electric motor provided with inductor windings, with induced windings and with a shaft with which a wheel is made integral that comprises a rim and a tire, first acceleration transducer means fastened to said rim, second acceleration transducer means fastened to said tire, said induced windings being connected to means for supplying direct-current power through an inverter for changing the polarity of said induced windings in an alternating manner with a preselected frequency, so that said shaft is driven to execute angular oscillations that torsionally excite said wheel, causing the wheel to vibrate in a rotational direction, said first and second acceleration transducer means detecting rotational vibrations and providing measurements of acceleration of said rim and of said tire.

5,691,478

DEVICE AND METHOD FOR REMOTE ZEROING OF A BIOLOGICAL FLUID PRESSURE MEASUREMENT DEVICE

Robert L. Barry, Queensbury, and Robert F. Alexander, Lake George, both of N.Y., assignors to Schneider/Namic, Glens Falls, N.Y.

Filed Jun. 7, 1995, Ser. No. 478,300

Int. Cl.⁶ G01L *9/06;* **A61B** *5/0215*

U.S. Cl. 73—721 **27 Claims**

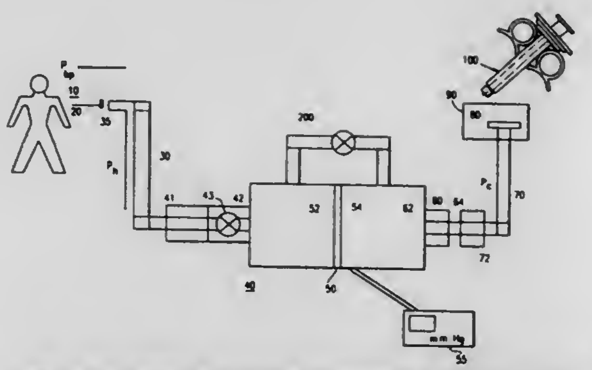
1. A device for measuring pressure, comprising:

a housing having a plurality of ports and a transducer including a sensing face and a compensating face;

the transducer being disposed in the housing and with respect to the ports so that the sensing face independently may be put in pressure communication with a pressure to be measured and the compensating face independently may be put in pressure communication with a compensating pressure;

a first valve means for selectively interrupting pressure communication between the sensing face and pressure to be measured; and

a shunt means for establishing pressure communication between the sensing face and the compensating face including a second valve means for selectively interrupting pressure communication between the sensing and compensating faces.



5,691,479

PRESSURE TRANSDUCER WITH A HOUSING FOR USE WITH A CONVENTIONALLY PACKAGED PRESSURE SENSOR

Burkhard Krisch, and Werner Riedel, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, München, Germany

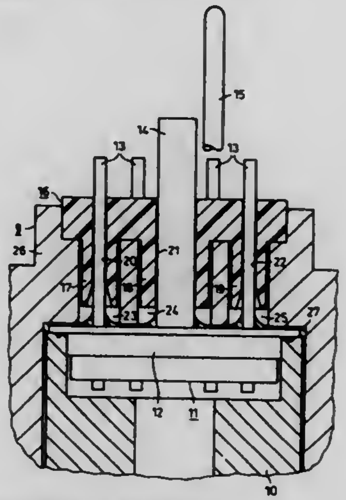
PCT No. PCT/DE93/01238, § 371 Date Sep. 25, 1995, § 102(e) Date Sep. 25, 1995, PCT Pub. No. WO94/15189, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 21, 1993, Ser. No. 491,901

Claims priority, application Germany, Dec. 23, 1992, 42 44 459.4

Int. Cl.⁶ G01L *7/00*

U.S. Cl. 73—756 **2 Claims**



1. A pressure transducer comprising:

a standard disk-shaped pressure sensor component having a conventional base, such as those used in conventionally manufactured semiconductor components, that is welded to a first end of a pressure supplying body in the edge area on one side, the pressure sensor component further having conventional electrical connecting wires and a conventional connecting tube, the electrical connecting wires and the connecting tube being arranged on a low-pressure side of the pressure sensor component;

a cap-like part which surrounds the pressure sensor component on the outside and whose bottom is above the low-pressure side of the pressure sensor component and which has individual openings for each of the electric connecting wires and the connecting tube, wherein the openings for the electric connecting wires are insulated; and

a pressure transmitting part that is connected by a separating membrane to a second end of the pressure supplying body;

wherein the base of the standard pressure sensor component is in contact with the bottom of said cap-like part through an intermediate filling of cast resin, and said cap-like part is welded to the pressure transmitting part.

5,691,480

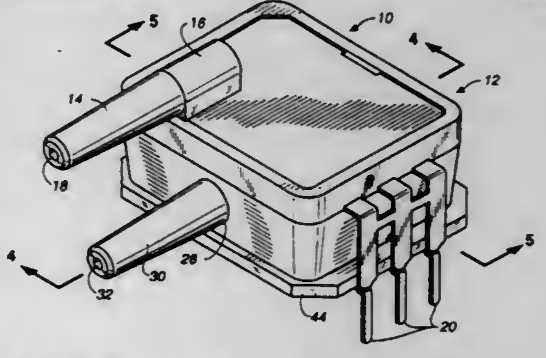
SENSOR PACKAGE WITH EXTERIOR COMPENSATION CIRCUIT

James T. Cook, Sr., Antioch; David D. Arnold, Saratoga, and Christos Cartsonas, Menlo Park, all of Calif., assignors to Sensym, Incorporated, Milpitas, Calif.

Continuation of Ser. No. 418,330, Apr. 7, 1995. This application Jan. 3, 1997, Ser. No. 778,533

Int. Cl.⁶ G01L *7/00*

U.S. Cl. 73—756 **2 Claims**



1. A low profile package for a micromachined silicon sensor die having a principal surface, the package comprising:

a lid having a principal exterior surface and defining a first port communicating to an interior of the lid from the principal exterior surface, the first port extending in a direction parallel to a plane of the principal exterior surface and including an extension portion extending from the lid in the direction parallel to a plane of the principal exterior surface;

a body defining an interior cavity adapted for holding the sensor die and to be closed by the lid, and having a principal interior surface adapted for mounting of the sensor die in the interior cavity, and defining a second port communicating with an interior of the body at a location on a bottom surface of the sensor die, the second port extending from a lateral surface of the body in a direction parallel to a plane of the principal interior surface and including an extension portion extending from the body in the direction parallel to a plane of the principal interior surface;

a plurality of conductive leads extending from the interior cavity of the body to a bottom surface of the body and adapted for mounting the body on a substrate, whereby the principal surface of the sensor die lies in a plane parallel to a plane defined by the substrate; and

a second substrate having electrical circuitry formed on its principal surface, and having a length and width about equal to that of an exterior surface of the body, the plurality of conductive leads each defining a bend, the second substrate being adapted for mounting on the exterior surface of the body and being held in place on the exterior bottom surface of the body by the bends in the conductive leads.

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5,691,481
METHOD AND APPARATUS FOR OBTAINING DATA ON THE STRAIN-STRESS RELATION OF TEST PIECES OF GREEN SAND MOLDS

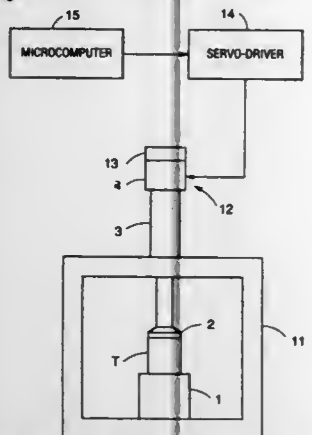
Tadashi Nishida, Toyokawa, Japan, assignor to Sintokogio, Ltd., Japan

Filed Dec. 1, 1995, Ser. No. 565,849

Claims priority, application Japan, Dec. 2, 1994, 6-329594

Int. Cl.^{6} G01D *1/16;7/02*

U.S. Cl. 73—790 **1 Claim**



1. A method for predicting the degree of deformation of a green sand mold to be moved and filled with molten metal comprising the steps of:

- producing a test piece from molding sand that is used to produce the green sand mold, under conditions approximating those for actually producing the green sand mold;
- putting on the test piece an incrementally varying load which increases over time;
- measuring at short intervals the varying load and the varying length of the test piece under the varying load;
- calculating the strain-stress relation of the test piece based on the measurements at such intervals;
- storing data indicative of the calculated strain-stress relation; and
- predicting the degree of deformation of the green sand mold produced from the molding sand from the stored data indicative of the calculated strain-stress relation.

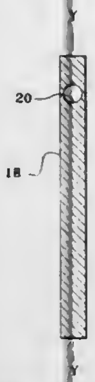
5,691,482
ADHESIVE SHEAR STRENGTH TEST APPARATUS

Earl S. Nickerson, Jr., Little Compton, and Wayne C. Tucker, Exeter, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1996, Ser. No. 682,898

Int. Cl.^{6} G01N *3/08*

U.S. Cl. 73—842 **11 Claims**



1. An adhesive shear strength test apparatus comprising:

- a first cylindrical rod having a bore of a certain diameter and a certain depth reamed into a first end along a longitudinal axis of the rod and having a counterbore of a diameter larger than the diameter of the bore reamed to a depth less than the depth of the bore into said first end along the longitudinal axis;
- a second cylindrical rod having a diameter essentially equal to the diameter of the bore, an insertion end of the second rod being inserted into the bore of the first rod, the second rod being aligned with the longitudinal axis of the first rod; and
- adhesive placed within a cylindrical space of uniform thickness formed between the second rod and an inner surface of the counterbore, the adhesive forming a bond between the first rod and the second rod such that the adhesive is subjected to a pure shear load when the first and second rods are subjected to a tensile load applied along the longitudinal axis.

5,691,483
METHOD AND APPARATUS FOR DETERMINING A REAL VELOCITY DISTRIBUTION OF SOLID PARTICLES TRAVELLING IN A GAS CARRIER FLOW FOR SHOT PEENING

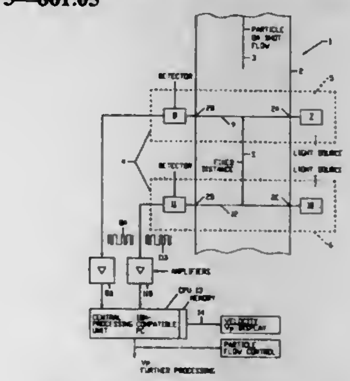
Wolfgang Linnemann, Aachen, Germany, assignor to Kugelstrahlzentrum Aachen GmbH, Herzogenrath, Germany

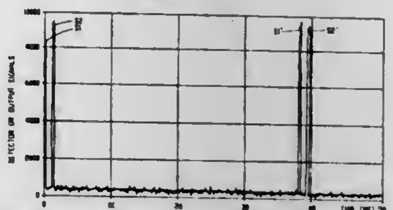
Filed Apr. 11, 1995, Ser. No. 420,062

Claims priority, application Germany, Apr. 12, 1994, 44 12 494.5

Int. Cl.^{6} G01F *1/76*

U.S. Cl. 73—861.05 **10 Claims**





7. An apparatus for determining a real particle velocity distribution of solid particles travelling in a gas carrier flow in a mechanical peening operation, comprising a blow channel (2) forming an enclosed flow passage for said solid particles, first light transparent openings (2A, 2B) in said blow channel (2), a first light source (7) positioned for passing a first light beam (9) through said flow passage and through said first light transparent openings substantially perpendicularly to a travel direction of said solid particles, second light transparent openings (2C, 2D) in said blow channel (2) downstream of said first light transparent openings (2A, 2B) as viewed in said travel direction of said solid particles, a second light source (10) for passing a second light beam (12) through said flow passage substantially perpendicularly to said travel direction and through said second light transparent openings (2C, 2D), a fixed spacing (s) between said first and second light beams (9 and 12), first and second optical detectors (8, 11) positioned at said first and second light transparent openings respectively for detecting light and producing respective first and second electrical signals (8A, 11A), first and second amplifiers (8B, 11B) connected to said first and second optical detectors respectively, and a computer connected to said first and second amplifiers for calculating said real particle velocity distribution by forming a sum velocity distribution from a multitude of velocities calculated by said computer on the basis of time differences between said first and second signals and said fixed spacing (s), and by then deducting from said sum velocity distribution a known random background velocity distribution to obtain said real particle velocity distribution.

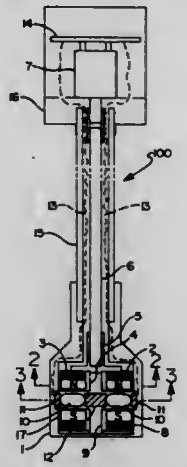
5,691,484
MAGNETIC FLOW SENSOR

Murray F. Feller, Rte. 2, Box 562A, Micanopy, Fla. 32667

Continuation-in-part of Ser. No. 429,534, Apr. 26, 1995, abandoned. This application Jul. 29, 1996, Ser. No. 681,765

Int. Cl.^{6} G01F *1/58*

U.S. Cl. 73—861.13 **13 Claims**



1. A flow sensor for measuring a rate of flow of an electrically conductive liquid, the sensor comprising:

- an electrically insulated flow passage;
- a permanent magnet providing magnetic flux orthogonal to the liquid flow;
- a pair of electrodes disposed opposite the passage and contacting the liquid, the electrodes being in line with and orthogonal to the flow passage and generally parallel to the magnetic flux, such that said flow passage forms a generally linear fluid flow path; and
- a mechanical drive for periodically repositioning the magnet to alternate the magnetic flux polarity to produce an alternating voltage at the electrodes having a magnitude proportional to a flow rate of the liquid.

5,691,485
COAXIAL DOUBLE TUBE TYPE CORIOLIS FLOWMETER

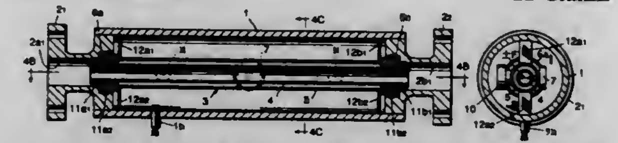
Takashi Endo; Kenichi Matsuoka; Kimihiro Ichinose; Hidemi Seki, and Shingo Gomi, all of Tokyo, Japan, assignors to Oval Corporation, Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 462,734

Claims priority, application Japan, Jun. 6, 1994, 6-123549; Feb. 15, 1995, 7-026644; May 2, 1995, 7-108823

Int. Cl.^{6} G01F *1/84*

U.S. Cl. 73—861.357 **22 Claims**



1. A Coriolis flowmeter comprising a cylindrical outer housing having longitudinal end portions, a connecting member at each of said end portions, a coaxial double tube means disposed within the cylindrical outer housing so as to be radially fixed but axially moveable, said double tube means comprising an inner tube through which fluid flows and an outer counterbalance tube disposed coaxially with said inner tube and secured to said inner tube, driving means for resonantly oscillating the inner tube and the outer counterbalance tube in an oscillating direction at the same frequency with opposite phases, a weight secured to the outer counterbalance tube for making the lateral natural frequency of the outer counterbalance tube equal to the natural frequency of the inner tube, sensing means for sensing a phase difference proportional to a Coriolis force acting on the inner tube, support means supporting said double tube means on said connecting member at oscillating nodes of the double tube means, said support means comprising rectangular leaf springs with the general plane of each rectangular leaf spring being parallel to the oscillating direction of said double tube means, said rectangular leaf springs extending diametrically from said double tube means with the general plane of each rectangular flat leaf spring being perpendicular to the oscillation direction.

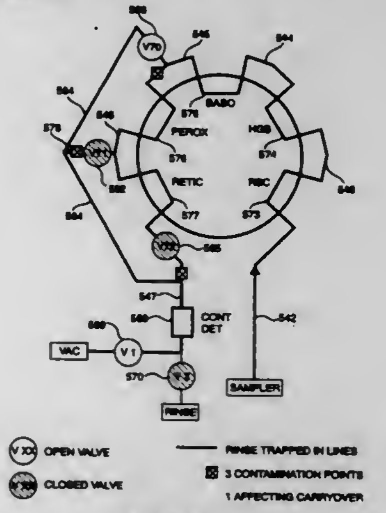
5,691,486
APPARATUS AND METHODS FOR SELECTING A VARIABLE NUMBER OF TEST SAMPLE ALIQUOTS TO MIX WITH RESPECTIVE REAGENTS

Bruce E. Behringer, Park Ridge, N.J.; John Cremins, Waterbury, Conn., and Gregory A. Farrell, Ridgewood, N.J., assignors to Bayer Corporation, Tarrytown, N.Y.

Filed Jul. 30, 1996, Ser. No. 688,433

Int. Cl.^{6} G01N *1/14*

U.S. Cl. 73—863.73 **18 Claims**



BLOOD FLOW -
CBC ONLY

1. A sample shear valve system for combining a sample aliquot with one or more reagents comprising:

- a first valve element having a first shear face;
- a second valve element having a second shear face, a first aliquot loop and a second aliquot loop, each of said first and second aliquot loops having a first opening and a second opening in said second shear face, the second shear face being in slidable contact with said first shear face to form a shear interface, the first and second valve elements having a first relative position and a second relative position;
- the first valve element further comprising a sample inlet, a sample outlet, and a sample conduit, wherein, in said first relative position, the sample inlet is in communication with said first opening of said first aliquot loop, the sample outlet is in communication with said second opening of said second aliquot loop, and the sample conduit connects said second opening of said first aliquot loop and said first opening of said second aliquot loop;
- a sampler connected to said sample inlet;
- a vacuum source switchably connected to said sample outlet;
- a rinse source switchably connected to said sample outlet;
- first reagent inlet and outlet passages in said first valve element, wherein, in said second relative position, the said first reagent

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inlet and outlet passages are respectively in communication with said first and second openings of said first aliquot loop at said shear interface;

second reagent inlet and outlet passages in said first valve element, wherein, in said second relative position, the said second reagent inlet and outlet passages are respectively in communication with said first and second openings of said second aliquot loop at said shear interface;

a bypass passage connecting said sample conduit and said sample outlet;

a first valve disposed in said bypass passage proximate said sample conduit having an open state and a closed state; and

a second valve disposed in said sample outlet between said bypass passage and said shear interface having an open state and a closed state.

13. A method of operating a sample shear valve having a first valve element and a second valve element in sliding contact between first and second relative positions and forming a shear interface, an aliquot loop in the second valve element with first and second openings at the shear interface, a sample inlet and sample outlet in the first valve element with openings at the shear interface for communicating with the aliquot loop openings when the first and second valve elements are in the first relative position, a bypass passage connecting the sample inlet and outlet, and a reagent inlet and outlet in the first valve element with openings at the shear interface for communicating with the aliquot loop openings when the first and second valve elements are in the second relative position, comprising:

filling the sample inlet, the aliquot loop and the sample outlet with a rinse liquid;

closing off the sample outlet between the bypass passage and the shear interface;

aspirating a sample into the sample inlet, through the bypass passage and into the sample outlet, whereby said rinse liquid remains in the aliquot loop and adjoining portions of the sample inlet and outlet;

moving the valve elements to the second position, whereby the reagent in the reagent inlet and outlet contacts the rinse liquid in the aliquot loop; and

returning the valve elements to the first position.

5,691,487

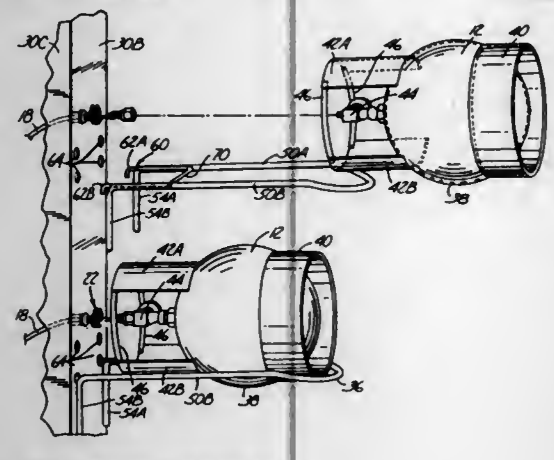
COUPLING OF AIR SAMPLES TO A SAMPLER

Thomas B. Green, Batavia, Ohio; Todd A. Wolsing, Taylor Mill, Ky., and Joseph A. Borer, Cincinnati, Ohio, assignors to Tekmar Company, Cincinnati, Ohio

Filed Nov. 13, 1995, Ser. No. 556,666

Int. Cl.^{6} G01N *1/22;1/26*

U.S. Cl. 73—863.86 **12 Claims**



1. An air sampler, comprising:

a stand;

a bracket adjustably fixed to the stand for supporting a sample enclosure, wherein the bracket is adjustable between a first position to support a relatively small sample enclosure and a second position to support a relatively large sample enclosure;

a valve carried by the stand for controlling samples taken from the sample enclosure, the valve having an inlet and an outlet; and

an inlet line having a first end coupleable to the sample enclosure and a second end fluidly coupled to the valve.

5,691,488

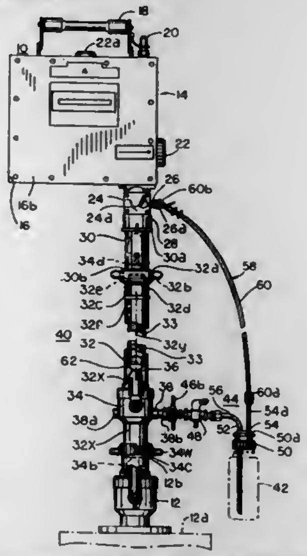
PORTABLE SAMPLING APPARATUS AND SYSTEM

Frank S. Giannone, North Bellmore, N.Y., assignor to MMC International Corp., Inwood, N.Y.

Filed Jun. 5, 1996, Ser. No. 658,316

Int. Cl.^{6} G01N *1/12*

U.S. Cl. 073—863.86 **17 Claims**



1. In a closed sampling system, including a product sample retrieval mechanism and a vapor return hose associated with said product sample retrieval mechanism;

a vapor return hose connection connected with a tape wiper assembly coupled with said retrieval mechanism through a vapor return check valve;

a vapor return hose associated with said product sample retrieval mechanism; and

a sampling container associated with said product sample retrieval mechanism and coupled with said vapor return hose.

5,691,489

AUTOMATIC PLAYER PIANO EXACTLY REPRODUCING HALF STROKE IN PLAYBACK

Yuji Fujiwara; Yasuhiko Oba, and Jun Yamamoto, all of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Sep. 12, 1996, Ser. No. 712,962

Claims priority, application Japan, Sep. 19, 1995, 7-240324

Int. Cl.^{6} G10F *1/02;5/02;* G10G *3/04*

U.S. Cl. 84—21 **8 Claims**

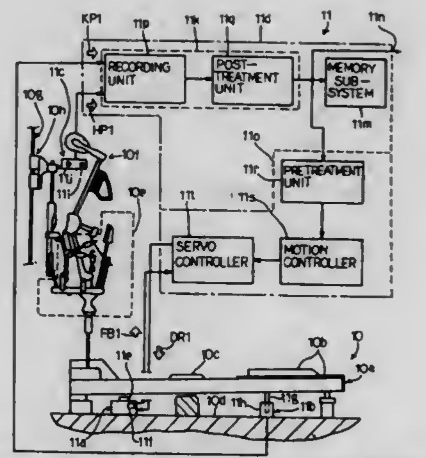
1. An automatic player piano comprising:

an acoustic piano including

a keyboard having a plurality of keys respectively assigned notes of a scale and turnable between respective rest positions and respective end positions when a player selectively depresses and releases through a fingering,

a plurality of vibrating means respectively associated with said plurality of keys for generating acoustic sounds with notes of said scale assigned to depressed keys,

a plurality of hammer assemblies respectively associated with said plurality of vibrating means so as to cause vibrating means associated with said depressed keys to generate said acoustic sounds,



a plurality of key action mechanisms coupled between said plurality of keys and said plurality of hammer assemblies, and selectively actuated by said depressed keys so as to selectively cause said plurality of hammer assemblies to strike said plurality of hammer assemblies, and

a plurality of damper assemblies respectively associated with said plurality of vibrating means and selectively brought into contact with said vibrating means at respective return points for absorbing vibrations after said depressed keys are released; and

an automatic playing system including

a plurality of key actuators respectively associated with said plurality of keys and responsive to driving signals so as to cause said plurality of keys to selectively turn without said fingering,

a playback sub-system responsive to music data codes containing a first piece of data information representative of one of said plurality of keys, a second piece of data information representative of a hammer velocity expected to associated one of said plurality of hammer assemblies, a third piece of data information representative of an impact timing of said one of said hammer assemblies against associated one of said vibrating means, a fourth piece of data information representative of a key velocity of said one of said plurality of keys on the way toward the rest position and a fifth piece of data information representative of a return time when associated one of said plurality of damper assemblies is brought into contact with said associated one of said plurality of vibrating means for generating one of said driving signal,

said playback sub-system having

a first trajectory generating means responsive to said second to fifth pieces of data information for determining a first trajectory from the rest position through a transit point to the end position and a second trajectory from said end position through said transit point to said rest position,

a second trajectory generating means for producing a decelerating trajectory integral with said first trajectory at said transit point and an accelerating trajectory integral with said second trajectory at said transit point on the basis of said second to fifth pieces of data information,

a judging means for deciding whether or not said decelerating trajectory crosses said accelerating trajectory before said one of said plurality of keys reaches said end position,

a composing means for producing a composite trajectory having said decelerating trajectory integral with said accelerating trajectory at a turning point where said one of said plurality of keys changes the direction of a motion when said judging means decides said decelerating trajectory crosses said accelerating trajectory, and

a driving current supplying means for producing said driving signals, each of said driving signals being representative of said first and second trajectories when said judging means decides that said decelerating trajectory does not cross said accelerating trajectory, each of said driving signals being representative of a composite trajectory integral with a part of said first trajectory and a part of said second trajectory at said transit point when said composing means produces said composite trajectory.

5,691,490

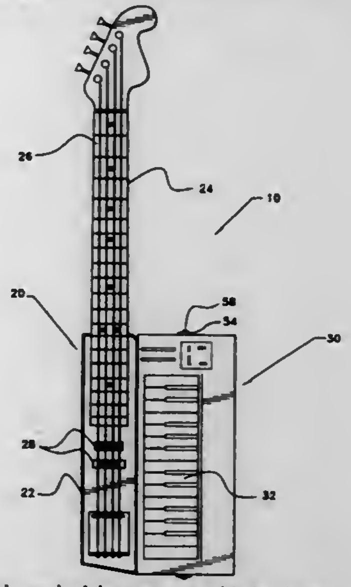
STRINGED MUSICAL INSTRUMENT WITH KEYBOARD

Maschon Williams, 6820 Santa Monica Blvd., Los Angeles, Calif. 90038

Continuation-in-part of Ser. No. 305,600, Dec. 12, 1994, Pat. No. 5,596,157. This application Jan. 15, 1997, Ser. No. 784,265

Int. Cl.^{6} G10D *15/00*

U.S. Cl. 84—170 **19 Claims**



1. A stringed musical instrument with keyboard, comprising: a stringed musical instrument comprising:

a body;

a neck; and

a plurality of strings extending across said neck and said body;

an extending portion attached to said body and extending outward from said strings;

a keyboard having a plurality of keys; and

means for adjustably attaching said keyboard to said extending portion.

5,691,491

VACUUM FORMED GUITAR BACKS

David DeGomez, 325 Normandy, Norwood, Mass. 02062

Filed Feb. 13, 1996, Ser. No. 600,536

Int. Cl.^{6} G01D *3/00*

U.S. Cl. 84—291 **7 Claims**

5. A stringed musical instrument comprising:

a back shell;

a soundboard attached to a front of said back shell;

a neck extending from said back shell substantially parallel to a plane of said soundboard; and

a plurality of strings extending from an end of said neck away from said back shell to said soundboard;

wherein said back shell includes;

a back portion extending parallel and spaced from said soundboard;

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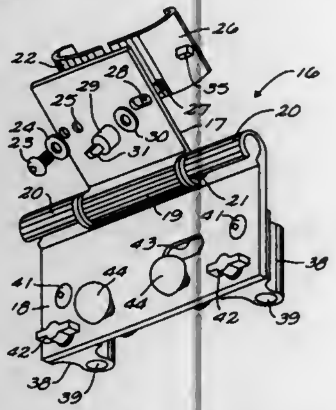
a plurality of sidewall portions extending transverse to the back portion so that the back portion and sidewall portions form a U-shaped cross section having an interior between opposing sidewall portions; and

a lip structure for attaching said soundboard, the lip structure extending transverse to said plurality of sidewall portions and outwardly away from said interior.

5,691,492
CARRIER ASSEMBLY FOR PERCUSSION INSTRUMENTS

Randall L. May, 2852 McGaw, Irvine, Calif. 92714
Filed Jan. 18, 1996, Ser. No. 588,244
Int. Cl.^{6} G10D *13/02;* **G10G** *5/00*
U.S. Cl. 84—421 **13 Claims**



1. Supporting hardware, for drums having a drum shell, a pair of drum beads and drum hoops and tension rods extending between and secured to the drum hoops, for supporting such drum on an external support, comprising:

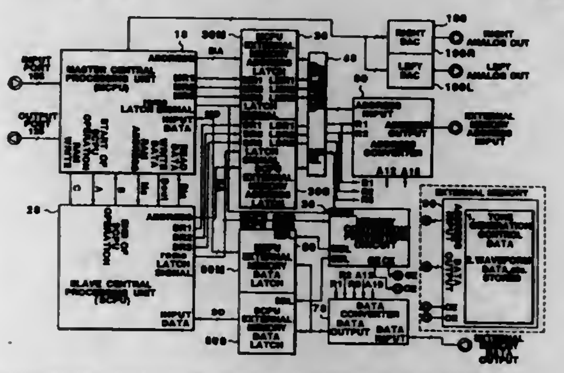
a hinge comprising a pair of hinge plates and a hinge pin interconnecting the same for pivotal movement,

one of said hinge plates including clamp means for clamping at least two of the drum tension rods for supporting the drums, and

another of said hinge plates having means for connection to an external support for supporting the drum clamped on said one hinge plate.

5,691,493
MULTI-CHANNEL TONE GENERATION APPARATUS WITH MULTIPLE CPU'S EXECUTING PROGRAMS IN PARALLEL

Ryuji Usami, Akigawa; Kosuke Shiba, Fussa; Koichiro Daigo, Fussa; Kazuo Ogura, Fussa; Jun Hosoda, Hanno; Teruo Jinbo, Fussa; Takashi Akutsu, Akishima; Yoshiki Negoro, Fussa; Yoshito Yamaguchi, Oome, and Hajime Manabe, Higashiyamato, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 709,101, May 29, 1991, Pat. No. 5,200,564. This application Jan. 7, 1993, Ser. No. 1,184
Claims priority, application Japan, Jun. 29, 1990, 2-170161; Jun. 29, 1990, 2-170169; Jul. 2, 1990, 2-175133
Int. Cl.^{6} G10H *1/12;1/14;7/02;* **G06F** *9/06*
U.S. Cl. 84—602 **9 Claims**



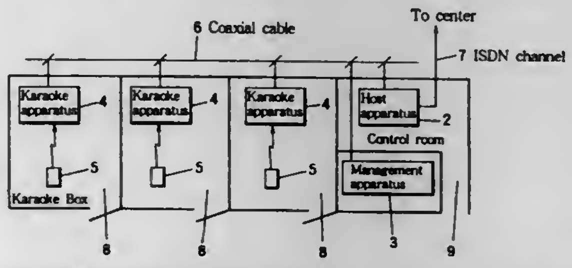
1. A digital information processing apparatus comprising:

at least first and second CPUs for executing respective programs of a multi-channel tone waveform generation process, said first and second CPUs being coupled to each other and including respective means to perform at least a portion of said multi-channel tone waveform generation process,

wherein a plurality of tone waveform signals are output in parallel from only one of said first and second CPUs responsive to execution of said respective programs of said multi-channel waveform generation process, without using either a tone generating circuit or discrete oscillators.

5,691,494
CENTRALIZED SYSTEM PROVIDING KARAOKE SERVICE AND EXTRANEOUS SERVICE TO TERMINALS

Tom Jen Sai, and Hirokazu Kato, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Sep. 29, 1995, Ser. No. 537,134
Claims priority, application Japan, Oct. 14, 1994, 6-249454
Int. Cl.^{6} G09B *5/00;* **G10H** *1/26*
U.S. Cl. 84—609 **10 Claims**



7. A method of transmitting data in an entertainment network, the entertainment network including at least one Karaoke apparatus, a host apparatus, a management apparatus, and a communication line coupling the Karaoke apparatus, the host apparatus, and the management apparatus, the method comprising:

selectively transmitting from the Karaoke apparatus to the communication line one of a signal representative of an entry code, the entry code representing a Karaoke service of a desired song, and a signal representative of an order code, the order code representing a request for an additional service other than the Karaoke service;

receiving the signal representative of the entry code at the host apparatus;

receiving the signal representative of the order code at the management apparatus;

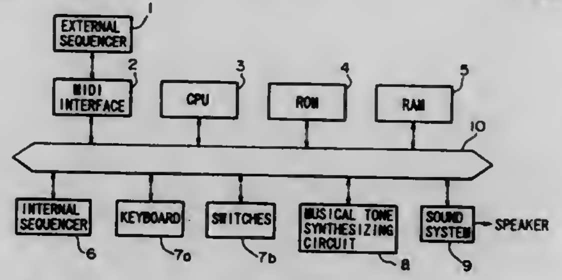
transmitting a signal representative of a response message from the management apparatus to the Karaoke apparatus through the communication line in response to a receipt of the signal representative of the order code at the management apparatus;

recording the request represented by the received order code at the management apparatus; and

receiving the signal representative of the response message at the Karaoke apparatus and displaying the received response message to indicate a status of the request represented by the order code.

5,691,495
ELECTRONIC MUSICAL INSTRUMENT WITH SYNCHRONIZED CONTROL ON GENERATION OF MUSICAL TONES

Junichi Fujimori, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Jun. 15, 1995, Ser. No. 490,805
Claims priority, application Japan, Jun. 17, 1994, 6-158235
Int. Cl.^{6} G10H *1/22;7/00*
U.S. Cl. 84—618 **5 Claims**



1. An electronic musical instrument comprising:

providing means for providing a plurality of tone-generation data which are sequentially transmitted in a time-series manner;

distinguishing means for distinguishing specific tone-generation data, representative of musical tones which should be generated simultaneously, from the plurality of tone-generation data;

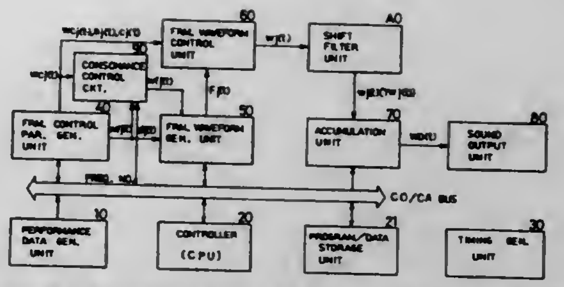
decision means for making decision as to whether or not a ready state is established, wherein the ready state indicates completion of preparation for sync generation of the musical tones represented by the specific tone-generation data; and

means for starting the generation of the musical tones when the decision means makes decision that the ready state is established.

5,691,496
MUSICAL TONE CONTROL APPARATUS FOR FILTER PROCESSING A MUSICAL TONE WAVEFORM ONLY IN A TRANSIENT BAND BETWEEN A PASS-BAND AND A STOP-BAND

Takashi Suzuki; Seiji Okamoto, both of Hamamatsu; Katsushi Ishii, Iwata, and Yutaka Washiyama, Hamamatsu, all of Japan, assignors to Kawai Musical Inst. Mfg. Co., Ltd., Shizuoka-ken, Japan
Filed Feb. 14, 1996, Ser. No. 600,000
Claims priority, application Japan, Feb. 14, 1995, 7-025058; Feb. 14, 1995, 7-025059; Feb. 14, 1995, 7-025060
Int. Cl.^{6} G10H *1/12;5/00*
U.S. Cl. 84—661 **42 Claims**

1. A musical tone control apparatus comprising:



musical tone waveform generation means for generating a musical tone waveform;

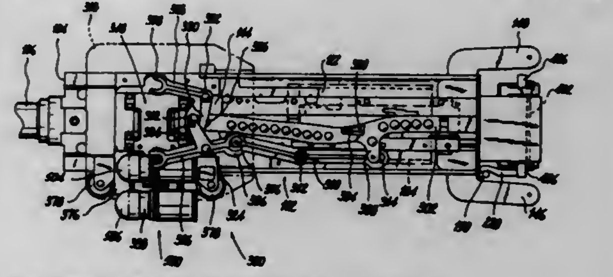
filter means for filter processing the musical tone waveform generated by said musical tone waveform generation means, said filter means filter processing all of the frequency bands of the musical tone waveform only in a transient band between a pass band and a stop band thereof;

control means for restricting the frequency band of the musical tone waveform so that the frequency band of the musical tone waveform generated by said musical tone waveform generation means is within the transient band of said filter means; and

musical tone output means for outputting the musical tone waveform subjected to filter processing by said filter means as a musical tone.

5,691,497
SELF-LOADING GRENADE LAUNCHER

Berthold Weichert, Zimmern; Ernst Wössner, Sulz; Gerhard Gielke, and Jürgen Gablowski, both of Oberndorf, all of Germany, assignors to Heckler & Koch, Oberndorf/Neckar, Germany
PCT No. PCT/EP94/03307, § 371 Date Sep. 5, 1995, § 102(e) Date Sep. 5, 1995, PCT Pub. No. WO95/10747, PCT Pub. Date Apr. 20, 1995
PCT Filed Oct. 6, 1994, Ser. No. 454,142
Claims priority, application Germany, Oct. 8, 1993, 43 34 421.7
Int. Cl.^{6} F41A *9/38*
U.S. Cl. 89—1.4 **55 Claims**



1. A self-loading grenade launcher comprising:

a cartridge belt feed including a plurality of pawls engaging in said cartridge belt, conveying a cartridge in horizontal direction up to a front of a cartridge chamber, said pawls being supported by at least two slides movable in opposite directions transverse to a firing direction and said pawls are arranged in a swingable feeder cover and protrude downwardly,

an inertia bolt, traveling from a release position due to a spring force of at least one closure spring, forward along a path of movement towards a cartridge chamber, said inertia bolt is adapted, upon forward travel, to push the cartridge conveyed by the pawls out of the cartridge belt into the cartridge chamber, and, after firing, due to the resultant recoil, to move back in return travel over the path of movement and cock said at least one closure spring,

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a control connected to said inertia bolt and said at least two slides and converts said forward and said backward travel of said inertia bolt into transversely directed alternating movement of said slides,'

a firing device including a firing pin cocked and held in cocked position by a lock, the lock being released and said cartridge fired before the inertia bolt has completed said forward travel, only when the cartridge has been introduced far enough into the cartridge chamber for withstanding the gas pressure of the firing, and

a housing connected to said cartridge chamber, extending along the path of movement and surrounding said chamber at least in part, said housing having a longitudinal center line including a center axis of said cartridge chamber; and

wherein between said inertia bolt and said housing, there is arranged a barrier comprising at least one ratchet pawl and ratchet teeth permitting said forward travel of said inertia bolt only after said inertia bolt has been moved backward to a minimum cocking position on a preceding return travel.

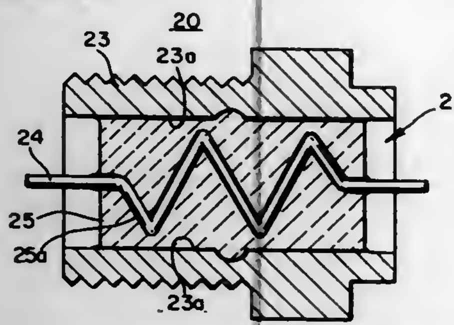
5,691,498
HERMETICALLY-SEALED ELECTRICALLY-ABSORPTIVE LOW-PASS RADIO FREQUENCY FILTERS AND ELECTROMAGNETICALLY LOSSY CERAMIC MATERIALS FOR SAID FILTERS

Homer William Fogle, Jr., Mesa, Ariz., assignor to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 832,473, Feb. 7, 1992, Pat. No. 5,367,956. This application Apr. 14, 1994, Ser. No. 227,677

Int. Cl.^{6} F42B *3/188*

U.S. Cl. 102—202.2 **7 Claims**



1. A monolithic combination electrical low-pass radio frequency absorbent filter and mechanical gas-tight seal apparatus comprising

an electrically conductive metallic casing having a passageway therethrough and an interior wall,

at least one metallic electrode extending through said passageway and not contacting said casing, and

means for attenuating high frequency electrical signals and for blocking the passage of gas through the passageway, said means including

a solid electromagnetically lossy substantially gas-impermeable plug fused to the interior wall of said casing passageway and to said electrode so as to partially imbed said electrode within said plug and completely span the remaining free cross section of said passageway,

the plug comprising a dense vitreous ceramic matrix of (a) a multi-component glass binder, 5–50% by weight, and (b) at least one electromagnetically lossy ferrimagnetic and/or ferroelectric filler interspersed throughout, 50–95% by weight, said ceramic matrix having mechanical and electrical properties of

linear expansion coefficient in the range of 3 to 20 ppm/°C.,
helium permeability not greater than 2×10^{-11} darcys,
working point in the range of 400° to 1000° C.,
strain point in the range of 250° to 700° C.,
Curie temperature in the range of 130° to 600° C.,
DC electrical volume resistivity in excess of 100 ohm-cm,
dielectric strength in excess of 150 volts/mil, and
unguided wave attenuation constant greater than 1 neper/meter at 1 MHz, and greater than 5 nepers/meter at 10 MHz and above.

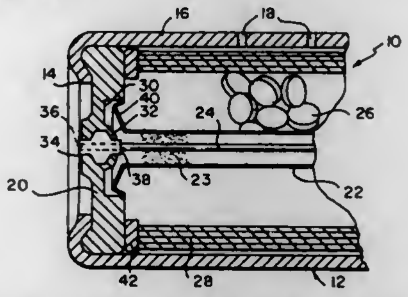
5,691,499
BRIDGEWIRE LADDER INITIATOR

Darrin L. Johnson, Fountain Hills, Ariz.; David W. Lindsey; Virginia E. Chandler, both of Ogden, Utah, and Robert D. Taylor, Hyrum, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Aug. 7, 1996, Ser. No. 689,315

Int. Cl.^{6} F42B *3/04;* **B60R** *21/26*

U.S. Cl. 102—202.5 **8 Claims**



1. A flash ignition system for use in an inflator that employs solid fuel gas generant material to effect the inflation of a protective bag to cushion a passenger from impact with the structure of a vehicle in the event of a crash, which inflator includes a tubular housing having an elongated chamber therein containing the solid fuel gas generant material with the tubular portion of the housing having aperture means therein for directing generated gases to the protective bag comprising,

an elongated perforated igniter tube positioned in the elongated chamber in the tubular housing with the solid fuel gas generant material therein distributed throughout the length of the chamber in surrounding relation to said igniter tube,

pyrotechnic ignition powder,

said igniter tube having an elongated chamber therein containing said pyrotechnic ignition powder,

an elongated initiator positioned in said igniter tube with said pyrotechnic ignition powder distributed throughout the length of said igniter tube in surrounding relation to said elongated initiator, said elongated initiator comprising a network of multiple bridgewires, and

means to apply an electrical stimulus to said network of multiple bridgewires.

5,691,500
REMOTELY-ACTUATED FIREWORKS LAUNCHER APPARATUS

Massimiliano Mancini, 6341 E. Norma Lee, W. Bloomfield, Mich. 48322

Filed Aug. 11, 1995, Ser. No. 514,486

Int. Cl.^{6} F42B *4/04*

U.S. Cl. 102—361 **6 Claims**

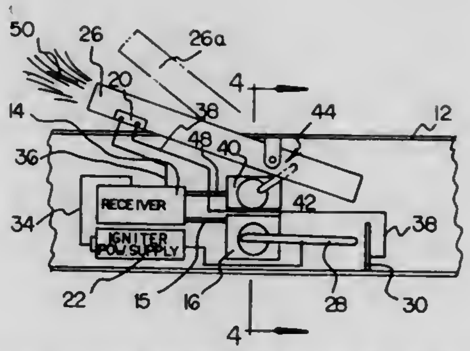
1. A remotely-actuated fireworks launcher apparatus, comprising:

a housing assembly,

an signal receiver housed within said housing assembly,

an ignition servo electrically connected to said signal receiver and housed with said housing assembly,

a servo-actuated ignition switch operated by said ignition servo, wherein said servo-actuated ignition switch is in an ignition circuit which also includes an electric igniter assembly, and a power supply,



a fireworks receiver assembly attached to said electric igniter assembly, wherein said fireworks receiver assembly receives a fireworks device that is ignited by said electric igniter assembly, and

a manually operated ignition signal transmitter which is actuated to transmit signals for activation of said signal receiver,

further including:

a receiver-tilt servo controlled by said signal receiver,

a manually operated tilt signal transmitter which is actuated to transmit signals for activation of said receiver-tilt servo,

a tilting assembly connected between said receiver-tilt servo and said fireworks receiver assembly, and

a pivot assembly, connected between said housing assembly and said fireworks receiver assembly.

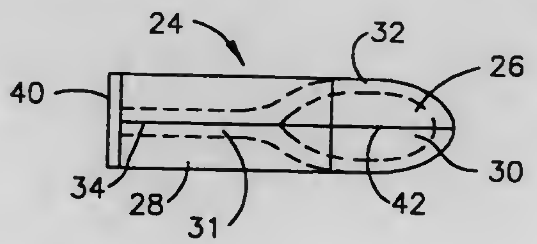
5,691,501
LONG-RANGE NONLETHAL BULLET

Raine M. Gilbert, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 8, 1996, Ser. No. 687,070

Int. Cl.^{6} F42B *8/14*

U.S. Cl. 102—444 **19 Claims**



1. A bullet, comprising:

a front section in a forward portion of the bullet, the front section including a tail that extends to a rear portion of the bullet, a hollow space located within a forward portion of the front section;

a solid section in the rear portion of the bullet, the solid section being substantially disposed around the tail;

at least two longitudinal scribe lines that extend along the front section and the tail; and

at least another two longitudinal scribe lines that extend along the solid section and are respectively aligned with the at least two longitudinal scribe lines, wherein depths of the at least two and at least another two longitudinal scribe lines are such that the bullet maintains shape integrity during flight while readily deploying into a flattened shape upon impact.

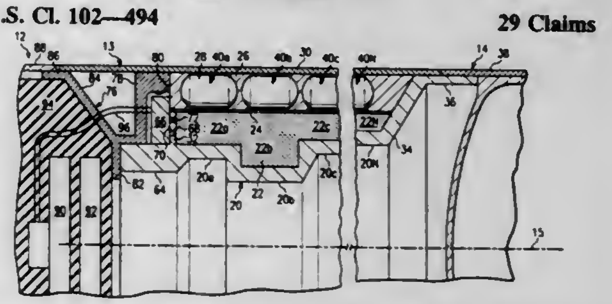
5,691,502
LOW VELOCITY RADIAL DEPLOYMENT WITH PREDETERMINDED PATTERN

Gerald Graves Craddock, Arlington, and Elmer C. Cruise, Grapeland, both of Tex., assignors to Lockheed Martin Vought Systems Corp., Grand Prairie, Tex.

Filed Jun. 5, 1995, Ser. No. 464,358

Int. Cl.^{6} F42B *12/32*

U.S. Cl. 102—494 **29 Claims**



1. In a device for radially deploying a plurality of objects at a low velocity in order to achieve a predetermined pattern of the deployed objects, said device comprising:

an inner wall member having a central longitudinal axis,

an annular body of low velocity explosive having a central longitudinal axis and a density of less than about 1.2 g/cc, said annular body of low velocity explosive having a detonation velocity of less than 6000 meters per second, said annular body of low velocity explosive being positioned exteriorly of said inner wall member with the central longitudinal axis of said annular body of low velocity explosive extending at least substantially along the central longitudinal axis of said inner wall member,

a plurality of annular arrays positioned coaxially with and exteriorly of said annular body of low velocity explosive at different locations along the central longitudinal axis of said annular body of low velocity explosive, each of said annular arrays comprising a plurality of objects positioned at spaced locations about the circumference of the respective annular array; the improvement:

wherein said inner wall member comprises a plurality of annular wall sections spaced along said central longitudinal axis, each of said annular wall sections having a substantially cylindrical outer surface, with longitudinally adjacent annular wall sections having differing outer diameters;

wherein said annular body of low velocity explosive comprises a plurality of annular explosive sections, each of said annular explosive sections being positioned coaxially with and exteriorly of the substantially cylindrical outer surface of a respective one of said annular wall sections;

wherein each of said annular arrays is positioned coaxially with and exteriorly of a respective one of said annular explosive sections and a respective one of said annular wall sections to form a radially adjacent combination of an annular wall section, an annular explosive section, and an annular array; and

wherein each such radially adjacent combination differs from each radially adjacent combination longitudinally adjacent thereto by at least one of an amount of low velocity explosive in the respective annular explosive sections, a composition of the low velocity explosive in the respective annular explosive sections a radial thickness of the respective annular wall sections, a rigidity of the respective annular wall sections and the mass of the plurality of objects in the respective annular arrays, such that the energy provided to the objects in a first one of said plurality of annular arrays by the annular explosive section radially adjacent thereto is different from the energy provided to the objects in a second one of said plurality of annular arrays by the annular explosive section radially adjacent thereto.

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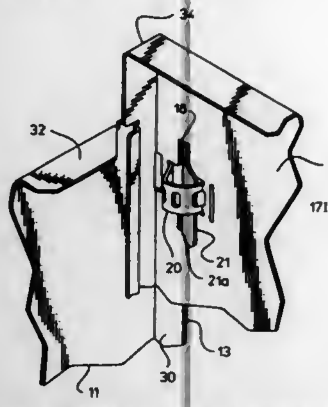
5,691,503
ELECTRO-MAGNETICALLY SHIELDED DOOR HINGE

Junichi Kato, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1994, Ser. No. 332,627

Int. Cl.⁶ H05K *9/00*

U.S. Cl. 174—35 R **20 Claims**



1. An EM shielded hinge structure for hinging a metallic access door to a metallic cabinet baving a plurality of side panels, said binge structure comprising:

a hinge tab extending from and integral with one side edge of said access door, said tab having a lower edge, an upper edge and an outer edge, said tab being bent at a first acute angle from the plane of the door, and a portion of said tab lower edge extending outwardly, thereby forming a notch between said tab and said one side edge of said access door; and

tab receiving means located in one of said side panels for receiving said hinge tab and for providing support for pivoting said hinge tab in a hinged relationship therewith, said tab receiving means including a first elongated slot in siad one side panels having a slot length coextensive with the length of said tab outer edge, said tab receiving means also including a raised metal arch extending inwardly from and integral with said side panel and bridging the central portion of said slot, said raised arch spaced apart from the surface of said side panel to permit said tab outer edge to freely rotate when said access door is swung open and closed, said arch forming an electro-magnetic shield to radiation otherwise leaking through said elongated slot.

5,691,504
MULTILAYER COMPUTER CHASSIS HAVING INTEGRAL CIRCUIT BOARD MOUNTING AND GROUNDING STRUCTURE

Steven L. Sands, and George Thomas Holt, both of Austin, Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed May 5, 1995, Ser. No. 435,921

Int. Cl.⁶ H05K *5/00*

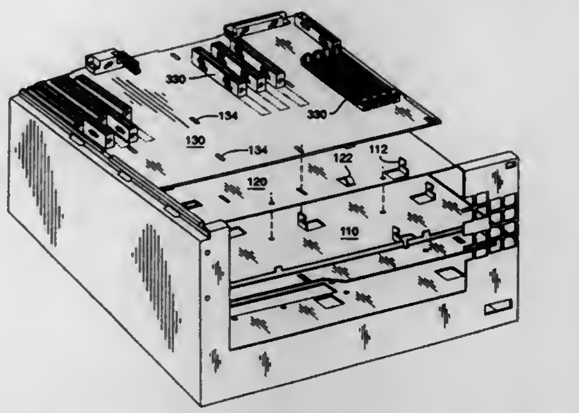
U.S. Cl. 174—35 R **36 Claims**

1. A chassis assembly comprising:

a circuit board;

an outer chassis portion composed of a conductive material and having a plurality of associated pairs of integral circuit board mounts and outer chassis apertures formed in a substantially planar wall thereof, said circuit board mounts protruding toward an interior of said outer chassis portion; and

an inner chassis portion having a plurality of associated pairs of integral spring members and inner chassis apertures formed in a substantially planar wall thereof, said plurality of circuit board mounts registerable with said plurality of inner chassis apertures to allow said plurality of circuit board mounts to pass through said plurality of inner chassis apertures as said wall of said inner chassis portion is brought into proximity with said wall of said outer chassis portion, said wall of said inner chassis portion substantially occluding said outer chassis apertures and said wall of said outer chassis portion substantially occluding said inner chassis apertures to form an electromagnetic interference (EMI) shield, said plurality of circuit board mounts and said plurality of spring members cooperable to mount said circuit board to said chassis and to provide a grounding path from said circuit board to said chassis for electrical currents associated with said circuit boar



wherein each of said plurality of circuit board mounts comprises a hook portion, an inner surface of said hook portion bearable against a first surface of said circuit board to retain said circuit board in proximity with said inner chassis portion.

5,691,505
ELECTRIC CABLE TERMINATION GLAND

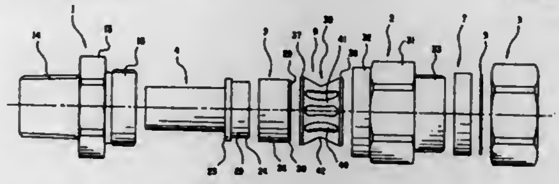
Trevor William Norris, Ashton-under-Lyne, England, assignor to Hawke Cable Glands Limited, England

Filed Jun. 21, 1996, Ser. No. 667,440

Claims priority, application United Kingdom, Jun. 24, 1995, 9512939

Int. Cl.⁶ H02G *3/18*

U.S. Cl. 174—51 **16 Claims**



1. An electric cable termination gland comprising an entry component for connection to electrical equipment, a middle nut to engage with said entry component and having an abutment shoulder therein, a tail nut to engage with said middle nut, said entry component having an end abutment received inside an end of said middle nut remote from said tail nut, and a continuity member located inside said middle nut between said abutment shoulder and said end abutment, said continuity member having two opposed ends and a middle region of reduced strength provided by a series of discrete bridge portions separated by spaced apart apertures such that tightening said middle nut on said entry component when an electric cable extends through the gland with a conductive part being exposed within said middle nut, subjects said continuity member to axial pressure causing said region of reduced strength to fold inwardly whereby said bridge portions are displaced towards and engage the conductive part to provide at least one electrical continuity contact within said middle nut.

5,691,506
GROUND STRUCTURE FOR SHIELD WIRE AND METHOD FOR GROUNDING WIRE

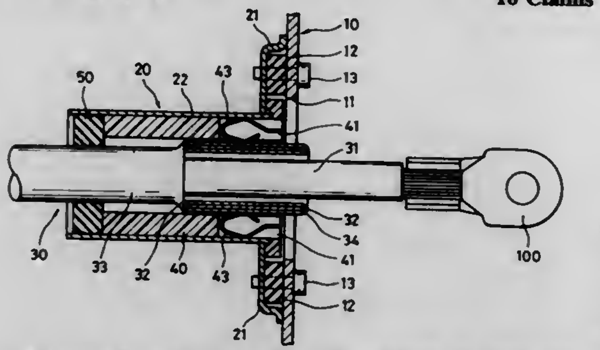
Sho Miyazaki; Fumiyoshi Tanigawa, both of Yokkaichi; Toshiyuki Sekimori, and Yasuyoshi Fukao, both of Toyota, all of Japan, assignors to Sumitomo Wiring Systems Ltd., Mie, Japan

Filed Sep. 7, 1995, Ser. No. 524,562

Claims priority, application Japan, Sep. 27, 1994, 6-258920

Int. Cl.⁶ H01R *9/05*

U.S. Cl. 174—65 R **16 Claims**



1. A ground structure for a shield wire wherein the shield wire includes an inner wire covered with an insulating member, a braided wire covering said inner wire, and an insulating member covering an outer periphery of said shield wire, the shield wire being passed through a through hole in a metal casing, and said braided wire being electrically connected to said metal casing, thereby grounding said shield wire, said ground structure comprising:

a U-shaped shield ring of a conductive material that has a double-wall tubular construction having two walls, said shield ring firmly holding said braided wire of said shield wire between said two walls;

a first tubular member of a conductive material in which said shield ring is inserted with a predetermined space formed therebetween, one end of said first tubular member being connected to said metal casing; and

spring pieces of a conductive material that are beld within said first tubulăr member, said spring pieces resiliently contacting an inner surface of said first tubular member and an outer surface of said conductive shield ring.

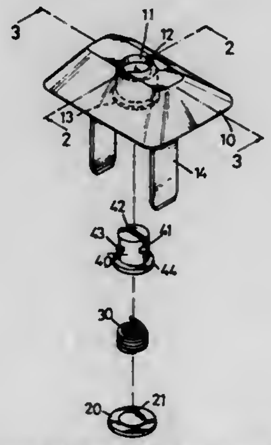
5,691,507
PROTECTIVE COVER FOR OUTLET

Ming-chin Wei, 3F-2, No. 13, Wuchuan 1st Rd., Wuku Industrial Park, Hsinchuang, Taipei Hsien, Taiwan

Filed Mar. 4, 1996, Ser. No. 610,273

Int. Cl.⁶ H02B *1/14*

U.S. Cl. 174—67 **19 Claims**



1. A protective cover for electrically insulating and mechanically concealing hot slots of an electrical supply outlet comprising:

a body baving a top surface, a bottom surface of a sufficient dimension to cover the hot slots, and a hole provided through the top surface;

a plurality of tongues extending from said bottom surface for inserting into the hot slots of the electrical supply outlet; and

means received in the hole for removing said body from said electrical supply outlet; wberein said hole is a through-bole for disposing said removing means from a bottom of the through-hole and said removing means comprises a peg slidably retained within the through-bole and a spring for urging said peg to protrude from the top surface of the body, the body being removable via a protruded portion of the peg.

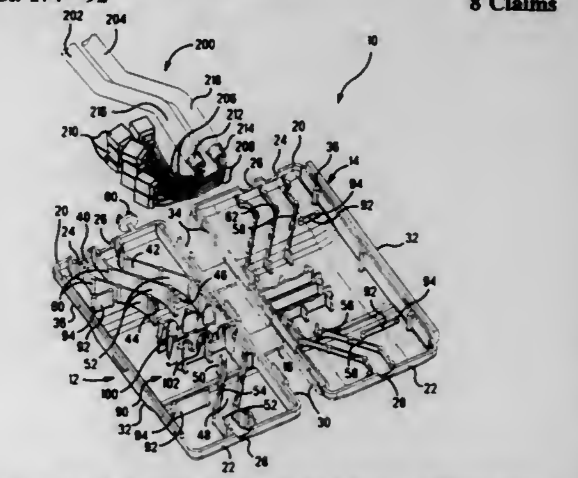
5,691,508
ENCLOSURE FOR SPLICED MULTICONDUCTOR CABLE

David Ray Radliff, Harrisburg; Todd Richard Okimoto, Pittsburgh, and Leung Man Shiu, Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 506,679, Jul. 25, 1995, Pat. No. 5,606,150. This application Oct. 31, 1995, Ser. No. 558,569

Int. Cl.⁶ H02G *15/113*

U.S. Cl. 174—92 **8 Claims**



1. An enclosure for being secured about a splice connection of a pair of electrical cables and having opposed first and second cover members adapted to be secured to each other about the splice connection to define the enclosure therearound, said enclosure comprising a splice-receiving region between opposed ends of said enclosure, said first cover defining at least one routing channel extending to said splice-receiving region from a respective cable entrance at each of said opposed enclosure ends, said first cover including at least two embossments spaced inwardly from said enclosure ends and along said routing channel and extending inwardly from respective inner cover surfaces, and said embossments being so positioned to require that said cables inserted therealong must be bent sequentially at two spaced locations and toward opposite sides of said first cover to pass by said embossments during cable insertion to extend between respective said cable entrances and said splice-receiving region, said routing channel thereby being serpentine and said cables being bent around said embossments defining a cable strain relief.

5,691,509
FLEXIBLE CABLE TERMINATION AND CONNECTOR SYSTEM

Alfiero Balzano, 11762 "O" Western Ave., Stanton, Calif. 90680

Filed Sep. 11, 1995, Ser. No. 526,689

Int. Cl.⁶ H01R *9/07*

U.S. Cl. 174—117 F **1 Claim**

1. A flat flexible cable, comprising:

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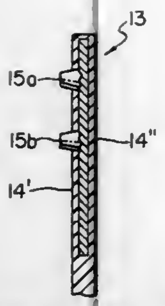
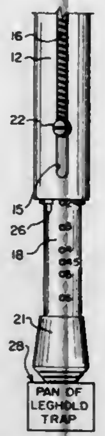


- a length of cable including conductors disposed side-by-side and parallel to one another, said conductors being encased in insulation material, said length of cable having a first connector end and a second connector end;
- said conductors at said first end being exposed for a predetermined length;
- said conductors at said second end including at least two two contact nodes projecting away from said conductors, all portions of said conductors at said second end, except said contact nodes, being encased in said insulation material;
- the width of said cable at said second end exceeds the width of said cable at said first end, and said cable second end further comprises registration holes through the insulation which are disposed on opposite sides of said conductors;
- said conductors at said second end are substantially flattened and extend along the longitudinal axis of said cable, and said nodes extend in a direction which is normal to said axis;
- contact pads;
- said nodes include roughened outer surfaces for scraping engagement with said contact pads; and
- means disposed against said second end forcibly urging said nodes into engagement with said contact pads.

5,691,510
PAN TENSION MEASURING DEVICE FOR LEGHOLD TRAPS

John W. Turman, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 13, 1995, Ser. No. 387,071
Int. Cl.^{6} G01G *3/00;19/00;* **A01M** *23/00;23/26*
U.S. Cl. 177—225 **2 Claims**



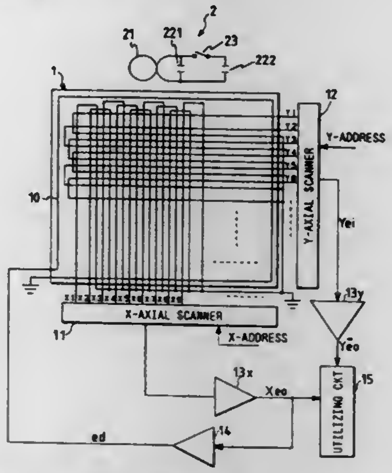
1. The combination of a trap pan tension scale device and an adjustable tension trap pan device on a trap comprising:

- a trap pan device including an adjustable tension trap pan, and
- a tension scale device including
- a housing with an elongated slot extending along the housing, said housing having an open front end,
- a compression means in the housing,
- a movable member having a rear portion telescoping in said housing and a front portion extending beyond said open end, said movable member having an outer end that is urged against said adjustable tension trap pan to move said movable member further into said housing against the compression forces of said compression means with amount of tension being related to the amount of force to move the movable member a selected distance into the housing,
- a fastening member extending through the housing slot and into said movable member to hold the movable member in the housing,
- a scale in the form of a series of spaced marks on said movable member calibrated in relation to distance along said movable member to indicate tension, and
- an indicator slidable on the movable member that is moved against said open end of the housing when said movable member moves into said housing whereby to indicate on said scale the tension on said adjustable tension trap pan.

5,691,511
CORDLESS DIGITIZER

Kelichi Matsushima, and Shuuji Hirano, both of Kanagawa, Japan, assignors to Graphtec Corporation, Kanagawa, Japan

Filed Oct. 25, 1994, Ser. No. 328,523
Claims priority, application Japan, Oct. 29, 1993, 5-325722
Int. Cl.^{6} G08C *21/60*
U.S. Cl. 178—19 **7 Claims**



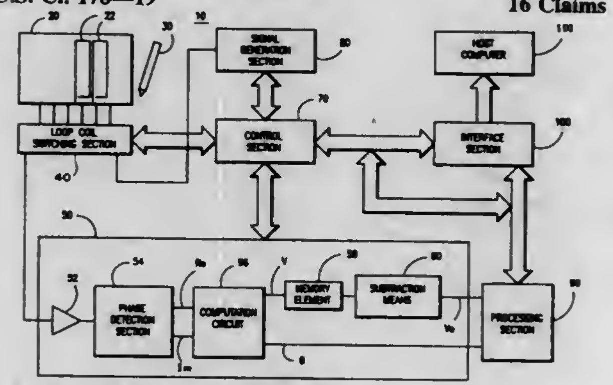
1. A cordless digitizer, comprising:

- a tablet including position detecting elements formed of loop coils, error compensating elements formed of loop coils, and an auxiliary element formed of a coil which is arranged around a reading range of said tablet; and
- a position indicator including a position indicating element; and
- error compensating means which, when said position indicator is set at a position on said tablet, obtains first outputs according to interactions between said position detecting elements, said auxiliary element of said tablet and said position indicating element of said position indicator, and second outputs according to interactions between said error compensating elements, said auxiliary element of said tablet and said position indicating element of said position indicator, wherein said first and second outputs are compared to produce third outputs from which error output components caused by direct actions between said position detecting elements and said auxiliary element of said tablet have been eliminated;
- a position detecting loop coil assembly provided on said tablet which comprises loop coils arranged thereon at predetermined intervals in such a manner that adjacent loop coils are set close to one another but not overlapped with one another; and
- loop coil selecting means for selecting, from among said loop coils, a predetermined loop coil as a position detecting element, and a loop coil adjacent to said predetermined loop coil as an error compensating element.

5,691,512
POSITION TRANSDUCER, AND METHOD FOR ELIMINATING NOISE THEREFROM

Katsuhito Obi, Otone-machi, Japan, assignor to Wacom Co., Ltd., Saitama, Japan

Filed May 3, 1995, Ser. No. 434,297
Claims priority, application Japan, May 16, 1994, 6-125758
Int. Cl.^{6} G08C *21/00*
U.S. Cl. 178—19 **16 Claims**



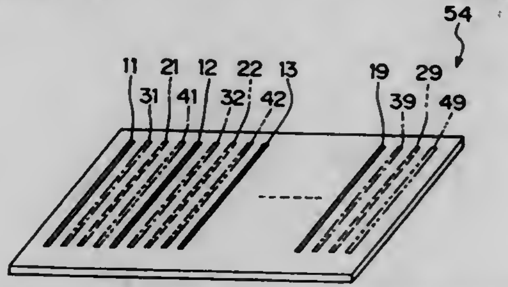
1. A position transducer, comprising:

- a plurality of loop coils arranged side by side in a direction of position sensing;
- a position indicator for electromagnetic interaction with one of said loop coils;
- a transmission means for selectively transmitting or interrupting a first signal to said one of said loop coils;
- a receiving means for receiving a second signal from said one of said loop coils;
- a first memory means for storing a level of said second signal, said level being obtained as a result of processing of said second signal;
- subtraction means for extracting an amplitude level, corresponding to said second signal developed in said one of said loop coils as a result of the electromagnetic interaction of said position indicator with said one of said loop coils, by subtracting a noise level obtained from a third signal received when transmission of said first signal is interrupted, from said second signal level; and
- processing means for calculating coordinates of said position indicator based on said amplitude level.

5,691,513
SCANNING METHOD FOR SENSOR COILS IN COORDINATE DATA INPUT DEVICE

Masayasu Yamamoto, and Takeshi Yoneda, both of Otone-machi, Japan, assignors to Wacom Co., Ltd., Otone-machi, Japan

Filed Sep. 25, 1995, Ser. No. 533,458
Int. Cl.^{6} G08C *21/00;* **G09G** *3/02*
U.S. Cl. 178—19 **17 Claims**



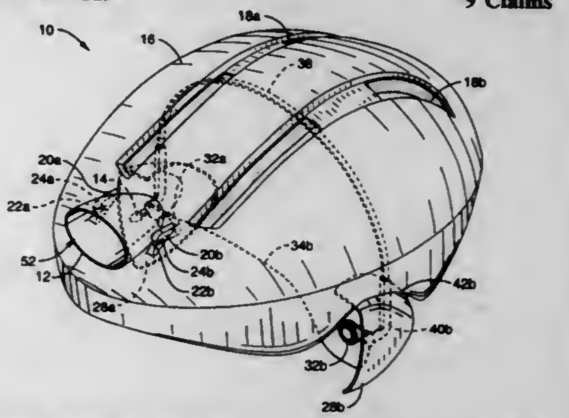
1. In a coordinate data input system which includes a sensor plate containing a plurality of sensor coils arranged parallel to the detecting direction and a pointing device, and detects the coordinate data on the pointing device by an interaction between each one of the sensor coils and the pointing device, a scanning method for succeedingly selecting one from the sensor coils to detect the signal generated by the interaction comprising;

- an interval scanning operation for scanning, skipping the predetermined number of sensor coils, the limited sensor coils located at the predetermined interval space of the whole sensor coils.

5,691,514
REARWARD SOUND ENHANCING APPARATUS

Timothy J. Landis, Loomis, Calif., assignor to OP-D-OP, Inc., Roseville, Calif.

Filed Jan. 16, 1996, Ser. No. 586,086
Int. Cl.^{6} H04R *25/00;* **A42B** *1/08*
U.S. Cl. 181—129 **9 Claims**



1. Sound enhancing apparatus for wearing on a person's head and enhancing sounds received by a least one of said person's ears from a rearward direction relative to said person's head, comprising:

- (a) a parabolic cup;
- (b) a microphone positioned within said parabolic cup;
- (c) an ear housing;
- (d) an earphone electrically connected to said microphone, said earphone positioned within said ear housing;
- (e) means, coupled to said parabolic cup, for supporting said parabolic cup on said person's head such that said parabolic cup receives sounds from a rearward direction relative to said person's head;
- (f) means, coupled to said ear covering, for positioning and holding said speaker adjacent to a wearer's ear; and
- (g) means, coupled to said earphone, for supporting said earphone adjacent to said persons ear and within said ear housing.

5,691,515
REARWARD SOUND ENHANCING APPARATUS

Timothy J. Landis, Loomis, Calif., assignor to OP-D-OP, Inc., Roseville, Calif.

Continuation-in-part of Ser. No. 586,086, Jan. 16, 1996. This application Jun. 28, 1996, Ser. No. 672,473
Int. Cl.^{6} H04R *25/00*
U.S. Cl. 181—129 **18 Claims**

1. A rearward sound enhancing apparatus worn over a wearer's ear, comprising:

- (a) an ear cover, said ear cover including an inner compartment and an outer compartment, said inner and outer compartments each having a rearward facing opening;
- (b) a microphone, said microphone mounted within said outer compartment of said ear cover;
- (c) a speaker, said speaker mounted within said inner compartment of said ear cover, said speaker electrically connected to said microphone; and

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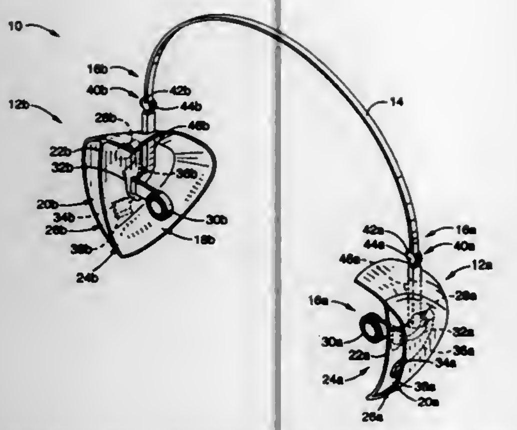


(d) support means, coupled to said ear cover, for supporting said ear cover over a wearer's ear.

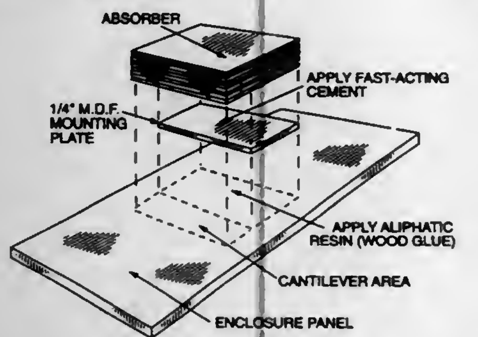
5,691,516
TUNABLE VIBRATION ABSORBER

Leonard Thomasen, Cotati, Calif., assignor to Tekna Sonic, Inc., Cotati, Calif.

Continuation-in-part of Ser. No. 263,927, Jun. 21, 1994, Pat. No. 5,583,324. This application Jul. 19, 1996, Ser. No. 683,894

Int. Cl.^{6} A47B *81/06*

U.S. Cl. 181—199 **2 Claims**



1. A method for tuning a vibration damping unit upon installation of the unit on a panel of a speaker enclosure, comprising:

providing a vibration damping unit comprising a mounting plate or base plate, a series of vibration damping plates and a series of spacers between adjacent damping plates and between the mounting or base plate and an adjacent damping plate, the damping plates, spacers and mounting or base plate being rigidly secured together in such a way as to provide a freely extending, cantilevered length of each damping plate,

providing a temporary spacer for positioning between the vibration damping unit and a speaker enclosure panel,

temporarily securing the vibration damping unit, via its mounting plate, to the temporary spacer and securing the temporary spacer to the speaker enclosure panel,

directing sound through a speaker of the speaker enclosure to thereby create vibrations in the speaker enclosure panel,

positioning the vibration damping unit in a position so as to overhang the temporary spacer, leaving a portion of the vibration damping unit's mounting plate spaced from the speaker enclosure panel while another portion of the unit's mounting plate is secured against the temporary spacer which is in turn secured against the speaker enclosure panel,

adjusting the length of overhang of the vibration damping unit relative to the temporary spacer while measuring vibrations of a selected frequency range in the speaker enclosure panel, until a overhang position of maximum attenuation in the selected frequency range is achieved, and

providing a tuning mounting plate for permanent installation of the vibration damping unit, the tuning mounting plate having dimensions to effect the dimension of overhang determined to achieve maximum attenuation in the selected frequency range, and securing the vibration damping unit to the tuning mounting plate and securing the tuning mounting plate to the speaker enclosure panel.

5,691,517
MULTIDIRECTIONAL LEVER SWITCH DEVICE

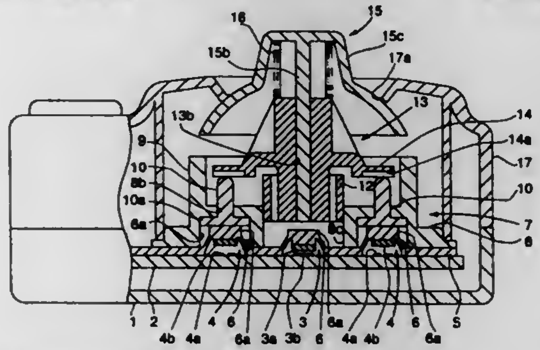
Tetsuo Yamamoto; Yoshikazu Taniguchi, and Junichi Kojima, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Continuation-in-part of Ser. No. 341,878, Nov. 15, 1994. This application May 17, 1995, Ser. No. 443,318

Claims priority, application Japan, Nov. 19, 1993, 5-314572; Jul. 4, 1994, 6-176115; Sep. 2, 1994, 6-234340

Int. Cl.^{6} H01H *25/04*

U.S. Cl. 200—6 A **10 Claims**



1. A lever switch device, comprising:

an operating lever that is tiltable into and about a plurality of tilting positions;

a plurality of switch elements disposed about the operating lever;

a plurality of operating elements, wherein each of the plurality of operating elements corresponds to one of said plurality of switch elements, wherein tilting of said operating lever into a tilting position displaces an operating element, said displacement causing a corresponding switch element to be actuated, wherein selected ones of the operating elements actuate corresponding switch elements in response to a first amount of tilting of the operating lever, and wherein others of said operating elements actuate corresponding switch elements in response to a second amount of tilting of said operation lever; and

a housing that extends along a longitudinal axis and that accommodates the operating lever, the plurality of switch elements and the plurality of operating elements, wherein tilting said operating lever said first amount in an acute angular direction relative to the longitudinal axis displaces one of the select ones of the operating elements and wherein tilting said operating lever said second amount in one of a parallel direction and a perpendicular direction relative to the longitudinal axis displaces one of said others of said operating elements.

5,691,518
SLIDING TRIGGER INTERLOCK AND SECONDARY DISCONNECT CONTACTS FOR DRAWOUT SWITCHES

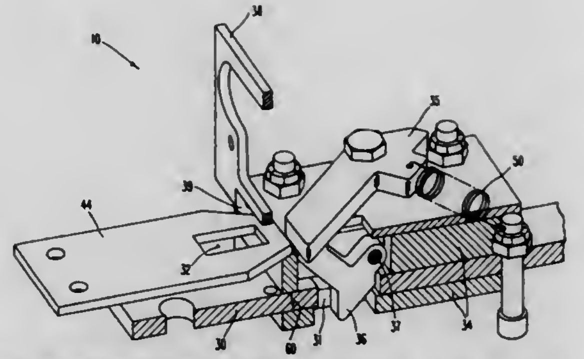
Murray K. Jones, Johnsonville, and Terry A. Jernigan, Florence, both of S.C., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Filed Oct. 13, 1995, Ser. No. 552,519

Int. Cl.^{6} H01H *9/20*

U.S. Cl. 200—50.21 **22 Claims**

1. An automatic interlocking mechanism for aligning a removable element to a stationary enclosure wherein the removable element is movable into and out of the stationary enclosure among



first, second and third positions, said automatic interlocking mechanism comprising:

a guide bar fixedly attached to one of the stationary enclosure and the removable element, said guide bar extending substantially parallel to the direction of movement of the removable element into and out of the stationary enclosure;

a slide block slidably mounted on said guide bar;

first means for locking said slide block in place on said guide bar at a first position, for releasing said slide block from its locked position when the removable element is moved to the second position from the first position so that said slide block can move relative to said guide bar when the removable element moves between the second and third positions, for latching the removable element to said slide block when the removable element is moved to the second position, and for preventing the removable element from engaging the slide block at a point other than the second position.

5,691,519
ELECTRIC SWITCH, FOR USE ON AUTOMOTIVE STEERING COLUMN SWITCH

Hermann Mahr, Waldalgesheim, Germany, assignor to Eaton Corporation, Cleveland, Ohio

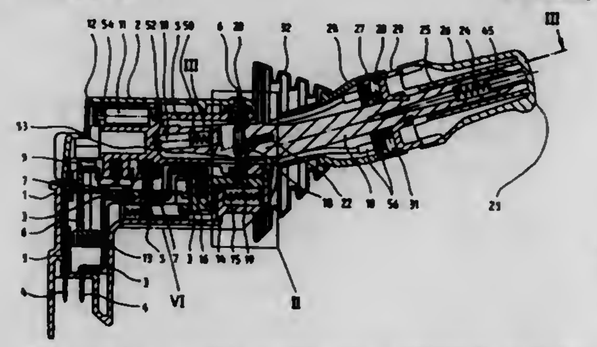
PCT No. PCT/DE94/00304, § 371 Date Mar. 11, 1996, § 102(e) Date Mar. 11, 1996, PCT Pub. No. WO94/21489, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 17, 1993, Ser. No. 525,794

Claims priority, application Germany, Mar. 25, 1993, 43 19 711.1

Int. Cl.^{6} H01H *9/00*

U.S. Cl. 200—61.54 **10 Claims**



1. An automotive steering column switch, featuring a casing and a switching lever fitted in the switch casing and rotatable about an axis and serving to switch at least one electric circuit, wherein the switching lever supports on an exposed end thereof a spring-loaded push button for acting upon a further electric circuit, characterized in that the push button (23) acts upon a spring-loaded connecting rod (22) which is in working connection with a pivotable cross lever (18) situated in the axis of rotation (6) of the switching lever (10) said cross lever connected to a spring-loaded switching member (14) acting upon contacts (4).

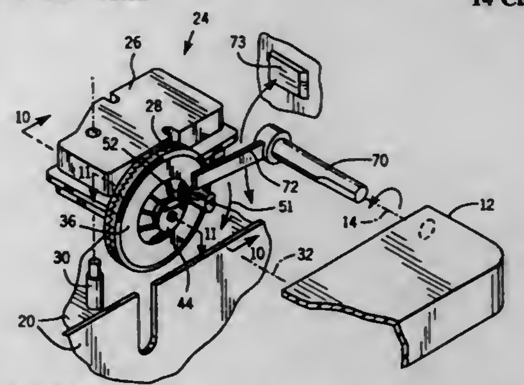
5,691,520
SELF ADJUSTING LID SWITCH

Kenyon A. Hapke, Libertyville, Ill.; David M. Howie, Waukesha, and Spencer C. Schantz, Dousman, both of Wis., assignors to U.S. Controls Corporation, New Berlin, Wis.

Filed Dec. 8, 1995, Ser. No. 569,467

Int. Cl.^{6} H01H *21/04*

U.S. Cl. 200—61.62 **14 Claims**



1. A switch assembly for a top-loading washing machine or the like having a lid hinged about a hinge axis at one edge to open and close between a closed position with the lid substantially aligned with a top surface of the washing machine, and an switch off position where a second edge of the lid opposite the hinged edge is raised with respect to a position of said second edge when the lid is closed, the switch assembly comprising:

a) a electric switch having contacts and an operator, the operator moving in a first direction to actuate the contacts at a switch actuation point and moving in a second direction to de-actuate the contacts at a de-actuation point;

b) a stop positioned with respect to the operator to limit movement of the operator at a stop point in the first direction after the actuation point of the contacts, the stop point being a predetermined distance from the de-actuation point; and

c) a twist joint having a first and second end twisting with respect to each other only upon an occurrence of a first predetermined force between the first and the second end, the first end connected with the lid to move with opening and closing of the lid and the second end connected with the switch operator to move the switch operator in the first direction with closing of the lid and to move in the second direction with opening of the lid;

whereby a first closing of the lid causes twisting of the twist joint after the switch operator reaches the stop point; and whereby the opening of the lid after the first closing causes the operator to move in the second direction past the de-actuation point before the lid has opened by a predetermined amount.

5,691,521
VACUUM CIRCUIT BREAKER WITH IMPROVED CONTACT ASSEMBLY

Katsuhiro Komuro; Yoshitaka Kojima; Yukio Kurosawa; Shunkichi Endoo; Tooru Tanimizu; Yoshimi Hakamata, and Katsumi Kuroda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1995, Ser. No. 419,542

Claims priority, application Japan, Apr. 11, 1994, 6-098252

Int. Cl.^{6} H01H *33/66*

U.S. Cl. 218—123 **12 Claims**

1. A vacuum switch comprising:

a vacuum vessel for forming a vacuum chamber;

a fixed side electrode unit provided in said vacuum vessel; and

a movable side electrode unit provided in said vacuum vessel;

each of said fixed side electrode unit and said movable side electrode unit being respectively comprised of an arc electrode member, an arc electrode supporting member for sup-

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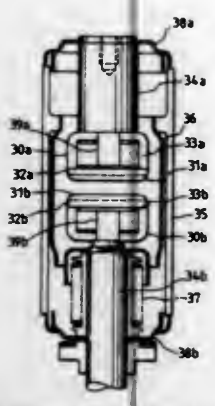
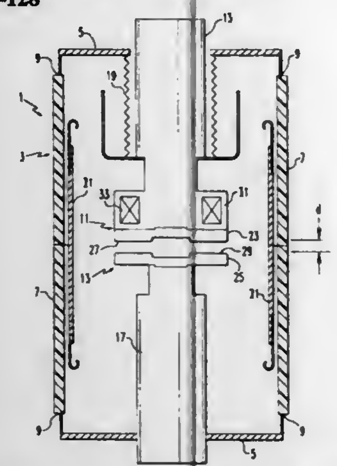


porting said arc electrode member, a coil electrode member and a conducting rod; wherein

joining portions between said arc electrode member and said arc electrode supporting member, said coil electrode member and said conducting rod are integrally and directly formed metallurgically by solid phase diffusion using a hot isostatic press process.

5,691,522
VACUUM INTERRUPTER WITH A SINGLE INTERNAL ASSEMBLY FOR GENERATING AN AXIAL MAGNETIC FIELD

Michael Bruce Schulman, and Paul G. Slade, both of Ithaca, N.Y., assignors to Eaton Corporation, Cleveland, Ohio
Filed Jun. 7, 1995, Ser. No. 488,401
Int. Cl.⁶ H01H ***33/66***
U.S. Cl. 218—128 **6 Claims**



1. A vacuum interrupter having a maximum interruption capability of peak current I_m, comprising first and second coaxially aligned electrode assemblies that are relatively movable along a common longitudinal axis between an open circuit position and a closed circuit position, each including a contact surface confronting the contact surface of the other electrode assembly, only the first electrode assembly including axial magnetic field means for producing a substantially longitudinal magnetic field B in a contact gap between the contact surfaces, wherein with the electrode assemblies in the open circuit position and the instantaneous arc current being I_m measured in kiloamperes, the instantaneous component of B in the axial direction B_a, measured in milliteslas, imposed on the majority of each contact surface is:

$$5I_m\mathrm{mT/kA} > B_a \geqq 3.2\,(I_m-9\ \mathrm{kA})\,\mathrm{mT/kA}.$$

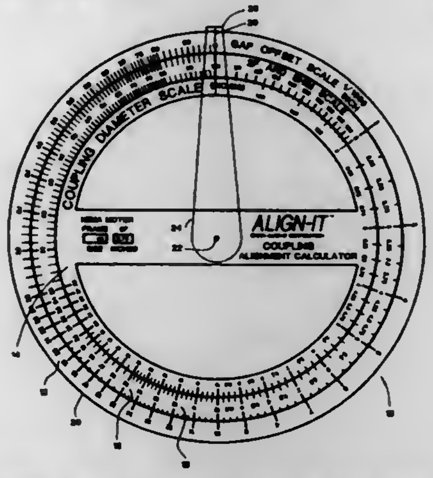
2. The vacuum interrupter of claim 1, wherein the contact gap in the open circuit position is d, and wherein the AMF means includes a generally annular-shaped effective coil having an average radius a and that comprises N circumferentially spaced segments each having a midpoint spaced an average distance z_o in the longitudinal direction from the contact surface, the segments defining N substantially identical parallel current paths through which approximately equal branch currents I' of the interrupter current I flows before entering the contact surface of the first electrode assembly, and a low current leakage path through which a branch current αI' of the interrupter current I flows before entering the contact surface of the first electrode assembly, αI' being less than I' through any of the segments, the vacuum interrupter being structured such that:

$$\frac{a^2}{[a^2+(z_0+d)^2]^{1.5}} \geqq 5.09\mathrm{m}^{-1}\,\frac{(N+\alpha)}{\cos\phi}\left[1-\frac{9\mathrm{kA}}{I_m}\right]$$

where φ is a phase shift of B_a from I, where a, z_o and d are measured in meters, and where I_m is measured in kiloamperes.

5,691,523
MACHINERY SHAFT ALIGNMENT CALCULATOR

Frank A. Calvo, Wellington, Fla., assignor to Align-it Corporation, Wellington, Fla.
Filed Dec. 3, 1996, Ser. No. 758,725
Int. Cl.⁶ G06C ***27/00***
U.S. Cl. 235—78 R **8 Claims**



1. An alignment calculator circular slide rule device for determining angular alignment positioning information for effecting alignment of coupled drive and driven units interconnected by coupling structure, comprising:

a lower disc comprising indicia circumferentially arranged thereon denoting shim dimensional characteristics for angular alignment of the drive and driven units by shim adjustment on support points of the drive unit selected from the group consisting of front and rear support points;

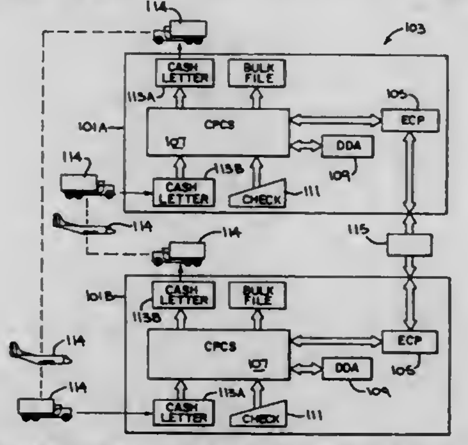
an upper disc coaxially coupled to the lower disc, including an inner ring portion having circumferentially arranged thereon indicia denoting diameter of the coupling structure and an outer ring portion having circumferentially arranged thereon indicia denoting gap offset values, the upper disc including an annular window portion permitting viewing of the lower disc indicia when the upper and lower discs are coaxially coupled to one another;

an index arm having an inner end portion which is coaxially coupled to the coaxially coupled upper and lower discs; and

a coupling member coaxially interconnecting the index arm, upper disc and lower disc, permitting independent rotational motion of each of same relative to the others.

5,691,524
ELECTRONIC CHECK PRESENTMENT SYSTEM HAVING A NON-ECP EXCEPTIONS NOTIFICATION SYSTEM INCORPORATED THEREIN

Stanley M. Josephson, Dallas, Tex., assignor to J.D. Carreker and Associates, Inc., Dallas, Tex.
Continuation of Ser. No. 236,632, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 23,364, Feb. 26, 1993, Pat. No. 5,412,190, which is a continuation-in-part of Ser. No. 731,529, Jul. 17, 1991, Pat. No. 5,237,159. This application May 15, 1996, Ser. No. 648,482
Int. Cl.⁶ G06F ***17/60;15/30***
U.S. Cl. 235—379 **27 Claims**



1. For use by a presenting bank and a payor bank having check presentment systems between which data related to checks may be electronically transmitted, a method of electronically communicating data pertaining to non-ECP exceptions, comprising the steps of:

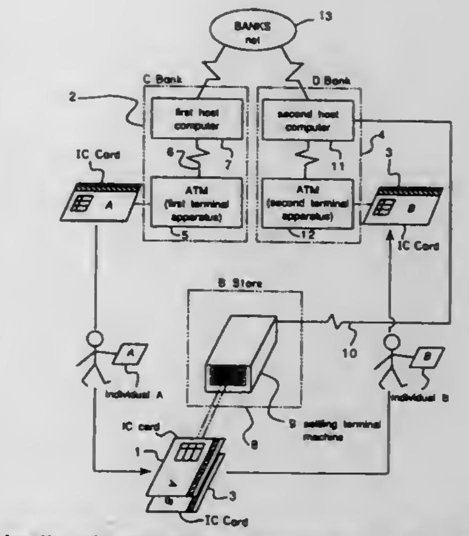
electronically transmitting, from said presenting bank to said payor bank, predetermined presentment information relating to said checks and permitting a determination by said payor bank as to which of said checks are properly payable by said payor bank;

comparing records of an exceptions file with records of a receive control file, said exceptions file capable of containing records subject to both ECP and non-ECP exceptions to thereby produce an electronic file of said which of said checks are properly payable by said payor bank; and

electronically transmitting said electronic file to said presenting bank to thereby provide advance electronic return notification of both ECP and non-ECP exceptions to checks presented by said presenting bank to said payor bank.

5,691,525
DATA TRANSFER SYSTEM AND DATA TRANSFER TERMINAL DEVICE

Shigeo Aoki, Ikoma; Takuya Oka, Hirakata, and Yukihiko Kimura, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan
Continuation of Ser. No. 854,661, Apr. 30, 1992, abandoned. This application Dec. 16, 1996, Ser. No. 767,150
Claims priority, application Japan, Aug. 31, 1990, 2-231720
Int. Cl.⁶ G06F ***17/60***
U.S. Cl. 235—379 **11 Claims**



1. A financial transaction data processing system comprising:

a plurality of host bank computers operatively maintained by a plurality of banking institutions and each containing account information denoting money balances of plural host bank accounts;

a communications network interconnecting said plurality of host bank computers;

a plurality of automated teller machines operatively maintained by the plurality of banking institutions and connectable to said plurality of host bank computers so as to access said account information to transfer money to and from said plural host bank accounts;

a transaction terminal device detachably and operatively connectable to at least one of said plurality of host bank computers, said transaction terminal device having two IC card insertion slots; and

a plurality of portable IC cards each containing a non-volatile IC chip memory for storing a carrier money balance and each insertable into at least one of said plurality of automated teller machines and into one of said IC card insertion slots of said transaction terminal device;

wherein each of said automated teller machines includes means, responsive to the insertion therein of one of said portable IC cards and to input instructions, for effecting a first transaction by deducting a first specified amount of money from the balance of a designated host bank account of a connected one of said host bank computers and adding the first specified amount to the carrier money balance of said one of said portable IC cards;

wherein said transaction terminal device includes at least one manipulation key for specifying a second specified amount of money, transfer means, responsive to the insertion of two of said portable IC cards into said IC card insertion slots and to input instructions, for effecting a second transaction by deducting the second specified amount of money specified by said at least one manipulation key from the carrier money balance stored in the IC chip memory of a first of said two portable IC cards and adding the second specified amount of money to the carrier money balance stored in the IC chip memory of a second of said two portable IC cards, a memory for storing data relating to said second transaction, and transmitting means for transmitting second transaction verification data indicative of the second transaction from said memory to a connected one of said plurality of host bank computers;

wherein one of said automated teller machines further includes means, responsive to the insertion therein of said second of said portable IC cards and to input instructions, for initiating a verification process in which an amount of the carrier money balance of said second of said portable IC cards is verified with reference to said second transaction verification data transmitted to the connected one of the plurality of host bank computers by said transaction terminal device and, thereafter, if said second transaction verification data has been transmitted to said connected host bank computer, for effecting a third transaction by adding a third specified amount of money to a designated host bank account of a connected host bank computer and deducting the third specified amount from the carrier money balance of said second of said portable IC cards; and

wherein, when said second of said portable IC cards is inserted into said one of said automated teller machines before said second transaction verification data has been transmitted to

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said connected one of the plurality of host bank computers by said transaction terminal device, said third transaction is effected after said second transaction verification data has been transmitted to said connected one of the plurality of host bank computers by said transaction terminal device.

5,691,526

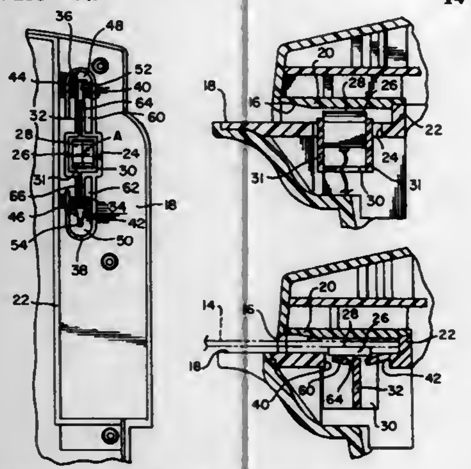
MAGNETIC CARD READER ASSEMBLY HAVING A FIRST MEMBER THAT HAS A FIRST LEG INTEGRALLY CONNECTED TO A SIDE WALL OF THE GUIDE SLOT

William James Evans, San Francisco, Calif., assignor to U.S. Order, Inc., Herndon, Va.

Filed Jun. 7, 1995, Ser. No. 472,999

Int. Cl.^{6} G06K *7/08*

U.S. Cl. 235—449 **14 Claims**



1. A magnetic reader assembly comprising:

a magnetic read head;

a guide slot being defined by a first side wall, a second bottom wall and a third side wall, said first side wall having an opening for receiving said magnetic read head;

a U-shaped first member having a first leg and a second leg, said first leg being integrally connected to said first side wall as one piece unitary member;

a read head mounting frame being fixedly connected to said magnetic read head, said read head mounting frame being pivotally connected to said second leg of said U-shaped member.

5,691,527

TWO DIMENSIONAL CODE READING APPARATUS

Masahiro Hara, and Motoaki Watabe, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 26, 1995, Ser. No. 579,608

Claims priority, application Japan, Dec. 26, 1994, 6-322873

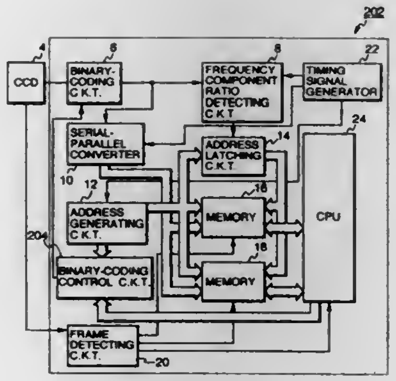
Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—456 **20 Claims**

1. A two-dimensional code reading apparatus comprising:

a CCD sensor that captures an image including a two-dimensional code by optically scanning the image along scanning lines, the two-dimensional code being a rectangular matrix of cells, the two-dimensional code including a data field and three orientation symbols, the orientation symbols having the same pattern, located at three corners of the matrix, respectively, the data field and the orientation symbols each consisting of a given number of the cells, respectively, the CCD sensor outputting scanning line signals having signal levels corresponding to the brightness of portions of the captured image on the scanning lines;

a single binary-coding circuit that codes the scanning line signals outputted from the CCD sensor into binary-coded scanning line signals according to the signal levels of the scanning line signals, and outputs the binary-coded scanning line signals;



a frequency component ratio detecting circuit that compares a frequency component ratio indicated by portions of the binary-coded scanning line signals outputted from the binary-coding circuit with a single reference frequency component ratio corresponding to the pattern of the orientation symbols so as to detect portions of the binary-coded scanning line signals showing the reference frequency component ratio and to provide orientation symbol signals indicative thereof;

memory means for storing the binary-coded scanning line signals as image data at memory locations indicated by addresses each corresponding to coordinates on the image captured by said CCD sensor;

an address latching circuit that determines coordinates on the captured image to which the orientation symbol signals provided by the frequency component ratio detecting circuit correspond according to a timing of signals output by the frequency component ratio detecting circuit, and writes the determined coordinates in the image data stored in the memory means; and

a CPU that reads the image data, in which the coordinates of the orientation symbol signals are written by the address latching circuit, from the memory means to determine positions of the orientation symbols in the captured image based on the coordinates of the orientation symbol signals, and reads data represented by the two-dimensional code based on the positions of the orientation symbols.

5,691,528

SCANNING SYSTEM FOR EITHER HAND-HELD OR STATIONARY OPERATION FOR READING 1-D OR 2-D BARCODES

Peter Wyatt, Portland, Oreg.; Raj Bridgelall, Mount Sinai, N.Y.; Joseph Katz, Stony Brook, N.Y.; David Goren, Ronkonkoma, N.Y., and Philip Swift, Port Jefferson, N.Y., assignors to Symbol Technologies Inc., Holtsville, N.Y.

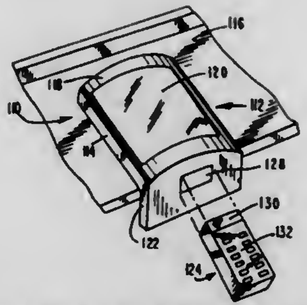
Continuation-in-part of Ser. No. 153,053, Nov. 17, 1993, Pat. No. 5,504,316, Ser. No. 981,448, Nov. 25, 1992, Pat. No. 5,478,997, Ser. No. 28,107, Mar. 8, 1993, Pat. No. 5,408,081, Ser. No. 108,521, Jul. 19, 1993, abandoned, and Ser. No. 37,143, Mar. 25, 1993, abandoned, which is a division of Ser. No. 715,267, Jun. 14, 1991, Pat. No. 5,235,167, said Ser. No. 108,521is a division of Ser. No. 868,401, Apr. 14, 1992, Pat. No. 5,280,165, which is a division of Ser. No. 520,464, May 8, 1990, Pat. No. 5,168,149, which is a continuation-in-part of Ser. No. 428,770, Oct. 30, 1989, Pat. No. 5,099,110. This application Jan. 25, 1995, Ser. No. 377,732

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—462 **35 Claims**

1. A point-of-sale unit, comprising:

a fixed base unit;



an optical scanner for reading indicia with a scan pattern, the scanner being arranged in a first mode for attachment to the base unit for hands-free operation, and in a second mode for removal from the base unit for portable operation unattached to the base unit;

means for detecting which of the modes the scanner is in; and

means for changing the scan pattern to an optimized pattern for the detected mode.

5,691,529

Patent Not Issued For This Number

5,691,530

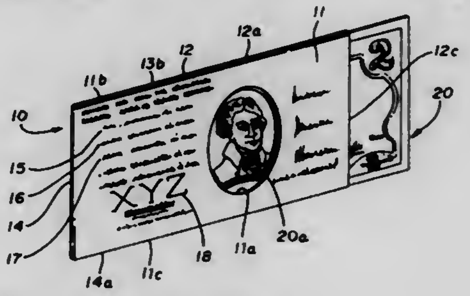
PROMOTIONAL SYSTEM AND VERIFICATION APPARATUS THEREFOR

Samuel G. Solitt, Akron, Ohio, assignor to S.G. Solitt & Associates, Inc., Akron, Ohio

Filed Oct. 19, 1995, Ser. No. 545,123

Int. Cl.^{6} G06K *19/00*

U.S. Cl. 235—487 **20 Claims**



1. A promotional system, comprising:

(a) an envelope having

  (1) front and rear walls forming a currency-receiving pocket therebetween and

  (2) said front wall having at least one through opening therein;

(b) an article of currency, removably received within said currency-receiving pocket; and

(c) a label, removably affixed to said article of currency; and

(d) said from wall of said envelope having inner and outer surfaces with said outer surface presenting an indicia-bearing area.

5,691,531

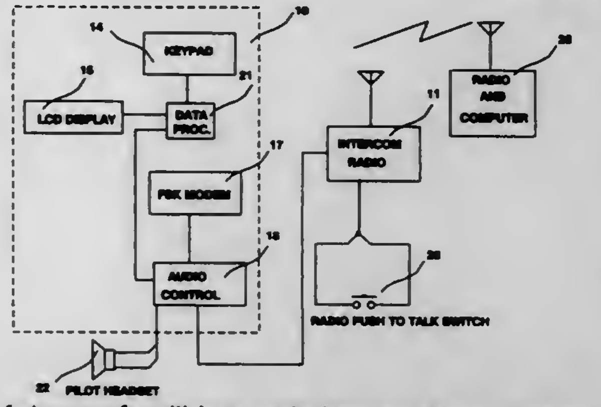
DATA INSERTION SYSTEM FOR MODULATING THE CARRIER OF A RADIO VOICE TRANSMITTER WITH MISSILE CONTROL SIGNALS

Gordon L. Harris, Rancho Santa Fe; Neil A. Levy, Encinitas, and Daniel R. Weisz, Vista, all of Calif., assignors to Leigh Aerosystems Corporation, Carlsbad, Calif.

Filed Nov. 6, 1996, Ser. No. 744,284

Int. Cl.^{6} F41G *9/00;* **H04Q** *7/00*

U.S. Cl. 244—3.14 **6 Claims**



1. A system for utilizing a regular intercom/radio voice communication device for transmitting control signals from a control site to a missile radio receiver and computer control comprising:

a data insertion unit at the site, said data insertion unit including a data processor, a modem for converting the output signals of said data processor to audio signals, an audio control, and a keypad,

the data processor being preprogrammed for control of the missile, the keypad being manually operable to provide control signals in accordance with the coordinates of a target,

a headset including a microphone connected to said audio control,

the audio signal output of said modem being fed to said audio control, and

means for controlling said audio control to alternatively feed either the output of said headset microphone or the output of said modem to said intercom/radio communication device.

5,691,532

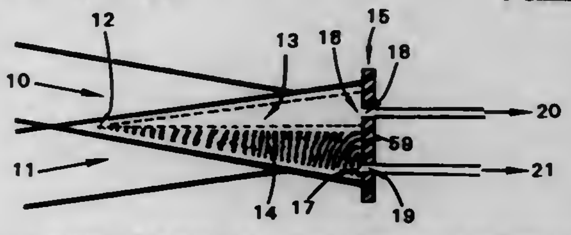
PHOTONIC HETERODYNING HAVING AN IMAGE COMPONENT SEPARATOR

John N. Hait, 7085 Charmant Dr., #39, San Diego, Calif. 92122

Filed Sep. 17, 1996, Ser. No. 715,220

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—214 R **6 Claims**



1. A method of photonic heterodyning comprising the following steps:

providing at least one input beam set of photonic energy having first and second fundamental frequencies to be heterodyned;

producing dynamic interference using energy of said at least one input beam set, and

separating sideband energy from at least one location within said dynamic interference to provide at least one photonic output, said sideband energy being produced by movement of energy components within said dynamic interference relative to said at least one location.

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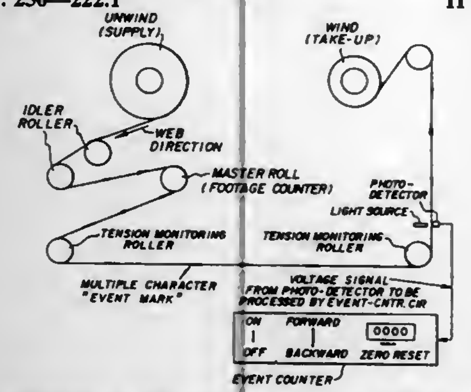
5,691,533
METHOD AND APPARATUS FOR THE DETECTION OF THE LOCATION OF MULTIPLE CHARACTER MARKS

Dennis R. Freeman, Spencerport; Warren Kosel, Penfield, and Thomas E. Phillips, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1995, Ser. No. 560,556
Int. Cl.^{6} G01N *21/89*
U.S. Cl. 250—222.1 **11 Claims**

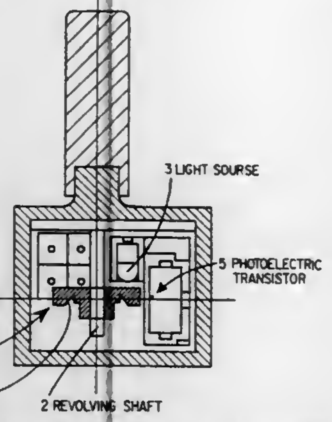

UNWIND (SUPPLY)
WIND (TAKE-UP)
IDLER ROLLER
WEB DIRECTION
MASTER ROLL (FOOTAGE COUNTER)
PHOTO-DETECTOR
LIGHT SOURCE
TENSION MONITORING ROLLER
TENSION MONITORING ROLLER
MULTIPLE CHARACTER "EVENT MARK"
VOLTAGE SIGNAL FROM PHOTO-DETECTOR TO BE PROCESSED BY EVENT-CNTR. CIR
ON
OFF
FORWARD
BACKWARD
0000
ZERO RESET
EVENT COUNTER

5. An apparatus for detecting the location of multiple character marks as a single event comprising means for applying multiple character marks on a linear material and means for continuously moving said linear material containing said marks into a detection zone, the detection zone comprising a light source and a photodetector located on either side of the linear material, the photodetector being connected to a circuit which registers a voltage drop as a mark enters the detection zone, said circuit being connected to a means for simultaneously triggering a time window during which changes in voltage are ignored and not counted or marked as an event, the duration of the time window being longer than the time it takes for a full character mark to pass under the detection zone and shorter than the time it takes for the leading edge of the next multicharacter marks to reach the detection zone.

5,691,534
DIGITAL SIGNAL OUPUT DEVICE HAVING A TRANSPARENT GEAR WHEEL

Hsin-Te Tseng, 4F, No. 19, Shih-Chien St., Pei-Tou, Taipei, Taiwan

Filed May 2, 1996, Ser. No. 641,725
Int. Cl.^{6} G01D *5/34*
U.S. Cl. 250—231.14 **4 Claims**

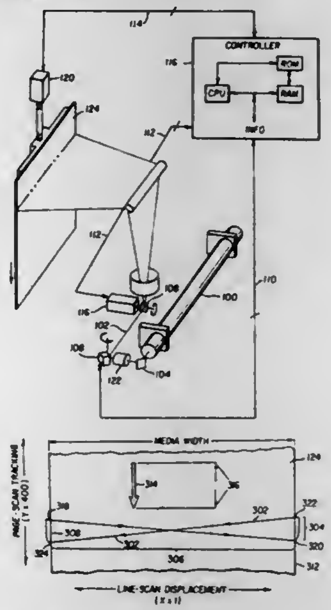


1. A digital signal output device comprising a revolving shaft, a transparent gear wheel fixedly mounted around said revolving shaft and turned by the revolving shaft, said transparent gear wheel having a plurality of teeth alternatively spaced by gaps around the periphery and an annular sloping wall at one side around the center, and a plurality of photoelectric inductors spaced from the periphery of said transparent gear wheel and arranged in parallel, wherein when said transparent gear wheel is turned by said revolving shaft, the light from a light source is projected onto the sloping wall of said transparent gear wheel and reflected radially through the teeth and/or gaps of said transparent gear wheel onto said photoelectric inductors, causing said photoelectric inductors to be or not to be triggered.

5,691,535
GANGED LASER SCANNING SYSTEM WHICH CORRECTS BEAM ALIGNMENT ALONG A BOW-TIE PATH

John C. Boutet, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 8, 1996, Ser. No. 598,456
Int. Cl.^{6} G01T *1/105*
U.S. Cl. 250—234 **25 Claims**



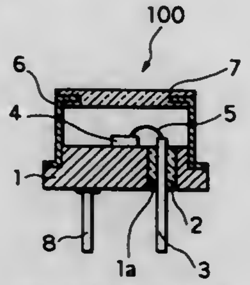
1. An apparatus for aiming a laser system comprising one or more moveable components including a laser source and a lens, while scanning a media with a beam, wherein said laser emits said beam, comprising:

- means for moving said media continuously along a media path in one direction while said beam travels along a bow-tie path defined by a route that returns said beam to its initial position;
- means for effectuating movement of said beam by altering the position of at least one of said movable laser components;
- means for initiating movement of said beam from a line start location on a first edge of said media and moving said beam across said media to a second, opposite edge in a direction transverse to said media path;
- means for moving said beam at a second edge of said media in a direction of travel opposite that of said media path, a distance approximate to a desired line spacing of said media;
- means for moving said beam transverse to said media path to return said beam to said first edge;
- means for moving said beam along said first edge of said media in said direction of travel opposite that of said media path to return said beam to said line start location at said first edge, whereupon the aforementioned cycle is repeated a plurality of times until said media is scanned; and
- means for combining at least two said lasers, wherein said combination forms a ganged laser assembly.

5,691,536
PHOTO-DETECTOR HAVING A UNIFORM OUTPUT CHARACTERISTIC AND FABRICATING METHOD THEREFOR

Masaki Shimoyama, Kusatsu; Shuichi Kodama, Otsu, and Kazuhiro Kondo, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan

Filed May 30, 1995, Ser. No. 454,056
Claims priority, application Japan, Jun. 3, 1994, 6-122461
Int. Cl.^{6} G01J *1/00;* **H01L** *31/0232*
U.S. Cl. 250—239 **2 Claims**



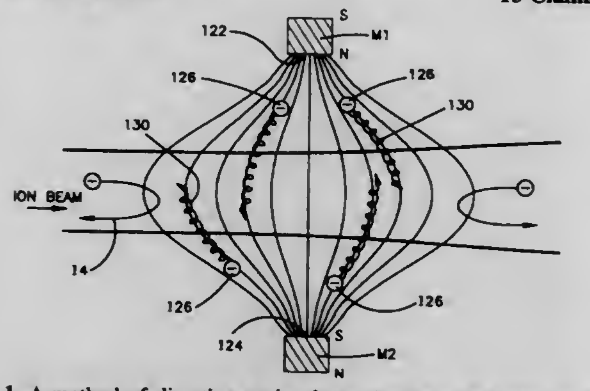
1. A method for fabricating a photo-detector comprising the steps of:

- mounting a photosensitive semiconductor on a base means and making an electrical connection with a pair of leads;
- preparing a plurality of light-transmitting members having light transmittances different from each other;
- measuring the intensity of the output of said photosensitive semiconductor under a predetermined quantity of light incident on said photosensitive semiconductor;
- selecting one of said light-transmitting members in accordance with said intensity of the output of the photosensitive semiconductor; and
- disposing said selected one of the light-transmitting members to cover said photosensitive semiconductor.

5,691,537
METHOD AND APPARATUS FOR ION BEAM TRANSPORT

John Chen, 38 Cornell Rd., Beverly, Mass. 01915; Victor Benveniste, 8 Harbor Heights, Gloucester, Mass. 01930; Thomas N. Horsky, 816 Depot Rd., Boxborough, Mass. 01719, and William E. Reynolds, 210 Perkins Row, Topsfield, Mass. 01983

Filed Jan. 22, 1996, Ser. No. 589,303
Int. Cl.^{6} H01J *37/30;* **H01S** *1/00*
U.S. Cl. 250—251 **15 Claims**



1. A method of directing an ion beam from an ion source to a treatment station for ion beam treatment of a work piece by controlling movement of neutralizing electrons within the ion beam; said method comprising the steps of:

a) directing a beam of ions along a beam travel path from a source to an implantation station where target workpieces are placed for ion beam treatment;

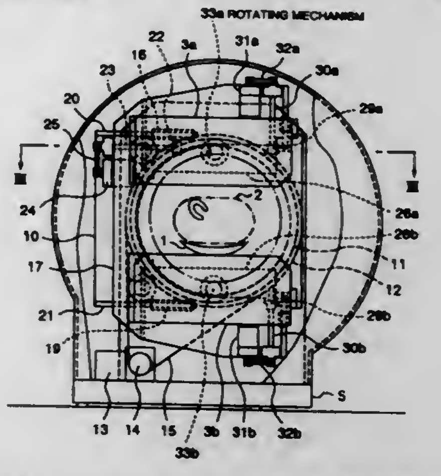
b) injecting neutralizing electrons into the ion beam at a neutralizing location before the ion beam contacts the target workpieces; and

c) creating a dipole magnetic field that extends through the ion beam before the ion beam reaches the neutralizing location for impeding movement of electrons in a direction parallel to an ion beam travel path at the region of the dipole magnetic field by positioning first and second magnets having pole pieces of opposite polarity that face each other across the ion beam next to the ion beam at a position before the ions reach the neutralizing location.

5,691,538
TWIN-DETECTOR TYPE SCINTILLATION CAMERA APPARATUS CAPABLE OF SETTING DETECTING DIRECTIONS OF DETECTORS IN DESIRED DIRECTION

Masahito Ohike, Noda, and Minoru Inamoto, Kashiwa, both of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jun. 20, 1996, Ser. No. 668,267
Claims priority, application Japan, Jun. 23, 1995, 7-179693
Int. Cl.^{6} G01T *1/166*
U.S. Cl. 250—363.05 **5 Claims**



1. A twin-detector type scintillation camera apparatus, comprising:

- a pair of detectors disposed in opposition to each other with a table for supporting an object under examination being interposed therebetween to detect radioactive rays emitted from said object;
- a rotatable frame disposed in a plane extending in a direction orthogonal to a longitudinal axis of said table for supporting said paired detectors at one side thereof;
- a translation mechanism mounted on said rotatable frame for moving said detectors in parallel with each other in a plane extending orthogonally to said longitudinal axis of said object supporting table while maintaining parallelism between said detectors;
- an approaching mechanism for moving said pair of detectors in directions orthogonal to the directions in which said detectors are moved in parallel with each other by said translation mechanism; and
- rotating means for driving rotationally each of said detectors, respectively, by a predetermined angular distance from given positions of said detectors, respectively.

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5,691,539

INTRAORAL SENSING DEVICE TO BE PLACED INTO THE MOUTH OF A PATIENT FOR PRODUCING TOOTH AND JAW IMAGES

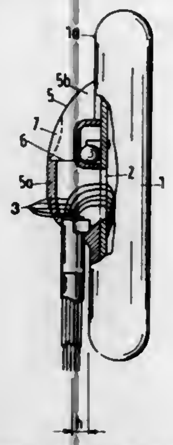
Manfred Pfeiffer, 18, Warrington Crescent, GB - London W9 1EL, Great Britain

Filed Apr. 22, 1996, Ser. No. 637,326

Claims priority, application Germany, Apr. 22, 1995, 295 06 839 U

Int. Cl.^{6} A61B *6/14;* G01T *1/24*

U.S. Cl. 250—370.09 **9 Claims**



1. An intraoral sensing device for producing tooth and jaw images of a patient, said sensing device comprising:

a housing with a back, said housing having an interior;

an image sensor positioned in said interior of said housing;

a printed circuit board with electrical contacts positioned in said interior of said housing and connected to said image sensor;

an electric cable, for connecting said sensing device to an image processing unit, extending into said interior of said housing at a location of entry at said back and comprising electrical leads, said electrical leads connected to said electrical contacts of said printed circuit board; and

wherein said electric cable exits from said location of entry at said back from said housing at an angle of 0° to 10° relative to said back.

5,691,540

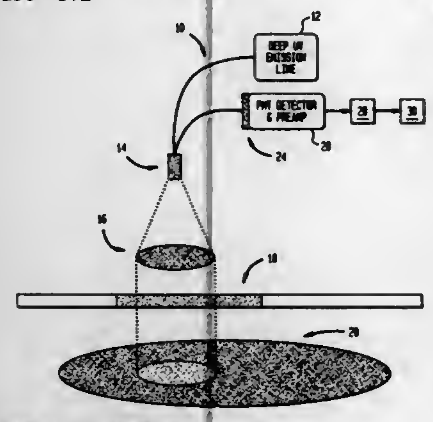
ASSEMBLY FOR MEASURING A TRENCH DEPTH PARAMETER OF A WORKPIECE

Scott D. Halle, Hopewell Junction; Philip Charles Danby Hobbs, Briarcliff Manor; Tadashi Mitsui, Wappingers Falls; Theodore G. van Kessel, Millbrook, and Hemantha Kumar Wickramasinghe, Chappaqua, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 30, 1996, Ser. No. 643,090

Int. Cl.^{6} G01B *11/22*

U.S. Cl. 250—372 **6 Claims**



1. An assembly comprising:

an ultra-violet radiation source;

a split fiber bundle having a first branch for propagating the ultra-violet radiation from the radiation source to a lens, and a second branch;

a lens for focusing the ultra-violet radiation to a workpiece and refocusing an ultra-violet interference signal to said split fiber bundle, the ultra-violet interference signal being developed when ultra-violet radiation propagates through said workpiece and reflects from its base region to thereby interfere with ultra-violet radiation that is directly reflected by a workpiece surface which is different from said base region; and

a detector responsive to the ultra-violet interference signal received through said second branch, said detector transforming the ultra-violet interference signal to an electrical signal which is a measure of a trench depth of said workpiece.

5,691,541

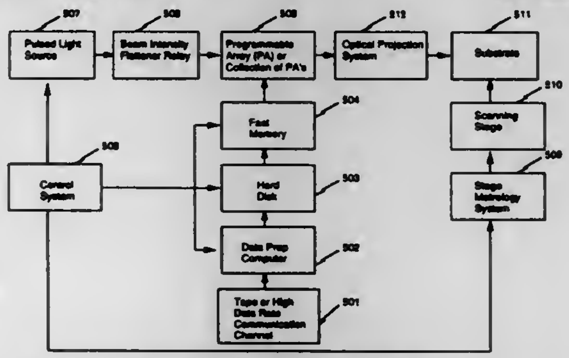
MASKLESS, RETICLE-FREE, LITHOGRAPHY

Natale M. Ceglio, Livermore, and David A. Markle, Saratoga, both of Calif., assignors to The Regents of the University of California, Oakland, and Ultratech Stepper, Inc., San Jose, both of Calif.

Filed May 14, 1996, Ser. No. 645,531

Int. Cl.^{6} G21K *5/00*

U.S. Cl. 250—492.1 **20 Claims**



1. A maskless lithography system comprising;

a programmable array of binary light switches (PABLS), said programmable array comprising active elements that can be digitally programmed to direct, or not direct, incident light into a fixed pupil location,

a pulsed or strobed radiation source that illuminates the programmable array with a sequence of pulses,

a projection system that images the array pattern onto a substrate, and

a scanning substrate stage that is in motion during the sequence of pulses but which moves only a small fraction of a minimum feature size during the time duration of a single pulse.

5,691,542

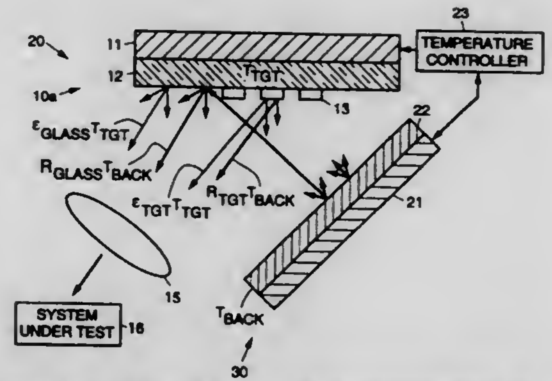
EMISSIVITY TARGET THAT PROVIDES POSITIVE AND NEGATIVE DIFFERENTIAL TEMPERATURE PATTERNS RELATIVE TO A BACKGROUND TEMPERATURE

Kenn S. Bates, Lakewood; Richard A. James, Long Beach, both of Calif., and Bradley R. Risinger, Ellicott City, Md., assignors to Hughes Aircraft, Los Angeles, Calif.

Filed Jul. 11, 1996, Ser. No. 680,306

Int. Cl.^{6} G01M *11/02*

U.S. Cl. 250—495.1 **9 Claims**



1. An electro-optical target that radiates spatially differential energy at positive and negative target temperatures relative to a background temperature for use in testing a system under test, said target comprising:

an emissivity target having a predetermined target pattern disposed thereon;

a controlled heated background source that radiates energy at a controlled background temperature; and

a dual temperature controller for controlling the respective temperatures of the emissivity target and the controlled background source.

5,691,543

INSPECTING DEVICE AND METHOD FOR DETECTING MINUTE CONTOUR DEFECTS

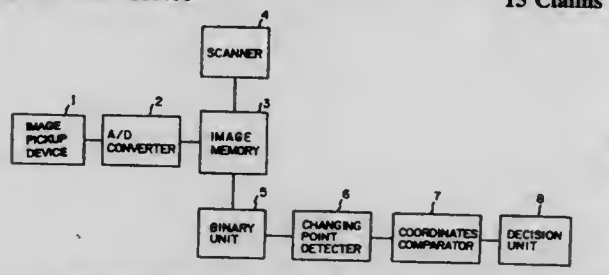
Yutaka Ishizaka, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 2, 1995, Ser. No. 460,498

Claims priority, application Japan, Jun. 2, 1994, 6-121060

Int. Cl.^{6} G01N *21/88*

U.S. Cl. 250—559.06 **15 Claims**



1. A contour inspecting device for detecting a defect of a contour of an object to be inspected, comprising:

an image storing means for storing an image of the object to be inspected captured by an image pick up means;

a scanning means for scanning, along a plurality of scanning lines, an inspection region which covers at least a part of the image stored in the image storing means;

a binary means for converting an image signal read out by the scanning means into a binary signal;

a detecting means for detecting positions of changing points at which the value of the binary signal changes on the plurality of scanning lines;

a comparing means for calculating an inclination between changing points on two of said plurality of scanning lines separated from each other by a predetermined interval; and

a decision means for deciding whether or not the contour of the inspection object has a defect on the basis of a comparison of said inclination with a specified value.

5,691,544

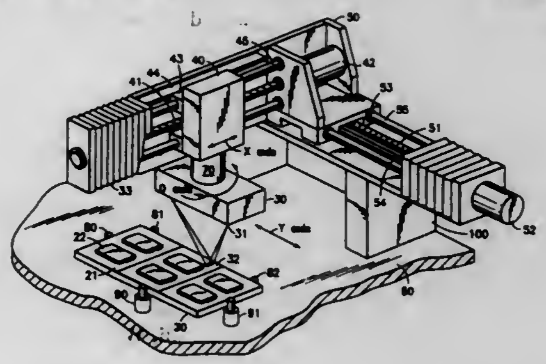
APPARATUS FOR OBTAINING THREE-DIMENSIONAL DATA FROM MULTIPLE PARTS OR DEVICES IN A MULTI-POCKETED TRAY

Howard Stern, Greenlawn; William E. Yonescu, Smithtown, and Alex Mauro, Holbrook, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 476,212, Jun. 7, 1995, Pat. No. 5,600,150, which is a continuation-in-part of Ser. No. 903,524, Jun. 24, 1992, Pat. No. 5,463,227. This application Aug. 12, 1995, Ser. No. 709,189

Int. Cl.^{6} G01N *21/86*

U.S. Cl. 250—559.29 **8 Claims**



1. Apparatus for obtaining three-dimensional data from devices having corresponding elements, said elements being arranged in at least one of a row and a column, comprising:

means for receiving a multi-pocketed tray;

said multi-pocketed tray having a plurality of tray pockets arranged in at least one of rows and columns;

said tray pockets being adapted for receiving a plurality of said devices;

said tray pockets holding a plurality of said devices with corresponding elements of at least first and second devices being aligned in at least one of a two-device row and a two-device column;

a three-dimensional sensor; and

scanning means for scanning said three-dimensional sensor along at least one of said two-device row and said two-device column, such that data from corresponding elements of said two-device row or said two-device column are obtained in a straight-line scan.

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5,691,545

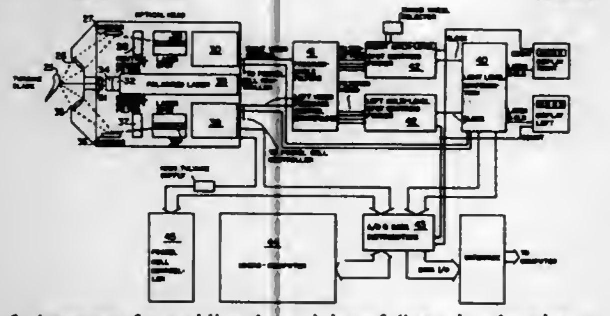
METHOD AND APPARATUS FOR ELECTRO-OPTICALLY DETERMINING THE DIMENSION, LOCATION AND ATTITUDE OF OBJECTS

Timothy R. Pryor; Bernard Hockley; Nick Liptay-Wagner; Omer L. Hageniers, and W. J. Pastorius, all of Windsor, Canada, assignors to Sensor Adaptive Machines Inc., Windsor, Canada

Division of Ser. No. 334,350, Nov. 2, 1994, Pat. No. 5,510,625, which is a division of Ser. No. 124,605, Sep. 21, 1993, Pat. No. 5,362,970, which is a division of Ser. No. 836,508, Feb. 18, 1992, Pat. No. 5,280,179, which is a division of Ser. No. 711,397, Jun. 6, 1991, Pat. No. 5,164,579, which is a continuation of Ser. No. 511,967, Apr. 17, 1990, abandoned, which is a continuation of Ser. No. 381,031, Jul. 19, 1989, abandoned, which is a continuation of Ser. No. 262,131, Oct. 25, 1988, abandoned, which is a continuation of Ser. No. 59,632, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 757,208, Jul. 22, 1985, Pat. No. 4,674,869, which is a continuation of Ser. No. 697,683, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 634,191, Jul. 24, 1984, abandoned, which is a continuation of Ser. No. 378,808, May 17, 1982, abandoned, which is a division of Ser. No. 34,278, Apr. 30, 1979, Pat. No. 4,373,804. This application Jun. 5, 1995, Ser. No. 462,247

Int. Cl.⁶ G01C *3/10;* **H01J** *40/14*

U.S. Cl. 250—559.38 **21 Claims**



1. Apparatus for enabling determining of dimension, location or attitude of an object, said apparatus comprising:

electro-optical sensor means for determining range to said object, said sensor means having an axis of measurement,

movement means for moving said axis relative to an object to be measured so as to determine range to multiple object points on said object so as to enable dimension, location or attitude of said object to be determined, and

microcomputer means for controlling operation of said sensor means and for controlling a detection characteristic or a light characteristic of said sensor means.

5,691,546

SEMICONDUCTOR DEVICE HAVING A HIGH CURRENT GAIN AND A HIGHER GE AMOUNT AT THE BASE REGION THAN AT THE EMITTER AND COLLECTOR REGIONS, AND PHOTOELECTRIC CONVERSION APPARATUS USING THE DEVICE

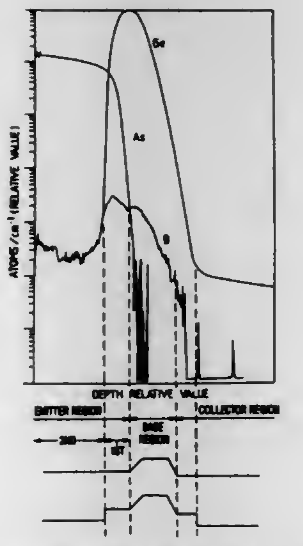
Masakazu Morishita, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 215,665, Mar. 22, 1994, abandoned, which is a continuation of Ser. No. 927,056, Aug. 10, 1992, abandoned, which is a division of Ser. No. 448,211, Dec. 8, 1989, Pat. No. 5,159,424. This application Nov. 23, 1994, Ser. No. 348,073

Claims priority, application Japan, Dec. 10, 1988, 63-312725; Dec. 10, 1988, 63-312726; Mar. 29, 1989, 1-77439; Mar. 29, 1989, 1-77441; Mar. 30, 1989, 1-79932

Int. Cl.⁶ H01L *29/06*

U.S. Cl. 257—19 **22 Claims**



1. A semiconductor device comprising a first emitter region of a first conductivity type, a second emitter region formed of a polycrystalline semiconductor of the first conductivity type adjacent to said first emitter region, a base region of a second conductivity type adjacent to said first emitter region at a first side of said base region, and a collector region of the first conductivity type adjacent to a second side of said base region,

wherein said first emitter region, and said base region include at least silicon and germanium atoms, said second emitter region includes at least silicon atoms, and said collector region includes a first sub-region including silicon and germanium atoms provided at a side adjacent to said base region, and second sub-region including silicon atoms but not including germanium atoms and adjacent to said first sub-region, and interface between said first and second sub-regions is within said collector region.

5,691,547

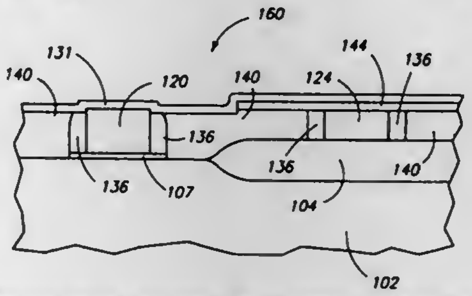
PLANAR THIN FILM TRANSISTOR STRUCTURES

Monte Manning, Kuna, and Charles Dennison, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 82,401, Jun. 23, 1993, Pat. No. 5,411,909, which is a continuation-in-part of Ser. No. 21,274, Feb. 22, 1993, Pat. No. 5,422,499. This application Jan. 23, 1995, Ser. No. 376,866

Int. Cl.⁶ H01L *29/76*

U.S. Cl. 257—67 **9 Claims**



1. A semiconductor transistor device formed on a semiconductor substrate, comprising:

a transistor gate having a top surface;

a transistor gate sidewall spacer against the transistor gate;

a discrete conductor having a top surface which is substantially coplanar with the transistor gate top surface;

a discrete conductor sidewall spacer against the discrete conductor;

an insulating filler provided over the semiconductor substrate and against both the transistor gate sidewall spacer and the discrete conductor sidewall spacer, the insulating filler having generally planar upper insulating surfaces which are substantially coplanar with the top surfaces of the transistor gate and the discrete conductor; and

a generally planar semiconductor thin film provided over the transistor gate, over the adjacent generally planar upper insulating surfaces of the insulating filler, and at least partially over the discrete conductor, the generally planar semiconductor thin film being doped to form source and drain regions of a thin film transistor which is bottom gated by the transistor gate.

5,691,548

SOLID STATE IMAGING DEVICE HAVING HIGH SENSITIVITY AND EXHIBITING HIGH DEGREE OF LIGHT UTILIZATION AND METHOD OF MANUFACTURING THE SAME

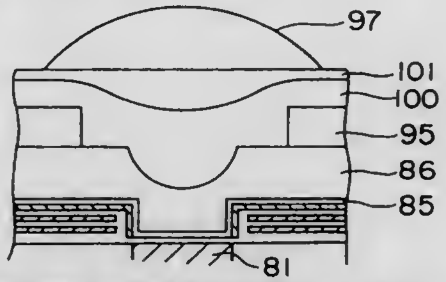
Tetsuro Akio, Fukuyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 314,231, Sep. 28, 1994, abandoned. This application Apr. 30, 1996, Ser. No. 641,203

Claims priority, application Japan, Sep. 28, 1993, 5-241030

Int. Cl.⁶ H01L *27/148;29/768;31/0232*

U.S. Cl. 257—232 **3 Claims**



2. A solid state imaging device having a plurality of pixels including a photoelectric conversion portion and a convex type micro-lens disposed above the photoelectric conversion portion, the device comprising:

a support layer formed between the photoelectric conversion portion and the convex type micro-lens for supporting the convex type micro-lens, said support layer being formed of a material having a refractive index lower than that of the convex type micro-lens; and

a concave type micro-lens layer disposed between the support layer and the photoelectric conversion portion, said concave type micro-lens layer being formed of a material having a refractive index higher than that of the support layer.

5,691,549

SIDEWALL STRAP

Chung Hon Lam, Williston; James S. Nakos, Essex; Donald McAlpine Kenney, Shelburne, and Eric Adler, Jericho, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 362,692, Dec. 22, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 720,991

Int. Cl.⁶ H01L *29/80;31/112*

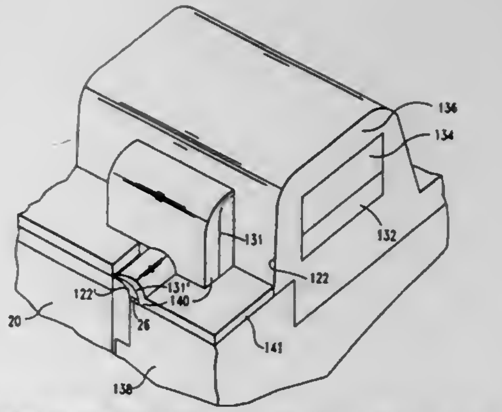
U.S. Cl. 257—282 **18 Claims**

1. A semiconductor structure, comprising:

a first conductive sidewall rail having a first outer surface, said first outer surface extending horizontally to define a rail direction;

a first and a second conductive region adjacent said rail, said second conductive region being displaced in said rail direction from said first conductive region, said second conductive region being electrically connected to said first conductive sidewall rail;

a conductive member contacting said first outer surface, said conductive member connecting said first rail to said first conductive region, said conductive member being distinct from said first conductive region; and



said first and second conductive regions being electrically connected exclusively through said first conductive sidewall rail.

5,691,550

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

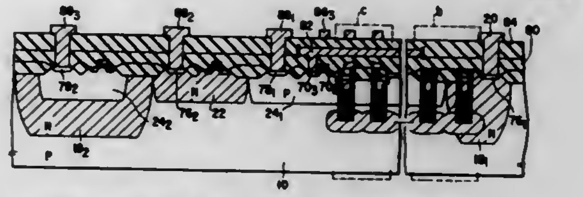
Yusuke Kohyama, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 38,278, Mar. 29, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,287

Claims priority, application Japan, Mar. 30, 1992, 4-074485

Int. Cl.⁶ H01L *27/108;29/76;29/94*

U.S. Cl. 257—301 **8 Claims**



1. A dynamic random access memory, comprising:

a semiconductor substrate of a first conductivity type;

a first well region of a second conductivity type formed in a major surface of said semiconductor substrate, said first well region having a first width between the two edges of said first well region and half way between the top and bottom surfaces of said first well region;

a first trench formed in a major surface of the first well region, said first trench entirely formed within said first well region, wherein sidewalls of said first trench are in contact with an insulating film;

a plurality of second trenches formed in said major surface of the semiconductor substrate, wherein sidewalls of each of said second trenches are provided with an insulating film;

at least one third trench formed in said major surface of the semiconductor substrate, said third trench located between said first trench and said second trenches, wherein sidewalls of said third trench are provided with an insulating film;

semiconductor regions formed at the bottom of said first trench, said second trenches and said third trench respectively, and within said first well region and said semiconductor substrate, said semiconductor regions each having a width between the two edges of one of said semiconductors region and half way between the top and bottom surfaces of said one of said semiconductor regions less than said first width, and said semiconductor regions contacting each other to form a wiring layer;

capacitors respectively formed in said first trench, said second trenches and said third trench, wherein each of said capacitors has a first electrode and a second electrode insulated from each other, and wherein each of said first electrodes is connected to said wiring layer;

cell transistors formed in said major surface of said semiconductor substrate, each cell transistor having a gate electrode and

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source/drain regions of the second conductivity type, wherein a first source/drain region of each of said cell transistors is respectively connected to the second electrode of only those of said capacitors formed in said second trenches; and

a bit line electrically connected to a second source/drain region of each of said cell transistors.

5,691,551

SEMICONDUCTOR MEMORY DEVICE

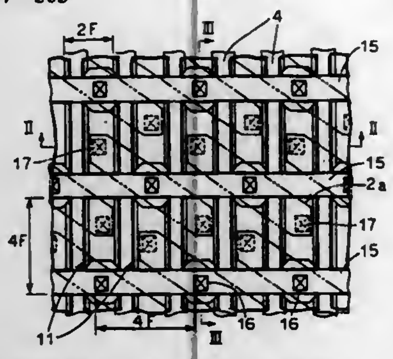
Takahisa Eimori, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 513,702, Aug. 11, 1995, abandoned, which is a division of Ser. No. 292,303, Aug. 18, 1994, Pat. No. 5,442,212. This application Nov. 18, 1996, Ser. No. 746,806

Claims priority, application Japan, Aug. 31, 1993, 5-215869

Int. Cl.^{6} H01L *29/68*

U.S. Cl. 257—303 **13 Claims**



1. A semiconductor memory device, including

a plurality of word lines arranged approximately parallel to each other,

a plurality of bit lines approximately orthogonal to the word lines and approximately parallel to each other, and

a plurality of memory cells each including one transistor and one capacitor,

said capacitor of said each memory cell having a lower electrode arranged above said bit lines, wherein

pitch of said bit lines is set to be larger than pitch of said word lines and a lower electrode contact of said lower electrode is arranged in each rectangular area surrounded by said word lines and said bit lines, and that

the distance between the centers of lower electrode contacts of said lower electrodes of adjacent capacitors and the distance between centers of said bit line contact and said lower electrode contact adjacent to said bit line contact are both made larger than half the distance between bit line adjacent contacts along the same bit line,

said lower electrode contact is arranged at a vertex of a hexagon with one of bit line contacts formed along said bit line being the center, said hexagon being approximately symmetrical with respect to said bit line, and

length of each side of said hexagon is smaller than said distance between bit line contacts adjacent along one same bit line.

5,691,552

NONVOLATILE SEMICONDUCTOR MEMORY FORMED WITH SILICON-ON-INSULATOR STRUCTURE

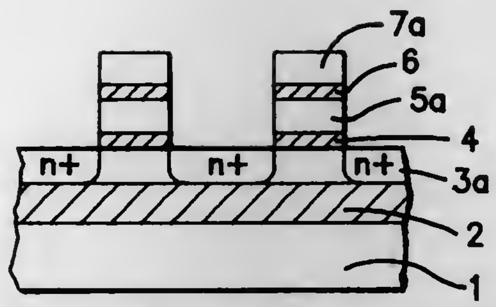
Kenichi Oyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 24, 1995, Ser. No. 547,629

Claims priority, application Japan, Oct. 26, 1994, 6-260844

Int. Cl.^{6} H01L *29/788;* **G11C** *11/34*

U.S. Cl. 257—316 **15 Claims**



1. An electrically programmable and erasable nonvolatile semiconductor memory device having a plurality of memory cells connected in series, each of said memory cells including a floating gate, a control gate, a source region, a drain region and a channel region and having a first threshold voltage in an erased condition and a second threshold voltage in a programmed condition, said nonvolatile semiconductor memory device comprising:

an insulating substrate:

a semiconductor film selectively formed on said insulating substrate and having therein the source region, the drain region and the channel region of each of said memory cells; and

a plurality of MOSFETs, each sharing a different set of said channel, source and drain regions with an associated one of said memory cells so as to be connected in parallel to the associated one of said memory cells.

5,691,553

SEMICONDUCTOR DEVICE AND POWER CONVERTER USING SAME

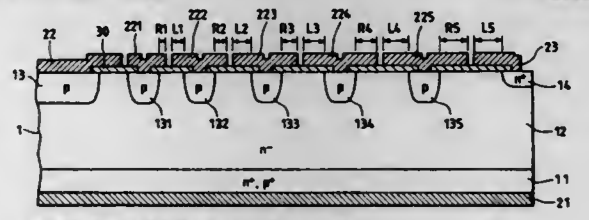
Mutsuhiro Mori, Mito; Yasumichi Yasuda, Hitachi, and Hiromi Hosoya, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1995, Ser. No. 530,540

Claims priority, application Japan, Sep. 20, 1994, 6-224747

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 257—328 **11 Claims**



1. A semiconductor device including:

a pair of main surfaces;

a first semiconductor region of a first conductivity type having a surface which is in contact with one main surface;

a second semiconductor region of a second conductivity type extending from the one main surface into the first semiconductor region;

a plurality of.third semiconductor regions of the second conductivity type formed so as to surround the second semiconductor region and extending from the one main surface into the first semiconductor region;

a first main electrode formed on the other main surface;

a second main electrode which is in ohmic-contact with the second semiconductor region and which covers the surface of the first semiconductor region through an insulating film; and

a plurality of auxiliary electrodes which are respectively in ohmic-contact with the third semiconductor regions and which cover the surface of the first semiconductor region through an insulating film on the second semiconductor region side and on the side opposite thereto,

wherein at the surface of the first semiconductor region which is in contact with the one main surface, the area of the region covered with the auxiliary electrodes is not less than one half of the area of the surface of the first semiconductor region which is in contact with the one main surface,

wherein the distance between one of the third semiconductor regions and a second one of the third semiconductor regions adjacent to said one of the third semiconductor regions on a peripheral side of the semiconductor device is wider than the distance between said one of the third semiconductor regions and a third one of the third semiconductor regions adjacent to said one of the third semiconductor regions on an inner side, and

wherein between the third semiconductor regions adjacent to each other, the area of one of the auxiliary electrodes which covers the surface of the first semiconductor region on the peripheral side of the semiconductor device is wider than the area of an adjacent one of the auxiliary electrodes which covers the surface of the first semiconductor region on the inner side.

5,691,554

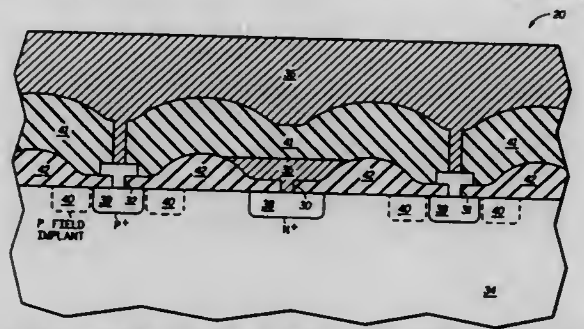
PROTECTION CIRCUIT

Lloyd P. Matthews, Buda, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 15, 1995, Ser. No. 573,094

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—328 **16 Claims**



1. A circuit operable for protecting a protected device in an integrated circuit from energy having a voltage greater than a breakdown voltage of said protected device, said circuit comprising a semiconductor diode, wherein P and N portions of said diode are formed in a substrate and are separated by a portion of said substrate and a more highly doped portion of said substrate, a first terminal of said semiconductor diode coupled to an input pin of said integrated circuit and a second terminal of said semiconductor diode coupled to ground, wherein said semiconductor diode is coupled to said protected device, and wherein said semiconductor diode and said protected device have a substantially similar breakdown voltage.

5,691,555

INTEGRATED STRUCTURE CURRENT SENSING RESISTOR FOR POWER DEVICES PARTICULARLY FOR OVERLOAD SELF-PROTECTED POWER MOS DEVICES

Raffaele Zambrano, Catania, Italy, and Richard A. Blanchard, Los Altos, Calif., assignors to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, Italy

Continuation-in-part of Ser. No. 481,198, Jun. 7, 1995, Pat. No. 5,491,357, which is a continuation of Ser. No. 242,261, May 13, 1994, abandoned. This application Feb. 8, 1996, Ser. No. 598,394

Claims priority, application European Pat. Off., May 19, 1993, 93830207

Int. Cl.^{6} H01L *29/78*

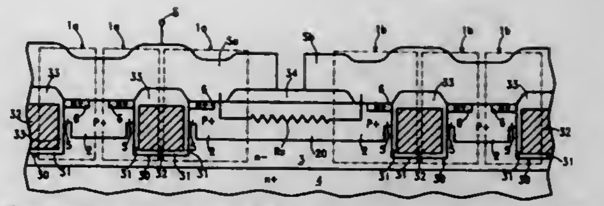
U.S. Cl. 257—332 **13 Claims**

1. A power device, comprising:

a semiconductor substrate;

a semiconductor layer of a first conductivity formed on said substrate and having a surface;

first and second trenches formed in said semiconductor layer and having first and second trench walls respectively;



first and second insulator layers formed within said first and second trenches on said first and second trench walls respectively;

first and second conductors formed within said first and second trenches on said first and second insulators respectively;

first and second regions of a second conductivity formed in said semiconductor layer and contiguous with said first and second trench walls respectively;

third and fourth regions of said first conductivity formed in said semiconductor layer and contiguous with said first and second trench walls and said first and second regions respectively;

a first body region of said second conductivity formed in said semiconductor layer and contiguous with said first and third regions respectively;

a second body region of said second conductivity formed in said semiconductor layer and contiguous with said second and fourth regions respectively;

a first electrode coupled to said third region and to said first body region;

a second electrode coupled to said fourth region and to said second body region; and

an interconnecting body region of said second conductivity formed in said semiconductor layer and contiguous with said first and second body regions.

5,691,556

STEP-UP SEMICONDUCTOR INTEGRATED CIRCUIT AND ELECTRONIC EQUIPMENT USING THE SEMICONDUCTOR INTEGRATED CIRCUIT

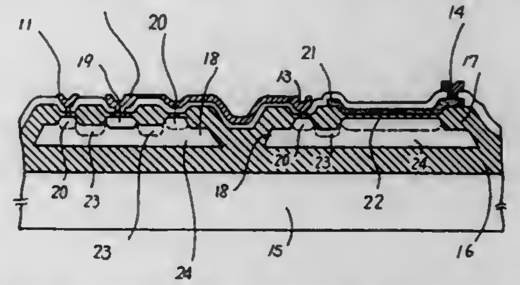
Yutaka Saito; Hiroshi Takahashi; Hiroshi Odagiri, and Katsuhiro Horiguchi, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Feb. 17, 1994, Ser. No. 197,732

Claims priority, application Japan, Feb. 17, 1993, 5-028265; Feb. 22, 1993, 5-032309; Mar. 16, 1993, 5-056206; Mar. 22, 1993, 5-062256; Dec. 28, 1993, 5-335424

Int. Cl.^{6} H01L *27/01;29/00*

U.S. Cl. 257—350 **50 Claims**



1. A boosting semiconductor integrated circuit comprising: a support substrate; an insulation film formed on the support substrate; a semiconductor film formed on the insulation film; and a plurality of boosting elements each including a charge storing element and a rectifying element; wherein the plurality of boosting elements are electrically connected in series with each other, a portion of the semiconductor film corresponding to each boosting element is electrically separated from a portion of the semiconductor film corresponding to the other boosting elements with a dielectric isolation layer which is formed on the insulation film, wherein the rectifying element has a first terminal comprised of the semiconductor film and a second terminal disposed on the first

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terminal, and wherein the charge storing element comprises the second terminal, a dielectric layer disposed on the second terminal and a conductive layer disposed on the dielectric layer.

5,691,557
SEMICONDUCTOR CIRCUIT HAVING INPUT PROTECTIVE CIRCUIT

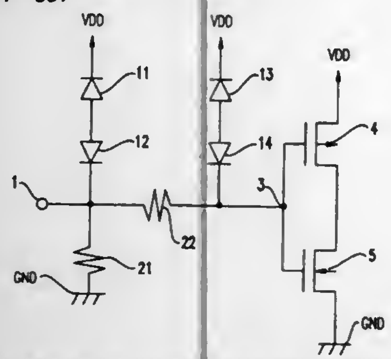
Toshio Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 356,965

Claims priority, application Japan, Dec. 17, 1993, 5-317838

Int. Cl.^{6} H01L *29/72*

U.S. Cl. 257—357 **23 Claims**



1. A semiconductor device having an input protective circuit for an internal circuit, said input protective circuit comprising:

a first node;
a second node connected to said internal circuit;
a power supply line;
an input terminal connected to said first node without an intervention of a substantial impedance;
a first resistor connected between said first node and second node;
a first discharge circuit connected between said second node and said power supply line; and
a second discharge circuit connected between said first node and said power supply line.

5,691,558
DRIFT-FREE AVALANCHE BREAKDOWN DIODE

Neil A. Davies, Sonnenbuehl-Genkingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

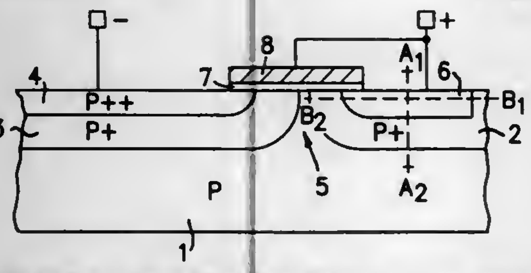
PCT No. PCT/DE94/01462, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/17013, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 8, 1994, Ser. No. 505,226

Claims priority, application Germany, Dec. 18, 1993, 43 43 365.0

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—367 **5 Claims**



1. An avalanche breakdown diode having a p-type substrate, comprising:

a first p-doped region formed in the p-type substrate;
a second p-doped region formed in the first p-doped region, the second p-doped region having a doping concentration greater than the first p-doped region;
a n-doped region formed in the p-type substrate;
a third p-doped region formed underneath the n-doped region, the third p-doped region and the first p-doped region defining an interspace having a predetermined width and including the p-type substrate, the third p-doped region covering at least a portion of the n-doped region adjacent to the interspace;
an insulating layer formed over the interspace;
a conducting layer applied to the insulating layer; and
wherein the second p-doped region is connected to a negative voltage, the n-doped region is connected to a positive voltage and the conductive layer is connected to the positive voltage.

5,691,559
SEMICONDUCTOR DEVICES WITH LOAD ELEMENTS

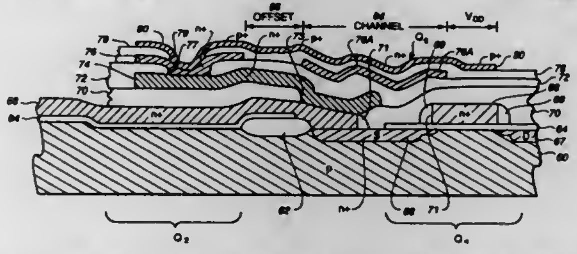
Masakazu Kimura, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 871,871, Apr. 20, 1992, Pat. No. 5,349,206, which is a continuation-in-part of Ser. No. 410,936, Sep. 22, 1989, Pat. No. 5,107,322. This application Sep. 19, 1994, Ser. No. 308,777

Claims priority, application Japan, Nov. 10, 1988, 63-284686

Int. Cl.^{6} H01L *27/02*

U.S. Cl. 257—369 **3 Claims**



1. A semiconductor device having a MISFET and a load element in a cell confined to a cell area, the cell area having edges, said device comprising:

a substrate having an impurity diffusion region forming part of said MISFET;
a power supply line at one edge of the cell area;
a gate electrode of said MISFET disposed on said substrate;
a second electrode formed on, and at least partially insulated from, said substrate and contacting said impurity diffusion region;
a first insulating layer covering said second electrode and provided with a first contact hole which exposes a contact region of said second electrode;
a first conductive layer formed on said first insulating layer and connected to said contact region of said second electrode via said first contact hole;
a second insulating layer covering said first conductive layer and provided with a second contact hole which is laterally spaced from said first contact hole and exposes a contact region of said first conductive layer, at least a portion of said second contact hole being located directly above said gate electrode; and
a second conductive layer disposed above said second insulating layer and connected to said contact region of said first conductive layer via said second contact hole, said second conductive layer extending from said second contact hole to said power supply line, wherein
said second conductive layer forms at least a portion of said load element.

5,691,560
NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF MANUFACTURING THE SAME

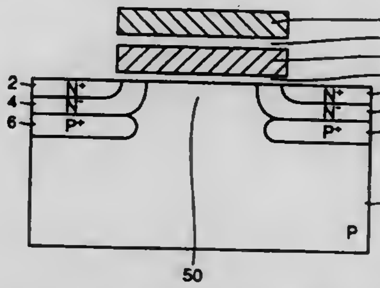
Kiyohiko Sakakibara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 317,643

Claims priority, application Japan, Jul. 19, 1994, 6-166828

Int. Cl.^{6} H01L *29/788*

U.S. Cl. 257—316 **7 Claims**



1. A nonvolatile semiconductor memory device which performs erasing by injecting electrons into a floating gate electrode, comprising:

a semiconductor substrate of a first conductivity type having a main surface;
a source region and a drain region of a second conductivity type formed on said main surface of said semiconductor substrate and spaced from each other by a predetermined distance to define a channel region therebetween;
a first impurity region of the second conductivity type formed under and surrounding at least said drain region and extending to the main surface of the semiconductor substrate, said first impurity region having an impurity concentration lower than that of said drain region; and
a second impurity region of the first conductivity type formed under at least said first impurity region without extending under a portion of said first impurity region near said channel region at the main surface of the semiconductor substrate, wherein only the second impurity region of the first conductivity type is formed in contact with the bottom surface of the first impurity region of the second conductivity type.

5,691,561
SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

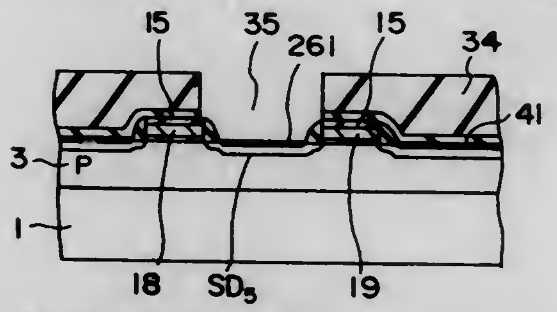
Hiroshi Goto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1994, Ser. No. 363,517

Claims priority, application Japan, Feb. 18, 1994, 6-021172

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—369 **2 Claims**



1. A semiconductor device comprising:

a semiconductor layer having a first region to be formed of a first MOS transistor and a second region to be formed of a second MOS transistor;
a field insulating layer surrounding said first region and said second region on a surface of said semiconductor;
a first gate insulating layer formed on said surface of said semiconductor layer in said first region;
a second gate insulating layer formed on said surface of said semiconductor layer in said second region;
a gate electrode formed on said first gate insulating layer and said second gate insulating layer over said field insulating layer;
a gate covering insulating film formed on top face and side faces of said gate electrode;
an opening formed in a part of said gate covering insulating film;
a first silicide layer formed on a surface of said gate electrode under said opening;
first conductive type impurity diffusion layers as a source and a drain of said first MOS transistor formed in said semiconductor layer both sides of said gate electrode in said first region;
a second silicide layer formed on surface of each said first conductive type impurity diffusion layer, said second silicide layers are made of the same material as that of said first silicide layer;
second conductive type impurity diffusion layers as a source and a drain of said second MOS transistor formed in said semiconductor layer both sides of said gate electrode in said second region;
a third silicide layer formed on surface of each said second conductive type impurity diffusion layer, said third silicide layers are made of the same material as that of said first silicide layer;
a lower interconnection made of a conductive material and contacted on said first silicide layer through said opening, said lower interconnection electrode is extended to said field insulating layer;
a contact pad formed on a part of said gate covering insulating film and one of said second silicide layers, said contact pad is made of the same material as that of said lower interconnection;
an interlevel insulator formed on said gate covering insulating film, said second and third silicide layers, said lower interconnection and field insulating layer;
a contact hole formed in said interlevel insulator so as to expose said contact pad; and
an upper interconnection formed on said interlevel insulator and contacted to said contact pad electrically through said contact hole.

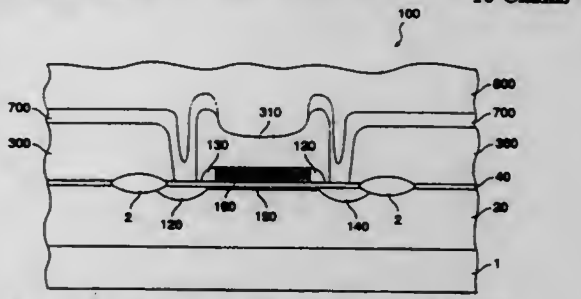
5,691,562
THROUGH GLASS ROM CODE IMPLANT TO REDUCE PRODUCT DELIVERING TIME

Min-Liang Chen, Hsinchu; Ying-Kit Tsui, Taipei, and Jau-Nan Kau, Hsinchu, all of Taiwan, assignors to Mosel Vitelic, Inc., Hsinchu, Taiwan

Division of Ser. No. 242,382, May 13, 1994, Pat. No. 5,514,609. This application Apr. 13, 1995, Ser. No. 423,671

Int. Cl.^{6} H01L *29/76;29/94*

U.S. Cl. 257—391 **16 Claims**



1. A read only memory semiconductor device comprising:

a partially completed semiconductor device comprising a gate electrode, source/drain regions, and a channel region;

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a dielectric layer overlying at least said gate electrode and exposing portions of said source/drain regions, said dielectric layer including an upper surface, said first dielectric being a BPSG layer;
a recessed region defined in said upper surface of said first dielectric layer overlying said gate electrode, said recessed region being a portion of said BPSG layer; and
a channel region implanted from impurities through said recessed region of said dielectric layer and said gate electrode.

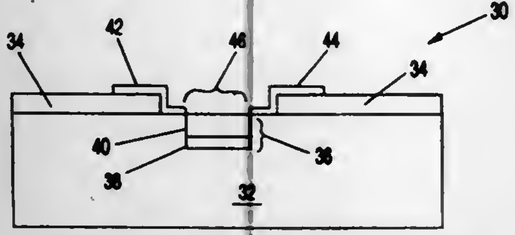
5,691,563
SILICON METAL-SEMICONDUCTOR-METAL PHOTODETECTOR

Steven R. J. Brueck; David R. Myers, and Ashwani K. Sharma, all of Albuquerque, N. Mex., assignors to Sandia National Laboratories, Albnquerque, N. Mex.

Continuation of Ser. No. 4,803, Jan. 15, 1993, Pat. No. 5,449,945. This application Sep. 12, 1995, Ser. No. 527,304

Int. Cl.^{6} H01L *31/00*

U.S. Cl. 257—449 **2 Claims**



1. A silicon-based photodiode having effective response to radiation in the visible to near infrared wavelengths comprising:
a planar layer comprising crystalline Si having a defected layer within it produced by ion implantation extending into the Si layer below the surface of the Si layer exposed to the radiation wherein the defected layer has its highest concentration of defects in its deepest portion such that a region of relatively higher resistivity and containing a greater number of recombination centers is formed therein sufficient to reduce the collection at the electrodes of charge carriers produced below the defected layer;
at least two Schottky barrier electrodes on the Si layer adjacent the defected layer;
and means to sense the photodiode response to the radiation, said means being connected between the at least two electrodes.

5,691,564
SEMICONDUCTOR DEVICE WITH HIGH SPEED OPERATION AND HIGH INTEGRATION

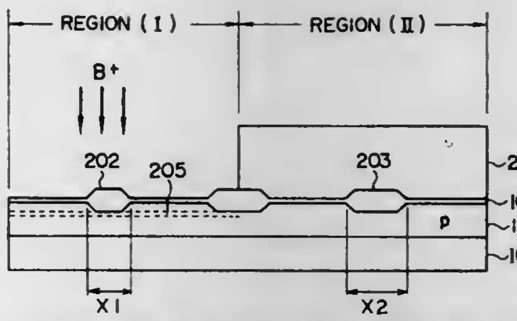
Hisato Oyamatsu, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation of Ser. No. 212,108, Mar. 11, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 566,490

Claims priority, application Japan, Mar. 11, 1993, 5-050955

Int. Cl.^{6} H01L *29/00;27/108;29/76*

U.S. Cl. 257—509 **12 Claims**



1. A semiconductor device comprising:
a semiconductor substrate having a first region having a first surface and a second region having a second surface, said first region being adjacent to said second region;
first MOS transistors formed in the first region;
a first insulating film formed on the first surface of the semiconductor substrate for isolating the first MOS transistors from each other, the first insulating film having a first width between the first MOS transistors;
second MOS transistors formed in the second region;
a second insulating film formed on the second surface of the semiconductor substrate for isolating the second MOS transistors from each other, the second insulating film having a second width between the second MOS transistors, wherein the second width of the second insulating film is wider than the first width of the first insulating film; and
a channel stopper region formed only in the first region by selectively implanting impurity ions through the first insulating film only in the first region, wherein the channel stopper region is isolated from the second MOS transistors in the second region.

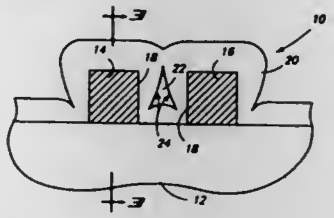
5,691,565
INTEGRATED CIRCUITRY HAVING A PAIR OF ADJACENT CONDUCTIVE LINES

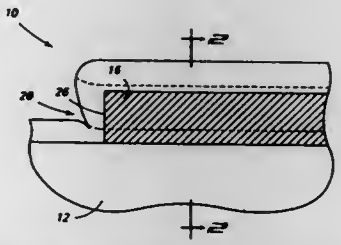
Monte Manning, Kuna, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 580,281, Dec. 27, 1995. This application Sep. 24, 1996, Ser. No. 719,150

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 257—632 **6 Claims**





1. Integrated circuitry comprising:
a pair of spaced and adjacent electrically conductive elongated lines, the lines comprising ends; and
the pair of conductive lines being encapsulated with an electrically insulative material, a top sealed elongated void provided relative to the electrically insulative material between the lines facilitating electrical isolation of the lines from one another, the void having an end, a portion of the insulating material being at the end of the void, the portion of the insulating material at the end of the void not having a retrograde profile relative to the ends of the lines.

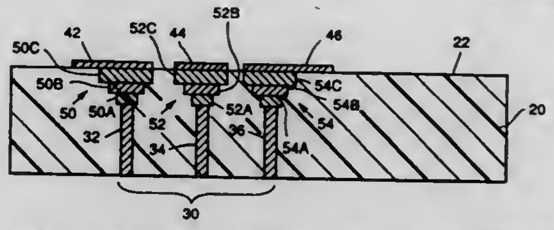
5,691,566
TAPERED THREE-WIRE LINE VERTICAL CONNECTIONS

Rick Sturdivant, Placentia, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Mar. 25, 1996, Ser. No. 621,670

Int. Cl.^{6} H01L *29/40;23/58*

U.S. Cl. 257—664 **16 Claims**



1. An electrical rf connection between an rf 3-wire transmission line buried in a dielectric substrate and corresponding conductive pads formed on a substrate surface, the 3-wire line including first, second and third wires having a wire cross-sectional dimension, including for each wire of the 3-wire line a tapered section connecting the wire to a corresponding pad, each tapered section changing in cross-sectional dimension from a first dimension at a first end connected to an end of the wire and a second dimension at a second end connected to a pad, wherein the tapered sections provide a smooth transition of electromagnetic fields between said 3-wire line and said pads.

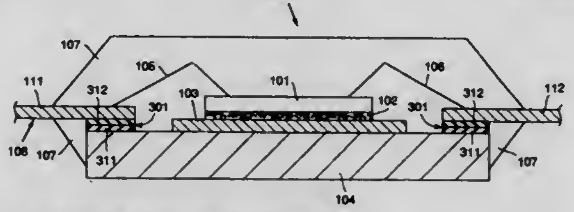
5,691,567
STRUCTURE FOR ATTACHING A LEAD FRAME TO A HEAT SPREADER/HEAT SLUG STRUCTURE

Randy H. Y. Lo, Campbell; Boonmi Mekdhanasarn, Sunnyvale, and Daniel P. Tracy, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 19, 1995, Ser. No. 530,772

Int. Cl.^{6} H01L *23/495;23/48*

U.S. Cl. 257—675 **8 Claims**



1. A semiconductor device comprising:
a heat sink;
a fully cured layer of thermally conductive, electrically insulating epoxy connected to a portion of the heat sink;
a layer of thermally conductive, electrically insulating thermoplastic connected to the layer of epoxy; and
a lead frame connected to the layer of thermoplastic.

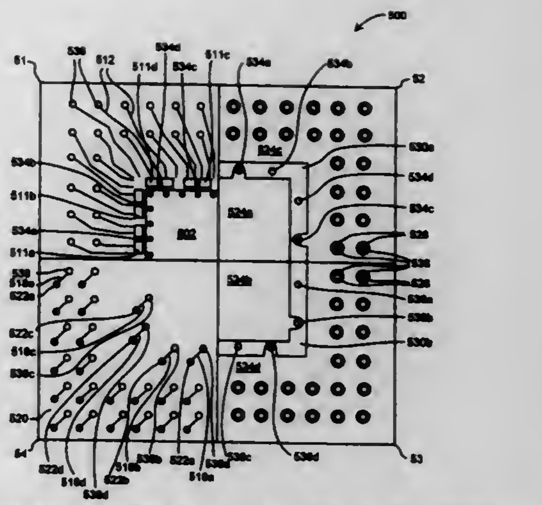
5,691,568
WIRE BONDABLE PACKAGE DESIGN WITH MAXIUM ELECTRICAL PERFORMANCE AND MINIMUM NUMBER OF LAYERS

Tai-Yu Chou, Pleasanton, and Sanjay Dandia, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed May 31, 1996, Ser. No. 656,033

Int. Cl.^{6} H01L *23/52;23/48*

U.S. Cl. 257—691 **21 Claims**



1. A package substrate for a semiconductor die having core circuits, input-output circuits, a first plurality and a second plurality of power bond pads for the core circuits, a third plurality and a fourth plurality of power bond pads for the input-output circuits, and a plurality of signal bond pads, the package substrate comprising:
a top surface, a bottom surface, first and second conductive patterns, and first, second and third dielectric layers;
the first dielectric layer disposed between the top surface and the first conductive pattern, the second dielectric layer disposed between the first and second conductive patterns, and the third dielectric layer disposed between the second conductive pattern and the bottom surface;
the top surface having a first land for connecting to the first plurality of power bond pads, a second land for connecting to the second plurality of power bond pads, a third land for connecting to the third plurality of power bond pads, a fourth land for connecting to the fourth plurality of power bond pads, and a plurality of traces for connecting to the plurality of signal bond pads;
the bottom surface having a plurality of first external connectors, a plurality of second external connectors, a plurality of third external connectors, a plurality of fourth external connectors, and a plurality of signal external connectors;
the first conductive pattern having a first plane and a third plane, the first plane connected to the first land and the plurality of first external connectors, and the third plane connected to the third land and the plurality of third external connectors;
the second conductive pattern having a second plane and a fourth plane, the second plane connected to the second land and the plurality of second external connectors, and the fourth plane connected to the fourth land and the plurality of fourth external connectors, the first and second planes positioned in a biplanar relationship for forming an electrical capacitance, and the third and fourth planes positioned in a biplanar relationship for forming an electrical capacitance thereby decoupling the core circuits of said semiconductor die from the input-output circuits of said semiconductor die; and
the plurality of signal traces connected to the plurality of signal external connectors.

5,691,569
INTEGRATED CIRCUIT PACKAGE THAT HAS A PLURALITY OF STAGGERED PINS

Mark J. Palmer, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 20, 1995, Ser. No. 575,498

Int. Cl.^{6} H01L *23/48;23/52*

U.S. Cl. 257—692 **8 Claims**

1. An electronic package, comprising:
a package which has a plurality of contacts that extend from an external surface of said package, said contacts are arranged into a plurality of unit cells wherein each unit cell is separated from an adjacent unit cell by a space, each unit cell has a rectangular pattern of four contacts and a center contact located in a center of said rectangular pattern, said external surface of said package further having a plurality of routing

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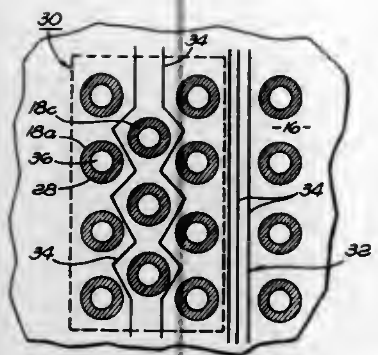


lines that extend along said space between said unit cells of contacts on said external surface of said package.

5,691,570
INTEGRATED CIRCUITS HAVING PATTERNS OF MIRROR IMAGES AND PACKAGES INCORPORATING THE SAME

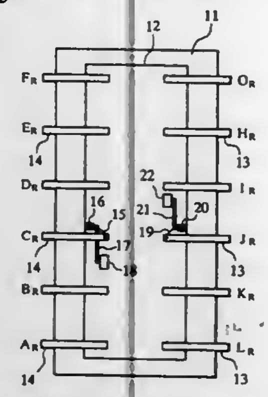
Eiji Kozuka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation of Ser. No. 311,540, Sep. 23, 1994, abandoned. This application Sep. 25, 1996, Ser. No. 719,336

Claims priority, application Japan, Sep. 29, 1993, 5-243213; Sep. 13, 1994, 6-218606

Int. Cl.^{6} H01L *23/48;23/58*

U.S. Cl. 257—693 **11 Claims**



1. A semiconductor device for mounting in a package having a plurality of outer pins, the semiconductor device comprising:

a semiconductor wafer;

a first integrated circuit having a first pattern of elements, a first side and a second side opposing the first side and a first centerline between the first and second sides;

a second integrated circuit having a second pattern of elements, a third side and a fourth side opposing the third side and a second centerline between the third and fourth sides, wherein said second pattern is a mirror image of said first pattern; and

a scribe line area between said second and third sides, wherein said first and second patterns each include a plurality of bonding pads for bonding wires through which each bonding pad is electrically connected to a respective one of said outer pins, the bonding pads are arranged along said first, second, third and fourth sides and all of said bonding pads are wholly outside of said scribe line area, and said first and second integrated circuits and said scribe line area are formed on said semiconductor wafer.

5,691,571
SEMICONDUCTOR DEVICE HAVING FINE CONTACT HOLE WITH HIGH ASPECT RATIO

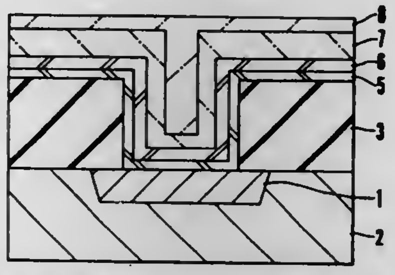
Kazuyuki Hirose, and Kuniko Kikuta, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 26, 1995, Ser. No. 578,318

Claims priority, application Japan, Dec. 28, 1994, 6-338719

Int. Cl.^{6} H01L *23/48;29/46;29/52;29/64*

U.S. Cl. 257—751 **6 Claims**



1. A semiconductor device comprising: at least one hole formed on a semiconductor substrate; a barrier metal formed on at least a portion in contact with said semiconductor substrate in the hole; and a metal interconnection constituted by two layers, which consists of a first Al-containing metal film formed on said barrier metal, and a second Al-containing metal film subsequently formed on said first Al-containing metal film and having a melting point lower than a melting point of said first Al-containing metal film, wherein said second Al-containing metal film comprises an Al—Sn alloy film having an Sn concentration of between 0.1 and 98 atom %.

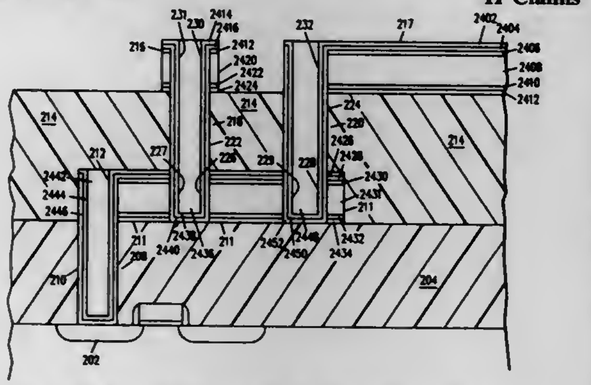
5,691,572
INTERCONNECT STRUCTURES FOR INTEGRATED CIRCUITS

Henry Wei-Ming Chung, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 240,044, May 9, 1994, abandoned. This application Jan. 24, 1996, Ser. No. 590,806

Int. Cl.^{6} H01L *23/528;23/532*

U.S. Cl. 257—751 **11 Claims**



1. An integrated circuit having an interconnect structure comprising:

a first horizontal metallic conductor having a thickness and a width;

a second horizontal metallic conductor having a thickness and a width;

a dielectric layer in contact with and disposed between the first and second horizontal metallic conductors; and

a vertical metallic conductor, the vertical metallic conductor having a body portion disposed within the dielectric layer, having a first end portion intruding into the first horizontal metallic conductor to form a first interface, and having a second end portion intruding into the second horizontal metallic conductor to form a second interface;

wherein the first and second horizontal metallic conductors comprise respective Titanium/Titanium Nitride/Aluminum-Copper alloy/Titanium Nitride stacks, and wherein the vertical metallic conductor comprises a Titanium/Titanium Nitride layer stack and Tungsten.

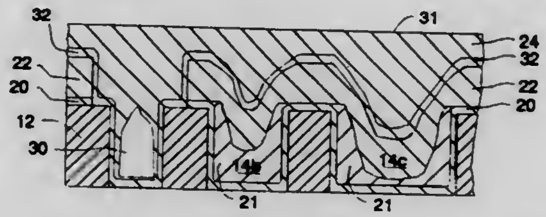
5,691,573
COMPOSITE INSULATION WITH A DIELECTRIC CONSTANT OF LESS THAN 3 IN A NARROW SPACE SEPARATING CONDUCTIVE LINES

Steven Avanzino, Cupertino; Darrell M. Erb, Los Altos; Robin Chenng, Cupertino, and Rich Klein, Mountain View, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 481,030

Int. Cl.^{6} H01L *23/485;23/52*

U.S. Cl. 257—758 **14 Claims**



1. An integrated circuit semiconductor device having a semiconductor body with a plurality of active devices and multilevel interconnections disposed on the semiconductor body comprising:

at least one interconnection level having at least one pair of conductive lines with opposing walls separated by a narrow space of not greater than 0.5 micron and each wall of the pair having a top at a height to establish an aspect ratio of not less than 2 to 1 relative to said narrow space;

additional pairs of conductive lines each having opposing walls separated by a space greater than 0.5 micron and each of walls having a top planar with the top of the walls of said one pair;

a solid nonconformal insulating material having a dielectric constant of not greater than 4 and being disposed over the top of and along each of the opposing walls of said one pair of conductive lines and bridging the narrow space to enclose, in the narrow space, a void comprising a gaseous insulating material having a dielectric constant of slightly greater than 1, the void in the narrow space being of such a size that the resultant dielectric constant of the combined solid insulating material and the gaseous insulating material in the narrow space is less than 3, said nonconformal insulating material being disposed over the tops of the opposing walls and at least partially in the spaces between the additional pairs of conductive lines.

5,691,574
SEMICONDUCTOR DEVICE CAPABLE OF HIGH SPEED OPERATION AND BEING INTEGRATED WITH HIGH DENSITY

Kazumasa Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 307,003, Sep. 16, 1994, abandoned. This application Sep. 25, 1996, Ser. No. 719,586

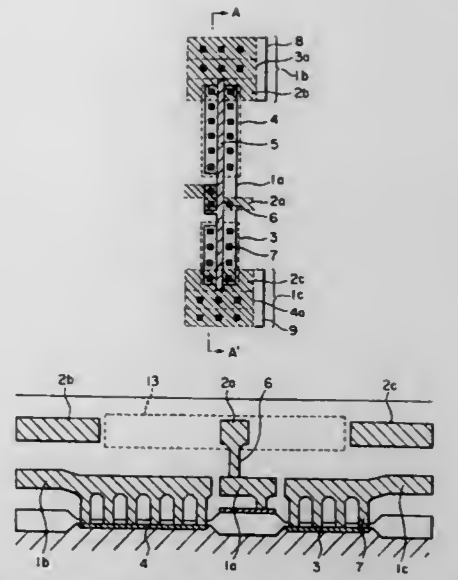
Claims priority, application Japan, Sep. 27, 1993, 5-238615

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—758 **11 Claims**

1. A semiconductor device having a multi-level wiring structure including wiring layers at a first level and wiring layers at a second level, comprising:

a first diffusion area and a second diffusion area in a surface of the semiconductor device spaced apart along an axis connecting said diffusion areas;



a first power supply wiring layer at said first level extending over said axis and having end portions over extensions of said axis beyond said diffusion areas, and having a first thickness;

a first wiring at said first level projecting from said first power supply wiring layer along said axis over said first diffusion area and connected to said first diffusion area;

a second wiring at said first level formed over said second diffusion area along said axis and connected to said second diffusion area;

a second power supply wiring layer at said second level extending over extensions of said axis beyond said diffusion areas overlapping said end portions of said first power supply wiring layer, and having a second thickness greater than said first thickness; and

at least one contact hole connecting said first power supply wiring layer to said second power supply wiring layer.

5,691,575
SEMICONDUCTOR MEMORY DEVICE

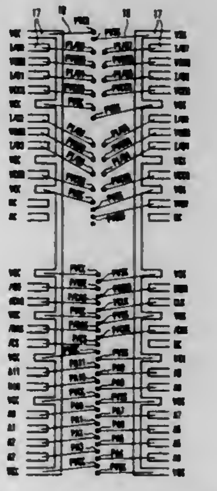
Kouki Hagiya, and Ken Shibata, both of Tachikawa, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Chiba-ken, both of Japan

Continuation of Ser. No. 258,546, Jun. 10, 1994, Pat. No. 5,473,198. This application Sep. 13, 1995, Ser. No. 527,807

Claims priority, application Japan, Jun. 11, 1993, 5-166461

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—786 **20 Claims**



1. A semiconductor memory module, comprising:

a substrate having a main surface and a rear surface; and

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first and second semiconductor memory devices, each having:

(a) a semiconductor substrate having a main surface and a rear surface, said main surface of the semiconductor substrate including a first edge and a second edge opposing said first edge, said first and second edges extending in a first direction;

(b) a first memory array block and a second memory array block, arranged nearby each other in a second direction perpendicular to said first direction, said first memory array block being arranged nearby said first edge and said second memory array block being arranged nearby said second edge;

(c) at least a first bonding pad and a second bonding pad, arranged nearby each other in said second direction on said main surface of the semiconductor substrate and between said first and said second memory array blocks, said first bonding pad being nearby said first memory array block and said second bonding pad being nearby said second memory array block;

(d) a resin molding for sealing said semiconductor substrate;

(e) a first lead and a second lead each having a first end portion and a second end portion, the first end portions of said first and second leads being over said main surface of the semiconductor substrate and the second end portions of said first and second leads being positioned outside of said resin molding, said first lead of said first semiconductor memory device crossing said first edge of the second semiconductor memory device, and said second lead of the second semiconductor memory device crossing said first edge of the second semiconductor memory device; and

(f) a first wiring connecting said first lead to said first bonding pad, and a second wiring connecting said second lead to said second bonding pad, said first semiconductor memory device being mounted on said main surface of said substrate and said second semiconductor memory device being mounted on said rear surface of said substrate, so that said rear surface of said semiconductor substrate of said first semiconductor memory device faces said rear surface of said semiconductor substrate of said second semiconductor memory device, wherein said first and second bonding pads are for data input/output, and wherein said first lead of the first semiconductor memory device is electrically connected to said second lead of said second semiconductor memory device.

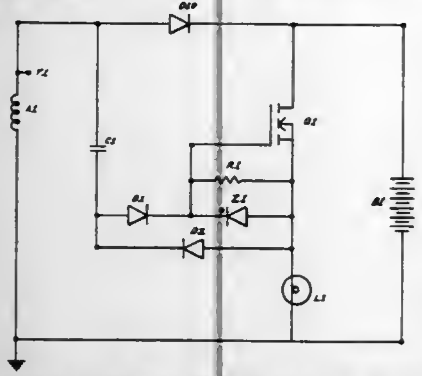
5,691,576
ENGINE OPERATED SWITCH FOR CONTROLLING OPERATION OF ELECTRICAL LOAD RESPONSIVE TO ALTERNATOR VOLTAGE AND/OR BATTERY VOLTAGE

Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32741

Continuation of Ser. No. 743,163, Aug. 8, 1991, Pat. No. 5,459,357. This application Oct. 16, 1995, Ser. No. 543,610

Int. Cl.^{6} B60L *11/12;* **H02P** *9/04*

U.S. Cl. 307—10.7 **5 Claims**



1. A system for controlling the operation of an electrical load in a vehicle, said vehicle being driven by an engine, said engine also driving an alternator having an alternating current output, said output being rectified to charge a battery which is part of the electrical system of said vehicle, an amplifying device be responsive to said alternator output for automatically controlling the flow of power from said battery to said electrical load and having an input terminal, said input terminal connected through a control network to receive power from said alternating current output when said engine is operating and wherein said control network contains a diode and a capacitor in series between said input terminal and said alternating current output.

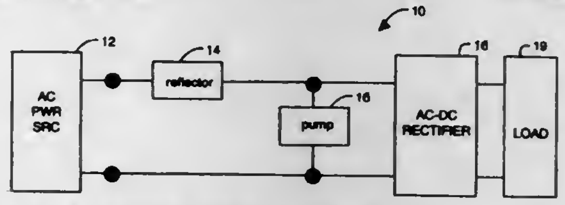
5,691,577
REFLECTOR-PUMP NETWORK FOR PREEMPTING AC POWER SUPPLY HARMONIC DISTORTION AND FOR SATIATING THE COMPLEX HARMONIC POWER DEMAND OF A RECTIFIER

Steve Smith, 5100 Channel Ave., Richmond, Calif. 94804

Filed May 3, 1996, Ser. No. 642,414

Int. Cl.^{6} H02M *1/12*

U.S. Cl. 307—105 **12 Claims**



1. A reflector-pump network, comprising:

a pair of input terminals providing for a connection to a source of fixed-frequency single-phase alternating current power;

a pair of output terminals providing for the connection to a rectifier that generates a complex harmonic current demand comprising at least odd triplet harmonics of a fundamental frequency of said fixed-frequency single-phase alternating current power;

at least one reflector connected between the input and output terminals and providing for the isolation of said complex harmonic current demand from the input terminals; and

at least one pump connected across the output terminals and providing a satiating power source for said complex harmonic current demand;

wherein, the at least one reflector presents at least an additional ten percent of the load impedance to said AC power supply at the fundamental frequency, and;

wherein, the at least one pump and the at least one reflector cooperate in isolating signals between the input and output terminals at the frequencies included in said at least odd triplet harmonics.

5,691,578
BATTERY-SPARING RETAIL/HOME CIRCUIT FOR A SENSOR

John Driska, Princeton Junction, N.J., assignor to Azrak-Hamway International, Inc., New York, N.Y.

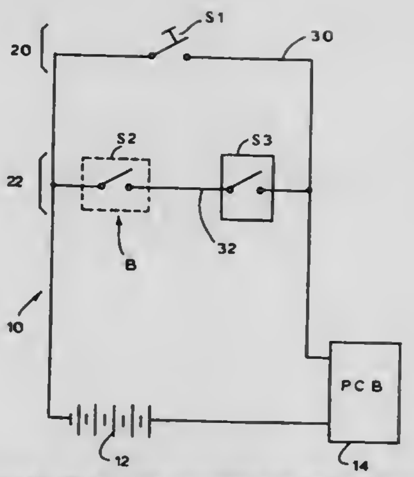
Filed Sep. 26, 1996, Ser. No. 721,617

Int. Cl.^{6} H01H *47/00;9/02*

U.S. Cl. 307—112 **7 Claims**

1. A battery-sparing retail/home circuit for a sensor comprising:

(A) first switch means including a first user-operable switch for energizing a first circuit, said first user-operable switch being biased to an open orientation for opening the first circuit and movable to a closed orientation for closing the first circuit, said first user-operable switch always being operable to close the first circuit; and



(B) second switch means including a second user-operable switch in a series circuit with a sensor-operated switch, said second user-operable switch being accessible by a user only after purchase of said retail/home circuit and movable between an off orientation opening the series circuit and an on orientation rendering the series circuit dependent on said sensor-operated switch only;

said first and second switch means being in parallel.

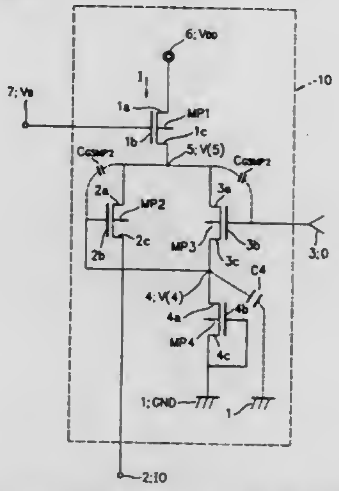
5,691,579
CURRENT SWITCHING CIRCUIT OPERABLE AT HIGH SPEED WITHOUT EXTERNALLY SUPPLIED REFERENCE BIAS

Tomio Takiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 3, 1996, Ser. No. 582,442

Int. Cl.^{6} H01H *19/64*

U.S. Cl. 307—113 **6 Claims**



1. A current switching circuit having a signal input terminal and a current output terminal, the current switching circuit comprising:

a first node;

a constant current source connected to said first node;

a first switching transistor connected between the first node and a second node, the first switching transistor having a first control electrode, said first control electrode being connected to the signal input terminal;

a second switching transistor connected between the first node and the current output terminal, the second switching transistor having a second control electrode, said second control electrode being connected to the second node; and

a resistive conduction member interconnected between the second node and a predetermined potential for a resistive current conduction therebetween.

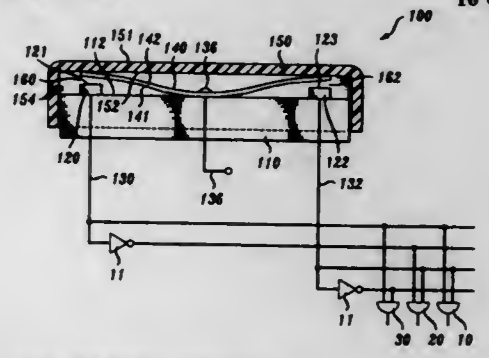
5,691,580
BUTTON INTERFACE FOR STATE MACHINE

Kevin Alan Shelby, 56 Garfield Pl., Red Bank, N.J. 07701

Filed May 22, 1995, Ser. No. 447,328

Int. Cl.^{6} H01H *35/00;9/26*

U.S. Cl. 307—119 **16 Claims**



1. A switch apparatus, comprising:

a first electrical contact;

a second electrical contact;

a cover element suspended over said first electrical contact and said second electrical contact, wherein said cover element has a first region disposed above said first electrical contact, a second region disposed above said second electrical contact, and a middle region disposed between said first region and said second region; and

a third electrical contact disposed below said cover element, wherein a predetermined tactile force applied to said first region of said cover element causes an electrical connection between said first electrical contact and said third electrical contact, a predetermined tactile force applied to said second region of said cover element causes an electrical connection between said second electrical contact and said third electrical contact, and a predetermined tactile force applied to said middle region of said cover element causes an electrical connection between said third electrical contact and both said first electrical contact and said second electrical contact.

5,691,581
ARM ASSEMBLY AND VOICE COIL MOTOR

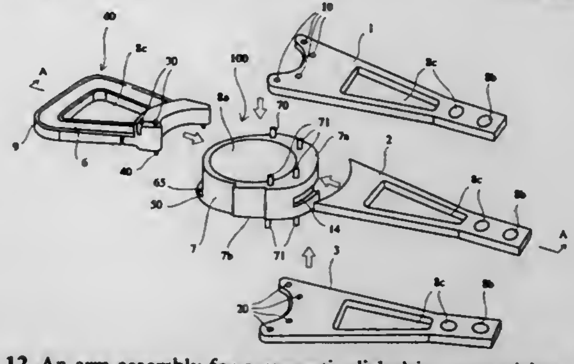
Teruo Umehara, Hanyu, and Fumihiko Takahashi, Saitama-ken, both of Japan, assignors to Hitachi Metals, Ltd., and Hitachi Metals Kiko, Ltd., both of Tokyo, Japan

Filed Jun. 20, 1995, Ser. No. 492,546

Claims priority, application Japan, Jan. 6, 1995, 7-562

Int. Cl.^{6} H02K *41/00;* **G11B** *5/48*

U.S. Cl. 310—13 **12 Claims**



12. An arm assembly for a magnetic disk drive, comprising:

a rotatable boss member having an upper, lower and side surfaces with pins extending from the upper and lower surfaces;

upper, lower and middle arm plates, each arm plate having a recording/reproducing head attached thereto, the upper and lower arm plates having holes therein, the pins, which extend from the upper and lower surfaces of the rotatable boss

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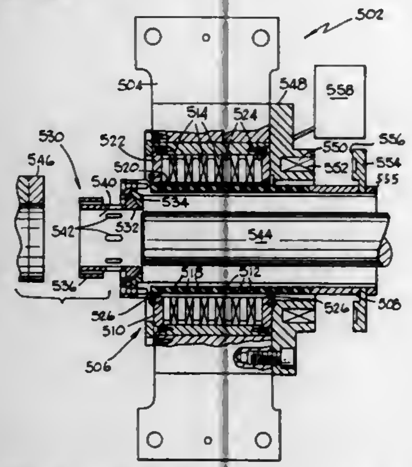
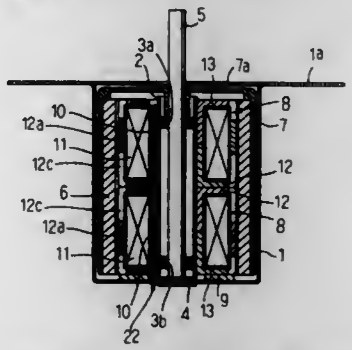
member, being fitted respectively in the holes in the upper and lower arm plates; and
a resin attaching the middle arm plate to the side surface of the rotatable boss member.

5,691,582
CAN BODY MAKER WITH LINEAR MOTOR REDRAW ACTUATOR
Phillip John Lucas, Lakewood, Colo., and Crawford R. Meeks, Woodland Hills, Calif., assignors to Coors Brewing Company, Golden, Colo.
Continuation-in-part of Ser. No. 36,043, Mar. 23, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 380,952
Int. Cl.^{6} H02K *41/00*
U.S. Cl. 310—14 **30 Claims**



1. Apparatus for forming can body preforms into elongated can bodies comprising:
a stationary support frame;
a housing having can forming and ironing dies located therein mounted on said support frame;
support means mounted on said support frame adjacent to said housing;
a redraw assembly having a generally cylindrical passageway extending therethrough on said support frame for reciprocal movement relative thereto;
reciprocating means for reciprocating said redraw assembly;
said redraw assembly having a redraw sleeve having a generally cylindrical passageway extending therethrough;
said redraw sleeve having opposite end portions and a central portion;
one of said opposite end portions connected to said reciprocating means;
the other of said opposite end portions having a can body preform having a closed bottom end and an integral, open ended cylindrical sidewall mounted thereon with said cylindrical sidewall surrounding said other of said opposite end portions;
a reciprocable ram for movement through said redraw sleeve to contract a can body preform between said housing and said redraw sleeve to move said can body preform through said can forming and ironing dies; and
a plurality of radially extending, circumferentially spaced apart air escape openings in said central portion of said redraw sleeve and spaced from said cylindrical sidewall to permit escape of air as said rams moves through said one of said opposite end portions and said central portion of said redraw sleeve toward said can body preform.

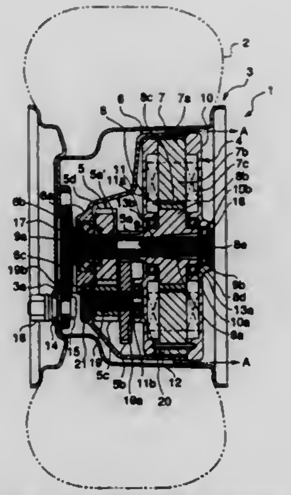
5,691,583
STEPPING MOTOR WITH INTERNAL POWER CONNECTIONS
Yuzuru Suzuki, and Hideki Akagawa, both of Shizuoka-ken, Japan, assignors to Minebea Kabushiki-Kaisha, Nagano-ken, Japan
Filed Apr. 30, 1996, Ser. No. 640,385
Claims priority, application Japan, Aug. 31, 1995, 7-246734
Int. Cl.^{6} H02K *15/00*
U.S. Cl. 310—49 R **5 Claims**



1. In an outer rotor type stepping motor comprising, in combination:
(a) a rotating shaft (**5**) rotatably mounted in a casing (**1**);
(b) a rotor yoke (**7**) having a sleeve-like shape including a top portion closed by a top-plate portion (**7***a*) and an open bottom portion, said top-plate portion (**7***a*) of said rotor yoke (**7**) having a center hole in which said rotating shaft (**5**) is fixedly mounted, said rotor yoke (**7**) being provided with a permanent magnet (**6**) in its inner peripheral surface;
(c) an upper stator (**8**) and lower stator (**8**) each of which is constructed of a coil (**11**) and a stator yoke (**12, 13**), and fixedly mounted in said casing (**1**) to surround said rotating shaft (**5**), said coil (**11**) having its conductor wound on respective upper and lower bobbins (**10, 10**) each having a sleeve-like shape including opened upper and lower end portions, each said bobbin (**10**) being provided with an outer flange (**14, 15**) in its opposite opened-end portions, said stator yoke (**12, 13**) surrounding said coil (**11**);
the improvement wherein:
(d) each of said upper and lower bobbins (**10, 10**) is provided with an axial ridge portion (**16***a*) in an inner peripheral surface thereof, each ridge portion (**16***a*) extending in a longitudinal direction of the respective bobbin (**10**) thereof and being having at least one through-hole (**17***a*, **17***b*, **18***a*, **18***b*) extending in parallel with said ridge portion (**16***a*), said through-hole of said upper bobbin (**10**) being aligned with a corresponding through-hole of said lower bobbin (**10**); and
(e) a plurality of power feeding members (**20, 20, 22, 22**) pass through said through-hole of said upper and said lower bobbin (**10, 10**) and are connected with a plurality of lead wires (**21, 21**) which extend outward from said coils (**11, 11**), said power feeding members (**20, 20, 22, 22**) having their end portions extended outward from said casing (**1**) to form a plurality of power feeding terminals.

5,691,584
WHEEL MOTOR FOR VEHICLES
Naoya Tolda; Yoshiaki Kotani; Yoshihiro Iijima; Junji Okuda, and Yoshihisa Hirose, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Flied Sep. 1, 1994, Ser. No. 299,595
Claims priority, application Japan, Sep. 9, 1993, 5-248706; Sep. 28, 1993, 5-264198
Int. Cl.^{6} H02K *7/00*
U.S. Cl. 310—67 R **15 Claims**

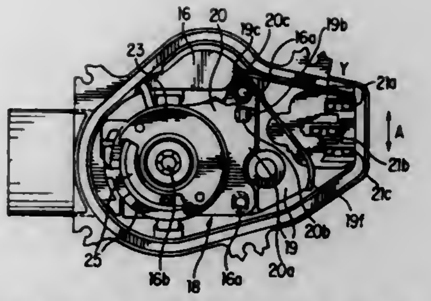
1. A wheel motor for a vehicle having a vehicle body, comprising:



a wheel having an inner peripheral portion defining a central space therein;
an electric motor arranged in said central space of said wheel, said electric motor generating and outputting a rotative driving force for rotatively driving said wheel; and
a gear reducer arranged in said central space of said wheel, said gear reducer having a plurality of gears including a final stage gear having an axial through hole formed therein in coaxial relation to an axis of rotation of said final stage gear;
said electric motor including:
a housing fixed to said vehicle body and having opposite end portions, said gear reducer being accommodated in said housing,
a stator secured to said housing and having an inner periphery defining a central space therein,
a rotor rotatably fitted in said central space of said stator, said rotor generating said rotative driving force during rotation thereof, and said rotor having an axial through hole formed therein in coaxial relation to an axis of rotation of said rotor, and
an output shaft connected through said gear reducer to said rotor to be rotatively driven by said rotor through said gear reducer, said output shaft being drivingly connected to and supporting said wheel for transmitting said rotative driving force generated by said rotor through said gear reducer to said wheel, said output shaft extending through said axial through hole of said final stage gear of said gear reducer which is rigidly fitted on said output shaft, said output shaft extending through said axial through hole of said rotor so as to be out of contact with said rotor, and said output shaft being rotatably supported by said opposite end portions of said housing.

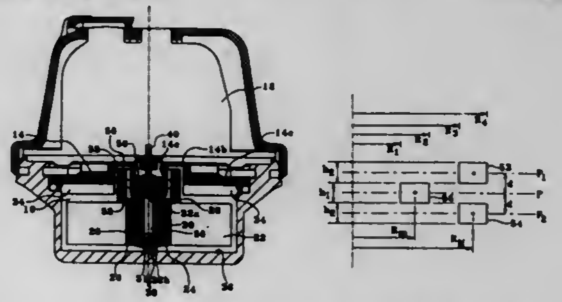
5,691,585
TERMINAL CONNECTION FOR AN ELECTRIC MOTOR WITH A SPEED REDUCER
Hirokazu Shoda, Gunma-ken, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma-ken, Japan
Filed Mar. 21, 1996, Ser. No. 620,031
Claims priority, application Japan, Mar. 28, 1995, 7-094429
Int. Cl.^{6} H02K *5/00*
U.S. Cl. 310—71 **19 Claims**

1. A terminal connector for an electric motor with a speed reducer having an output shaft, the terminal connector comprising a support plate having at least one power terminal for electrical connection with at least one brush terminal of said motor, said support plate including a first portion and a second portion, said first portion being provided with said at least one power terminal and said second portion being located adjacent said output shaft,



said first portion being movable with respect to said second portion to facilitate alignment and connection of said at least one power terminal with said at least one brush terminal.

5,691,586
SYSTEM FOR PROVIDING ROTARY DRIVE BETWEEN TWO MECHANICAL MEMBERS BY MEANS OF MAGNETIC COUPLING, AND A FLUID METER INCLUDING SUCH A SYSTEM
Jean-Paul Yonnet, Meylan, and Jérôme Delamare, Grenoble, both of France, assignors to Schlumberger Industries, S.A., Montrouge, France
Filed Jan. 13, 1995, Ser. No. 372,091
Claims priority, application France, Jan. 13, 1994, 94 00331
Int. Cl.^{6} H02K *49/06;5/00*
U.S. Cl. 310—75 D **11 Claims**



1. A drive system for rotating two mechanical members about an axis by means of magnetic coupling, the system comprising a magnetic element secured to each of said mechanical members, the two magnetic elements being concentric, the first of said magnetic elements possessing N magnetic poles regularly distributed about the axis of rotation in a ring having a minimum radius R_1 and a maximum radius R_2, where N is even, the second magnetic element possessing N magnetic poles regularly distributed about said axis of rotation in a first ring and N magnetic poles regularly distributed about the axis of rotation in a second ring identical to the first ring, where both rings have a minimum radius R_3 and a maximum radius R_4, said rings of said second magnetic element being mechanically secured to each other and each having a respective midplane perpendicular to the axis of rotation that is axially offset by a distance d from the midplane of the ring of the first magnetic element in such a manner as to lie on opposite axial sides of said first magnetic element, wherein said first and second magnetic elements are magnetically coupled by attractive forces, the magnetization of each magnetic element having a direction that is contained in a plane perpendicular to the axis of rotation, and wherein the ratio $2d/|(R_3+R_4)-(R_1+R_2)|$ lies in the range 0.2 to 0.8.

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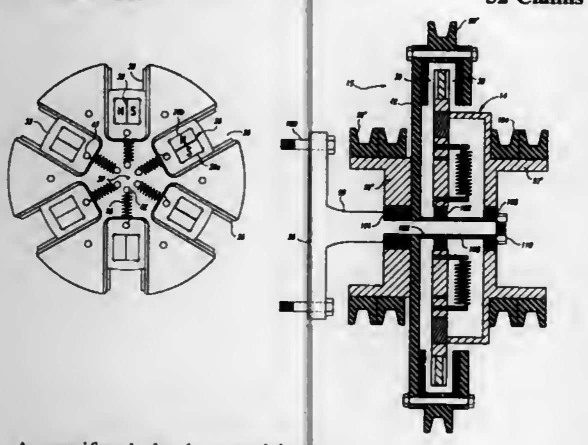
5,691,587
MAGNETIC CENTRIFUGAL CLUTCH

Karl J. Lamb, Port Angeles, Wash., assignor to Magna Force, Inc., Port Angeles, Wash.

Continuation-in-part of Ser. No. 546,066, Oct. 20, 1995, which is a continuation of Ser. No. 237,031, May 3, 1994, Pat. No. 5,477,094, which is a continuation-in-part of Ser. No. 65,867, May 21, 1993, Pat. No. 5,477,093. This application Mar. 15, 1996, Ser. No. 616,370

Int. Cl.⁶ H02K *49/00;* **H02P** *15/00*

U.S. Cl. 310—103 **32 Claims**



1. A centrifugal clutch comprising:
a first rotor having a first rotary axis and having a band of non-ferrous electroconductive material spaced outwardly from said axis by a radial distance;
a second rotor facing said first rotor, and having a second rotary axis aligned with said first rotary axis;
and permanent magnets moveably mounted on said second rotor such as to move outwardly relative to said second rotary axis responsive to centrifugal force resulting from rotation of said second rotor from an inactive inner position to an active outer position wherein poles of said magnets are spaced by an air gap from said band, said magnets being located mostly within a circle on said centered on said second axis and having a radius equal to said radial distance when said magnets are in said inner position;
and force applying components on said second rotor applying a return force to said magnets directed inwardly toward said second axis for returning said magnets to their inner position when said second rotor is not rotating, said return force being insufficient to overcome said centrifugal force when said second rotor is rotating at least at a preset speed.

5,691,588
DRIVE ARRANGEMENT FOR A HYBIRD VEHICLE

Dieter Lutz; Dieter Bauch-Panetzky, both of Schweinfurt; Reinhard Feldhaus, Oerlenbach-Ebenhausen, and Wolfgang Thieler, Hassfurt, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

PCT No. PCT/DE94/00759, § 371 Date Jan. 11, 1996, § 102(e) Date Jan. 11, 1996, PCT Pub. No. WO95/01885, PCT Pub. Date Jan. 19, 1995

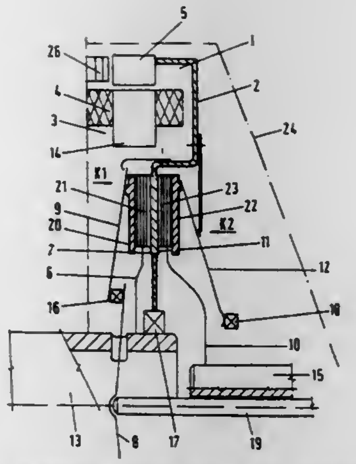
PCT Filed Jun. 21, 1994, Ser. No. 571,888

Claims priority, application Germany, Jul. 9, 1993, 43 23 602.2

Int. Cl.⁶ H02K *49/00*

U.S. Cl. 310—92 **13 Claims**

1. A drive arrangement for a hybrid vehicle comprising: an electric motor including
an external rotor having a cylindrically shaped hub body and a plurality of permanent magnets;
a rotor bearing; and
a stator;
an internal combustion engine including a casing and a crank shaft;



a drive train including a casing and a gear input shaft; and
first and second actuatable clutches positioned on opposing axial faces of said hub body, each clutch having first and second functional components, said first functional component of said first clutch being non-rotatably connected to said crank shaft, said first functional component of said second clutch being non-rotatably connected to said gear input shaft, said second functional component of both said first and second clutches being non-rotatably connected to said hub body of said external rotor, and wherein said rotor bearing is disposed in a position selected from the group consisting of (a) between said first and second clutches (b) on said casing of said internal combustion engine and (c) on said casing of said drive train.

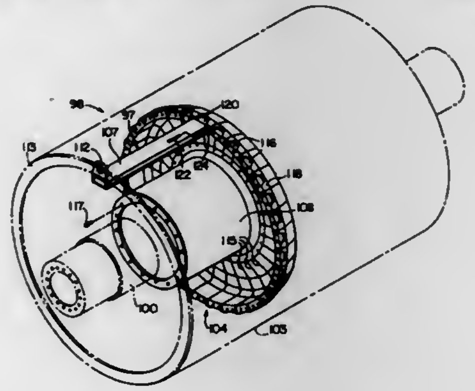
5,691,589
DETACHABLE MAGNET CARRIER FOR PERMANENT MAGNET MOTOR

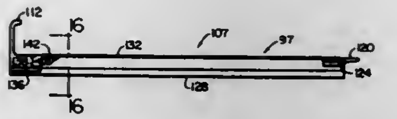
Thomas A. Keim, Boxborough; Peter P. Mongeau, Westboro, both of Mass., and Thomas Dade, Poquoson, Va., assignors to Kaman Electromagnetics Corporation, Hudson, Mass., and Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Jun. 30, 1995, Ser. No. 496,928

Int. Cl.⁶ H02K *21/12*

U.S. Cl. 310—156 **37 Claims**





1. An apparatus for mounting a high-energy-product permanent magnet to a rotor of an electric machine, said apparatus comprising:
a carrier means comprising a base and upwardly extending side walls to form a cavity for retaining a permanent magnet; and

attachment means for releasably maintaining said carrier means on a rotor surface at a rotor pole location and positioning the permanent magnet received in said carrier means relative to said rotor, said attachment means independently maintaining said carrier means to said rotor to permit said carrier means to be singularly removed from and attached to the rotor;
wherein said carrier means and said attachment means provide a magnetic flux path between a magnet received in said carrier means and the rotor when said carrier means is positioned on the rotor.

5,691,590
ALTERNATOR WITH MAGNETIC NOISE REDUCTION MECHANISM

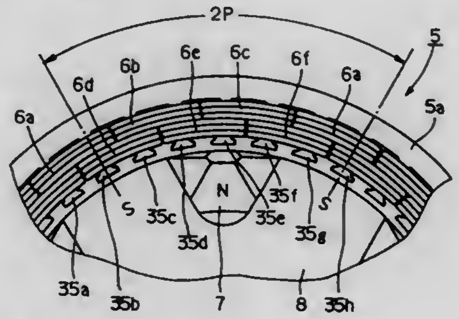
Junji Kawai, Kariya, and Atsushi Umeda, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 139,707, Oct. 22, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,595

Claims priority, application Japan, Oct. 23, 1992, 4-286249; Nov. 20, 1992, 4-335175

Int. Cl.⁶ H02K *3/48;1/12*

U.S. Cl. 310—180 **16 Claims**



1. An alternator for a vehicle comprising:
a generally cylindrical frame;
a rotor rotatably supported by said frame and having pole cores for generating a rotating magnetic field; and
a stator fixedly supported by said frame,
wherein said stator includes:
- a plurality of equi-angularly spaced teeth extending radially inwardly toward said rotor with respective slots between said plurality of teeth, said plurality of equi-angularly spaced teeth of said stator including six teeth per two pole-pitch of said rotor; and
- a plurality of stator coils having a first group of three stator coils and a second group of three stator coils, each of said first group of three stator coils and each of said second group of three stator coils being wound on one of pair of adjacent ones of said six teeth, said first group of three stator coils being shifted from said second group of three stator coils by π/3 radian in electrical angles.

5,691,591
SWITCHED RELUCTANCE MOTOR WITH INDIRECT POSITION SENSING AND MAGNETIC BRAKE

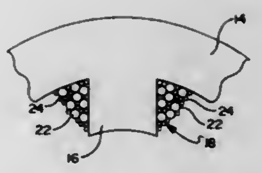
Roy A. McCann, Kettering, Ohio, assignor to ITT Automotive Electrical Systems Inc., Auburn Hills, Mich.

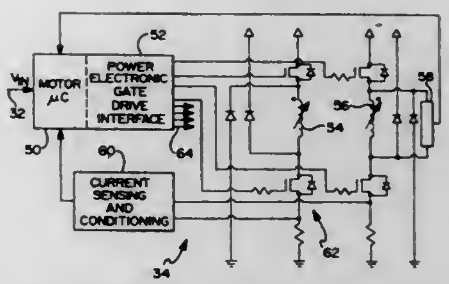
Filed May 19, 1995, Ser. No. 445,444

Int. Cl.⁶ H02K *1/00;3/00*

U.S. Cl. 310—198 **15 Claims**

1. A switched reluctance motor, comprising:
a rotor that rotates about an axis and has a plurality of rotor poles;
a stator that is stationary about said axis and generally surrounds said rotor, said stator including a plurality of stator poles, said rotor poles moving into and out of alignment with said stator poles when said rotor rotates about said axis;
a main current conductive coil having a first inductance and being disposed about at least one of said stator poles;
an auxiliary current conductive coil disposed about said at least one stator pole such that an inductance ratio of said main coil to said auxiliary coil is constant irrespective of a position of said rotor poles relative to said stator poles, said auxiliary coil having a second inductance that is greater than said first inductance;
a selectively controllable current source for individually energizing said main coil and said auxiliary coil, respectively, to thereby produce a magnetic flux that controls whether said rotor rotates about said axis;
a voltage sensor for determining a voltage across said auxiliary coil when said auxiliary coil is energized by said current source; and
means for determining a difference in a current phase value associated with a current in said auxiliary coil and a voltage phase value associated with the voltage across said auxiliary coil, said difference being indicative of a position of said rotor pole relative to said stator pole.




52
MOTOR μC
POWER ELECTRONIC GATE DRIVE INTERFACE
32
50
60
64
58
56
54
CURRENT SENSING AND CONDITIONING
62
34

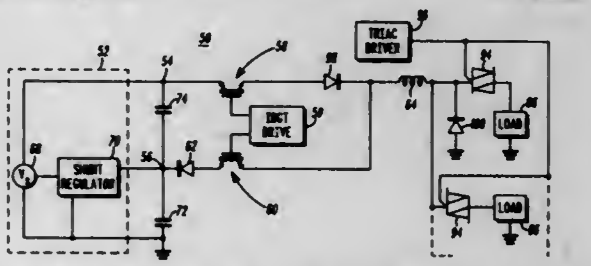
5,691,592
ACTUATOR DRIVE AND ENERGY RECOVERY SYSTEM

Mark D. Gunderson, Gurnee, and George T. Maly, Freeport, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 14, 1995, Ser. No. 528,034

Int. Cl.⁶ H01L *41/09*

U.S. Cl. 310—317 **12 Claims**



1. An Actuator drive and energy recovery system comprising:
a power supply presenting at least first and second serially interconnected output terminals and a grounded terminal;
a charge switching element connected to the first output terminal;
a recovery switching element connected to the second output terminal; and
a resonating inductor connected between both the charge and recovery switching elements and a load for increasing a voltage supplied to the load above a voltage supplied by the power supply thereby providing a single path for charging and recovering energy between the power supply and the load.

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5,691,593

PIEZOELECTRIC/ELECTROSTRICTIVE ACTUATOR HAVING AT LEAST ONE PIEZOELECTRIC/ ELECTROSTRICTIVE FILM

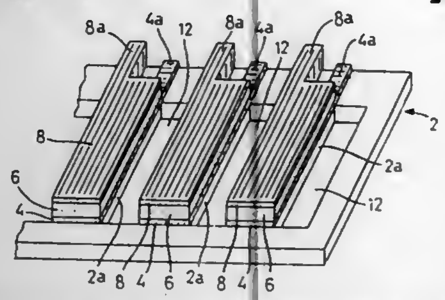
Yukihisa Takeuchi, Nishikamo-gun; Koji Kimura, and Masato Komazawa, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., and Seiko Epson Corporation, both of Japan

Continuation-in-part of Ser. No. 384,469, Feb. 2, 1995, which is a continuation of Ser. No. 102,960, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 860,128, Mar. 31, 1992, abandoned, which is a continuation of Ser. No. 550,977, Jul. 11, 1990, abandoned. This application Feb. 22, 1995, Ser. No. 392,083

Claims priority, application Japan, Jul. 11, 1989, 1-178747; Jan. 20, 1990, 2-011174

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—328 **24 Claims**



1. A piezoelectric/electrostrictive actuator, formed by a method comprising the following steps:

providing a sintered non-piezoelectric/non-electrostrictive ceramic substrate;

forming at least one actuator unit directly on a surface of said sintered non-piezoelectric/non-electrostrictive ceramic substrate, by a method comprising the steps of:

forming a first electrode film on said surface of said ceramic substrate,

forming, by a thick-film forming process, a green piezoelectric/electrostrictive ceramic film on said first electrode film, and

forming a second electrode film on the piezoelectric/ electrostrictive ceramic film, and

sintering at least said green piezoelectric/electrostrictive ceramic film formed on said first electrode film to provide a sintered piezoelectric/electrostrictive ceramic film bonded to the first electrode film without a bonding adhesive.

5,691,594

PIEZOELECTRIC/ELECTROSTRICITVE ELEMENT HAVING CERAMIC SUBSTRATE FORMED ESSENTIALLY OF STABILIZED ZIRCONIA

Yukihisa Takeuchi, Aichi-ken, and Koji Kimura, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 239,856, May 9, 1994, Pat. No. 5,430,344, which is a continuation of Ser. No. 912,920, Jul. 14, 1992, abandoned. This application May 19, 1995, Ser. No. 444,930

Claims priority, application Japan, Jul. 18, 1991, 3-203831; Oct. 3, 1991, 3-283494; Mar. 21, 1992, 4-09472

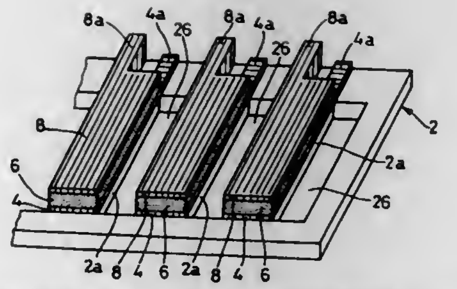
Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—330 **35 Claims**

1. A piezoelectric/electrostrictive element comprising:

a thin ceramic substrate; and

a piezoelectric/electrostrictive portion formed on said ceramic substrate by a film forming technique without glass such that the piezoelectric/electrostrictive portion directly contacts said ceramic substrate, said piezoelectric/electrostrictive portion consisting essentially of a plurality of electrodes, and at least one piezoelectric/electrostrictive layer which is heat-treated, wherein said ceramic substrate is formed of a material which includes as a major component zirconia having a crystal phase that is stabilized by addition of at least one compound selected from the group consisting of: yttrium oxide, ytterbium oxide, cerium oxide, calcium oxide and magnesium oxide.



5,691,595

VIBRATORY GYROSCOPE

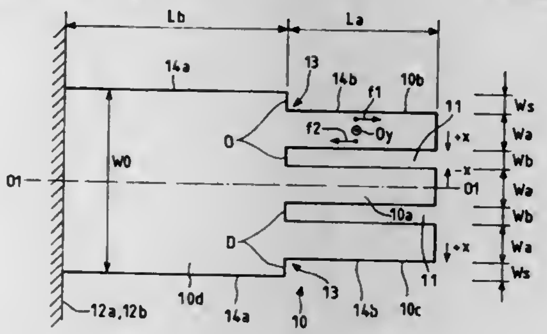
Yoshiro Tomikawa, Yonezawa; Kazumasa Ohnishi, and Akira Satoh, both of Nagaoka, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, and Yoshiro Tomikawa, Yamagata, both of Japan

Filed Sep. 20, 1995, Ser. No. 531,260

Claims priority, application Japan, Sep. 20, 1994, 6-251248

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—370 **9 Claims**



1. A vibratory gyroscope, comprising:

a plate-shaped vibrator defining an x-z plane, the vibrator including a base portion and parallel first, second and third elastic arms extending from the base portion in a z-axis direction, the first and second elastic arms being separated by a first slit, and the first and third elastic arms being separated by a second slit such that the first elastic arm is located between the second and third elastic arms;

driving means for generating vibration in at least one of said first, second and third elastic arms in a first direction; and

detecting means for detecting a vibration component in at least one of said first, second and third elastic arms in a second direction when the vibrator rotates around the z-axis direction, the second direction being perpendicular to the first direction;

wherein a maximum width of the base section is greater than a distance between an outside edge of the second elastic arm and an outside edge of the third elastic arm, both the maximum width and the distance being measured in an x-axis direction;

wherein the base section of the vibrator includes first and second outer edges, and wherein both the outside edge of the second elastic arm and the outside edge of the third elastic arm define parallel lines extending in the z-axis direction which are located between the first and second outer edges of the base section; and

wherein each of the first, second and third elastic arms includes a common width in the x-axis direction, and wherein a distance in the x-axis direction separating the outside edge of the second elastic arm and the first outer edge of the base section is less than 0.8 times the common width of each of the first, second and third elastic arms.

5,691,596

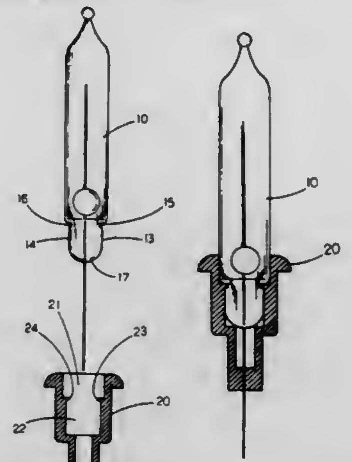
CHRISTMAS TREE LIGHT

Chuan Jen Yu, P.O. Box 82-144, Taipei, Taiwan

Filed Jan. 30, 1996, Ser. No. 593,927

Int. Cl.^{6} H01R *33/00*

U.S. Cl. 313—318.1 **1 Claim**



1. A Christmas tree light comprising a lamp holder injection-molded from flexible plastics and defining a bulb mounting chamber, and a bulb fastened to the bulb mounting chamber of said lamp holder, wherein said lamp holder comprises two transverse ribs bilaterally disposed inside said bulb mounting chamber;

said bulb comprises two engagement faces disposed at two opposite sides near a bottom end thereof and forced into engagement with the periphery of the bulb mounting chamber of said lamp holder, and two transverse retaining grooves disposed at two opposite sides above said engagement faces and forced into engagement with the transverse ribs of said lamp holder;

the engagement faces of said bulb have a respective non-circular profile fitting the periphery of the bulb mounting chamber of said lamp holder; and

said bulb has a smoothly arched bottom end inserted into the bulb mounting chamber of said lamp holder.

5,691,597

COLOR CATHODE-RAY TUBE AND METHOD FOR MANUFACTURING THE SAME

Takashi Nishimnra, Fukaya, and Toru Takahashi, Kumagaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 26, 1996, Ser. No. 592,532

Claims priority, application Japan, Jan. 27, 1995, 7-011231

Int. Cl.^{6} H01J *29/86;31/20*

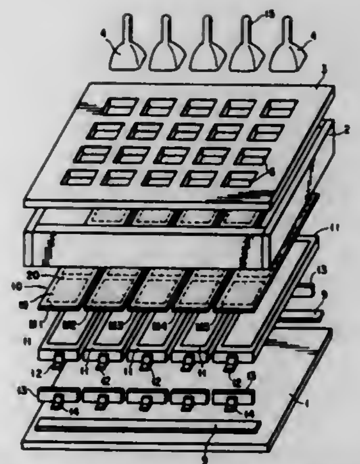
U.S. Cl. 313—402 **15 Claims**

1. A color cathode-ray tube comprising:

an envelope including a substantially rectangular face plate having first and second axes perpendicular to each other, and a rear plate opposing the face plate;

a phosphor screen formed on an inner surface of the face plate;

a shadow mask arranged in the envelope and opposing the phosphor screen, the shadow mask including a plurality of mask pieces arranged in series along the first axis, each of the mask pieces extending along the second axis and having an effective portion in which a number of electron beam passage apertures are formed;



a plurality of mask frames supporting the respective mask pieces at both ends thereof as viewed in a direction of the second axis;

a plurality of stages provided on the face plate, each defining a distance between one mask piece and the phosphor screen, each of the stages having a first end in contact with the inner surface of the face plate and a second end in contact with one of the mask frames or an end of the mask piece, as viewed in the direction of the second axis; and

beam emitting means mounted on the rear plate, for emitting electron beams to the phosphor screen through the effective portions of the mask pieces so as to dividedly scan a plurality of regions of the phosphor screen.

5,691,598

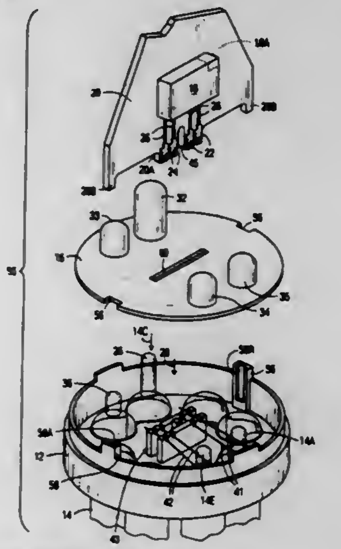
FLUORESCENT LAMP WITH THERMAL HEAT SHIELD BETWEEN LAMP TUBE AND BALLAST CIRCUITRY

Kelvin B. Belle, Willoughby Hills, Ohio; Leon F. Chamberlain, Palm Springs, Calif.; Raymond A. Fillion, Schenectady, N.Y.; Jozsef Fulop, Budapest, Hungary; David J. Kachmarik, North Olmsted, Ohio; Donald W. Kuk, Albany, N.Y.; Robert S. McFeely, Valley View, Ohio; Ferenc Papp, and Istvan Wursching, both of Budapest, Hungary, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1995, Ser. No. 569,019

Int. Cl.^{6} H01J *1/62;63/04;1/02;7/24*

U.S. Cl. 313—493 **17 Claims**



1. A fluorescent lamp, comprising:

(a) a lamp tube having first and second ends, and containing fill materials for causing light generation when provided with electrical power;

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(b) first and second power-transferring means at said first and second ends of said lamp tube, respectively, for providing said fill materials in said lamp tube with said electrical power;

(c) a support member for supporting at least the first end of said lamp tube;

(d) a housing for ballast circuitry; said housing being attached to said support member and being substantially free of ventilating apertures; and

(e) a thermal heat shield separating said first power-transferring means from ballast circuitry which is contained within said housing, which supplies power to said first power-transferring means, and which has a lifetime that becomes substantially less as its operating temperature increases;

(f) said thermal heat shield being generally flat except for at least one cover for accommodating an end of said lamp tube;

(g) said thermal heat shield being substantially the sole thermal convective heat shield between said first power-transferring means and said ballast circuitry;

(h) said thermal heat shield being constructed so that it reflects back to said first power-transferring means and any adjacent portion of said lamp tube sufficient radiant energy to reduce the operating temperature of said ballast circuitry by more than about one degree Celsius compared with the absence of said heat shield.

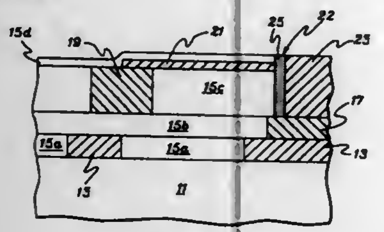
5,691,599
MULTI-CHROMIC LATERAL FIELD EMISSION DEVICES WITH ASSOCIATED DISPLAYS AND METHODS OF FABRICATION

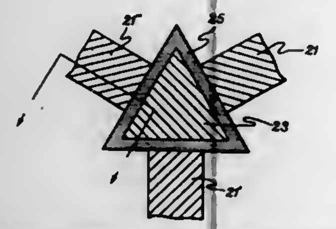
Michael David Potter, Grand Isle, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 324,633, Sep. 18, 1994. This application May 2, 1996, Ser. No. 641,794

Int. Cl.^{6} H01J *19/24*

U.S. Cl. 313—495 **8 Claims**





5. A display device comprising a plurality of light emitting field emission structures ("LEFESs"), said plurality of LEFESs being organized in a display matrix, each LEFES of said plurality of LEFESs comprising:

a continuous phosphor layer, said continuous phosphor layer having a plurality of emission regions; and

a plurality of lateral emitters, each lateral emitter of said plurality of lateral emitters being separately electrically controllable and extending parallel to an upper surface of a supporting substrate of said FED, and wherein each lateral emitter is associated with an emission region of said plurality of emission regions, wherein electrons emitted by each lateral emitter into said continuous phosphor layer cause a light emission from the associated emission region of said continuous phosphor layer.

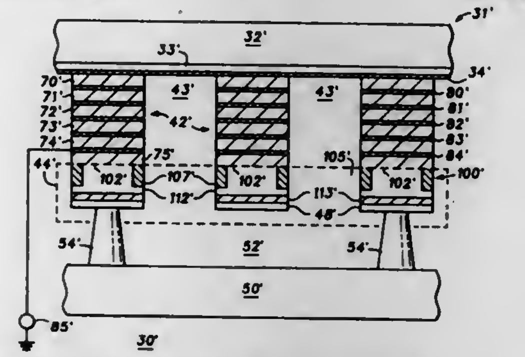
5,691,600
EDGE ELECTRON EMITTERS FOR AN ARRAY OF FEDS

Curtis D. Moyer, Phoenix; Jeffery A. Whalin, Fountain Hills; Wayne Morrow, Phoenix, and Steven A. Voight, Gilbert, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Jun. 8, 1995, Ser. No. 489,017

Int. Cl.^{6} H01J *1/66*

U.S. Cl. 313—497 **10 Claims**



7. An array of field emission devices comprising:

a plate substrate having a first and a second planar surface positioned in parallel opposed relationship with a selected thickness therebetween;

a plurality of parallel, laterally spaced apart first grooves formed in the first planar surface and having a first depth, each of the first grooves having first side surfaces on opposite sides of and defining each of the first grooves and a plurality of lands positioned in the first planar surface, one each between adjacent first grooves;

a plurality of parallel, laterally spaced apart second grooves formed in the second planar surface and having a second depth, each of the second grooves having second side surfaces on opposite sides of and defining each of the second grooves, the second grooves being positioned so that each second groove crosses each first groove at an angle to the first grooves, the first and second depths combined being greater than the thickness of the plate substrate so that an opening is formed through the substrate at each area or region where a second groove crosses a first groove;

a layer of gate metal deposited on the second side surfaces of the plurality of second grooves and on the first side surfaces of the plurality of first grooves in each of the openings, the layer of gate metal extending continuously along at least one of the second surfaces of each second groove and forming row conductors for the array;

emitter material supported on each of the lands so as to form an edge emitter in conjunction with the layer of gate metal on the first side surfaces of the plurality of first grooves in each of the openings, the emitter material extending continuously along each land and forming column conductors for the array; and

an optically transparent faceplate assembly spaced from the plate substrate and substantially parallel with the first and second surfaces, the face plate assembly including cathodoluminescent material and a conductive anode and positioned to receive electrons emitted by the emitter material.

5,691,601
METAL-HALIDE DISCHARGE LAMP FOR PHOTOOPTICAL PURPOSES

Anna-Maria Frey, Munich; Jürgen Maier, Berlin; Manfred Pilsak, Munich; Ralf Seedorf, Berlin; Clemens Barthelmes, Berlin, and Thomas Dittrich, Berlin, all of Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

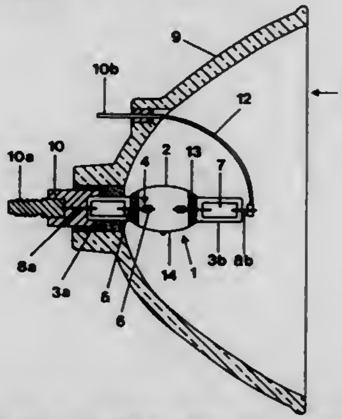
PCT No. PCT/DE94/00752, § 371 Date Dec. 14, 1995, § 102(e) Date Dec. 14, 1995, PCT Pub. No. WO95/05674, PCT Pub. Date Feb. 23, 1995

PCT Filed Jun. 30, 1994, Ser. No. 557,145

Claims priority, application Germany, Aug. 16, 1993, 43 27 534.6

Int. Cl.^{6} H01J *61/12*

U.S. Cl. 313—571 **20 Claims**



1. A metal-halide discharge lamp for photooptical purposes having

a translucent discharge vessel (2);

two spaced electrodes (4) which face one another within the vessel and which are connected to power leads (8) extending to the outside,

characterized by

an arrangement for providing a light source which is close to a pin-point light source and which provides light at a color temperature of at least 5000 K,

wherein said arrangement comprises

an electrode spacing of a maximum of 15 mm; and

a filling within the vessel which comprises

0.1 to 4.5 mg/cm^3 of Al I$_3$, as the essential or sole metal-halide component for light generation by said light source; and 0 to 2.0 mg/cm^3 of halides (Ha) of indium (InHa) and mercury (HgHa$_2$), or halides (Ha$_2$) of mercury (Hg).

5,691,602
MULTIPLE CAVITY KLYSTRON

Wako Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,849

Claims priority, application Japan, Oct. 31, 1994, 6-266879

Int. Cl.^{6} H01J *23/20;* **H01P** *7/06*

U.S. Cl. 315—5.48 **10 Claims**

1. A multiple cavity resonant structure for a klystron comprising:

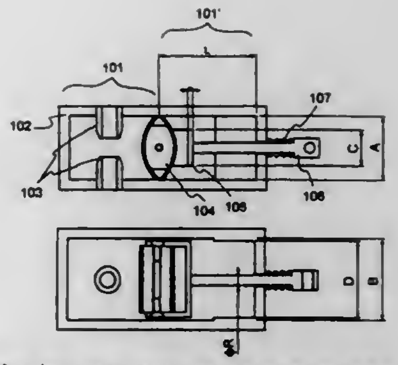
a cavity casing having a first wall and a second wall displaced in an axial direction from said first wall, said second wall having a hole formed therein;

a tuning device disposed in said cavity casing for varying an inductance thereof;

a drift tube mounted on said cavity casing between said first wall and said tuning device, said drift tube extending along a first axis substantially perpendicular to said axial direction;

a tuning device support connected to said tuning device;

a connecting rod having an end thereof connected to said tuning device support, and having an opposite end thereof extending outside of said cavity casing out of contact therewith through said hole defined in said second wall of the cavity casing and extending into said cavity casing so as to space said tuning device a distance L in said axial direction from said second wall; and



a bellows connected to a portion of said connecting rod outside of said cavity casing and to an outside portion of said cavity casing, for hermetically sealing said tuning device;

wherein said tuning device, said first wall, a first length of said cavity casing, and said drift tube define a first resonant cavity and are dimensioned and arranged such that said first resonant cavity has a predetermined operating frequency and

wherein said tuning device, said connecting rod, a second length of said cavity casing, and said second wall define a second resonant cavity and are dimensioned and arranged such that said second resonant cavity has a plurality of resonant frequencies in TEM and TE$_{11}$ modes, and wherein said dimensions and arrangement of said second resonant cavity is such that at least one of said plurality of resonant frequencies in said TEM and TE$_{11}$ modes of said second resonant cavity is lower than the operating frequency of said first resonant cavity, and each of said plurality of resonant frequencies in TEM and TE$_{11}$ modes of said second resonant cavity is different from the operating frequency of said first resonant cavity.

5,691,603
ELECTRONIC BALLAST WITH MULTIPLE LAMP LOADS

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 326,197, Oct. 20, 1994, Pat. No. 5,459,375, Ser. No. 330,605, Oct. 28, 1994, Pat. No. 5,481,160, and Ser. No. 459,132, Jun. 2, 1995, which is a continuation of Ser. No. 220,520, Mar. 31, 1994, Pat. No. 5,426,347, which is a continuation-in-part of Ser. No. 47,944, Apr. 16, 1993, Pat. No. 5,491,385, which is a continuation-in-part of Ser. No. 955,229, Oct. 1, 1992, Pat. No. 5,233,270, which is a continuation-in-part of Ser. No. 607,271, Oct. 31, 1990, which is a continuation-in-part of Ser. No. 787,692, Oct. 15, 1985, which is a continuation of Ser. No. 555,426, Nov. 23, 1983, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, said Ser. No. 220,520is a continuation-in-part of Ser. No. 62,329, May 17, 1993, which is a continuation of Ser. No. 700,049, May 8, 1991, which is a continuation of Ser. No. 489,096, Apr. 27, 1983, which is a continuation-in-part of Ser. No. 178,107, said Ser. No. 330,605is a continuation of Ser. No. 20,696, Feb. 22, 1993, abandoned. This application Sep. 21, 1995, Ser. No. 531,481

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—209 R **31 Claims**

1. An arrangement comprising:

a source providing a source voltage across a pair of source terminals; the source voltage having a substantially sinusoidal waveform and a frequency many times higher than that of the power line voltage usually present on an ordinary electric utility power line; and

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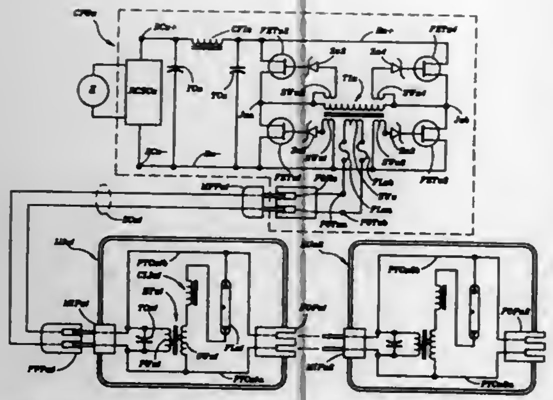


plural lamp loads; each lamp load having a pair of load terminals connected directly with the pair of source terminals; each lamp load being further characterized by: (i) including a ballasting circuit having a capacitive element and an inductive element; (ii) including a gas discharge lamp having a pair of lamp terminals connected in circuit with the capacitive element as well as with the inductive element, thereby to constitute a tuned circuit; and (iii) drawing a load current from the source terminals, the load current having a sinusoidal waveshape and being substantially in phase with the waveform of the source voltage.

5,691,604
METHOD AND CIRCUIT SYSTEM FOR CONTROLLING A LIGHTING ELECTRONICS APPLIANCE

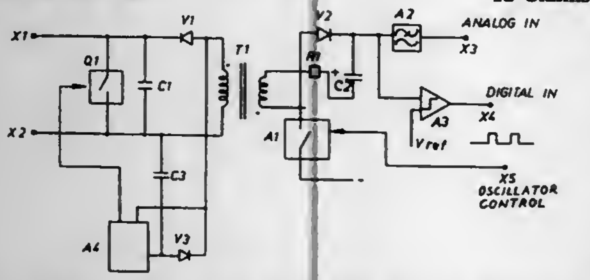
Teijo Viljanen, Kauniainon, Finland, assignor to Oy Helvar, Finland

Filed Nov. 15, 1995, Ser. No. 559,771

Claims priority, application Finland, Nov. 24, 1994, 945515

Int. Cl.⁶ H05B *37/02;* **G05F** *1/00*

U.S. Cl. 315—291 **12 Claims**



1. A method for controlling an appliance used in lighting electronics, especially an electronic ballast or an electronic light controller included in a discharge lamp, comprising: connecting an analog or digital type of signal foe controlling the operating status of an appliance to be controlled to a common control circuit and the appliance to be controlled, identifying the type of control signal, and deciphering the type of control signal and deciphering the contents of information in the analog or digital control signal received thereby on the basis of the signal type, including a circuit for separating the digital and analog information in the analog or digital control signal from each other, a logical element for deciphering the digital or analog information and an oscillator comprising an electronic switch element which is controlled by the logical element.

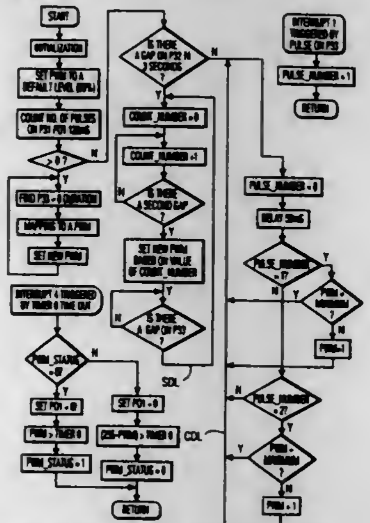
5,691,605
ELECTRONIC BALLAST WITH INTERFACE CIRCUITRY FOR MULTIPLE DIMMING INPUTS

Yongping Xia; Joshua Zhu; Sreeraman Venkitasubrahmanian, all of Torrance; Raj Jayaraman, Rancho Palos Verdes, all of Calif., and Thomas Farkas, South Euclid, Ohio, assignors to Philips Electronics North America, New York, N.Y.

Continuation-in-part of Ser. No. 414,859, Mar. 31, 1995, abandoned. This application Aug. 9, 1995, Ser. No. 512,868

Int. Cl.⁶ H02B *37/02*

U.S. Cl. 315—307 **54 Claims**


START
INITIALIZATION
IS THERE A GAP ON P32 IN 3 SECONDS ?
INTERRUPT 1 TRIGGERED BY PULSE ON P33
PULSE_NUMBER + 1
RETURN
COUNT_NUMBER = 0
N
Y
SOL
COL

1. A controller for an electric lamp, comprising:

a) a receiver for receiving an "input signal carrying control commands", said input signal having a fundamental period with a nominal voltage waveform, said receiver including decoding means for decoding control commands present in the input signal according to at least two of:
   - (i) a first control technique wherein commands are indicated by the phase angle of a phase angle cut in the nominal waveform;
   - (ii) a second control technique wherein commands are indicated by the number of fundamental periods between start and stop points of the command, the stop and start points being fundamental periods having a nominal voltage less than the nominal waveform; and
   - (iii) a third control technique wherein commands are indicated by an occurrence signature of a pre-selected perturbation in the nominal waveform occurring within a control period of a pre-selected number of fundamental periods; and

b) means for controlling the operation of the electric lamp in response to the decoded command.

5,691,606
BALLAST CIRCUIT FOR FLUORESCENT LAMP

Mihail Moisin, Lake Forest, Ill., and Mark E. Martich, Hanover, Mass., assignors to Pacific Scientific Company, Newport Beach, Calif.

Continuation of Ser. No. 316,395, Sep. 30, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 723,289

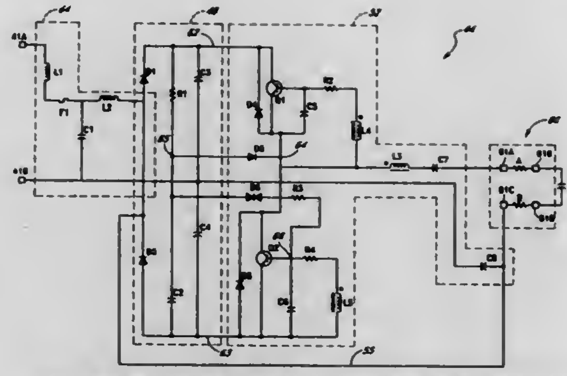
Int. Cl.⁶ H05B *37/00*

U.S. Cl. 315—307 **2 Claims**

1. A fluorescent lamp apparatus for connecting at least one fluorescent lamp with an input power source, said input power source having a high voltage input line and a low voltage input line for supplying an AC input voltage, said fluorescent lamp apparatus comprising:

a rectification and voltage doubler stage, an input of said rectification and voltage doubler stage connected to said input power source;

an active resonant stage, an input of the active resonant stage connected to an output of the rectification and voltage doubler stage and an output of the active resonant stage connected to said at least one fluorescent lamp;



a feedback capacitor for feeding back a portion of a high frequency current signal that is applied to the at least one lamp, a first terminal of said feedback capacitor connected to said at least one fluorescent lamp and to the input of said rectification and voltage doubler stage, and a second terminal of said feedback capacitor connected to the low voltage input line; and

a feedback line for feeding back all frequency components of said current signal that is applied to said at least one lamp, a first end of said feedback line connected to said at least one fluorescent lamp and a second end of said feedback line connected to said input of said rectification and voltage doubler stage, such that the combination of said feedback capacitor and said feedback line places said feedback capacitor in parallel with said input power source.

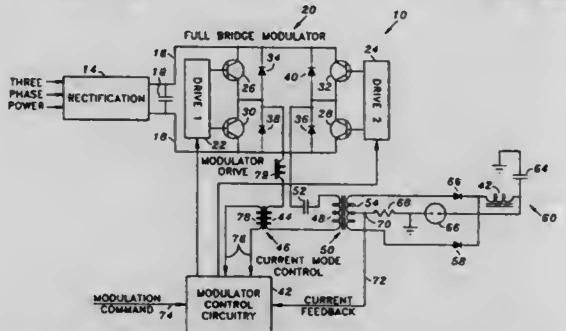
5,691,607
MODULAR HIGH POWER MODULATOR

Robert Matthew Zawislak, Palatine; Kenneth John King, Algonquin; John Michael Rein, Elgin, and Jeffrey Coe Perkins, Island Lake, all of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 26, 1996, Ser. No. 638,458

Int. Cl.⁶ G05F *1/00*

U.S. Cl. 315—308 **10 Claims**



1. A modulator for pulsed illumination sources, comprising:

a) a source of AC power;

b) a rectifier for converting said AC power to unregulated DC power;

c) a full-bridge converter arranged to receive said DC power and to convert it to substantially square-wave AC power at a carrier frequency, the duty cycle of said square wave being variable at a lower modulation frequency under current control;

d) a load;

e) a transformer connected between said converter and said load;

f) a low-pass filter connected between said transformer and said load for removing said carrier-frequency AC from the output of said transformer;

g) a modulation control circuit connected to said converter and having a modulation command input;

h) a monitoring element arranged to provide to said modulation control circuit a signal indicative of the primary current of said transformer; and

i) a current sensing element arranged to provide to said modulation control circuit a signal indicative of the instantaneous current through said load;

j) said modulation control circuit being arranged to vary said modulation frequency in accordance with said modulation command input, said primary current signal, and said instantaneous current signal.

5,691,608
IMAGE DISPLAY APPARATUS

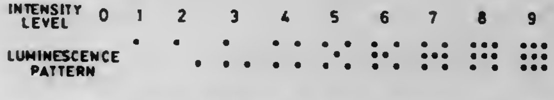
Mitsuru Yamamoto; Hidetoshi Suzuki, both of Atsugi; Ichiro Nomura, and Toshiaki Majima, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,331, Jan. 27, 1992, abandoned, which is a continuation of Ser. No. 586,382, Aug. 14, 1990, abandoned, which is a continuation of Ser. No. 58,114, Jun. 4, 1987, abandoned. This application Jul. 19, 1993, Ser. No. 92,948

Claims priority, application Japan, Jun. 16, 1986, 61-138227; Jun. 16, 1986, 61-138228; Jun. 16, 1986, 61-138229; Jun. 16, 1986, 61-138230

Int. Cl.⁶ G09G *1/04;* **H01J** *29/56*

U.S. Cl. 315—383 **39 Claims**



1. An image display apparatus in which luminance contrast is produced by the scanning of electron beams, comprising:

a phosphor display including a plurality of picture elements each having a plurality of miniature luminescent units which respectively exhibit luminescence in response to the application of one of a plurality of corresponding electron beams, said picture elements being arranged in lines and columns;

solid-state electron-beam generating means having a plurality of electron sources for generating the plurality of electron beams which respectively energize said plurality of miniature luminescent units in each of said picture elements, wherein said solid-state electron-beam generating means is impressed with a predetermined voltage such that said solid-state electron beam generating means operates substantially in its saturated region thereby producing the plurality of corresponding electron beams with minimum variation therebetween, and the fluorescent intensity of each respectively energized miniature luminescent unit of said phosphor display will be substantially the same; and

control means for controlling said solid-state electron-beam generating means in accordance with a gradation signal to selectively actuate said plurality of electron sources such that the number of said miniature luminescent units within each picture element that are simultaneously energized by a corresponding electron beam is varied to regulate the fluorescent intensity of each of said picture elements, wherein the luminance contrast of said image display apparatus is controlled by varying the area of the luminescent portion of each picture element.

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POWER SUPPLY FOR A RASTER CENTER CONTROLLER FOR A VIDEO DISPLAY APPLIANCE

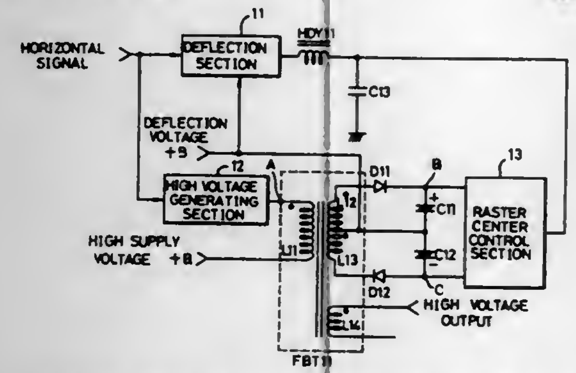
Kwang Ho Park, Kyoungsangbuk-Do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Jul. 1, 1996, Ser. No. 673,575

Claims priority, application Rep. of Korea, Jul. 7, 1995, P95-20019

Int. Cl.^{6} G09G *1/04;* **H01J** *29/70*

U.S. Cl. 315—398 **3 Claims**



1. A power supply for a raster center controller for a video display appliance having a flyback transformer for generating a high voltage for driving a cathode ray tube, and a raster center controller, coupled to a horizontal deflection coil, for controlling movement of a raster on said cathode ray tube, said power supply comprising:

coil means, provided in a secondary winding of said flyback transformer, for generating and providing to said raster center controller a pulse voltage signal having a pulse width which corresponds to a pulse width of said high voltage developed in said flyback transformer;

a first power supply means, coupled between said coil means and said raster center controller, for receiving said pulse voltage signal developed in said coil means and providing a positive supply voltage to said raster center controller; and

a second power supply means, coupled between said coil means and said raster center controller, for receiving said pulse voltage signal developed in said coil means and providing a negative supply voltage to said raster center controller.

5,691,610

PROCESS FOR REDUCING THE FRICTION BETWEEN A ROTATING HEAD DRUM AND RECORDING MEDIUM IN TAPE FORM DURING WINDING OPERATION

Klaus Oldermann, Villingen-Schwenningen, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

PCT No. PCT/EP94/00450, § 371 Date Oct. 27, 1995, § 102(e) Date Oct. 27, 1995, PCT Pub. No. WO94/19799, PCT Pub. Date Sep. 1, 1994

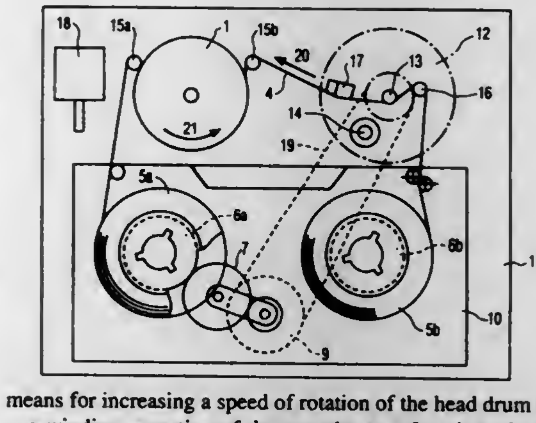
PCT Filed Feb. 17, 1994, Ser. No. 501,122

Claims priority, application Germany, Feb. 26, 1993, 43 05 927.9

Int. Cl.^{6} G11B *15/64;15/18;15/473*

U.S. Cl. 318—6 **2 Claims**

1. Process for reducing the friction between a head drum and a recording medium of a tape form wrapping around the head drum of a recorder for one of the recording and playback of signals, comprising:



means for increasing a speed of rotation of the head drum during a winding operation of the recorder as a function of one of a current of a head-drum motor and of a motor driving hubs.

5,691,611

ABNORMALITY DETECTING SYSTEM AND ABNORMALITY DETECTING METHOD FOR ROTOR POSITION DETECTION MEANS, AND MOTOR CONTROL SYSTEM

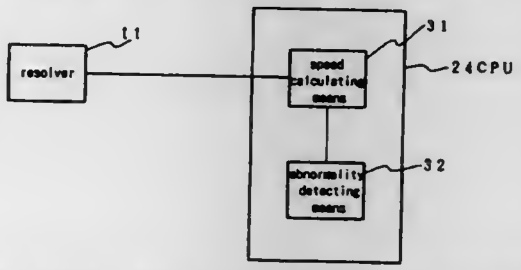
Hiroyuki Kojima, Nishio; Akira Suzuki, Obu, and Yutaka Hotta, Chiryu, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Jul. 10, 1995, Ser. No. 500,081

Claims priority, application Japan, Jul. 12, 1994, 6-159961

Int. Cl.^{6} H02K *23/00*

U.S. Cl. 318—254 **8 Claims**



1. An apparatus for rotor position sensing with abnormality detection, comprising:

rotor position detecting means for detecting a magnetic pole position of a motor,

speed calculating means for calculating instantaneous speed and average speed of the motor on the basis of an output value generated by the rotor position detecting means, and

abnormality detecting means for comparing an absolute value of a difference between the instantaneous speed and average speed of the motor with a set value and for determining an abnormality in the rotor position detecting means as an absolute value of the difference greater than the set value.

5,691,612

WINDSHIELD WIPER CONTROL

Lawrence G. Corey, Smithfield, N.C., assignor to Eaton Corporation, Cleveland, Ohio

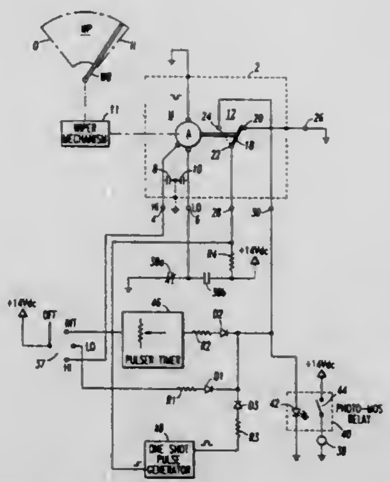
Filed Jan. 29, 1996, Ser. No. 592,948

Int. Cl.^{6} H02P *1/04*

U.S. Cl. 318—444 **18 Claims**

1. A windshield wiper control comprising:

a wiper motor for driving a windshield wiper through a wipe cycle comprising movement of said wiper from a first position to a second position and back to said first position;



sensing means driven by said motor in correspondence with said wiper, said sensing means being operable for indicating said wiper being at a predetermined position in advance of said first position;

an electric power supply;

relay means comprising contacts connected in circuit with said motor for alternately connecting said motor to said power supply and to a dynamic braking circuit;

control switch means operable for connecting said power supply to said relay means for energizing said relay means, thereby for operating said relay contacts for connecting said motor to said power supply; and

pulse generator means responsive to operation of said sensing means for generating a pulse of predetermined duration to said relay means for maintaining said relay means energized for a predetermined time interval sufficient for said wiper to arrive at said first position.

5,691,613

METHOD FOR DETERMINING A ROTOR POSITION OF A ROTARY MOTOR OR LINEAR MOTOR, AND CIRCUIT ARRANGEMENT FOR CARRYING OUT THE METHOD

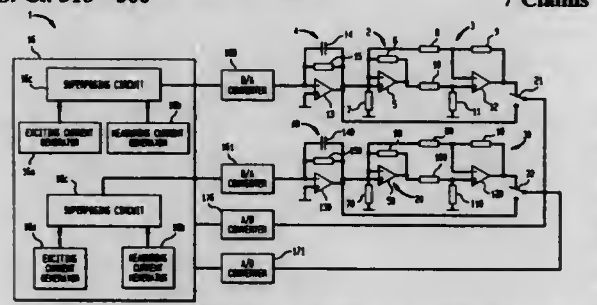
Peter Gutwillinger, Vienna, Austria, assignor to LST Laser & Strahl Technik Herstellungs- und Handelsgesellschaft m.b.H., Vienna, Austria

Filed May 28, 1996, Ser. No. 652,675

Claims priority, application Austria, May 30, 1995, 909/95

Int. Cl.^{6} H02P *6/18*

U.S. Cl. 318—500 **7 Claims**



1. A method for determining a position of a rotor of a rotary motor or linear motor having at least two stator windings and a rotor with salient poles and operating at a first frequency, comprising the steps of:

superimposing an exciting current for the stator windings with a periodic measuring current having a second frequency exceeding the first frequency of the motor so as to be prevented from interfering with excitation of the stator windings,

measuring a reactive voltage drop caused by the measuring current across the stator windings;

calculating on the basis of the measured voltage drop the inductance of the stator windings to provide an information about an actual rotor position;

comparing the actual rotor position with a desired rotor position; and

adjusting the actual rotor position in response to a deviation of the actual rotor position from the desired rotor position by modifying the exciting current.

3. A circuit arrangement for determining a position of a rotor of a rotary motor or linear motor, comprising:

a stator having a winding, and a rotor movable relative to the stator and formed with salient poles;

a first generator for forming an exciting current at a first frequency to flow through the stator winding to effect a movement of the rotor;

a second generator forming a measuring current to flow through the stator winding, with the measuring current having a second frequency which exceeds the first frequency of the exciting current to cause a voltage drop across the stator winding without effecting the position of the rotor;

a voltage drop detection circuit for measuring the voltage drop across the stator winding;

a control circuit receiving a signal from the voltage drop detection circuit commensurate with the measured voltage drop and calculating the inductance on the basis of the measured voltage drop for determining the actual rotor position and comparing it with a desired rotor position, said control circuit being connected to the first generator to allow regulation of the exciting current in response to the calculated value of the inductance.

5,691,614

SERVO SYSTEM ADJUSTING METHOD AND SERVO CONTROL SYSTEM

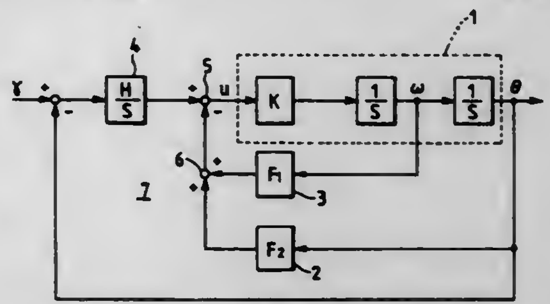
Hiroaki Takeishi, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1995, Ser. No. 423,698

Claims priority, application Japan, Apr. 18, 1994, 6-078507; Apr. 11, 1995, 7-085425

Int. Cl.^{6} G05B *13/00*

U.S. Cl. 318—561 **4 Claims**



1. A servo system coefficient adjusting method for an integration-proportional differentiation type compensation system for generating a control input for an object to be controlled by summing an integration of a control error, a controlled amount output from the controlled object and a differentiation of the controlled amount, multiplied by gain coefficients, respectively, wherein a transfer function of the object to be controlled is approximated by a double-integral-type, comprising the steps of:

selecting one of a feedback gain coefficient F_1 of differentiation of the controlled amount, a feedback gain coefficient F_2 of the controlled amount and a gain coefficient H of integration of the control error;

setting a gain value of the selected feedback gain coefficient;

determining values of the remaining feedback gain coefficients based on the set gain value of the selected feedback gain coefficient and the formulas:

$$F_2/F_1=a*H/F_2$$

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$$F_1=b^*(F_2/F_1)/K$$

where

$2 \leqq a \leqq 3$,

$1.5 \leqq b$, and

K is a gain of the object to be controlled; and

setting the determined values of the remaining feedback gain coefficients.

5,691,615
ADAPTIVE PI CONTROL METHOD

Tetsuaki Kato, Oshino-mura; Osamu Yoshida, Kanazawa; Masaru Nakamura, and Soichi Arita, both of Oshino-mura, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

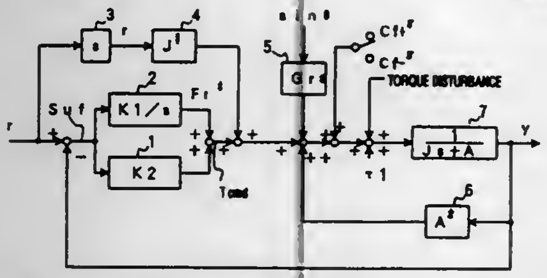
PCT No. PCT/JP93/00995, § 371 Date Mar. 14, 1994, § 102(e) Date Mar. 14, 1994, PCT Pub. No. WO94/02989, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 16, 1993, Ser. No. 204,313

Claims priority, application Japan, Jul. 17, 1992, 4-212268; Oct. 28, 1992, 4-311142

Int. Cl.⁶ H02M *1/12*

U.S. Cl. 318—609 **9 Claims**



1. An adaptive proportional-plus-integral control method for a motor control system including a proportional-plus-integral loop as a speed loop, comprising the steps of:

determining a torque command τ to be supplied to a motor in accordance with the following equation on the basis of an equation of motion

$$\tau=K2 \cdot Suf+J^* \cdot r'+A^* \cdot y+Gr^* \cdot \sin\theta+Fr^*+Cf^*+\tau 1 \text{ and;}$$

obtaining terms of K2·Suf and Fr* of the above equation as proportional and integral terms of an ordinary proportional-plus-integral control,

wherein K2 represents a proportional constant, Suf represents a speed deviation obtained by subtracting an actual motor speed from a speed command, r' represents a differential of the speed command with respect to time which is a command acceleration, J*, A*, Gr*, Fr*, and Cf* represent estimated values of inertia, coefficient of dynamic friction, coefficient of gravitational disturbance, constant gravitational disturbance, and Coulomb's friction, respectively, and θ represents a rotational angle of a robot arm which will give the greatest effect on the gravitational disturbance, and wherein

the estimated value J* of the inertia is obtained by integrating the value obtained by multiplying the speed deviation Suf by the command acceleration r' and a reciprocal (1/α) of an adjusting parameter α determining an adaptive speed with respect to time,

the estimated value A* of the coefficient of dynamic friction is obtained by integrating the value obtained by multiplying the speed deviation Suf by the actual motor speed y and a reciprocal (1/β) of an adjusting parameter β with respect to time,

the estimated value Gr* of the coefficient of gravitational disturbance is obtained by integrating the value obtained by multiplying the speed deviation Suf by sin θ corresponding to a rotational angle θ of said arm and a reciprocal (1/γ) of an adjusting parameter γ with respect to time,

the estimated value Fr* of the constant gravitational disturbance is obtained by integrating the value obtained by multiplying the speed deviation Suf by a reciprocal (1/δ) of an adjusting parameter δ with respect to time,

the estimated value Cf* of the Coulomb's friction is obtained by integrating the value obtained by multiplying the speed deviation Suf by a reciprocal (1/ϵ) of an adjusting parameter ϵ with respect to time, and

the switching input τ1 is determined to be a maximum value of gravitational disturbances given by rotational angles of arms other than said robot arm which will give the greatest effect on said gravitational disturbance when said speed deviation Suf is zero or positive, and is determined to be a minimum value of the gravitational disturbances when said speed deviation Suf is negative.

5,691,616
FULLY-CLOSED-LOOP SERVOMOTOR CONTROL SYSTEM

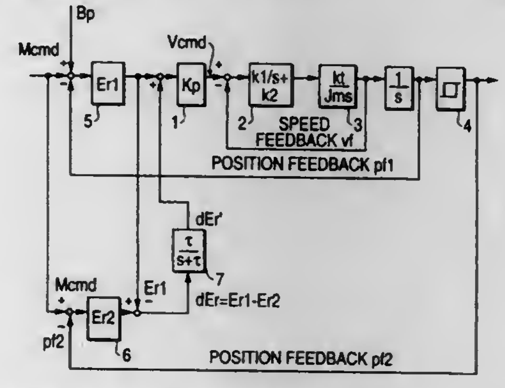
Yasusuke Iwashita, Oshino-mura, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

Filed Dec. 20, 1995, Ser. No. 575,575

Claims priority, application Japan, Dec. 26, 1994, 6-336602

Int. Cl.⁶ G05B *11/01*

U.S. Cl. 318—615 **5 Claims**



1. A fully-closed-loop servomotor control method comprising steps of:

adding the difference between a move command and an actual position of a servomotor to a value in a first error counter at every predetermined processing period;

adding the difference between the move command and an actual position of a machine moving part driven by means of the servomotor to a value in a second error counter at every said processing period;

obtaining the difference between the respective output values of the first and second error counters and smoothing the difference to obtain an error counter difference;

obtaining a speed command by multiplying the sum of the error counter difference and the first position deviation by a predetermined position loop gain;

delivering the difference between the speed command and the actual speed of the servomotor to a speed control loop; and

additionally applying a predetermined correction value for backlash correction to the input of the first error counter when the rotating direction of the servomotor is reversed.

5,691,617
DISC DRIVE TRANSDUCER DEADBEAT SETTLE METHOD UTILIZING INTERVAL CORRECTION

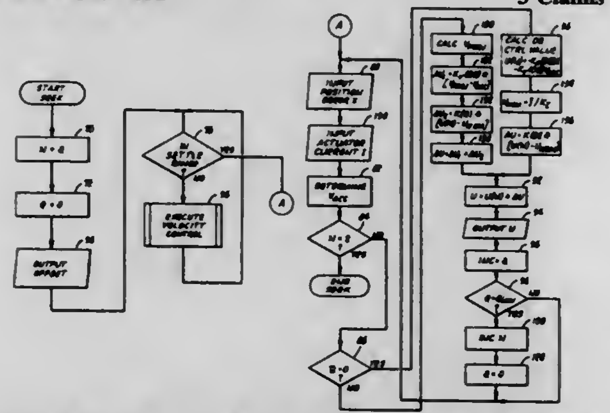
Otis L. Funches, Oklahoma City, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

PCT No. PCT/US93/06526, § 371 Date Jan. 11, 1996, § 102(e) Date Jan. 11, 1996, PCT Pub. No. WO95/02882, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 12, 1993, Ser. No. 117,190

Int. Cl.⁶ H02P *3/00*

U.S. Cl. 318—632 **3 Claims**



1. In a disc drive of the type having a rotatable disc and a controllably positionable actuator adjacent the disc, the disc including a surface upon which a plurality Of tracks are defined, the actuator having a transducer for reading data from and writing data to the tracks, the disc drive further having a power amplifier for driving the actuator to accelerate the transducer radially across the disc surface in response to a control signal and a servo system, including a servo microprocessor, for generating the control signal in relation to measured parameters indicative of at least the location of the transducer with respect to a target track, a method for settling the transducer onto the target track during which the transducer is controllably decelerated from a non-zero initial velocity at a selected distance from the target track 10 a substantially zero terminal velocity over the target track, the method comprising the steps of:

inputting said parameters to the servo microprocessor in each of a plurality of time intervals, wherein said time intervals are grouped into a plurality of deadbeat intervals;

determining a deadbeat value of said control signal from said parameters in the first time interval of each deadbeat interval;

determining an interval correction to said deadbeat value for each time interval of each deadbeat interval;

generating the control signal in relation to the sum of the deadbeat value and the interval correction; and

outputting the control signal from the servo microprocessor to the power amplifier.

5,691,618
BATTERY PACK CHARGING DEVICE

Masahiko Kobayashi, Hamura; Tadao Shinozaki, Funabashi, and Tomomi Aramaki, Kanagawa, all of Japan, assignors to Yupiteru Industries Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00131, § 371 Date Feb. 16, 1996, § 102(e) Date Feb. 16, 1996, PCT Pub. No. WO95/20828, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 31, 1994, Ser. No. 530,258

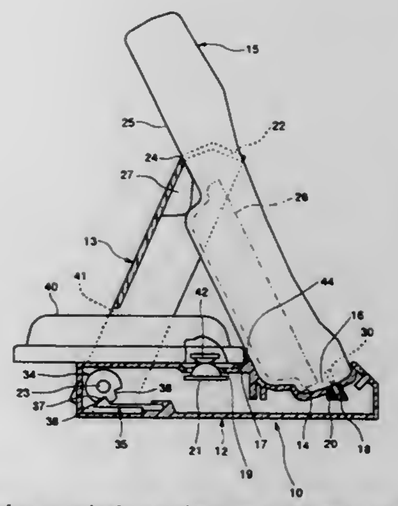
Claims priority, application Japan, Nov. 16, 1992, 4-328944

Int. Cl.⁶ H01M *10/46;2/10*

U.S. Cl. 320—2 **9 Claims**

1. A charging device for charging a battery pack housed within a communication device, comprising:

a flat-shaped main body;



first charging terminals provided in the main body, the first charging terminals being adapted to make electrical contact with charge reception terminals of the communication device: and

a rotatable cover which can be opened and closed by being rotated with respect to the main body, such that when the cover is in a closed position, the cover covers the first charging terminals, and when the cover is in an open position, the cover is in an upright state which enables the cover to act as a support member which is adapted to support at least a back surface of the communication device when the communication device is in a charging position on the charging device.

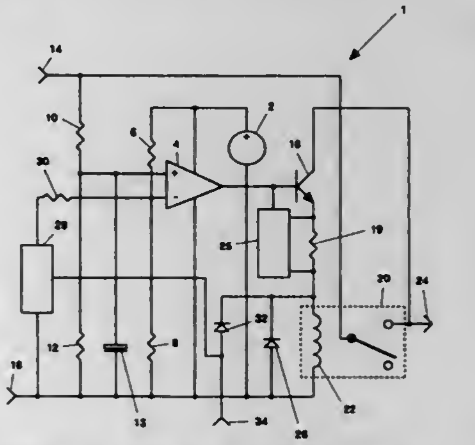
5,691,619
AUTOMATIC SAFETY SWITCH FOR PREVENTING ACCIDENTAL BATTERY DISCHARGE

Stefan G. Vingsbo, 1217 Post Oak Park, Houston, Tex. 77027

Filed Oct. 31, 1994, Ser. No. 331,704

Int. Cl.⁶ H01M *10/46;* **H02H** *3/24*

U.S. Cl. 320—13 **1 Claim**



1. An automatic battery safety switch comprising:

A voltage reference having a reference voltage, a battery having a voltage, a comparator, a timer, said voltage reference being coupled to said comparator wherein a voltage threshold is established, said comparator being further coupled to a voltage divider that provides a fraction of said battery voltage, said comparator being responsive to a difference between said fraction of said battery voltage and said voltage threshold by means of generating a first state of a first signal, said first state of said first signal being coupled to a switching means in the event that said fraction of said battery voltage is greater than

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said voltage threshold, said switching means responding to said first state of said first signal by providing an electrical connection between said battery and at least one load;

said switching means responding to a second state of said first signal by terminating said electrical connection between said battery and said at least one load when said fraction of said battery voltage is less than said voltage threshold, said second state of said first signal being indicative of a depleted battery;

Said timer intermittently raising said voltage threshold, said raised voltage threshold causing termination of said electrical connection between said battery and said at least one load in the event at least one small load is excessively draining said battery, said at least one small load comprising the automatic battery safety switch.

5,691,620

BATTERY CHARGING METHOD

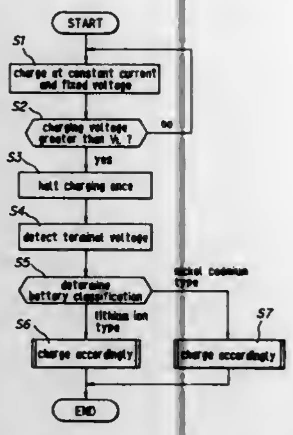
Tamiji Nagai, and Hitoshi Akiho, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 306,604, Sep. 15, 1994, abandoned. This application Dec. 10, 1996, Ser. No. 762,300

Claims priority, application Japan, Sep. 17, 1993, 5-231171

Int. Cl.^{6} H01M *7/00;10/44*

U.S. Cl. 320—15 **25 Claims**



12. A battery charging method comprising the steps of:

providing a battery charging circuit to provide a charging voltage to selectively charge a first battery of a first type of battery and a second battery of a second type of battery, said second type of battery being a nickel-cadmium battery, charging one of the first or the second batteries by connecting the one battery into the battery charging circuit, and selecting charging profiles for the first and second batteries such that a terminal voltage for the first battery when fully charged is greater than a terminal voltage for the second battery when fully charged, detecting the types of the first and second batteries and charging the first battery and the second battery using different methods in accordance with a detection result, wherein detecting the types of the first and second batteries is undertaken by halting the battery charging and detecting whether a drop in the terminal voltage of a fully charged battery occurs corresponding to as nickel-cadmium battery.

5,691,621

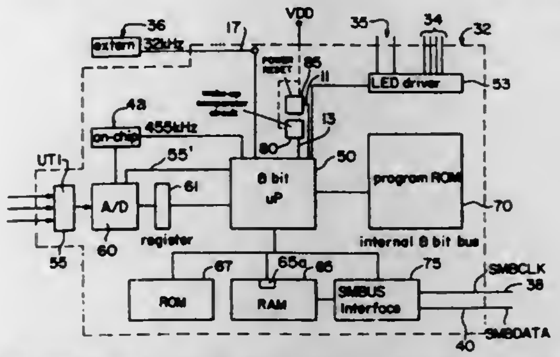
BATTERY PACK HAVING A PROCESSOR CONTROLLED BATTERY OPERATING SYSTEM

Duong Var Phuoc, Eching; Rudi Wieczorek, Munich; Elmar Zeising, Haindlfing, all of Germany; Louis W. Hruska, Northboro, Mass.; Alwyn H. Taylor, Wellesley Hills, Mass.; Daniel D. Friel, Woburn, Mass., and Matthew P. Hull, Jamestown, R.I., assignors to Duracell, Inc., Needham, Mass.

Division of Ser. No. 336,945, Nov. 10, 1994. This application Jun. 7, 1995, Ser. No. 473,341

Int. Cl.^{6} H02J *7/04*

U.S. Cl. 320—31 **30 Claims**



1. A smart battery which provides electrical power and which reports predefined battery parameters to an external device having a power management system, said smart battery comprising:

(a) at least one rechargeable cell connected to a pair of terminals to provide electrical power to an external device during a discharge mode and to receive electrical power during a charge mode, as provided or determined by said remote device,

(b) a data bus for reporting predefined battery identification and charge parameters to the external device,

(c) an analog means for generating analog signals representative of battery voltage and current at said terminals, and an analog signal representative of battery temperature at said cell,

(d) a hybrid integrated circuit (Ic) having a microprocessor for receiving the analog signals and converting them to digital signals representative of battery voltage, current and temperature, and calculating actual charge parameters over time from said digital signals, said calculations including a capacity reset and an error calculation which is incremented after each partial charge and extinguished at each capacity reset;

(e) a data memory defined within said hybrid IC for storing said predefined battery identification and actual charge parameters, even when nominally fully discharged, said charge parameters including a cumulative error value,

(f) a bus controller defined within said hybrid IC for sending battery messages to said remote device over said data bus, said messages including said predefined battery identification and said actual charge parameters.

5,691,622

IDLE CURRENT CUTOFF CIRCUIT

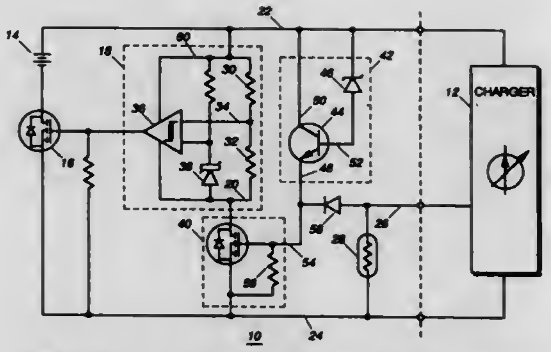
Erika D. Mack, Duluth, and José M. Fernandez, Lawrenceville, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1995, Ser. No. 578,845

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 320—29 **15 Claims**

1. An idle current cutoff circuit for use in a battery pack having at least one battery cell for providing a battery voltage between a B+ line and a B− line, an over-voltage switch coupled in series with said at least one battery cell, and an over-voltage control circuit, having a reference line, for controlling operation of said over-voltage switch such that it opens when said battery voltage reaches an over-voltage level, said idle current cutoff circuit comprising:



a cutoff switch, having an input, connected between said reference line of said over-voltage control circuit and said B− line;

a threshold switch connected between said input of said cutoff switch and said B+ line; and

wherein said cutoff switch is off until said battery voltage reaches a predetermined level below said over-voltage level, said threshold switch causing said cutoff switch to turn on when said battery voltage reaches said predetermined level.

5,691,623

BATTERY CHARGING SYSTEM, STEPPING AND INTERACTIVELY SELF-ADJUSTING TO THE NORMAL VOLTAGE OF THE BATTERY

Eleftherios Tsantilis, 20 Kydathinaion Str, Athens 10558, Greece

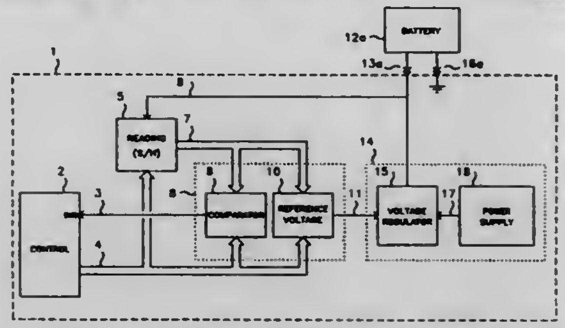
PCT No. PCT/GR94/00004, § 371 Date Nov. 18, 1994, § 102(e) Date Nov. 18, 1994, PCT Pub. No. WO94/22202, PCT Pub. Date Sep. 29, 1994

Continuation of Ser. No. 341,535, Nov. 18, 1994, abandoned. This PCT application Mar. 18, 1994, Ser. No. 757,190

Claims priority, application Greece, Mar. 19, 1993, 930100109

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 320—39 **2 Claims**



1. An integral fully automatic charging system, self-adjusting to a variety, of different voltage, capacity, chemistry and construction design types, of rechargeable batteries having a battery voltage that varies with their state of charge, comprising:

control means, for timing a series of predetermined short duration, of the order of 6 min, periodic intervals of charging, wherein each one of said periodic intervals includes an initial subinterval of inactivity of predetermined short duration, of the order of 1 min, and for enabling various predetermined control signals, during the charging process;

reading means, responsive to a first plurality of selected signals of said various control signals enabled immediately after termination of said subinterval of inactivity and connected with the battery which is selected from said variety of different voltage, capacity, chemistry and construction design types, of rechargeable batteries and connected each time to said charging system, for reading in each one of said periodic intervals, the battery's terminal voltage parameter as a parameter associated with said connected battery, and wherein said reading means includes means for sampling said battery's terminal voltage parameter in each said periodic interval and holding said sampled battery's terminal voltage parameter, at least, until after another said sampling and holding of said battery's terminal voltage parameter has been carried out in the next said periodic interval;

comparator means, connected to said reading means and responsive to a second plurality of selected signals of said various control signals, enabled after termination of said subinterval of inactivity, following said first plurality of selected signals, for comparing said sampled and held battery's terminal voltage parameter of the running said periodic interval, with said sampled and held battery's terminal voltage parameter of the immediately previous said periodic interval, and wherein said comparator means, includes means, for effecting termination of said charging process, based upon evidence that there is no increase in the value of said battery's terminal voltage parameter of any battery type—selected from said variety, of different voltage, current, chemistry and construction design types, of rechargeable batteries, and connected each time to said charging system—sampled and held in the running said periodic interval, compared to the value of said battery's terminal voltage parameter of said connected battery sampled and held in the immediately previous said periodic interval, or based upon evidence that, for a limited predetermined number of repetitions, said value of said battery's terminal voltage parameter sampled and held in the running said periodic interval is equal to the value of said battery's terminal voltage parameter of said connected battery sampled and held in the immediately previous said periodic interval;

reference voltage means, connected to said reading means, responsive to a third plurality of selected signals of said various control signals, enabled if said comparator means has not effected termination of said charging process, for setting, independently in each one of said periodic intervals, the charging voltage parameter associated with the voltage of the charging current under which is charged a different voltage type battery—selected from said variety, of different voltage, current, chemistry and construction design types, of rechargeable batteries, and connected each time to said charging system—said charging voltage parameter being set based on said battery's terminal voltage parameter of any different voltage type battery—selected from variety, of different voltage, current, chemistry and construction design types, of rechargeable batteries, and connected each time to said charging system—amplified slightly higher by a predetermined factor of the order of 1.25, constant for all of said periodic intervals, said battery's terminal voltage parameter being sampled and held in the corresponding said periodic interval; and

charging means, connected to said reference voltage means and coupled to said connected battery, for allowing, in each one of said periodic intervals, the magnitude of said charging current, under regulated said voltage of the charging current in accordance with said charging voltage parameter of the corresponding said periodic interval, to vary according to internal resistance of any different capacity type battery—selected from said variety, of different voltage, current, chemistry and construction design types, of rechargeable batteries, and connected each time to said charging system—at its actual charging state.

5,691,624

METHOD AND APPARATUS FOR DETECTING A FULL-CHARGE CONDITION WHILE CHARGING A BATTERY

Sang-tae Im, Kyungki-do; Hwan-Ho Seoung, Seoul, and Byung-Cho Choi, Inchun-Kwangyeoksi, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 24, 1996, Ser. No. 639,098

Claims priority, application Rep. of Korea, Apr. 24, 1995, 95-9620

Int. Cl.^{6} H01M *10/44;10/46;10/48*

U.S. Cl. 320—48 **15 Claims**

1. A circuit for detecting and indicating a full-charge condition of a rechargeable battery undergoing recharging while coupled to the circuit, the circuit comprising:

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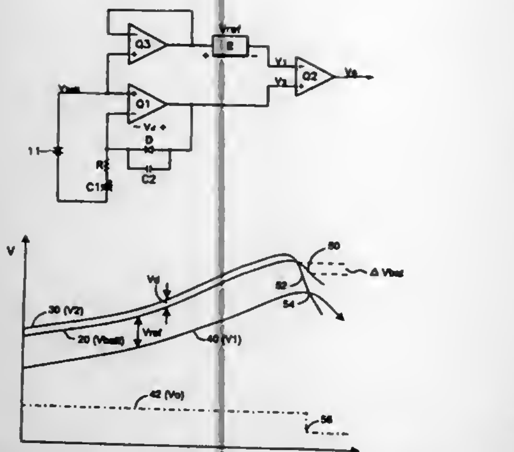


a reference voltage means coupled to the battery to provide a reference voltage (V1);

means (C1) responsive to a voltage produced by the battery for providing an indication of a maximum battery voltage achieved while the battery is charging;

a comparator having a first input coupled to the reference voltage means for comparing the reference voltage (V1) to a monitoring voltage (V2) presented to a second input of the comparator such that the comparator provides an output signal (Vo) having a first state while the reference voltage (V1) is less than the monitoring voltage (V2) and a second state when the reference voltage (V1) exceeds the monitoring voltage (V2);

means for providing the monitoring voltage (V2) responsive to the battery voltage such that the monitoring voltage (V2) falls below the reference voltage (V1) in response to the battery voltage exhibiting at least a predetermined drop (NDV) below the maximum battery voltage, whereby the comparator output signal (Vo) changes state to indicate a full-charge condition of the battery.

11. A method of detecting a full-charge condition of a rechargeable battery undergoing recharging, comprising the steps of:

charging a first capacitor while a voltage produced by the battery is rising so as to develop a charge on the first capacitor indicative of a peak battery voltage achieved while the battery is charging;

if the battery voltage falls below the peak battery voltage, discharging the first capacitor through a second capacitor thereby charging the second capacitor as long as the battery voltage is below the peak battery voltage;

monitoring a voltage developing across the second capacitor while it is charging so as to monitor a negative delta voltage (NDV) amount by which the battery voltage has fallen below the peak battery voltage; and

if the amount by which the battery voltage has fallen below the peak battery voltage exceeds a predetermined NDV value, providing an indication that a full-charge condition of the battery is detected.

5,691,625

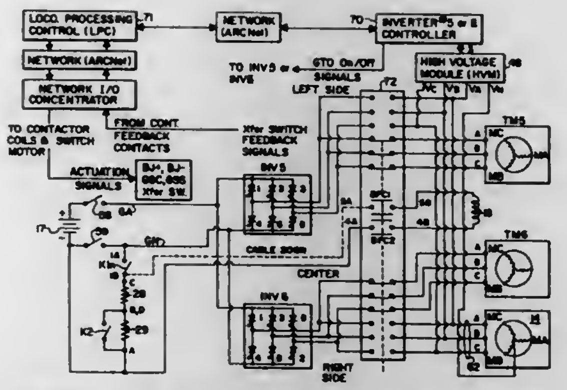
USING SENSED STATOR TERMINAL VOLTAGES FOR DETERMINING ALTERNATOR ROTOR POSITION FOR CRANKING AN ENGINE

Ajith Kuttannair Kumar, and Thomas Detlor Stitt, both of Erie, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 23, 1996, Ser. No. 718,033

Int. Cl.⁶ H02P *6/00*

U.S. Cl. 322—20 **2 Claims**


LOCO. PROCESSING CONTROL (LPC)
NETWORK (ARCNet)
INVERTER 5 or 6 CONTROLLER
NETWORK (ARCNet)
NETWORK I/O CONCENTRATOR
HIGH VOLTAGE MODULE (HVM)
TO CONTACTOR COILS & SWITCH MOTOR
FROM CONT FEEDBACK CONTACTS
ACTUATION SIGNALS
INV 5
INV 6
CENTER
LEFT SIDE
RIGHT SIDE
CABLE BOX
TM5
TM6

1. A method for determining rotor position of an n-phase alternator driven by an inverter, the alternator having a stator and a rotor and, in operation, having n stator terminal voltages and a neutral voltage, the inverter being connected between relatively positive and negative power busses, the method comprising the steps of:

sensing the stator terminal voltages of the alternator with respect to the negative power bus;

calculating the alternator neutral voltage by adding the stator terminal voltages and dividing by n;

determining the stator terminal voltages with respect to the alternator neutral voltage by subtracting the alternator neutral voltage from each respective stator terminal voltage;

filtering and clamping the stator terminal voltages with respect to the alternator neutral voltage using a predetermined time constant and upper and lower voltage limits;

applying a hysteresis loop to the outputs of the filtering and clamping step to provide filtered output states plus hysteresis such that if a respective filtered output state plus hysteresis is greater than zero, then the corresponding stator state is zero, otherwise the corresponding stator state is one; and

combining the resulting stator states to provide a simulated rotor position state.

5,691,626

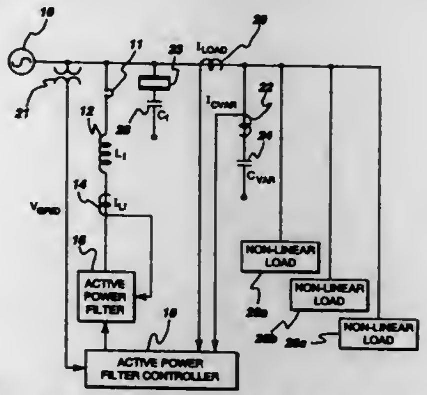
ACTIVE DAMPING CONTROL FOR ACTIVE POWER FILTER

Albert Andreas Maria Esser, Niskayuna; Paul Michael Szczesny, Clifton Park; Jeffrey Joseph Nasadoski, Gloversville, all of N.Y.; Robert Joseph Bastian, Madison, Conn., and Peter Claudius Sanza, Niskayuna, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 7, 1995, Ser. No. 474,212

Int. Cl.⁶ G05F *3/00;1/70*

U.S. Cl. 323—205 **15 Claims**



1. An active damping control device for an active power filter, the device comprising:

a filter circuit comprising an inductor and a capacitor for suppressing noise in the active power filter, and a first current sensor system for sensing a three phase capacitor current of the capacitor;

a second current sensor system for detecting a three phase load current;

an active power filter controller for extracting the fundamentals of the capacitor and load currents and calculating a reference current for the active power filter to dampen high frequency components of the active power filter.

5,691,627

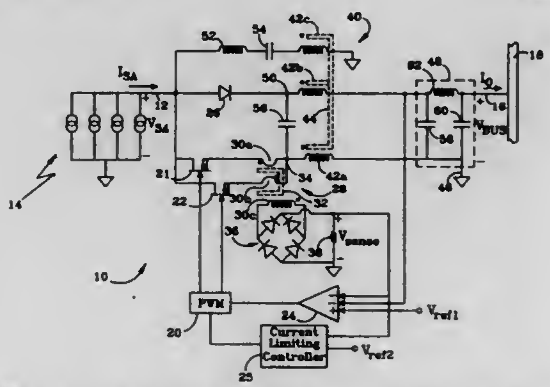
PUSH-PULL FULL SHUNT SWITCHING BUS VOLTAGE LIMITER WITH CURRENT SENSE CAPABILITY

Kin E. Shum, Los Angeles, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

Filed Sep. 17, 1996, Ser. No. 715,211

Int. Cl.⁶ G05F *1/10*

U.S. Cl. 323—222 **22 Claims**



19. A bus voltage limiter (BVL) connected between a power source that provides substantially constant current and a variable output voltage, and a load, said BVL connected said power source to said load and comprising:

a coupled power inductor having first and second power windings;

a current transformer having first and second sensor windings that are connected in parallel with opposite polarity, and having a third sensor winding;

first and second complementary switches that alternately switch with duty cycles D and 1-D, respectively, to deliver current from said power source through said second winding to said load, whereby the output voltage of said power source is varied to maintain output power to said load substantially equal to input power from said power source, said first complementary switch, comprising:

a pair of active switches that are connected in series with said first and second sensor windings, respectively, to alternately deliver current from said power source through said first and second sensor windings with a duty cycle D/2 and through the second power winding with an effective duty cycle D to the load, said alternating conduction of current through the first and second sensor windings producing a bidirectional voltage across the third sensor winding that automatically resets the current transformer during each cycle,

a rectifier that converts the bidirectional voltage to a unidirectional signal that is a function of the current from the power source; and

a control circuit that adjusts the duty cycle D/2 of the active switches in response to the unidirectional signal.

5,691,628

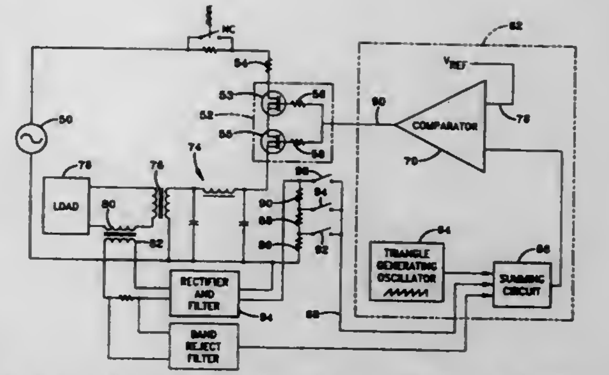
REGULATION OF CURRENT OR VOLTAGE WITH PWM CONTROLLER

Joseph A. Martin, Grove City, Ohio, assignor to Rochester Instrument Systems, Inc., Rochester, N.Y.

Filed Mar. 21, 1995, Ser. No. 407,772

Int. Cl.⁶ G05F *1/40;1/455*

U.S. Cl. 323—237 **28 Claims**



1. A controller circuit for providing, at a controller output, a periodic output waveform having a regulated magnitude derived from a periodic source connected to a controller input, the controller circuit providing line and load regulation compensating for line and load variations, the circuit comprising:

(a) a switch having an input connected to the controller input, an output and a switching control input;

(b) a magnitude detector having an input connected to the controller output, a detector output, and means for developing a detector output signal which is a function of the magnitude of the AC output waveform, the detector output signal provided at the detector output;

(c) a pulse width modulated oscillator having an input coupled to the detector output, means for developing an oscillator frequency greater than the frequency of the periodic source, an output, and means for developing an output pulse signal having a frequency greater than the frequency of the periodic source and having a width which is modulated proportional to the signal at the oscillator input, the output pulse signal produced at the output of the oscillator, the oscillator output connected to the switching control input of the switch for periodically switching the switch between its on and off states at a duty ratio which is an inverse function of the magnitude of the controller output; and

(d) a low pass filter having an input coupled to the output of the switch and an output coupled to the controller output and adapted to reject frequencies at and above the oscillator frequency and produce at the filter output a resulting filtered signal at the frequency of the periodic input.

5,691,629

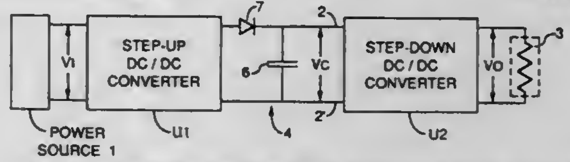
NON-VOLATILE POWER SUPPLY HAVING ENERGY EFFICIENT DC/DC VOLTAGE CONVERTERS WITH A SMALL STORAGE CAPACITOR

Kevin Belnap, Layton, Utah, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 13, 1995, Ser. No. 505,718

Int. Cl.⁶ G05F *1/563*

U.S. Cl. 323—266 **2 Claims**



1. Apparatus for supplying electrical power to a load circuit for a brief time after power is lost comprising:

(a) a step-up DC to DC voltage convertor;

(b) a step-down DC to DC voltage converter having an output circuit to be coupled to said load circuit;

(c) coupling circuit means for coupling an output circuit of said step-up voltage convertor to an input circuit of said step-down voltage convertor, said coupling means including an energy storage capacitor coupled across the input circuit of said step-down voltage convertor together with a unidirectional impedance means for preventing energy stored within said capacitor to be fed back to said step-up voltage convertor; and

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- (d) means for causing said step-down convertor to operate as a step-up convertor when the voltage across said energy storage capacitor becomes less than the voltage across said output load circuit.

5,691,630
POWER SUPPLY CONTROL APPARATUS

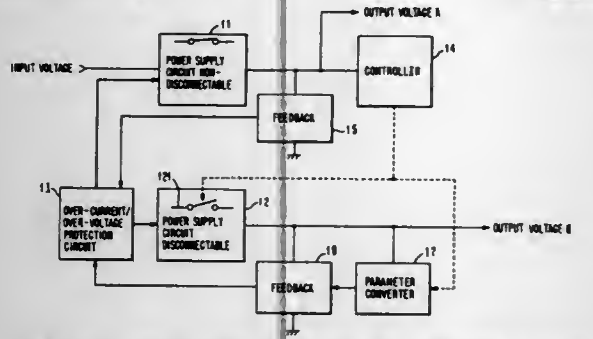
Takashi Chosa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1995, Ser. No. 539,077

Claims priority, application Japan, Oct. 12, 1994, 6-245808

Int. Cl.^{6} G05F *1/577*

U.S. Cl. 323—267 **12 Claims**


OUTPUT VOLTAGE A
11
14
INPUT VOLTAGE
POWER SUPPLY CIRCUIT NON-DISCONNECTABLE
CONTROLLER
FEEDBACK
15
13
121
12
OVER-CURRENT/ OVER-VOLTAGE PROTECTION CIRCUIT
POWER SUPPLY CIRCUIT DISCONNECTABLE
OUTPUT VOLTAGE B
16
17
FEEDBACK
PARAMETER CONVERTER

1. A power supply control apparatus for controlling a power supply circuit for outputting voltages of at least two systems, comprising:

- a first power supply circuit for generating a first voltage;
- a second power supply circuit for generating a second voltage;
- a controller circuit which is driven by said first voltage;
- a disconnecting circuit for disconnecting said second voltage by said controller circuit in accordance with a predetermined condition;
- a power supply controller circuit for controlling said second power supply circuit on the basis of said second voltage; and
- a supplying circuit for supplying a signal indicative of a state in which said second voltage has been outputted to said power supply controller circuit when said second voltage is disconnected by said disconnecting circuit.

5,691,631
POWER SUPPLY APPARATUS

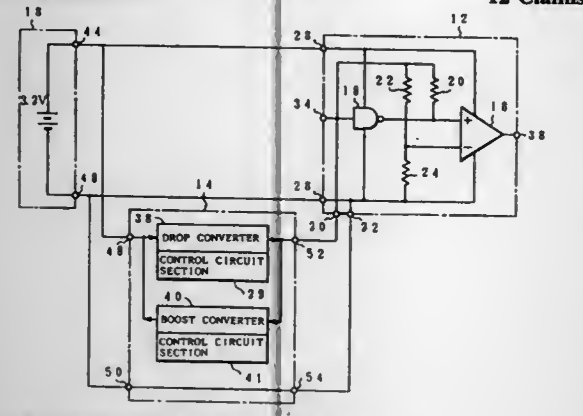
Hiroshi Shimamori; Ryuichi Yanagisawa, and Shinichi Ohtsu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 5, 1995, Ser. No. 462,289

Claims priority, application Japan, Jul. 10, 1994, 6-243657

Int. Cl.^{6} G05F *1/56*

U.S. Cl. 323—272 **12 Claims**



1. A power supply apparatus comprising:

- a load circuit which operates by supply of a prescribed first supply voltage and a second supply voltage different from said first supply voltage, consumes said first supply voltage and said second supply voltage by a load in a first operation mode, and returns said first supply voltage to a supply side of said second supply voltage in a second operation mode;
- a first power circuit which supplies said first supply voltage to said load circuit; and
- a second power circuit which receives input of said first supply voltage from said first power circuit, converts said first supply voltage into said second supply voltage and supplies the converted voltage to said load circuit in said first operation mode of said load, and converts a current output from said load circuit into said first supply voltage and feeds back the converted voltage to said first power circuit in the second operation mode of said load circuit, said second power circuit comprises:
  - a down-converter which converts said first supply voltage into said second supply voltage and supplies same to said load circuit in said first operation mode of said load circuit,
  - an up-converter which converts a current output from said load circuit into said first supply voltage and feeds same back to said first power circuit in the second operation mode of said load circuit, and
  - a control circuit which switching-controls each of said down-converter and said up-converter.

5,691,632
SWITCHING POWER SUPPLY

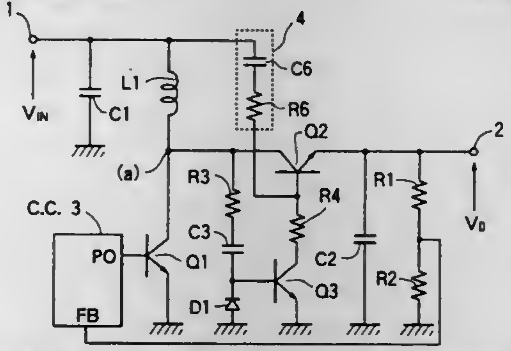
Tetushi Otake, Tokyo, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,761

Claims priority, application Japan, May 26, 1995, 5-152700; Oct. 13, 1995, 5-290548

Int. Cl.^{6} G05F *1/46*

U.S. Cl. 323—282 **9 Claims**



1. In a switching power supply to obtain a predetermined output voltage, for causing an inductance element to generate a flyback voltage when a switching element turns off and for rectifying a voltage in which the flyback voltage is superposed on an input voltage through a rectifying element, the switching power supply comprising:

- a transistor rectifying element, which includes a PNP type bipolar transistor, electrically coupled between the inductance element and an output terminal, for rectifying the input voltage;
- a driving transistor, which includes an NPN type bipolar transistor, electrically coupled between a base of the transistor rectifying element and a low potential point such as ground, for controlling operation of said transistor rectifying element, said driving transistor receiving a supply of an ON and OFF control signal from a connection point of the transistor rectifying element and an output side of the inductance element;
- a capacitor connected between a base of the driving transistor and the connection point of the transistor rectifying element and the inductance element, for coupling the control signal to the base of the driving transistor; and

- an auxiliary bias circuit, connected between the base of the transistor rectifying element and an input side or intermediate terminal of the inductance element, for coupling forward and reverse directional, auxiliary bias voltages to the transistor rectifying element according to operation of the switching element.

5,691,633
METHOD OF AND APPARATUS FOR DETERMINING A PROPERTY OF A SAMPLE

Ying Liu; Eric William Abel, both of Dundee; Jill Janette Freda Belch, Scone, all of Scotland, and Richard John Tweedie, Belfast, Northern Ireland, assignors to British Technology Group Limited, London, England

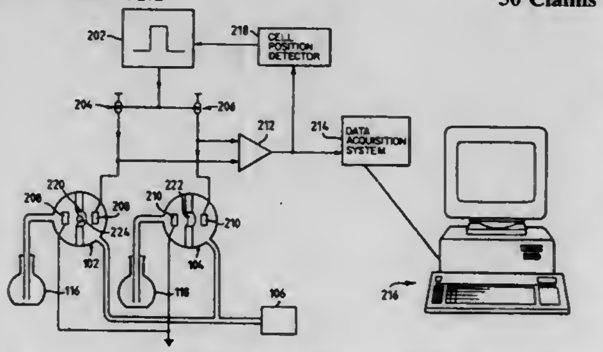
PCT No. PCT/GB93/01544, § 371 Date Apr. 7, 1995, § 102(e) Date Apr. 7, 1995, PCT Pub. No. WO94/02846, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 22, 1993, Ser. No. 374,659

Claims priority, application United Kingdom, Jul. 24, 1992, 9215733

Int. Cl.^{6} G01N *33/48*

U.S. Cl. 324—71.1 **50 Claims**



1. A method of determining a distinctive property of a sample, comprising steps of:

- applying an electrical pulse to an electrode arrangement across said sample in an electrolyte, said sample being transportable relative to said electrode arrangement, and said electrical pulse having an ON duty cycle of less than 20%;
- detecting a response to said electrical pulse;
- applying a transform to said detected response; and
- determining said distinctive property of said sample from said transform of said detected response.

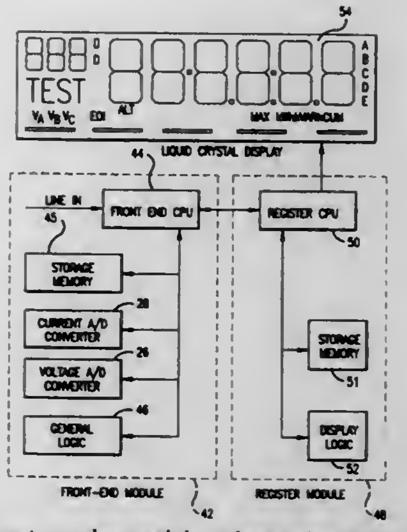
5,691,634
WYE SERVICE POWER METER

Coy Stephen Lowe, Talking Rock, Ga., assignor to Schlumberger Industries, Inc., Norcross, Ga.

Filed Sep. 1, 1995, Ser. No. 522,904

Int. Cl.^{6} G01R *21/06;11/40*

U.S. Cl. 324—107 **14 Claims**



1. A device for monitoring power in a wye power service having three phases, said device comprising:

- a sampling element arranged and configured to sample a current value and a voltage value from each of the three phases; and
- a processor, coupled to said sampling element, to calculate power (i) by using the current value and the voltage value for the at least one phase when the voltage value for the at least one phase is available, and (ii) by using the current value for the at least one phase and the voltage values for the other two phases if the voltage value for the at least one phase is unavailable.

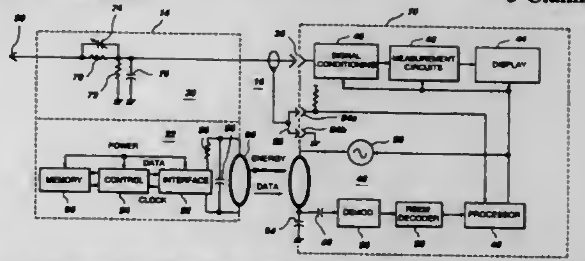
5,691,635
PROBE IDENTIFICATION SYSTEM FOR A MEASUREMENT INSTRUMENT

René Paulus Maria Pot, Enschede, and Heinrich Peter Dijkstra, Almelo, both of Netherlands, assignors to Fluke Corporation, Everett, Wash.

Filed Jan. 29, 1996, Ser. No. 593,760

Int. Cl.^{6} G01R *1/04*

U.S. Cl. 324—115 **3 Claims**



1. A system for identifying an auxiliary device for a measuring instrument, comprising:

- an RF signal generator;
- a transmit/receive coil coupled to the output of said RF generator to receive an RF signal and produce therefrom a field of radiated energy;
- a transponder associated with said auxiliary device and positioned within said field of radiated energy and activated thereby, said transponder producing in response to said radiated energy a stream of identification digital data which amplitude modulates said RF signal at said transmit/receive coil;
- a demodulator coupled to said transmit/receive coil to separate said identification digital data from said RF signal; and
- a processor for receiving said identification digital data.

5,691,636
PROBE ASSEMBLY MOUNTING FOR A GRINDING MACHINE

Gary W. Allshouse, Muncy; James E. Cawthern, Jr., Linden, both of Pa., and Randall K. Hopkins, Milford, Mass., assignors to Andritz Sprout-Bauer, Inc., Muncy, Pa.

Filed Aug. 25, 1993, Ser. No. 111,996

Int. Cl.^{6} G01B *7/14*

U.S. Cl. 324—207.15 **15 Claims**

1. A gap measuring probe assembly comprising:

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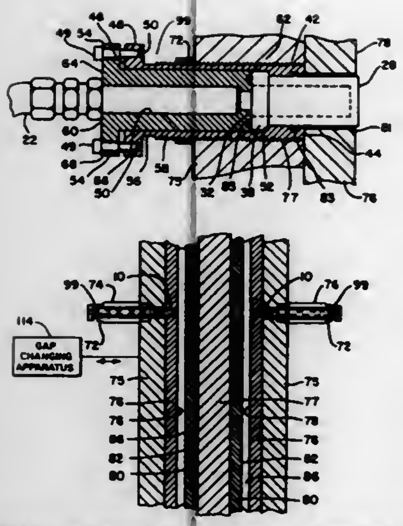


a probe means comprising an eddy current detector for generating a signal indicative of a gap;

a non-metallic, non-magnetic zirconium ceramic wear resistant housing around said probe means;

a mounting adapter having a cylindrical shape and defining a cylindrical through bore, said probe assembly being positioned in said bore and having a forward end projecting from said adapter and a back end retained in said bore;

an adapter plug having a cylindrical shape sufficiently small to fit in the bore of said mounting adapter and abut the back end of said probe assembly; and

securing means selectively engageable between the mounting adapter and adapter plug for preventing motion between the mounting adapter and the adapter plug and thereby selectively fixing said probe assembly by mechanical force in said bore.

5,691,637
MAGNETIC FIELD POSITION TRANSDUCER FOR TWO OR MORE DIMENSIONS

Richard K. Oswald, San Jose, and Ronald A. Smith, Los Gatos, both of Calif., assignors to True Position Magnetics, Inc., Campbell, Calif.

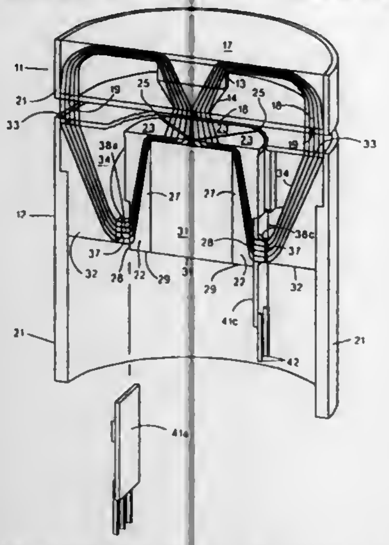
PCT No. PCT/US92/07435, § 371 Date Jun. 20, 1994, § 102(e) Date Jun. 20, 1994, PCT Pub. No. WO94/05964, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 28, 1992, Ser. No. 193,167

Int. Cl.^{6} G01B *7/14;7/30;* **G01R** *33/12;* **G01D** *5/20*

U.S. Cl. 324—207.23 **20 Claims**

1. A magnetic field position transducer system for measuring proximity of a first independently movable element within a valid data range of, and relative to a second independently movable element in two or more dimensions comprising, in combination,



a) a magnetic button secured to the first movable element having means for providing a magnetic field having a single magnetic field axis of symmetry,

b) a probe secured to the second movable element providing a symmetrical distribution of magnetically susceptible material around a measurement axis of symmetry, coupling to a plurality of separate preferential magnetic field paths,

c) a means sensing magnetic flux density in each separate preferential magnetic field path for generating an electrical signal proportional to the magnetic flux density sensed in the particular preferential magnetic field path, and

d) means for comparing the electrical signals generated,

wherein the magnetic button and the probe secured to the respective movable elements are respectively oriented on opposite sides of a common plane such that the magnetic field and the measurement axes of symmetry are aligned perpendicularly with respect to the common plane, whereby, proximity of the first movable element within a valid data range of, and relative to the second movable element can be determined in at least two dimensions from the comparison of the electrical signals generated.

5,691,638
APPARATUS FOR OBTAINING 3-PHASE POSITION DETECTING SIGNALS BY USING A SINGLE POSITION DETECTING ELEMENT

Itsuki Bahn, Nerima-ku, Japan, assignor to Kabushikigaisha Sekogiken, Tokyo, Japan

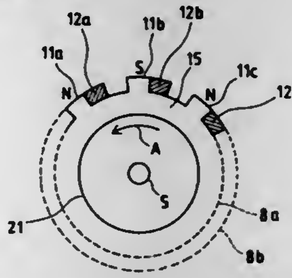
PCT No. PCT/JP95/00077, § 371 Date Aug. 30, 1995, § 102(e) Date Aug. 30, 1995, PCT Pub. No. WO95/22851, PCT Pub. Date Aug. 24, 1995

PCT Filed Jan. 24, 1995, Ser. No. 507,281

Claims priority, application Japan, Feb. 22, 1994, 6-061929

Int. Cl.^{6} G01B *7/30;* **H02P** *6/16;7/00;6/02*

U.S. Cl. 324—207.25 **3 Claims**



1. An apparatus for obtaining 3-phase position detecting signals by using a single position detecting element, in which

a circumference of a rotating disk for a 3-phase electric motor, which is to be controlled by detecting a position of a rotor while being rotated synchronously with said rotor, is divided into sections where a number of sections is equal to a number of salient poles of said rotor;

each section of said rotating disk is divided into three subsections, a first, second, and third subsections, each having an equal width in the circumferential direction, and said divided subsections have physical properties or constructions differing from each other;

one position detecting element is fixed to the motor body at a position facing the outer peripheral portion of said rotating disk; and

when said position detecting element faces said first, second, and third subsections on said rotating disk in sequence as said rotating disk rotates, the change in electromagnetic action created between each subsection and said position detecting element is processed via an electric circuit, and taken out as position detecting signals of first, second, and third phases, which have a width of an electrical angle of 120 degrees respectively and are continuous with each other without gap.

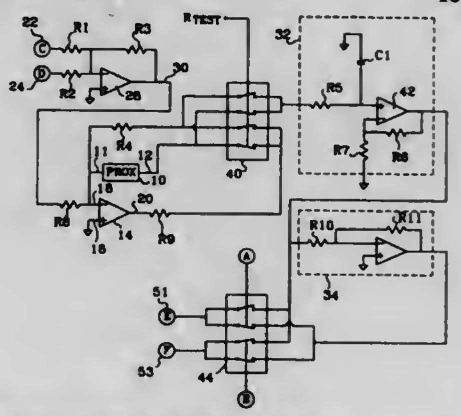
5,691,639
PROXIMITY SENSOR CIRCUIT WITH FREQUENCY CHANGING CAPABILITY

Nick A. Demma, Minneapolis; James E. Lenz, Brooklyn Park, both of Minn.; Dragutin Milosevic, Grosskrotzenburg, Germany, and Joseph J. Simonelic, Rockford, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 28, 1996, Ser. No. 703,163

Int. Cl.^{6} G01B *7/14*

U.S. Cl. 324—207.26 **18 Claims**



1. A proximity sensing circuit, comprising:

a proximity detector having a coil, said coil having a first end and a second end;

an amplifier having a first input, a second input and an output, said coil being connected between said first input and said output of said amplifier;

a first source of a first waveform having a first frequency;

a second source of a second waveform having a second frequency;

means for combining said first and second waveforms to provide a combined waveform, said combining means being connected to said first input of said amplifier;

a filter connected to said output of said amplifier to provide a first output signal;

an inverter connected to said filter to provide a second output signal;

first means for creating a first series of pulses, said first creating means having an output connected to an input of said first source of said first waveform;

second means for creating a second series of pulses, said second creating means having an output connected to an input of said second source of said second waveform;

first means, connected in signal communication with said first creating means, for periodically changing the frequency of said first series of pulses; and

second means, connected in signal communication with said second creating means, for periodically changing the frequency of said second series of pulses.

5,691,640
FORCED BALANCE METAL DETECTOR

Kevin James King, Golden Valley, Minn., assignor to Ramsey Technology, Inc., Coon Rapids, Minn.

Filed Nov. 17, 1995, Ser. No. 559,988

Int. Cl.^{6} G01R *33/12;* **G01N** *27/72;* **G01V** *3/10*

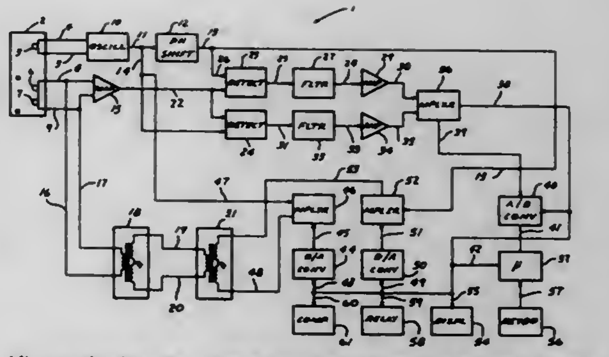
U.S. Cl. 324—233 **19 Claims**

18. A method of detecting metal in a food product, comprising the steps of:

(a) generating a radio frequency field in the vicinity of the food product;

(b) detecting the radio frequency field in the vicinity of the food product;

(c) generating a corrective signal to maintain electrical balance of the radio frequency field in the vicinity of the food product;



(d) monitoring the characteristics of the corrective signal required to balance the radio frequency field in the vicinity of the food product, thereby producing a first set of data; and

(e) analyzing the first set of data so as to detect the presence of metal in the food product when the signal characteristics required for maintaining the balance in the presence of the food product differ from the signal characteristics required to maintain the balance in the presence of food product not containing metal and from the signal characteristics required to maintain the balance when no food product is present.

5,691,641
NMR PICKUP DEVICE DELIVERING A SIGNAL REPRESENTATIVE OF BREATHING OF A PATIENT

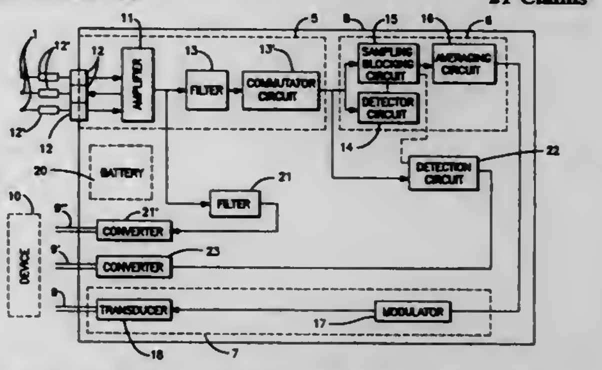
Albert Cansell, Wissembourg; Michel Kraemer, Durrenbach; Christian Brevard, Wissembourg, all of France; Jacques Felblinger, Bern, and Chris Boesch, Thun, both of Switzerland, assignors to "O.D.A.M." Office de Distribution d'Appareils Medicaux (Societe Anonyme), Wissembourg, France

Filed Jan. 11, 1996, Ser. No. 585,018

Claims priority, application France, Jan. 9, 1995, 95 00335

Int. Cl.^{6} G01R *33/34;* **A61B** *5/055*

U.S. Cl. 324—309 **21 Claims**



1. In a detector device for delivering a signal representative of the respiration of a patient, adapted to be used in a charged and sensitive electromagnetic environment, adjacent or within a nuclear magnetic resonance apparatus, and by a patient within the tunnel of the magnet of an MRI, the improvement wherein the device comprises: at least two non-metallic electrodes mounted on a base of a support body of a non-magnetic material and adapted to be applied against the skin of the patient in the cardiac region; a processing unit for processing electrical signals emitted by the heart, comprising a first module for acquiring and shaping cardiac electric signals, a second module for extracting the respiratory signal, and a third module for electro-optical conversion of the respiratory signal, said processing unit being disposed in a shielded casing forming a Faraday cage and carried by the base; and an optical connection means connecting said casing to at least one other apparatus located outside the charged and sensitive electromagnetic environment.

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5,691,642

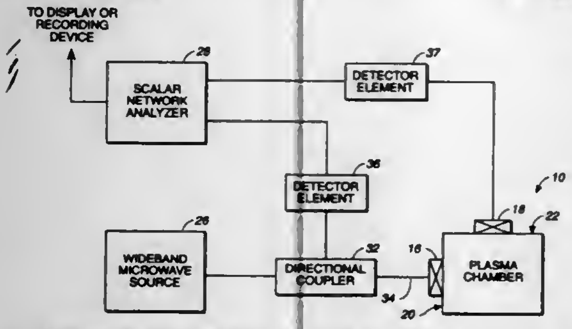
METHOD AND APPARATUS FOR CHARACTERIZING A PLASMA USING BROADBAND MICROWAVE SPECTROSCOPIC MEASUREMENTS

Daniel M. Dobkin, Sunnyvale, Calif., assignor to Trielectrix, Sunnyvale, Calif.

Filed Jul. 28, 1995, Ser. No. 508,366

Int. Cl.⁶ G01N *27/62;* **G01L** *21/30;* **B01D** *59/44;* **H01J** *49/36*

U.S. Cl. 324—464 **25 Claims**



1. A method for measuring quantitative characteristics of a subject plasma confined within a chamber, said method comprising the steps of:

generating a set of calibration spectra by measuring transmission of electromagnetic energy through a calibration plasma confined within said chamber, each calibration spectrum within said set of calibration spectra being obtained using a different set of reference parameters related to said quantitative characteristics;

determining a reference parameter transformation on the basis of said calibration spectra, said reference parameter transformation relating measured spectra of electromagnetic energy transmitted through said calibration plasma to values of said reference parameters;

generating a test spectrum by measuring transmission of electromagnetic energy through said subject plasma; and

estimating said quantitative characteristics by analyzing said test spectrum using said reference parameter transformation.

5,691,643

GROUND FAULT DETECTING APPARATUS AND METHOD FOR DETECTING GROUND FAULT OF FIELD CIRCUIT AND EXCITING CIRCUIT BY DETECTING GROUND FAULT CURRENT FLOWING FROM GROUND TO NEUTRAL POINT OF EXCITING CIRCUIT

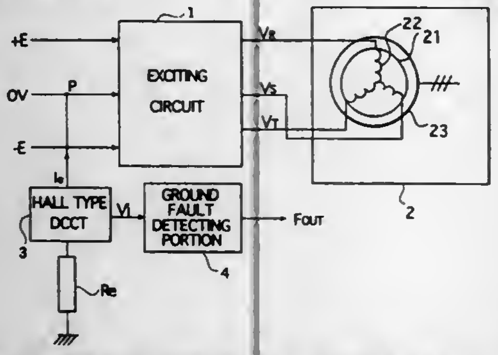
Takashi Ishiguro, Niiza, and Yoshinori Takei, Fuchu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Oct. 6, 1995, Ser. No. 539,907

Claims priority, application Japan, Oct. 11, 1994, 6-244974

Int. Cl.⁶ G01R *31/06;* **H02H** *7/06*

U.S. Cl. 324—510 **18 Claims**



1. An apparatus for detecting a ground fault on an exciting circuit and a field circuit of an AC excited variable speed rotating machine, the exciting circuit outputting an exciting voltage of controlled frequency and/or an amplitude, and the field circuit outputting a field current produced by the exciting voltage, the apparatus comprising:

a ground resistance connected between a neutral point of said field circuit and ground;

a current detecting means for detecting a ground current flowing between the ground and said neutral point through said ground resistance and outputting a detected signal; and

a ground fault detecting means for extracting a component of a fundamental wave signal from the detected signal and for detecting said ground fault according to the extracted component and a frequency of the fundamental wave signal with constant detecting sensitivity regardless of a change of the exciting voltage, the fundamental wave signal controlling the frequency and/or an amplitude of the exciting voltage.

5,691,644

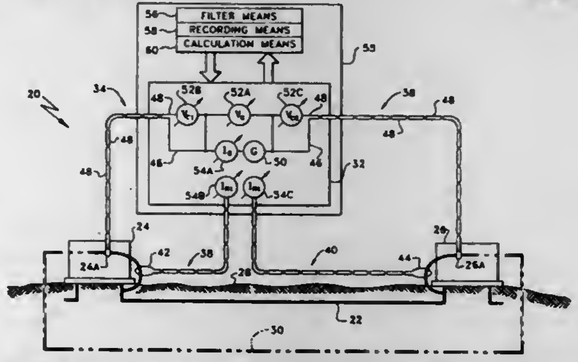
NEUTRAL CORROSION CONDITION SURVEY-MITIGATING INDUCED VOLTAGE EFFECTS

Boris M. Danilyak, Philadelphia, Pa., assignor to Henkels & McCoy, Blue Bell, Pa.

Filed May 10, 1996, Ser. No. 644,397

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—543 **26 Claims**



1. A method for non-intrusively determining the longitudinal active resistance of a neutral conductor of an underground electrical cable forming a portion of an electrical system, the electrical cable additionally comprising a phase conductor carrying AC current therethrough while the electrical cable remains connected to the electrical system providing normal electrical service to the electrical system, the neutral conductor being connected between a pair of electrically grounded structures, said method for determining being accomplished while leaving the electrical cable in normal operation and comprising the steps of:

(a) impressing an electrical test current signal of a selective frequency on the neutral conductor from a test signal generator connected between the electrically grounded structures using a first signal-voltage cable and a second signal-voltage cable, while the electrical cable remains in service providing normal electrical service to the electrical system and while the neutral conductor remains connected to the grounded structures;

(b) determining a voltage waveform across said first signal-voltage cable to form a first voltage waveform;

(c) determining a voltage waveform across said second signal-voltage cable to form a second voltage waveform;

(d) determining a voltage waveform across said test signal generator to form a third voltage waveform;

(e) determining a current waveform through the neutral conductor;

(f) calculating a longitudinal from s resistance value from said determined waveforms, each of said waveforms includes a respective RMS magnitude.

5,691,645

PROCESS FOR DETERMINING INTRINSIC MAGNETIC PERMEABILITY OF ELONGATED FERROMAGNETIC ELEMENTS AND ELECTROMAGNETIC PROPERTIES OF COMPOSITES USING SUCH ELEMENTS

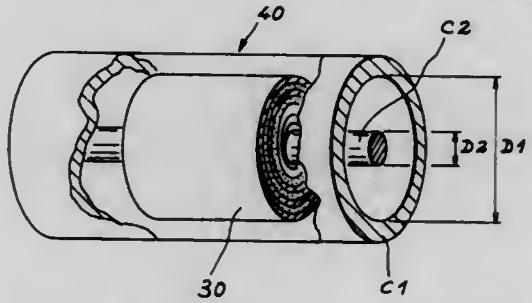
Olivier Acher, Antony; Pierre Marie Jacquart, Roissy-en-Brie, and Alfred Schaal, Massy, all of France, assignors to Commissariat a L'Energie Atomique, France

Filed Jul. 31, 1995, Ser. No. 464,606

Claims priority, application France, Dec. 17, 1992, 92 15234

Int. Cl.⁶ G01N *27/72;* **G01R** *27/04*

U.S. Cl. 324—637 **44 Claims**



1. A process for determining intrinsic magnetic permeability of ferromagnetic elements having an elongated shape in at least one direction, comprising:

winding the ferromagnetic elements to form a torus, said ferromagnetic elements being coated with an electrically insulating material, said ferromagnetic elements being longitudinally disposed in the torus in a substantially tangential direction relative to the torus,

placing said torus in a coaxial line of a magnetic permeability measuring means for facilitating measurement of magnetic permeability (μm) of said torus,

measuring magnetic permeability (μm) of the torus using said measuring means, and

from the magnetic permeability (μm) measured and ferromagnetic material fraction (F) determined to be contained in the torus deducing the intrinsic magnetic permeability (μf) of said ferromagnetic elements.

5,691,646

CAPACITANCE-TYPE DISPLACEMENT MEASURING DEVICE WITH ELECTRODES HAVING SPIRAL PATTERNS

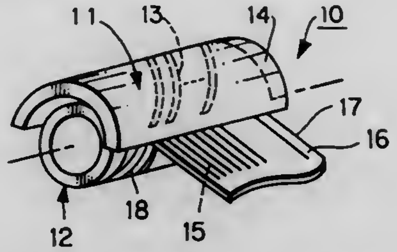
Kouji Sasaki, Kanagawa, Japan, assignor to Mitutoya Corporation, Tokyo, Japan

Filed Nov. 16, 1995, Ser. No. 559,559

Claims priority, application Japan, Dec. 7, 1994, 6-330689; Dec. 12, 1994, 6-332084

Int. Cl.⁶ G01R *27/26;* **G01B** *3/18*

U.S. Cl. 324—662 **11 Claims**



1. A capacitance-type measuring device for measuring relative position between first and second elements which are arranged to be relatively movable with a predetermined gap, comprising: an array of transmitting electrodes disposed on said first element, alternating signals having different phases from each other being supplied to each transmitting electrode; a receiving electrode disposed on said first element such as to be isolated from said array of transmitting electrodes; and a coupling electrode disposed on said second element to be capacitively coupled to plural electrodes in said array of transmitting electrodes and said receiving electrode, said receiving electrode being adapted to output an electric signal corresponding to a relative position between said first and second elements, the electric signal being supplied to a measuring circuit, wherein

one of said first and second elements is an inner member having a cylindrical outer surface, the other is an outer member having an incomplete cylindrical inner surface which is opposed to said outer surface with a predetermined gap, said first and second elements being held to be relatively movable in either axial direction or angular direction, and

said array of transmitting electrodes and said receiving electrode are disposed on one of said outer surface of said inner member and said inner surface of said outer member, and said coupling electrode is disposed on the other.

5,691,647

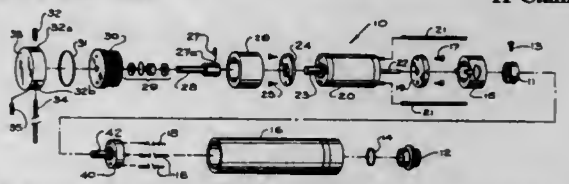
OBJECT SENSING DEVICE AND METHOD FOR USING SAME

Dean Bentzien, Brookfield; Hermann Dohl, Richfield; Frank Riedl, Sussex, and Armin Dohl, Germantown, all of Wis., assignors to Tooling & Production Systems, Inc., Sussex, Wis.

Filed Mar. 3, 1995, Ser. No. 398,472

Int. Cl.⁶ G01R *27/02;* **G08B** *21/00*

U.S. Cl. 324—714 **11 Claims**



1. An object sensing device for sensing the presence and absence of a tool, the object sensing device comprising:

an object sensing mechanism having a housing and a resistive element located within said housing;

the object sensing mechanism coupled to the resistive element;

the object sensing mechanism including an object sensing arm extending from and located external to said housing;

whereby the object sensing arm of the object sensing mechanism may contact an object located at a predetermined position and at a predetermined resistance of the resistive element.

5,691,648

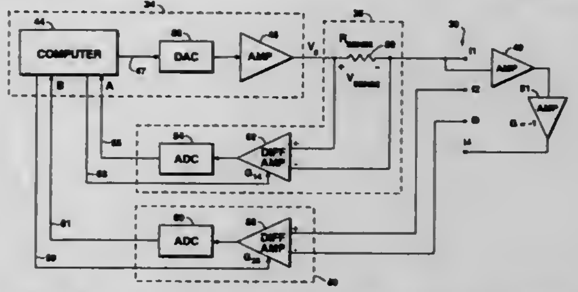
METHOD AND APPARATUS FOR MEASURING SHEET RESISTANCE AND THICKNESS OF THIN FILMS AND SUBSTRATES

David Cheng, 711 Hibernia Ct., Sunnyvale, Calif. 94087

Continuation-in-part of Ser. No. 974,853, Nov. 10, 1992, Pat. No. 5,495,178. This application Nov. 16, 1995, Ser. No. 558,434

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—716 **36 Claims**



1. A method for measuring sheet resistance of a film surface comprising:

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- engaging a probe assembly including a plurality of probes with a surface of a film;
- creating a variable voltage using a voltage source on said probe assembly to create a variable voltage in said film, thereby creating a variable current through a portion of said film;
- measuring said variable current flowing through said portion of said film at a plurality of points in time;
- measuring a film voltage between two of said probes of said probe assembly at a corresponding plurality of points in time to when said variable current is measured, said film voltage being influenced by said variable current; and
- calculating a sheet resistance of said film from a plurality of ratios of said measured film voltages to corresponding measured currents.

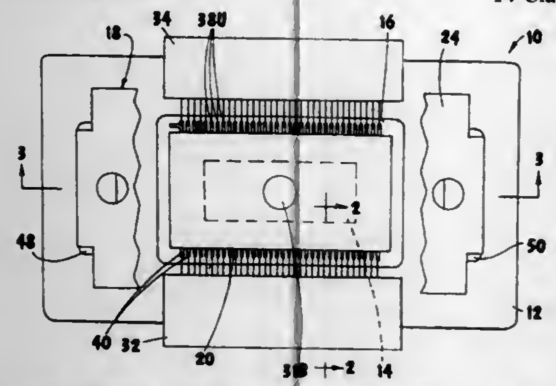
5,691,649
CARRIER HAVING SLIDE CONNECTORS FOR TESTING UNPACKAGED SEMICONDUCTOR DICE

Warren M. Farnworth, Nampa; Salman Akram, Boise, and Mike Brooks, Caldwell, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 398,309, Mar. 1, 1995, Pat. No. 5,519,332, which is a continuation-in-part of Ser. No. 345,064, Nov. 14, 1994, Pat. No. 5,541,525, which is a continuation-in-part of Ser. No. 124,899, Sep. 21, 1993, Pat. No. 5,495,179, which is a continuation-in-part of Ser. No. 46,675, Apr. 14, 1993, Pat. No. 5,367,253, which is a continuation-in-part of Ser. No. 973,931, Nov. 10, 1992, Pat. No. 5,302,891, which is a continuation of Ser. No. 709,858, Jun. 4, 1991, abandoned. This application Jan. 16, 1996, Ser. No. 587,175

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—755 **14 Claims**



1. An apparatus for testing unpackaged semiconductor dice comprising:
- a base for retaining a semiconductor die;
- an array of external contacts formed on the base, said external contacts in electrical communication with a first set of contact pads on the base;
- an interconnect mountable to the base, said interconnect including contact members for electrically contacting contact locations on the die, said contact members in electrical communication with a second set of contact pads on the interconnect;
- a connector member attachable to the base said connector member comprising a plurality of tine contacts, each of said tine contacts including a first portion for electrically contacting a contact pad of the first set, and a second portion for electrically contacting a contact pad of the second set; and
- a second interconnect interchangeable with the interconnect for electrically contacting a second semiconductor die retained on the base.

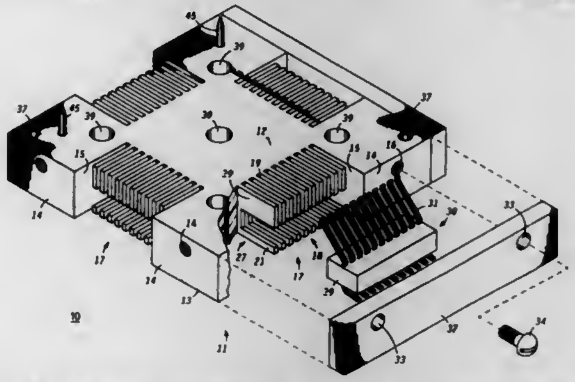
5,691,650
APPARATUS FOR COUPLING A SEMICONDUCTOR DEVICE WITH A TESTER

Maureen Sugai, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg

Continuation of Ser. No. 435,025, May 4, 1995, abandoned, which is a division of Ser. No. 47,901, Apr. 19, 1993, Pat. No. 5,440,231. This application Dec. 2, 1996, Ser. No. 759,324

Int. Cl.^{6} G01R *31/02;1/073*

U.S. Cl. 324—755 **20 Claims**



1. An adjustable test fixture for mating with leadframe leads, comprising:
- an electrically nonconductive base, the electrically nonconductive base having at least one side wherein the at least one side has a recess extending into the electrically nonconductive base and terminating at a backwall;
- a plurality of guidemembers extending from the backwall; and
- a detachable contactor assembly, the detachable contactor assembly having a top side and a bottom side and a plurality of leads which mate with the plurality of guidemembers, each lead having a first end and a second end wherein the first end projects from the top side and the second end projects from the bottom side.

5,691,651
DEVICE FOR TESTING INTEGRATED CIRCUITS

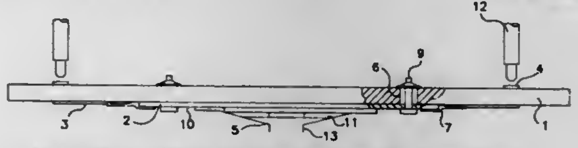
Eckhard Ehlermann, Hohenzollernstrasse 81, 8000 Munich 40, Germany

Continuation of Ser. No. 822,761, Jan. 21, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 410,598

Claims priority, application Germany, Jan. 23, 1991, 41 01 920.2

Int. Cl.^{6} G01R *1/073*

U.S. Cl. 324—760 **24 Claims**



1. A device for testing an integrated circuit comprising:
- a test card having a given thermal expansion coefficient;
- a holder means for holding a plurality of contact needles so as to make electrical contact with pads of the integrated circuit, the pads being disposed in a plane, wherein the holder means is supported by the test card and having a thermal expansion coefficient lower and different than the given thermal coefficient of the test card and a thermal expansion behavior which substantially matches that of the integrated circuit;
- first connecting means disposed on the test card for establishing electrical contact between the test card and a test instrument;
- second connecting means disposed between the test card and the holder means having expanding and contracting sections for establishing electrical contact between the test card and the holder means;
- fastening means connecting the test card to the holder means for allowing the holder means to move independently in relation to the test card ensuring that temperature-dictated expansion of the test card is not impeded by the holder means to avoid warping of the test card and thereby retaining a geometry relation of the contact needles to one another and to the plane of the pads of the integrated circuit.

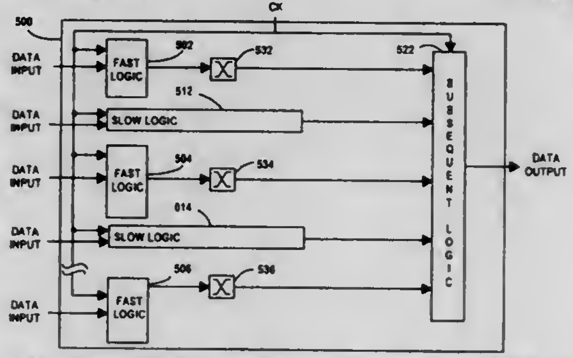
5,691,652
COMPLETION DETECTION AS A MEANS FOR IMPROVING ALPHA SOFT-ERROR RESISTANCE

Robert H. Miller, Jr., and John R. Spencer, both of Loveland, Colo., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Feb. 20, 1996, Ser. No. 603,977

Int. Cl.^{6} H03K *19/096;17/16*

U.S. Cl. 326—26 **11 Claims**



1. A dynamic logic circuit having improved alpha soft-error resistance, comprising
- a plurality of fast logic portions;
- a plurality of slow logic portions; and
- a plurality of logic isolator circuits, each logic isolator circuit corresponding to a respective fast logic portion and each receiving the output of its respective fast logic portion as an input signal, and each detecting and holding a valid logic state of the detected input signal at an output, wherein each logic isolator circuit is implemented using substantially fewer pn-junctions than its corresponding fast logic portion.

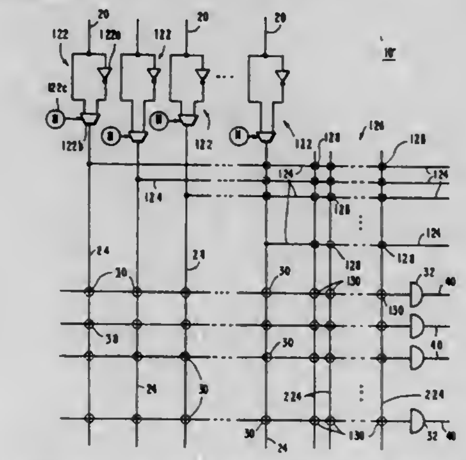
5,691,653
PRODUCT TERM BASED PROGRAMMABLE LOGIC ARRAY DEVICES WITH REDUCED CONTROL MEMORY REQUIREMENTS

David Wolk Mendel, Sunnyvale, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Jan. 16, 1996, Ser. No. 586,087

Int. Cl.^{6} H03K *19/94;7/38*

U.S. Cl. 326—39 **7 Claims**



1. A logic array circuit having a plurality of input logic signal leads and a plurality of output logic signal leads, said logic array circuit comprising:
- a plurality of main word line conductors;
- a plurality of auxiliary word line conductors;
- circuitry for programmably selectively connecting any of said main and auxiliary word line conductors to each of said output logic signal leads so that the signal on each said output logic signal lead is a logical function of signals on the main and auxiliary word line conductors to which that output logic signal lead is connected;
- programmable inversion circuitry associated with each of said input logic signal leads for programmably selectively applying to a respective one of said main word line conductors the true or complement of the signal on said input logic signal lead; and
- programmable switching circuitry for programmably selectively applying to an auxiliary word line conductor the inverse of the signal applied to a main word line conductor when the logic array circuit requires both the true and complement of the signal on that main word line conductor.

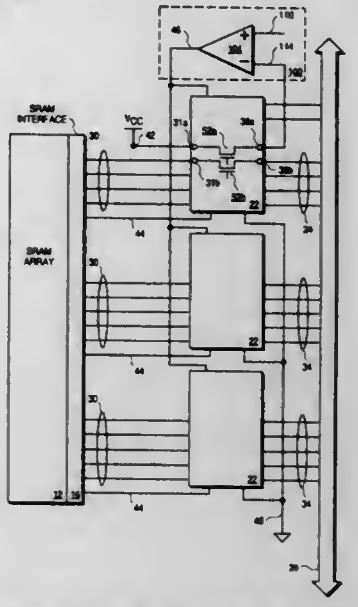
5,691,654
VOLTAGE LEVEL TRANSLATOR CIRCUIT

Gary W. Green, Pleasanton; Mathew R. Arcoleo, San Jose, and Piyush Sevalia, Sunnyvale, all of Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif..

Filed Dec. 14, 1995, Ser. No. 572,618

Int. Cl.^{6} H03K *17/16*

U.S. Cl. 326—80 **16 Claims**



1. A method of limiting the voltages of input signals, and of generating output signals with voltages less than or equal to a desired voltage limit, comprising the steps of:
- generating a reference signal and a lower rail signal, the reference signal being at a voltage equal to the sum of the lower rail voltage and the desired voltage limit;
- applying an input signal to an input of a digital device having a second upper rail voltage and a second lower rail voltage terminal;
- generating a difference signal by subtracting the output of the digital device from the reference signal;
- applying the difference signal to the second upper rail voltage terminal of the digital device and applying the lower rail signal to the second lower rail voltage terminal of the digital device.

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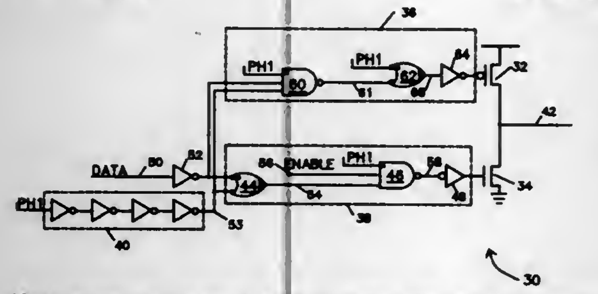
5,691,655
BUS DRIVER CIRCUIT CONFIGURED TO PARTIALLY DISCHARGE A BUS CONDUCTOR TO DECREASE LINE TO LINE COUPLING CAPACITANCE

Joseph P. Geisler, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 27, 1995, Ser. No. 562,682
Int. Cl.^{6} H03K *17/16*

U.S. Cl. 326—86 **20 Claims**



19. A method for operating a bus to reduce line to line coupling, comprising:

presetting each of a plurality of conductors configured into said bus to an initial value during a first drive state;

driving each of said plurality of conductors toward a second value different from said initial value during a first drive phase of a logic drive state;

driving a first portion of said plurality of conductors to said initial value during a second drive phase of said logic drive state; and

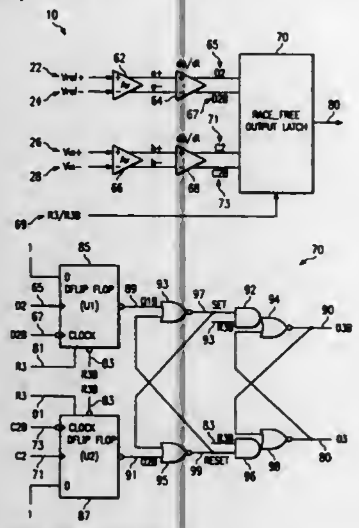
driving a second portion of said plurality of conductors to said second value during said second drive phase of said logic drive state.

5,691,656
PRECISION (Nπ)/2 LATCHING PHASE DETECTOR

Randall L. Sandusky, Divide, Colo., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1995, Ser. No. 394,657
Int. Cl.^{6} G01R *25/00*

U.S. Cl. 327—7 **12 Claims**



1. A phase detector comprising:

a reference differentiator coupled to a reference signal having a reference phase, said reference differentiator having means for blocking DC offset and low frequency signals;

an input differentiator coupled to an input signal having an input phase, said input differentiator having means for blocking DC offset and low frequency signals;

a latch coupled to said input differentiator and to said reference differentiator; and

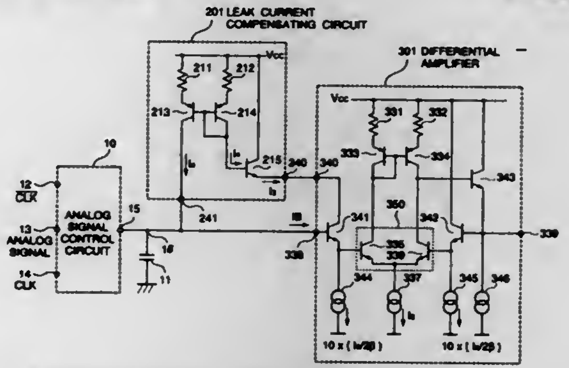
said latch having a latch output indicating the difference between said reference phase and said input phase.

5,691,657
SAMPLE-AND-HOLD CIRCUIT INCLUDING A ROBUST LEAKAGE CURRENT COMPENSATING CIRCUIT

Yoji Hirano, and Goro Ueda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 14, 1996, Ser. No. 600,007
Claims priority, application Japan, Feb. 14, 1995, 7-025045
Int. Cl.^{6} G11C *27/02*

U.S. Cl. 327—94 **8 Claims**



1. A sample-and-hold circuit comprising:

a first means for supplying a potential of an input signal to one end of a hold capacitor, and another end of said bold capacitor being connected to a first supply voltage;

a first transistor having a base connected to the one end of said hold capacitor and operating in an emitter follower fashion;

an amplifier circuit having a second transistor having a base connected to an emitter of said first transistor, wherein said amplifier outputs an amplified potential corresponding to the potential supplied to the one end of the hold capacitor;

a third transistor having an emitter connected to a collector of said first transistor, said third transistor having a collector connected to a second supply voltage; and

a second means for supplying to said base of said first transistor the same current as a base current of said third transistor, wherein the second means is connected to the base of the third transistor.

5,691,658
CURRENT MODE AMPLIFIER, RECTIFIER AND MULTI-FUNCTION CIRCUIT

Hans W. Klein, Danville, Calif., assignor to IMP, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 355,082, Dec. 13, 1994, abandoned, Division of Ser. No. 248,383, May 24, 1994, Pat. No. 5,565,815. This application Jan. 2, 1996, Ser. No. 582,430
Int. Cl.^{6} H02M *7/217*

U.S. Cl. 327—104 **8 Claims**

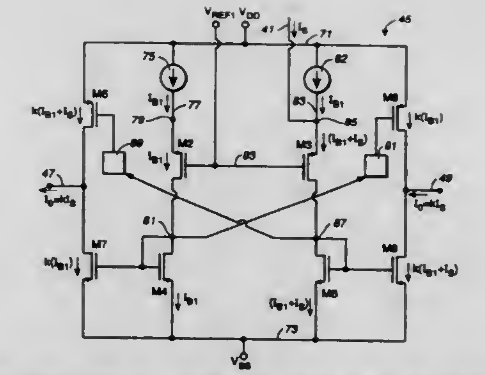
1. An analog current signal electronic circuit, comprising:

at least one current mirroring circuit characterized by passing current in only one direction,

means receiving a single ended bipolar analog current input signal for passing said current input signal through said mirroring circuit without any bias current applied thereto,

first and second output circuits having respective first and second output nodes, and

means connected to mirror the single ended bipolar current signal in said mirroring circuit into each of the first and second output circuits in a manner to produce an analog output current signal at said first and second output nodes that is a rectified version of said current input signal, and



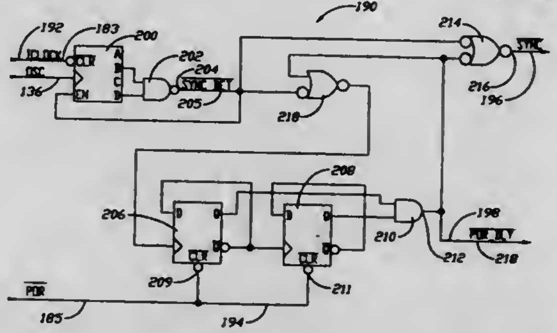
means other than the current mirroring circuit for maintaining substantially constant a voltage of an input node that receives said single ended bipolar input current signal.

5,691,659
DATA LINK MODULE FOR TIME DIVISION MULTIPLEXING CONTROL SYSTEMS

Robert E. Riley, Jackson, Miss., assignor to Square D Company, Palatine, Ill.

Division of Ser. No. 305,253, Sep. 13, 1994, Pat. No. 5,553,070. This application Nov. 30, 1995, Ser. No. 565,743
Int. Cl.^{6} H03L *7/00*

U.S. Cl. 327—143 **8 Claims**



1. In a data link module powered by a DC supply voltage and having means for producing an output control signal in response to data received on a data bus on a time division multiplexing basis for use in a time division multiplexing control system having a master clock module for producing a master clock signal, the improvement being a power on reset delay comprising:

A. means for detecting an initial application of continuous DC supply voltage to the data link module; and

B. means for inhibiting the output control signal producing means from changing the output control signal in response to data prior to the continuous application of the DC supply voltage for a preselected time period.

5,691,660
CLOCK SYNCHRONIZATION SCHEME FOR FRACTIONAL MULTIPLICATION SYSTEMS

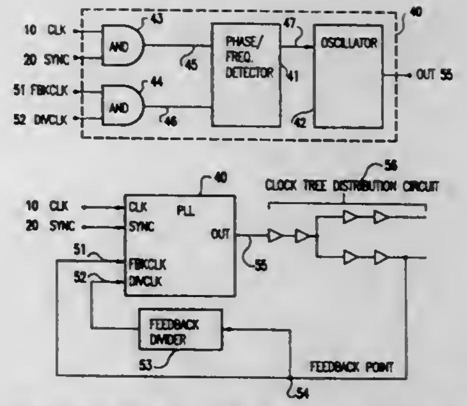
Robert Edward Busch, Essex Junction, Vt.; Kenneth Michael Zick, Dallas, Tex., and Robert Maurice Houle, Williston, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1995, Ser. No. 563,415
Int. Cl.^{6} H03L *7/08;7/16*

U.S. Cl. 327—147 **10 Claims**

1. A circuit for synchronizing a multiplied system clock signal, comprising:

means for generating a system clock signal;



a first device, operatively connected to said generating means, for receiving said system clock signal, and for generating a synchronization signal; and

a plurality of second devices, operatively connected to said generating means and said first device, for receiving said system clock signal and said synchronization signal, each of said second devices including a multiplied clock generator circuit for outputting said multiplied system clock signal and for synchronizing said multiplied system clock signal with said system clock signal, such that each said multiplied system clock signal produced by one of said second devices is synchronized and in phase with other multiplied system clock signals produced by other ones of said second devices,

wherein said multiplied system clock signal comprises a non-integer fractional multiple of said system clock signal,

wherein said multiplied clock generator circuit comprises:

first and second logic circuits;

a phase/frequency detector circuit coupled to each of said first and second logic circuits; and

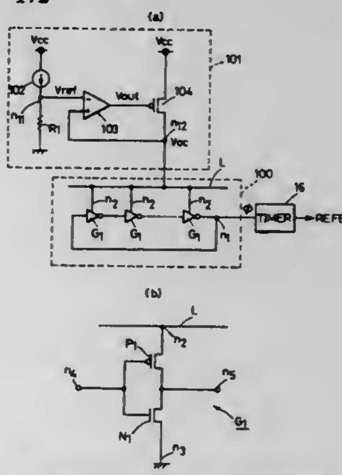
an oscillator circuit for receiving an output of said phase/frequency detector circuit, said oscillator circuit including means for outputting said multiplied system clock signal.

5,691,661
PULSE GENERATING CIRCUIT AND A SEMICONDUCTOR MEMORY DEVICE PROVIDED WITH THE SAME

Tatsuya Fukuda; Shigeru Mori; Masanori Hayashikoshi, and Seiji Sawada, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 49,398, Apr. 21, 1993, Pat. No. 5,465,063. This application Jun. 2, 1995, Ser. No. 458,775
Claims priority, application Japan, Aug. 7, 1992, 4-211678
Int. Cl.^{6} H03L *1/02;* G11C *11/34*

U.S. Cl. 327—172 **9 Claims**



1. A pulse signal generating circuit comprising:

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signal generating means for generating a pulse signal at a pulse period;

temperature detecting means for detecting an operation temperature and producing a detection signal therefrom; and

control means for controlling the pulse period of the pulse signal, which is generated by said signal generating means in response to said detection signal supplied from said temperature detecting means, wherein

the pulse signal generated by said signal generating means has a pulse period P at a normal operation temperature and when the operation temperature varies from the normal operation temperature, the control means controls the pulse period of the pulse signal to increase or decrease in inverse direction to the variance in operation temperature;

said signal generating means includes a plurality of inverters, which are mutually connected in a ring form, and

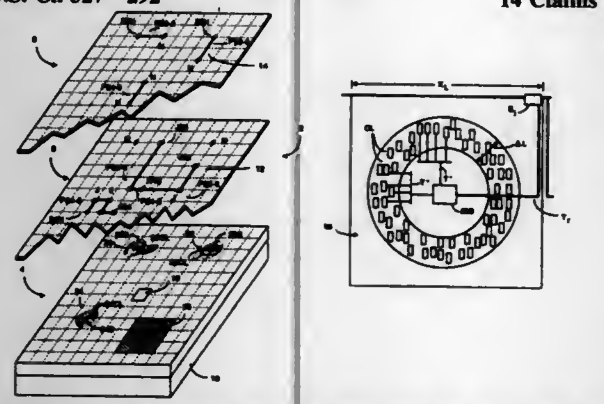
said control means includes switch means for selectively forming a ring oscillator formed of said plurality of inverters, or formed of some of said plurality of inverters, in response to said detection signal supplied from said temperature detecting means.

5,691,662
METHOD FOR MINIMIZING CLOCK SKEW IN INTEGRATED CIRCUITS AND PRINTED CIRCUITS

Alfred J. Soboleski, Sunnyvale, and Yukio Sakaguchi, Los Altos, both of Calif., assignors to Hitachi Microsystems, Inc., San Jose, Calif.

Continuation of Ser. No. 224,443, Apr. 7, 1994, abandoned.
This application Apr. 15, 1996, Ser. No. 632,166
Int. Cl.^{6} H03K *19/096; 19/177*

U.S. Cl. 327—292 **14 Claims**



1. For use with a circuit having a master buffer unit receiving a clock signal and a plurality of regional buffers to be coupled to said master buffer and a plurality of clocked loads to be coupled to a chosen one of said plurality of regional buffers, said circuit being fabricated on a substrate that includes at least a first overlying layer of interconnect traces that couple said clock signal to said plurality of regional buffers, a method for reducing clock skew, the method comprising the following steps:

(a) grid-partitioning said substrate into a number of uniquely identifiable regions;

(b) positioning said master buffer unit on said substrate;

(c) positioning each of said plurality of said regional buffers centrally on chosen ones of said regions;

(d) providing a substantially equal length interconnect trace to each of said plurality of regional buffers in each of said regions on said first overlying layer by inserting phantom, joiner cells in selected ones of said interconnect traces between said master buffer and selected regional buffers so that substantially equal length traces to each of said plurality of regional buffers are defined;

(e) associating a chosen plurality of said clocked loads with said chosen regional buffer, said chosen plurality of said clocked loads being positioned a substantially equal distance within a ring-shaped area from said chosen regional buffer; and

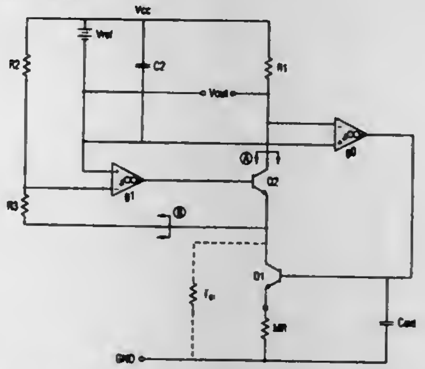
(f) coupling said plurality of clocked loads to each said plurality of regional buffers.

5,691,663
SINGLE-ENDED SUPPLY PREAMPLIFIER WITH HIGH POWER SUPPLY REJECTION RATIO

Mehrdad Nayebi, Palo Alto; Mahmud Musbah, Santa Clara, both of Calif., and Norio Shoji, Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Mar. 25, 1996, Ser. No. 621,653
Int. Cl.^{6} G06G *7/12*

U.S. Cl. 327—560 **11 Claims**



1. An amplifier circuit for simultaneously biasing and amplifying signals generated by a magnetoresistive element corresponding to data read from a magnetic medium, the amplifier circuit configured for receiving power from a single-ended supply voltage source and comprising:

a. a receiving circuit configured for receiving the signals generated by the magnetoresistive element;

b. a first circuit element for setting a gain of the amplifier circuit and providing an output signal corresponding to the signals generated by the magnetoresistive element;

c. a reference voltage coupled to the single-ended supply voltage;

d. a first biasing circuit for providing a first biasing current to the magnetoresistive element, the first biasing circuit controlled by a first voltage difference between the output signal and the reference voltage;

e. a second biasing circuit for providing a second biasing current to the magnetoresistive element, the second biasing circuit controlled by a second voltage difference between a first voltage level and the reference voltage; and

f. a first transistor coupled between the receiving circuit and the first circuit element for controlling generation of the output signal by the first circuit element, wherein the first circuit element, the transistor and the second biasing circuit are all referenced to the single-ended supply voltage for providing an increased power supply rejection ratio.

5,691,664
PROGRAMMABLE ANALOG ARRAY AND METHOD FOR ESTABLISHING A FEEDBACK LOOP THEREIN

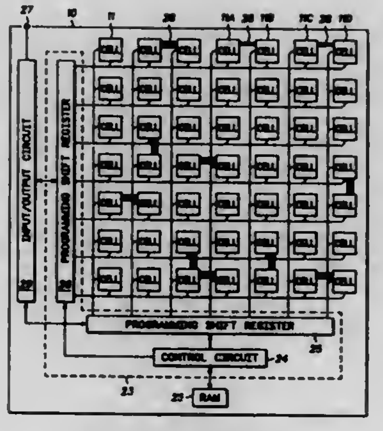
David J. Anderson, Scottsdale, and Danny A. Bersch, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

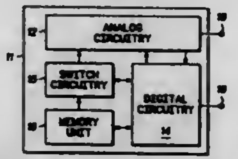
Filed Jan. 16, 1996, Ser. No. 586,503
Int. Cl.^{6} H03K *3/26;* **H01L** *25/00*

U.S. Cl. 327—565 **20 Claims**

1. A programmable analog array, comprising:

an array of cells, a plurality of cells in the array of cells including analog circuitry which is configurable as a plurality of circuit functions and digital circuitry which converts an analog signal received from the analog circuitry into digital information;





a local feedback loop established within the array of cells the local feedback loop reconfiguring the analog circuitry in accordance with the digital information:

interconnection circuitry coupled to the array of cells, wherein the interconnection circuitry enables interconnection of different cells in the array of cells; and

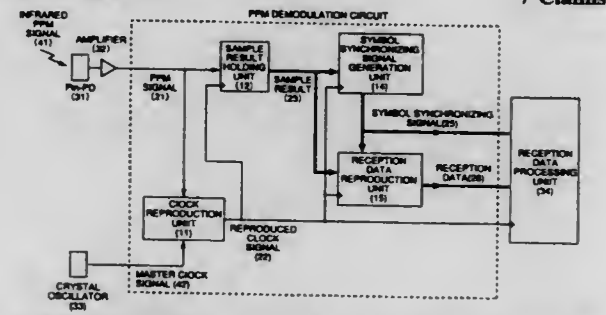
an accessing circuit, wherein the accessing circuit selectively accesses a first cell of the plurality of cells, transmits cell configuration data to the first cell to internally configure the first cell as one of the plurality of circuit functions, and transmits interconnection data to the interconnection circuitry.

5,691,665
PPM DEMODULATION DEVICE

Yoshihiro Ohtani, Souraku-gun, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1996, Ser. No. 719,755
Claims priority, application Japan, Jun. 29, 1995, 7-253061
Int. Cl.^{6} H03K *9/04*

U.S. Cl. 329—313 **7 Claims**


PPM DEMODULATION CIRCUIT
INFRARED PPM SIGNAL (41)
AMPLIFIER (32)
Pin-PD (31)
PPM SIGNAL (21)
SAMPLE RESULT HOLDING UNIT (12)
SAMPLE RESULT (25)
SYMBOL SYNCHRONIZING SIGNAL GENERATION UNIT (14)
SYMBOL SYNCHRONIZING SIGNAL(25)
RECEPTION DATA REPRODUCTION UNIT (15)
RECEPTION DATA(26)
RECEPTION DATA PROCESSING UNIT (34)
CLOCK REPRODUCTION UNIT (11)
REPRODUCED CLOCK SIGNAL (22)
MASTER CLOCK SIGNAL (42)
CRYSTAL OSCILLATOR (33)

1. A PPM demodulation device for demodulating reception data that is pulse position modulated with a pulse that alters between a first level and a second level inserted into a predetermined symbol position, said PPM demodulation device comprising:

clock reproduction means for providing a reproduced clock signal from said pulse position modulated reception data,

sample result holding means for sampling said pulse position modulated reception signal by said clock reproduction means for holding a result thereof,

symbol synchronizing signal generation means for generation a symbol synchronizing signal to achieve synchronization of said symbol position according to said reception data, and

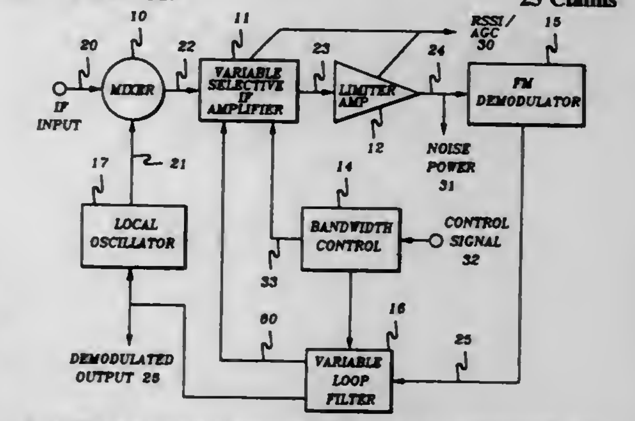
demodulation means for, when there is reception data of said second level at a plurality of pulse slot positions within the same symbol indicated by said symbol synchronizing signal out of sampling data held by said sample result holding means, rendering valid a pulse of a pulse slot position first detected of the second level within said symbol.

5,691,666
FULL THRESHOLD FM DEVIATION COMPRESSION FEEDBACK DEMODULATOR AND METHOD

Joseph C. Owen, 302 Mill St., Box 97, Seven Mile, Ohio 45062

Filed Jun. 7, 1995, Ser. No. 481,931
Int. Cl.^{6} H03D *3/06; 7/16*

U.S. Cl. 329—319 **23 Claims**



1. A FM demodulator utilizing FM deviation compression feedback comprising:

a local oscillator supplying local oscillations;

a mixer means having an input receiving an FM signal of prescribed FM deviation and an input receiving said local oscillations and converting said FM signal to a converted IF output signal having a prescribed reduced FM deviation;

an IF amplifier comprising at least one stage coupled to said mixer means output signal for amplifying and selective filtering of said converted IF signal output within a prescribed bandwidth;

a means for coupling an output of said IF amplifier to an FM demodulator, and providing a demodulated output signal to an output terminal of said FM demodulator; and

a feedback loop delivering a feedback signal from said output terminal of said FM demodulator to an input of said oscillator for controlling said mixing in said mixer means in a manner as to track said FM signal of prescribed FM deviation, wherein said feedback loop comprises a filter means for reducing said feedback signal at higher demodulation frequencies and increasing said feedback signal at lower demodulation frequencies, thereby reducing the FM deviation of said converted IF signal to the prescribed reduced FM deviation.

5,691,667
RF RADIATION ABSORBING MATERIAL DISPOSED BETWEEN THE CATHODE AND ANODE OF AN ELECTRON BEAM TUBE

Alan Hugh Pickering; Geoffrey John Rowlands; Roy Heppinstall; Edward Stanley Sobieradzki, and Geoffrey Thomas Clayworth, all of Essex, Great Britain, assignors to English Electric Valve Co., Ltd., Essex, Great Britain

PCT No. PCT/GB92/01684, § 371 Date May 17, 1994, § 102(e) Date May 17, 1994, PCT Pub. No. WO93/06632, PCT Pub. Date Jan. 4, 1993

PCT Filed Sep. 14, 1992, Ser. No. 211,030

Claims priority, application United Kingdom, Sep. 18, 1991, 9119947

Int. Cl.^{6} H01J *23/54;* **H03F** *3/54*

U.S. Cl. 330—44 **17 Claims**

15. An electron beam tube amplifying arrangement comprising: an electron gun for generating an electron beam along an electron

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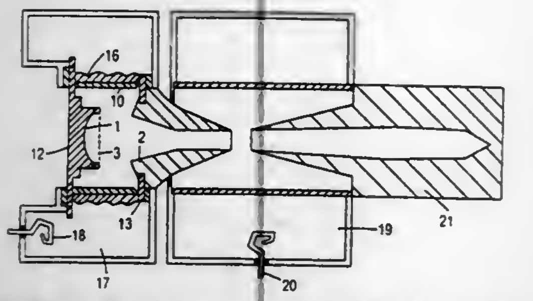


beam path, said electron gun comprising a cathode and an anode; an r.f. radiation absorbing material comprising a mixture of silicone rubber and ferrite particles surrounding said electron beam path between said cathode and said anode and arranged to provide electrical insulation between first and second parts of said tube, said first part including said anode and said second part including said cathode, said first and second parts being at different voltages when in use; means coupled to said tube for applying a high frequency signal to be amplified thereto; means coupled to said tube for modulating said electron beam with said signal to produce an amplified signal; and means coupled to said tube for extracting said amplified signal from said arrangement.

5,691,668

FEEDFORWARD AMPLIFIER

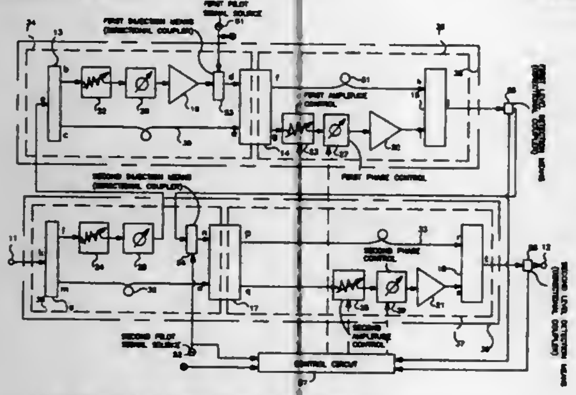
Yoshishige Yoshikawa, Ibaraki; Hiroaki Kosugi, Hirakata; Hisashi Adachi, Minou; Kazuo Nagao, and Shinichi Kugou, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 12, 1996, Ser. No. 599,799

Claims priority, application Japan, Feb. 13, 1995, 7-024127

Int. Cl.^{6} H03F *1/32*

U.S. Cl. 330—151 **7 Claims**


FIRST PILOT SIGNAL SOURCE
FIRST INJECTION MEANS (DIRECTIONAL COUPLER)
FIRST AMPLITUDE CONTROL
SECOND PILOT SIGNAL SOURCE
SECOND AMPLITUDE CONTROL
CONTROL CIRCUIT

1. A feedforward amplifier comprising:

a first feedforward circuit and a second feedforward circuit;

said first feedforward circuit comprising

a first distortion detection circuit and a first distortion cancellation circuit operating at a first frequency, said first distortion detection circuit detecting distortion in the output of a main amplifier, said first distortion cancellation circuit canceling the detected distortion by amplifying the detected distortion by a first auxiliary amplifier and inserting the amplified detected distortion into the output of said main amplifier;

said second feed forward circuit comprising

a second distortion detection circuit and a second distortion cancellation circuit operating at a second frequency, said second distortion detection circuit detecting distortion in the output of said first feedforward circuit, said second distortion cancellation circuit canceling the detected distortion by amplifying the detected distortion by a second auxiliary amplifier and inserting the amplified detected distortion into the output of said first feedforward circuit,

wherein said first frequency and said second frequency are different from each other.

5,691,669

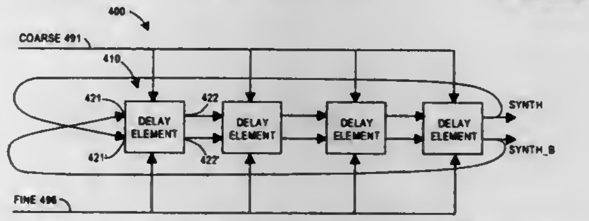
DUAL ADJUST CURRENT CONTROLLED PHASE LOCKED LOOP

Li Ching Tsai, and Hugh S. C. Wallace, both of Ft. Collins, Colo., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Jan. 11, 1996, Ser. No. 585,053

Int. Cl.^{6} H03L *7/099*

U.S. Cl. 331—17 **18 Claims**



9. A phase locked loop for providing multiple-gain frequency acquisition of a signal, comprising:

a phase detector responsive to a reference signal and a synthesized signal for producing a phase error signal;

a controller responsive to the phase error signal for generating a coarse adjust control signal and a fine adjust control signal; and

a dual adjust current-controlled oscillator for producing the synthesized signal, said dual adjust current-control oscillator being responsive to the coarse adjust control signal for controlling a range level of an oscillating frequency range of the synthesized signal and the fine adjust control signal for controlling an oscillating frequency of the synthesized signal, wherein the oscillating frequency is within the oscillating frequency range.

5,691,670

INTEGRATED MICROWAVE-SILICON COMPONENT

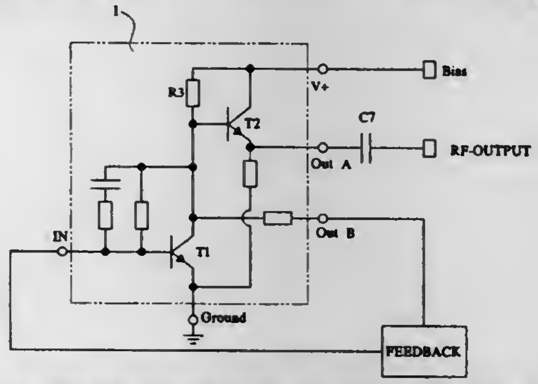
Gerhard Lohninger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 27, 1996, Ser. No. 721,675

Claims priority, application Germany, Sep. 29, 1995, 195 36 431.7

Int. Cl.^{6} H03B *5/18;* **H03F** *3/04;3/68;* **H04B** *1/28*

U.S. Cl. 331—96 **13 Claims**



1. An integrated microwave-silicon component having a circuit input, a voltage supply and a ground, said component comprising:

a first transistor having a base, an emitter and a collector, said base connected to the circuit input, and said emitter connected to the ground;

a second transistor having a base, an emitter and a collector, said base connected to said collector of said first transistor, and said collector connected to the voltage supply;

a first circuit output connected to said emitter of said second transistor;

a second circuit output connected to said collector of said first transistor via a first resistor;

said emitter of said first transistor connected to said emitter of said second transistor via a second resistor;

a third resistor connected between said base and said collector of said first transistor; and

a fourth resistor connected between said base and said collector of said second transistor.

5,691,671

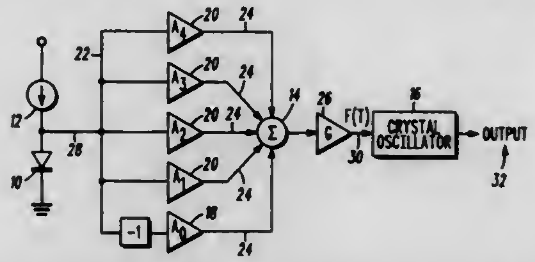
METHOD AND APPARATUS FOR A CRYSTAL OSCILLATOR USING PIECEWISE LINEAR ODD SYMMETRY TEMPERATURE COMPENSATION

Michael L. Bushman, Hanover Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 12, 1996, Ser. No. 678,904

Int. Cl.^{6} H03B *5/32;* **H03L** *1/02*

U.S. Cl. 331—158 **20 Claims**



1. A method for temperature compensating a crystal oscillator across a predetermined temperature range, comprising the steps of:

providing a substantially linear temperature sensitive sensor, a source driver, a summation circuit, a crystal oscillator including a tuning circuit and a plurality of operational amplifiers having inputs and outputs and including adjustable gain and clipping;

driving the sensor with the source driver such that a substantially linear temperature-dependent signal is provided;

coupling the signal to the inputs of the plurality of operational amplifiers;

adjusting the gain and clipping of each amplifier such that the output of each amplifier provides a piecewise linear signal having odd symmetry about an inflection temperature of a Bechmann curve of the crystal oscillator;

summing the outputs over the temperature range in the summation circuit such that a compensation signal proportional to the Bechmann curve is provided; and

applying the compensation signal to the tuning circuit such that the crystal oscillator is substantially temperature compensated.

5,691,672

MAGNETIC COUPLING DEVICE BETWEEN A TEM LINE MAIN CONDUCTOR AND A WAVEGUIDE FORMING A λG/2 RESONATOR

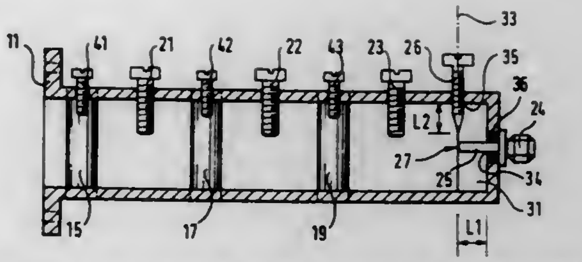
Jean-Claude Cruchon, Bouffemont, and Jean Denis Schubert, Verneuil sur Seine, both of France, assignors to Alcatel Telspace, Nanterre Cedex, France

Filed Aug. 2, 1996, Ser. No. 691,387

Claims priority, application France, Aug. 4, 1995, 95 09540

Int. Cl.^{6} H01P *5/103*

U.S. Cl. 333—26 **6 Claims**



1. Magnetic coupling device between a main conductor of a TEM line and a waveguide forming a λg/2 resonator and procuring the propagation of an electromagnetic wave, said main conductor being fixed to a wall of said waveguide and extended by a pin inside said waveguide, said device comprising a tuning screw penetrating into said waveguide near the free end of said pin and perpendicular to said pin and an iris around and centered on said pin, said iris being closed on one side by said wall and its interior volume forming a zone in which the wave of the associated magnetic field is evanescent, the median axis of said tuning screw being in the plane of the aperture of said iris.

5,691,673

SEMICONDUCTOR INTEGRATED CIRCUIT APPARATUS HAVING INPUT/OUTPUT PORTIONS IMPEDANCE-MATCHED FOR TRANSMISSION LINES

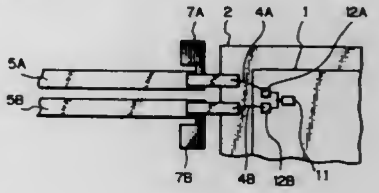
Toru Ishikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

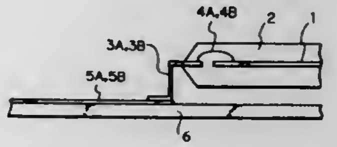
Filed Jun. 17, 1996, Ser. No. 665,757

Claims priority, application Japan, Jun. 15, 1995, 7-171657

Int. Cl.^{6} H01P *5/00*

U.S. Cl. 333—33 **19 Claims**





1. A semiconductor integrated circuit apparatus comprising:

a semiconductor chip having an input/output means;

first and second terminal means connected to said input/output means; and

first and second transmission lines, connected to said first and second terminal means, respectively,

wherein the following formula is substantially satisfied:

$$Z=\sqrt{(L1+L2)/C1}$$

where Z is an impedance of each of said first and second transmission lines,

L1 and L2 are inductances of said first and second terminal means, and

C1 is a capacitance of said input/output means, and

wherein said input/output means comprises a compensation capacitor, to substantially adjust the capacitance of said input/output means.

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DIELECTRIC RESONATOR APPARATUS COMPRISING AT LEAST THREE QUARTER-WAVELENGTH DIELECTRIC COAXIAL RESONATORS AND HAVING CAPACITANCE COUPLING ELECTRODES

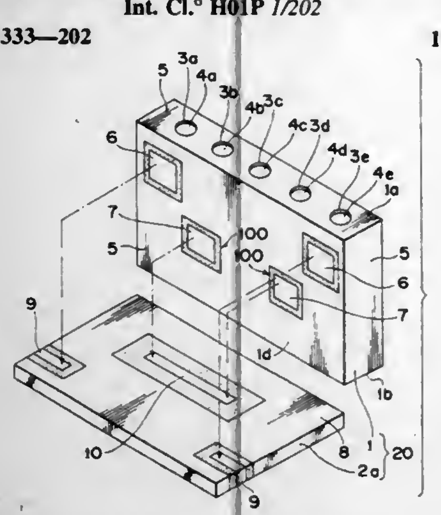
Tadahiro Yorita, and Hirofumi Miyamoto, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 20, 1994, Ser. No. 308,974

Claims priority, application Japan, Sep. 20, 1993, 5-233795

Int. Cl.^{6} H01P *1/202*

U.S. Cl. 333—202 **19 Claims**



16. A dielectric resonator apparatus comprising:

a dielectric block of a dielectric material having first and second end surfaces, and side surfaces located between the first end surface and the second end surface;

at least one cylindrical resonator hole penetrating said dielectric block, said at least one resonator hole having a respective opening on the first end surface of said dielectric block and another respective opening on the second end surface of said dielectric block;

an outer conductor disposed on the first and second end surfaces and on said side surfaces of said dielectric block;

a respective inner conductor on a corresponding inner portion of said at least one resonator hole, a respective first end of said corresponding inner conductor being located at the first end surface of said dielectric block and respectively electrically insulated from said outer conductor, and a respective second end of said corresponding inner conductor electrically connected to said outer conductor at said second end surface of said dielectric block, constituting at least one quarter-wavelength dielectric coaxial resonator;

a pair of input and output electrodes for capacitively coupling with respective portions of said at least one said dielectric coaxial resonator, said input and output electrodes being located on said dielectric block, said pair of input and output electrodes being spaced away from the first end surface of said dielectric block by a respective first predetermined distance and respectively electrically insulated from said outer conductor;

two capacitance coupling electrodes for capacitively coupling with respective portions of said at least one dielectric coaxial resonator, said two capacitance coupling electrodes being respectively electrically insulated from said outer conductor, and spaced away from the first end surface by a respective second predetermined distance, which is greater than said respective first predetermined distance, in a direction along a lengthwise direction of said at least one resonator, and at a position where an electric field strength due to said at least one dielectric coaxial resonator is weaker than an electric field strength associated with said input and output electrodes.

5,691,675

RESONATOR WITH EXTERNAL CONDUCTOR AS RESONANCE INDUCTANCE ELEMENT AND MULTIPLE RESONATOR FILTER

Hiroshi Hatanaka, Fujimi, Japan, assignor to Nihon Dengyo Kosaku Co., Ltd., Tokyo, Japan

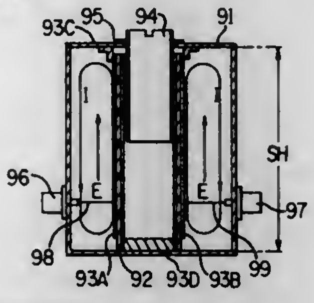
PCT No. PCT/JP95/00629, § 371 Date Nov. 28, 1995, § 102(e) Date Nov. 28, 1995, PCT Pub. No. WO95/27318, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 31, 1995, Ser. No. 556,905

Claims priority, application Japan, Mar. 31, 1994, 6-087807; Oct. 25, 1994, 6-284124; Feb. 15, 1995, 7-051971

Int. Cl.^{6} H01P *1/20*

U.S. Cl. 333—202 **6 Claims**



1. A resonator comprising:

an external conductor having upper and lower walls;

a variable resonance capacity element comprising

a hollow dielectric cylinder having inner and outer surfaces and upper and lower end portions facing the upper and lower walls, respectively, of said external conductor a suitable distance away,

a first fixed electrode composed of a metal thin layer that adheres around the inner surface of said hollow dielectric cylinder and has a lower end portion electrically connected to the lower wall of said external conductor and an upper end portion separated from the upper wall of said external conductor,

a second fixed electrode composed of a metal thin layer that adheres around the outer surface of said hollow dielectric cylinder defining a circumferential space with said external conductor and has an upper end portion electrically connected to the upper wall of said external conductor and an lower end portion separated from the lower wall of said external conductor, and

a hollow or solid cylindrical movable electrode that is coaxial with said first and second fixed electrodes and is attached to the upper wall of said external conductor so that an insertion length of said movable electrode into said hollow dielectric cylinder can be varied;

an input terminal having an inner conductor;

an output terminal having an inner conductor; and

means provided in said circumferential space for connecting said second fixed electrode to the inner conductor of said input terminal and the inner conductor of said output terminal in a high-frequency fashion.

5,691,676

STRIP LINE FILTER, RECEIVER WITH STRIP LINE FILTER AND METHOD OF TUNING THE STRIP LINE FILTER

Jan Snel; Franciscus H.A. De Jongh; Pieter W. Jedeloo, and Antonius C.J.C. Van De Acker-veken, all of Roermond, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

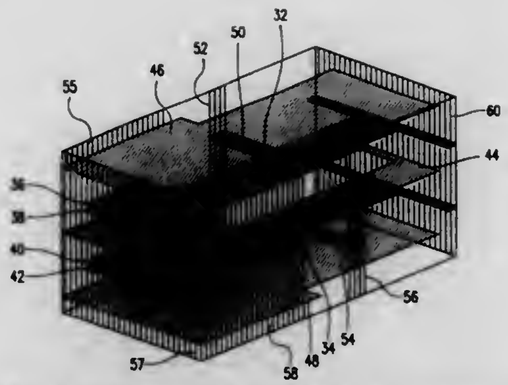
Filed Dec. 18, 1995, Ser. No. 573,852

Claims priority, application European Pat. Off., Dec. 19, 1994, 94203675

Int. Cl.^{6} H01P *1/203*

U.S. Cl. 333—204 **18 Claims**

1. A filter comprising at least first and second mutually electromagnetically coupled strip line resonators, wherein



the first and second strip line resonators are separated by the ceramic dielectric,

the first and second strip line resonators are situated in first and second planes, respectively, that are adjacent and substantially parallel to each other,

the first and second strip line resonators are electromagnetically coupled at least via the broad side, and

a spatial arrangement of the first and second strip line resonators is such that an area of the first resonator has a substantial overlap with an area occupied by the second resonator.

5,691,677

TUNABLE RESONATOR FOR MICROWAVE OSCILLATORS AND FILTERS

Lino De Maron, Cassano d'Adda, and Riccardo Urciuoli, Pessano con Bornago, both of Italy, assignors to Italtel spa, Milan, Italy

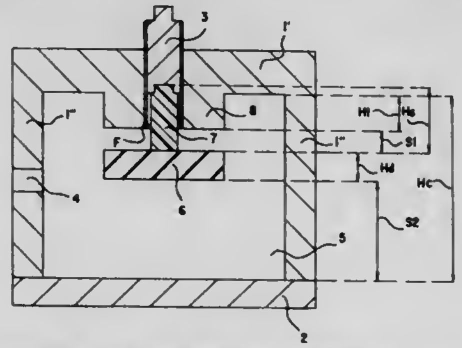
PCT No. PCT/EP94/02154, § 371 Date Jun. 12, 1996, § 102(e) Date Jun. 12, 1996, PCT Pub. No. WO95/01658, PCT Pub. Date Jan. 12, 1995

PCT Filed Jul. 1, 1994, Ser. No. 586,648

Claims priority, application Italy, Jul. 2, 1993, MI93A1431

Int. Cl.^{6} H01P *7/10*

U.S. Cl. 333—219.1 **23 Claims**



1. A tunable microwave resonator, comprising:

walls delimiting a cavity, said walls including a first wall formed with an opening;

a tuning screw extending in said opening, a cylindrical dielectric resonator disposed in said cavity, and a dielectric support projecting in said opening, said dielectric support acting as a spacer and rigidly connecting said dielectric resonator to said tuning screw;

said cavity and said dielectric resonator being exciteable to one or more resonant modes of an electromagnetic field, wherein a current induced by the resonant modes is transfered outside said cavity;

and a toroidal extension formed on said first wall inside said cavity and surrounding said opening, said toroidal extension extending a given length inside said cavity, said toroidal extension reducing a thermal effect on the resonance frequency, and increasing a mechanical stability.

5,691,678

ELECTROMAGNETS

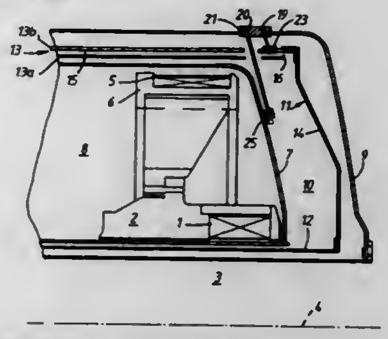
Russell Peter Gore, Abingdon, and Graham Gilgrass, Sutton, both of Englaod, assignors to Oxford Magnet Technology Limited, Eynsham, England

Filed Jul. 17, 1995, Ser. No. 502,957

Claims priority, application United Kingdom, Jul. 28, 1994, 9415188

Int. Cl.^{6} H01F *1/00*

U.S. Cl. 335—216 **6 Claims**



1. A superconducting electromagnet comprising:

an annular inner helium container vessel,

windings of an annular magnet contained within said inner vessel,

an outer annular vacuum chamber within which the inner vessel is contained, and

a generally annular hollow thermal shield enclosing the inner vessel and disposed between said inner vessel and said outer annular vacuum chamber in spaced apart relationship so that longitudinal axes of said shield and the magnet are substantially co-extensive,

an outer wall of the shield being at least partly defined by generally cylindrical mutually spaced inner and outer thermal screens which, in combination, define a double wall screen,

an inner wall of the shield being defined by an additional thermal screen having a single cylindrical wall which is concentric with the longitudinal axis of the magnet, the outer thermal screen being joined by a pair of generally annular end caps to the inner wall of the shield, and the inner thermal screen being axially spaced apart from the pair of end caps.

5,691,679

CERAMIC SUPERCONDUCTING LEAD RESISTANT TO MOISTURE AND BREAKAGE

Robert Adolph Ackermann, Schenectady; Kenneth Gordon Herd, Niskayuna; Evangelos Trifon Laskaris, Schenectady; John Eric Tkaczyk, Delamson; Kenneth Wilbur Lay, Schenectady, and Richard Andrew Ranze, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 329,918, Oct. 27, 1994, abandoned. This application Dec. 12, 1996, Ser. No. 764,351

Int. Cl.^{6} H01F *1/00*

U.S. Cl. 335—216 **10 Claims**

1. A superconductive lead assembly for a superconductive device cooled by a cryocooler coldhead having a first stage and a second stage, said superconductive lead assembly comprising:

a) a first ceramic superconductive lead having a first end flexibly, dielectrically, and thermally connectable to said first stage and a second end flexibly, dielectrically, and thermally connectable to said second stage; and

b) a first glass-reinforced-epoxy lead overwrap in general surrounding contact with and attached to said first ceramic superconductive lead, wherein said first glass-reinforced-epoxy

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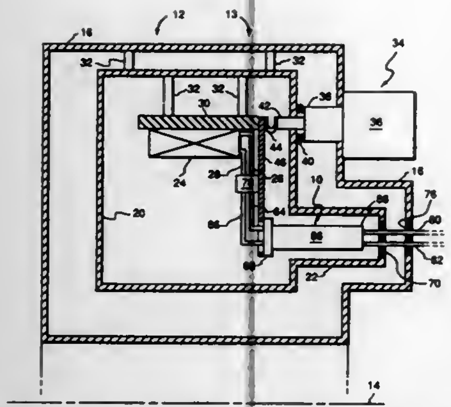


lead overwrap has a coefficient of thermal expansion generally equal to that of said first ceramic superconductive lead.

5,691,680

METHOD OF RECOGNIZING THE IMPINGEMENT OF A RECIPROCATING ARMATURE IN AN ELECTROMAGNETIC ACTUATOR

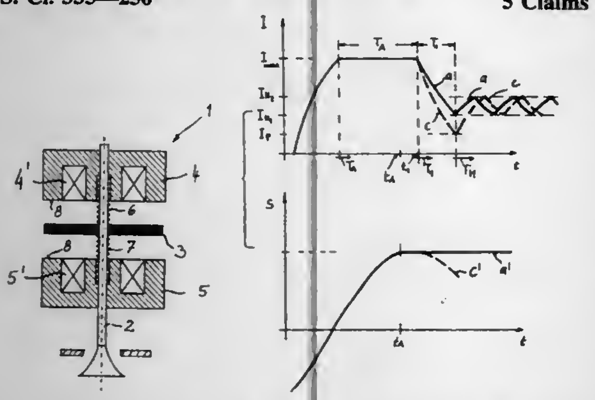
Ekkehard Schrey, Aachen, and Lutz Kather, Würselen, both of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Germany

Filed Jul. 22, 1996, Ser. No. 683,973

Claims priority, application Germany, Jul. 21, 1995, 195 26 683.8

Int. Cl.^{6} H01F *3/00;* **H02K** *33/00;* **H01H** *47/00*

U.S. Cl. 335—256 **5 Claims**



1. A method of recognizing armature impingement in an electromagnetic actuator having an electromagnet including a solenoid, an armature movable toward and away from the electromagnet and return means for exerting a force on the armature, comprising the following steps:

(a) maintaining a solenoid current at a predetermined magnitude I_{max} during a predetermined period T_A for capturing the armature at the electromagnet;

(b) switching off the solenoid current at a moment t_1 upon lapse of the period T_A;

(c) upon lapse of a period T_1 running from moment t_1, oscillating the solenoid current between a lower holding current threshold I_{H1} and an upper holding current threshold I_{H2};

(d) detecting a current course from moment t_1; and

(e) deriving a signal from said current course.

5,691,681

METHOD OF PRODUCING A FIELD MAGNET FOR A DC MOTOR AND A FIELD MAGNET FOR A DC MOTOR

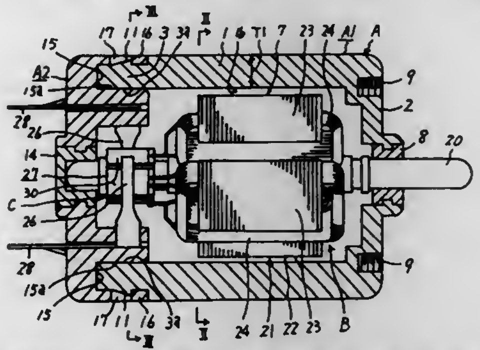
Shougo Okugawa, Mie-ken, Japan, assignor to Nakagawaseimitsukogyo Kabushikikaisha, Japan

Filed Nov. 3, 1995, Ser. No. 552,660

Claims priority, application Japan, Jan. 13, 1995, 7-021238

Int. Cl.^{6} H01F *7/20*

U.S. Cl. 335—284 **2 Claims**



1. A method of fabricating a field magnet for a DC motor, comprising the steps of:

(a) providing an outer mold of a nonmagnetic material having a hollowed inner portion formed in an annular shape to surround the outer periphery of the molding space for the field magnet;

(b) providing an inner mold of a nonmagnetic material having an outer peripheral face having an annular shape corresponding to the inner periphery of said outer mold for shaping the inner periphery of said field magnet, said inner mold having plural magnetizing poles disposed on the outer peripheral face thereof;

(c) said outer and inner molds being arranged so that the cylindrical molding space for the field magnet is formed between the inner face of the outer mold and the outer peripheral face of the inner mold with the magnetic fluxes emitted from the magnetizing poles passing through the outer and inner molds and the molding space therebetween;

(d) providing a mixture of ferromagnetic material and a binder as a molding material and filling said molding space with said molding material, directing magnetic flux between said magnetizing poles using said molding material in said molding space as a part of the magnetic path between said magnetizing poles to orient the axes of easy magnetization of particles of the ferromagnetic material in the direction of the magnetic fluxes with the ferromagnetic material which respectively opposes the magnetizing poles and on the side of the inner peripheral face being magnetized more intensely than the ferromagnetic material in the other portions, thereby configuring field poles; and

(e) fixing the axes of easy magnetization of particles of the ferromagnetic material powder by solidifying the molding material while maintaining the axes of easy magnetization to be oriented in the direction of the magnetic fluxes, thereby simultaneously configuring the field poles and the magnetic path interposed between the field poles in the molding material.

5,691,682

VERY HIGH FIELD MICRO MAGNETIC ROLLER AND METHOD OF MAKING SAME

Frederick John Jeffers, Escondido, Calif.; Svetlana Reznik, and J. Kelly Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

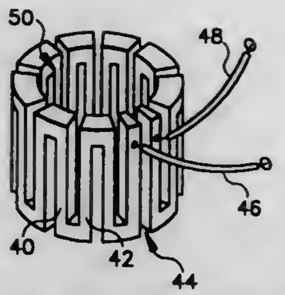
Filed Jan. 10, 1995, Ser. No. 370,720

Int. Cl.^{6} H01F *7/02*

U.S. Cl. 335—302 **17 Claims**

1. A micro magnetic roller recorder comprising:

a) a cylindrical roller of solid magnetic material,



b) a plurality of poles magnetized in said magnetic material, said poles located around the periphery of said roller, wherein said poles represent encoded data to be recorded on magnetic media,

c) said material having an energy produce of at least $4–20\times10^6$ GOe, and

d) said roller having a diameter less than 0.2".

5,691,683

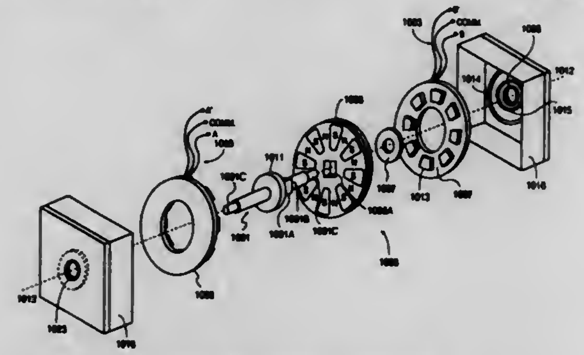
MULTI-POLE COMPOSITE MAGNET

Elmer C. Allwine, Jr., 450 Harvard Ave. #9C, Santa Clara, Calif. 95051

Division of Ser. No. 958,987, Oct. 9, 1992, Pat. No. 5,440,185, which is a continuation-in-part of Ser. No. 784,207, Oct. 28, 1991, Pat. No. 5,258,735. This application Apr. 17, 1995, Ser. No. 424,140

Int. Cl.^{6} H01F *7/02*

U.S. Cl. 335—306 **1 Claim**



1. A multi-pole composite magnet comprising:

a first section having a first hub having a first axis about which said first hub is capable of rotating, said first hub having a first plurality of members integrally formed with said first hub and radially extending away from said first axis in a plane perpendicular to said first axis; and

a second section having a second hub having a second axis about which said second hub is capable of rotating, said second axis coinciding with said first axis, said second hub having a second plurality of members integrally formed with said second hub and radially extending away from said second axis in a plane perpendicular to said second axis, wherein said first and second plurality of members are permanently magnetized in opposite directions parallel to either said first or second axis, wherein said first and second sections are rigidly mated together, and wherein each member of said first plurality of members is located between a pair of members of said second plurality of members and wherein each member of said second plurality of members is located between a pair of members of said first plurality of members.

5,691,684

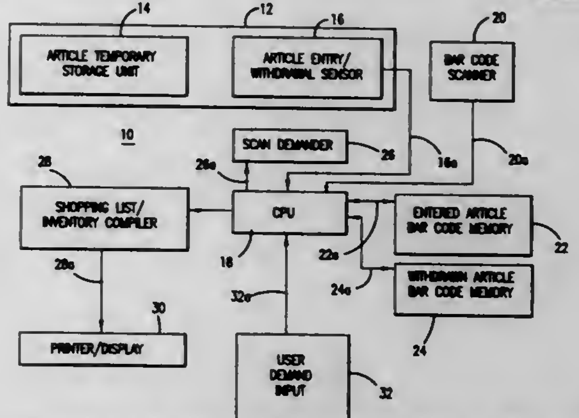
ARTICLE STORAGE CONTAINER WITH BAR CODE SCANNING

Judy Murrah, St. James, N.Y., assignor to Symbol Technologies, Inc., Holtsville, N.Y.

Filed Sep. 20, 1995, Ser. No. 530,806

Int. Cl.^{6} G06F *17/60;* **F25D** *23/00*

U.S. Cl. 235—385 **3 Claims**


14
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ARTICLE TEMPORARY STORAGE UNIT
ARTICLE ENTRY/ WITHDRAWAL SENSOR
BAR CODE SCANNER
10
SCAN DEMANDER
26
26a
16a
20a
28
SHOPPING LIST/ INVENTORY COMPILER
CPU
ENTERED ARTICLE BAR CODE MEMORY
22
18
22a
28a
24a
WITHDRAWN ARTICLE BAR CODE MEMORY
32a
30
PRINTER/DISPLAY
USER DEMAND INPUT
32
24

1. A method for processing of consumable articles bearing bar code symbols indicative of their character, said method comprising the steps of:

(a) defining a set of storage units comprising at least a refrigerator and a pantry for releasable containment of said articles;

(b) sensing article entry and article withdrawal from each of said units;

(c) providing sensing output based upon the sensing of article entry and article withdrawal from each of said units;

(d) scanning and storing the bar codes of articles on initial entry thereof into each of said units;

(e) scanning and storing the bar codes of articles withdrawn from each of said units;

(f) scanning and storing the bar codes of articles entered into each of said units following withdrawal from each of said units; and

(g) providing output indication of failure of correspondence between the stored bar codes resulting from entry and withdrawal of articles from each of said units;

whereby steps (d), (e) and (f) are practiced in part by providing separate storage facilities for scanned bar codes respectively in article entry and withdrawal, and step (g) is practiced by reading out a stored bar code from one of said separate storage facilities and determining whether the read out bar code is stored in the other of said separate storage facilities.

5,691,685

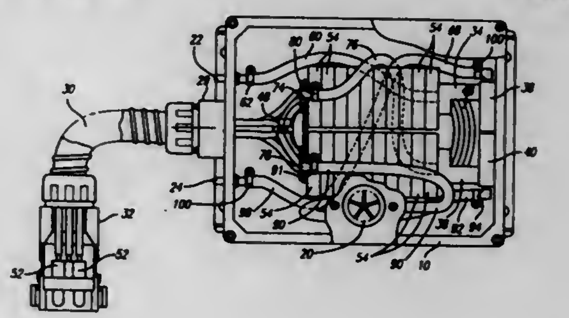
HIGH FREQUENCY WATER COOLED INDUCTION HEATING TRANSFORMER

Victor E. Delucia, 5121 West Park Dr., Valley Village, Calif. 91601

Filed Jul. 24, 1996, Ser. No. 685,517

Int. Cl.^{6} H01F *27/08;27/30*

U.S. Cl. 336—61 **7 Claims**



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1. A high frequency transformer comprising: a secondary having a pair of elongated cylindrical self-supporting electrically conductive members mounted in spaced relationship on respective parallel horizontal axes; a primary winding wound longitudinally through said electrically conductive members; and a pair of magnetic core members surrounding respective ones of said cylindrical members in coaxial relationship therewith, each of said electrically conductive cylindrical members including a coaxial inner sleeve radially spaced from the inner wall thereof to define an annular space, and means for circulating a coolant through said annular space.

5,691,686
TRANSFORMER ZERO-PHASE CURRENT TRANSFORMER

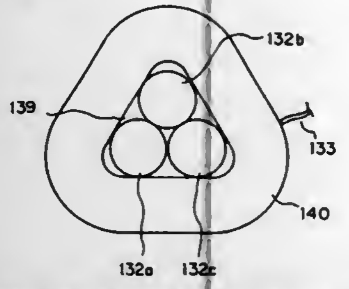
Masahiro Ishikawa; Osamu Hasegawa, both of Kagawa; Yasuhiko Ookubo; Morio Machida, both of Kanagawa; Kazuaki Oyama, Kagawa; Satoshi Oka, Kagawa, and Motonobu Noma, Kagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 265,795, Jun. 27, 1994, Pat. No. 5,539,614. This application Mar. 15, 1995, Ser. No. 404,583

Claims priority, application Japan, Sep. 29, 1993, 5-242815; Mar. 15, 1994, 6-044109

Int. Cl.^{6} H01F *27/02;40/06*

U.S. Cl. 336—90 **4 Claims**



1. A zero-phase current transformer comprising:
an annular core having a shape which is substantially triangular, said annual core enclosing an aperture region having a shape which is also substantially triangular;
three primary conductors disposed within and passing through said aperture region for carrying an AC current; and
a secondary conductor wound on said annular core.

5,691,687
CONTACTLESS MAGNETIC SLIP RING

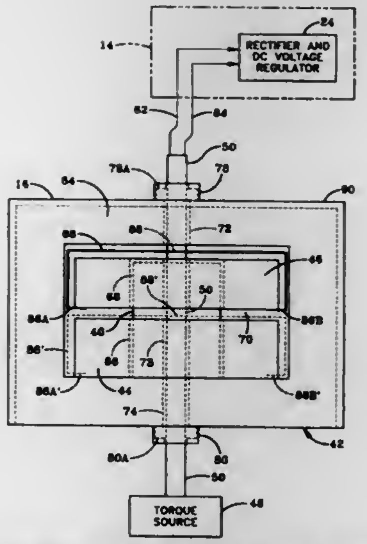
Hiroyuki Kumagai, Boulder Creek, and Joe D. Deardon, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 3, 1995, Ser. No. 520,865

Int. Cl.^{6} H01F *21/06*

U.S. Cl. 336—120 **14 Claims**

1. A system for coupling electrical signals and power between transmitting and receiving equipment one of which is rotatable and the other of which is stationary, said system comprising:
(a) a primary coil having a predetermined number of wrapped wires each of a predetermined wire gauge, said wrapped wires having first and second ends that are connected to one of said transmitting and receiving equipment;
(b) at least one secondary coil spaced apart for said primary coil and having a predetermined number of wrapped wires each of a predetermined wire gauge, said wrapped wires having first and second ends that are connected to the other of said transmitting and receiving equipment, said primary and secondary coils each having an opening which is concentric with each other;
(c) means for mechanically coupling one of said primary and secondary coils to the rotatable equipment;



(d) inner and outer cores with the outer core comprising layers of sheets of magnetic metal and the inner core having a diameter which is dimensioned to be and is inserted into each of said opening of said primary and secondary coils and yet to be spaced apart from each of said primary and secondary coils, said outer core being dimensioned to encompass a portion of each of said primary and secondary coils.

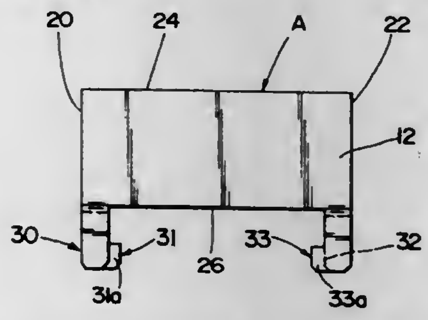
5,691,688
PTC DEVICE

Jeffrey A. West, Bellville, and Robert L. Newman, Mansfield, both of Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Jul. 20, 1994, Ser. No. 277,761

Int. Cl.^{6} H01C *7/10*

U.S. Cl. 338—22 R **20 Claims**



1. A PTC device comprising a PTC material sandwiched between a pair of metal terminal plates having outer surfaces that define opposite faces for said PTC device, said PTC device having an outer periphery that includes opposite ends and opposite sides, at least one pair of legs extending outwardly from one of said opposite sides, each leg in said pair of legs being integral with one of said metal terminal plates, one of the legs in said pair of legs being adjacent one of said opposite ends and another of the legs in said pair of legs being adjacent another of said opposite ends, at least one leg in said pair of legs terminating in a hook portion that extends in a direction between said opposite ends along said one of said sides in spaced relationship to said one of said sides, and each leg in said pair of legs being located entirely adjacent one of said opposite faces without extending over to the other of said opposite faces.

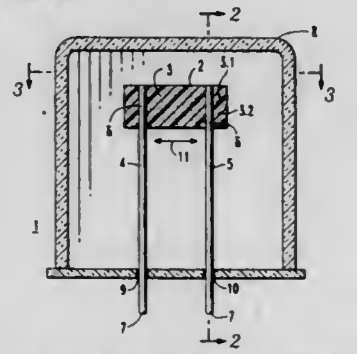
5,691,689
ELECTRICAL CIRCUIT PROTECTION DEVICES COMPRISING PTC CONDUCTIVE LIQUID CRYSTAL POLYMER COMPOSITIONS

James D. B. Smith, Monroeville; Karl F. Schoch, Jr., Pittsburgh, both of Pa.; Selami Y. Pusatcioglu, Meqnon, and Xiaoyun Shirley Lai, BrownDeer, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 11, 1995, Ser. No. 514,201

Int. Cl.^{6} H01C *7/10*

U.S. Cl. 338—22 R **14 Claims**



1. An electrical circuit protection device, which comprises:
(a) a PTC element comprised of a cross-linked conductive polymer composition which exhibits PTC behavior, in which the cross-linked conductive polymer comprises a polymeric component of a liquid crystalline polymer of poly(p-hydroxybenzoate-co-2,6-hydroxynaphthoate) and, distributed in the polymeric component, a particulate conductive filler;
(b) two elongated electrodes which are electrically connected at a first portion to the PTC element and which are electrically connectable at a second portion to a source of electrical power to cause current to pass through the PTC element.

5,691,690
CHIP TYPE JUMPER

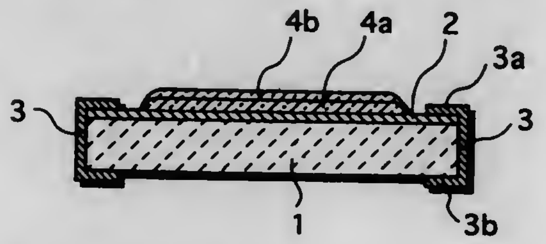
Hiroaki Minato, and Toshihiro Mori, both of Kyoto, Japan, assignors to Rohm Co. Ltd., Kyoto, Japan

Filed Jun. 27, 1994, Ser. No. 265,945

Claims priority, application Japan, Jun. 30, 1993, 5-189229

Int. Cl.^{6} H01C *1/012;* **H01L** *23/02*

U.S. Cl. 338—309 **8 Claims**



1. A chip type jumper comprising:
an insulating chip substrate;
a conductor film formed on a surface of said chip substrate;
a pair of side electrodes formed at respective edges of said chip substrate in electrical connection with said conductor film; and
a protective member covering said conductor film between said pair of side electrodes;
wherein said protective member comprises a first protective layer formed directly on said conductor film, and a second protective layer formed on said first protective layer; and
wherein said second protective layer has a length equal to that of said first protective layer, but a width that is narrower than that of said first protective layer.

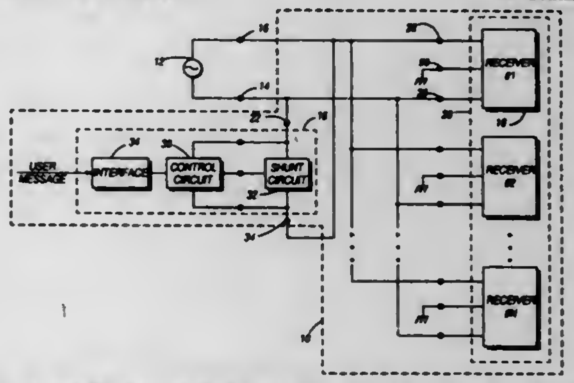
5,691,691
POWER-LINE COMMUNICATION SYSTEM USING PULSE TRANSMISSION ON THE AC LINE

Jeffrey D. Merwin, Buffalo Grove, and John G. Konopka, Barrington, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 6, 1997, Ser. No. 779,194

Int. Cl.^{6} H04M *11/04*

U.S. Cl. 340—310.02 **20 Claims**



1. A power-line communication system for use with a conventional AC source having a hot wire and a neutral wire, the system comprising:
a pulse transmitter having a hot terminal and a reference terminal, the hot terminal being couplable to the hot wire of the AC source and the reference terminal being connected to one of (i) earth ground and (ii) the neutral wire of the AC source, an AC voltage being present between the hot wire and the neutral wire of the AC source, the AC voltage having a positive half cycle and a negative half cycle, the pulse transmitter including a shunt circuit coupled between the hot terminal and the reference terminal, and a control circuit for rendering the shunt circuit conductive and non-conductive, wherein when the shunt circuit is conductive a current having an amplitude and a duration flows from the hot terminal to the reference terminal, the shunt circuit including an energy clamp circuit for limiting the amplitude and the duration of the current, the current being of sufficient amplitude to cause a pulse in the AC voltage, wherein a predetermined sequential pattern of pulses in the AC voltage corresponds to a predetermined message; and
at least one receiver connected downstream from the pulse transmitter, the receiver having a hot connection and a neutral connection, the hot connection being couplable to the hot wire of the AC source and the neutral connection being couplable to the neutral wire of the AC source, the receiver being operable to detect pulses in the AC voltage and to translate a predetermined sequential pattern of pulses in the AC voltage into a corresponding predetermined message.

5,691,692
PORTABLE MACHINE WITH MACHINE DIAGNOSIS INDICATOR CIRCUIT

Dale R. Herbstritt, Clemmons, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 25, 1996, Ser. No. 591,331

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—438 **10 Claims**

1. A combination comprising:
a) a portable machine having a frame and an engine supported by the frame, the engine having a power source and a means for cutting off power to the engine;
b) a machine diagnosis circuit comprised of at least one protective switch connected in series with the engine power source and said means for cutting off power to the engine, said circuit also including a first diagnosis indicator across the at least one protective switch, the first diagnosis indicator comprising a first LED pair and a first resistor, the first LED pair adapted to

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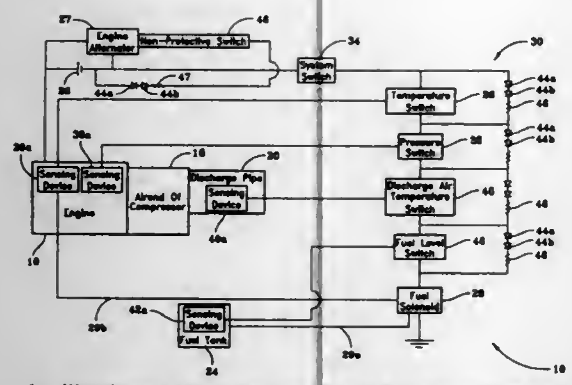


be illuminated when the associated at least one protective switch is opened, said circuit also including at least one non-protective switch and a second diagnosis indicator comprising a second LED pair and a second resistor, the second diagnosis indicator is wired through the at least one non-protective switch so that the second LED pair is illuminated when the at least one non-protective switch is closed, the at least one protective switch and the at least one non-protective switch being connected to a sensing means for measuring the value of a machine operating parameter associated with the at least one protective and the at least one non-protective switch; and

c) means for indicating the specific location of an engine fault condition, said means for indicating the specific location of an engine fault condition overlaying the first and second diagnosis indicators.

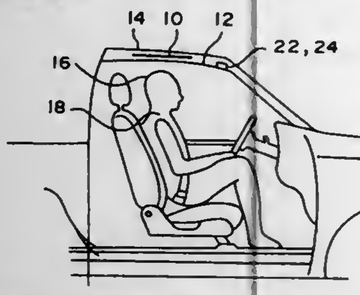
5,691,693
IMPAIRED TRANSPORTATION VEHICLE OPERATOR SYSTEM

Philip W. Kithil, Santa Fe, N. Mex., assignor to Advanced Safety Concepts, Inc., Santa Fe, N. Mex.

Filed Sep. 28, 1995, Ser. No. 535,576

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—439 **19 Claims**



1. Impaired operator detection and warning apparatus, for detecting significant impairment of the operating ability of a transportation vehicle operator, by measurement and analysis of the motion of said operator's head, and for warning of said impairment, comprising:

(a) Sensing means, for sensing the position of said operator's head, and for producing electrical output signals dependent upon said position of said operator's head;

(b) Signal processing, analysis, and alarm activation means, connected to said sensing means, for achieving any needed amplification of said output signals, for any height of said operator within an expected ranges of heights for said operator, and for determining the time profile of the motion of said operator's head by analysis of said output signals, and for comparing said time profile of said motion of said operator's head, with reference profiles characteristic of normal and impaired operator head motion, and for activation of an alarm means, upon a determination, based upon said comparison of said profiles, that said operator is significantly impaired in operating ability; and

(c) said alarm means, connected to said signal processing, analysis and alarm activation means, for alerting said operator to said determination that said operator is significantly impaired.

5,691,694
METHOD FOR ALARMING OF TIRE DEFLATION AND APPARATUS THEREFOR

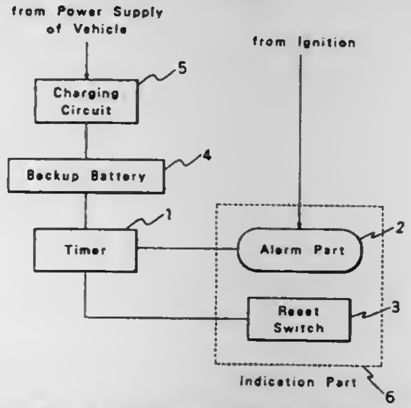
Hiroto Horie, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, and Sumitomo Electric Industries, Ltd., Osaka-fu, both of Japan

Filed Sep. 22, 1995, Ser. No. 531,898

Claims priority, application Japan, Sep. 27, 1994, 6-231622

Int. Cl.⁶ B60C *23/00*

U.S. Cl. 340—442 **4 Claims**



1. A tire deflation alarm apparatus adapted to be provided on a vehicle which utilizes air-filled tires, comprising:

a timer for measuring a period of time from when the air pressure of the tire has been set to a normal value to the time when the air pressure spontaneously drops to a dangerous value, the period of time being established beforehand;

an alarm means connected to the timer and designed to give an alarm after the period of time has elapsed;

a reset switch for resetting the timer to the zero hour; and

a backup battery and charging circuit connected to the timer so that the period of time can be measured when the power is cut off, by means of the backup battery and the charging circuit.

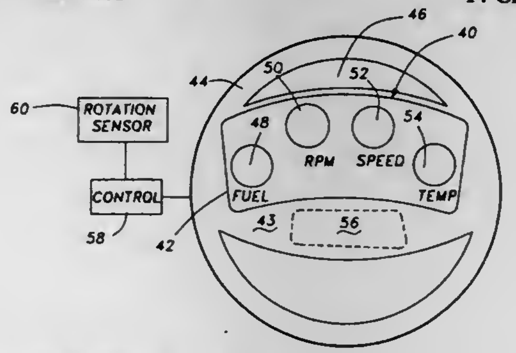
5,691,695
VEHICLE INFORMATION DISPLAY ON STEERING WHEEL SURFACE

John E. Lahiff, Farmington Hills, Mich., assignor to United Technologies Automotive Systems, Inc., Detroit, Mich.

Filed Jul. 24, 1996, Ser. No. 686,107

Int. Cl.⁶ B60Q *3/00*

U.S. Cl. 340—461 **14 Claims**



1. A vehicle steering wheel comprising:

a steering wheel body having a central portion and an outer rim connected for rotation with said central portion;

a reconfigurable display unit placed on said central portion, and rotating with said central portion and said outer rim; and

a control for providing information to said display unit, said control causing said display unit to display said information on said central portion of said steering wheel, said control monitoring rotation of said steering wheel body and reconfiguring the orientation of said display information on said display unit to maintain said information relatively horizontal in orientation relative to an operator.

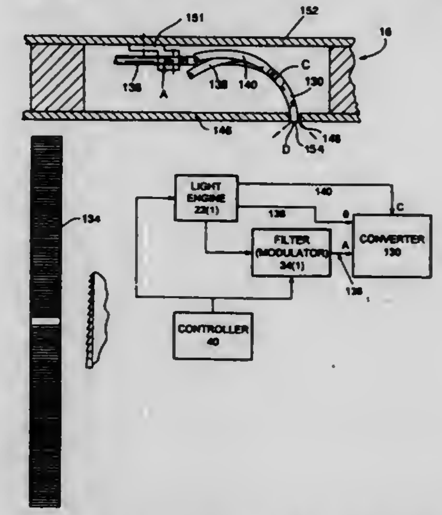
5,691,696
SYSTEM AND METHOD FOR BROADCASTING COLORED LIGHT FOR EMERGENCY SIGNALS

Timothy J. Mazies, Oak Forest; Jerry L. Williams, Tinley Park, both of Ill., and William J. Cassarly, Richmond Hts., Ohio, assignors to Federal Signal Corporation, Oak Brook, Ill., and General Electric Company, Schenectady, N.Y.

Filed Sep. 8, 1995, Ser. No. 525,833

Int. Cl.⁶ B60Q *1/52*

U.S. Cl. 340—471 **22 Claims**



1. A system for generating and broadcasting lighting signals from a vehicle, comprising: means for providing distinct beams of continuous light including at least first and second beams; a modulator optically coupled to receive the first beam for modifying the properties of the first beam into modulated light periodically varying between at least two output states; and a converter optically coupled to the modulator and to the second beam by distinct fiber optic transmission paths for conveying the modulated light and the second beam to an exterior of the vehicle, thereby broadcasting from the vehicle at least one of the modulated light and the second beam.

5,691,697
SECURITY SYSTEM

Carlos E. Carvalho, Tyngsboro; John P. Osborne, Holland, and Donald O. Hallee, N. Easton, all of Mass., assignors to Kidde Technologies, Inc., Marlborough, Mass.

Filed Sep. 22, 1995, Ser. No. 532,351

Int. Cl.⁶ G08B *13/20*

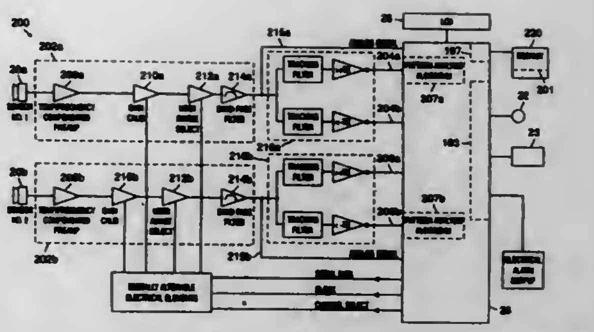
U.S. Cl. 340—544 **46 Claims**

34. A security system comprising:

a pressure sensing circuit for generating an electrical signal in response to changes in pressure; and

a signal processing circuit, connected to receive the electrical signal, for determining whether the electrical signal represents an intrusion pattern, further comprising:

a trigger circuit, connected to receive the electrical signal, for determining whether the electrical signal represents a possible intrusion and for waking up the signal processing circuit, when the electrical signal represents a possible intrusion, to



initiate the signal processing circuit's determination as to whether the electrical signal represents the intrusion pattern.

5,691,698
IDENTIFICATION AND/OR SENSOR SYSTEM

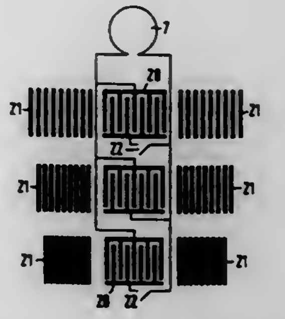
Gerd Scholl, München; Leonhard Reindl, Stephanskirchen; Werner Ruile, München, and Thomas Ostertag, Ulm, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 17, 1995, Ser. No. 422,452

Claims priority, application Germany, Apr. 15, 1994, 44 13 211.5

Int. Cl.⁶ G08B *13/14*

U.S. Cl. 340—572 **8 Claims**



1. A system for at least one of identification and sensing, comprising:

a transmitting and receiving apparatus transmitting broadband interrogation signals by radio;

a configuration for at least one of identification and sensing having resonators for determining at least one parameter to be interrogated, said resonators having a figure of merit enabling said resonators to store energy from a broadband radio signal received from said transmitting and receiving apparatus, whereby the stored energy decays according to a time function and is transmitted back to said transmitting and receiving apparatus as a reply signal; and

said transmitting and receiving apparatus transmitting interrogation signals by radio to said configuration for at least one of identification and sensing and receiving and evaluating reply signals transmitted back form said configuration for at least one of identification and sensing, said transmitting and receiving apparatus being a broadband device;

wherein said resonators are SAW resonators forming an encoding of said configuration; wherein said configuration further has a receiving/transmitting antenna and said resonators are activated/deactivated by switching-on/switching-off said resonators to/from said configuration receiving/transmitting antenna by selective operation of switching means by a user to selectively program the code of said configuration.

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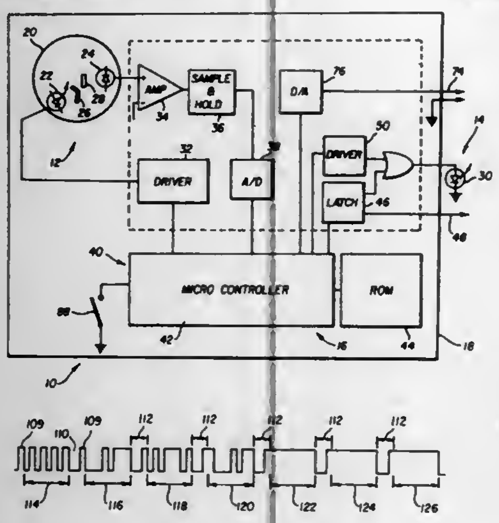
5,691,699
SECURITY DETECTOR WITH OPTICAL DATA TRANSMITTER

Burton Warner Vane, and Leigh Austin Laughlin, both of Fairport, N.Y., assignors to Detection Systems, Inc., Fairport, N.Y.

Filed Feb. 8, 1996, Ser. No. 598,300
Int. Cl.^{6} G08B *17/12*

U.S. Cl. 340—578 **19 Claims**



1. A fire detector self-contained by a housing, said self-contained fire detector comprising:

an optical emitter disposed for viewing from outside said housing; and,

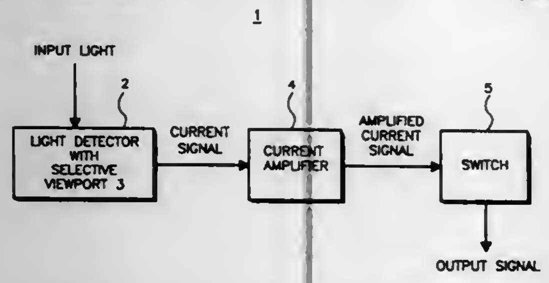
a micro-controller within said housing, said micro-controller determining detector specific values of predetermined parameters and causing said emitter optically to transmit a multi-byte data stream including a code representing said detector specific values.

5,691,700
APPARATUS AND METHOD USING NON-CONTACT LIGHT SENSING WITH SELECTIVE FIELD OF VIEW, LOW INPUT IMPEDANCE, CURRENT-MODE AMPLIFICATION AND/OR ADJUSTABLE SWITCHING LEVEL

Stephen K. Phelps, South Windsor; Frederick T. Olender, Somers, and Martin F. Zabieiski, Manchester, all of Conn., assignors to United Technologies Corporation, East Hartford, Conn.

Filed Sep. 15, 1994, Ser. No. 306,776
Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—600 **13 Claims**



3. An apparatus for detecting light, said apparatus comprising:

a light detector having a selective viewport, generating a current signal, based on the light received through the selective viewport;

said selective viewport including an elongated hollow member having at least one light trap member disposed therein;

a current amplifier coupled to receive the current signal from the light detector, generating an amplified current signal based on the current signal;

a switch coupled to receive the amplified current signal from the current amplifier, generating an output signal based on the amplified current signal;

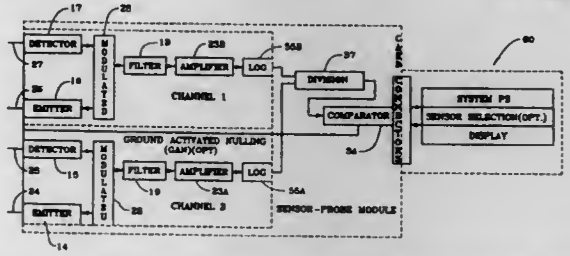
wherein the light detector includes an optical fiber having first and second ends, the first end of the optical fiber being mounted in a first end of the elongated, hollow member, and a photodiode arranged in proximity to the second end of the optical fiber, capable of generating the current signal based on the light received through a second end of the selective viewport.

5,691,701
FLUID OR VAPOR DIAGNOSTIC DEVICE

Scott D. Wohlstein, Convent Station, N.J., and Emil W. Ciurczak, Laurel, Md., assignors to SD Laboratories, Inc., Franklin, Pa.

Continuation-in-part of Ser. No. 677,643, Mar. 28, 1991, Pat. No. 5,296,843. This application Mar. 22, 1994, Ser. No. 216,557
Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—603 **16 Claims**



1. A non-destructive diagnostic device for continuously testing fluid, gas or vapor contained in a fluid, gas or vapor reservoir comprising:

a) at least two light sources, each of said light sources emitting light at a different preselected wavelength, each of said light sources directing light into the fluid, gas or vapor reservoir;

b) detectors for receiving light from each of said light sources after it has been directed through the reservoir, said detectors positioned a distance from said light sources thereby forming a gap through which the fluid or vapor may pass;

c) means, connected to said detectors, for determining the absolute intensity of light from each of said light sources after the light has been directed through the fluid, gas or vapor in the reservoir and detected by said detectors;

d) means for determining the ratio of absolute intensity of light detected by each of said detectors after the light has been directed through the fluid, gas or vapor; and,

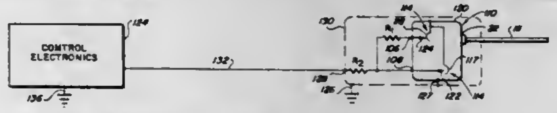
e) means, responsive to said means for determining, for creating a control signal indicating that said ratio is outside of a preselected limit.

5,691,702
PNEUMATIC PRESSURE DETECTOR FOR FIRE AND GROUND FAULT DETECTION

Wayne R. Hay, Pleasant Hill, Calif., assignor to Whittaker Corporation, Concord, Calif.

Filed Sep. 8, 1995, Ser. No. 525,190
Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—626 **21 Claims**



1. Sensor apparatus comprising:

a dual switch assembly integrally formed in a self-contained module, said dual switch assembly having a first flexible diaphragm and associated first switch contact in a normally closed condition on one side of a central plenum and a second flexible diaphragm and associated second switch contact in a normally open condition on an opposite side of said plenum;

first and second electrical terminals mounted on the exterior of a first housing enclosing said module and connected respectively to said first and second switch contacts;

sensing means containing a pressurized gas coupled to said plenum to control the positions of said diaphragms relative to their respective associated switch contacts;

electrical circuitry associated with said module including:

- a first resistor connected in circuit between said first and second electrical terminals;
- a second resistor having one end connected to the juncture of said second terminal and said first resistor and the other end connected to a third terminal mounted on the exterior of a second housing enclosing said electrical circuitry and said first housing;

a control electronics stage remotely located from said module for providing indications of the circuit conditions of said electrical circuitry and said switch assembly;

respective ground connections from a ground reference means to said control electronics stage and to said second housing; and

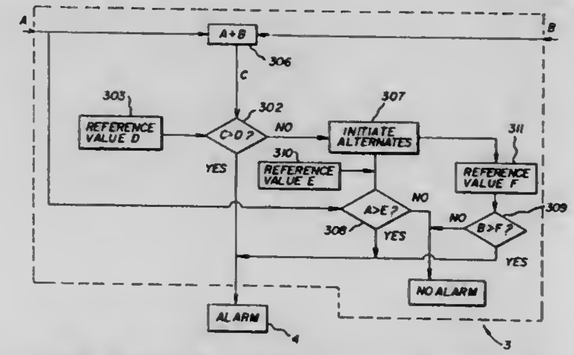
a single electrical conductor connected between said control electronics stage and said third terminal to enable control electronics stage to sense said circuit conditions including the occurrence of a ground fault.

5,691,703
MULTI-SIGNATURE FIRE DETECTOR

Richard J. Roby; Daniel T. Gottuk, and Craig L. Beyler, all of Columbia, Md., assignors to Hughes Associates, Inc., Columbia, Md.

Filed Jun. 7, 1995, Ser. No. 487,050
Int. Cl.^{6} G08G *17/10*

U.S. Cl. 340—628 **27 Claims**



1. A multi-signature fire detection apparatus, comprising:

first detector means for detecting a first type of fire signature, said first detector means outputting a first signal indicative of a first detected fire signal;

second detector means for detecting a second type of fire signature, said second detector means outputting a second signal indicative of a second detected fire signature;

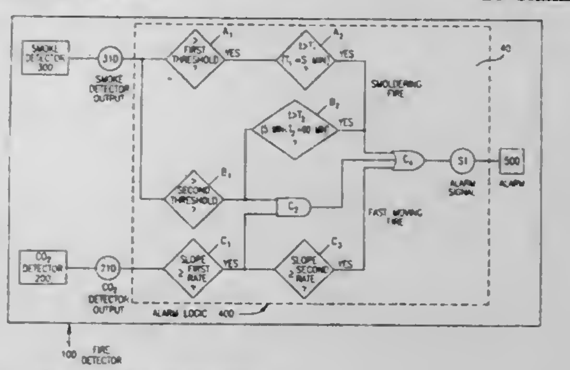
signal processing means for combining said first and second signals, wherein outputs of said first and second detector means are coupled to said signal processing means, said signal processing means comparing said first and second signals to a first predetermined reference value, and outputting a fire condition signal if a combination of said first and second signals exceeds said first predetermined reference value, wherein said first detector means detects a particulate size distribution indicative of a potential fire condition, and said second detector means detects gases indicative of the potential fire condition.

5,691,704
PRACTICAL AND IMPROVED FIRE DETECTOR

Jacob Y. Wong, Santa Barbara, Calif., assignor to Engelhard Sensor Technologies, Inc., Iselin, N.J.

Filed Jan. 29, 1996, Ser. No. 593,750
Int. Cl.^{6} G08B *17/10*

U.S. Cl. 340—628 **20 Claims**



1. A fire detector, comprising:

a smoke detector;

a non-dispersive infrared (NDIR) carbon dioxide (CO_2) sensor;

logic means for generating an alarm signal when any of the following criteria are met:

- light obscuration exceeds a threshold level for greater than a first preselected time;
- light obscuration exceeds a reduced threshold level for greater than a second preselected time; or
- light obscuration exceeds the reduced threshold level and the rate of increase in the concentration of CO_2 exceeds a predetermined rate; and

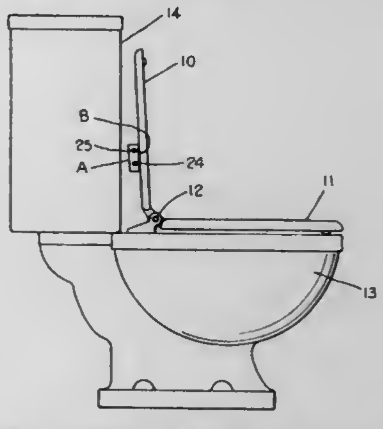
an alarm responsive to the alarm signal.

5,691,705
ALARM APPARATUS FOR USE ON A TOILET AND METHOD

Kenneth H. East, 4689 Adrian Way, Plano, Tex. 75024

Continuation-in-part of Ser. No. 498,564, Jul. 6, 1995, Pat. No. 5,594,423. This application Nov. 12, 1996, Ser. No. 747,232
Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—686 **7 Claims**



1. A method for sounding an alarm for use on a toilet indicating access by a child, having a member which must be moved for gaining access for using the toilet, comprising the steps of:

providing an assembly and means for securing the assembly to said member;

mounting a battery in said assembly;

sounding an audible signal responsive to an alarm device powered by said battery carried in said assembly;

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actuating said alarm device when said member is moved through a predetermined angle responsive to a position operated switch;
controlling and deactivating said position operated switch responsive to a switch actuator in said assembly; and
deactivating said position operated switch after a predetermined time, so that said position operated switch is reactivated after said time delay;
whereby an audible signal is given indicating that the member has been moved.

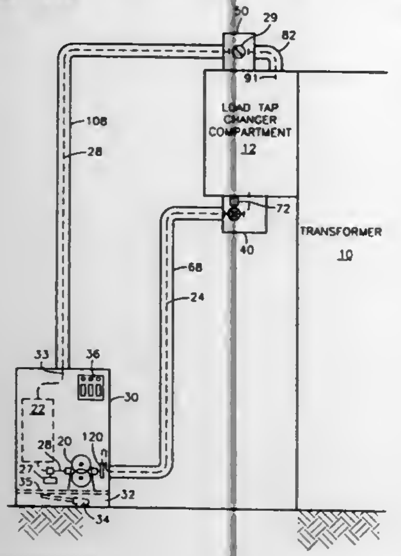
5,691,706
TRANSFORMER LEAK ALARM

David McMahan Butler, Knoxville, and Johnny James Clark, Maryville, both of Tenn., assignors to Filmax, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 692,567, Aug. 6, 1996, which is a continuation of Ser. No. 400,985, Mar. 8, 1995, abandoned. This application Oct. 2, 1996, Ser. No. 720,577

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—646 **16 Claims**



1. The combination of:
an electric power transmission device selected from the group consisting essentially of a transformer, load tap changer, breaker, closure, reclosure, switch and switching bank;
a quantity of dielectric oil for circulation through said power transmission device;
an oil filtration unit external of said power transmission device having filter means, pump means, first oil conduit means, second oil conduit means and third oil conduit means, said first oil conduit means connecting said filter means with said power transmission device, said second oil conduit means connecting said power transmission device with a suction inlet of said pump means and said third oil conduit means connecting said filter means with a discharge from said pump means;
electric motor means for driving said pump means to circulate said quantity of dielectric oil through said electric power transmission device, said filter means and said first, second and third oil conduit means;
electric motor control means for energizing and de-energizing said electric motor means, said motor control means including an oil flow sensor and a first solenoid valve in said second oil conduit means; said first solenoid valve being closed to interrupt flow through said second oil conduit means, said motor control means being operative to de-energize said electric motor means and to close said first solenoid valve means when said flow sensor detects a value of oil flow within said second oil conduit means to be less than a predetermined value.

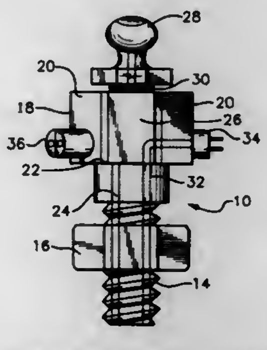
5,691,707
SENSORY FITTING FOR MONITORING BEARING PERFORMANCE

Charles C. Smith, and Thomas R. Bernard, both of Baton Rouge, La., assignors to Security Operating Systems, Inc., Baton Rouge, La.

Filed Dec. 15, 1995, Ser. No. 573,428

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—682 **59 Claims**



1. A device for monitoring bearing performance in apparatus having at least one aperture sized and disposed to connectably receive a grease fitting for providing lubricant to said bearing, which device comprises a sensing fitting sized and configured to be connectably received in said aperture, said sensing fitting including (a) temperature sensing means to enable detection of impending bearing failure, (b) a connecting end sized and configured to be fixedly yet detachably received by said aperture and when installed in said aperture said connecting end being proximate to said beating, (c) an axial bore extending along the longitudinal axis of said sensing fitting for providing a grease path, and (d) a wire path extending through said connecting end and parallel with but offset from said axial bore of said sensing fitting, a portion of said temperature sensing means extending the length of said wire path.

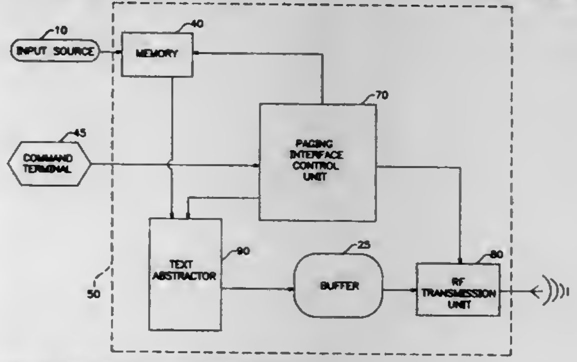
5,691,708
TEXT ABSTRACTION METHOD AND APPARATUS

Edward Marcus Batchelder, Brookline, and R. Pito Salas, Arlington, both of Mass., assignors to Lotus Development Corporation, Cambridge, Mass.

Filed Aug. 14, 1995, Ser. No. 514,809

Int. Cl.^{6} H04B *7/00;* **G08B** *5/22;* **H04M** *11/00*

U.S. Cl. 340—825.44 **46 Claims**



24. A paging system comprising:
an input source for receiving textual information;
a memory operatively connected to said input source for storing said received textual information;
text abstraction means for abstracting said received textual information; and
a controller communicating with said memory and with said text abstraction means for controlling the operation of said paging system;
an output buffer for storing said abstracted textual information.

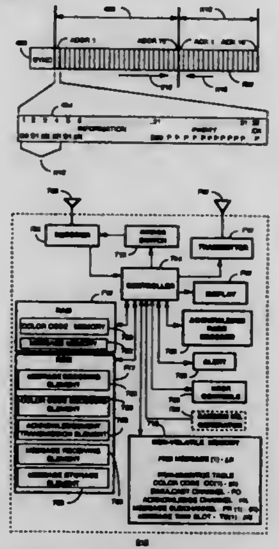
5,691,709
COMMUNICATION TRANSCEIVER PROVIDING UNSCHEDULED ACKNOWLEDGE BACK RESPONSES AND METHOD THEREFOR

Eduardo Guntin, Parkland, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 10, 1995, Ser. No. 541,852

Int. Cl.^{6} H04Q *7/18*

U.S. Cl. 340—825.44 **20 Claims**



13. A communication system utilizing time division duplex communication to provide unscheduled acknowledge back responses, comprising:
a plurality of transmission cells defining geographical transmission areas which include a plurality of cell receivers and a cell transmitter for transmitting addresses and a color code identifying said cell transmitter transmitting the addresses during a first scheduled time interval;
a communication transceiver for receiving an address and the color code identifying the cell transmitter transmitting the address during the first scheduled time interval, the communication transceiver for selecting, in accordance with the address received, a reserved response time slot from a predetermined number of reserved response time slots occurring during a second scheduled time interval to be utilized for transmitting an unscheduled acknowledge back response, and for transmitting the unscheduled acknowledge back response during the reserved response time slot selected;
at least one of the plurality cell receivers for receiving the unscheduled acknowledge back response transmitted within the predetermined number of reserved response time slots during the second scheduled time interval; and
said cell transmitter, identified by the color code received by the at least one of the plurality of cell receivers, further transmitting addresses identifying communication transceivers for which messages are intended and the messages during one of a sequence of scheduled message transmission frames designated by the color code.

5,691,710
SELF LEARNING IR REMOTE CONTROL TRANSMITTER

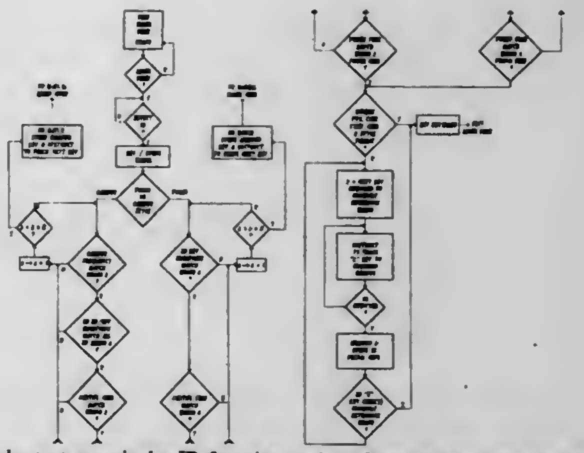
Michael G. Pietraszak, Hoffman Estates, and Carl W. Stacy, Elmwood Park, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 2, 1992, Ser. No. 969,896

Int. Cl.^{6} G08C *19/00*

U.S. Cl. 340—825.72 **4 Claims**

1. A method of teaching a remote control device having a memory containing the IR function codes of a plurality of different IR signal transmitters, some of which have the same power on/off code, to transmit the IR function codes of one of said plurality of different signal transmitters comprising:
transmitting an on/off IR function code from said one signal transmitter to said remote control device;
receiving the transmitted on/off IR function code;
searching said memory for said received on/off IR function code to determine whether said received on/off IR function code is in said memory and if so;
sequentially checking said on/off IR function code to determine a unique match in said memory; and
configuring the keyboard of said remote control device for transmitting other IR function codes in said memory corresponding to said one signal transmitter.



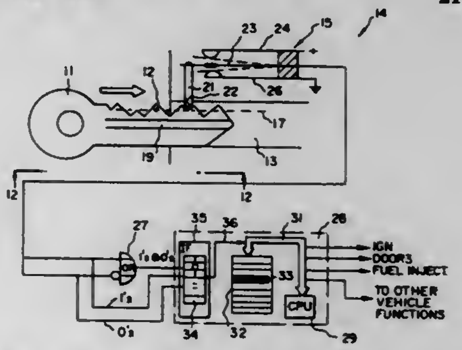
5,691,711
DIGITAL ELECTRONIC KEY AND LOCK SYSTEM

Adam A. Jorgensen, 1911 NW. 36th St., Oakland Park, Fla. 33309

Filed Feb. 24, 1995, Ser. No. 393,857

Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.31 **21 Claims**



1. A digital key and lock system for enabling access to at least one protected domain in response to an enabling signal, comprising:
key means having at least one key cam configured for representing a digital key code composed of at least zero and one bits marked in line on said key cam; an electronic device having means for receiving the digital key code, code-containing means for containing at least one further digital code, code-comparing means connected to said means for receiving the digital key code and to said code-containing means, said code comparing means operative for generating the enabling signal when said digital key code is equal to said further digital code; at least one key lock having a key inlet adapted to receive the key, and a digital code reader connected to the key lock being operative for reading the digital key code; and electronic gating means coupled to said digital code reader for deriving from said digital key code steering pulses for steering said digital key code into said key code receiving means.

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5,691,712

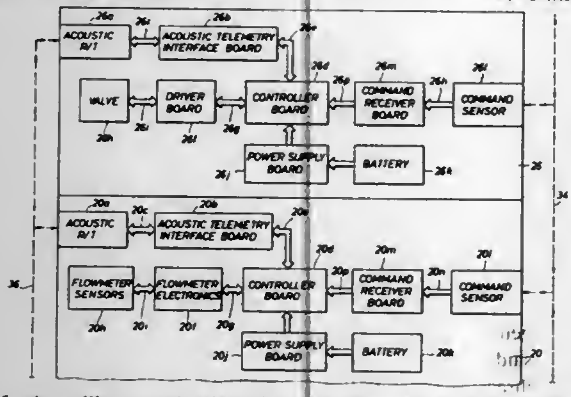
MULTIPLE WELLBORE TOOL APPARATUS INCLUDING A PLURALITY OF MICROPROCESSOR IMPLEMENTED WELLBORE TOOLS FOR OPERATING A CORRESPONDING PLURALITY OF INCLUDED WELLBORE TOOLS AND ACOUSTIC TRANSDUCERS IN RESPONSE TO STIMULUS SIGNALS AND ACOUSTIC SIGNALS

Dale E. Meek, and Vladimir Vaynshteyn, both of Sugarland, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 25, 1995, Ser. No. 506,637

Int. Cl.^{6} G01V *1/40*; **E21B** *34/08*

U.S. Cl. 340—853.3 **46 Claims**



1. A wellbore tool adapted to be disposed in a fluid filled wellbore, comprising:

sensor means for sensing a stimulus propagating in the wellbore fluid and responsive thereto for generating a first output signal or a second output signal;

an included wellbore tool adapted to be operated and adapted to generate a confirmation signal having an address encoded therein indicative of at least an initiation of the operation of said included wellbore tool;

transducer means for transmitting a first acoustic signal into an acoustic data bus in response to the address encoded in said confirmation signal and receiving a second acoustic signal from said acoustic data bus; and

controller means interconnected between said sensor means, said included wellbore tool, and said transducer means for operating said included wellbore tool in response to said first output signal from said sensor means.

5,691,713

COMMUNICATION APPARATUS ALLOWING A RECEIVER TO RECOGNIZE A GENERALIZED SITUATION OF A SENDER

Eiji Ishida, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Japan

Continuation of Ser. No. 373,447, Jan. 17, 1995, abandoned. This application Sep. 3, 1996, Ser. No. 718,013

Claims priority, application Japan, Jan. 18, 1994, 6-016958

Int. Cl.^{6} G08C *17/00;19/16*

U.S. Cl. 340—870.01 **18 Claims**

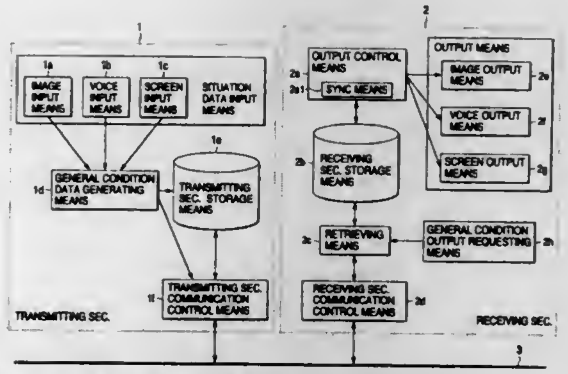
1. A communication apparatus comprising:

a transmitting section comprising;

means for capturing situation data representing a communicative status of a sender prior to communicating to the sender, the situation data includes at least one of image data, voice data and computer screen data;

data generating means for degrading the situation data to form degraded situation data and to generate generalized status data representing a communicative status of the sender and including the degraded situation data, wherein the degraded situation data renders details of the at least one of image data, voice data and computer screen data imperceptible;

transmitting section communication control means for transmitting the generalized status data; and


1
2
3
1a
1b
1c
1d
1e
1f
IMAGE INPUT MEANS
VOICE INPUT MEANS
SCREEN INPUT MEANS
SITUATION DATA INPUT MEANS
GENERAL CONDITION DATA GENERATING MEANS
TRANSMITTING SEC. STORAGE MEANS
TRANSMITTING SEC. COMMUNICATION CONTROL MEANS
TRANSMITTING SEC.
2a
2a1
2b
2c
2d
2e
2f
2g
2h
OUTPUT CONTROL MEANS
SYNC MEANS
RECEIVING SEC. STORAGE MEANS
RETRIEVING MEANS
RECEIVING SEC. COMMUNICATION CONTROL MEANS
OUTPUT MEANS
IMAGE OUTPUT MEANS
VOICE OUTPUT MEANS
SCREEN OUTPUT MEANS
GENERAL CONDITION OUTPUT REQUESTING MEANS
RECEIVING SEC.

a receiving section comprising:

receiving section communication control means for receiving the generalized status data from said transmitting section prior to communicating to the sender, thus enabling recognition of the generalized status of the sender without revealing details of the at least one of image data, voice data and computer data;

means for outputting the generalized status of the sender including the degraded situation data; and

a network for interconnecting said transmitting section and said receiving section.

5,691,714

PROCESS FOR THE SERIAL TRANSMISSION OF DIGITAL MEASUREMENT VALUES

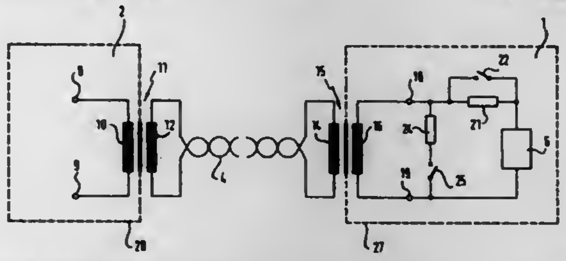
Walter Mehnert, Grillparzer Strasse 6, 85521 Ottobrunn, and Thomas Theil, Alte-Traubinger-Strasse 5, 82340 Feldafing, both of Germany

Filed Dec. 11, 1995, Ser. No. 570,209

Claims priority, application Germany, Dec. 9, 1994, 44 43 959.8

Int. Cl.^{6} G08C *19/06*

U.S. Cl. 340—870.05 **20 Claims**



1. A method of transmitting measurement values from a measuring unit to a receiver unit

said measuring unit comprising a sensor supplying an analog measurement signal, an analog/digital converter encoding said analog measurement signal into distinct digital measurement values with a sampling rate having a selectable value, and a transmitter sending digital signals representing said digital measurement values to said receiver unit, and

said receiver unit comprising a decoder synthesising in a real time mode recovered measurement values from said transmitted digital signals so that said recovered measurement values correspond to the digital measurement values generated by said encoder in said measuring unit,

wherein said method comprises the following steps:

selecting said value of said sampling rate such that the absolute value of the difference between two immediately successive digital measurement values cannot exceed a selected incremental amount,

representing said difference and its sign by a two bit incremental alteration value as +1, −1 or 0,

transmitting within a predeterminable period of time during which many digital measurement values are generated only one of these digital measurement values completely while of all the others only the respective incremental alteration value is transmitted, and

within each of said predeterminable periods of time generating a first recovered measurement value by adding correctly with respect to sign to the completely transmitted measurement value the incremental alteration value representing the difference to the immediately successive digital measurement value and, thereafter, generating in said predetermined period of time all subsequent recovered measurement values by adding correctly with respect to sign the respective incremental alteration value to the immediately preceding recovered measurement value.

5,691,715

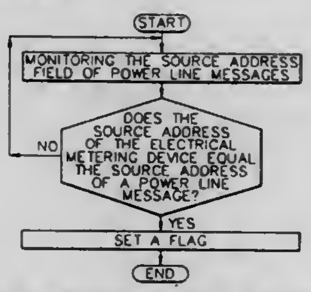
METHOD AND APPARATUS FOR DETECTING FRAUDULENT POWER LINE COMMUNICATIONS SIGNAL

Maurice Joseph Ouellette, North Berwick, Me., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 263,994, Jun. 22, 1994, abandoned. This application Jan. 25, 1996, Ser. No. 591,128

Int. Cl.^{6} G08B *19/00*

U.S. Cl. 340—870.09 **20 Claims**


START
MONITORING THE SOURCE ADDRESS FIELD OF POWER LINE MESSAGES
DOES THE SOURCE ADDRESS OF THE ELECTRICAL METERING DEVICE EQUAL THE SOURCE ADDRESS OF A POWER LINE MESSAGE?
NO
YES
SET A FLAG
END

1. A method of detecting fraudulent signals transmitted on a power line communications system which allows a plurality of electrical metering devices to communicate with a system control center via power lines which transmit power to a plurality of electrical loads via the plurality of electrical metering devices, the method comprising the steps of:

transmitting signals via the power lines, from an electrical metering device having a predetermined address, wherein the signals transmitted by the electrical metering device include a source address portion designating the predetermined address of the electrical metering device;

monitoring a source address portion of the signals transmitted over the power lines, wherein at least a portion of the transmitted signals include the signals transmitted by the electrical metering device having the predetermined address;

comparing the transmitted source address portion with the predetermined address of the electrical metering device; and

detecting fraudulently transmitted power line signals which have a source address portion which equals the predetermined address of the electrical metering device and which were not transmitted by the electrical metering device.

5,691,716

KEYBOARD WITH KEYS FOR MOVING CURSOR

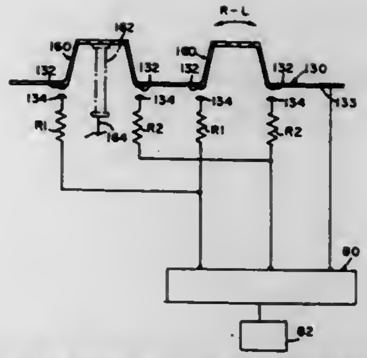
Robert J. Crowley, 64 Puritan La., Sudbury, Mass. 01776, and Donald N. Halgren, 35 Central St., Manchester, Mass. 01944

Continuation-in-part of Ser. No. 447,116, Aug. 18, 1995, which is a continuation of Ser. No. 98,851, Jul. 29, 1993, Pat. No. 5,459,461. This application Nov. 29, 1995, Ser. No. 564,631

Int. Cl.^{6} H03K *17/94*

U.S. Cl. 341—22 **10 Claims**

1. A signal generator for sending information to a computer monitor to effect proportional movement of a pointer or cursor on that monitor, comprising:



a plurality of depressable keys on said signal generator, for the sending of electrical signals to said monitor through an electrical circuit; and

a further electrical circuit comprising a multiplicity of electrical components spaced adjacent the periphery of each of at least two of said depressable keys, each of said spaced components connected in parallel to correspondingly positioned spaced electrical components of the other of said at least two of said depressable keys, and to a processing unit for input to said monitor, said circuit being arranged between at least two of said depressable keys on said signal generator and said signal generator, to effect motion in a cursor on said monitor, when said at least two of said depressable keys are given a sideways direction of motion with respect to said signal generator on which said keys are disposed.

5,691,717

DATABASE RECORD COMPRESSION SYSTEM AND METHOD THEREFOR INCLUDING FIRST AND SECOND DICTIONARIES

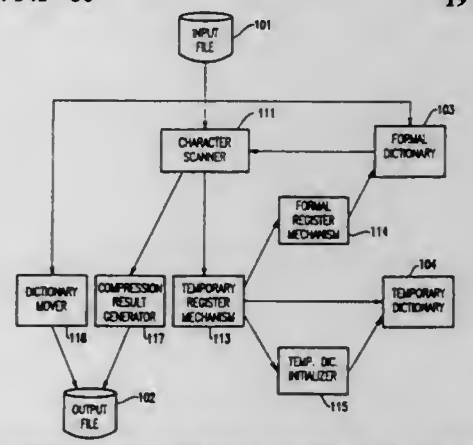
Minoru Tamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 22, 1995, Ser. No. 577,215

Claims priority, application Japan, Dec. 26, 1994, 6-322190

Int. Cl.^{6} H03M *7/00*

U.S. Cl. 341—50 **19 Claims**



1. A database record compression system for use with an input file for inputting a plurality of strings, comprising:

a first dictionary for storing a plurality of compressed strings and entry numbers corresponding to the compressed strings; and

a second dictionary for compressing and storing strings of the plurality of strings input from said input file which are not stored in said first dictionary,

wherein said first dictionary comprises a formal dictionary and said second dictionary comprises a temporary dictionary, at least one entry of said temporary dictionary being initialized when a number of registrations in said temporary dictionary reaches a predetermined number of initializations.

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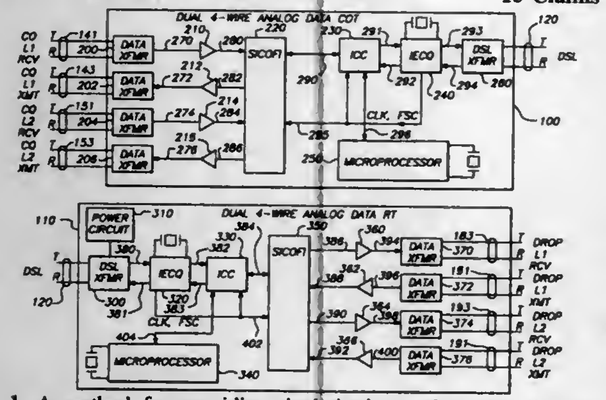
5,691,718
DUAL 4-WIRE ANALOG DATA MULTIPLEXER

Nicholas A. Balatoni, Santa Clara; Tom Blackburn, San Jose, and C. David Dow, Foster City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 7, 1995, Ser. No. 482,264
Int. Cl.^{6} H03M *1/00*
U.S. Cl. 341—126 **13 Claims**



1. A method for providing dual 4-wire analog data services between a telephone company location and a customer premises over a ingle twisted pair, said method comprising:

at the telephone company location

converting two downstream analog data signals into a downstream multiplexed binary signal and converting an upstream multiplexed binary signal into two upstream analog data signals;

converting the downstream multiplexed binary signal and the upstream multiplexed binary signal to a digital encoded signal, wherein the digital encoded signal is selected from a group consisting of 2B1Q and 4B3T signals;

transmitting the digital encoded signal over said single twisted pair between the telephone company location and the customer premises; and

at the customer premises

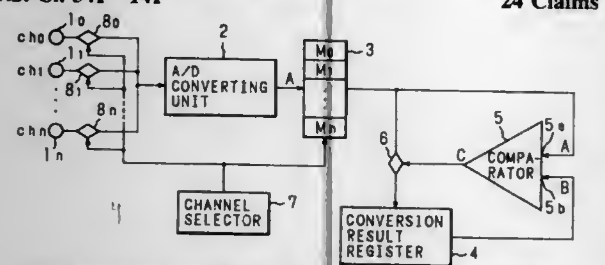
converting the digital encoded signal into the downstream multiplexed binary signal and the upstream multiplexed binary signal; and

converting the downstream multiplexed binary signal into two downstream analog data signals for use by two 4-wire analog data circuits at the customer premises and converting two upstream analog data signals from said two 4-wire analog data circuits at the customer premises into the upstream multiplexed binary signal.

5,691,719
ANALOG/DIGITAL CONVERTER CAPABLE OF DEFINING AND STORING A/D CONVERTED DATA

Akihiko Wakimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric Semiconductor Software Co., Ltd., Hyogo, both of Japan

Filed Aug. 17, 1995, Ser. No. 516,076
Claims priority, application Japan, Aug. 29, 1994, 6-203526
Int. Cl.^{6} H03M *1/00*
U.S. Cl. 341—141 **24 Claims**



1. An analog/digital converter (A/D converter) comprising:

an A/D converting unit configured to convert an analog signal and provide a digital output;

a first register for storing the digital output from the A/D converting unit;

a second register for receiving the data in said first register

a comparator for comparing the data in said first register and the data in said second register with each other and providing an output signal corresponding to a result of comparing; and

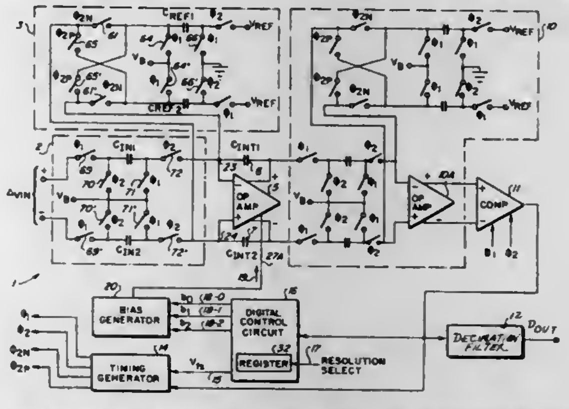
a first switch connected between the first register and the second register and receiving the output signal from the comparator,

wherein said first switch is responsive to the output signal from the comparator to open or close on the basis of the result of comparing by said comparator.

5,691,720
DELTA SIGMA ANALOG-TO-DIGITAL CONVERTER HAVING PROGRAMMABLE RESOLUTION/BIAS CURRENT CIRCUITRY AND METHOD

Binan Wang; Timothy V. Kalthoff, and Miaochen Wu, all of Tuscon, Ariz., assignors to Burr- Brown Corporation, Tucson, Ariz.

Filed Mar. 8, 1996, Ser. No. 613,112
Int. Cl.^{6} H03M *3/00*
U.S. Cl. 341—143 **20 Claims**



1. In a delta sigma analog-to-digital converter including an input sampling circuit, a feedback reference sampling circuit, an integrator including an operational amplifier, a comparator, and a digital filter, the input sampling circuit and the feedback reference sampling circuit being coupled to a first input of the operational amplifier, an output of the operational amplifier being coupled to an input of the comparator, an output of the comparator being coupled to an input of the digital filter, programmable resolution control circuitry comprising in combination:

(a) a clock generator circuit supplying a clock signal to the input sampling circuit and the feedback reference sampling circuit at a sampling frequency determined by a sampling frequency control signal;

(b) a bias current control circuit supplying a first bias control signal in response to a second bias control signal to the operational amplifier to control the settling time required for an output voltage of the operational amplifier to recover from a voltage step superimposed on the output voltage; and

(c) a control circuit receiving a resolution control signal and producing both the sampling frequency control signal and the second bias control signal in response to the resolution control signal,

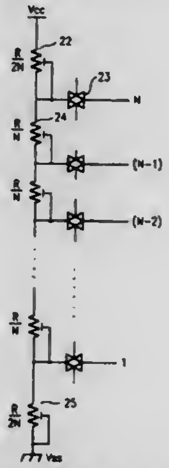
the clock generator circuit operating in response to the sampling frequency control signal to increase the sampling frequency in response to an increase in the resolution control signal,

the bias current control circuit operating in response to the first bias control signal to increase the bias current in the operational amplifier in response to an increase in the resolution control signal.

5,691,721
DIGITAL/ANALOG CONVERTER HAVING SEPARATELY FORMED VOLTAGE DIVIDING RESISTANCE REGIONS

Sung Soo Kim, Daekukwangyeok-si, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Sep. 29, 1995, Ser. No. 536,961
Claims priority, application Rep. of Korea, Sep. 30, 1994, 24984/1994
Int. Cl.^{6} H03M *1/78*
U.S. Cl. 341—154 **25 Claims**



1. An N bit (where N is an integer) converter having separately formed voltage dividing resistance regions comprising:

a semiconductor substrate of a first conductivity type;

(N+1) well regions of a second conductivity type, each formed separately on the semiconductor substrate;

an input resistance region of the first conductivity type having a high concentration of impurities formed in a first well region of the (N+1) well regions;

(N−1) ladder resistance regions of the first conductivity type having a high concentration of impurities respectively formed in (N−1) well regions, each resistance of the (N−1) ladder resistance regions being approximately two times greater than a resistance of the input resistance region;

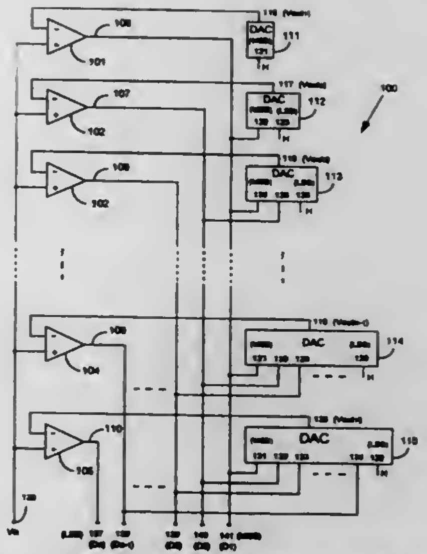
an output resistance region of the first conductivity type having a high concentration of impurities formed in an (N+1)th well region of the (N+1) well regions, a resistance of the output resistance region being approximately equal to the resistance of the input region; and

(N+1) impurity diffusion regions of the second conductivity type having a high concentration of impurities formed in the respective (N+1) well regions, separated from the respective input, ladder, and output resistance regions for applying backward bias voltages to the respective input, ladder, and output resistance regions formed in the (N+1) well regions.

5,691,722
DIRECT-DIGITIZING, SELF STABILIZING ANALOG TO DIGITAL CONVERTER

Wenwei Wang, 9004 Kennedy Dr., No. 1E, Des Plaines, Ill. 60016

Filed May 21, 1996, Ser. No. 651,883
Int. Cl.^{6} H03M *1/38*
U.S. Cl. 341—161 **21 Claims**



1. An n-bit analog to digital converter, wherein n is an integer greater than 1, comprising:

n comparator means, designated consecutively from a first comparator means to an n-th comparator means;

a terminal for receiving an analog input signal, said terminal being connected to each of said comparator means;

n internal voltage output digital to analog converter means with essentially the same full-scale output voltage corresponding to a full-scale range of said analog to digital converter, and with essentially the same absolute accuracy in terms of voltage, but with n essentially different resolutions, ranging consecutively from a 1-bit digital to analog converter means to an n-bit digital to analog converter means;

wherein said n-bit analog to digital converter is divisible into n stages, ranging consecutively from a first stage comprising said first comparator means and said 1-bit digital to analog converter means, to an n-th stage comprising said n-th comparator means and said n-bit digital to analog converter means; and wherein

in each of said stages, a voltage output of one of said digital to analog converter means is provided as a reference voltage to one of said comparator means;

wherein the least-significant-bit input terminal of each of said digital to analog converter means is functionally equivalent to being connected to a constant logic high level;

wherein an output terminal of said first comparator means is essentially connected to every most-significant-bit input terminal of said digital to analog converter means in immediately subsequent stages, an output terminal of a second comparator means is essentially connected to every next-most-significant-bit input terminal of said digital to analog converter means in immediately subsequent stages, and so forth, with an exception that an output terminal of said n-th comparator means being not connected to any of said digital to analog converter means; and

wherein a binary output of said first comparator means provides the most significant bit signal of an analog to digital conversion output, a binary output of said second comparator means provides the next most significant bit signal of said analog to digital conversion output, and so forth, a binary output of said n-th comparator means provides the least significant bit signal of said analog to digital conversion output.

5,691,723
APPARATUS AND METHOD FOR ENCODING AND DECODING DATA ON TACTICAL AIR NAVIGATION AND DISTANCE MEASURING EQUIPMENT SIGNALS

Dennis D. King, Sandy, and Jeffery W. Brabender, Taylorsville, both of Utah, assignors to E-Systems, Inc., Dallas, Tex.

Filed Sep. 11, 1995, Ser. No. 526,231
Int. Cl.^{6} G01S *5/02*
U.S. Cl. 341—178 **20 Claims**

1. A method of encoding data on a pulse pair of a navigation signal having a first pulse and a second pulse, comprising the step of:

encoding said navigation signal with a data bit on a pulse pair having a first pulse and a second pulse separated by a pulse interval by varying with an encoder as a part of a navigation

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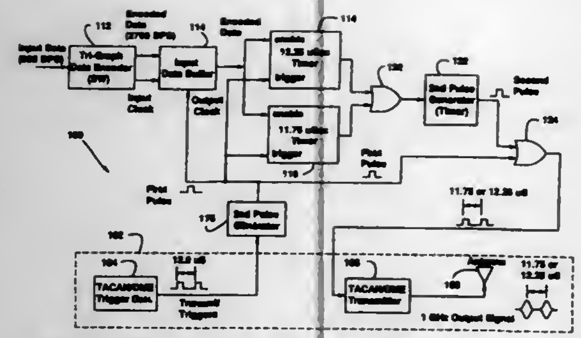


system said pulse interval between the first pulse and said second pulse to represent the data bit.

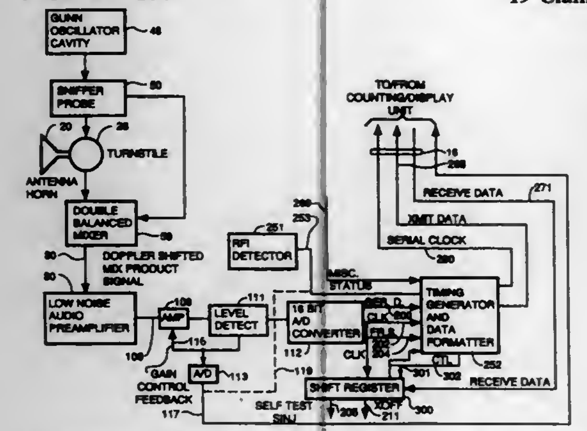
5,691,724
POLICE TRAFFIC RADAR USING FFT PROCESSING TO FIND FASTEST TARGET

John L. Aker, 820 W. 63rd. St., Kansas City, Mo. 64113; Robert S. Gammenthaler, Lot 28, Pecan Hills, Princeton, Tex. 75407, and Alan B. Mead, 730 Ave. F, Plano, Tex. 75074-6752

Continuation of Ser. No. 386,552, Feb. 10, 1995, Pat. No. 5,570,093. This application Aug. 9, 1996, Ser. No. 695,333

Int. Cl.^{6} G01S *13/50*

U.S. Cl. 342—104 **19 Claims**



1. A method of measuring the speed of moving targets in police traffic surveillance radar unit having at least two display windows, comprising the steps of:

(1) transmitting a radar signal toward one or more moving targets;

(2) receiving a spectrum of radar return signals from moving and stationary objects, said stationary objects being defined as those objects which have no relative velocity with respect to said police traffic surveillance radar unit if said radar unit is not moving;

(3) calculating the speed of a moving target which has the strongest radar return signal which is not the radar return signal indicative of the speed that the police traffic surveillance radar unit itself is moving, said strongest radar return signal being found in said spectrum of radar return signals;

(4) calculating the speed of at least one of the fastest moving targets having a radar return signal in said spectrum of radar return signals; and

(5) displaying in a first of said at least two display windows the speed of the moving target having said strongest radar return signal which is not the radar return signal indicative of the speed that the police traffic surveillance radar unit itself is moving, and selectively displaying the speed of one of the fastest moving targets determined in step (4) above.

5,691,725
DISTANCE MEASURING APPARATUS CAPABLE OF MEASURING PLURAL DISTANCE DATA FOR CALCULATED ANGLE RANGES

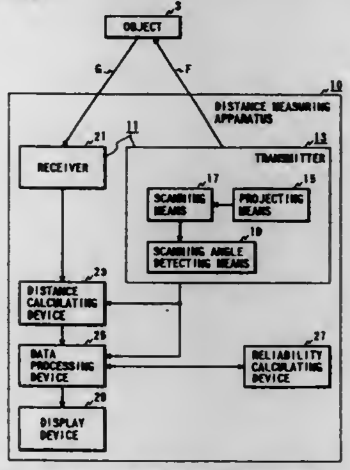
Sbolchi Tanaka, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 29, 1996, Ser. No. 609,904

Claims priority, application Japan, Sep. 8, 1995, 7-231421

Int. Cl.^{6} G01S *13/06*

U.S. Cl. 342—126 **20 Claims**


OBJECT
DISTANCE MEASURING APPARATUS
RECEIVER
TRANSMITTER
SCANNING BEAMS
PROJECTING BEAMS
SCANNING ANGLE DETECTING BEAMS
DISTANCE CALCULATING DEVICE
DATA PROCESSING DEVICE
RELIABILITY CALCULATING DEVICE
DISPLAY DEVICE

1. A distance calculating apparatus comprising:

a transmitter/receiver device including at least one of a transmitter for projecting electromagnetic waves while scanning the electromagnetic waves, and a receiver for receiving reflection waves that are electromagnetic waves reflected from an object while scanning the reflection waves;

an angle detecting device for detecting at least one of an angle when said electromagnetic waves are projected and an angle when said reflection waves are received;

a distance calculating device for calculating a distance to the object corresponding to said angle based on time measured from the projection of the electromagnetic waves and the reception of the reflection waves, thereby using said calculated distance as detection data; and

a data processing device for acquiring distance data in a calculation angle region corresponding to a plurality of said distance calculations based upon the detection data obtained during a plurality of distance calculations.

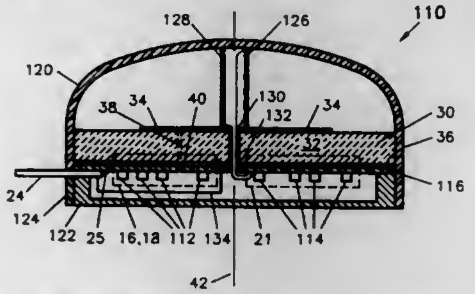
5,691,726
GPS/RADIO ANTENNA COMBINATION

Mark E. Nichols, Sunnyvale, and Eric B. Rodal, Morgan Hill, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Division of Ser. No. 510,840, Aug. 3, 1995, Pat. No. 5,654,717. This application Sep. 23, 1996, Ser. No. 710,670

Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **13 Claims**



1. An antenna combination comprising:

microstrip means for receiving a GPS satellite signal including GPS location determination information and issuing a conducted GPS signal representative of said GPS satellite signal;

radio antenna means for receiving an airwave radio signal having a frequency band within a frequency range of 80 to 1900 MHz from a radio signal broadcaster and issuing a conducted radio signal representative of said airwave radio signal;

a diplexer, coupled to the microstrip means and the radiowave antenna means, for combining said conducted GPS signal and said conducted radio signal and issuing a combined signal; and

an output cable, coupled to the diplexer, for providing said combined signal as an output.

5,691,727
ADAPTIVE POLARIZATION DIVERSITY SYSTEM

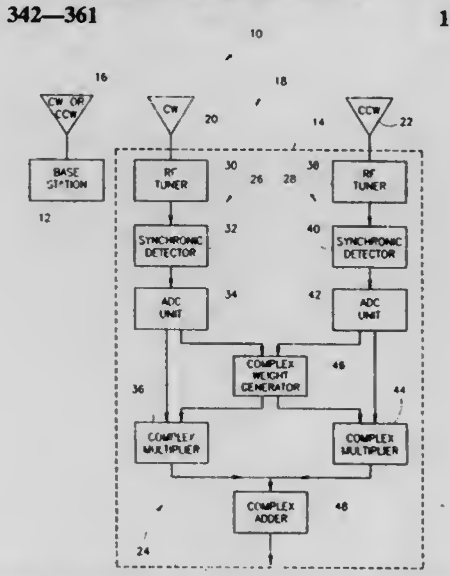
Baruch Cyzs, Kiryat Motzkin, Israel, assignor to State of Israel-Ministry of Defense Armament Development Authority-Rafael, Haifa, Israel

Flied Dec. 22, 1995, Ser. No. 577,407

Claims priority, application Israel, Jan. 3, 1995, 112233

Int. Cl.^{6} H01Q *21/06;21/24*

U.S. Cl. 342—361 **17 Claims**



1. Adaptive polarization diversity system for radio link communication comprising:

(a) base station antenna for transmitting either a clockwise polarized transmission or a counter-clockwise polarized transmission, said transmission including a training pilot signal; and

(b) at least one subscriber unit for receiving said transmission, said at least one subscriber unit including:

i) a first subscriber unit antenna for receiving a clockwise polarized transmission,

ii) a second subscriber unit antenna for receiving a counter-clockwise polarized transmission, said counter-clockwise polarized transmission carrying substantially identical informational content as said clockwise circularly polarized transmission; and

iii) a dual channel receiver for adaptively combining said clockwise polarized transmission with said counter-clockwise polarized transmission in proportion to first and second weights, respectively, said dual channel receiver determining said first and second weights so as to substantially optimally receive said training pilot signal.

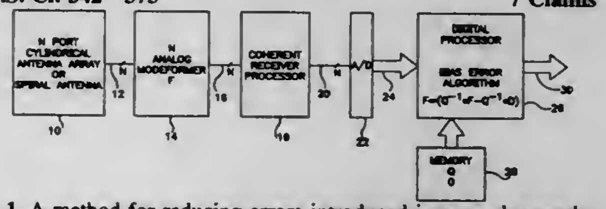
5,691,728
METHOD AND APPARATUS FOR BIAS ERROR REDUCTIOON IN AN N-PORT MODEFORMER OF THE BUTLER MATRIX TYPE

Allan Charles Goetz, La Jolla, and Robert Gene Riddle, II, San Diego, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 25, 1996, Ser. No. 621,853

Int. Cl.^{6} H01Q *3/22;3/24;3/26*

U.S. Cl. 342—373 **7 Claims**


N PORT CYLINDRICAL ANTENNA ARRAY OR SPIRAL ANTENNA
N ANALOG MODEFORMER F
COHERENT RECEIVER PROCESSOR
A/D
DIGITAL PROCESSOR
BIAS ERROR ALGORITHM
MEMORY Q 0

1. A method for reducing errors introduced in an analog modeformer of the Butler matrix type, the method comprising the steps of:

receiving a set of N antenna arm signals from a cylindrically symmetric antenna array, where N is an integral power of 2;

transforming, in an analog modeformer of the Butler matrix type, the N antenna arm signals to N corrupted mode signals that contain bias errors introduced in the modeformer; and

compensating for the bias errors in the mode signals to provide a more accurate mode forming transformation of the antenna signals.

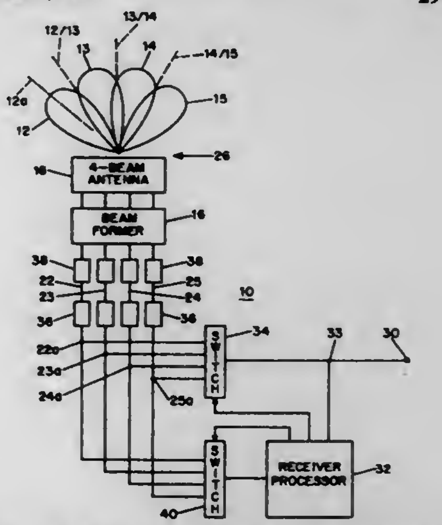
5,691,729
APERTURE-TO-RECEIVER GAIN EQUALIZATION IN MULTI-BEAM RECEIVING SYSTEMS

John H. Gutman, Brandon, Vt., and John C. Papson, Melville, N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed Nov. 4, 1996, Ser. No. 740,803

Int. Cl.^{6} G01S *3/02;3/12*

U.S. Cl. 342—374 **29 Claims**



1. A method of aperture-to-receiver gain equalization to enable selection of one beam channel for reception of an information signal incoming via two beam channels, comprising the steps of:

(a) providing a plurality of antenna-to-receiver beam channels, each to couple a signal received via one of a plurality of partially overlapping antenna beams;

(b) determining for each beam channel a threshold level representative of the lowest signal level measured at a receiver during a time period, said signal level corresponding to a noise level with no information signal present;

(c) providing gain correction factors reflecting channel-to-channel differences in said threshold level, said gain correction factors representative of relative difference in aperture-to-receiver gain between beam channels; and

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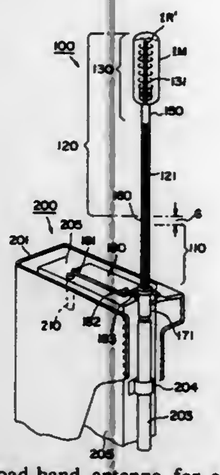
- (d) comparing, with use of at least one said gain correction factor, the signal levels of a user signal as received via first and second beam channels, and selecting one of said first and second channels for reception of information signals from said user;

said at least one gain correction factor being used in step (d) to offset a relative difference in aperture-to-receiver gain between said beam channels for channel selection purposes.

5,691,730
RETRACTABLE BROAD-BAND ANTENNA FOR PORTABLE TELEPHONES

Yoshimi Egashira, Sagamihara, and Minoru Taguchi, Shiroi-machi, both of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 326,585, Oct. 20, 1994, abandoned.
This application Sep. 9, 1996, Ser. No. 708,789
Int. Cl.^{6} H01Q *1/24;1/36*
U.S. Cl. 343—702 **5 Claims**



1. A retractable broad-band antenna for a portable telephone characterized in that said antenna comprises:

a linear first antenna element, said linear first antenna element having an electrical length such that a resonant frequency of said linear first antenna element is in a lower region of a frequency band used;

a linear second antenna element which is coupled in series to a tip of the first antenna element via a high-frequency coupling means, said linear second antenna element having an electrical length such that a resonant frequency of said linear second antenna element is in a higher region of the frequency band used; and

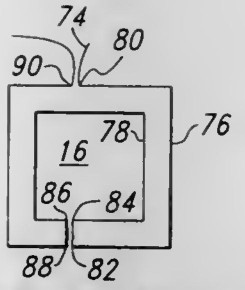
a third antenna element used for receiving incoming call signals, said third antenna element being provided on a tip-side portion of the second antenna element.

5,691,731
CLOSED SLOT ANTENNA HAVING OUTER AND INNER MAGNETIC LOOPS

Cornelis Maria Johannes van Erven, Enschede, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 76,036, Jun. 15, 1993, Pat. No. 5,432,518.
This application Jun. 7, 1995, Ser. No. 481,010
Int. Cl.^{6} H01Q *11/12*
U.S. Cl. 343—742 **8 Claims**

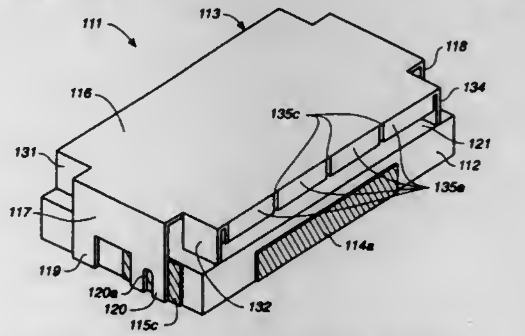
1. A closed slot antenna, said antenna comprising a wire which is configured to form an antenna having an outer magnetic loop and an inner magnetic loop, said outer loop and said inner loop being generally concentric about a center point, said wire proceeding in a first angular direction with respect to said center point from a first point on the outer loop to a second point on the outer loop thereby traversing a first portion of the outer loop, said wire then reversing direction inwardly to a third point on the inner loop and proceeding in a second angular direction nearly completely about the inner magnetic loop until reaching a fourth point on the inner loop, said fourth point in non-contacting, close proximity to said third point, and reversing direction outwardly to a fifth point on the outer loop, and proceeding in said first angular direction about a second portion of the outer loop to a fifth point on the outer loop, said sixth point in non-contacting, close proximity to said second point thereby forming a virtual inner closed magnetic loop between said third point and said fourth point and a virtual outer closed magnetic loop between said first point and said sixth point.



5,691,732
SURFACE MOUNTED CHASSIS ANTENNA ATOP DIELECTRIC BASE PLATE AND HAVING REMOVABLE EDGE PORTIONS FOR TUNING RESONANCE

Teruhisa Tsuru, Kyoto, and Mitsuhide Kato, Shiga, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 9, 1995, Ser. No. 555,762
Claims priority, application Japan, Nov. 11, 1994, 6-278032
Int. Cl.^{6} H01Q *1/38*
U.S. Cl. 343—745 **4 Claims**



1. An antenna device for surface mounting, comprising:

a dielectric base plate having an upper surface; and

a chassis made of an electrically conductive material and attached to said dielectric base plate, said chassis having a horizontal planar radiative part with a lower surface over and opposite said upper surface of said dielectric base plate and side walls at edges of said radiative part, said side walls including removable pieces and attachment walls which are both perpendicular to and bent downward from said radiative part, said removable pieces being adapted to be removed for adjusting resonance frequency of said antenna device, said attachment walls being perpendicular to said removable pieces, said attachment walls each having a feed electrode and a grounding electrode protruding further downward therefrom and being in contact with said base plate.

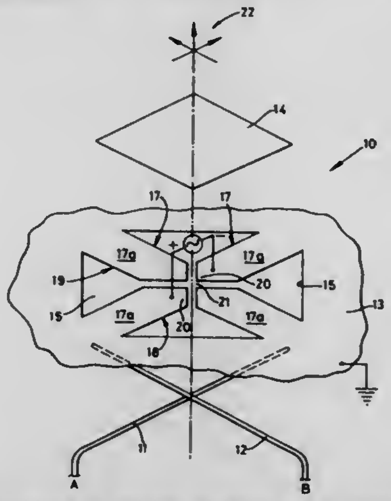
5,691,733

Patent Not Issued For This Number

5,691,734
DUAL POLARIZATING ANTENNAE

Richard Simon Greville Davies, Cheltenham, United Kingdom, assignor to Alan Dick & Company Limited, Cheltenham, United Kingdom

Filed Jun. 1, 1995, Ser. No. 457,133
Claims priority, application United Kingdom, Jun. 1, 1994, 9410994
Int. Cl.^{6} H01Q *9/28;21/26*
U.S. Cl. 343—795 **17 Claims**

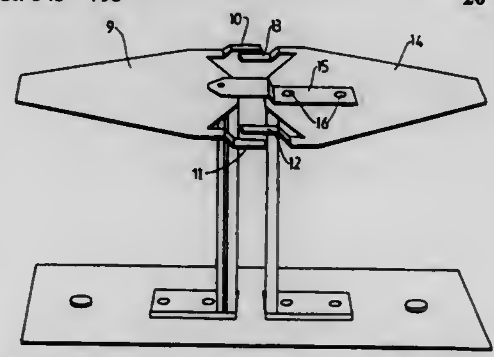


1. A dual polarization antenna including a non-conducting space surrounded by a ground plane; two angularly offset sets of dipole structures penetrating into the space, each set having an orientation and comprising a pair of aligned short circuit elongate dipoles extending from the ground plane into the space from diametrically opposed directions to terminate in respective free ends such that said free ends are adjacent but spaced from each other to define a gap between them; separate means for exciting each set, or dipole structure within a set, individually and a radiating element overlying the dipole structures such that the dipole structures couple, in use, with the radiating element, causing said radiating element to radiate polarizations determined by the orientation of each of said sets of dipole structures.

5,691,735
DIPOLE ANTENNA HAVING COUPLING TABS

Roger John Butland, 6 Atwood Grove, Churton Park, Wellington 6004, New Zealand, and William Emil Heinz, 47 Beazley Avenue, Wellington 6004, New Zealand

Continuation of Ser. No. 379,639, Feb. 6, 1995, abandoned.
This application Sep. 19, 1996, Ser. No. 715,767
Claims priority, application New Zealand, Aug. 7, 1992, 243877
Int. Cl.^{6} H01Q *9/16;9/28*
U.S. Cl. 343—795 **20 Claims**

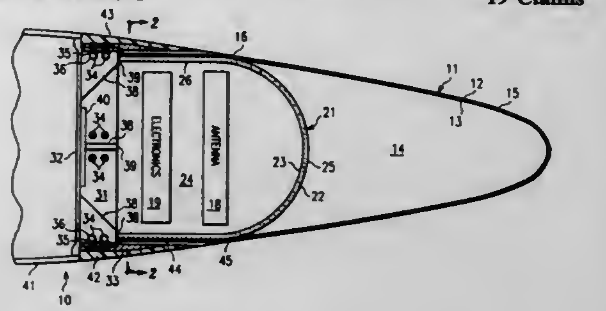


1. A dipole having first and second radiating elements with proximal and distal ends and lateral edges, the proximal ends of said radiating elements being connected to respective terminals of a drive point, the distal ends of said radiating elements extending outwardly from said drive point, and wherein reactive coupling is provided between said first and second radiating elements by spaced apart tabs positioned substantially at corners of the respective proximal ends and lateral edges of said radiating elements.

5,691,736
RADOME WITH SECONDARY HEAT SHIELD

David Lynn Hunn, Kennedale, Tex.; Douglas Ward Freitag, Brookville, Md.; James Richard Wood, Irving, and Shawn M. Keough, Arlington, both of Tex., assignors to Loral Vought Systems Corporation, Grand Prairie, Tex.

Filed Mar. 28, 1995, Ser. No. 412,193
Int. Cl.^{6} H01Q *1/42;* **B64D** *7/00*
U.S. Cl. 343—872 **19 Claims**



1. In an apparatus comprising:

a hollow radome having an inner surface forming an interior hollow space, said radome having a nose portion and a rear portion;

at least one temperature sensitive component positioned within said interior hollow space and encompassed laterally by said rear portion of said radome; and

a heat shield positioned within said interior hollow space between said at least one temperature sensitive component and said nose portion of said radome, said heat shield being spaced apart from said nose portion of said radome;

the improvement which comprises:

said heat shield being formed of a ceramic material having a dielectric constant at 17 GHz and 21° C. in the range of about 1 to about 3.5, a thermal conductivity of less than 0.7 W/M-K, and a density at 21° C. of less than 3.2 g/cc.

5,691,737
SYSTEM FOR EXPLAINING AN EXHIBIT USING SPECTACLE-TYPE DISPLAYS

Ryo Ito, and Akira Shimazu, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1994, Ser. No. 306,099
Claims priority, application Japan, Sep. 21, 1993, 5-233962
Int. Cl.^{6} G09G *5/00;* **G08C** *19/00*
U.S. Cl. 345—8 **31 Claims**

1. A system for explaining an exhibit including a plurality of exhibit elements, comprising in combination:

a plurality of installed image generating devices, each operatively associated with at least one exhibit element for outputting an image associated with the exhibit element at predetermined frequencies; and

a plurality of spectacle-type displays, wherein the outputs of said image generating devices at said predetermined frequencies

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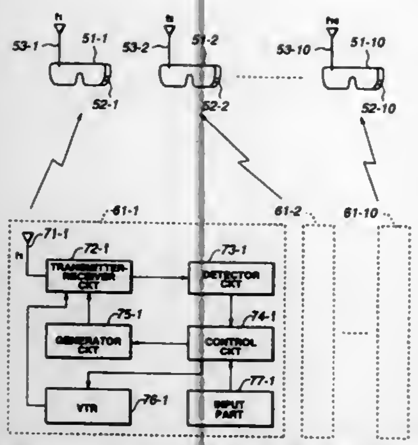


are received by said plurality of spectacle-type displays so as to display in display portions thereof said image of the exhibit element.

5,691,738
THIN-FILM ELECTROLUMINESCENT DISPLAY AND METHOD OF FABRICATING SAME

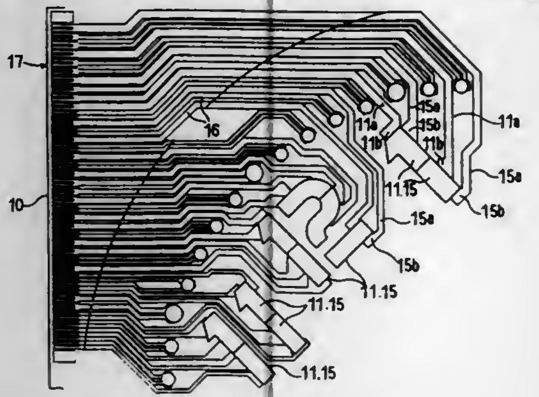
Masumi Arai, Okazaki; Nobuei Ito, Chiryu, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 29, 1995, Ser. No. 413,109

Claims priority, application Japan, Mar. 30, 1994, 6-061417; Feb. 3, 1995, 7-017074

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 345—76 **19 Claims**



1. A thin-film electroluminescent display comprising:

a substrate;

a light-emitting element formed by a first electrode layer, a first dielectric layer, a luminescent layer, a second dielectric layer, and a second electrode layer laminated in that order on said substrate;

said first electrode layer forming first electrodes having corners within a plane defined by said first electrode layer;

said second electrode layer forming second electrodes having corners located within a plane defined by said second electrode layer, said corners of said second electrodes being located opposite to said corners of said first electrodes, said corners of said first and second electrodes opposite to each other being rounded with a radius larger than a predetermined value; and

a voltage source applying a voltage between said first electrode layer and said second electrode layer to cause said luminescent layer to emit light.

5,691,739
DRIVING DEVICE FOR A LIQUID CRYSTAL DISPLAY WHICH USES COMPENSATING PULSES TO CORRECT FOR IRREGULARITIES IN BRIGHTNESS DUE TO CROSS TALK

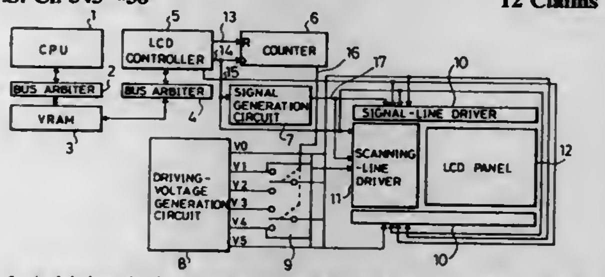
Hidetsugu Kawamori, and Nobuaki Takahashi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1994, Ser. No. 363,016

Claims priority, application Japan, Aug. 2, 1994, 6-181439

Int. Cl.^{6} G09G *3/20*

U.S. Cl. 345—58 **12 Claims**



1. A driving device, which drives a display section that includes signal lines, scanning lines, and a plurality of liquid crystal display elements that are connected to the signal lines and the scanning lines and that are disposed in the form of matrix, comprising:

a scanning-line driver for releasing to the scanning lines a scanning signal for selecting the scanning lines successively;

a signal-line driver for releasing to the signal lines a display signal for displaying images in synchronism with the scanning signal;

a driving-voltage generation circuit for generating a plurality of voltages, having different voltage levels, used by the scanning-line driver to generate the scanning signal and used by the signal-line driver to generate the display signal; and

a compensator which, during a compensating period that follows a display period during which display signals corresponding to one picture are transmitted to the signal lines, applies to each liquid crystal display element a compensating voltage that is proportional to the number of polarity inversions during the display period, and that is capable of cancelling a lowering in an effective value of a driving voltage for the liquid crystal display elements during the display period, the driving voltage being a difference in voltages between the levels of the display signal and the scanning signal, wherein the compensator further includes a compensation-number generation circuit and a plurality of switches, installed in the scanning-line driver and the signal-line driver, wherein the plurality of switches switch between voltages generated by the driving-voltage generation circuit based upon a number of compensations determined by the compensation-number generation circuit, and output resulting voltages.

5,691,740
LIQUID CRYSTAL APPARATUS AND DRIVING METHOD

Yoshihiro Onitsuka; Hiroshi Inoue, both of Yokohama; Osamu Taniguchi, Chigasaki; Atsushi Mizutome, Fujisawa; Tadashi Mihara, Atsugi, and Akira Tsuboyama, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

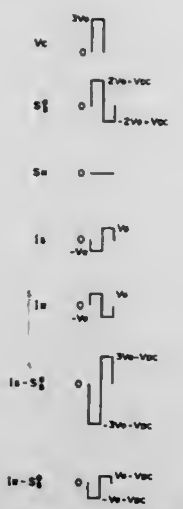
Division of Ser. No. 156,976, Nov. 24, 1993, which is a continuation of Ser. No. 708,067, May 30, 1991, which is a division of Ser. No. 511,956, Apr. 17, 1990, Pat. No. 5,041,821, which is a continuation of Ser. No. 177,591, Apr. 4, 1988, abandoned. This application May 4, 1995, Ser. No. 434,990

Claims priority, application Japan, Apr. 3, 1987, 62-083277; Jun. 8, 1987, 62-143872; Jun. 8, 1987, 62-143873; Jun. 9, 1987, 62-144749

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—96 **27 Claims**

1. A liquid crystal apparatus, comprising



a liquid crystal device comprising scanning electrodes and data electrodes intersecting with the scanning electrodes, and a chiral smectic liquid crystal disposed between the scanning electrodes and the data electrodes and assuming a first orientation state and a second orientation state depending on a voltage polarity applied thereto so as to form a pixel at each intersection of the scanning electrodes and the data electrodes; and

voltage application means for:

- applying a scanning selection signal and a scanning non-selection signal to the scanning electrodes, the scanning selection signal having a voltage of one polarity or a voltage of the other polarity with respect to a voltage level of a non-selected scanning electrode,
- in synchronism with the scanning selection signal, selectively applying data signals each comprising an AC waveform having a voltage of one polarity and a voltage of the other polarity with respect to the voltage level of a non-selected scanning electrode to the data electrodes so that pixels at the intersections of a selected scanning electrode receiving the scanning selection signal and selected data electrodes receive a voltage causing a switching from the first orientation state to the second orientation state or a switching from the second orientation state to the first orientation state, and pixels at the intersections of a non-selected scanning electrode and the data electrodes receive an AC voltage superposed with a DC voltage not causing a switching from the first orientation state to the second orientation state or a switching from the second orientation state to the first orientation state, and
- inverting the polarity of the DC voltage for each prescribed period.

5,691,741
DISPLAY APPARATUS WITH DATA COMMUNICATION CHANNEL

Shaun Carl Kerigan, Kilmalcolm; Andrew Ramsay Knox, Kilbirnie, and Roger Timothy Wood, Largs, all of Great Britain, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1995, Ser. No. 378,325

Claims priority, application United Kingdom, Jan. 29, 1994, 9401701

Int. Cl.^{6} G09G *5/00*

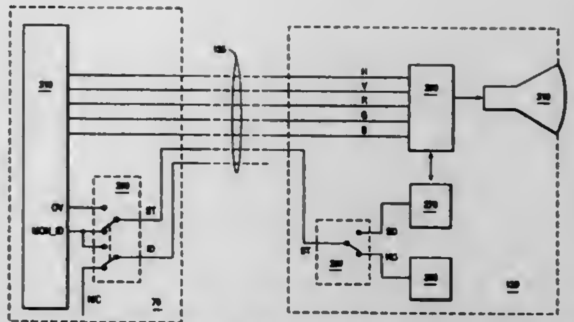
U.S. Cl. 345—112 **5 Claims**

1. Display apparatus, comprising:

a connector for connecting a display device (**130**;**130'**) to the display apparatus;

a data input (MON_ID) for receiving first data, in serial data bit stream format, from a first output (ST) of the display device (**130**;**130'**) and for receiving second data from a second output (ID) of the display device (**130**;**130'**);

switch means (**320**) for selectively connecting the data input (MON_ID) to either of the first output (ST) or the second output (ID); and



display processor logic (**310**) connected to the switch means (**320**) for generating one or more video signals to generate an image on the display device (**130**,**130'**) as a function of the data directed to the data input (MON_ID) by the switch means (**320**).

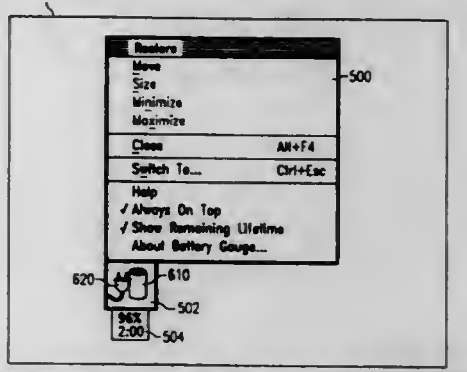
5,691,742
SOFTWARE BATTERY GAUGE FOR PORTABLE COMPUTERS

Clint H. O'Connor, Austin, and John J. Pearce, Del Valle, both of Tex., assignors to Dell U.S.A., L.P., Austin, Tex.

Filed May 24, 1995, Ser. No. 449,160

Int. Cl.^{6} H02J *7/04*; **G01R** *31/36*

U.S. Cl. 345—116 **21 Claims**



1. In a computer comprising a display and a processor and connectable to at least one battery for deriving power therefrom, a method for providing to a user a charge condition of each of said at least one battery comprising, for each of said at least one battery:

displaying on said display a user interface indicating a charge condition of said battery, said user interface comprising a graphical status indicator portion and a textual status indicator portion;

upon each elapse of a preselected time period, eliciting battery status information for said battery;

updating said graphical and textual status indicators displayed on said display using said elicited battery status information

prior to said eliciting, determining whether said charge condition of said battery changed during said preselected time period and responsive to a determination that said charge condition of said battery has not changed during said preselected time period, omitting performance of said eliciting and updating.

5,691,743
IMAGE DISPLAY DEVICE

Satoshi Kusano, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo-to, Japan

Filed Nov. 16, 1995, Ser. No. 559,571

Claims priority, application Japan, Nov. 18, 1994, 6-285488

Int. Cl.^{6} G09G *5/34*

U.S. Cl. 345—123 **7 Claims**

1. An image display device comprising:

a first memory for storing an image data;

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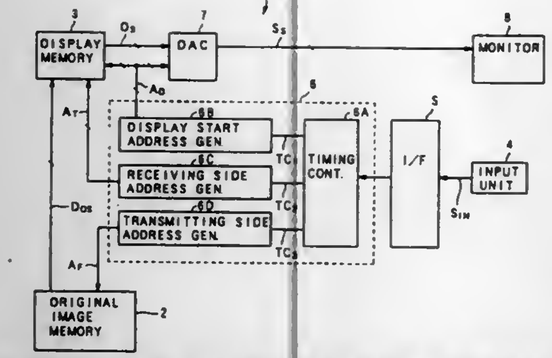


transmitting means for reading out a portion of the image data stored in the first memory from a position of a transmitting side address and transmitting the read image data;

a second memory for receiving the image data from the transmitting means and storing the transmitted image data from a position of a receiving side address, said second memory renewing the stored image data endlessly by cyclicly changing the receiving side address and overwriting the transmitted image data;

a display means for reading out the image data stored in said display memory from a position of a display start address and displaying the read image data on a screen thereof;

scroll information receiving means for receiving scroll information including a scroll direction and a scroll amount inputted by an operator; and

control means for determining the display start address, the receiving side address and the transmitting side address in accordance with the scroll information, said second memory having a storage capacity larger than a data capacity of image displayed on one screen of said display means.

5,691,744
PROCESSOR SYSTEM COMPRISING A PROCESSOR AND A MEMORY FIELD FOR CONTAINING A COMPUTER INTERFACE

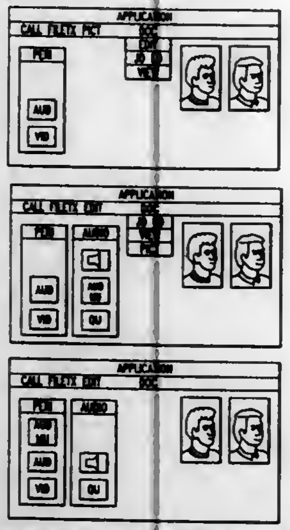
Karin Helene Marie Anstötz, Cologne, Germany, and Karel Gerard Coolegem, The Hague, Netherlands, assignors to Koninklijke PTT Nederland N.V., Netherlands

Continuation of Ser. No. 269,047, Jun. 29, 1994, abandoned. This application Apr. 18, 1996, Ser. No. 634,370

Claims priority, application European Pat. Off., Jul. 8, 1993, 93202012

Int. Cl.⁶ G09G *5/08*

U.S. Cl. 345—146 **8 Claims**



1. A processor system comprising a processor and a memory field for containing a computer interface having a number of elements each representing a function, an element being directly displayed on a screen in case this element is entirely displayed all the time and independent of whether or not this element bas been activated, and an element being selectively displayable on the screen in case this element is not entirely displayed all the time but is only entirely displayed after this element has been activated, the processor system being adapted for displaying at least one element directly on a screen, the processor system being adapted for

allocating a first element parameter to a first element, the first element parameter being a function of a number of times this first element has been activated,

allocating an element type to the first element,

allocating a second element parameter to a second element, the second element parameter being a function of a number of times this second element has been activated,

allocating an element type to the second element,

comparing the first element parameter with a threshold value and based on a comparison result either directly displaying the first element on the screen or enabling the first element for selective display on the screen,

comparing the second element parameter with another threshold value and based on another comparison result either directly displaying the second element on the screen or enabling the second element for selective display on the screen, and

based on the comparison results either interchanging values of at least two element types or not interchanging values of said at least two element types,

the memory field and the computer interface being adaptable by storing new values of element parameters and of element types.

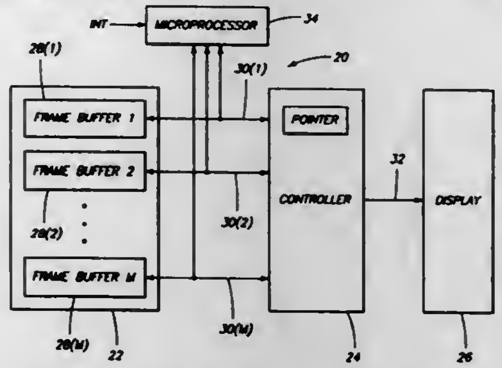
5,691,745
LOW POWER PIXEL-BASED VISUAL DISPLAY DEVICE HAVING DYNAMICALLY CHANGEABLE NUMBER OF GRAYSCALE SHADES

Amit Mital, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jan. 6, 1995, Ser. No. 369,723

Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—148 **12 Claims**



1. A driver for a visual display device, comprising:

m n-bit/pixel frame buffers to hold m sets of pixel data, where m>1 and n>1; and

an n-bit controller for switching among the m n-bit/pixel frame buffers at a selected rate during a display cycle to output a composite stream of the m sets of pixel data capable of producing a number of various grayscale shades, the number of grayscale shades, including white, being as follows:

No. of Shades=$m\times(2^n-1)+1$.

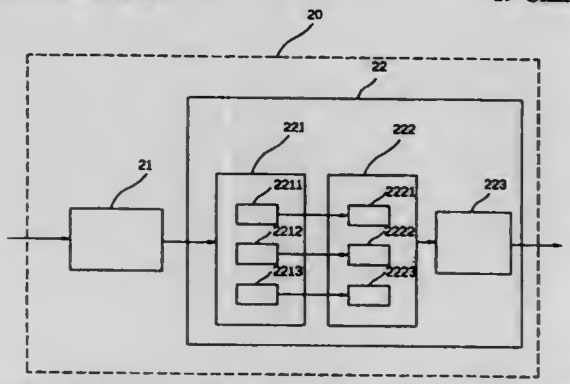
5,691,746
DIGITAL VIDEO FORMAT CONVERSION BY UPSAMPLING DECOMPRESSED DATA USING ON-THE-FLY INTERPOLATION AND COLOR CONVERSION

Rong-Fuh Shyu, Taiwan, Taiwan, assignor to Winbond Electronics Corp., Hsin-Chu, Taiwan

Continuation of Ser. No. 330,464, Oct. 28, 1994, abandoned. This application Jul. 31, 1996, Ser. No. 688,725

Int. Cl.⁶ G09G *5/02*

U.S. Cl. 345—150 **19 Claims**



1. An apparatus for executing a digital video format conversion for upsampling a decompressed digital video data outputted from a decompressor, comprising:

a video interpolation device processing said decompressed digital video data by way of on-the-fly interpolating and filtering procedures in series and line by line to obtain an interpolated and filtered digital video data, wherein said on-the-fly interpolating and filtering procedures are executed in the moment while said decompressed digital video data is outputted from said decompressor; and

a color space converter electrically connected to said video interpolation device for converting said interpolated and filtered digital video data from a first color space into a second one to complete said digital video format conversion.

5,691,747
ELECTRONIC POINTING DEVICE

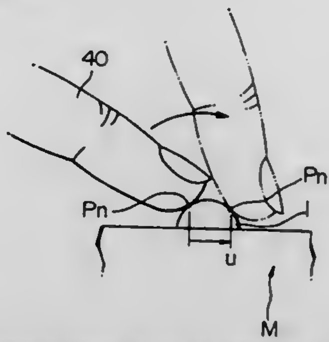
Kazuhiko Amano, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 359,753

Claims priority, application Japan, Dec. 20, 1993, 5-320582; Dec. 20, 1993, 5-320583

Int. Cl.⁶ G09G *3/02*

U.S. Cl. 345—167 **25 Claims**



1. An electronic pointing device for determining a static position on a viewing screen of a computing device, the point device comprising:

an elastic member having an extended upper body portion and a planar bottom surface bonded to a base section, said elastic member for propagating vibrational pressure waves generated from a pressed point on said body portion, said vibrational pressure waves attenuating as they propagate across said elastic member;

at least three pressure sensing means disposed in said base section for detecting vibrational pressure waves propagated from said pressed point and providing position indicating signals in correspondence with attenuated results of said detected vibrational pressure waves; and

first computing means for computing projected coordinates of said pressed point in accordance with said position indicating signals for defining orthogonal coordinates of said pressed point relative to a reference point of said planar bottom section.

5,691,748
COMPUTER SYSTEM HAVING MULTI-DEVICE INPUT SYSTEM

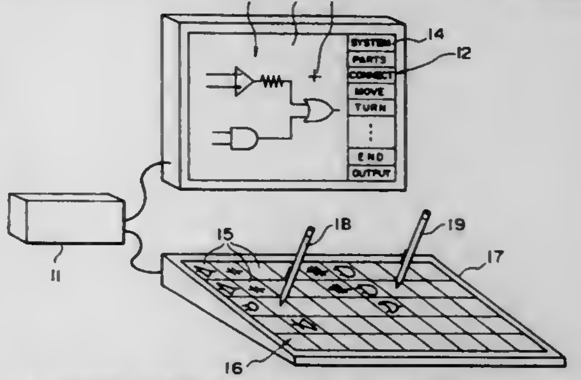
Yasuhiro Fukuzaki, Saitama-ken, Japan, assignor to Wacom Co., Ltd, Saitama, Japan

Filed Mar. 31, 1995, Ser. No. 415,061

Claims priority, application Japan, Apr. 2, 1994, 6-87421

Int. Cl.⁶ G08C *21/00*

U.S. Cl. 345—173 **10 Claims**



1. A computer system having a multi-device input system, said computer system comprising:

a display unit;

a computer including a regular processor for carrying out regular processing and a menu selector for carrying out menu selection processing with respect to display contents on a display screen of said display unit;

a coordinate detecting device having a coordinate detectable area, the coordinate detecting device including a menu display area for displaying a plurality of menu items, the coordinate detecting device being capable of displaying the menu items simultaneously with detecting coordinate information of at least two position pointing devices operated on said coordinate detectable area, the coordinate detecting device responding to the position pointing devices to supply coordinate information about the position pointing devices to said computer;

at least one, but not all, of said position pointing devices being exclusively used for selecting menu items from the menu item display area; and

a position pointing device identifier for identifying the type of said position pointing device;

the coordinate information derived from said coordinate detecting device being sent to said menu selector in response to said position pointing device identifier determining that the position pointing device operated in said coordinate detectable area is a position pointing device exclusively used for menu item selection, the coordinate information derived from said coordinate detecting device being sent to said regular processor in response to said position pointing device identifier determining that it is a position pointing device other than the position pointing device used exclusively for menu selection.

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5,691,749
IMAGE DISPLAY APPARATUS

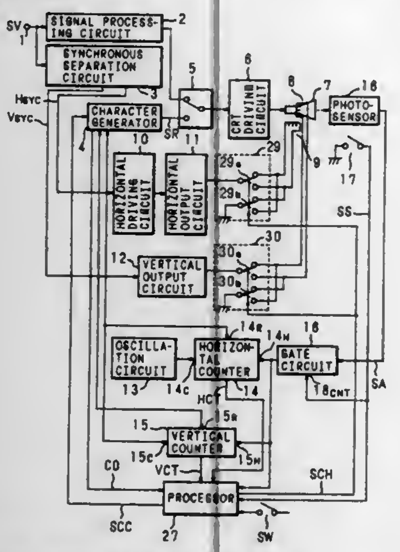
Kazuyuki Sugiyama, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,604

Claims priority, application Japan, Dec. 21, 1993, 5-322586

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 345—181 **19 Claims**



1. An image display apparatus comprising:

a screen for displaying scanning lines generated by scanning of an electron beam;

scanning direction switching means for switching a scanning direction of the electron beam between a first scanning direction for scanning from a first portion to a second portion of said screen and a second scanning direction for scanning from the second portion to the first portion of said screen;

determining means, including a remotely located photosensor opposed to the screen, for determining a first number of scanning lines displayed prior to the photosensor detecting the electron beam scanning in the first scanning direction, the scanning direction switching means switching the scanning direction to the second scanning direction and restarting the electron beam scanning upon the determining means determining the first number of scanning lines, and for determining a second number of scanning lines displayed prior to the photosensor detecting the electron beam scanning in the second scanning direction; and

calculating means for calculating an average of the first and second number of scanning lines determined and for determining the position of a point on said screen opposed to said photosensor based on the average calculated.

5,691,750
INK LEVEL SENSING FOR DISPOSABLE INK JET PRINT HEAD CARTRIDGES

Mark Joseph Edwards, Lexington, Ky., assignor to Lexmark International, Inc., Lexington, Ky.

Filed Nov. 24, 1992, Ser. No. 980,847

Int. Cl.^{6} B41J *2/195;29/393*

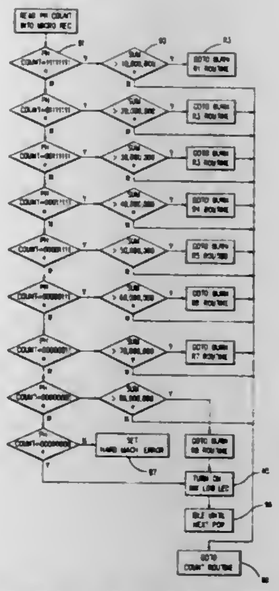
U.S. Cl. 347—7 **8 Claims**

5. A method of recording an ink level on a disposable print head having a plurality of resistance paths, several discrete actuators, and an ink supply, comprising the steps of:

providing energization of each of the several discrete actuators of the print head to dispense ink from the ink supply onto a record medium;

maintaining a count of actuations of the print head in a counter;

periodically adding the count from the counter into a cumulative count in a non-volatile memory; and,



changing the resistance in the resistance paths on the print head in response to the cumulative count.

5,691,751

Patent Not Issued For This Number

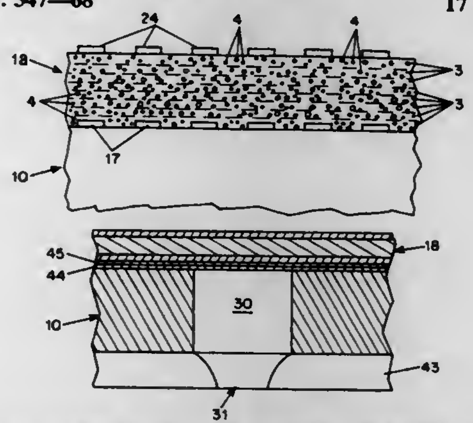
5,691,752
PEROVSKITE THIN-FILM INK JET TRANSDUCER

Edward R. Moynihan, Plainfield, N.H.; Paul A. Hoisington, Norwich, Vt., and David W. Gailus, Merrimack, N.H., assignors to Spectra, Inc., Hanover, N.H.

Division of Ser. No. 258,709, Jun. 13, 1994, Pat. No. 5,500,988, which is a continuation-in-part of Ser. No. 89,310, Jul. 9, 1993, Pat. No. 5,446,484, which is a division of Ser. No. 615,893, Nov. 20, 1990, Pat. No. 5,265,315. This application Apr. 10, 1995, Ser. No. 419,033

Int. Cl.^{6} B41J *2/045*

U.S. Cl. 347—68 **17 Claims**



1. An ink jet head for use in an jet system comprising a substrate having two opposed sides and a plurality of openings extending through the substrate providing ink chambers therein, each ink chamber having a volume, an orifice plate on one of the sides of the substrate containing a plurality of orifices for corresponding ink chambers in the substrate, and a thin-film piezoelectric transducer element on the opposite side of the substrate including a polycrystalline perovskite-seeded PZT piezoelectric film having a thickness range from about 1 micron to about 25 microns and having an electroded electroded portion disposed adjacent to each of the ink chambers for selective actuation of a corresponding portion of the transducer element to vary the volume of the chamber adjacent thereto.

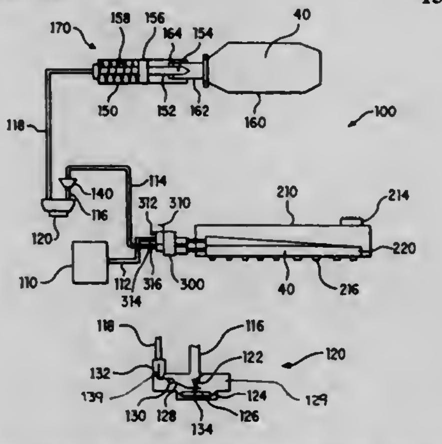
5,691,753
VALVING CONNECTOR AND INK HANDLING SYSTEM FOR THERMAL INK-JET PRINTBAR

Brian S. Hilton, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 213,282, Mar. 15, 1994, abandoned. This application Feb. 12, 1996, Ser. No. 598,625

Int. Cl.^{6} B41J *2/175;* **F16K** *31/12;* **E03B** *00/00*

U.S. Cl. 347—85 **15 Claims**



1. An ink handling system used in a thermal inkjet printer, comprising:

a container holding ink;

an ink connector connected to the container for removing the ink from the container without exposing the ink to atmosphere;

a removable printbar including inkjets;

a manifold holding ink in the removable printbar, the manifold supplying said ink to the inkjets of the removable printbar;

a regulator connected between the ink connector and the removable printbar, said regulator regulates a flow of the ink from the container to the removable printbar, and said regulator is a diaphragm valve comprising,

a wall defining a cavity:

an entrance fitting connected between the ink connector and said cavity, the entrance fitting having an inside and containing a needle that seals against the inside of the entrance fitting;

an outlet connected to said cavity and coupled to the manifold to supply ink to the manifold from the cavity;

a metering plate disposed within the cavity;

a spring attached to the metering plate and to an interior surface of said wall, the spring applying tension against the metering plate;

a fulcrum disposed within said cavity;

a metering lever pivoting around said fulcrum, a first end of the metering lever attached to an end of the needle, and a second end of the metering lever being positioned between the spring and a first side of the metering plate; and

a diaphragm located on an opposite second side of the metering plate for controlling movement of the metering lever, wherein a decreasing pressure within the cavity due to ink flowing out of the outlet causes the diaphragm to contract and the metering lever to pull the needle from the entrance fitting to allow ink to flow from the container into the cavity and an increasing pressure within the cavity caused by the ink eventually causes the metering plate to stretch the diaphragm causing the metering lever to push the needle into the entrance fitting to stop the flow ink; and

vacuum means connected to the manifold for removing all of the ink from the manifold.

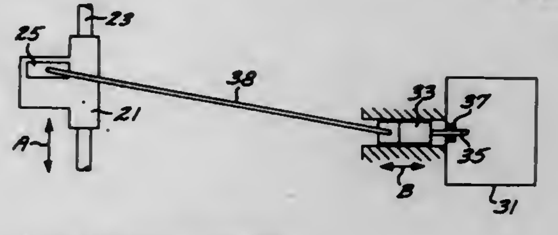
5,691,754
RIGID TUBE OFF-AXIS INK SUPPLY

Chuong C. Ta, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 19, 1996, Ser. No. 700,068

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—85 **6 Claims**



1. An ink jet printer comprising:

a movable print carriage;

an ink jet printhead cartridge removably supported by said movable print carriage;

a stationary ink reservoir located remotely from said ink jet printhead cartridge;

a movable ink conveying coupler fluidically coupled to said stationary ink reservoir; and

a rigid ink conveying tube connected between said movable ink conveying coupler and said ink jet printhead cartridge;

wherein said movable ink conveying coupler (a) moves relative to said stationary ink reservoir as said movable carriage moves along a carriage axis, and (b) moves orthogonally to the carriage axis.

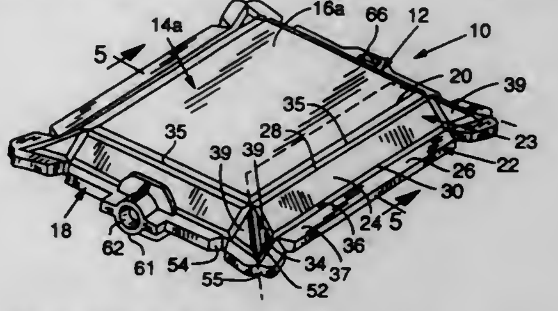
5,691,755
COLLAPSIBLE INK CARTRIDGE

Norman E. Pawlowski, Jr., and Bruce Cowger, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 18, 1994, Ser. No. 229,047

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—86 **18 Claims**



1. An ink cartridge for storing ink, comprising:

a body having a plurality of wall panels selectively arranged in a nonplanar orientation to define a full configuration of the body wherein the wall panels define a cavity having a volume for storing ink, the wall panels being collapsible to transition the body from the full configuration to an empty configuration, the empty configuration being defined where the wall panels are collapsed inwardly into the cavity such that the volume of the cavity is diminished; and

a resilient frame that surrounds and projects from the body, the body collapsing within the frame in the empty configuration, the frame resiliently expanding as the body collapses, resiliency of the frame urging the body toward the full configuration.

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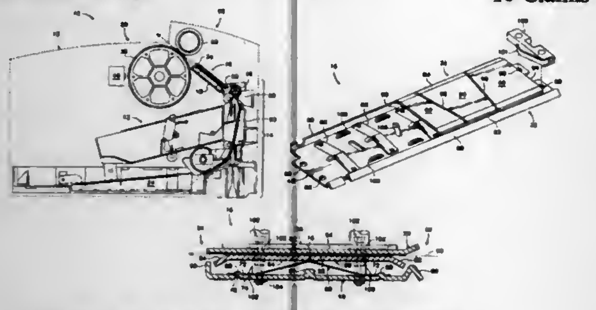
5,691,756
PRINTER MEDIA PREHEATER AND METHOD

James D. Rise, Lake Oswego; William Y. Pong, Tualatin; Timothy L. Crawford, Tigard; Meade Neal, Mulino; Larry E. Hindman, Woodburn, and Carl T. Urban, Lake Oswego, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation-in-part of Ser. No. 981,646, Nov. 25, 1992, Pat. No. 5,389,958. This application Dec. 16, 1994, Ser. No. 358,138

Int. Cl.^{6} B41J *2/01*

U.S. Cl. 347—102 **16 Claims**



1. A printer having a media preheater comprising:
a frame;
a media supply connected to the frame;
a print head connected to the frame;
a rigid heater connected to the frame, including an active heating element, and having a heater major inner surface;
a plate array formed by a plurality of rigid plates connected to the frame and having a plate outer surface facing the heater inner surface, the plate array being substantially coextensive with the heater and having two exterior edges and a plurality of interior edges;
the plate array being mounted to the frame for movement toward and away from the heater to accommodate media passing between the heater and the plate array; and
the plate array being biased toward the heater, such that the plate array is in contact with the heater when no media is present, and such that media of a certain length passing between the heater array and plate is compressed therebetween to ensure flatness.

5,691,757
LASER MARKING METHOD AND AQUEOUS LASER MARKING COMPOSITION

Shoiti Hayashihara, and Masaki Shinmoto, both of Yono, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, and Kansai Paint Kabushiki Kaisha, Amagasaki, both of Japan

Filed Dec. 12, 1994, Ser. No. 355,084

Claims priority, application Japan, Dec. 22, 1993, 5-345468

Int. Cl.^{6} B41J *2/385;2/355;* **G03G** *9/08;* **G01D** *15/10*

U.S. Cl. 347—155 **20 Claims**

1. A laser marking method which comprises the steps of:
providing on a surface of a base article a thin film of a laser marking composition that has been subjected to a heat treatment for 1 minute to 2.5 hours, said laser marking composition containing a color former, a developer having a melting point of 200° C. or above, and a laser light absorptive inorganic compound, and
applying laser light to said thin film.

5,691,758
THERMAL RECORDING APPARATUS USING RECORDING SHEET MADE OF THERMAL REVERSIBLE MATERIAL

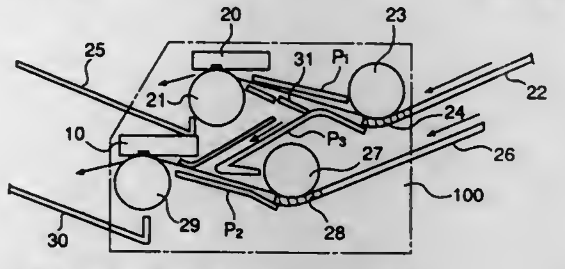
Takeshi Kamada, Atsugi, and Toshiaki Kumashiro, Ebina, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 873,152, Apr. 24, 1992, abandoned. This application Nov. 25, 1994, Ser. No. 348,906

Claims priority, application Japan, Apr. 25, 1991, 3-094641

Int. Cl.^{6} B41J *2/32*

U.S. Cl. 347—171 **10 Claims**



1. A reading and writing system, comprising:
a thermal recording sheet on which information is to be recorded by heating said thermal recording sheet to a first temperature and information is to be erased therefrom by heating said thermal recording sheet to a second temperature, said thermal recording sheet having crystals made of organic low molecular weight particles which are dispersed in resin, the crystals changing in size in accordance with a temperature supplied thereto so that said thermal recording sheet is changed between a transparent state and a non-transparent state, the transparent state and the non-transparent state each being respectively maintained when said thermal recording sheet is at a normal temperature;
a reading system including:
a first tray; and
an image sensor for optically reading a document supplied from the first tray, and
a recording system for recording and erasing information on said thermal recording sheet, including:
a thermal head for heating said thermal recording sheet in a pattern;
a supplying roller for supplying said thermal recording sheet to said thermal head;
an ejecting roller for ejecting said thermal recording sheet out of said apparatus;
mode selecting means for selecting a recording mode or an erasing mode;
temperature detecting means for detecting a temperature of said thermal head;
storage means for storing a table indicating relationships between a temperature detected by said temperature detecting means and an amount of thermal energy to be supplied to said thermal recording sheet by using said thermal head in each of said recording mode and said erasing mode, the amounts of thermal energy being based on a first temperature to which said thermal recording sheet is to be heated in the recording mode and a second temperature to which said thermal recording sheet is to be heated in the erasing mode;
control means for controlling an amount of thermal energy supplied from said thermal head to said thermal recording sheet based on a mode selected by said mode selecting means and a temperature detected by said temperature detecting means with reference to said table so that said thermal recording sheet is heated to the first temperature in a pattern corresponding to information to be recorded in the recording mode and is heated to the second temperature in the erasing mode; and
a second tray for holding said thermal recording sheet,
wherein the supplying roller supplies said thermal recording sheet from the second tray to said thermal head.

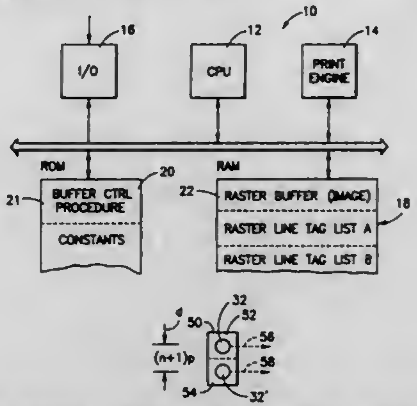
5,691,759
METHOD AND APPARATUS FOR INTERLEAVING RASTER SCAN LINES IN A MULTI-BEAM LASER IMAGING DEVICE

Gary Hanson, Meridian, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 5, 1996, Ser. No. 583,393

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—233 **5 Claims**



1. A laser printer for producing a raster image comprising plural raster scan lines of pixels, each raster scan line separated from an adjacent raster scan line by a pitch distance p, said printer comprising:
a movable photoreceptor;
n laser source means, where n≧2, for producing n optical beams which, when incident on said photoreceptor, are separated by a distance of (n+1)p in a direction of movement of said photoreceptor;
motive means for moving said photoreceptor with respect to said optical beams;
scan means for scanning said n optical beams in parallel paths across said photoreceptor;
image buffer memory means for storing plural raster scan lines of pixel values comprising an image;
control means for modulating said n optical beams, respectively, with pixel values from one set of n raster scan lines from said image buffer memory means as said n optical beams are scanned across said photoreceptor, each of said n raster scan lines of said one set separated by a distance of (n+1)p on said photoreceptor, said control means further causing said motive means to move said photoreceptor by a distance (n×p) prior to a start of each scan action of said scan means and to again modulate said n optical beams with pixel values from another set of n raster scan lines that are, respectively, (n+1)p distant from said n raster scan lines of said one set.

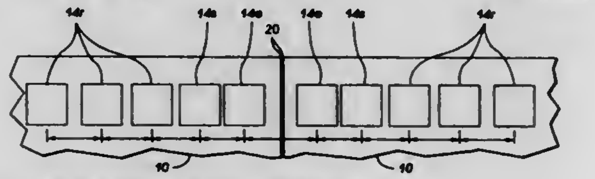
5,691,760
PHOTOSENSITIVE SILICON CHIP HAVING PHOTOSITES SPACED AT VARYING PITCHES

Paul A. Hosier, Rochester, and Jagdish C. Tandon, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1995, Ser. No. 542,246

Int. Cl.^{6} B41J *2/45;* **H01L** *27/00*

U.S. Cl. 347—238 **15 Claims**



1. A photosensitive device, comprising:
a semiconductor chip;
a plurality of regular photosites provided on a main surface of the chip, each regular photosite defining a perimeter, the regular photosites being arranged in a linear array with each regular photosite being spaced from the perimeter of a neighboring regular photosite by a predetermined first spacing distance;
an end photosite provided at one end of the linear array, said end photosite not included in said plurality of regular photosites, the end photosite defining a perimeter; and
a next-to-end photosite provided between the end photosite and a regular photosite in the linear array, said next-to-end photosite not included in mid plurally of regular photosites, the next-to-end photosite defining a perimeter,
the perimeter of the end photosite being spaced from the perimeter of the next-to-end photosite by a predetermined second spacing distance, the second spacing distance being less than the first spacing distance.

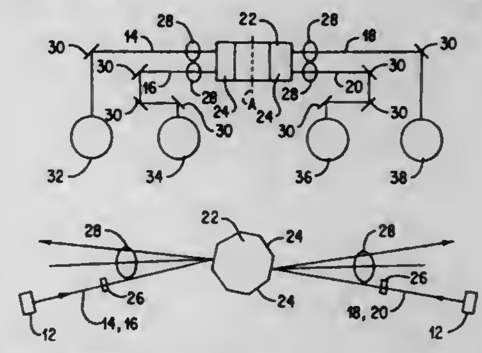
5,691,761
METHOD AND APPARATUS FOR MULTI-CHANNEL PRINTING IN A RASTER OUTPUT SCANNING SYSTEM

Tibor Fisli, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 2, 1994, Ser. No. 352,766

Int. Cl.^{6} B41J *2/47;* **G01D** *15/14;* **G02B** *26/00;27/00*

U.S. Cl. 347—241 **26 Claims**



1. A raster output scanning system for a printing device, comprising:
a polygon having a plurality of facets;
a plurality of input optical channels, a first one of the input optical channels directing a first one of a plurality of light beams onto a first facet of the polygon, and a second one of the input optical channels directing a second one of the plurality of light beams onto a second facet of the polygon, the polygon deflecting one of the light beams onto each of a plurality of disparate optical paths; and
an optical system located on the disparate optical paths, the optical system directing at least one of the light beams onto each of first, second, third and fourth image receiving locations.

5,691,762

Patent Not Issued For This Number

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1204
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5,691,763
TERMINATED CABLE PORTION INSPECTION DEVICE FOR STRIPPED TERMINAL CRIMPING MACHINE

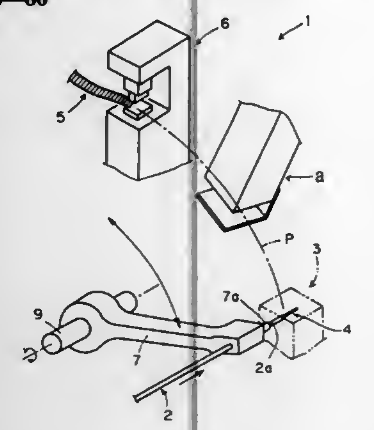
Yoshihide Ichikawa; Hideki Ohmori, both of Yokkaichi; Tuneyoshi Takahashi, and Kiyohide Abe, both of Tokyo, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., and Kabushiki Kaisha Meidensha, both of Japan

Filed Sep. 7, 1995, Ser. No. 524,517

Claims priority, application Japan, Sep. 14, 1994, 6-220600; Sep. 14, 1994, 6-220601

Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—86 **8 Claims**



1. In a stripped terminal crimping machine including a stripping portion for stripping a coating at an end of a cable, a terminal crimping portion for crimping a crimp terminal to the stripped end of the cable, a transport mechanism for transporting the stripped cable end in a first direction along a bidirectional path from an initial position of the bidirectional path to the terminal crimping portion and then transporting the stripped cable end in a second direction along the bidirectional path from the terminal crimping portion to the initial position after crimping of the crimp terminal, and a terminated cable portion inspection device for photographing the cable end transported along the bidirectional path to inspect a stripped portion and a terminal crimped portion of the cable by image processing;

said terminated cable portion inspection device comprising:

an image pickup camera having a high shutter speed;

a pair of illuminating portions on opposite sides of a photographing path of said image pickup camera for directing illumination in substantially the same direction as a photographing direction of said image pickup camera toward the cable end passing therethrough along the bidirectional path, said pair of illuminating portions being elongated in substantially the same direction as a longitudinal direction of the cable;

an optical fiber for guiding light emitted from a light source to light projecting portions of said illuminating portions;

a first sensor for detecting a timing of photographing the cable end transported in the first direction along the bidirectional path by said image pickup camera; and

a second sensor for detecting a timing of photographing the cable end transported in the second direction along the bidirectional path by said image pickup camera,

said first sensor and said second sensor being located in positions deviated from an optical axis of said image pickup camera.

5,691,764
APPARATUS FOR EXAMINING TARGET OBJECTS SUCH AS LCD PANELS

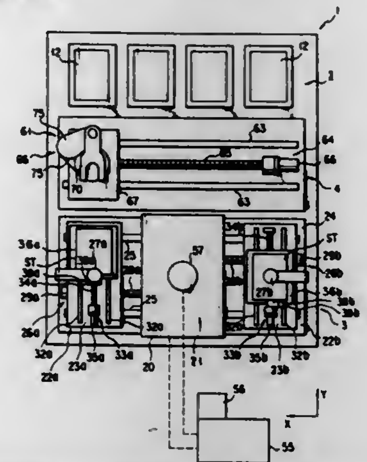
Kiyoshi Takekoshi; Shinji Iino, and Itaru Iida, all of Yamanashi-ken, Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Aug. 3, 1995, Ser. No. 510,669

Claims priority, application Japan, Aug. 5, 1994, 6-184375; Oct. 14, 1994, 6-249483

Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—86 **19 Claims**



1. An apparatus for examining target objects, comprising:

an examination mechanism provided within an examination area, for examining the target objects;

first and second alignment areas between which the examination area is interposed, for aligning the target objects;

first and second work tables onto which the target objects are to be loaded detachably;

driving means for moving said first and second work tables within a horizontal plane, said driving means allowing said first work table to move between said first alignment area and said examination area and allowing said second work table to move between said second alignment area and said examination area; and

control means for controlling said driving means such that said first and second work tables are moved in said first and second alignment areas, respectively, to align said target objects on said first and second work tables with a predetermined state corresponding to said examination mechanism, and said target objects on said first and second work tables are alternately examined within the examination area by said examination mechanism;

wherein said apparatus is a probe apparatus used in a lighting inspection system for LCD panels as said target objects, said examination mechanism includes probe electrodes for supplying an electrical signal to the LCD panels, and said probe apparatus comprises a light source for supplying light to the LCD panels during the lighting inspection.

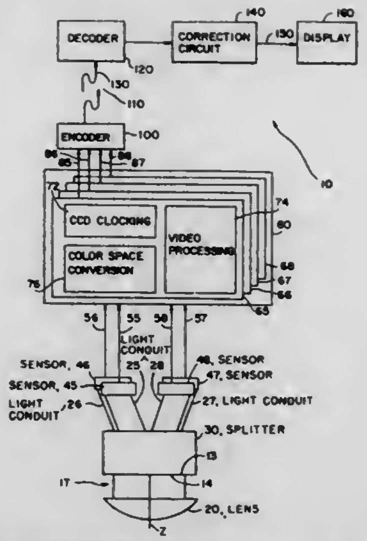
5,691,765
IMAGE FORMING AND PROCESSING DEVICE AND METHOD FOR USE WITH NO MOVING PARTS CAMERA

Steve W. Schieltz, Palm Beach County; Terry Laurence Glatt, Pompano Beach, and Carl Kupersmit, Palm Beach County, all of Fla., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Filed Jul. 27, 1995, Ser. No. 508,115

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—335 **11 Claims**



1. A method of video surveillance comprising the steps of:

providing a video camera having an image plane and a fisheye lens, the fisheye lens having a lens constant indicative of distortion caused by the fisheye lens, a primary axis and a substantially hemispheric field of view and the camera having an image plane, the image plane having a center point through which the primary axis passes;

mounting the camera at a mounting point vertically above a surveillance plane such that the primary axis of the fisheye lens lies substantially perpendicular to the surveillance plane;

causing the video camera to form a fisheye image, the fisheye image being distorted by the fisheye lens and comprising a plurality of pixels, each pixel having unique fisheye coordinates;

generating a corrected image of sub-area in the field of view by the steps of:

providing angular coordinates of an object in the field of view by simulating a hypothetical camera having a hypothetical axis and such that the hypothetical axis passes through the center point and the object in the field of view at specific pan and tilt angles;

selecting an area of the fisheye image, wherein the area comprises a subset of the plurality of pixels, each pixel of the subset being displaced from the specific pan angle by an angle "a";

determining the unique fisheye coordinates of each pixel of the subset of the plurality of pixels by means of a formula comprising the lens constant, the specific tilt angle "b" and the angle "a", said formula being given by

$$X_d = f.\cos^{-1}(\cos(a).\cos(b)).\cos(\tan^{-1}(\tan(a)/\sin(b)))$$

$$Y_d = f.\cos^{-1}(\cos(a).\cos(b)).\sin(\tan^{-1}(\tan(a)/\sin(b))),$$

where "f" is the lens constant and X_d and Y_d are the unique fisheye coordinates; and

mapping the pixels in the subset of the plurality of pixels to normal coordinates, thereby forming the corrected image of the sub-area.

5,691,766
VIDEO CAMERA WITH VENTED LIGHT

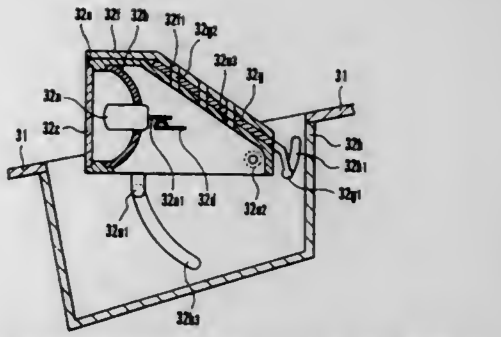
Yukiko Murata; Mutsumi Inuma, both of Kanagawa-ken, and Junichi Doi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 112,556, Aug. 26, 1993, abandoned. This application Nov. 15, 1995, Ser. No. 558,760

Claims priority, application Japan, Sep. 4, 1992, 4-262872; Sep. 7, 1992, 4-238362

Int. Cl.^{6} H04N *7/04*

U.S. Cl. 348—370 **11 Claims**



1. An electronic apparatus, comprising:

(a) an apparatus body;

(b) lighting means capable of being stowed in said apparatus body, wherein said lighting means having a heat dissipation hole formed therein, which is arranged to be capable of opening or closing;

(c) stowage control means for controlling the stowage of said lighting means in said apparatus body; and

(d) heat dissipation control means for controlling opening or closing operation of said heat dissipation hole according to stowage operation by said stowage control means.

5,691,767
VIDEO CONFERENCING SYSTEM WITH HIGH RESOLUTION STILL IMAGE CAPABILITY

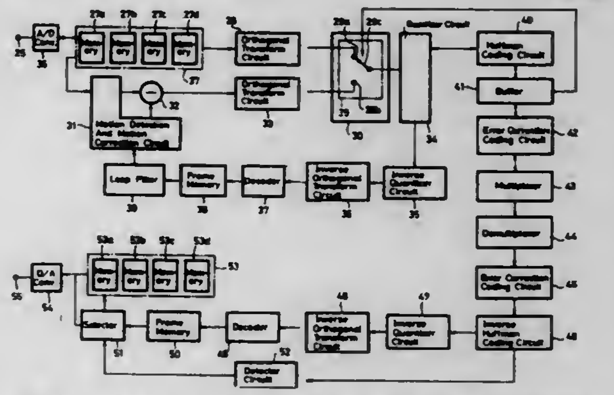
Katsumi Tahara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 958,739, Oct. 9, 1992, abandoned. This application Apr. 24, 1996, Ser. No. 638,987

Claims priority, application Japan, Oct. 15, 1991, 3-266370

Int. Cl.^{6} H04N *7/24*

U.S. Cl. 348—384 **17 Claims**



14. An apparatus for compressing a digital signal representing a high resolution video image, comprising:

means for receiving said digital signal representing a high resolution video image;

means for sampling said digital signal using a plurality of sampling clocks having respectively different phases to produce a plurality of sample digital signals, each of said sample digital signals representing a respective lower resolution video image;

a plurality of storage means each for storing a respectively different one of said sample digital signals;

means for differencing at least one of said sample digital signals stored in the respective storage means with a different one of said sample digital signals to produce a difference signal; and

means for outputting said difference signal as a compressed digital signal.

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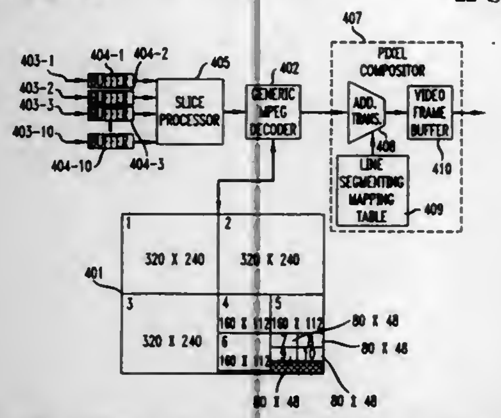
5,691,768
MULTIPLE RESOLUTION, MULTI-STREAM VIDEO SYSTEM USING A SINGLE STANDARD DECODER

Mehmet Reha Civanlar, Middletown, and Robert D. Gaglianello, Little Silver, both of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Jul. 7, 1995, Ser. No. 499,807

Int. Cl.^{6} H04N *7/46*

U.S. Cl. 348—392 **22 Claims**



1. A video decoding system for simultaneously decoding plural input bitstreams representing coded and compressed pixel data from frames of associated plural input video signals of plural input images to form a single output bitstream representing decoded and decompressed pixel data in frames of an output video signal that is a composite of the frames of the plural input video signals, each of said coded and compressed input bitstreams being coded and compressed in a frame divisible format of successive slices which represent the coded and compressed pixel data in one or more macroblocks of pixels in a frame of the associated input video signal, each slice having an identifiable delineated slice start code (SSC) which identifies a row of the slice in the frame of the associated input video signal, and a first macroblock in each slice having an identifiable macroblock address increment (MAI) which identifies the position of that first macroblock in the slice relative to a fixed position in the frame and which can be retrieved from the coded and compressed pixel data in the slice in the input bitstream, the system comprising:

a plurality of storage means, each storage means for storing a portion of one of said input bitstreams that represents the coded and compressed pixel data in a frame of the associated input video signal;

processing means for multiplexing slices of the coded and compressed pixel data from the stored portions of the input bitstreams in said plurality of storage means in a predetermined manner to form a combined bitstream of successive slices of coded and compressed pixel data that represents coded and compressed pixel data in a composite frame that is a composite of the frames of the input video signals associated with the multiplexed input bitstreams, the SSC of each slice being renumbered as necessary in the combined bitstream according to the row of the pixel data associated with the slice in the composite frame and the MAI of each slice being renumbered as necessary according to the relative position of the first macroblock of the slice in the composite frame; and

a single standard decoder which converts the combined bitstream of successive slices of coded and compressed pixel data associated with the composite frame to a decoded and decompressed composite frame of pixel data, wherein the decoded and decompressed composite frame of pixel data can be decoded and displayed as a single image comprising plural input images associated with the input bitstreams multiplexed by said processing means.

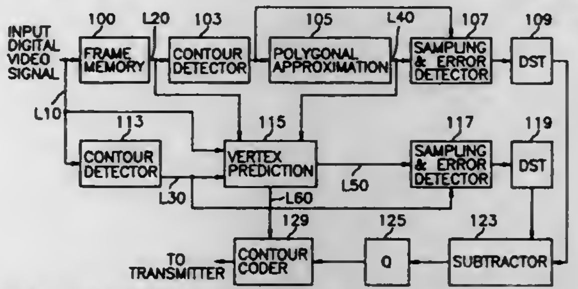
5,691,769
APPARATUS FOR ENCODING A CONTOUR OF AN OBJECT

Jin-Hun Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co, Ltd., Seoul, Rep. of Korea

Filed Sep. 7, 1995, Ser. No. 524,708

Int. Cl.^{6} H04N *7/24*

U.S. Cl. 348—403 **2 Claims**



1. An apparatus for encoding a contour of an object expressed in a digital video signal, said digital video signal having a plurality of frames including a current frame and a previous frame, which comprises:

a first contour detecting means for detecting a boundary of the object within the previous frame to generate a previous contour, wherein the previous contour provides previous boundary information for tracing the boundary of the object in the previous frame;

means for determining a number of vertex points on the previous contour;

means for providing a polygonal approximation of the previous contour by fitting the previous contour with a plurality of first line segments, to thereby generate vertex information representing the positions of the vertex points of the previous contour, each of the first line segments joining two neighboring vertex points;

first means for providing N sample points for each of the first line segments and calculating an error for each of the N sample points on each of the first line segments to produce a first set of errors for each of the first line segments, wherein said N sample points are equi-spaced on each of the first line segments and each of the first set of errors represents the distance between said each of the N sample points and the previous contour;

first transform means for transforming the first set of errors for each of the first line segments into a first set of discrete sine transform coefficients;

second contour detecting means for detecting a boundary of the object within the current frame to generate a current contour, wherein the current contour provides current boundary information for tracing the boundary of the object in the current frame;

means for detecting predicted vertex points based on an estimation of motion between the current and the previous frames through the use of the vertex information and the current boundary information from the current contour, to thereby provide predicted vertex information and motion vectors, the predicted vertex information representing the positions of the predicted vertex points and each of the motion vectors representing a displacement between a vertex point and its corresponding predicted vertex point;

second means for providing N sample points for each of second line segments joining two predicted vertex points and calculating an error for each of the N sample points on each of the second line segments to produce a second set of errors for each of the second line segments, wherein said N sample points are equi-spaced on each of the second line segments and each of the errors of the second set represents the distance between said each of the N sample points and the current contour;

second transform means for transforming the second set of errors for each of the second line segments into a second set of discrete sine transform coefficients;

means for generating a set of differences by subtracting the second set of discrete sine transform coefficients from the first set of discrete sine transform coefficients corresponding thereto;

means for converting the set of differences into a set of quantized differences; and

means for encoding the set of quantized differences and the motion vectors.

5,691,770
DEVICE AND METHOD FOR CODING VIDEO PICTURES

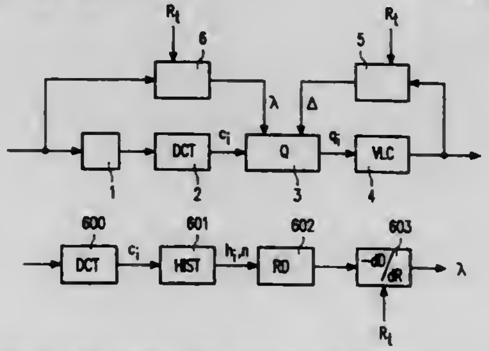
Gerrit J. Keesman; Willem M. J. Coene, and Eduard W. Salomons, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, NY, N.Y.

Filed Apr. 24, 1996, Ser. No. 637,254

Claims priority, application European Pat. Off., Apr. 25, 1995, 95201055

Int. Cl.^{6} H04N *7/32;7/30*

U.S. Cl. 348—405 **20 Claims**



1. A device for coding video pictures, comprising:

a picture transformer (2) for transforming blocks of pixels into coefficients;

coding means (3,4) for encoding said coefficients, the bit rate R and distortion D of the encoded picture being determined by a coding parameter (r_k);

means (3) for selecting one from a series of coding parameter values for which the sum D+λR is minimal for an applied value of λwherein λ is a Lagrangian multiplier; and

calculation means (6) for calculating the value of λ; characterized in that the calculation means (6) comprise:

means (**601**) for measuring the amplitude distribution of coefficients;

means (**602**) for estimating the bit rate R and distortion D from said amplitude distribution for a plurality of coding parameter values to obtain an estimated RD curve; and

means (**603**) for computing λ=–dD/dR at a selected point of said RD curve.

5,691,771
PROCESSING OF REDUNDANT FIELDS IN A MOVING PICTURE TO ACHIEVE SYNCHRONIZED SYSTEM OPERATION

Noriaki Oishi; Motoki Kato; Toshihiko Kitazawa, and Kazunori Yasuda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 26, 1995, Ser. No. 578,317

Claims priority, application Japan, Dec. 29, 1994, 6-340583

Int. Cl.^{6} H04N *3/36*

U.S. Cl. 348—97 **12 Claims**

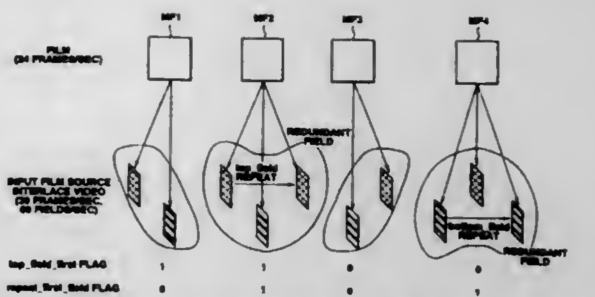
1. A method of processing a signal representing a moving picture which is divided into a plurality of frames such that each respective frame is formed of one odd field and one even field, the signal generated according to a 3:2 pull-down process where each respective redundant field is repeated after two respective frames for converting a motion picture film to a moving pictures video and supplied at a predetermined clock rate from a moving picture source for input to a signal processing device for predetermined processing operations on the input signal, said method comprising the steps of:

detecting a redundant field from the input signal;

combining the odd and even fields to form the respective frames such that the redundant field is eliminated from the input signal;

inserting a predetermined invalid frame into the input signal to obtain an output signal for processing at a substantially the same clock rate as the predetermined clock rate of the input signal such that the moving picture source and signal processing device are synchronized to operate at substantially the same clock rate; and

adding supplemental data to the output signal for indicating which of the respective odd and even fields are combined to form the respective frames and for indicating where the predetermined invalid frame is inserted, wherein the supplemental data includes a first flag for specifying whether the odd field precedes the even field in the respective frame of the input signal, a second flag for specifying whether the respective frame of the input signal contains two fields or three fields, and a third flag for specifying whether a current frame of the output signal is the predetermined invalid frame.



5,691,772
WHITE BALANCE ADJUSTMENT DEVICE

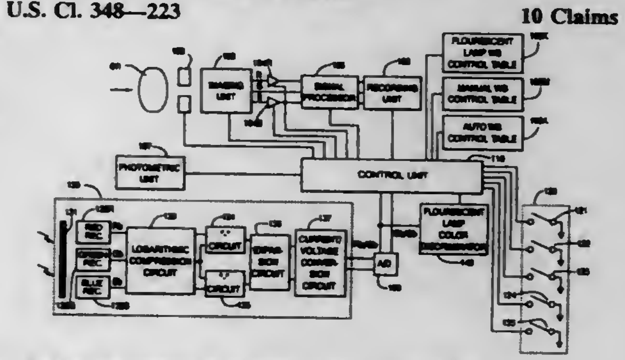
Masahiro Suzuki, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 157,482, Nov. 26, 1993, Pat. No. 5,504,525. This application Jun. 7, 1995, Ser. No. 485,120

Claims priority, application Japan, Nov. 25, 1992, 4-315357

Int. Cl.^{6} H04N *9/73*

U.S. Cl. 348—223 **10 Claims**



1. A white balance adjustment device comprising:

an imaging unit which forms and outputs an image signal of an illuminated subject;

an adjustment mode selection unit which selects a white balance adjustment mode from a fluorescent type adjustment mode and a nonfluorescent type adjustment mode;

a measurement unit which outputs a color value corresponding to measured color aspects of light received from the illuminated subject;

a fluorescent lamp color discrimination unit which selects a type of fluorescent lamp color from a first and second type of fluorescent lamp color in response to the color value output

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from the measurement unit when the fluorescent type adjustment mode is selected; and

a white balance adjustment unit which adjusts the white balance of the subject image signal in accordance with the adjustment mode selected by said adjustment mode selection unit, the color value output by said measurement unit, and the selected type of fluorescent lamp color.

5,691,773

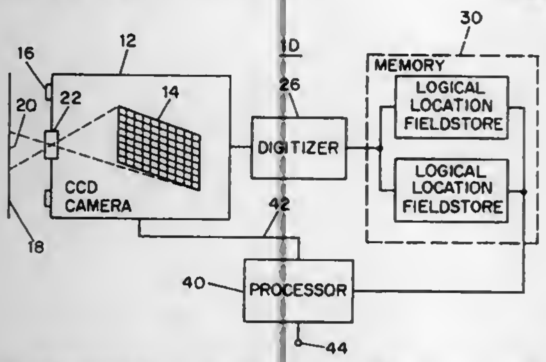
ANTI-HAND-JITTERING DATAFORM READERS AND METHODS

Ynjiun P. Wang, and Angi Ye, both of Fort Myers, Fla., assignors to Metanetics Corporation, Fort Myers, Fla.

Filed Sep. 12, 1995, Ser. No. 526,868

Int. Cl.^{6} H04N *9/64*

U.S. Cl. 348—249 **22 Claims**



1. A dataform reader, configured to reduce effects of image offset causing registration error between sequential fields of image data, comprising:

a sensor array responsive to illumination reflected from a dataform to provide signals representative of illumination levels on first and second groups of sensors respectively representing first and second field images subject to image offset;

a memory coupled to said sensor array to store first field image data representative of said illumination levels on the first group of sensors and to store second field image data representative of said illumination levels on the second group of sensors; and

a processor arranged to access said memory to utilize said first field image data to decode a portion of said dataform and to utilize said second field image data to supplement decoding of said dataform.

5,691,774

APPARATUS FOR DETECTING MOTION VECTOR AND ENCODING PICTURE SIGNALS

Kazunori Yasuda, Kanagawa; Tsuyoshi Oda, Chiba, and Kouichi Uchide, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 26, 1995, Ser. No. 507,103

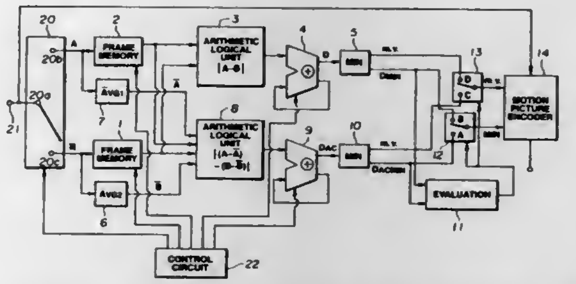
Claims priority, application Japan, Jul. 27, 1994, 6-175529

Int. Cl.^{6} H04N *7/36*

U.S. Cl. 348—413 **7 Claims**

1. A method for comparing data representing a first sequential picture frame and a second sequential picture frame to detect a motion vector, comprising the steps of:

generating a first motion vector and first minimum value by block matching said data of said first sequential picture frame and said second sequential picture frame on the basis of luminance patterns included in said picture frames and calculating a difference between matched blocks of said first and second sequential picture frames, wherein a luminance pattern is obtained by eliminating dc components from a luminance signal so as to yield only ac components;



generating a second motion vector and second minimum value by block matching said data of said first sequential picture frame and said second sequential picture frame and calculating a difference between matched blocks of said first sequential picture frame data and said second sequential picture frame data;

evaluating said first motion vector and first minimum value against said second motion vector and second minimum value to determine which meets a predetermined criteria;

outputting either said first motion vector and first minimum value or said second motion vector and second minimum value as an optimum motion vector and optimum minimum value based upon said evaluating; and

encoding video frame data based upon said optimum motion vector and optimum minimum value.

5,691,775

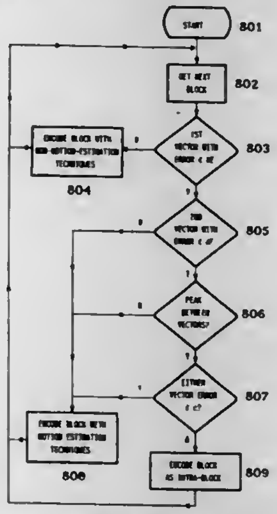
REDUCTION OF MOTION ESTIMATION ARTIFACTS

Brian Astle, Plainsboro, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 30, 1995, Ser. No. 413,189

Int. Cl.^{6} H04N *7/12*

U.S. Cl. 348—416 **18 Claims**



1. A computer-implemented method for processing video signals representative of pixels of a current block of a current picture, the method comprising the steps of:

(a) comparing the current block to a plurality of blocks of a previous picture to provide a plurality of corresponding motion vectors, wherein each motion vector corresponds to a respective motion estimation error measure;

(b) determining whether the current block contains at least one region of high spatial energy and at least one region of relatively low spatial energy associated with different motion vectors of the plurality of corresponding motion vectors; and

(c) encoding the block in accordance with the determination of step (b).

5,691,776

METHOD OF TRANSMITTING TELTEXT PAGES INCLUDING AN INDEX TABLE WITH A CODE FOR SELECTING PARTICULAR AND COMMON EXTENSION PAGES TO ENHANCE BASIC PAGES

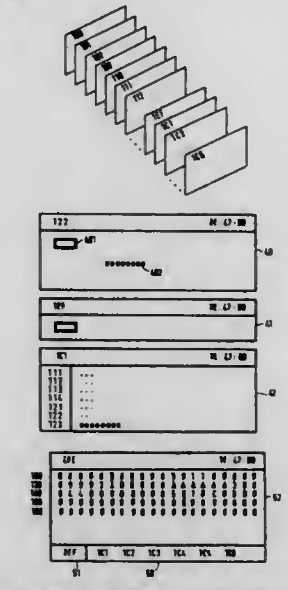
Henricus A. W. Van Gestel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 353,840, Dec. 12, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 657,495

Claims priority, application European Pat. Off., Jun. 16, 1994, 94201729

Int. Cl.^{6} H04N *7/08;7/087*

U.S. Cl. 348—467 **15 Claims**



1. A method of transmitting teletext pages including a plurality of basic pages and an extension page for enhancing said basic pages, characterized in that the method comprises the step of transmitting a list of extension pages and a table of codes, wherein each code links one of said basic pages to at least one selected extension page, and each code comprises a bit for linking said basic page to a predetermined one of said list of extension pages, and a multibit value identifying a further one of said list of extension pages.

5,691,777

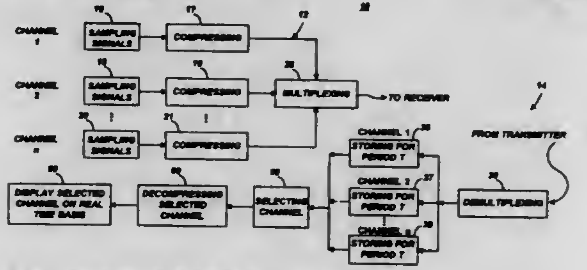
METHOD AND APPARATUS FOR SIMULTANEOUS COMPRESSION OF VIDEO, AUDIO AND DATA SIGNALS

Lord Samuel Anthony Kassatly, 4150 Middlefield Rd., Palo Alto, Calif. 94303

Continuation-in-part of Ser. No. 573,539, Aug. 27, 1990, Pat. No. 5,157,491, which is a continuation-in-part of Ser. No. 457,403, Dec. 18, 1989, Pat. No. 4,975,771, which is a continuation-in-part of Ser. No. 308,826, Feb. 10, 1989, Pat. No. 4,903,126, and a continuation-in-part of Ser. No. 258,722, Oct. 17, 1988, abandoned. This application Jan. 27, 1992, Ser. No. 826,372

Int. Cl.^{6} H04N *7/12;11/02*

U.S. Cl. 348—408 **25 Claims**



1. A compression apparatus comprising:

a transform device for accepting video signals and for generating transform components therefrom;

a selector connected to said transform device, for selecting desirable transform components;

said selector prioritizing said selected desirable transform components according to an allocation scheme:

compressor for compressing only said prioritized selected desirable transform components according to said allocation scheme;

a multiplexer for multiplexing said prioritized and compressed transform components;

wherein the video signals include signals from at least a first and second sources;

wherein said selector selects and determines the priority of allocation of desirable transform components for said at least first and second sources;

wherein said multiplexer multiplexes said selected desirable transform components from said first and second sources according to said allocation scheme; and

wherein said signals from said second source include non-video signals that have been modulated onto desirable video frequencies.

5,691,778

DOUBLE-WIDE TELEVISION SET HAVING DOUBLE-DECK VIDEOCASSETTE RECORDER AND CD-OK SYSTEM AND METHOD OF CONTROLLING THE SAME USING GRAPHIC-REMOTE CONTROLLER

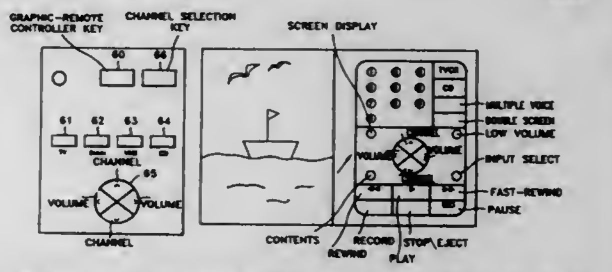
Kwon-eui Song, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Feb. 6, 1996, Ser. No. 597,120

Claims priority, application Rep. of Korea, Aug. 31, 1995, 95-28489

Int. Cl.^{6} H04N *5/44*

U.S. Cl. 348—564 **1 Claim**



1. A method of controlling a double-wide television set having at least one sub-screen, using a simplified remote controller having a graphic-remote controller key and one or more selection keys, said method comprising the steps of:

(a) displaying the graphic-remote controller on the sub-screen of the double-wide television set by depressing the graphic-remote controller key;

(b) selecting a predetermined block in said graphic-remote controller displayed on the sub-screen in step (a) by depressing one of said selection keys, and displaying on the sub-screen a control command graphic of the selected block;

(c) inputting a predetermined control command by shifting a cursor position in the control command graphic displayed in step (b);

(d) performing an operation corresponding to the predetermined control command input from said step (c);

(e) displaying the graphic-remote controller on the sub-screen if the operation is completed in step (d) and awaiting another input; and

(f) terminating the program if the graphic-remote controller key is depressed and returning to step (b) if any of the selection keys, other than the graphic-remote controller key, is depressed.

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5,691,779
COLOR CONVERSION APPARATUS THAT RESTRICTS THE COLOR REPRODUCTION RANGE OF PRIMARY COLOR SIGNALS

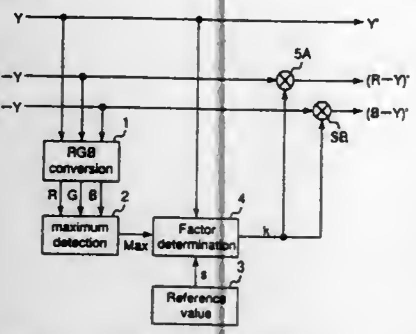
Haruo Yamashita, Ibaraki, and Tsumoru Fukushima, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 421,930, Apr. 14, 1995, Pat. No. 5,619,280. This application Dec. 13, 1996, Ser. No. 764,184

Claims priority, application Japan, Apr. 14, 1994, 6-75848

Int. Cl.^{6} H04N *9/68*

U.S. Cl. 348—645 **1 Claim**



1. A color conversion apparatus comprising:
- a primary color conversion means that converts a video signal consisting of a luminance signal and two color difference signals into primary color signals,
- a maximum value detecting means that selects and outputs the maximum value of the outputs of said primary color conversion means for each pixel,
- a reference value setting means that sets an admissible maximum level of said primary color signals,
- a factor determining means that determines, depending on said luminance signal, a correction factor that restricts the output of said maximum value detecting means to a value not greater than the output of said reference value setting means, and
- a multiplying means that multiplies said two color difference signals by said correction factor,

said color conversion apparatus outputting the outputs of said multiplying means as new color difference signals.

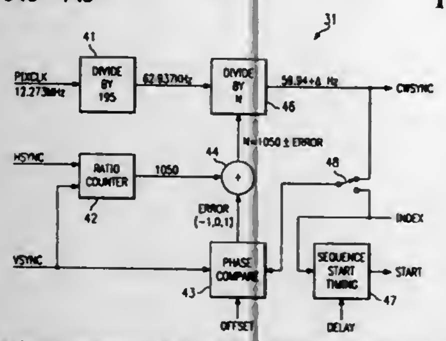
5,691,780
PHASE ERROR CONTROL FOR COLOR WHEEL

Stephen W. Marshall, Richardson; Donald Hicks, Lewisville, and William R. Breithaupt, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 13, 1995, Ser. No. 489,971

Int. Cl.^{6} H04N *9/12;9/475*

U.S. Cl. 348—743 **11 Claims**



1. A method of providing a color wheel sync signal for synchronizing a color wheel to an incoming video signal, where said video signal has been sampled with a pixel clock and converted from a series of interlaced fields to a series of frames separated in accordance with a vertical sync signal, and where said color wheel generates at least one index signal per revolution, comprising the steps of:
- receiving an input signal that causes a potential phase difference between said vertical sync signal and one of said index signal and said color wheel sync signal;
- comparing said one of said index signal and said color wheel sync signal said vertical sync signal; thereby providing a phase error value;
- dividing said pixel clock by one-fourth the number of pixels per line, thereby providing a divided pixel clock signal;
- adding said phase error value to the number of lines in two frames; and
- dividing said divided pixel clock signal by the result of said adding step, thereby providing said color wheel sync signal.

5,691,781
FIXATION OF CATHODE RAY TUBE IN TV RECEIVER CABINET

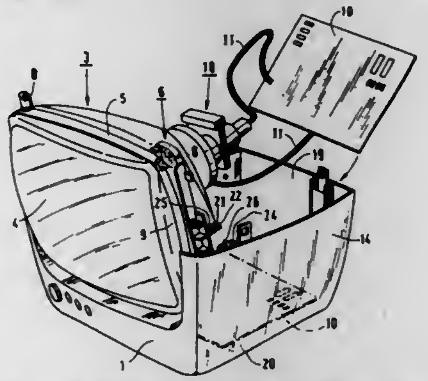
Giovanni Siccardo, Bercamo, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1996, Ser. No. 673,784

Claims priority, application European Pat. Off., Jun. 23, 1995, 95201716

Int. Cl.^{6} H04N *5/64;5/645;5/655;1/46*

U.S. Cl. 348—827 **8 Claims**



1. A TV receiver comprising a cabinet, a cathode ray tube with a substantially rectangular screen and two brackets which are secured to lateral parts of the cathode ray tube for the purpose of mounting the cathode ray tube in the cabinet, characterized in that the cabinet comprises a lower and an upper cabinet part, said lower cabinet part being box-shaped and having a base on which television circuits are mounted, vertical sides and a open top portion, one of said vertical sides having an opening therein for at least partially receiving the cathode ray tube, and said upper cabinet part having a shape complementary to said lower cabinet part for receiving a remaining portion of said cathode ray tube and for closing the open top portion of said lower cabinet part, and said brackets and said lower cabinet part comprise means for temporarily positioning and holding the cathode ray tube in a tilted position in the lower cabinet part allowing access to the television circuits mounted on the base of the lower cabinet part for servicing purposes.

5,691,782
LIQUID-CRYSTAL DISPLAY WITH INTER-LINE SHORT-CIRCUIT PREVENTIVE FUNCTION AND PROCESS FOR PRODUCING SAME

Ryuji Nishikawa, Hashima-gun, and Yoshikazu Hirose, Anpachi-gun, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

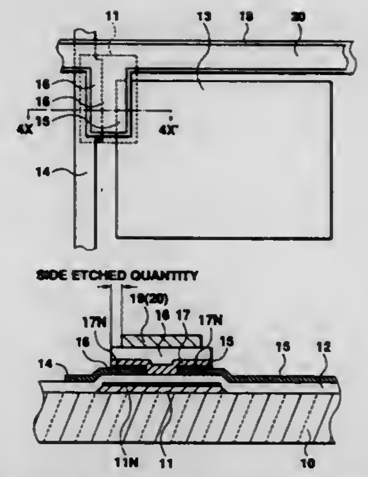
Filed Jul. 7, 1995, Ser. No. 499,633

Claims priority, application Japan, Jul. 8, 1994, 6-157310; Dec. 9, 1994, 6-306549

Int. Cl.^{6} G02F *1/136;1/1333*

U.S. Cl. 349—47 **12 Claims**

1. A liquid-crystal display comprising:
- a plurality of pixel electrodes for driving a liquid crystal set in a matrix array on a substrate,



- a plurality of drain lines formed between columns of said pixel electrodes,
- a plurality of gate lines formed between rows of said pixel electrodes, said gate lines patterned into a first shape and having lower layers including an insulating layer and a semiconductor layer each patterned into a second shape substantially similar to said first shape of said gate lines under an entire region of said gate lines, and
- a plurality of thin film transistors, each formed adjacent to a crossing point of a corresponding one of said drain lines and a corresponding one of said gate lines, each applying a voltage to a corresponding one of said pixel electrodes; each of said thin film transistors having:
  - a source electrode including a portion of said corresponding one of said pixel electrodes,
  - a drain electrode including a portion of said corresponding one of said drain lines, said semiconductor layer formed to extend over said source electrode and said drain electrode, said insulating layer formed on said semiconductor layer, and
  - a gate electrode formed on said insulating layer and including a portion of said corresponding one of said gate lines, wherein said corresponding one of said gate lines and said gate electrode are formed to be narrower than a line width of said insulating layer.

5,691,783
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR DRIVING THE SAME

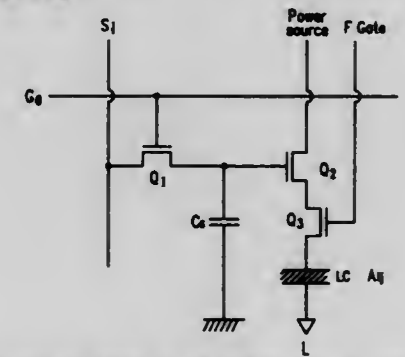
Takaji Numao, Nara, Japan; Akira Tagawa, Oxford, United Kingdom; Kazuhiko Tamai, Tenri, Japan; Mitsuhiro Koden, and Tokihiko Shinomiya, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1994, Ser. No. 269,450

Claims priority, application Japan, Jun. 30, 1993, 5-161616; Aug. 31, 1993, 5-216211; Jun. 7, 1994, 6-125602

Int. Cl.^{6} G02F *1/136;1/141;* **G09G** *3/36*

U.S. Cl. 349—48 **4 Claims**



1. A ferroelectric liquid crystal display device, comprising:
- a plurality of pixels, each including:
  - ferroelectric liquid crystal material having ferroelectric liquid crystal molecules therein, capable of being aligned in a first stable alignment state, whereby a principal axis of each of the molecules is aligned at an angle ω with respect to a central line, and of being aligned in a second stable alignment state, whereby the principal axis of each of the molecules is aligned at an angle −ω with respect to the central line; and
  - a pair of polarizers on opposite sides of the ferroelectric liquid crystal material, a polarizing axis of one of the polarizers being substantially aligned with the central line,
- wherein the plurality of pixels are arranged in a matrix, and each of the plurality of pixels is connected to a driving circuit including:
  - a first switching device for controlling an output of a driving signal;
  - a charge-retaining capacitance for receiving an output from the first switching device; and
  - a second switching device for receiving the output received by the charge-retaining capacitance from the first switching device as a switching control signal for controlling an output of a charge for display sent from a display power source and for sending the charge for display to establish an arbitrary field across the ferroelectric liquid crystal molecules in the corresponding pixel, and
- wherein the driving circuit comprises
  - a third switching device, connected between the second switching device and the pixel, for controlling an output of the charge for display sent from the second switching device to the corresponding pixel, wherein
  - the first switching devices are activated line by line to store a prescribed charge in each of the charge-retaining capacitances, and thereafter a plane-scanning switching control signal is supplied to each of the third switching devices to update the charges for display stored in the pixels substantially simultaneously.

5,691,784
APPARATUS FOR THE PROJECTION OF FRINGE-LIKE LIGHT PATTERNS

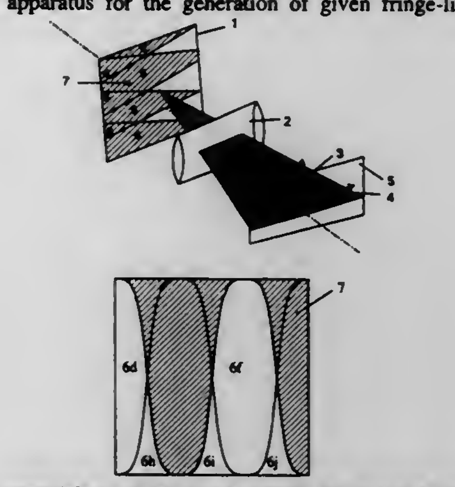
Gerd Häusler, Alterlanger Str. 33, D-97056 Erlangen, and Ralf Lampalzer, Hirschenrangen 46, D-90607 Rueckersdorf, both of Germany

Filed Dec. 12, 1994, Ser. No. 355,291

Claims priority, application Germany, Dec. 15, 1993, 43 42 830.4

Int. Cl.^{6} G02F *1/13;1/1343;* **G01B** *11/24*

U.S. Cl. 349—1 **9 Claims**



1. An apparatus for the generation of given fringe-like light patterns, comprising a mask, and an astigmatic imaging system for projecting light from said mask onto an object; wherein
- the mask is assembled from non-stripe shaped sub-areas, and
- a transparency or a luminance of said sub-areas can be controlled, and

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said sub-areas are controlled to be bright or dark, in a way that their combination results in a desired sub-mask, the projected image of said sub-mask onto said object displaying the desired fringe-like light-pattern,

wherein it is possible to switch over between different given light patterns by other combinations of bright or dark controlled sub-areas,

said sub-areas are shaped in a way that the transparent part of the formed sub-mask varies continuously in x-direction, such that a light pattern is formed with continuous variation of brightness, and

said sub-areas are shaped in a way that some of said sub-areas are controlled to be bright with two or more of said light patterns.

5,691,785

COLOR PROJECTION TYPE DISPLAY APPARATUS HAVING THREE LIQUID DISPLAYS OF SAME STRUCTURE

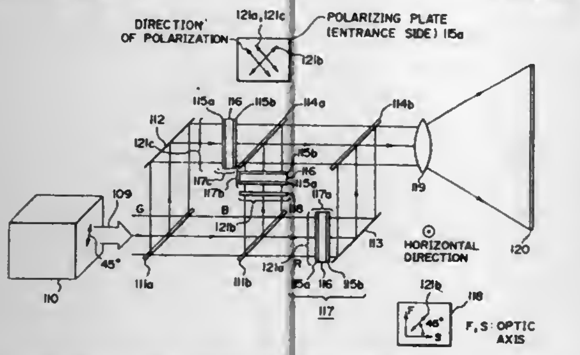
Masahlro Usui; Hiroshi Kida; Shinsuke Shikama, and Mitsushige Kondo, all of Nagaokakyo, Japan, assignors to Mltsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 203,607, Feb. 28, 1994, Pat. No. 5,570,209, which is a continuation of Ser. No. 760,927, Sep. 17, 1991, abandoned. This application Jun. 10, 1996, Ser. No. 659,562

Claims priority, application Japan, Sep. 18, 1990, 2-250494; Sep. 18, 1990, 2-250495; Sep. 20, 1990, 2-252564

Int. Cl.^{6} G02F *1/1335;* **H04N** *9/31*

U.S. Cl. 349—8 **5 Claims**



1. A projection type display apparatus, comprising:

polarized light source means for generating light and converting the light into a first linearly polarized light to be outputted;

spectroscope means including dichroic mirror means for separating said first linearly polarized light into light rays of red, green and blue colors;

three liquid crystal display elements each of which permits the respective light rays of red, green and blue colors to pass therethrough, the transmittance of each pixel being controlled by a desired image signal, each of said liquid crystal display elements including a liquid crystal cell and a pair of polarizing plates disposed on opposite sides of said liquid crystal cell, said three liquid crystal display elements being of the same structure and outputting image-bearing light rays;

a phase plate disposed on the entrance side of a particular one or two of said three liquid crystal display elements, said phase plate being adapted to rotate the plane of polarization of said first linearly polarized light through 90 degrees; and

a projecting lens for enlarging and projecting said image-bearing light rays.

5,691,786

LIQUID CRYSTAL DISPLAY DEVICE HAVING COMPENSATING CAPACITIVE ELEMENT FOR DEFECTIVE PIXELS

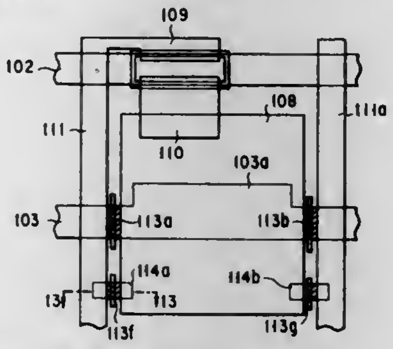
Yutaka Nakal, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 17, 1995, Ser. No. 516,362

Claims priority, application Japan, Aug. 24, 1994, 6-199378

Int. Cl.^{6} G02F *1/1343*

U.S. Cl. 349—39 **25 Claims**



1. A liquid crystal display device comprising:

transparent substrate;

plurality of pixel electrodes arranged in rows and columns on the transparent substrate;

a plurality of thin film transistors arranged in the rows and the columns and dedicated to the pixel electrodes, respectively, the thin film transistors serving as switching elements and having gate electrodes, source regions and drain regions, respectively;

a plurality of scan lines arranged in a direction of the rows and connected to the gate electrodes of the thin film transistors, respectively;

a plurality of signal lines arranged in a direction of the columns and connected to the drain regions of the thin film transistors, respectively;

a plurality of storage capacitive lines arranged in the direction of the rows;

a plurality of storage capacitive elements having storage capacitive electrodes opposed to parts of the pixel electrodes, respectively, and first insulating films interposed between the storage capacitive electrodes and the pixel electrodes, respectively, the storage capacitive electrodes constituting capacitances together with the pixel electrodes, respectively;

a plurality of first cut regions each including a first conductor electrically disconnectably formed between a corresponding one of the storage capacitive lines arranged in the direction of the rows and a corresponding one of the storage capacitive electrodes of the storage capacitive elements arranged in the direction of the rows;

a plurality of compensating storage capacitive elements dedicated to the pixel electrodes, respectively; and

a plurality of second cut regions each including a second conductor electrically disconnectably formed between a corresponding one of the pixel electrodes and a corresponding one of the compensating storage capacitive elements;

wherein each of the compensating storage capacitive elements is a capacitive element interposed between a corresponding one of the scan lines and a corresponding one of the pixel electrodes located adjacent to the corresponding one of the scan lines.

5,691,787

ACTIVE MATRIX TYPE LCD HAVING SHORT RESISTORS MADE OF MICROCRYSTALLINE N+SI

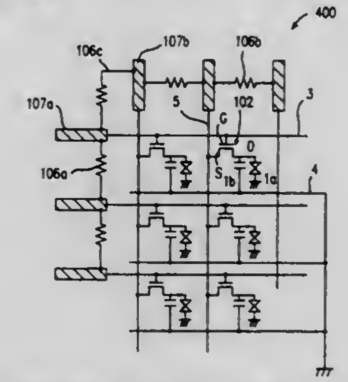
Takayuki Shimada; Kazushige Miyamoto, both of Yamatokoriyama; Shinya Tanaka, Sakai, and Naofumi Kondo, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1996, Ser. No. 681,965

Claims priority, application Japan, Aug. 25, 1995, 7-217983

Int. Cl.^{6} G02F *1/1333;1/136;1/1343;* **H01L** *29/04*

U.S. Cl. 349—40 **8 Claims**



1. An active matrix type liquid crystal display device comprising:

a first substrate including a plurality of gate signal lines, a plurality of source signal lines crossing the plurality of gate signal lines, a switching element provided in the vicinity of each crossed point of the plurality of gate signal lines and the plurality of source signal lines, and a pixel electrode connected to the switching element;

a second substrate having a counter electrode; and

a liquid crystal layer interposed between the first and second substrates,

wherein at least the plurality of gate signal lines are connected to each other by short resistors made of microcrystalline n+Si.

5,691,788

LCD HAVING A POLARIZATION OR DIFFUSION PLATE WITH AN IRREGULARLY COATED FIRST OPAQUE MATERIAL AND A BLACK MATRIX OF A SECOND OPAQUE MATERIAL

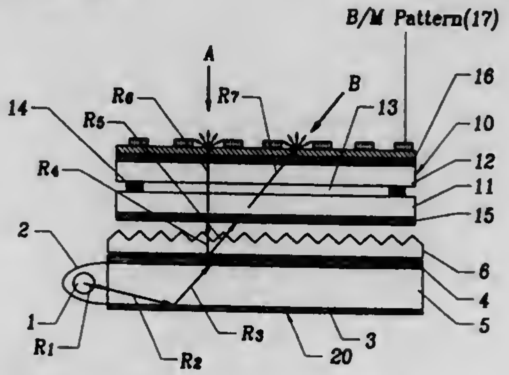
Dong-gyu Kim, Kyonggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 11, 1996, Ser. No. 586,462

Claims priority, application Rep. of Korea, Jan. 6, 1995, 95-182

Int. Cl.^{6} G02F *1/1335;1/1333*

U.S. Cl. 349—96 **15 Claims**



1. A liquid crystal display (LCD), comprising:

a backlight;

a liquid crystal cell;

a diffusion plate for diffusing light after passing through said liquid crystal cell, said diffusion plate being made of a transparent plate on which transparent material is coated ruggedly;

first opaque material irregularly coated with a predetermined density on said diffusion plate; and

a black matrix of second opaque material printed on said diffusion plate with a pattern corresponding to a shape of said liquid crystal cell.

5,691,789

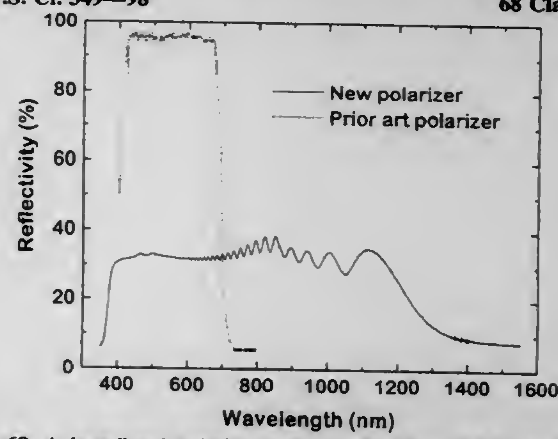
SINGLE-LAYER REFLECTIVE SUPER BROADBAND CIRCULAR POLARIZER AND METHOD OF FABRICATION THEREFOR

Le Li, 3491 Overlook Ave., Yorktown Heights, N.Y. 10598, and Sadeg Mustafa Faris, 24 Pocantico River Rd., Pleasantville, N.Y. 10570

Filed Oct. 30, 1995, Ser. No. 550,022

Int. Cl.^{6} G02F *1/1335;1/13;* **C09K** *19/36;* **G02B** *5/30*

U.S. Cl. 349—98 **68 Claims**



68. A broadband polarizer comprising a film of at least one material having a cholesteric order which includes sites of varying helix pitch distributed across the thickness of said film and at least one liquid crystal material distributed across the thickness of said film and disposed at said sites at least one of said materials being unpolymerized, said film having a given bandwidth.

5,691,790

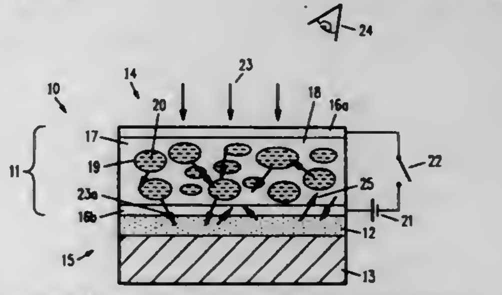
COLORED LIQUID CRYSTAL DISPLAY HAVING A REFLECTOR WHICH REFLECTS DIFFERENT WAVELENGTHS OF LIGHT FOR DIFFERENT INCIDENT ANGLES

John Havens, Menlo Park, and Paul S. Drzaic, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 4, 1995, Ser. No. 511,161

Int. Cl.^{6} G02F *1/1335;1/333;* **G02B** *5/32*

U.S. Cl. 349—113 **20 Claims**



1. A colored reflective liquid crystal display, comprising

a light valve which substantially scatters light in a scattering state and is substantially transparent in a non-scattering state,

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comprising a liquid crystal composite wherein plural volumes of liquid crystal material are dispersed in an encapsulating medium;

said light valve having a viewing and a non-viewing side, wherein some of the light scattered in the scattering state is forwardly scattered; and

a reflector disposed on said non-viewing side of said light valve which reflects white light toward said viewing side when said light valve is in the scattering state, and reflects colored light toward said viewing side when said light valve is in the non-scattering state, wherein the wavelength of the light reflected by said reflector is dependent on the incidence angle of the light.

5,691,791

REFLECTIVE LIQUID CRYSTAL DISPLAY DEVICE AND REFLECTOR

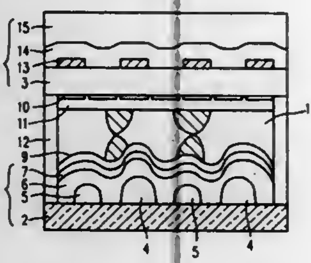
Kozo Nakamura, Tenri; Hisakazu Nakamura, Yamatokoriyama; Seiichi Mitsui, Kashiwa; Naofumi Kimura, Nabari, and Kazuhiko Tsuda, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

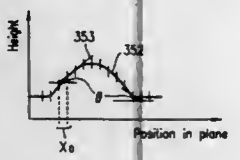
Continuation-in-part of Ser. No. 281,004, Jul. 27, 1994, Pat. No. 5,559,617. This application May 13, 1996, Ser. No. 645,493

Claims priority, application Japan, Jul. 30, 1993, 5-190500; Mar. 26, 1996, 8-070789

Int. Cl.⁶ G02F *1/1335;1/1347*

U.S. Cl. 349—113 **15 Claims**





1. A reflective liquid crystal display device including a first substrate and a second substrate, a liquid crystal layer interposed between the first and second substrates, a polarizing plate, and a reflection layer;

wherein the polarizing plate and the reflection layer are located on opposite sides of the liquid crystal layer, and

further wherein a surface of the reflection layer reflecting light has projections, and flat portions, the flat portions being areas where a tilt angle of a tangent line drawn against a profile of the surface with the projections is less than 2°, in the flat portions occupying in a 20% to 60% of the total surface area of the surface.

5,691,792

METHOD FOR PRODUCING A LIQUID CRYSTAL DISPLAY APPARATUS BY IRRADIATING AN ALIGNING FILM WITH LIGHT TO REDUCE PRETILT ANGLES OF LIQUID CRYSTAL MOLECULES THEREOF

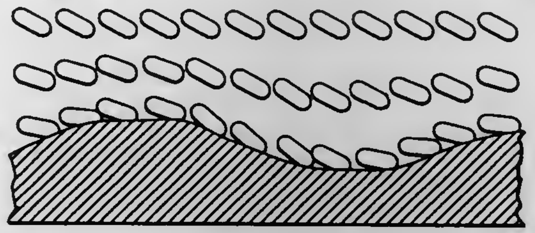
Shigeaki Mizushima, Ikoma; Kazuyuki Aburazaki, Tenri; Noriko Watanabe, Nara; Mitsuaki Hirata, Tenri; Hiroko Iwagoe, Yamatokoriyama, and Tomoko Okamura, Funabashi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 187,547, Jan. 28, 1994. This application May 24, 1995, Ser. No. 449,115

Claims priority, application Japan, Jan. 29, 1993, 5-14177; Jun. 4, 1993, 5-134983; Jul. 22, 1993, 5-181738; Jul. 30, 1993, 5-190499; Aug. 27, 1993, 5-213229

Int. Cl.⁶ G02F *1/1337*

U.S. Cl. 349—124 **14 Claims**



1. A method for producing a liquid crystal display apparatus having a pair of substrates with a liquid crystal layer interposed therebetween and having picture elements disposed in a matrix, the method comprising the steps of:

forming a film to be an aligning film for controlling the alignment of liquid crystal molecules in the liquid crystal layer, on at least one of the pair of substrates; and

irradiating the film with light to reduce the pretilt angles of liquid crystal molecules, and providing an aligning property to the film.

5,691,793

LIQUID CRYSTAL DISPLAY APPARATUS HAVING GAP ADJUSTING MEANS UNDER THE SEALING REGION

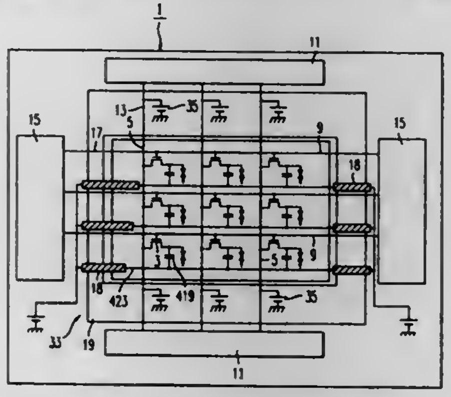
Yoshihiro Watanabe, Yokohama; Hiroki Nakamura, Chigasaki, and Takako Sugawara, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 196,215, Jul. 13, 1994, Pat. No. 5,504,601. This application Dec. 22, 1995, Ser. No. 577,662

Claims priority, application Japan, Jul. 15, 1992, 4-187908

Int. Cl.⁶ G02F *1/1339*

U.S. Cl. 349—155 **21 Claims**



1. A liquid crystal display apparatus, comprising:

a switching element array substrate having switching elements, scanning lines, signal lines, and pixel electrodes, said scanning lines and said signal lines being coupled to said switching elements, said pixel elements being coupled to said switching elements;

a scanning line driver circuit coupled to said scanning lines;

a signal line driver circuit coupled to said signal lines;

an opposed substrate having a counter electrode being arranged opposite to said switching element array substrate with a gap in order to define a display region, said opposed substrate being bonded to said switching element array substrate with a sealing member formed in a sealing region around said display region; and

an optical modulating layer formed at the gap between said switching element array substrate and said opposed substrate and sealed with said sealing member,

wherein said switching element array substrate includes adjusting means for adjusting a first gap between a first region of said switching element array substrate and said opposed substrate to be equal to a second gap between a second region of said switching element array substrate and said opposed substrate, said first region of said switching element array substrate being located under the sealing member and between the display region and the scanning line driver circuit, said second region of said switching element array substrate being located under the sealing member and between the display region and the signal line driver circuit, and

said adjusting means being arranged in at least one of said first and second regions.

5,691,794

LIQUID CRYSTAL DISPLAY DEVICE

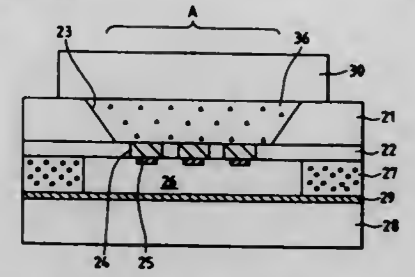
Junichi Hoshi, Hadano; Shigetoshi Sugawa, Atsugi; Shunsuke Inoue, Yokohama; Osamu Hamamoto, Hiratsuka; Yoshihiko Fukumoto, Atsugi; Yutaka Genchi, Tokyo; Masaru Kamio, Kawasaki, and Mamoru Miyawaki, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1994, Ser. No. 189,169

Claims priority, application Japan, Feb. 1, 1993, 5-033958; Feb. 1, 1993, 5-033962; Feb. 1, 1993, 5-033969; Feb. 1, 1993, 5-033970; Feb. 1, 1993, 5-033971; Feb. 1, 1993, 5-033972; Dec. 24, 1993, 5-345940

Int. Cl.⁶ G02F *1/1333;1/136*

U.S. Cl. 349—158 **20 Claims**



1. A liquid crystal display device comprising:

a substrate having a plurality of picture element electrodes provided on a first plane of said substrate;

an opposed electrode oriented opposed to said picture element electrodes; and

a liquid crystal provided between said picture element electrodes and said opposed electrode,

said liquid crystal display device further comprising a concave portion formed in a light-translucent region of said substrate corresponding to said picture element electrodes in a second plane opposite said first plane, and said concave portion being sealed by a transparent substrate to form a space, said space having a light transmitting and flowable material enclosed therein.

5,691,795

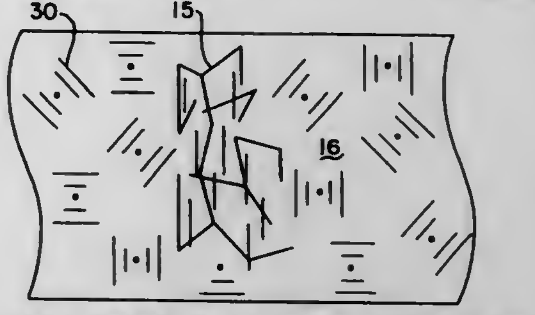
POLYMER STABILIZED LIQUID CRYSTALLINE LIGHT MODULATING DEVICE AND MATERIAL

J. William Doane, Kent; Deng-Ke Yang, and Liang-Chy Chien, both of Stow, all of Ohio, assignors to Kent State University, Kent, Ohio

Continuation of Ser. No. 969,093, Oct. 30, 1992, Pat. No. 5,437,811, and a continuation-in-part of Ser. No. 694,840, May 2, 1991, abandoned, and a continuation-in-part of Ser. No. 885,154, May 18, 1993, Pat. No. 5,384,067. This application Apr. 20, 1995, Ser. No. 425,289

Int. Cl.⁶ G02F *1/13;1/1335;1/1333*

U.S. Cl. 349—169 **21 Claims**



1. A light modulating cell comprising liquid crystalline light modulating material of liquid crystal and phase-separated domains of polymer which form a cell wall structure, the liquid crystal being a chiral nematic liquid crystal having positive dielectric anisotropy and including chiral material in an amount effective to form a focal conic texture having a pitch length effective to reflect light outside the visible spectrum, said cell wall structure and liquid crystal cooperating to form a stable focal conic texture in the absence of a field, and to permit the liquid crystal to change textures upon the application of a field, and wherein said phase separated domains are formed in the presence of a field effective to homeotropically align the liquid crystal such that a portion of the liquid crystal in the vicinity of the domains is characterized by a preferential homeotropic alignment in the absence of a field, the resulting material being characterized by light scattering focal conic texture in the absence of a field and optically clear homeotropic alignment in a field-ON condition.

5,691,796

OPHTHALMIC MOUNTING FOR BIFOCAL LENSES

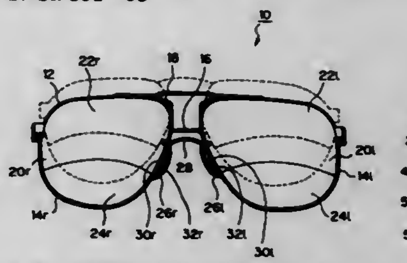
Tohru Negishi, 264-2, Bonsai-cho, Omiya-shi, Saitama-ken, Japan

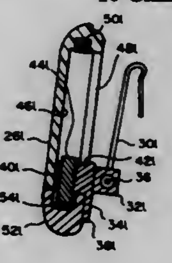
Filed Oct. 29, 1996, Ser. No. 739,205

Claims priority, application Japan, Nov. 2, 1995, 7-320932

Int. Cl.⁶ G02C *7/06;5/12*

U.S. Cl. 351—55 **16 Claims**





1. An ophthalmic mounting comprising:

a pair of right and left lens holding means;

a pair of hollow right and left nose pads including a corresponding pair of elongated right and left guide openings, each of said pair of right and left nose pads having an upper end and a lower end;

support means for slidably supporting said pair of right and left nose pads relative to said pair of right and left lens holding means, said support means extending from said pair of right and left lens holding means and including a pair of right and

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left sliding members freely slid along said pair of right and left guide openings such that at least two different focal fields can be moved into and out of desired position of use; and

locking means including a pair of right and left first locking elements located within said pair of right and left nose pads and moved with said pair of right and left sliding members, and a pair of right and left second locking elements located at the upper ends of said pair of right and left nose pads and adapted to cooperate with said pair of right and left first locking elements so as to lock said pair of right and left lens holding means in a raised position.

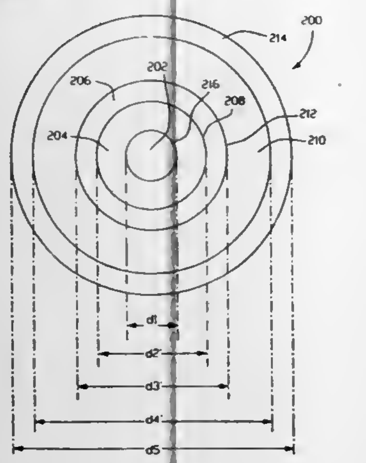
5,691,797
MULTIFOCAL CONTACT LENS

Leonard Seidner, Manalapan, N.J., and Maurice Poster, Jericho, N.Y., assignors to Permeable Technologies, Inc., Morganville, N.J.

Continuation-in-part of Ser. No. 308,065, Sep. 16, 1994, Pat. No. 5,619,289, which is a continuation-in-part of Ser. No. 40,422, Mar. 31, 1993, Pat. No. 5,404,183, Ser. No. 111,845, Aug. 25, 1993, Pat. No. 5,493,350, and Ser. No. 201,699, Feb. 25, 1994, Pat. No. 5,526,071, which is a continuation-in-part of Ser. No. 40,422, said Ser. No. 111,845is a continuation-in-part of Ser. No. 40,422. This application Jan. 19, 1996, Ser. No. 588,638

Int. Cl.^{6} G02C *7/04*

U.S. Cl. 351—161 **21 Claims**



1. A multifocal contact lens customized for a patient, having an anterior side with a power curve defined in part by (i) an aspheric central surface having a negative eccentricity with a magnitude between approximately 0.6 and approximately 1.0, (ii) an inner annular surface contiguous with said central surface, (iii) a second annular surface contiguous along a radially inner periphery with said inner annular surface, and (iv) an outer annular surface contiguous along a radially inner periphery with said second annular surface, each of the annular surfaces being concentric or coaxial with said central surface, said central surface corresponding to a distance vision correction zone, said inner annular surface corresponding to an intermediate vision correction zone, said second annular surface corresponding to a near vision correction zone, and said outer annular surface corresponding to a distant vision correction zone.

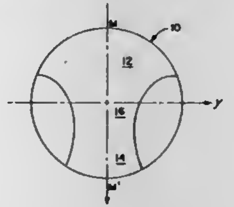
5,691,798
PROGRESSIVE POWER OPHTHALMIC LENS

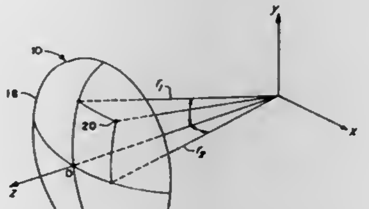
Scott W. Smith, Apex, N.C., assignor to Teijin Chemicals Ltd., Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 508,112

Int. Cl.^{6} G02C *7/06*

U.S. Cl. 351—169 **4 Claims**





1. A progressive addition ophthalmic lens providing a continuous visual field, the lens comprising:

a progressive power surface, said progressive power surface comprising,

a distance viewing portion having a first focal power,

a near viewing portion having a second focal power,

an intermediate portion having a mean focal power which varies progressively from said first focal power to said second focal power along an umbilical meridian connecting said distance viewing portion to said near viewing portion,

wherein said mean focal power is defined by a polynomial equation of the form $P=b_1+b_2X+b_3X^2+\ldots b_9X^8$ wherein b_1 through b_9 are non-zero coefficients and X is the ordinate value of the coordinate axis and wherein said progressive power surface provides a smooth continuous transition of said mean power within the visual field along a line of lateral gaze and a line of ocular convergence.

5,691,799
METHOD AND APPARATUS FOR MEASURING VERTICAL AND HORIZONTAL PUPILLARY DECENTRATION

Narayanan Ramachandran, 5G Fernwood Dr., Bolingbrook, Ill. 60440

Continuation-in-part of Ser. No. 595,024, Jan. 31, 1996, Pat. No. 5,640,219. This application Aug. 21, 1996, Ser. No. 700,987

Int. Cl.^{6} A61B *3/10;3/00*

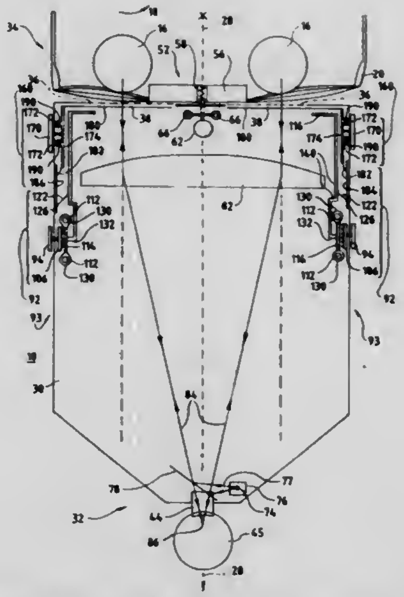
U.S. Cl. 351—204 **14 Claims**

1. An apparatus for measuring in combination, vertical and horizontal decentration of a pupil of a patient relative to a spectacle frame, the apparatus comprising:

a housing having a distal end defining at least one target aperture, said housing having a proximal end opposite the distal end;

an eye-piece disposed toward the proximal end, said eye-piece permitting an operator to observe the pupil of the patient through the target aperture such that the eye-piece, the target aperture, the spectacle frame, and the pupil of the patient are in operative alignment;

at least two adjustable horizontal reference markers, each operatively coupled to the housing and vertically displaceable relative thereto, one of the horizontal reference markers configured to be aligned with and intersect a center of the pupil, and



the other horizontal reference marker configured to be aligned with at least one of an upper edge and a lower edge of the spectacle frame;

said at least two horizontal reference markers operatively coupled to a circuit which provides an electrical signal corresponding to a measurement of a vertical distance between the center of the pupil and at least one of the upper and lower edges of the spectacle frame, said vertical distance representing the vertical decentration;

at least two adjustable vertical reference markers, each operatively coupled to the housing and horizontally displaceable relative thereto, one of the vertical reference markers configured to be aligned with and intersect the center of the pupil, and the other vertical reference marker configured to be aligned with at least one of a temporal edge and a nasal edge of the spectacle frame; and

said at least two vertical reference markers operatively coupled to a circuit which provides an electrical signal corresponding to a measurement of a horizontal distance between the center of the pupil and at least one of the temporal and nasal edges of the spectacle frame, said horizontal distance representing the horizontal decentration.

5,691,800
OPHTHALMOLOGIC APPARATUS

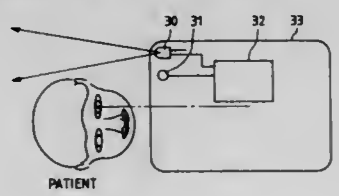
Yoichi Iki, and Seiho Yamashita, both of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

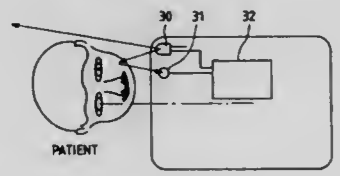
Filed Jan. 3, 1996, Ser. No. 580,991

Claims priority, application Japan, Jan. 23, 1995, 7-008376

Int. Cl.^{6} A61B *3/10*

U.S. Cl. 351—212 **6 Claims**





1. An ophthalmologic apparatus comprising:

a measuring device for measuring an eye being examined;

a display for displaying the result of the measurement by said measuring device;

a counter for counting the number of times of measurement of said eye being examined with respect to the right and left eyes; and

a display control device for causing said display to display the number of times of measurement of each of the right and left eyes counted by said counter.

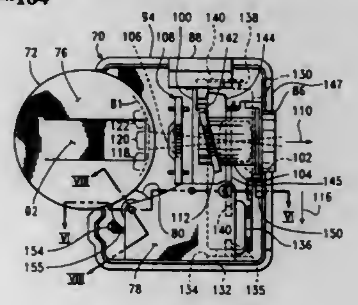
5,691,801
HAND-HELD VIEWER FOR MOTION PICTURE CASSETTES

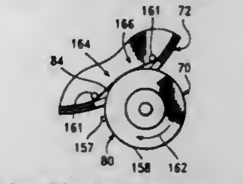
Jay Morton, 10228 Shireoaks La., Boca Raton, Fla. 33498

Filed Apr. 26, 1996, Ser. No. 638,169

Int. Cl.^{6} G03B *1/00;21/00*

U.S. Cl. 352—184 **8 Claims**





1. Apparatus for handling and moving a film strip having a plurality of sprocket holes extending along an edge in a uniform spaced-apart relationship, wherein said apparatus comprises:

a drive wheel having an outer cylindrical surface and a pin portion extending outward from said outer cylindrical surface;

wheel drive means for rotating said drive wheel at a constant rotational velocity around an axis of rotation extending along a longitudinally extending center of said outer cylindrical surface; and

film guide means for holding a portion of said film strip in contact with said outer cylindrical surface along an arcuate path, wherein said pin portion engages an individual sprocket hole within said plurality thereof at a beginning of said arcuate path, moves said film strip in engagement with said individual sprocket hole along said arcuate path, and is released from said individual sprocket hole at an end of said arcuate path, with movement of said film strip in engagement with said pin portion as said pin portion moves along said arcuate path bringing a next sprocket hole within said plurality thereof into position at said beginning of said arcuate path for engagement with said pin portion.

5,691,802
CATADIOPTRIC OPTICAL SYSTEM AND EXPOSURE APPARATUS HAVING THE SAME

Tomowaki Takahashi, Yokohama, Japan, assignor to Nikon Corporation, Japan

Filed Nov. 3, 1995, Ser. No. 552,453

Claims priority, application Japan, Nov. 7, 1994, 6-271631; Mar. 7, 1995, 7-047142; Jul. 14, 1995, 7-177858

Int. Cl.^{6} G03B *27/42*

U.S. Cl. 355—53 **35 Claims**

22. An exposure apparatus comprising:

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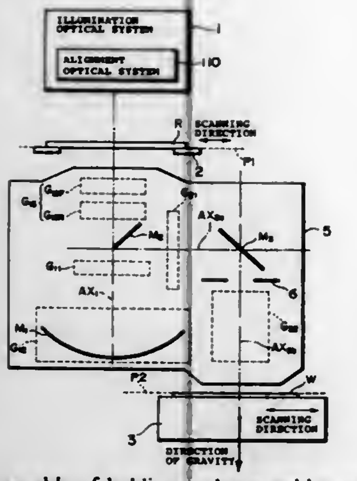


a first stage capable of holding a photosensitive substrate on a main surface thereof;

a second stage for holding a mask having a predetermined pattern:

an illumination optical system for irradiating an exposure light beam having a predetermined wavelength to said mask and transferring an image of the predetermined pattern on said mask onto said substrate; and

a catadioptric optical system provided between said first stage and said second stage to project the pattern on said mask onto said substrate, said catadioptric optical system comprising

a first imaging optical system for forming an intermediate image of the pattern on said mask, said first imaging optical system comprising a first optical element group having a positive refracting power, and a second optical element group including a negative lens component and a concave mirror and having a positive refracting power,

a second imaging optical system having a reduction magnification and adapted to form an image of the intermediate image formed by said first imaging optical system on said substrate, a composite magnification of said second imaging optical system and said first imaging optical system being a reduction magnification, and

a first optical path deflecting member arranged in an optical path from said first imaging optical system to said second imaging optical system to guide a light beam from said first imaging optical system to said second imaging optical system,

wherein a light beam from said mask passes through said first optical element group and reaches said concave mirror in said second optical element group, and the light beam reflected by said concave mirror passes through said first optical element group again and reaches said first optical path deflecting member.

5,691,803

ADVANCED EXPOSURE APPARATUS AND EXPOSURE METHOD USING THE SAME

Jae-kwan Song; Jeong-kon Kim; Kyoung-shin Park, and Kyung-sung Bae, all of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 21, 1996, Ser. No. 604,302

Claims priority, application Rep. of Korea, Jun. 19, 1995, 95-16257

Int. Cl.^{6} G03B *27/52*

U.S. Cl. 355—55 **8 Claims**

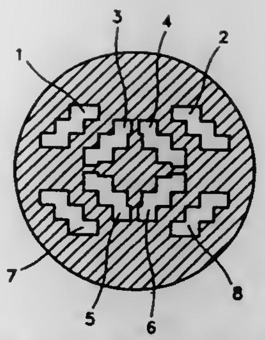
1. An advanced exposure apparatus comprising:

a light source;

an adjusting portion comprising a filter to limit the light emitted from said light source;

a refractive/diffractive portion for refracting and diffracting the light emitted from said adjusting portion; and

a focussing portion for focussing the light emitted from said refractive/diffractive portion onto a wafer,



wherein said filter is provided with first group holes and second group holes of the same size, said first group holes being disposed a first distance from the center of said filter and said second group holes being disposed a second distance from the center of said filter, said second distance being greater than said first distance.

5,691,804

Patent Not Issued For This Number

5,691,805

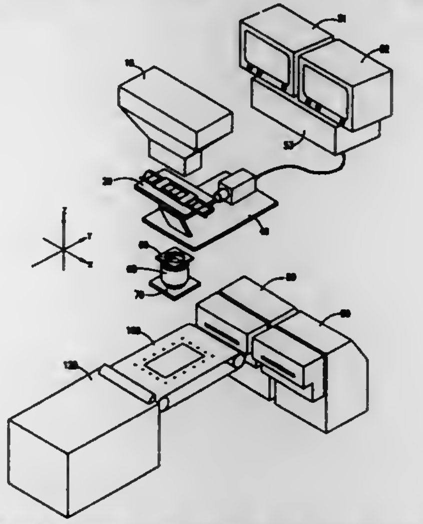
MULTIPLE FORMAT 3D PHOTOGRAPHIC PRINTER

Allen Kwok Wah Lo, Dunwoody, and Nicholas L. Lam, Norcross, both of Ga., assignors to Image Technology International, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 189,786, Feb. 1, 1994, Pat. No. 5,424,801. This application Jan. 24, 1995, Ser. No. 377,442

Int. Cl.^{6} G03B *27/58;27/44*

U.S. Cl. 355—72 **23 Claims**



1. A photographic printer for producing 3D photographs from at least two different sizes or types of 3D lenticular print material, said printer comprising:

a print material storage and dispensing means for storing and dispensing at least two different types or sizes of 3D lenticular print material;

a movable easel for receiving a section of print material from said print material storage and dispensing means for supporting the section of print material in a first 3D print position for printing 3D photographs, for moving the section of print material from the first 3D printing position to at least a second 3D printing position, and for supporting the section of print material in the at least second 3D printing position;

a film carrier for transporting photographic film and supporting the photographic film;

a lamphouse for illuminating the photographic film; and

a movable, variable-magnification projection lens means for, in cooperation with said lamphouse, projecting an image from the photographic film onto the section of print material.

5,691,806

PROJECTION EXPOSURE APPARATUS CONTAINING AN ENCLOSED HOLLOW STRUCTURE

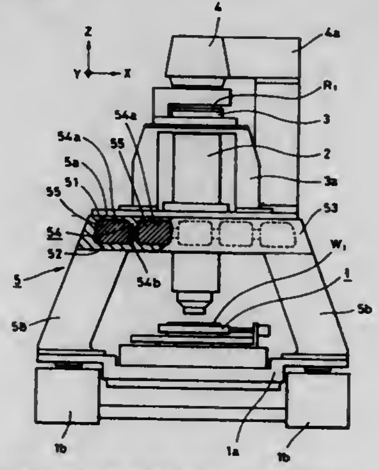
Yukio Tokuda, Kawasaki, and Yukio Takabayashi, Utsunomiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1995, Ser. No. 531,344

Claims priority, application Japan, Oct. 6, 1994, 6-268418

Int. Cl.^{6} G03B *27/58*

U.S. Cl. 355—72 **23 Claims**



1. A projection exposure apparatus, comprising:

a projection optical system for projecting a pattern of an original onto a substrate;

a substrate stage for holding the substrate thereon; and

a support member, being arranged above said substrate stage, for supporting said projection optical system,

wherein at least a portion of said support member facing said substrate stage has an enclosed hollow structure with at least one built-in strengthening rib.

5,691,807

PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS WITH INDICATING MEANS

Naoki Fuei, Kawaguchi, and Mahito Yoshioka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 472,059, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 347,179, Nov. 22, 1994, abandoned, which is a continuation of Ser. No. 38,899, Mar. 29, 1993, abandoned. This application Feb. 22, 1996, Ser. No. 605,713

Claims priority, application Japan, Oct. 22, 1992, 4-308043

Int. Cl.^{6} G03G *21/18;15/02*

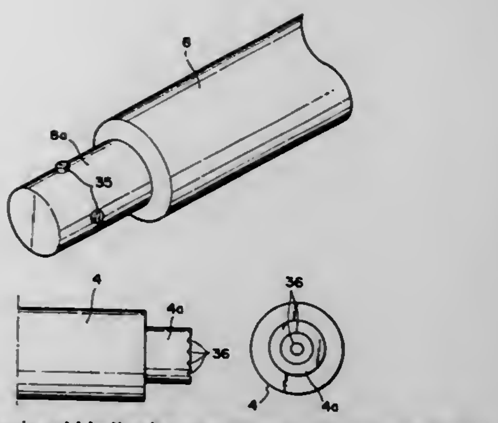
U.S. Cl. 355—210 **68 Claims**

1. A process cartridge having at least one reusable part, including a shaft, and being mountable onto an image forming apparatus, said process cartridge comprising:

a frame;

process means provided on said frame for contributing to an image formation; and

indicating means integrally formed with said shaft of said reusable part for indicating the number of usages of said reusable part, wherein said indicating means remains integral with said shaft after said process cartridge is disassembled.



5,691,808

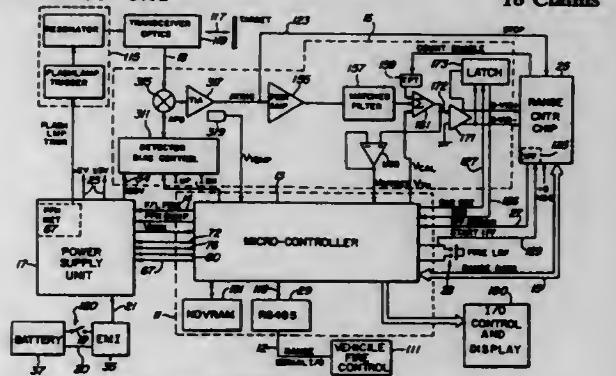
LASER RANGE FINDER RECEIVER

Charles E. Nourrcier, Jr., Lakewood, and Robert Kuehn, El Segundo, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Jul. 31, 1995, Ser. No. 509,374

Int. Cl.^{6} G01C *3/08;* **H01J** *40/14*

U.S. Cl. 356—5.01 **18 Claims**



1. A laser range finder comprising:

receiver means including a detector means for generating a detected signal; a means for summing said detected signal with a calibration signal and producing a first output signal; a means for generating an offset voltage signal from said first output signal; a threshold detection means for providing a second output signal indicative of a target return; and a means monitoring said second output signal for supplying a third output signal from which false alarms can be detected; and

programmed processor means supplied with said offset voltage and said third output signal for generating said calibration signal and for adjusting the value of said calibration signal utilizing said offset voltage and said third output signal until a selected false alarm rate is achieved.

5,691,809

METHOD AND APPARATUS FOR STUDYING ORGANIC DEPOSITION

James E. Tackett, Castlerock; Gary R. Cook, Highlands Ranch, and Michael A. Jessee, Louviers, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Sep. 6, 1995, Ser. No. 524,190

Int. Cl.^{6} G01N *21/64;33/26*

U.S. Cl. 356—72 **28 Claims**

1. A cell for determining conditions at which organic deposition occurs from a liquid sample, the cell comprising:

a generally cylindrical housing having a sidewall and first and second opposing ends;

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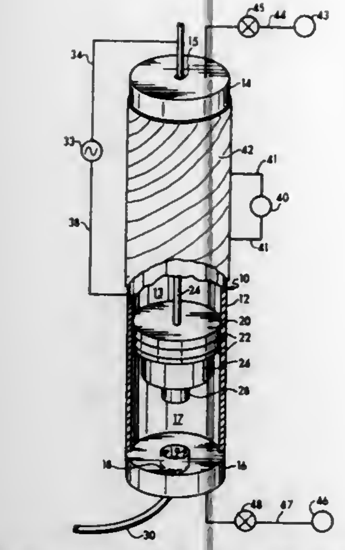


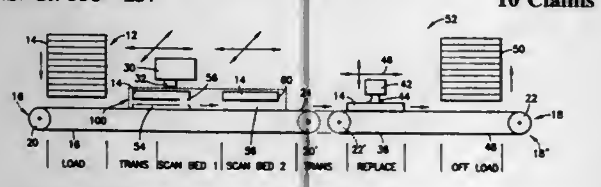
a first cap secured to said first end of said housing;
a second cap secured to said second end of said housing;
means for visually inspecting a liquid sample which is present within said cell;
means for controlling the temperature of said liquid sample;
means for controlling the pressure of said liquid sample;
means for detecting fluorescence changes occurring within the sample; and
means for measuring an electrical property of the sample, the property selected from the group consisting of conductivity and conductance.

5,691,810

DUAL-BED SCANNER WITH REDUCED TRANSPORT TIME

Steven J. Bilodeau, Setauket, and William E. Yonescu, Smithtown, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed May 5, 1995, Ser. No. 435,821
Int. Cl.⁶ G01N *21/00*; B07C *5/00*
U.S. Cl. 356—237 **10 Claims**



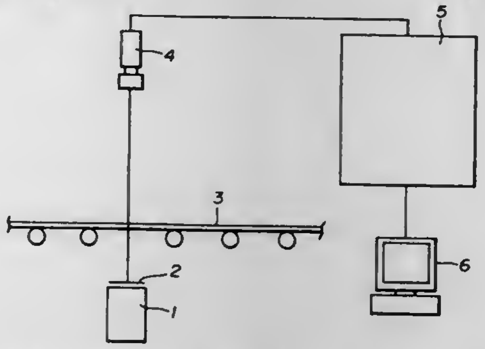
1. Apparatus for scanning elements in a plurality of pocketed trays, comprising:
an optical sensor;
said optical sensor being of a type movable in a pattern for scanning said elements;
first means for moving a first pocketed tray of said plurality of pocketed trays into an operable position with said optical sensor; and
second means for moving a second pocketed tray of said plurality of pocketed trays toward a position adjacent said first pocketed tray while said optical sensor is performing said pattern over said first pocketed tray, such that said optical sensor begins scanning said second pocketed tray at said position adjacent with reduced transport delay.

5,691,811

METHOD OF AND APPARATUS FOR DETECTING DEFECT OF TRANSPARENT SHEET AS SHEET GLASS

Hiroshi Kihira, Matsusaka, Japan, assignor to Central Glass Company, Limited, Yamaguchi, Japan

Filed Feb. 8, 1996, Ser. No. 598,291
Claims priority, application Japan, Feb. 10, 1995, 7-022432
Int. Cl.⁶ G01N *21/00*
U.S. Cl. 356—237 **8 Claims**



1. A method of detecting a defect of a transparent sheet wherein a light source casts light on the transparent sheet through a screen having a row of alternate light transmitting portions and shading portions and a one-dimensional camera receives the light transmitted through the transparent sheet and produces an image for inspection of the defect comprising the steps of:
representing an image of said screen produced by said camera which is out of focus by a waveform which is representative of brightness of said light transmitting portions and said shading portions of said screen,
setting said camera to focus on a point where the difference between a maximum brightness and a minimum brightness represented by said waveform becomes minimum or on a point adjacent thereto, said image produced by said camera including light image portions and dark image portions corresponding to said light transmitting portions and shading portions of said screen, said waveform being representative of brightness of said light image portions and dark image portions which are located on one scanning line,
arranging said light transmitting portion and said shading portions of said screen in a checkered pattern, and
determining that a portion of the transparent sheet corresponding to said waveform is defective when said waveform includes a light image portion, a dark image portion and a light image portion arranged in order or a dark image portion, a light image portion and a dark image portion arranged in order.

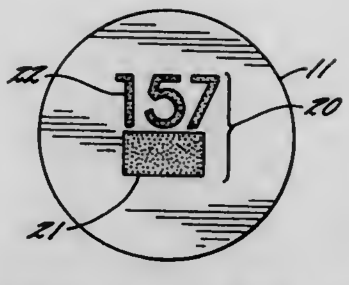
5,691,812

CALIBRATION STANDARD FOR CALIBRATING A DEFECT INSPECTION SYSTEM AND A METHOD OF FORMING SAME

Eugene C. Bates, Ft. Mill, S.C., and Michael B. Ferrara, Charlotte, N.C., assignors to ADE Optical Systems Corporation, Charlotte, N.C.

Filed Mar. 22, 1996, Ser. No. 620,890
Int. Cl.⁶ G01J *1/02*
U.S. Cl. 356—243 **20 Claims**

1. A calibration standard for calibrating a defect inspection system, the calibration standard comprising:
a substrate; and
a multiplicity of artificial defects of a predetermined uniform size disposed on a selected area of said substrate, said defects being randomly spaced with respect to one another within said selected area and of sufficient density to form a visually discernable contrast with adjacent portions of the substrate surface which are devoid of said defects, said visually discernable contrast with adjacent portions of the substrate forming predetermined visually discernable indicia.

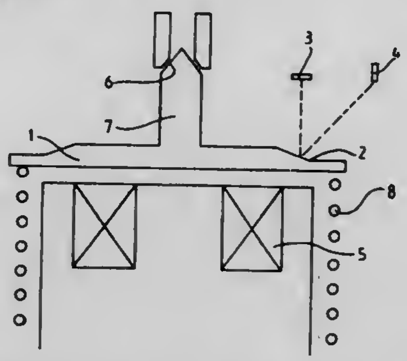


5,691,813

VALVE POSITION SENSOR

Christopher Wood, Aylesford, England, assignor to Lucas Industries public limited Co., Great Britain

Filed Jul. 12, 1995, Ser. No. 501,551
Claims priority, application United Kingdom, Jul. 30, 1994, 9415446
Int. Cl.⁶ G01B *11/14*
U.S. Cl. 356—375 **9 Claims**



1. A position sensor for sensing the position of a valve element movable in a first direction between first and second positions, the position sensor comprising an energy source for emitting an energy beam in a direction parallel to the first direction, reflector means for reflecting the energy beam, the reflector means being movable with the valve element and inclined to the first direction, and detector means for detecting the position of the reflected energy beam, the detector means being located to sense the reflected energy beam when the valve element occupies its first position, the detector means being sensitive to the intensity of the reflected energy beam at that location.

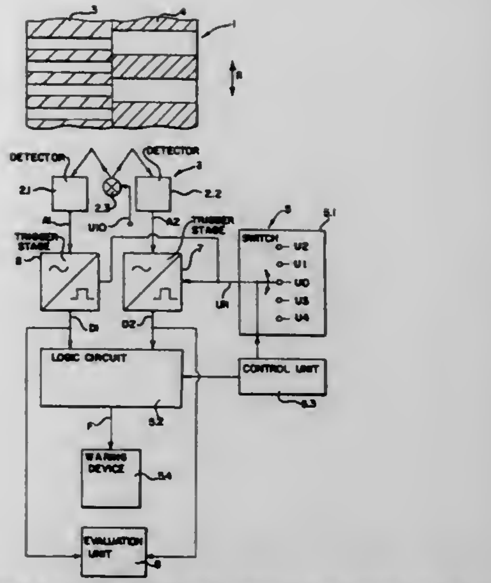
5,691,814

POSITION MEASURING INSTRUMENT

Erich Strasser, Trostberg, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Oct. 13, 1995, Ser. No. 542,662
Claims priority, appilcation Germany, Oct. 13, 1994, 44 36 546.2
Int. Cl.⁶ G01B *11/00*
U.S. Cl. 356—375 **21 Claims**

1. A position measuring instrument having a scanning unit for generating position-dependent analog signals that are each triggered in a trigger stage at a predetermined trigger threshold voltage in order to generate digital scanner signals and to form position measurement values, the position measuring instrument having a light source and a testing device coupled to the scanning unit, the testing device comprising:



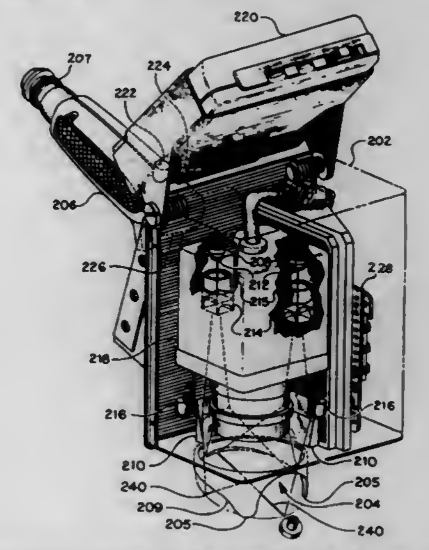
a switch coupled to either the light source or an input of the trigger stage; and an evaluation unit coupled to an output of the trigger stage wherein the switch generates a plurality of test voltages and applies one of the plurality of test voltages to either the trigger stage to vary the trigger threshold voltage or to the light source to vary the position-dependent analog signals wherein in one state, the test voltage is within an allowable amplitude in normal operation of the position-dependent analog signal, and, in a further state, the test voltage is outside the allowable amplitude in normal operation of the position-dependent analog signal and further comprising a logic circuit coupled to the output of the trigger stage for monitoring the digital state of the test voltage and the digital state of the digital scanner signal, the logic circuit generating an error signal as a function of a change of the digital state under prescribed conditions.

5,691,815

LASER INSPECTION TOOL SYSTEM

Edward D. Huber, Sunnyvale; Rick A. Williams, Orinda, and Scott E. Reinhart, Hayward, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Jan. 2, 1996, Ser. No. 582,154
Int. Cl.⁶ G01B *11/02*
U.S. Cl. 356—375 **15 Claims**



1. An inspection system for determining the height of a target object above a measurement surface, said system comprising:

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first and second light sources spaced apart from the measurement surface and generating respective first and second lines of light, both lines of light being projected at a projected angle onto the target object and the measurement surface, the first line of light being at an angle to the second line of light;

a camera positioned to receive both an image of a first portion of the first line of light reflected by the target object and an image of a second portion of the first line of light reflected by the measurement surface and positioned to receive both an image of a first portion of the second line of light reflected by the target object and an image of a second portion of the second line of light reflected by the measurement surface, the received image of the first portion of the first line of light reflected by the target object being offset from the received image of the second portion of the first line of light reflected by the measurement surface, the received image of the first portion of the second line of light reflected by the target object being offset from the received image of the second portion of the second line of light reflected by the measurement surface, and

a processor coupled to the camera for calculating the offsets between the received light reflected by the target object and the received light reflected by the measurement surface, for calculating the height of the target object above the measurement surface using the calculated offsets, and for adjusting the calculated object height to compensate for an alignment error of the inspection system.

5,691,816
COMPACT DENSITOMETER DEVICE

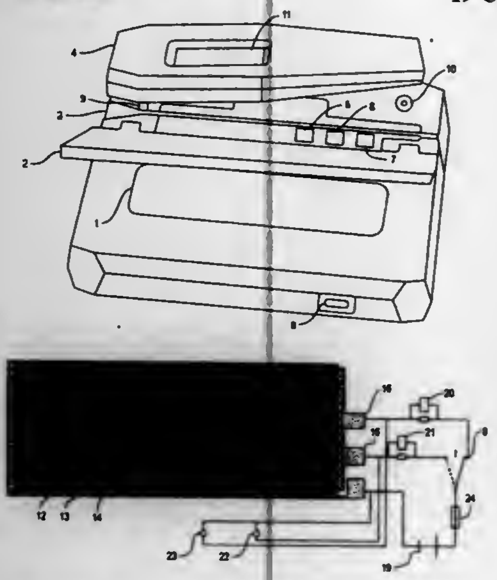
Klaus Schwuchow, Walter Kollow Strasse 39, 65812 Bad Soden/Taunus, Germany

Continuation of Ser. No. 220,589, Mar. 31, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 606,658

Claims priority, application Germany, Mar. 31, 1993, 9304880 U

Int. Cl.⁶ G01J *3/46*

U.S. Cl. 356—402 **19 Claims**



1. A universal film, quality inspection device comprising:

a housing;

a sensitometer located within said housing;

a light source associated with said sensitometer; and

a densitometer located within said housing, wherein said light source comprises an electrically excitable multicolor luminescent foil.

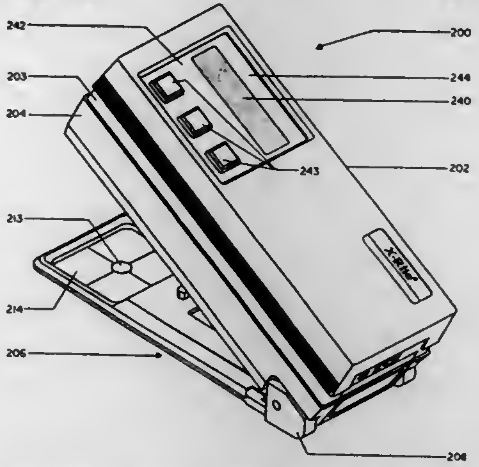
5,691,817
APPARATUS AND METHOD FOR CALIBRATION IN A SPECTROPHOTOMETER

Mark A. Cargill, Belding, and Bernard J. Berg, Kentwood, both of Mich., assignors to X-Rite, Incorporated, Grandville, Mich.

Continuation of Ser. No. 514,792, Aug. 14, 1995, abandoned, which is a continuation of Ser. No. 975,981, Nov. 13, 1992, abandoned, which is a continuation of Ser. No. 679,995, Mar. 29, 1991, abandoned, which is a continuation of Ser. No. 487,670, Mar. 1, 1990, abandoned. This application Aug. 20, 1996, Ser. No. 700,155

Int. Cl.⁶ G01N *21/25*

U.S. Cl. 356—405 **43 Claims**



1. A compensation method adapted for use in color measuring apparatus for measuring color characteristics of actual object samples under test, said method comprising the steps of:

employing a reference sample and projecting light toward said reference sample through use of a light source means;

performing a first plurality of measurements of said reference sample, with each measurement providing a measured color characteristic value of said reference sample for each of a series of spectral segments across a light spectrum;

said first plurality of measurements of said reference sample includes a second plurality of measurements made over time for each spectral segment of said series of spectral segments;

performing a plurality of side sensor measurements, with each of said side sensor measurements providing a measured light source intensity value indicative of the intensity of said light source means, and with said side sensor measurements being performed in the absence of complete spectral equivalence between said side sensor measurements and said first plurality of measurements of said reference sample;

determining a filter compensation coefficient for each of said segment as a function of a ratio of at least two of said measured color characteristic values of said reference sample for the corresponding segment, and as a function of a ratio of at least two of said measured light source intensity values; and

compensating measurements of color characteristic values of said actual object samples under test for a particular segment, as a function at least in part of said filter compensation coefficient for said particular segment.

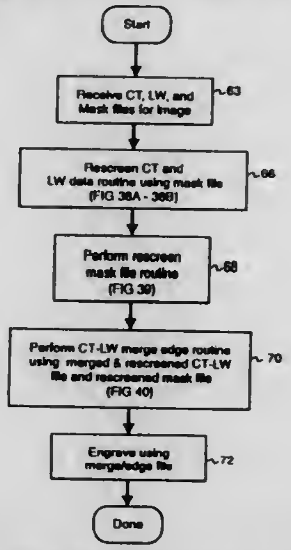
5,691,818
SYSTEM AND METHOD FOR ENHANCING EDGES AND THE LIKE FOR ENGRAVING

Douglas G. Newell, Englewood; Karl F. Seibert, Kettering, and David R. Seitz, Vandalia, all of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 434,592, May 4, 1995, which is a continuation of Ser. No. 38,679, Mar. 26, 1993, Pat. No. 5,438,422, and a continuation of Ser. No. 125,938, Sep. 23, 1993, Pat. No. 5,440,398, which is a continuation-in-part of Ser. No. 22,127, Feb. 25, 1993, Pat. No. 5,424,845. This application Sep. 18, 1995, Ser. No. 529,557

Int. Cl.⁶ B41C *1/04;* **H04N** *1/40*

U.S. Cl. 358—299 **8 Claims**


Start
Receive CT, LW, and Mask files for Image
63
Rescreen CT and LW data routine using mask file (FIG 38A - 38B)
66
Perform rescreen mask file routine (FIG 39)
68
Perform CT-LW merge edge routine using merged & rescreened CT-LW file and rescreened mask file (FIG 40)
70
Engrave using merge/edge file
72
Done

1. A method for engraving by comprising the steps of:

providing an image having a first area represented by a first set of image data and a second area represented by a second set of image data;

generating a mask file of data corresponding to said image;

rescreening at least one of said first set of image data or said second set of image data to the same resolution as said second set of image data or said first set of image data, respectively;

merging said first and second sets of data using said mask file to provide a merged image data file;

rescreening said merged image data file to a predetermined resolution;

rescreening said mask file of data to a predetermined resolution to provide a rescreened mask file of data, said rescreened mask file of data comprising first mask data corresponding to said first set of image data, second mask data corresponding to said second set of image data and transition data corresponding to a transition area associated with a juncture of said first and second sets of data;

generating said processed image data file using said merged image data and said rescreened mask file.

5,691,819
APPARATUS FOR PRODUCING A LEGIBLE VIDEO IMAGE DURING HIGH SPEED REPRODUCTION OF A DIGITAL VIDEO SIGNAL

Hirofumi Uchida, Neyagawa, and Tatsuro Juri, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 16, 1994, Ser. No. 197,490

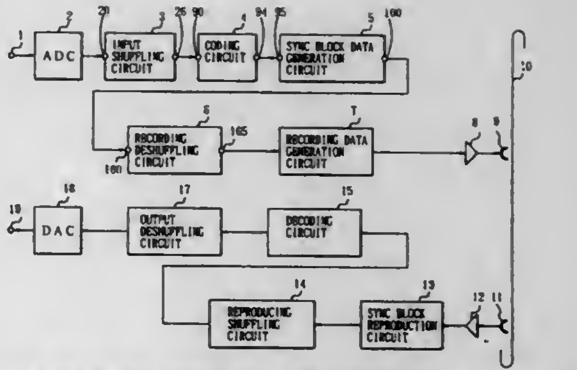
Claims priority, application Japan, Feb. 17, 1993, 5-027691

Int. Cl.⁶ H04N 9/79

U.S. Cl. 358—310 **7 Claims**

1. An apparatus for recording and reproducing a digital video signal comprising:

input shuffling means for


1
2
ADC
20
3
INPUT SHUFFLING CIRCUIT
26
90
4
CODING CIRCUIT
94
95
5
SYNC BLOCK DATA GENERATION CIRCUIT
100
10
6
RECORDING DESHUFFLING CIRCUIT
100
105
7
RECORDING DATA GENERATION CIRCUIT
8
9
18
19
DAC
17
OUTPUT DESHUFFLING CIRCUIT
15
DECODING CIRCUIT
14
REPRODUCING SHUFFLING CIRCUIT
13
SYNC BLOCK REPRODUCTION CIRCUIT
12
11

dividing a video image into a first predetermined number of segments in a vertical direction and into a second predetermined number of segments in a horizontal direction in order to divide said video image into super blocks of a number corresponding to a product of said first predetermined number by said second predetermined number,

dividing each super block into a fifth predetermined number of macro blocks each comprising data of a third predetermined number of horizontal pixel and a fourth predetermined number of vertical pixel,

setting a predetermined order of said fifth predetermined number macro blocks in each super block so that said fifth predetermined number of macro blocks are consecutively arranged from one end to another end in each super block,

setting a video segment comprising said second predetermined number of macro blocks belonging to different super blocks and having a same number in said predetermined order of macro blocks in each super block, and

arranging said video segment as the unit of data processing;

coding means for generating coded data of which a variable length coding operation is applied to video data to limit an amount of said coded data to a predetermined amount of data for every video segment;

synchronizing block data generation means for generating synchronizing block data to store a main component of said coded data of one macro block of said video segment in one synchronizing block;

recording deshuffling means for rearranging said synchronizing block data so that a video image is divided horizontally into super block groups of said first predetermined number each having said second predetermined number of consecutive super blocks, data of said first predetermined number of super block groups are ordered from one end to another end on said video image, super blocks of said second predetermined number are ordered from one end to another end on said video image in each super block group, and said synchronizing block data are arranged in said predetermined order of said macro blocks in each super block; and

recording means for recording said rearranged synchronizing block data on said first predetermined number of video tracks of a magnetic tape.

5,691,820
DATA COMMUNICATION SYSTEM AND FACSIMILE MACHINE IN THE DATA COMMUNICATION SYSTEM

Masao Komatsu, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 15, 1994, Ser. No. 260,064

Claims priority, application Japan, Oct. 4, 1993, 5-247270

Int. Cl.⁶ H04N *1/36;1/41;1/00*

U.S. Cl. 358—434 **38 Claims**

1. A data communication system comprising:

a transmitter for transmitting data in a state where an amount of data to be transmitted for each block is not less than a minimum value of a total amount of data to be transmitted for each block, and where the data to be transmitted for each block includes data from which fill bits are eliminated; and

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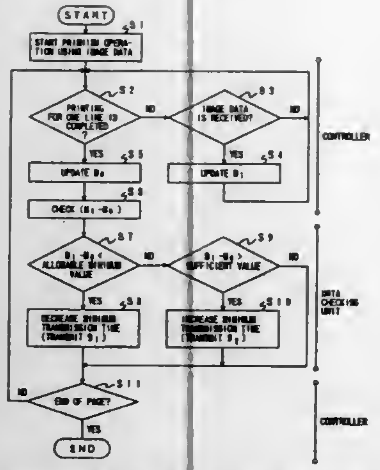


a receiver, operatively connected to said transmitter, for receiving the data transmitted from said transmitter,

said receiver comprising:

storage means for storing said data from which fill bits have been eliminated out of the data received for each block by said receiver;

processing means for processing the data from which fill bits are eliminated, read out from said storage means;

determination means for determining, based on an amount of said data from which fill bits are eliminated and which has not yet been processed and remains in said storage means, whether or not the minimum value of the total amount of data to be transmitted for each block can be changed; and

signal output means for outputting, when said determination means determines that the minimum value of the total amount of data to be transmitted for each block can be changed, a request signal, the request signal being transmitted to said transmitter,

said transmitter comprising:

detecting means for detecting the request signal from said receiver; and

changing means for changing, when said detecting means detects the request signal, the minimum value of the total amount of data to be transmitted for each block, so that the data is transmitted in a state where a changed minimum value of the total amount of data to be transmitted for each block is ensured.

5,691,821

A/D CONVERTING APPARATUS AND IMAGE SENSING APPARATUS

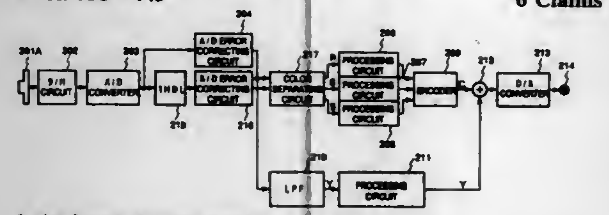
Teruo Hieda, and Kousuke Nobuoka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1993, Ser. No. 160,234

Claims priority, application Japan, Dec. 4, 1992, 4-350712; Dec. 22, 1992, 4-356698; Dec. 25, 1992, 4-358969

Int. Cl.^{6} H04N *1/40;* H03M *1/20*

U.S. Cl. 358—445 **6 Claims**



1. An image sensing apparatus comprising:

an image sensing element for converting an optical image into an electric image pick-up signal and outputting the image pick-up signal;

an A/D converter for converting the image pick-up signal outputted by said image sensing element into a digital signal;

level detecting means for detecting a level of the image pick-up signal outputted by said A/D converter;

adjusting an means for adjusting amount of light incident upon said image sensing element in dependence upon the level detected by said level detecting means;

γ-knee converting means having a plurality of conversion characteristics for applying non-linear processing to the image pick-up signal outputted by said image sensing element; and

selecting at least means for selecting one of the plurality of γ-knee characteristics in dependence upon the output signal level of said A/D converter.

5,691,822

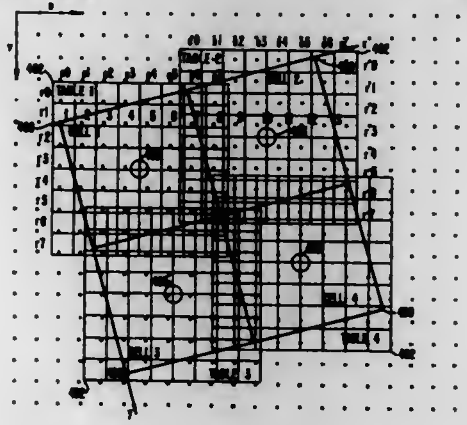
RAPID VARIABLE ANGLE ELECTRONIC HALFTONE SCREENING USING UNROTATED THRESHOLD MATRICES

Peter R. Jones, 138 Hawthorne Ave., Larkspur, Calif. 94939

Filed Jan. 10, 1995, Ser. No. 371,080

Int. Cl.^{6} H04N *1/40;1/46*

U.S. Cl. 358—454 **15 Claims**



1. In a digital halftone system wherein images are represented by a matrix of microdots located on an orthogonal rectangular u-v coordinate grid having a u axis and a v axis, wherein said matrix of microdots is divided into a plurality of square halftone cells with the centers of the halftone cells located on an orthogonal rectangular x-y coordinate grid, the x-y grid being oriented at a reference angle, θ, to the u-v coordinate grid, a computer-implemented method for assigning correspondences between threshold matrix cells and microdots, comprising the steps of:

a) storing a threshold matrix including rows and columns of threshold element cells containing threshold values, each threshold element cell addressable by identifying its row and column;

b) assigning correspondences between microdots of a row of microdots and addresses of said threshold element cells, wherein successive adjacent microdots within a given halftone cell are assigned in sequence, in a predetermined direction, to successive threshold element cells separated by a predetermined integer number of columns within a row of the threshold matrix; and

c) determining, whether a next adjacent microdot in the row is outside the given halftone cell;

d) upon a determination in said c) step that said next adjacent microdot in the row is outside the given halftone cell, computing an alignment between said threshold matrix and a next halftone cell containing said next adjacent microdot; and

e) assigning a threshold element cell to said next adjacent microdot responsive to said alignment.

5,691,823

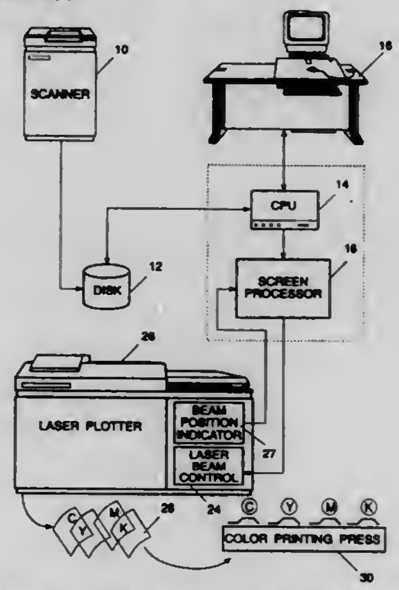
APPARATUS AND METHOD FOR RANDOM SCREENING

Ephraim A. Carlebach, Ra'anana, Israel, assignor to Scitex Corporation Ltd., Herzliya, Israel

Filed Jun. 26, 1995, Ser. No. 494,958

Int. Cl.^{6} H04N *1/23*

U.S. Cl. 358—457 **6 Claims**



1. Apparatus for random screening comprising an exposure select operator which receives two-dimensional coordinate information relating to a screen and input density information relating to an image to be screened, the operator being characterized in that it provides, for a given input density, a multiplicity of minimum size clusters of contiguous regions which are either all exposed or all not exposed, arranged generally along exposure lines and in columns perpendicular thereto, the edges of adjacent ones of clusters which lie generally along the same exposure line or column not all being precisely mutually aligned therealong.

5,691,824

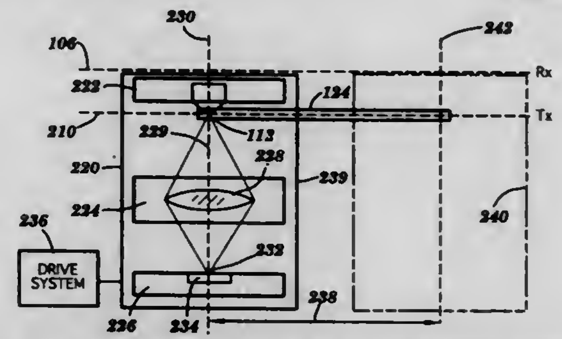
SCANNING SYSTEM FOR SCANNING REFLECTIVE AND TRANSMISSIVE IMAGES

Kevin J. Haded, Chelmsford, Mass.; Mark G. Brook, Londonderry, N.H.; Mark E. Tellam, Charlestown, Mass.; John F. Omvik, North Andover, Mass., and Joseph A. Wheeler, Gloucester, Mass., assignors to Agfa Division, Bayer Corporation, Wilmington, Mass.

Filed Jun. 29, 1995, Ser. No. 496,778

Int. Cl.^{6} H04N *1/04*

U.S. Cl. 358—487 **35 Claims**



1. A flat-bed scanner for scanning an original document to obtain a digitized representation of said original document, said flat-bed scanner comprising:

(A) A stationary reflective object focal plane;

(B) A stationary transmissive object focal plane disposed substantially parallel to and at a vertical distance below said stationary reflective object focal plane;

(C) Means for selecting between said stationary reflective object focal plane and said stationary transmissive object focal plane;

(D) A scan carriage movably disposed for linear motion along a scanning axis, said scan carriage including an illumination source disposed between said stationary reflective object focal plane and said stationary transmissive object focal plane for illuminating a scan line of said original document located in said selected object focal plane, said scan carriage further including optical imaging and sensor means disposed below said stationary transmissive object focal plane for obtaining a digitized representation of said scan line; and

(E) Means for moving said scan carriage along said scanning axis to obtain digitized representations of successive scan lines of said original document in said selected object focal plane, said digitized representations of said successive scan lines together comprising said digital representation of said original document.

5,691,825

OPTICAL IMAGE SCANNER

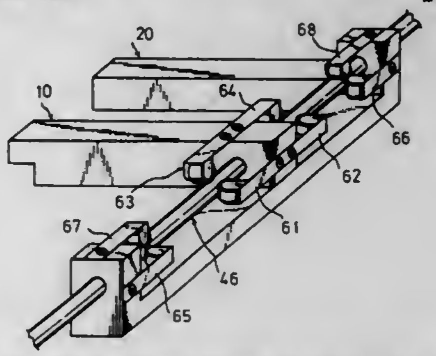
Tatsuo Fujiwara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 265,029, Jun. 24, 1994, Pat. No. 5,592,308. This application Aug. 30, 1996, Ser. No. 707,979

Claims priority, application Japan, Sep. 17, 1993, 5-231559

Int. Cl.^{6} H04N *1/00;1/04;* H01J *3/14;* G03G *15/28*

U.S. Cl. 358—497 **24 Claims**



5. A two-carrier type image scanner in which a first carrier is moved at a scanning speed and a second carrier is moved at half the scanning speed, in parallel to a document surface and commonly in a first direction, said image scanner optically reading out image information such as figures and characters on a document surface using an optical system mounted on the carriers, said image scanner characterized in that:

one side of each of said carriers is movably engaged with a fixed guide shaft extending in the first direction; and

a second, opposite side of each of said carriers is guided along a fixed guide rail disposed in parallel with said guide shaft, said first and second carriers including respective, first and second pinch rollers coming into contact with said fixed guide shaft and disposed at corresponding engaging portions of said first and second carriers which engage said fixed guide shaft, and wherein deviation of each said carrier in the yaw and pitch directions is suppressed by adjusting pinching loads of the pinch rollers with respect to the fixed guide shaft.

5,691,826

TRANSMISSION MECHANISM FOR A SCANNER

Yu-ming Yeh, and Yang-teh Lee, both of Taipei, Taiwan, assignors to Behavior Tech Computer Corporation, Taipei, Taiwan

Filed Aug. 16, 1996, Ser. No. 689,915

Int. Cl.^{6} H04N *1/04;* B65H *5/00*

U.S. Cl. 358—498 **9 Claims**

1. A transmission mechanism for a scanner comprising a frame having a main hole and a plurality of positioning holes for mount-

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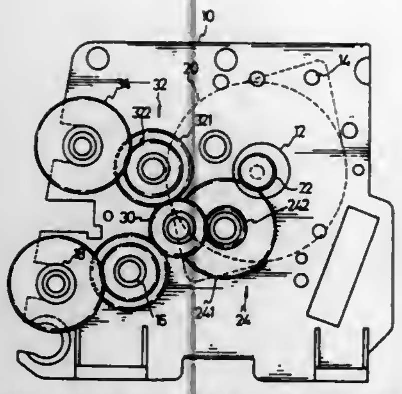


ing a step motor, a plurality of first holes for mounting a transmission mechanism having a driving gear and an intermediate gear and notches for mounting paper rollers, the improvement wherein;

said transmitting mechanism comprises a first transmission gear set having a first large gear mated with said driving gear and a first small gear mated with said intermediate gear and two second transmission gear sets each having a second small gear mated with a driven gear and two second big gears, said intermediate gear being mated with each of said two second big gears.

5,691,827

IMAGE PROCESSING APPARATUS FOR CONVERTING A COLOR IMAGE INTO A PATTERN IMAGE WITH A LINE HAVING A WIDTH WHICH IS EQUAL TO OR LESS THAN A PREDETERMINED WIDTH NOT BEING CONVERTED

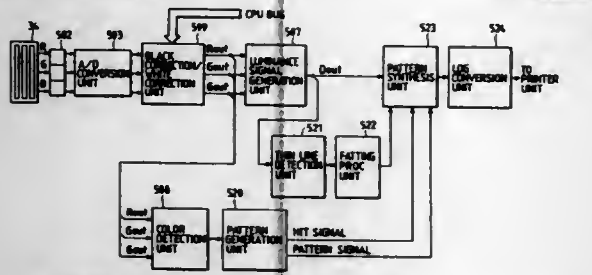
Masafumi Kamei; Yoshiyuki Suzuki; Shizuo Hasegawa, all of Tokyo; Hiroyuki Ichikawa, Kawasaki; Yoshihiro Funamizu, Soka; Akio Itoh, Machida, and Yoshinori Abe, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 843,725, Feb. 28, 1992, Pat. No. 5,485,288. This application May 2, 1995, Ser. No. 433,201

Claims priority, application Japan, Mar. 1, 1991, 3-059656; May 29, 1991, 3-153940; Nov. 7, 1991, 3-319865

Int. Cl.^{6} H04N *1/56*

U.S. Cl. 358—530 **32 Claims**



1. An image processing apparatus comprising:

reading means for reading a color image on an original; and

converting means for converting the color image read by said reading means, into a pattern image,

wherein said converting means does not convert a color line in the color image read by said reading means, having a width which is equal to or less than a predetermined width, into the pattern image.

8. An image processing apparatus comprising:

reading means for reading a color image and an original;

line detection means for detecting line width of thin lines in the color image read by said reading means;

image processing means for converting the color image read by said reading means, into a monochromatic pattern image; and

control means for causing image processing in said image processing means to vary in accordance with the result of detection by said line detection means.

5,691,828

APPARATUS AND TECHNIQUE FOR GENERATING A SCREEN REPRODUCTION OF AN IMAGE

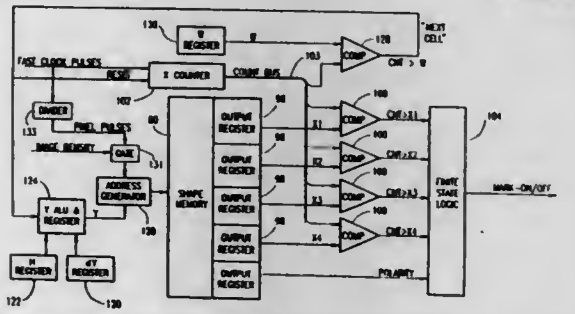
Alex Weiss, Netanya, and Uri F. Gronemann, Tel Aviv, both of Israel, assignors to Scitex Corporation Ltd., Herzliya, Israel

Filed Apr. 1, 1994, Ser. No. 221,938

Claims priority, application Israel, Apr. 8, 1993, 105343

Int. Cl.^{6} H04N *1/405;1/52*

U.S. Cl. 358—534 **6 Claims**



1. A technique for screening an image for half-tone reproduction by image reproduction apparatus comprising a marking device which is operative to mark a medium along a multiplicity of parallel marking lines comprising the steps of:

providing a digital representation of density values of an original image;

storing dot shape information representative of a screen function in a line-by-line arrangement in correspondence with said parallel marking lines; and

extracting said dot shape information from storage for said density values in the form of information that designates on and off points for each marking line.

5,691,829

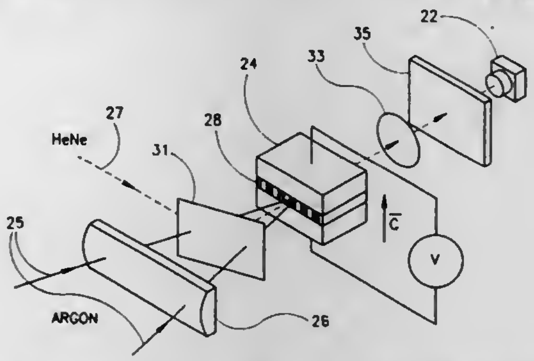
METHOD FOR FIXING OPTICAL INFORMATION IN CRYSTALS AND FOR QUASI-PHASE MATCHING IN FREQUENCY MIXING

Baruch Fischer, and Moshe Horowitz, both of Haifa, Israel, assignors to Technion Research & Development Foundation Ltd., Haifa, Israel

Continuation of Ser. No. 207,062, Mar. 8, 1994, abandoned. This application Oct. 17, 1995, Ser. No. 543,883

Int. Cl.^{6} G03H *1/02;1/22;* **G02F** *1/35*

U.S. Cl. 359—7 **16 Claims**



1. A method for reversibly fixing optical images and holograms in a crystal having a predefined polarization, said method comprising the steps of:

projecting on the crystal a first input light pattern comprising an image or hologram having grating vectors which are substantially perpendicular to the ferroelectric polarization direction of the crystal, said image or hologram having interference fringe planes which are substantially parallel to said ferroelectric polarization direction;

applying, simultaneous with said projecting step, a voltage to the crystal along said polarization direction thereof, to induce an internal electric field pattern therein;

blocking said first input light pattern; and

applying a second voltage with polarity opposite to said voltage, such that ferroelectric domains are induced with a modulation direction substantially perpendicular to said polarization direction to provide transverse domain gratings, and said first input light pattern is permanently fixed in said crystal until erased by application of an electric field thereto simultaneous with a second input light pattern.

5,691,830

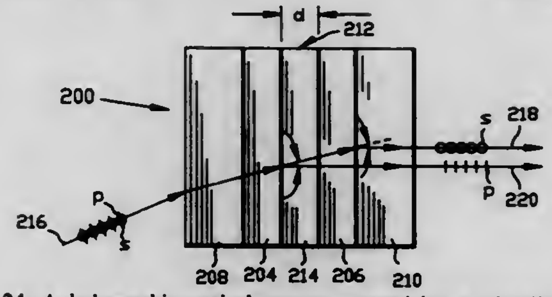
HOLOGRAPHIC OPTICAL SYSTEM INCLUDING WAVEPLATE AND ALIASING SUPPRESSION FILTER

LeRoy David Dickson, Morgan Hill; Francis Stephen Luecke, San Jose, both of Calif., and James Matthew Zavislan, Auburn, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 951,641, Sep. 25, 1992, abandoned, which is a continuation-in-part of Ser. No. 774,410, Oct. 10, 1991, abandoned. This application Mar. 13, 1995, Ser. No. 403,113

Int. Cl.^{6} G02B *5/32;5/30;27/28*

U.S. Cl. 359—15 **25 Claims**



24. A holographic optical system, comprising a plurality of holographic blur filters arranged in a stacked relationship, with non-polarization retardant spacers therebetween, along the direction of an input light beam, each filter diffractively responding to a specific range of radiation wavelengths by selectively dividing said range of radiation wavelengths into first and second polarization components which are parallel to each other and separated a predetermined distance from one another.

5,691,831

OPTICAL BEAM SCANNING DEVICE WITH HOLOGRAM DISC

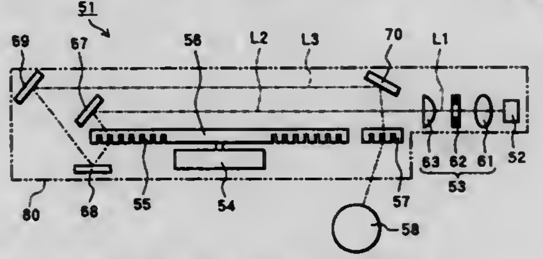
Kazunari Taki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Jun. 28, 1995, Ser. No. 496,006

Claims priority, application Japan, Jun. 29, 1994, 6-147443; Oct. 27, 1994, 6-263486; Nov. 18, 1994, 6-309569

Int. Cl.^{6} G02B *5/32;26/08*

U.S. Cl. 359—18 **17 Claims**



16. An optical beam scanning device comprising:

a laser source emitting laser light;

a rotatable circular hologram disc for diffracting the laser light from the laser source, the hologram disc having one surface formed with a hologram pattern for diffracting the laser light;

driving means for rotationally driving the circular hologram disc to change the diffraction direction, in which the hologram disc diffracts the laser light, thereby scanning a subject medium with the laser light in an in-scan direction, the hologram disc being mounted on the driving means with the surface formed with the hologram pattern facing downwardly;

an optical system for directing the laser light from the laser source onto an upper surface of the hologram disc so that the laser light passes the hologram disc from the upper surface to its lower surface whereby the laser light is diffracted, the optical system including a laser unit and an incidence member, the laser unit guiding the laser light from the laser source to the incidence member while converging the laser light in a cross-scan direction perpendicular to the in-scan direction to converge at a focal point on the hologram disc, the laser unit having a focal length longer than the diameter of the hologram disc, the incidence member being disposed to cause the laser light from the laser unit to fall incident on the hologram disc at a position of incidence, the laser unit being located on one side of a center of the hologram disc and the incidence member being located on an opposite side of the center of the hologram disc so that the laser light travels from the laser unit to the incidence member substantially parallel to the upper surface of the hologram disc; and

reflection means for reflecting the laser light, which has been diffracted by the hologram disc and which has been outputted from the lower surface of the hologram disc, upwardly past an outer edge of the hologram disc.

5,691,832

COHERENCE MULTIPLEXED TRANSMISSION SYSTEM

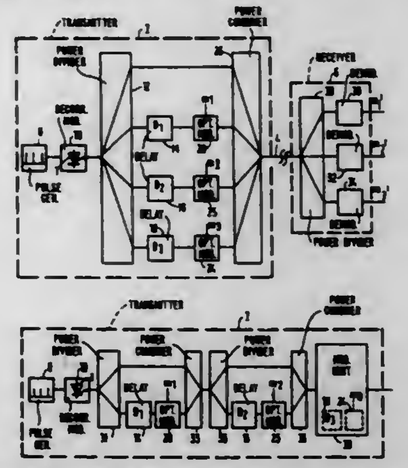
Coen T.H.F. Liedenbaum, and John J.E. Reid, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1994, Ser. No. 283,448

Claims priority, application Belgium, Aug. 2, 1993, 09300803

Int. Cl.^{6} H04J *14/00;* **G02F** *2/00*

U.S. Cl. 359—115 **12 Claims**



1. A multiplex digital transmission system comprising:

a transmitter which includes

signal generating means producing at least first and second digital signals having respective autocorrelation function values corresponding to respective non-zero delays;

a first and a second modulator coupled to said signal generating means for respectively modulating the autocorrelation function values of said first and second digital signals in accordance with first and second modulation signals respectively supplied to said first and second modulators; and

means for combining the modulated first and second digital signals to form a transmit signal at an output of said transmitter;

a transmission channel coupled to the output of said transmitter for conveying said transmit signal; and

a receiver coupled to said transmission channel to receive the transmit signal therefrom and comprising first and second

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demodulators respectively responsive to the autocorrelation function values of the modulated first and second digital signals to recover said first and second modulation signals;

characterized in that said signal generating means comprises a carrier wave generator and a decorrelation modulator coupled thereto, said first and second digital signals being derived from a carrier wave produced by said generators, said carrier wave having an autocorrelation function which includes periodic components; said decorrelation modulator modulating said carrier wave so as to reduce the number of said periodic components of said autocorrelation function thereof, thereby enhancing the transmission capacity of said transmission system.

5,691,833

ROTARY POLYGON MIRROR DEVICE

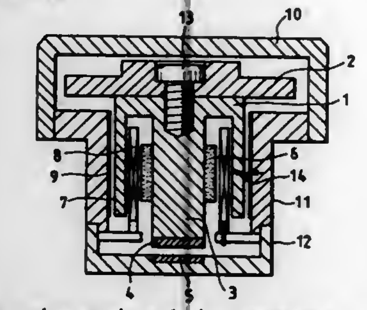
Junshin Sakamoto, and Susumu Saito, both of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1996, Ser. No. 698,152

Claims priority, application Japan, Aug. 18, 1995, 7-210804

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—200 **4 Claims**



1. A rotary polygon mirror device comprising:

a polygon mirror;

a rotatable cylinder for holding said polygon mirror; and

a casing, disposed around an outer peripheral surface of said rotatable cylinder, for forming a predetermined gap between said outer peripheral surface of said rotatable cylinder and an inner peripheral surface of said casing;

wherein the thermal expansion coefficient of said casing is 1.2–1.6 times as large as that of said rotatable cylinder and said rotatable cylinder is used in the rotating region of at least 20,000 revolutions per minute.

5,691,834

ULTRA COMPACT SCANNING SYSTEM FOR A WIDE RANGE OF SPEEDS, ANGLES AND FIELD DEPTH

George A. Plesko, Media, Pa., assignor to Geo Labs, Inc., Media, Pa.

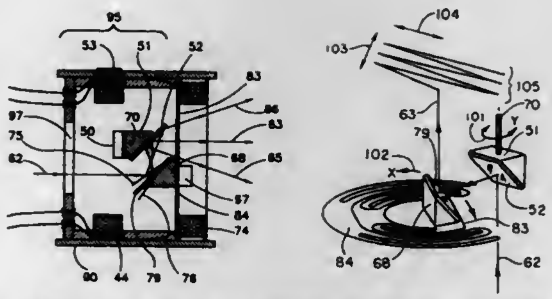
Division of Ser. No. 332,629, Oct. 31, 1994, Pat. No. 5,596,446, which is a continuation-in-part of Ser. No. 006,754, Jan. 21, 1993, Pat. No. 5,469,291, which is a continuation of Ser. No. 612,983, Nov. 15, 1990, Pat. No. 5,187,612, and a continuation-in-part of Ser. No. 776,663, Oct. 15, 1991, Pat. No. 5,371,347, and a continuation-in-part of Ser. No. 114,646, Aug. 31, 1993, abandoned, and a continuation-in-part of Ser. No. 745,905, Aug. 16, 1991, Pat. No. 5,422,471. This application Jan. 20, 1997, Ser. No. 785,793

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—202 **3 Claims**

1. A light beam scanning system for scanning a target to read information therefrom, said system comprising a scan element for receiving a light beam and directing it toward a target as a scanning beam with an angular oscillatory movement of said beam, said scan element comprising:

a coil for carrying electric current, said coil having a coil axis and an opening along said coil axis;



a shaft having a shaft axis disposed substantially perpendicular to said coil axis;

a magnetic element mounted for rotation about said shaft axis in response to current in said coil and producing a magnetic field oriented generally perpendicular to said shaft axis;

a first beam-directing optical element coupled to said magnetic element for rotation therewith about said shaft axis;

a ferromagnetic circuit including at least one ferromagnetic element disposed with respect to said magnetic element so as to establish a minimum energy rotational orientation of said magnetic element in which said magnetic field of said magnetic element is oriented generally perpendicular to said coil axis; and

a second beam-directing optical element which is cooperative with said first beam-directing optical element to impart a two dimensional scan pattern to the beam.

5,691,835

SCANNING LENS

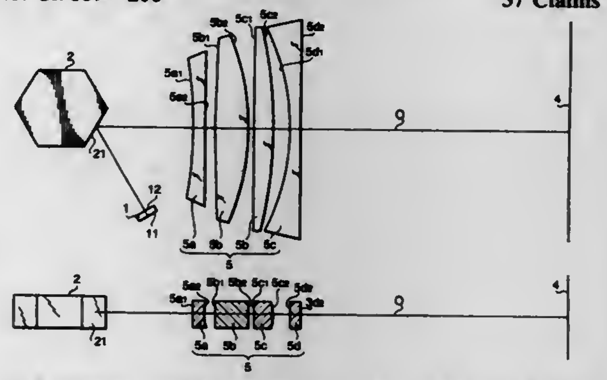
Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1995, Ser. No. 572,798

Claims priority, application Japan, Dec. 16, 1994, 6-334362; Apr. 14, 1995, 7-113595

Int. Cl.^{6} G02B *26/08;9/58*

U.S. Cl. 359—206 **37 Claims**



1. A scanning lens for imaging light beams, deflected in a main scanning direction by a deflector, onto a scanned surface, said scanning lens comprising, in order from said deflector toward said scanned surface:

a first lens having a negative power in at least said main scanning direction, a scanned surface side of said first lens comprising a cylindrical surface having negative power in a subscanning direction;

a second lens having a positive power in at least said main scanning direction;

a third lens having a positive power in at least said main scanning direction; and

a fourth lens having a negative power in at least said main scanning direction.

5,691,836

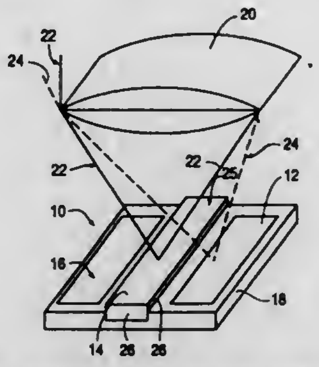
OPTICALLY ADDRESSED SPATIAL LIGHT MODULATOR AND METHOD

Rodney L. Clark, Burley, Ala., assignor to SY Technology, Inc., Huntsville, Ala.

Filed Jul. 11, 1995, Ser. No. 501,171

Int. Cl.^{6} G02F *1/03*

U.S. Cl. 359—247 **15 Claims**



1. An optically addressed spatial light modulator comprising:

a reflective modulator element including a metallic strip mounted above a conductor;

a detector for detecting incident radiation;

a focusing unit which focuses a write beam on said detector and a read beam on said reflective modulation element; and

a circuit receiving a signal output from said detector generated in response to said write beam and altering a modulation characteristic of said reflective modulator element in accordance with said signal, said read beam being modulated in accordance with an amount of alteration of said reflective modulator element,

wherein said modulation characteristic is a position of said metallic strip above said conductor, and said circuit alters said position by injecting a charge output in response to said signal into said conductor.

5,691,837

MAGNETO-OPTICAL ELEMENT AND OPTICAL MAGNETIC FIELD SENSOR USING THE SAME

Nobuki Itoh, Osaka; Hisashi Minemoto, Ootsu; Daisuke Ishiko, and Satoshi Ishizuka, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 14, 1996, Ser. No. 615,940

Claims priority, application Japan, Mar. 17, 1995, 7-058935

Int. Cl.^{6} G06F *1/00*

U.S. Cl. 359—324 **13 Claims**

1. A magneto-optical element comprising a film of a Bi-substituted rare earth iron garnet selected from the group consisting of garnets of the following chemical formulas (3) and (4)

$$(Bi_xGd_yR_zY_{3-x-y-z})(Fe_{5-w}Ga_w)O_{12} \tag{3}$$

wherein R represents at least one element selected from the group consisting of rare earth elements other than Gd, and x, y, z and w are such that $1.00 \leqq x \leqq 1.30$, $0.42 \leqq y \leqq 0.60$, $0.01 \leqq z \leqq 0.05$ and $0.40 \leqq w \leqq 0.62$, and

$$(Bi_{x'}Gd_{y'}R_{z'}Y_{3-x'-y'-z'})Fe_5O_{12} \tag{4}$$

wherein R is as defined above, and x', y' and z' are such that $1.10 \leqq x' \leqq 1.30$, $1.00 \leqq y' \leqq 1.80$, $0 \leqq z' \leqq 0.06$ provided that $x'+y' \leqq 3.0$.

5,691,838

INFRARED-BLOCKING OPTICAL FIBER

Masuhiro Shouji; Hiroki Katono; Takeo Ogihara, and Teruo Sakagami, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 467,545

Claims priority, application Japan, Jun. 16, 1994, 6-156408

Int. Cl.^{6} F21V *9/04;* **G02B** *5/08;5/20;* **C08F** *30/00*

U.S. Cl. 359—359 **14 Claims**

1. An infrared-blocking optical filter comprising a transparent substrate and an infrared-blocking film provided on a surface of the transparent substrate:

said infrared-blocking film being formed of a synthetic resin in which fine powder of a metal oxide material composed of indium oxide or tin oxide or a mixture thereof is dispersed, wherein the infrared-blocking film has a thickness of 0.1–50 μm and a content of the fine powder of the metal oxide material is 30–98 mass % based on the total mass of the infrared-blocking film.

5,691,839

LASER SCANNING OPTICAL MICROSCOPE

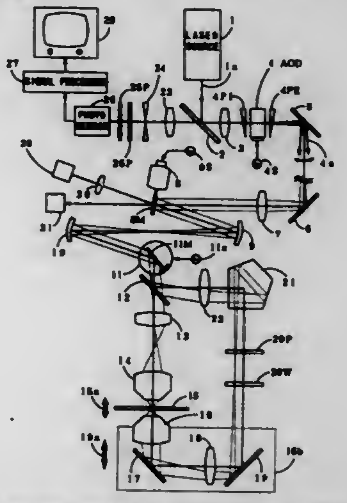
Koji Kobayashi, Chofu, Japan, assignor to Kowa Company Ltd., Japan

Filed Apr. 11, 1994, Ser. No. 225,544

Claims priority, application Japan, Apr. 15, 1993, 5-087693

Int. Cl.^{6} G02B *21/06;21/00;26/08*

U.S. Cl. 359—385 **42 Claims**



1. A laser scanning optical microscope in which a laser beam from a laser light source is focussed to a small spot by an objective optical system and projected onto a specimen while also being scanned two-dimensionally, and light reflected or transmitted by the specimen is detected and photoelectrically converted by light receiving means to thereby obtain information on the specimen, the laser scanning optical microscope comprising:

three or more optical scanning means having different scanning frequencies for two-dimensionally scanning the laser beam in a zig-zag pattern by scanning the laser beam in a first scanning direction perpendicular to a second scanning direction while the laser beam makes small oscillations along the first scanning direction, and scanning the laser beam in a third scanning direction parallel to the first scanning direction; and

signal processing means for converting a detection signal obtained from the light receiving means to a standard television scanning signal corresponding to a laser beam scanning pattern obtained with the three or more optical scanning means.

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5,691,840
VIDEO MICROSCOPE

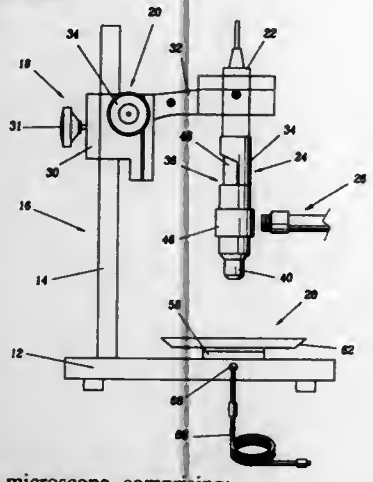
Jaewoo Bae, and Haenam Jeon, both of Suwon-si, Rep. of Korea, assignors to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

Filed Nov. 8, 1995, Ser. No. 555,113

Claims priority, application Rep. of Korea, Dec. 7, 1994, 94-33174

Int. Cl.^{6} G02B *21/06;* **H04N** *7/18*

U.S. Cl. 359—386 **8 Claims**



1. A video microscope, comprising:
a stage for receiving a specimen;
a first light guide for a transmission method;
a first polarizer, positioned below said stage, for partially polarizing light in the first light guide from a first light source;
a second light guide for a reflection method;
a second polarizer for partially polarizing light in the second light guide from a second light source;
a lens assembly for emitting the polarized light from the first or second polarizer, said lens assembly comprising:
an outer cylinder,
a rotatable cylinder rotatably fitted to the outer cylinder,
an analyzer,
a compensating plate,
a holder, mounted on the rotatable cylinder, for holding the analyzer and the compensating plate, the analyzer being rotated in accordance with the rotation of the rotatable cylinder,
a beam splitter case at a lower end of the outer cylinder, and having an internally threaded hollow hole for the second light guide,
an objective mounted on a lower part of the beam splitter case, and
a beam splitter, positioned in the beam splitter case, for reflecting the polarized light from the second polarizer to the objective;
a CCD mount comprising a CCD mounted on the lens assembly; and
means for adjusting the height and focus of said lens assembly.

5,691,841
STAGE DRIVING APPARATUS

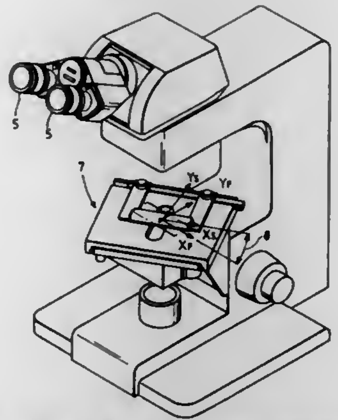
Mikio Ohsaki, Yokohama, and Jiro Mizuno, Fujisawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 16, 1996, Ser. No. 586,182

Claims priority, application Japan, Jan. 17, 1995, 7-004913

Int. Cl.^{6} G02B *21/26;21/00;* **G01N** *21/01*

U.S. Cl. 359—391 **16 Claims**



1. A stage driving apparatus comprising:
a stage for mounting a sample and rotatable about an optical axis of an observation optical system for observing the sample;
two guides, for moving said stage within a plane perpendicular to the optical axis of said observation optical system, rotatable together with said stage and orthogonal to each other;
an input device for inputting a signal representing a moving direction of said stage;
a converter for converting a signal inputted to said input device based on an observation image of the sample on said stage through said observation optical system into an output signal with a compensated relative rotational deviation between a moving direction defined by the observation image and a moving direction defined by said two guides; and
a driving device for moving said stage along said two guides based on the output signal from said converter.

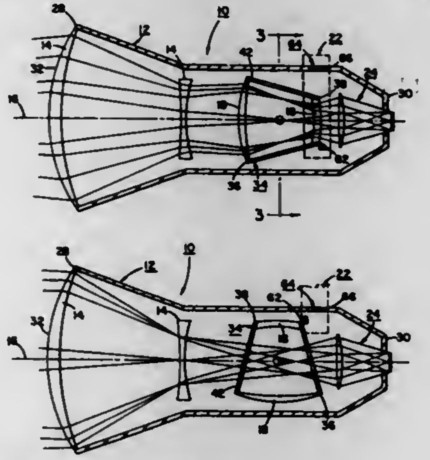
5,691,842
OPTICAL SIGHT ASSEMBLY

Gabor Devenyi, West Pentang, and Conrad Stenton, Midland, both of Canada, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 73,824, Jun. 8, 1993, Pat. No. 5,548,442. This application May 21, 1996, Ser. No. 651,171

Int. Cl.^{6} G02B *23/00*

U.S. Cl. 359—432 **20 Claims**



1. An optical assembly comprising:
a housing;
a plurality of optical elements, said plurality of optical elements being disposed within said housing and defining an optical path, at least one of the plurality of optical elements being a fixed optical element and at least one of the other plurality of optical elements being a moveable optical element, wherein the fixed optical element provides a first field of view and the combination of the fixed optical element and the moveable optical element provides a second field of view;
means for selectively introducing or removing said moveable optical element into or out of said optical path to selectively provide the second field of view; and
magnetic means for indicating the position of said moveable optical element within said housing to indicate the field of view selected, said magnetic means including a magnetic switch affixed to said housing and a permanent magnet affixed to said moveable optical element, wherein movement of the moveable optical element causes the permanent magnet to be moved in relation to the magnetic switch to indicate whether the moveable optical element is into or out of the optical path.

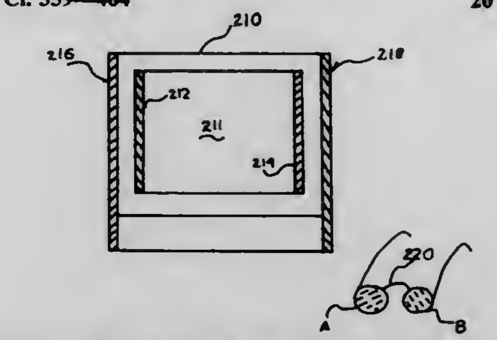
5,691,843
ENHANCED DEPTH PERCEPTION IN A TWO-DIMENSIONAL IMAGE

William J. O'Neill, 2901 E. Eisenhower Pkwy., Ann Arbor, Mich. 48108

Continuation-in-part of Ser. No. 164,507, Dec. 9, 1993, abandoned. This application Aug. 3, 1995, Ser. No. 511,091

Int. Cl.^{6} G02B *27/22;27/26*

U.S. Cl. 359—464 **20 Claims**



1. A system for imparting a sense of depth to a two-dimensional image having right and left edges, comprising:
a frame disposed around the perimeter of said image including at least the right and left edges thereof;
a strip of a first light-filtering material vertically disposed along the right edge of said image adjacent the inner left edge of said frame;
a strip of a second light-filtering material vertically disposed along the left edge of said image adjacent the inner right edge of said frame;
a second strip of said first light-filtering material vertically disposed along the left outermost edge of said frame;
a second strip of said second light-filtering material vertically disposed along the right outermost edge of said frame;
a layer of said first light-filtering material disposed between the left eye of a viewer and said framed image and said strips of said light-filtering materials; and
a layer of said second light-filtering material disposed between the right eye of a viewer and said framed image and said strips of said light-filtering materials,
said first and said second light-filtering materials being characterized in that they produce a light-cancellation effect when overlaid and viewed therethrough,
wherein said strips disposed adjacent said inner edges of said frame create the illusion that said image appears to recede relative to said frame, and
said material strips disposed along said outermost edges of said frame create the illusion that said frame appears to come forward relative to said outerward strips.

5,691,844
REFLECTION MIRROR

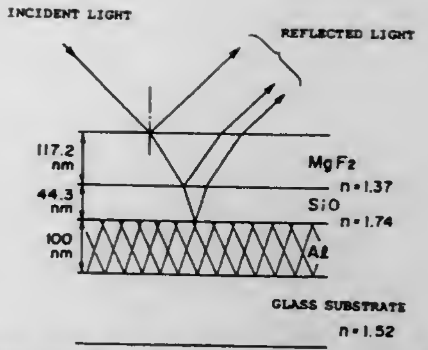
Tomihiro Oguchi; Hiroyuki Kubozoe; Hiroshi Tamura; Nozomu Kikuchi; Hirokazu Izumi; Tadashi Toriumi; Manabu Akagi, and Yoshihide Hamaguchi, all of Tokyo-to, Japan, assignors to Pioneer Electronic Corporation, Japan

Filed Mar. 6, 1995, Ser. No. 399,150

Claims priority, application Japan, Mar. 9, 1994, 6-038838

Int. Cl.^{6} G02B *27/26;1/10;5/08*

U.S. Cl. 359—465 **5 Claims**



1. A reflection mirror of a projection display unit which displays a stereoscopic image through light polarization glasses, for reflecting a linearly polarized light emitted from a projection source through a polarizing plate toward a screen, said reflection mirror comprising:
a glass substrate;
a metal film provided on the glass substrate;
a first dielectric film provided on the metal film; and
a second dielectric film provided on the first dielectric film,
wherein each of the first and second dielectric films includes a predetermined thickness, the first dielectric film has a first refractive index and the second dielectric film has a second refractive index smaller than the first refractive index so that a phase difference between a p-polarized light of a reflected light and a s-polarized light of the reflected light is within a range from –45 degrees to 45 degrees in case of an incident angle of the linearly polarized light being varied from 0 degrees to 45 degrees.

5,691,845
OPTICAL ISOLATOR, OPTICAL ISOLATOR WITH FIBER AND METHOD FOR MAKING THE SAME

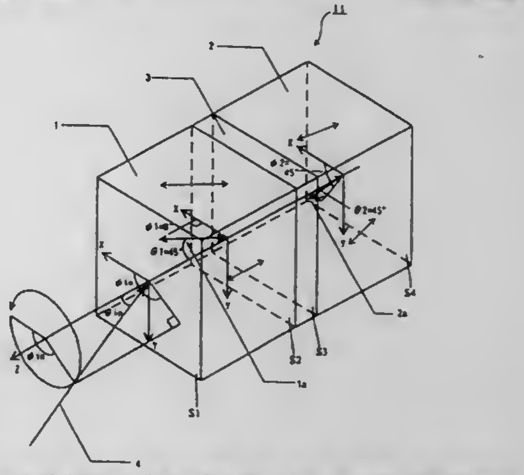
Shinji Iwatsuka, Oamishirasato-machi; Yoichi Kanagawa, Narita; Kenjiro Hata, Matsudo, and Makoto Sekijima, Ichikawa, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 10, 1995, Ser. No. 513,286

Claims priority, application Japan, Aug. 12, 1994, 6-210667; Jun. 28, 1995, 7-162478

Int. Cl.^{6} G02B *5/30*

U.S. Cl. 359—497 **12 Claims**



1. An optical isolator including first and second birefringent plates so arranged that the plane of polarization of a light passing through the first birefringent plate as an ordinary light and the plane of polarization of a light passing through the second birefringent plate as an ordinary light are non-parallel with each other and a Faraday rotator inserted between the first and second birefringent plates for rotating the plane of polarization of a light incident on the Faraday rotator through a fixed angle,
characterized in that the angles of the optical axes of the first and second birefringent plates are so set that a forward incident

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polarized light passes through the first and second birefringent plates both as ordinary lights or both as extraordinary lights, and the relationships $\phi \neq \phi_{eff}$ and $\theta_f + \phi_{eff} = 90°$, are satisfied when an actually used incident polarized light is incident in an oblique direction, where ϕ is the angle between the plane of polarization of the light passing through the first birefringent plate as an ordinary light and the plane of polarization of the light passing through the second birefringent plate as an ordinary light when a light is incident on the first birefringent plate in the direction normal to the first birefringent plate, where ϕ_{eff} is the angle between the plane of polarization of the light passing through the first birefringent plate as an ordinary light and the plane of polarization of the light passing through the second birefringent plate as an ordinary light when said actually used forward incident polarized light is incident in said oblique direction, and where θ_f is the angle of Faraday rotation of said Faraday rotator at its central temperature of use and at its central wavelength of use.

5,691,846

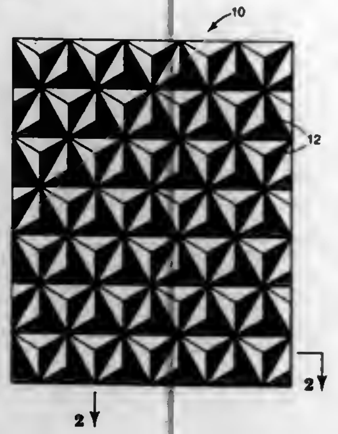
ULTRA-FLEXIBLE RETROREFLECTIVE CUBE CORNER COMPOSITE SHEETINGS AND METHODS OF MANUFACTURE

Olester Benson, Jr., Woodbury; Cheryl M. Frey, White Bear Lake; Jeanine M. Shusta, Mahtomedi; Susan K. Nestegard, Woodbury, all of Minn.; Vera L. Lightle, Hudson, Wis.; Kenneth L. Smith, White Bear Lake, and Chester A. Bacon, Jr., Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 326,696, Oct. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 285,648, Aug. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 139,433, Oct. 20, 1993, Pat. No. 5,450,235, and a continuation-in-part of Ser. No. 139,914, Oct. 20, 1993, Pat. No. 5,614,286. This application Jun. 7, 1995, Ser. No. 472,444

Int. Cl.^{6} G02B *5/124*

U.S. Cl. 359—530 **48 Claims**



17. A microstructured composite sheeting comprising: (a) a two dimensional array of cured microstructure elements, said array comprising a first polymeric material, and (b) an overlay film having two major surfaces and comprising a second polymeric material, said array being bonded to the first major surface of said overlay film with a fractured land and wherein the material of said microstructure elements and the material of said overlay film form an interpenetrating network, said microstructure elements being substantially independent from adjacent microstructure elements, said microstructure elements having been cured while in contact with said overlay film.

5,691,847

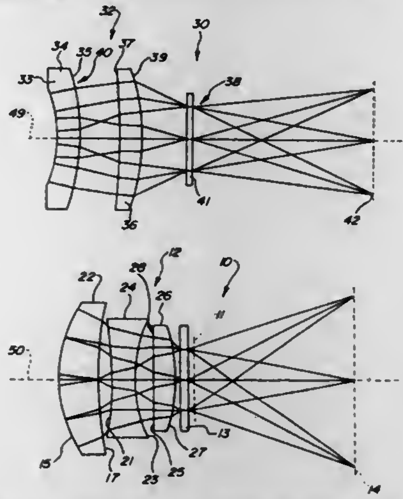
ATHERMALIZED AND ACHROMATIZED OPTICAL SYSTEMS EMPLOYING DIFFRACTIVE OPTICAL ELEMENT

Chungte W. Chen, Irvine, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 8, 1994, Ser. No. 285,540

Int. Cl.^{6} G02B *27/44;9/04;9/14*

U.S. Cl. 359—565 **13 Claims**



1. A method of simultaneously athermalizing and achromatizing an optical system, said method comprising the steps of:

(a) providing an optical system;

(b) assembling a lens group of at least three lenses of different materials, said materials having different thermal glass constants;

(c) securing a diffractive optical element to one of the lenses in said lens group, wherein said diffractive optical element further comprises means for correcting chromatic aberration, said diffractive optical element associated with one of said first, second or third lenses, wherein an effective focal length ratio between said first lens and said second lens approximates a ratio of their respective first and second thermal glass constants said lenses and diffractive optical elements generally positioned on an optical axis defined by said first lens providing a compact system being simultaneously athermalized and achromatized; and

(d) positioning said lens group and said diffractive optical element to focus energy onto a focal plane within said optical system.

5,691,848

ELECTRICAL CONTROL SYSTEM FOR VEHICLE OPTIONS

Paul S. Van Lente; Michael J. Suman; Mark L. Zeinstra, and William S. DeVree, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Division of Ser. No. 567,390, Aug. 14, 1990, Pat. No. 5,614,885, which is a continuation-in-part of Ser. No. 279,643, Dec. 5, 1988, abandoned. This application Jan. 31, 1995, Ser. No. 381,087

Int. Cl.^{6} G02B *27/00;5/08;7/182*

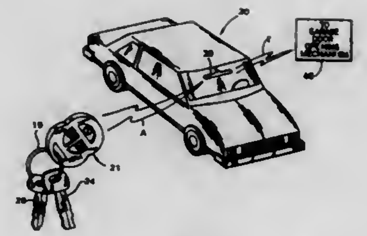
U.S. Cl. 359—601 **18 Claims**

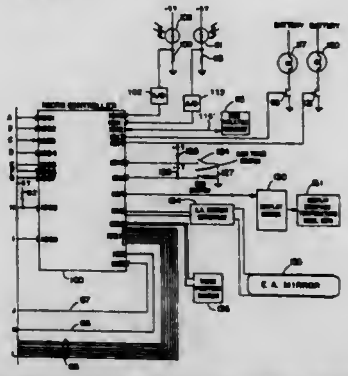
1. A control system and trainable electrically adjustable mirror for adjustment for different users of a vehicle comprising:

an electrically adjustable mirror having a variable reflectivity level that is electronically adjustable in response to a reflectivity control signal;

a memory for storing sets of reflectivity parameter data, each set of reflectivity parameter data corresponding to one of a plurality of users of a vehicle;

input means for providing an indication of which one of the plurality of users is using said electrically adjustable mirror; and





a control circuit coupled to said electrically adjustable mirror, said memory, and said input means, said control circuit reads the set of stored reflectivity parameter data from said memory for the user identified by said input means and generates and supplies a reflectivity control signal to said electronically adjustable mirror to adjust the reflectivity level of said electrically adjustable mirror according to the read reflectivity parameter data without requiring movement of said mirror.

5,691,849

REAR-VIEW ASSEMBLY FOR A VEHICLE AND AN ADAPTOR THEREFOR

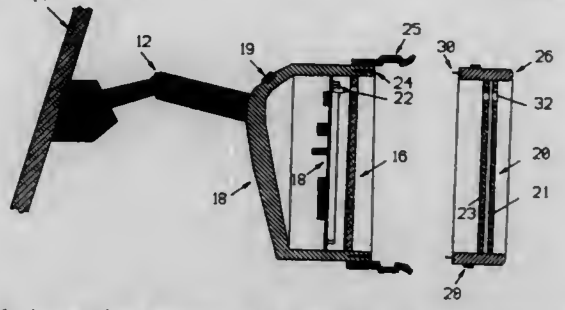
René Ledroit, Les Bons Villers; Jean-François Thomas, Braine-le-Château, and André Hecq, Nalinnes, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Feb. 18, 1994, Ser. No. 198,769

Claims priority, application United Kingdom, Feb. 25, 1993, 93 03 807.3

Int. Cl.^{6} G02B *27/00;5/08;7/182*

U.S. Cl. 359—603 **32 Claims**



1. A rear-view assembly for a vehicle to provide a user with rearward vision during operation of the vehicle, comprising:

a mirror;

a housing which carries the mirror;

an anti-dazzle adaptor which is comprised of an optical cell having at least one electrically adjustable luminous characteristic selected from the group consisting of transmissivity and reflectivity, and which is movably mounted in front of the mirror in a line of sight between the user and the mirror so that the optical cell is movable out of the line of sight in the event of a malfunction of the optical cell and thereby to return rearward vision to the user via the mirror alone; and

a support frame which is movable and which carries the optical cell, the housing and the support frame being provided with co-operating releasable securing means to secure the support frame to the housing in a releasable manner.

5,691,850

EYEPIECE

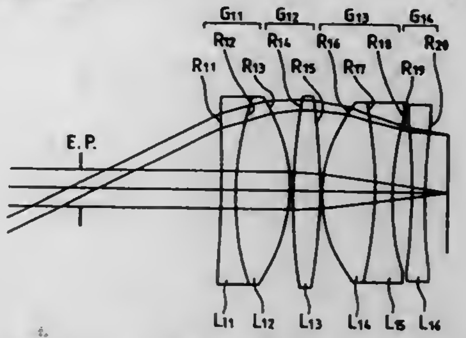
Masami Arisaka, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 406,161

Claims priority, application Japan, Mar. 25, 1994, 6-077875

Int. Cl.^{6} G02B *25/00;03/02*

U.S. Cl. 359—644 **8 Claims**



1. An eyepiece, which has an apparent visual angle of not less than 40°, comprising, in the following order from the eyepoint side:

a first lens group including a cemented lens of negative and positive lens components and having a positive refractive power;

a second lens group including a single positive lens component;

a third lens group including a cemented lens of positive and negative lens components and having a positive refractive power; and

a fourth lens group including a single negative lens component,

wherein at least one surface in said first to fourth lens groups is an aspherical surface whose peripheral portion has a radius of curvature larger than a radius of curvature near a vertex thereof, and

wherein said aspherical surface satisfies the following formulas:

$$x = C_0y^2/[1 + \sqrt{(1 - \kappa C_0^2y^2)}\,] + C_4y^4 + C_6y^6 + C_8y^8 + C_{10}y^{10}$$

$$|C_4| \leqq 1 \times 10^{-3}$$

where x is the distance measured from the vertex in an optical axis direction, y is the distance measured from the vertex in a direction perpendicular to the optical axis, $C_0 = 1/R$ (radius of curvature at the vertex) is the vertex curvature, κ is a constant of cone, and C_4, C_6, C_8, and C_{10} are respectively 4th-, 6th-, 8th-, and 10th-order aspherical surface coefficients.

5,691,851

ZOOM LENS

Akihiro Nishio; Makoto Misaka, and Takashi Kato, all of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 274,307, Jul. 12, 1994, abandoned. This application Oct. 23, 1996, Ser. No. 735,571

Claims priority, application Japan, Jul. 14, 1993, 5-174316; Aug. 4, 1993, 5-212197; Nov. 26, 1993, 5-321401; Nov. 29, 1993, 5-325842; Nov. 30, 1993, 5-326224; Mar. 15, 1994, 6-069920; Mar. 24, 1994, 6-053766; May 31, 1994, 6-118544; Jun. 7, 1994, 6-150316; Jun. 7, 1994, 6-150317

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—683 **48 Claims**

1. A zoom lens comprising, a front lens group having a first, a second and a third lens units in this order from the object side, and whose overall refractive power for the wide angle end is positive,

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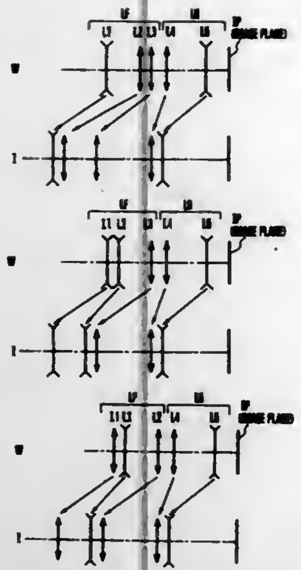


and a rear lens group having a lens unit of positive refractive power and a lens unit of negative refractive power, wherein when zooming from the wide angle end to the telephoto end, the separations between the lens units in said front lens group vary so that the overall refractive power of said front lens group is weaker in the telephoto end than in the wide angle end, and the separation between said positive lens unit and said negative lens unit narrows, whereby letting the focal length of the i-th lens unit be denoted by fi, the shortest focal length of the entire lens system by fW and the lateral magnification for the wide angle end of the i-th lens unit by βiW, the following conditions are satisfied:

$$0.5<|f5/fw|<1.5$$

$$1.1<\beta 5W<1.7.$$

5,691,852

Patent Not Issued For This Number

5,691,853
OBJECTIVE LENS FOR ENDOSCOPES

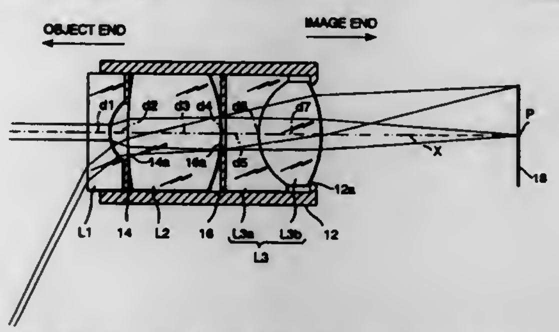
Hitoshi Miyano, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Oct. 5, 1995, Ser. No. 539,605

Claims priority, application Japan, Oct. 5, 1994, 6-241168

Int. Cl.^{6} G02B *9/00;7/02;5/00*

U.S. Cl. 359—740 **12 Claims**



1. An objective lens for an endoscope which has an optical lens system including a plurality of optical lens elements arranged at predetermined axial distances, said objective lens system comprising:

a lens barrel in which said optical lens elements are coaxially placed; and an aperture ring disposed between an adjacent two of said lens elements for restricting light rays entering said optical system and positioning said adjacent two lens elements at a specified axial distance; said aperture ring having an aperture having a marginal edge, said marginal edge being in contact with both of said adjacent two lens elements; said aperture ring having a thickness less than approximately 0.1 mm.

5,691,854
ZOOM LENS WITH DIFFERENTIAL FOCAL COMPENSATION FOR VISIBLE, IR, AND UV LIGHT

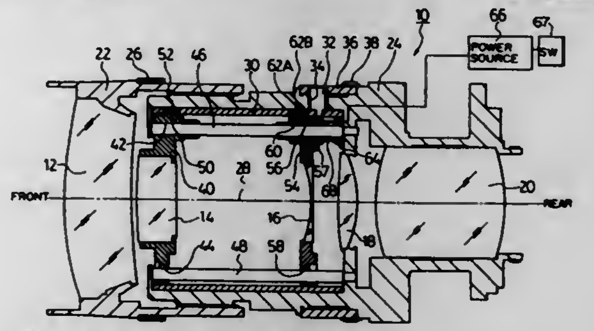
Shigeru Yoshida, and Hitoshi Miyano, both of Omiya, Japan, assignors to Fuji Optical Co., Ltd., Omiya, Japan

Filed Sep. 20, 1995, Ser. No. 531,053

Claims priority, application Japan, Sep. 27, 1994, 6-231819

Int. Cl.^{6} G02B *7/02;15/14*

U.S. Cl. 359—823 **8 Claims**



1. A zoom lens mechanism, comprising:

a zoom lens barrel;

a variable magnification lens part supported within said zoom lens barrel in such a manner to be movable forward and backward along an optical axis;

a correction lens part for correcting a focal inadequacy resulting from a movement of said variable magnification lens part, which is supported within said zoom lens barrel in such a manner to be movable forward and backward along an optical axis;

first control means for controlling a movement of said correction lens part so as to correct focal inadequacy resulting from a movement of said variable magnification lens part in a wavelength area of visible light;

second control means for controlling a movement of said correction lens part so as to correct a focal inadequacy resulting from a movement of said variable magnification lens part in a wavelength area of infrared light; and

switching means for selectively making said first control means or said second control means work.

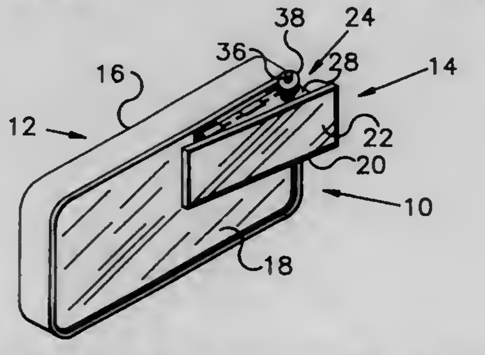
5,691,855
MOTOR VEHICLE WIDE ANGLE REAR VIEW MIRROR

Raymond Robert Lupkas, Trumbull, Conn., assignor to Jacqueline M. Lupkas, Trumbull, Conn.

Filed Aug. 14, 1995, Ser. No. 513,474

Int. Cl.^{6} G02B *5/08;7/182;5/10*

U.S. Cl. 359—866 **12 Claims**



1. A wide angle rear view mirror assembly adapted to be operatively associated with the conventional main rear view mirror assembly that is normally mounted on the outer side of a motor vehicle for expanding the lateral range of vision of the main rear view mirror assembly in the same direction as that of the main rear view mirror assembly, the main rear view mirror assembly having a main frame and a main rear view mirror element mounted therein, said wide angle rear view mirror assembly comprising:

A. a supplemental frame member

B. a supplemental rear view mirror element mounted in said supplemental frame member, said supplemental mirror element being optically flat,

C. means mounting said supplemental frame member on the main rear view mirror assembly, said means including a plate member disposed in a plane perpendicular to said main mirror and supplemental mirror elements and interconnecting said main mirror and supplemental mirror elements such that said supplemental mirror element is disposed in juxtaposition with the main rear view mirror element and lies in a plane which is disposed at a first angle relative to the plane of said main mirror element, said first angle being fixed relative to the plane of said main mirror element, said mounting means also permitting pivotal movement of said supplemental frame member and said supplemental mirror element about a pivot axis that is parallel to the longitudinal axis of the main mirror element such that said supplemental frame member and said supplemental mirror element can move angularly about said parallel pivot axis through a second angle which lies in a plane that is perpendicular to said plate member, and

D. means for moving said supplemental frame member through said second angle and for maintaining said supplemental frame member and said supplemental mirror element in any given position within said second angle,

wherein said supplemental mirror expands an angle of vision of a driver of said motor vehicle beyond the included angle of vision provided by the main mirror element of the main rear view mirror assembly.

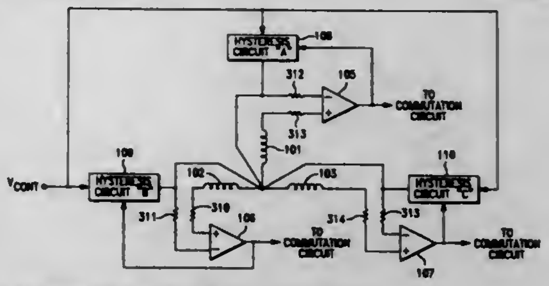
5,691,856
APPARATUS AND METHOD FOR PROVIDING SELECTIVE HYSTERESIS FOR ZERO CROSSINGS OF A DISK DRIVE SPINDLE MOTOR

John J. Kardash, Gilroy, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Oct. 10, 1995, Ser. No. 541,845

Int. Cl.^{6} G11B *15/46*

U.S. Cl. 360—73.03 **15 Claims**



1. A magnetic storage device comprising:

a rotatable disk for storing data;

a transducer for writing data onto the rotatable disk;

a spindle motor for rotating the disk, wherein the spindle motor has a plurality of windings;

a comparator coupled to one of the windings for detecting a zero crossing corresponding to when a voltage corresponding to one of the windings equals a reference voltage;

a control circuit coupled to the comparator for generating a control signal that indicates a slope of the voltage corresponding to one of the windings, wherein the determination is based on commutation signals that provide sequencing for the spindle motor;

a hysteresis circuit coupled to the control circuit for providing a hysteresis voltage to an input of the comparator according to the control signal, wherein after the zero-crossing is detected:

a positive hysteresis voltage is provided to the input of the comparator if the control signal indicates that the voltage corresponding to one of the windings has a positive slope; and

a negative hysteresis voltage is provided to the input of the comparator if the control signal indicates that the voltage corresponding to one of the windings has a negative slope.

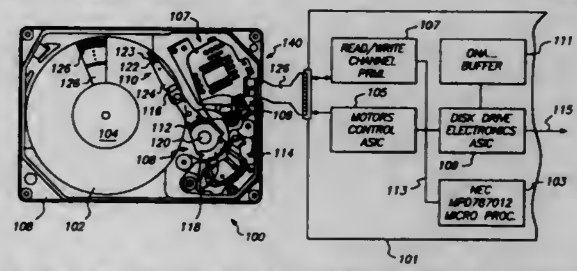
5,691,857
METHOD USING MATCHED FILTERS FOR DETERMINING HEAD POSITIONER MICRO-JOG IN HARD DISK DRIVE EMPLOYING MAGNETO-RESISTIVE HEADS

James Fitzpatrick, Mountain View, and Xiaodong Che, Sunnyvale, both of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Sep. 29, 1995, Ser. No. 536,416

Int. Cl.^{6} G11B *5/596*

U.S. Cl. 360—77.06 **19 Claims**



1. In a disk drive having a magneto-resistive read, inductive write transducer (MR) head assembly and a sampled digital detector read channel, a method of estimating a micro-jog distance for a selected track on the disk drive recording media, the selected track having a nominal centerline location, the method comprising the steps of:

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determining a first offset distance from the selected track nominal centerline where on-track read signal energy is maximized;

determining a second offset distance from the selected track nominal centerline comprising the step of:
  selecting an interference bit pattern having a first frequency;
  recording the interference bit pattern in each of two selected interference locations on the recording media, each of the interference locations being laterally offset to a respective side of the nominal track centerline by a selected distance less than the track pitch;
  reading the selected track at a plurality of various offset distances from the nominal centerline location;
  measuring a read signal energy responsive to the interference bit patterns at each of said various offset distances; and
  selecting one of said various offset distances as the second offset distance for the selected track so as to position the head assembly where the detected read signal energy responsive to the interference bit patterns is minimized; and

selecting a third offset distance intermediate the first and second offset distances as the micro-jog distance for the selected track.

5,691,858
MAGNETIC RECORDING AND REPRODUCING APPARATUS HAVING A SINGLE MASTER GEAR AND SLIDE MEMBER

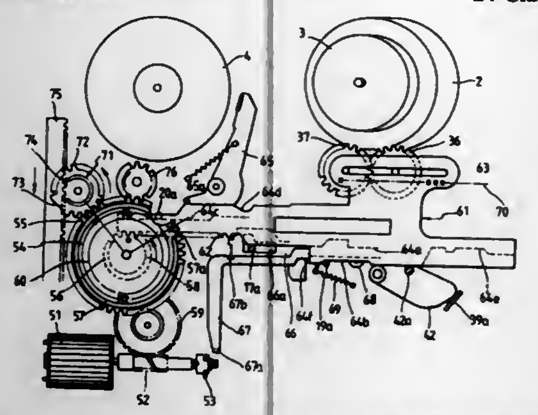
Jung-jae Lee, Seoul; Ju-hyeong Lee, Suwon; Myeong-su Choi, Suwon, and Jung-yong Lee, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation of Ser. No. 87,332, Jul. 8, 1993, abandoned. This application Aug. 7, 1995, Ser. No. 512,128

Claims priority, application Rep. of Korea, Jul. 8, 1992, 92-12164

Int. Cl.⁶ G11B *5/027*

U.S. Cl. 360—85 **24 Claims**



1. A magnetic recording and/or reproducing apparatus having a deck which comprises a head drum, a capstan and a pinch roller which are rotated, reel driving means for selectively driving two tape reels on which tape is wound, brake means for selectively stopping the rotation of said two tape reels, tape loading means for loading tape between said two tape reels and onto said head drum, tension maintaining means for maintaining tension in the loaded tape, pinch-roller driving means for pressing the tape between said capstan and said pinch roller, and at least one guide means for guiding traveling tape, said apparatus further comprising:
  a motor;
  a master gear member coupled to said motor so as to be rotated by said motor;
  a main slide member having a rack formed thereon, said rack being coupled to said master gear member;
  interlocking means having a plurality of interlocking portions for interlocking said main slide member with said tape loading means, said brake means, and said reel driving means of said deck; and
  control means for controlling said motor, and thus said master gear member and said main slide member, in order to change the operational states of respective portions of the deck to assume tape loading, tape reel braking and playback modes all within a single rotation of said master gear member.

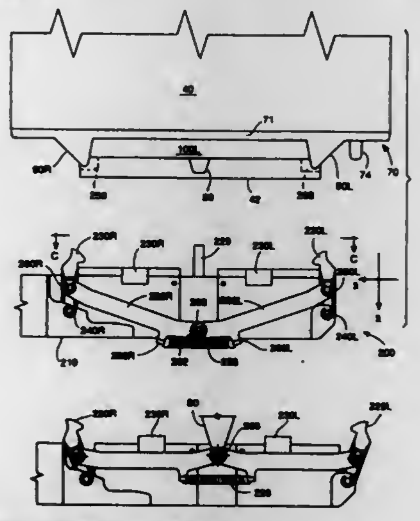
5,691,859
DRIVE WITH FEATURES WHICH ADJUST AND ACTUATE CARTRIDGE TRANSPORT AND LIBRARY WITH SUCH DRIVE

Michael Ulrich, Boulder, and Robert B. Ousley, Ward, both of Colo., assignors to Exabyte Corporation, Boulder, Colo.

Filed Dec. 19, 1995, Ser. No. 575,156

Int. Cl.⁶ G11B *15/68*

U.S. Cl. 360—92 **4 Claims**



1. A cartridge library comprising:
a library frame;
a magnetic tape drive mounted to the library frame;
a storage location for at least one cartridge, the storage location being provided on the library frame;
a cartridge gripper assembly for transporting a data cartridge between the tape drive and the storage location in the library, the gripper assembly comprising:
  a gripper base member;
  a pair of gripper fingers, each of the gripper fingers having a proximal end pivotally mounted to the gripper base member and a distal end adapted to engage a notch of a data cartridge;
  a pair of finger linkages, each finger linkage having a distal end pivotally attached to a corresponding one of the gripper fingers and a proximal end pivotally attached to an other of the finger linkages, the pair of finger linkages being pivotally attached to one another at a linkage pivot junction;
  a biasing member attached to the pair of finger linkages to provide a biasing force on the finger linkages; and
wherein the magnetic tape drive has a projection formed in a position to abut the finger linkages at the linkage pivot junction and to overcome the biasing force on the finger linkages.

5,691,860
SELF SEALING STRUCTURE FOR A REMOVABLE DISK HARD DISK DRIVE

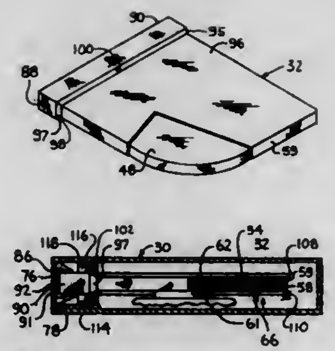
Robert P. Hoppe, Boulder Creek, Calif., assignor to Avatar Systems Corp., Milpitas, Calif.

Filed May 9, 1996, Ser. No. 644,270

Int. Cl.⁶ G11B *33/14;23/03*

U.S. Cl. 360—97.02 **20 Claims**

1. A hard disk drive system including:
a hard disk cartridge that includes:



  a disk for data storage;
  a housing positioned about said disk having:
    an inner housing end;
    an outer housing end; and
    means at said inner housing end for providing access to the disk; and
  a seal abutment structure positioned around said housing at said outer housing end; and
a disk drive including:
  a cartridge opening into which at least said inner housing end of said hard disk cartridge is inserted; and
  a gasket about said cartridge opening sized and positioned to sealably engage said seal abutment structure when said hard disk cartridge is fully inserted in said disk drive.

5,691,861
ACTUATOR ARM ASSEMBLY HAVING SIDE WALL PROJECTION FOR CARRYING JUXTAPOSED HEAD WIRES

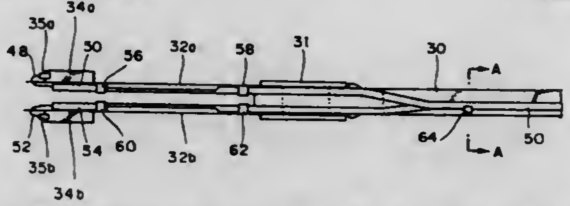
Koichiro Ohba, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 1, 1996, Ser. No. 625,162

Claims priority, application Japan, Jun. 15, 1995, 7-148806

Int. Cl.⁶ G11B *5/48*

U.S. Cl. 360—104 **5 Claims**



1. An actuator arm assembly for a disk drive having a base, comprising:
  an actuator arm rotatably mounted on said base, said actuator arm having a first surface and a second surface;
  a first suspension fixed at a base end portion thereof to said first surface of said actuator arm at a front end portion thereof;
  a first head mounted on a front end portion of said first suspension;
  a second suspension fixed at a base end portion thereof to said second surface of said actuator arm at the front end portion thereof;
  a second head mounted on a front end portion of said second suspension;
  a first lead wire bundle connected to said first head;
  a second lead wire bundle connected to said second head;
  a plurality of projections formed integrally with said actuator arm so as to project from a side surface of said actuator arm in a direction substantially parallel to said first surface and said second surface, said projections being spaced apart from each other and disposed in a single plane extending in a longitudinal direction of said actuator arm; and
  said first and second lead wire bundles being juxtaposed in said direction substantially parallel to said first and second surfaces and fixed to said projections by an adhesive.

5,691,862
RECORDING/REPRODUCING APPARATUS WITH AN INTEGRATED INDUCTIVE WRITE, MAGNETORESISTIVE READ HEAD

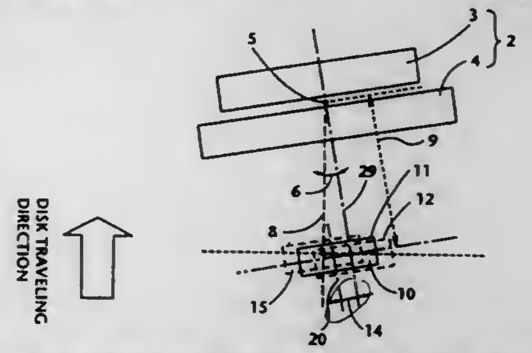
Masanobu Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 302,531, Sep. 8, 1994, Pat. No. 5,596,463. This application Jul. 29, 1996, Ser. No. 687,961

Claims priority, application Japan, Sep. 8, 1993, 5-223000; Sep. 27, 1993, 5-240077

Int. Cl.⁶ G11B *5/596*

U.S. Cl. 360—104 **6 Claims**



1. An integrated head mounted on a head slider which is arranged to be rotatable about a point so as to be accessible to tracks of a disk serving as a recording medium to make yaw angles with respect to tangents of said tracks, said integrated head comprising:
  write element means having a magnetic gap for writing data on said tracks of said disk; and
  read element means for reading data from said tracks of said disk, said read element means having a predetermined height in a direction perpendicular to a surface of said head slider and being located so that a center of said read element means as determined in a direction substantially parallel to track crossing directions, is separated by a first predetermined distance from said gap of said write element means, and a geometric center line of said read element means, which extends in a direction substantially perpendicular to said track crossing directions, is separated by a second distance from a geometric center line of said write element means, which extends in a direction substantially perpendicular to said track crossing directions.
  wherein said second distance between said write element means and said read element means is determined on the basis of the sum of the sine of said slider yaw addles with respect to the tangents of the innermost and outermost tracks, said first distance between said write element means and said read element means, and the height of said read element means.
  wherein said second distance is determined according to the following equation:

$$\mathrm{OFFSET}=\tfrac{1}{2}\times\{\sin(P1)+\sin(P2)\}\times S+\tfrac{1}{4}H$$

where
  OFFSET=said second distance between said write element means and said read element means;
  P1=the slider yaw angle with respect to said tangent of the innermost track;
  P2=the slider yaw angle with respect to the tangent of the outermost track;
  sin(P1)=the sine of the slider yaw angle P1;
  sin(P2)=the sine of the slider yaw angle P2;
  S=said first distance between said write element means and said read element means; and
  H=the height of said read element means.

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5,691,863

POWER FEEDING DEVICE FOR VTR ROTATING DRUM

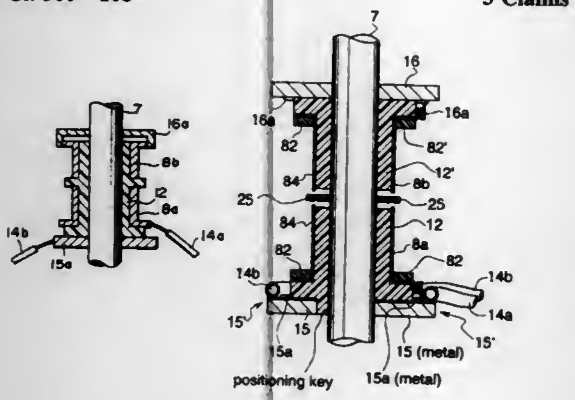
Toshiaki Takayanagi, Chiba-ken, Japan, assignor to Mabuchi Motor Co., Ltd., Chiba-Ken, Japan

Continuation-in-part of Ser. No. 170,009, Dec. 16, 1993, abandoned. This application Sep. 13, 1995, Ser. No. 527,542

Claims priority, application Japan, Dec. 18, 1992, 4-388808; Dec. 18, 1992, 4-388809

Int. Cl.^{6} G11B *5/52*; H02K *13/04*

U.S. Cl. 360—108 **5 Claims**



1. A power feeding device for a rotatable drum, the device comprising:

- a rotatable shaft connected to the rotatable drum and rotatable with the rotatable drum, said rotatable shaft being solid and formed of electrically conductive material;
- a first slip ring mounted on said rotatable shaft on one side of the rotatable drum, said first slip ring being made of electrically conductive material and formed of a first plurality of arc-shaped segments, said first plurality of arc-shaped segments being positioned around said shaft to define a plurality of slits substantially parallel to an axial direction of said shaft, said first slip ring being electrically insulated from said rotatable shaft;
- a second slip ring mounted on said rotatable shaft and electrically insulated from said first slip ring, said second slip ring being positioned on a side of said first slip ring substantially opposite the rotatable drum, said second slip ring being made of electrically conductive material and formed of a second plurality of arc-shaped segments, said second plurality of arc-shaped segments being positioned around said shaft to define a plurality of slits substantially parallel to an axial direction of said shaft, said second slip ring being electrically connected to said rotatable shaft on said side of said first slip ring substantially opposite the rotatable drum;
- an electrical component positioned in the rotatable drum and electrically connected to said second slip ring by an electrical path including said rotatable shaft, said electrical component having a first lead electrically connected to an external side of said first slip ring, and a second lead connected to an external side of said rotatable shaft;
- a hollow cylindrical core member positioned around said rotatable shaft, and between said rotatable shaft and said first and second plurality of arc-shaped segments, said core member is divided into first and second parts by a separator;
- a first hollow disc-shaped fixing washer positioned around said first plurality of arc-shaped segments, said first fixing washer is press-fitted to end faces of said first plurality of arc-shaped segments;
- each of said plurality of arc-shaped segments including a metal clad area of precious metal.

5,691,864

MAGNETORESISTIVE HEAD

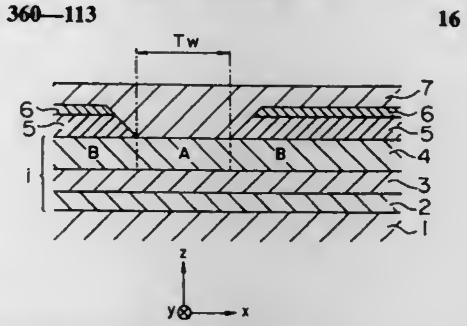
Masamichi Saito, Niigata-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1996, Ser. No. 674,942

Claims priority, application Japan, Jul. 19, 1995, 7-183121

Int. Cl.^{6} G11B *5/39*

U.S. Cl. 360—113 **16 Claims**



1. A magnetoresistive head comprising:

- a magnetoresistive sensor, and
- an antiferromagnetic layer formed on the magnetoresistive sensor;
- wherein said magnetoresistive sensor includes a ferromagnetic layer magnetized by exchange anisotropic coupling with said antiferromagnetic layer; and
- wherein said antiferromagnetic layer consists of an X-Mn (manganese) alloy having an irregular crystal structure, wherein X is at least one element selected from the group consisting of Ru (ruthenium), Ir (iridium) and Pt (platinum).

5,691,865

MAGNETIC DEVICE AND METHOD FOR LOCALLY CONTROLLABLY ALTERING MAGNETIZATION DIRECTION

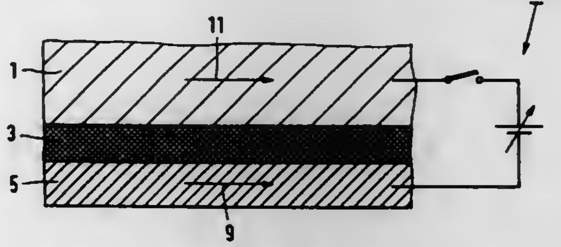
Mark T. Johnson; Friedrich J. A. Den Broeder, and Jelto W. Smits, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 389,853, Feb. 17, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 767,461

Claims priority, application European Pat. Off., Feb. 21, 1994, 94200453

Int. Cl.^{6} G11B *5/33*

U.S. Cl. 360—113 **16 Claims**



1. A method of controllably locally altering the magnetization direction in a body of magnetic material, characterized in that a layer of at least one of a non-metallic material and a semi-metallic material is disposed on a surface of the body, on which layer is provided a body of magnetic material having a fixed magnetization direction, whereby both bodies of magnetic material may be magnetically coupled across the interposed layer, the magnetic coupling being locally alterable by means for locally subjecting the layer to a variable electric field.

5,691,866

MAGNETIC HEAD AND METHOD OF MANUFACTURING THE SAME

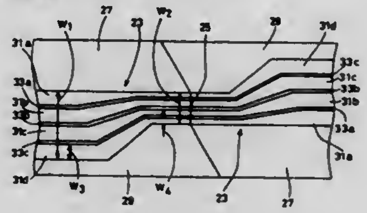
Tatsushi Yamamoto, Nara-ken, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

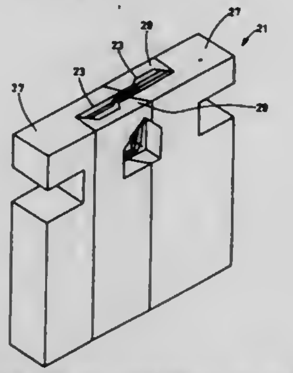
Continuation of Ser. No. 359,844, Dec. 20, 1994, abandoned, which is a continuation of Ser. No. 88,259, Jul. 7, 1993, abandoned. This application Feb. 21, 1996, Ser. No. 604,380

Claims priority, application Japan, Jul. 8, 1992, 4-180823

Int. Cl.^{6} G11B *5/31*

U.S. Cl. 360—126 **6 Claims**





1. A magnetic head having a magnetic core in which the thickness of said magnetic core at transducing magnetic gap is made smaller than that of other portions of said core, wherein

- said magnetic core has a structure in which a plurality of soft magnetic thin films and a plurality of electrically non-conductive insulating thin films form alternating layers in a stack, and
- each of said soft magnetic thin films has a first thickness at said transducing magnetic gap, and a second thickness in a region distant from said transducing magnetic gap, said first thickness and said second thickness being in a direction perpendicular to a surface upon which said soft magnetic thin films and said insulating thin films are alternately formed in said stack, the second thickness being larger than the first thickness, and
- each of alternately stacked said soft magnetic thin films and said insulating thin films being directly in contact with said transducing magnetic gap.

5,691,867

COMPLEX TYPE THIN FILM MAGNETIC HEAD AND PRODUCTION METHOD THEREOF

Hiroshi Onuma; Kazunori Onuma, and Takashi Tamura, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 3, 1996, Ser. No. 674,796

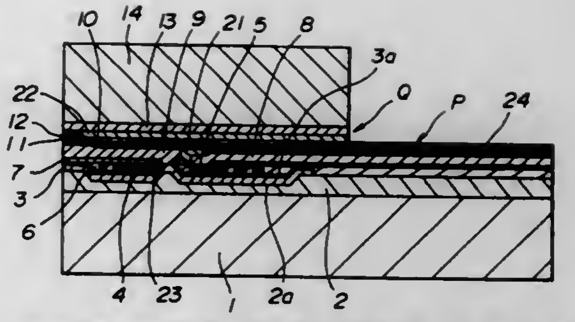
Claims priority, application Japan, Jul. 5, 1995, 7-170017

Int. Cl.^{6} G11B *5/39*

U.S. Cl. 360—126 **8 Claims**

1. A complex type thin film magnetic head comprising;

- an induced type magnetic head portion containing; a lower magnetic core made of soft magnetic material, having recess portions provided on the top surface of a substrate made of non-magnetic material; conductive coils in the shape of spiral, formed on the recess portions disposed on the lower magnetic core through a flattening layer made of insulation material, said conductive coils being embedded in the recess portions and; a upper magnetic core made of soft magnetic material, formed on said conductive coils through the flattening layer made of insulation material; and a magnetic resistance effect type magnetic head portion containing; magnetic resistance effect elements formed on said upper magnetic core serving as the lower magnetic layer at the same time through an insulation layer and; a upper magnetic layer formed on said magnetic resistance effect element through an insulation layer.



5,691,868

DISK CARTRIDGE WITH SHUTTER AND SLIDER, AND METHOD OF CONNECTING THEM

Takatsugu Funawatari; Hiroyuki Ishikawa; Hiroyuki Abe, all of Miyagi, and Kazuo Niizaka, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

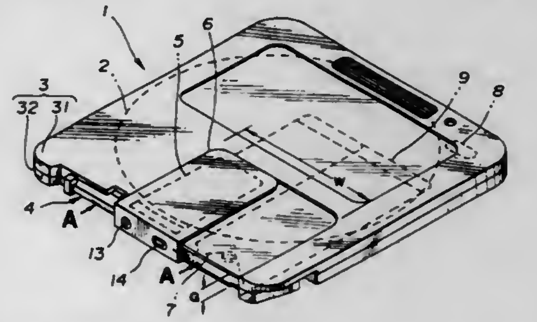
PCT No. PCT/JP95/00544, § 371 Date Nov. 24, 1995, § 102(e) Date Nov. 24, 1995, PCT Pub. No. WO95/27980, PCT Pub. Date Oct. 19, 1995

PCT Filed Mar. 24, 1995, Ser. No. 545,770

Claims priority, application Japan, Apr. 7, 1994, 6-69182

Int. Cl.^{6} G11B *23/03*

U.S. Cl. 360—133 **12 Claims**



1. A disk cartridge comprising:

- a shell body containing a disk-shaped recording medium adapted for rotation therein;
- a slider having a mating surface slidably disposed along an end of said shell body, said slider being made of synthetic resin;
- a plurality of connecting pins having proximal ends attached to said mating surface of said slider; and
- a shutter having a plurality of pin-insertion holes formed therethrough, said shutter being secured to said slider by said plurality of connecting pins, and said shutter opening or closing a head or spindle insertion aperture formed in said shell body in association with a sliding movement of said slider,
- wherein said plurality of connecting pins securing said shutter to said slider are inserted into said pin-insertion holes and permanently or plastically deformed at distal ends thereof to provide securing heads at said distal ends of said plurality of connecting pins, said securing heads having a greater diameter than a diameter of said pin-insertion holes so that said shutter is interposed between said securing heads and said mating surface of said slider, whereby said shutter and said slider are coupled together.

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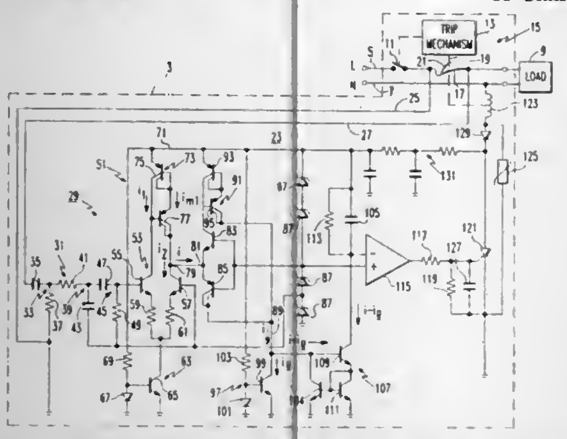
5,691,869
LOW COST APPARATUS FOR DETECTING ARCING FAULTS AND CIRCUIT BREAKER INCORPORATING SAME

Joseph C. Engel, Monroeville, and Raymond W. MacKenzie, Baldwin Boro, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 6, 1995, Ser. No. 471,132

Int. Cl.^{6} H02H *3/00*

U.S. Cl. 361—42 **11 Claims**



1. A circuit breaker for interrupting current in an electrical system subject to an arcing current of undetermined amplitude which repetitively strikes, said breaker comprising;

separable contacts which interrupt said current in said electrical system including said arcing current when open;

trip means comprising pulse generating means generating a pulse with an amplitude which is a direct-function of said undetermined amplitude of said arcing current each time said arcing current strikes to produce a series of pulses, trip signal generating means generating a trip signal as a function of an accumulated, time attenuated amplitude of said pulses, and means opening said separable contacts in response to said trip signal;

wherein said pulse generating means generates current pulses of a single polarity, and said trip signal generating means comprises a capacitor, means applying said pulses to said capacitor, adjusting means connected to said capacitor for adjusting a charge on said capacitor at a selected rate in an opposite sense from said pulses, and output means generating said trip signal when voltage across said capacitor reaches a predetermined value, said capacitor and adjusting means being selected such that said voltage across said capacitor is determined by said accumulated time attenuated amplitude of said pulses; and

wherein said pulse generating means includes means applying a convex function to said pulses to produce non-linear pulses which are applied to said capacitor by said trip signal generating means.

5,691,870
CIRCUIT FOR MONITORING AND DISABLING POWER SUPPLY SIGNALS TO A MICROPROCESSOR IN A COMPUTER SYSTEM UTILIZING SECONDARY VOLTAGE REGULATORS

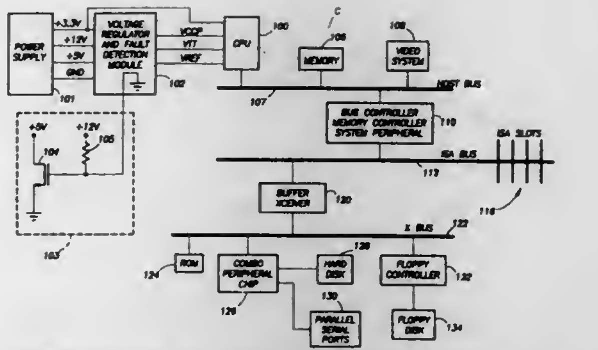
Ghassan R. Gebara, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 7, 1995, Ser. No. 551,787

Int. Cl.^{6} H02H *3/18*

U.S. Cl. 361—86 **24 Claims**

1. A circuit for monitoring and disabling power supply signals to a microprocessor used in a computer system which includes a main power supply providing at least one primary supply voltage signal and a DC—DC converter circuit which provides at least one secondary supply voltage signal to the microprocessor, the circuit comprising:



comparator means for sensing and comparing the secondary supply voltage signal with a reference voltage level, said comparator means for sensing providing a fault signal indicating by a first fault signal level that said secondary supply voltage signal is within a predetermined range of satisfactory power supply voltage values, and indicating by a second fault signal level that said secondary supply voltage signal is outside said predetermined range of satisfactory power supply voltage values; and

an electronic switch connected to receive said fault signal, said electronic switch being connected between a primary supply voltage line and ground, said switch being non-conductive when said fault signal is at said first fault signal level, said switch effectively coupling said primary supply voltage signal line to ground when said fault signal is at said second fault signal level.

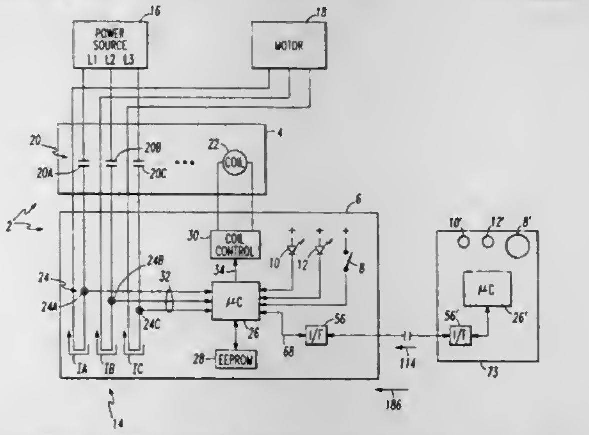
5,691,871
TEST CIRCUIT FOR ELECTRICAL SWITCHING DEVICE

Mark E. Innes, Asheville, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1995, Ser. No. 557,587

Int. Cl.^{6} H02H *3/00*

U.S. Cl. 361—96 **21 Claims**



1. A motor starter for an electrical circuit including a power source and a load, said motor starter indicating selection of a value to a user, said motor starter comprising:

electrical contactor means including separable contact means for switching an electrical current flowing between said power source and said load, and operating means responsive to a trip signal for opening and closing said separable contact means;

means for sensing the electrical current flowing between said power source and said load and providing a sensed current value therefrom; and

overload relay means including:

means for generating the trip signal as a time related function of:

(a) a trip current value and a test current value, and

(b) the trip current value and the sensed current value; and

test means including at least one of:

(a) first selecting means including means for selecting a first predetermined value as the trip current value and means for selecting the test current value for use by said means for generating the trip signal with the trip current value, and first means for indicating to the user when the test current value is selected in order that the user may verify said time related function, and

(b) second selecting means for selecting one of at least one second predetermined value as the trip current value for use by said means for generating the trip signal with the sensed current value, and second means for indicating to the user when the second predetermined value is selected as the trip current value in order that the user may verify said time related function.

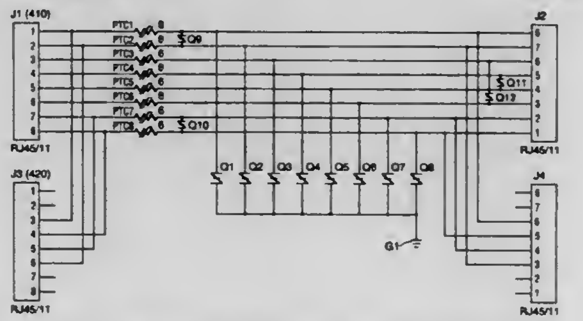
5,691,872
SINGLE LINE, MULTIPLE LINE TELECOMMUNICATIONS SURGE PROTECTOR

Richard L. Coben, Novato, Calif., assignor to Panamax Corporation, San Rafael, Calif.

Filed May 29, 1996, Ser. No. 654,596

Int. Cl.^{6} H01C *7/12*

U.S. Cl. 361—119 **13 Claims**



1. A telecommunications line surge protector comprising:

a first input connector;

a second input connector; and

a surge protection circuit having x protected paths, wherein the first input connector is connected to all x paths and the second input connector is connected to y protected paths, where x is an integer greater than one and y is an integer between 1 and (x−1), inclusive.

5,691,873
APPARATUS TO GENERATE MAGNETISM

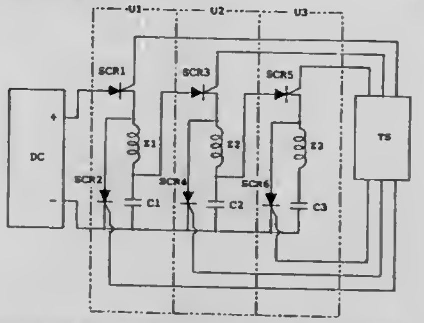
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Sep. 29, 1995, Ser. No. 536,638

Claims priority, application Japan, Oct. 1, 1994, 6-260983; Aug. 22, 1995, 7-234637

Int. Cl.^{6} H01F *7/18*

U.S. Cl. 361—166 **6 Claims**



1. An apparatus to generate magnetism, comprising (a) a plurality of cascaded magnetism-generating circuits, each of the magnetism-generating circuits further comprising:

a series circuit including a coil member to generate a magnetic field, a capacitor to provisionally store the current through said coil member, and a first thyristor, said series circuit comprising a first main current path; and

a second thyristor comprising a second main current path which is connected in parallel with said series circuit in such a manner that said first thyristor and said second thyristor are aligned with each other in a forward direction;

(b) a conduction-controlling circuit comprising means to operate the magnetism-generating circuits in a prescribed order.

5,691,874
POWER SWITCH CONTROL APPARATUS OF EQUIPMENT

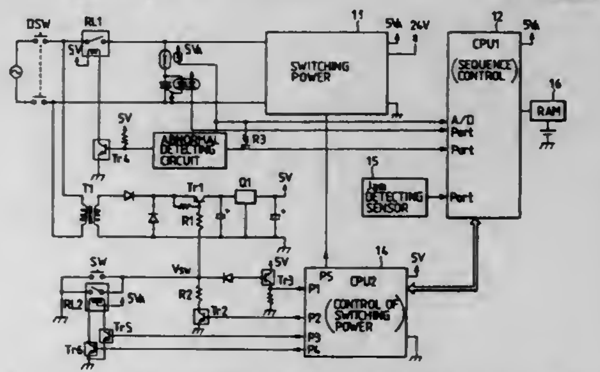
Kazuki Miyamoto; Naoyuki Ohki, both of Yokohama; Takahiro Ushiro, Kawasaki; Teruo Mitsui, Inagi, and Atsushi Chaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 302,964, Sep. 12, 1994, abandoned. This application Dec. 26, 1995, Ser. No. 578,445

Claims priority, application Japan, Sep. 17, 1993, 5-231488

Int. Cl.^{6} H01H *47/00*

U.S. Cl. 361—170 **8 Claims**



1. A power switch control apparatus of an equipment having:

a door switch for shutting off a power supply in response to an opening of a door to access an inside of said equipment;

a relay circuit which is connected serially to said door switch and is used to turn on/off the power supply;

a main switch that is manually operated in order to turn on the power source to said equipment;

driving means for driving said relay circuit in response to the operation of said main switch and for turning off the relay circuit in response to the opening of said door; and

detecting means for detecting an abnormality of said equipment,

wherein said switch control apparatus comprises holding means for generating a same signal to be generated in a state in which said main switch is operated when the abnormality is detected by said detecting means, for holding such a generation state even if said door is opened, and for cancelling the holding state after the door was closed.

5,691,875
SYSTEMS FOR PREVENTING ELECTROSTATIC ACCUMULATION

George Theodore Dangelmayer, Plaistow, N.H.; John Phillip Franey, Bridgewater, and Robert Garland Renninger, II, Glen Gardner, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 23, 1994, Ser. No. 311,689

Int. Cl.^{6} H05F *3/02*

U.S. Cl. 361—222 **5 Claims**

1. A grounding system for dissipating static electricity comprising:

a body-contacting member which forms an electrical connection with at least a portion of a human body; and

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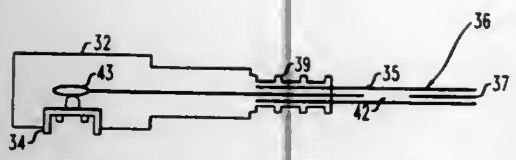


a grounding cable having an elongated conductive member with a first end for connection to ground potential, and a second end for electrically communicating with the body-contacting member, at least one end of the elongated conductive member being embedded within a resistive material having an electrical conductivity of 10^5–10^{12} ohms/square.

5,691,876

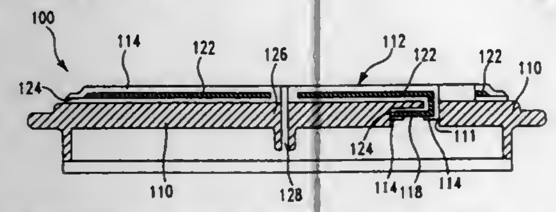
HIGH TEMPERATURE POLYIMIDE ELECTROSTATIC CHUCK

Aihua Chen, Fremont; Vijay Parkhe, Sunnyvale, and Sergio Edelstein, Los Gatos, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 31, 1995, Ser. No. 381,258

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **17 Claims**



1. A multilayer electrostatic chuck means comprising:
at least one self-adhered polyimide-comprising film acting as a dielectric layer within said electrostatic chuck, wherein said self-adhered polyimide-comprising film has a sustained operational temperature of at least 175° C.

5,691,877

CHIP TYPE THICK FILM CAPACITOR AND METHOD OF MAKING THE SAME

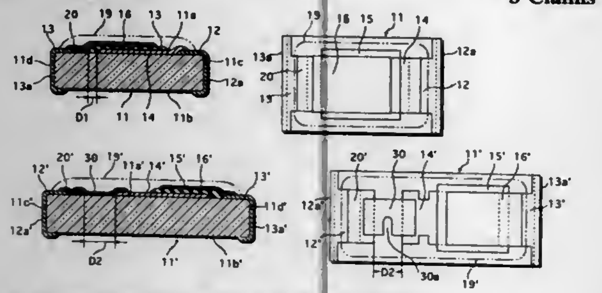
Toshihiro Hanamura, and Shigeru Kambara, both of c/o Rohm Co., Ltd. 21, Saiin Mizosaki-cho, Ukoyu Kyoto 615, Japan

Filed Feb. 16, 1996, Ser. No. 596,326

Claims priority, application Japan, Aug. 26, 1994, 6-201669; Aug. 26, 1994, 6-201670

Int. Cl.^{6} H01G *4/06;4/005;4/428;7/00*

U.S. Cl. 361—313 **8 Claims**



1. A chip type thick film capacitor comprising:
an insulating chip serving as a substrate and having a head surface;
a first lead electrode formed on the head surface of the chip;
a second lead electrode formed on the head surface of the chip and spaced from the first lead electrode;
a first capacitor electrode formed on the head surface of the chip, the first capacitor electrode being electrically connected to the first lead electrode but electrically insulated from the second lead electrode;
a dielectric layer formed on the first capacitor electrode;
a second capacitor electrode formed on the dielectric layer, the second capacitor electrode being electrically connected to the second lead electrode but electrically insulated from the first lead electrode; and
an auxiliary electrode formed on the head surface of the chip in electrical conduction with one of the first and second lead electrodes, the auxiliary electrode being spaced from the first capacitor electrode by a predetermined distance.

5,691,878

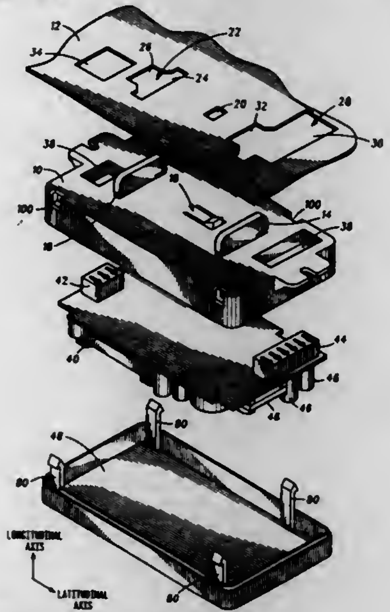
SNAP-LOCKABLE HOUSING FOR FLUORESCENT LAMP BALLASTS

Youngkee Ahn, and Jiri Slaby, both of Buffalo Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 2, 1996, Ser. No. 594,677

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 361—674 **18 Claims**



1. A ballast housing comprising:
a cover and a base substantially securely connected to each other to define a housing;
the cover having at least two fingers, each finger having a mating portion;
the base having at least two finger ports;
each finger port and finger being substantially complementarily configured and each mating portion of a finger extends into each finger port; and
the base including at least two guide-lock structures which guide insertion of the mating portion of the finger into the finger port and securely lock the finger in place, each guide-lock structure comprising a tab that is substantially latitudinally flexible and that is located adjacent to its corresponding finger port on the base.

5,691,879

LOCKING APPARATUS INCLUDING KEY ACTUATED MOVABLE LOCKING BAR FOR DISK DRIVE CARRIERS

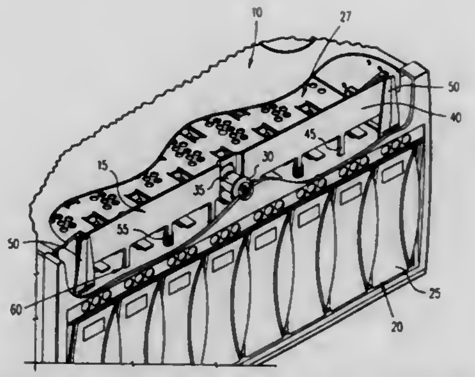
Arthur Lopez, and Steven L. Sands, both of Austin, Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed Nov. 14, 1996, Ser. No. 748,850

Int. Cl.^{6} G06F *1/16;* **H05K** *5/02;* **E05B** *65/46;* **G11B** *33/02*

U.S. Cl. 361—685 **22 Claims**

1. In a disk drive housing having at least two disk drive carrier bays in a disk drive carrier opening housing one or more corresponding disk drive carriers, a locking device for securing said disk drive carriers into said disk drive carrier bays, comprising:



a moveable locking bar assembly located inside said disk drive housing and spanning the disk drive carrier bays and comprising a locking bar and at least two locking pins projecting from said locking bar, one locking pin for each of said disk drive carriers bays, wherein said locking bar is moveable to either a locked or an unlocked position;
a key lock assembly attached to said disk drive housing and accessible from the exterior of said disk drive housing; and
a cam mechanism positioned for engaging and camming the locking bar assembly so as to move said locking bar assembly to either the locked position or the unlocked position, said cam mechanism actuated by said key lock assembly wherein, when said locking bar assembly is in the locked position, said locking pins engage the corresponding disk drive carriers securing the disk drive carriers into the disk drive carrier bays.

5,691,880

PORTABLE ELECTRONIC APPARATUS HAVING A HINGE MECHANISM WHICH ROTATABLY CONNECTS A FLAT DISPLAY UNIT TO A HOUSING INCORPORATING A FRAME FOR SUPPORTING A CIRCUIT BOARD

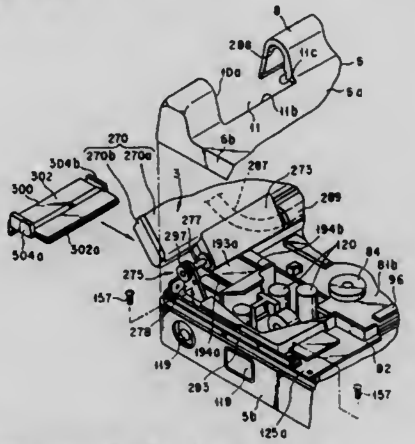
Masaru Seto; Kazuya Shibasaki, and Satoru Arai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 216,923, Mar. 23, 1994, Pat. No. 5,552,967. This application Sep. 5, 1996, Ser. No. 706,499

Claims priority, application Japan, Apr. 30, 1993, 5-104786; Jul. 9, 1993, 5-170063

Int. Cl.^{6} G06F *1/16;* **H05K** *7/02*

U.S. Cl. 361—681 **15 Claims**



1. A portable electronic apparatus comprising:
a flat display unit;
a box-shaped housing having a bottom wall;
a circuit unit incorporated in said housing, and having a circuit board and a frame to support the circuit board;
a hinge mechanism rotatably connecting said display unit to said housing, and having a stay which extends parallel to the bottom wall of said housing and cooperates with said bottom wall to sandwich said circuit unit; and
a screw driven into said bottom wall through said stay and said circuit unit to fasten said circuit unit and said hinge mechanism to said housing.

5,691,881

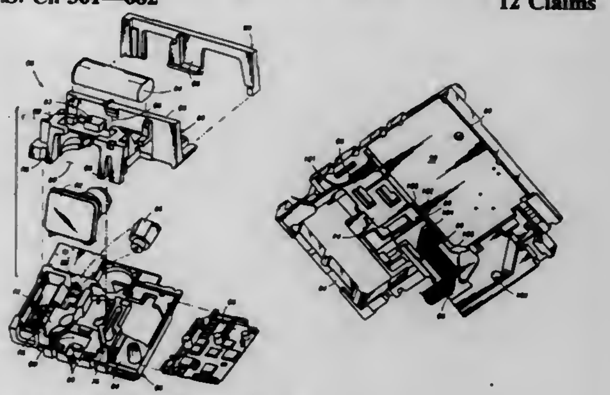
ELECTRONIC DEVICE HAVING E-PAC CHASSIS FOR SPATIAL ARRANGEMENT OF COMPONENTS AND CABLE ORGANIZATION INCLUDING CHANNEL WITH RETAINING WALL PREVENTING CABLE FROM DISLODGING FROM AN EDGE CONNECTOR

William J. McDonough, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 16, 1995, Ser. No. 441,899

Int. Cl.^{6} H05K *7/12;* **H02B** *1/20*

U.S. Cl. 361—682 **12 Claims**



1. An electronic device comprising:
first and second electronic components, at least one of the electronic components having an edge connector;
at least one conductive cable to interface the first and second electronic components, the cable being connected to the edge connector of said at least one electronic component; and
a chassis for holding the electronic components a spaced distance apart, the chassis having a cable channel formed therein to hold and guide the cable through predefined locations within the electronic device between the first and second electronic components, the cable channel including a retaining wall to prevent the cable from dislodging from the edge connector when said at least one electronic component is held by the chassis.

5,691,882

PCMCIA MOUNTING STRUCTURE

Hsi-Kuang Ma, 4F, No. 48, Sec. 2, Chung Cherng Rd., Taipei, Taiwan

Filed Jun. 4, 1996, Ser. No. 658,213

Int. Cl.^{6} G06F *1/16;* **H05K** *7/10*

U.S. Cl. 361—684 **7 Claims**

1. A peripheral device for attachment to a computer having a memory card slot comprising:
a) a memory card configured to be inserted into the memory card slot;
b) a lead cable connected to the memory card and to the peripheral device;
c) a housing enclosing the peripheral device and having a recess configured to store the lead cable and the memory card therein; and,

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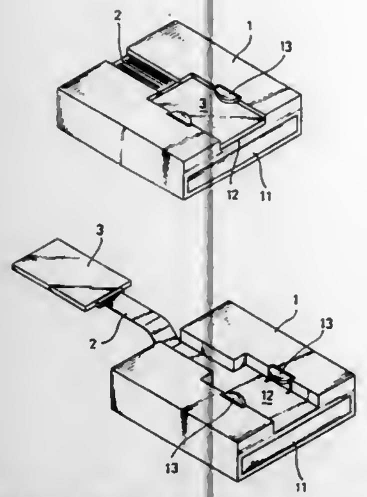


d) retainer means located on the housing to retain the memory card in the recess.

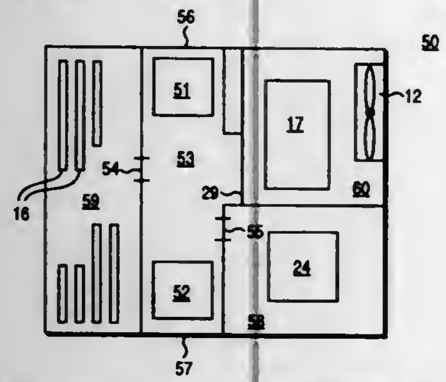
5,691,883
MULTIPLE INTAKE DUCT MICROPROCESSOR COOLING SYSTEM

Daryl J. Nelson, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 27, 1995, Ser. No. 578,984

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—697 **13 Claims**



1. In a computer system enclosure containing a processor, a power supply and at least one electrical component, a cooling system comprising:

an air duct containing said processor, said air duct directing a first air flow from the exterior of said enclosure over said processor to an inlet opening of a first compartment containing said power supply, said air duct further comprising a second opening downstream of said processor coupling second air flow from a second compartment containing said electrical component into said air duct; and

an air moving device disposed within said first compartment, said air moving device having an air exhaust to the exterior of said enclosure.

5,691,884
SEMICONDUCTOR DEVICE WITH REMOVABLY FIXED LEAD FRAME

Shin Soyano, and Susumu Toba, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

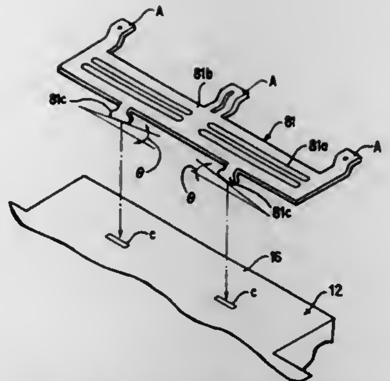
Filed Dec. 4, 1995, Ser. No. 566,957

Claims priority, application Japan, Dec. 8, 1994, 6-304722

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—707 **5 Claims**

1. A semiconductor device comprising:



an insulative case frame including a frame portion having elongated coupling holes and first and second openings;

a radiator base plate covering the first opening of the insulative case frame;

a circuit board with semiconductor chips thereon, said circuit board being bonded to the radiator base plate;

a resin sealant filled in an inner space of the case frame, said resin sealant covering the circuit board;

an insulative cover plate closing the second opening of the insulative case frame; and

at least one lead frame having elastic coupling protrusions and inner leads, said elastic coupling protrusions being elastically retained in the elongated coupling holes to securely connect the lead frame to the case frame, one elastic coupling protrusion and one elongated coupling hole which engage together being inclined relative to each other to have a torsion angle in a direction of inserting the coupling protrusion to the coupling hole, said elastic coupling protrusions situated adjacent to each other in the at least one lead frame being inclined in directions opposite to each other and inclined relative to the elongated holes to thereby elastically engage the coupling protrusion and the elongated hole.

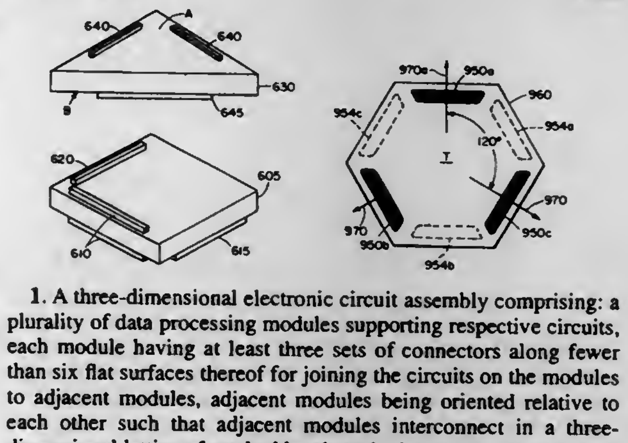
5,691,885
THREE-DIMENSIONAL INTERCONNECT HAVING MODULES WITH VERTICAL TOP AND BOTTOM CONNECTORS

Stephen A. Ward, Watertown; Gill A. Pratt, Lexington; John N. Nguyen, Belmont; John S. Pezaris, Winchester, and Norman Margolus, Somerville, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 279,693, Jul. 25, 1994, Pat. No. 5,568,361, which is a continuation of Ser. No. 852,603, Mar. 17, 1992, abandoned. This application Oct. 14, 1994, Ser. No. 323,382

Int. Cl.^{6} H05K *7/10;5/00;* **H01R** *29/00*

U.S. Cl. 361—735 **37 Claims**



1. A three-dimensional electronic circuit assembly comprising: a plurality of data processing modules supporting respective circuits, each module having at least three sets of connectors along fewer than six flat surfaces thereof for joining the circuits on the modules to adjacent modules, adjacent modules being oriented relative to each other such that adjacent modules interconnect in a three-dimensional lattice of stacked levels and wherein the connectors of each one of the modules connect along the same direction and the lattice is isomorphic with a diamond lattice when the modules are correlated to carbon atoms of the diamond lattice.

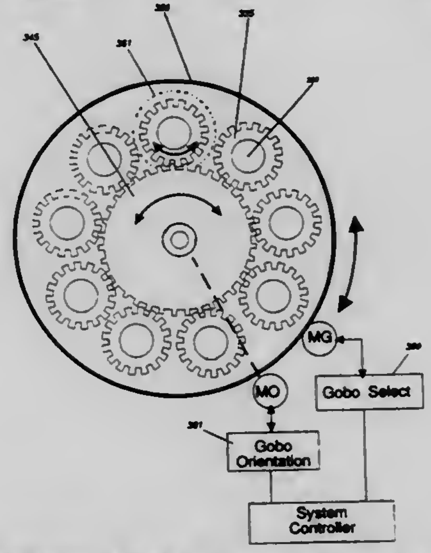
5,691,886
PROGRAMMABLE ROTATABLE GOBO SYSTEM

Timothy D. Stacy, Rowlett, Tex., assignor to Vari-Lite, Inc., Dallas, Tex.

Continuation of Ser. No. 539,121, Oct. 4, 1995, abandoned, which is a division of Ser. No. 122,777, Sep. 16, 1993, which is a division of Ser. No. 693,366, Apr. 30, 1991, Pat. No. 5,282,121. This application May 9, 1996, Ser. No. 647,190

Int. Cl.^{6} F21V *17/00*

U.S. Cl. 362—283 **6 Claims**



1. A mechanism adapted for positioning plural gobos in a luminaire, comprising:

plural gobo holders mounted for rotation about plural, individual axes of rotation, said gobo holders supported by a rotatable carrier;

an actuator coupled to said carrier and operable to rotate said carrier about an axis of rotation thereof;

a drive component coupled to each gobo holder;

an actuator coupled to said drive component and operable to rotate said drive component about an axis of rotation thereof, said axis of rotation of said drive component being coincident with said axis of rotation of said carrier;

said gobo holders being disposed radially about said drive component.

5,691,887
SELF-TIMING POWER-UP CIRCUIT

Joseph C. Sher, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 468,105, Jun. 6, 1995, Pat. No. 5,555,166. This application Aug. 22, 1996, Ser. No. 702,380

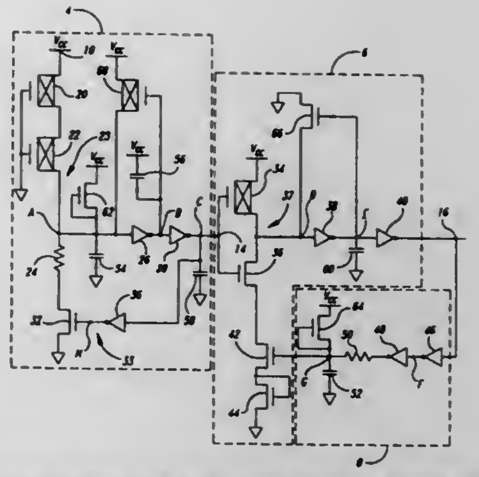
Int. Cl.^{6} H02M *7/10;* **H03K** *3/01*

U.S. Cl. 363—49 **24 Claims**

1. A power-up circuit formed in an integrated circuit for generating a power-up pulse, comprising:

an output stage having a first input and being operable to generate at an output one logic state upon receipt of a supply voltage and another logic state when the first input is at a predetermined logic state, the one logic state and the another logic state sequentially generated by the output stage defining the power-up pulse; and

a pulse control circuit connected between the first input and the output of the output stage, the pulse control circuit operable to generate and apply the predetermined logic state to the first input subsequent to a delay period after the generation of the one logic state by the output stage.



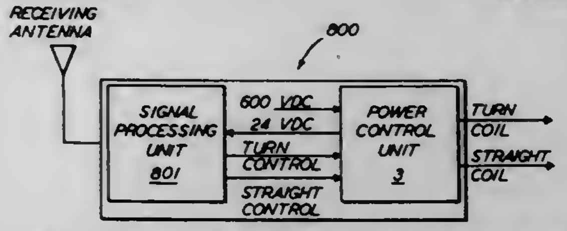
5,691,888
POWER CONTROLLING UNIT FOR A TROLLEY POLE SWITCH CONTROLLER

John H. Corvin, Greer; Charles C. Siegling, III, Greenville, both of S.C., and Francis A. Launier, Laval, Canada, assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 1, 1996, Ser. No. 644,406

Int. Cl.^{6} H02M *1/08;* **E01B** *7/10;* **B60M** *1/18*

U.S. Cl. 363—65 **20 Claims**



1. A power controlling unit for a controller of a trolley pole switch for use with a radio board of such controller, such trolley pole switch having at least one frog for switching the path of travel therethrough of an energy collector assembly of a trolley pole at a junction of power conduits at which a turn power conduit and a straight power conduit diverge from such straight power conduit, said power controlling unit comprising:

(a) a first reduction means for reducing and regulating power received from any one of such power conduits to an initial power level;

(b) a chopper control means for outputting a first pair of alternating logic signals and a second pair of alternating logic signals;

(c) a second reduction means controlled by said chopper control means such that when said second reduction means receives said first pair of alternating logic signals from said chopper control means, said second reduction means reduces said initial power level received from said first reduction means to a secondary power level usable by such radio board for operation of such radio board;

(d) a third reduction means for receiving said secondary power level from said second reduction means and said initial power level from said first reduction means such that said third reduction means reduces said secondary power level to a primary power level usable by said power controlling unit to operate same as long as said initial power level is received from said first reduction means;

(e) a turn output means for receiving said second pair of alternating logic signals from said chopper control means and said initial power level from said first reduction means such that when an intermediate turn command signal is also received from such radio board, said turn output means switches power

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in response thereto from any one of such power conduits to one electrical operator of such at least one frog thereby switching the path of travel that such energy collector assembly will take through such at least one frog to such turn power conduit; and

(f) a straight output means for receiving said second pair of alternating logic signals from said chopper control means and said initial power level from said first reduction means such that when an intermediate straight command signal is also received from such radio board, said straight output means switches power in response thereto from any one of such power conduits to another electrical operator of such at least one frog thereby switching the path of travel that such energy collector assembly will take through such at least one frog to such straight power conduit.

5,691,889

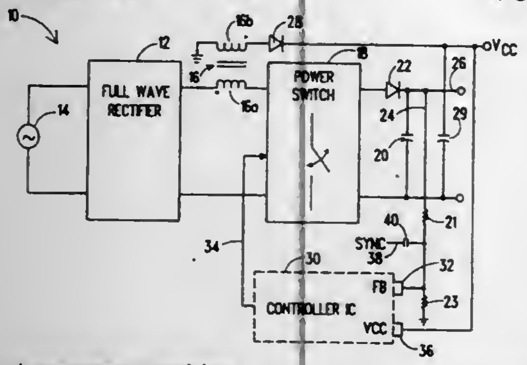
CONTROLLER HAVING FEED-FORWARD AND SYNCHRONIZATION FEATURES

John P. Bazinet, Concord; John A. O'Connor, Merrimack, and John H. Ziegler, Nashua, all of N.H., assignors to Unitrode Corporation, Merrimack, N.H.

Filed Dec. 13, 1995, Ser. No. 572,171

Int. Cl.^{6} H02M *7/155*

U.S. Cl. 363—89 **4 Claims**



1. A converter comprising:

a power switch for switching an input voltage at a predetermined frequency and duty cycle in response to a drive signal;

a smoothing circuit coupled to said power switch for smoothing said switched voltage to provide a DC output voltage and an output current; and

a controller circuit having an input terminal to which a feedback signal and a synchronization signal are coupled, said feedback signal being representative of said DC output voltage or said output current, said synchronization signal being coupled to said input terminal of said controller circuit through a capacitor.

5,691,890

POWER SUPPLY WITH POWER FACTOR CORRECTION CIRCUIT

Richard Charles Hyde, Lochwinnoch, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 27, 1996, Ser. No. 758,602

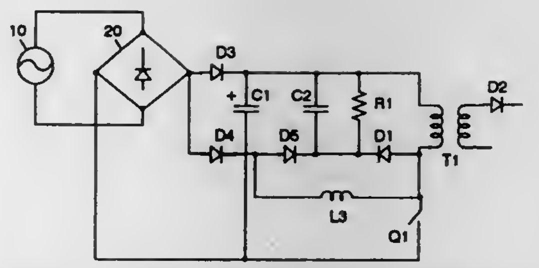
Claims priority, application United Kingdom, Dec. 1, 1995, 9524638

Int. Cl.^{6} H02M *5/42;3/335;7/68*

U.S. Cl. 363—89 **2 Claims**

1. A power supply comprising:

a transformer having a primary winding and a secondary winding,



rectifier means for rectifying an input AC mains signal to produce a DC rectified mains signal,

a power factor correction circuit for transferring electrical power from the rectifier means to the primary winding,

means for transferring electrical power from the primary winding to the secondary winding, and

wherein the power factor correction circuit includes a first diode having an anode connected to the rectifier means and a cathode connected to one end of the primary winding and a second diode having an anode connected to the rectifier means and a cathode connected to a second end of the primary winding via an inductor.

5,691,891

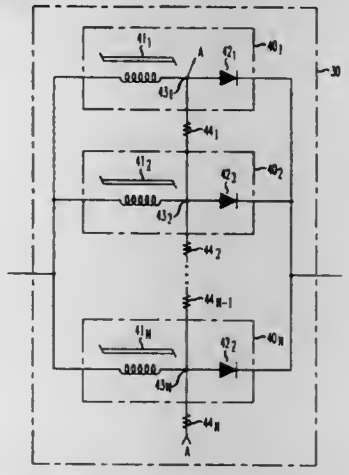
CURRENT BALANCING ARRANGEMENT FOR PARALLELED DIODE ARRANGEMENTS

Greg H. Fasullo; Mark Elliott Jacobs, both of Dallas, and Kenneth John Timm, Rockwall, all of Tex., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 3, 1996, Ser. No. 643,216

Int. Cl.^{6} H02M *5/42*

U.S. Cl. 363—93 **15 Claims**



1. In a power supply, a rectifier having a plurality of diodes coupled in parallel, each diode having in series therewith a saturable inductor and a node disposed between the diode and the inductor to form a diode/inductor pair, comprising:

at least one resistor coupled between at least two of the nodes.

5,691,892

RECTIFIER ARRANGEMENT FOR A THREE-PHASE GENERATOR

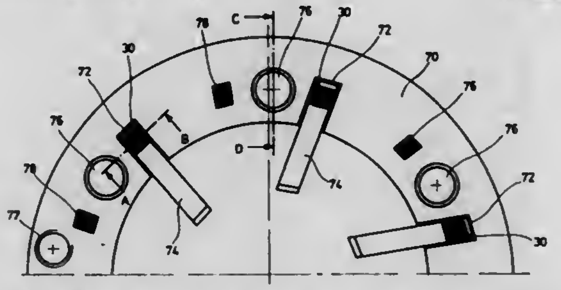
Friedhelm Meyer, Illingen; Richard Spitz; Herbert Goebel, both of Reutlingen; Ulrich Schaefer, Eningen; Vesna Biallas, Reutlingen; Anton Mindl, Tuebingen; Martin Frey, Lichtenstein, all of Germany; Henning Stilke, Llantwit-Major, Great Britain; Holger Haussmann, Metzingen, and Siegfried Schuler, Engstingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 9, 1995, Ser. No. 385,935

Claims priority, application Germany, Feb. 9, 1994, 44 03 996.4

Int. Cl.^{6} H02M *1/00*

U.S. Cl. 363—145 **14 Claims**



1. A rectifier arrangement for a three-phase generator comprising:

at least one conductive power diode allocated to each half-wave of each phase of the three-phase generator, the power diodes being contained on diode chips, the diode chips having a preselected polar orientation; and

a cooling arrangement including a first heat sink and a second heat sink, the first and second heat sinks being diametrically opposed, diode chips being arranged between the first heat sink and the second heat sink;

wherein the diode chips are at least one of electrically and thermally conductive, wherein diode chips arranged on a surface of the first heat sink have the same orientation and are arranged directly opposite and electrically isolated from the second heat sink, and wherein, along a preselected axis perpendicular to the surface of the first heat sink, only one of the diode chips is arranged.

5,691,893

ADAPTIVE CONTROL SYSTEM

Ian MacGregor Stothers, Norfolk, United Kingdom, assignor to Lotus Cars Limited, Norfolk, United Kingdom

PCT No. PCT/GB93/02171, § 371 Date Jun. 2, 1995, § 102(e) Date Jun. 2, 1995, PCT Pub. No. WO94/09482, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 21, 1993, Ser. No. 416,765

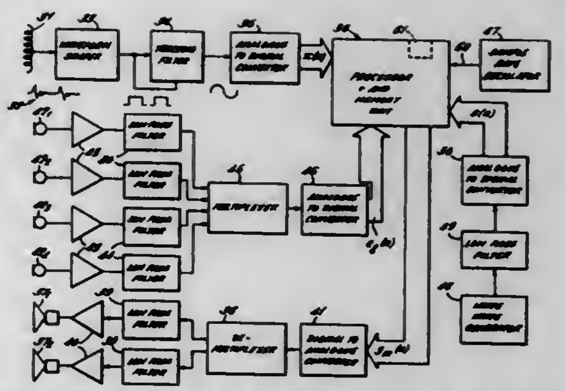
Claims priority, application United Kingdom, Oct. 21, 1992, 9222104

Int. Cl.^{6} G05B *13/02*

U.S. Cl. 364—148 **38 Claims**

1. An adaptive control system for reducing undesired signals comprising processing means adapted to provide at least one secondary signal to interfere with the undesired signals; and residual means to provide for said processing means at least one residual signal indicative of the interference between said undesired and secondary signals; wherein said processing means is adapted to use said at least one residual signal to adjust the or each secondary signal to reduce said at least one residual signal; wherein;

noise generation means is provided which adds at least one low level noise signal to said at least one secondary signal and provides said at least one low level noise signal to said processing means;



said processing means is adapted to transform said at least one low level noise signal and said at least one residual signal to provide the amplitude and phase of spectral components of said signals;

signal means is provided which provides at least one first signal indicative of at least selected undesired signals;

said processing means filters the at least one first signal indicative of at least selected undesired signals using adaptive response filter means having first and second filter coefficients;

said processing means adapts said first filter coefficients using the spectral components of said at least one low level noise signal and said at least one residual signal;

said processing means uses the first filter coefficients to filter one of the at least first signal indicative of at least selected undesired signals and the at least one residual signal;

said processing means adapts said second filter coefficients in response to the at least first signal indicative of at least selected undesired signals and the at least one residual signal, one of said signals having been filtered using the first filter coefficients;

said processing means in producing the at least one secondary signal uses the second filter coefficients to filter the at least first signal indicative of at least selected undesired signals; and

the processing means adapts said first and second filter coefficients to reduce said at least one residual signal.

5,691,894

CYLINDER POSITIONING CONTROL APPARATUS

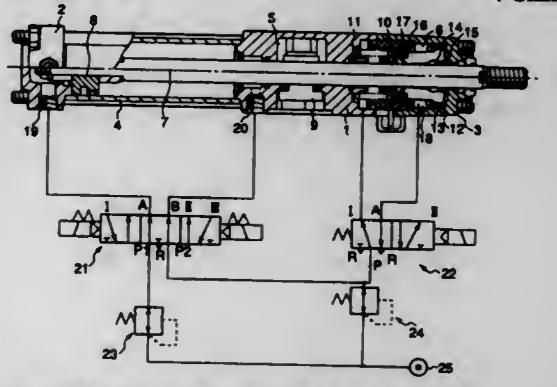
Kenji Fukushima; Hitoshi Yamamoto; Nobuhiro Fujiwara, and Hiroyuki Shimono, all of Yawara-mura, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Nov. 29, 1995, Ser. No. 564,715

Claims priority, application Japan, Feb. 6, 1995, 7-039406

Int. Cl.^{6} F01B *15/00;25/04;* **F15B** *13/16*

U.S. Cl. 364—148 **4 Claims**



1. A cylinder positioning control apparatus comprising:

(a) means for taking in a displacement x and speed V of a cylinder;

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(b) means for calculating a predicted overrun distance y_i for a present drive from a predicted overrun distance y_{i-1} in a preceding drive, a cylinder speed V_{i-1} at the time of outputting a braking signal during the preceding drive, and a speed V_i of the cylinder being driven;

(c) means for judging whether or not a condition to be satisfied to output a braking signal is satisfied, and for outputting a braking signal when said condition is satisfied;

(d) means for taking in a displacement x_{bp} and speed V_{bp} of the cylinder when the braking signal is output;

(e) means for taking in a displacement x_{stop} of the cylinder when it has stopped; and

(f) means for calculating a predicted overrun distance y_{i-1} and a cylinder speed V_{i-1} at the time of outputting a braking signal, which are to be used in calculation for a subsequent drive, from the displacement x_{bp} and speed V_{bp} of the cylinder when the braking signal was output, and the displacement x_{stop} of the cylinder stopped.

5,691,895

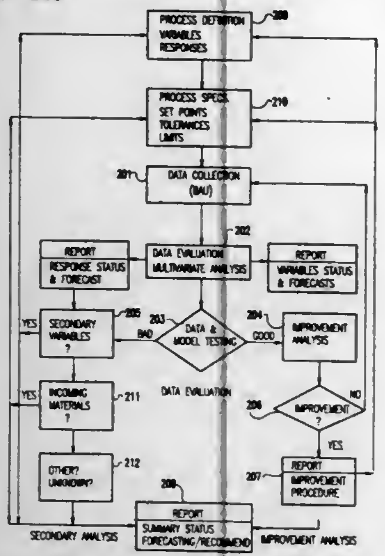
MECHANISM AND ARCHITECTURE FOR MANUFACTURING CONTROL AND OPTIMIZATION

Jerome M. Kurtzberg, and Menachem Levanoni, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1995, Ser. No. 573,818

Int. Cl.^{6} G05B *13/02*; G06F *18/00*

U.S. Cl. 364—148 **8 Claims**


PROCESS DEFINITION VARIABLES RESPONSES
200
PROCESS SPECS SET POINTS TOLERANCES LIMITS
210
DATA COLLECTION (BAU)
201
REPORT RESPONSE STATUS & FORECAST
DATA EVALUATION MULTIVARIATE ANALYSIS
202
REPORT VARIABLES STATUS & FORECASTS
YES
SECONDARY VARIABLES ?
205
203
BAD
DATA & MODEL TESTING
GOOD
204
IMPROVEMENT ANALYSIS
INCOMING MATERIALS ?
211
DATA EVALUATION
206
IMPROVEMENT
NO
YES
OTHER? UNKNOWN?
212
208
REPORT SUMMARY STATUS FORECASTING/RECOMMEND
207
REPORT IMPROVEMENT PROCEDURE
SECONDARY ANALYSIS
IMPROVEMENT ANALYSIS

1. A comprehensive, generic mechanism for modeling, monitoring, controlling and optimizing a manufacturing process as an on-line, real-time system, said mechanism comprising:

an application modeling network modeling equipment and processes for a specific manufacturing application, said application modeling network comprising nodes defining a plurality of processes, including specifications and tolerances, in the manufacturing application and edges interconnecting said nodes representing product flow;

a local control network connected to said application modeling network and evaluating information from said application modeling network, said local control network comprising nodes connected to selected nodes of said application modeling network and edges specifying control parameters flow, said local control network tuning processes of the nodes of the application modeling network as close as possible to current target parameters; and

a global optimization network connected to said local control network and to said application modeling network for processing information from said local control and application modeling networks and adjusting target parameters in the application modeling network to improve overall performance of said manufacturing process, said global optimization network comprising nodes performing statistical analysis of said information and edges specifying data analysis flow, wherein only the application modeling network is application dependent, the local control and global optimization networks being application independent, whereby all manufacturing processes are treated identically, thereby simplifying computational complexity with only a minimal set of parameters being obtained at any manufacturing level.

5,691,896

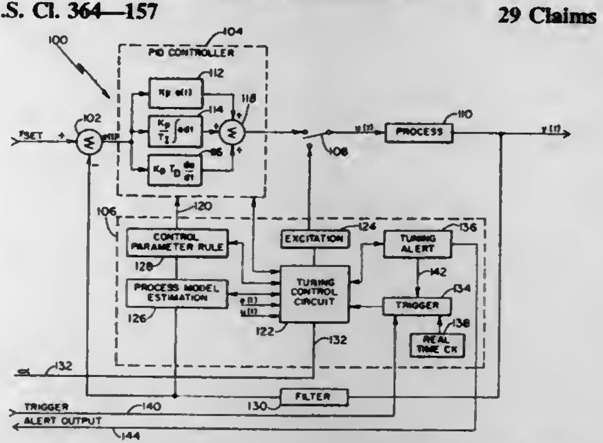
FIELD BASED PROCESS CONTROL SYSTEM WITH AUTO-TUNING.

Hehong Zon, Plymouth; Kale P. Hedstrom, St. Paul; Jogesh Warrior, and Coy L. Hays, both of Chanhassen, all of Minn., assignors to Rosemount, Inc., Eden Prairie, Minn.

Filed Aug. 15, 1995, Ser. No. 515,410

Int. Cl.^{6} G05B *13/02;11/42*

U.S. Cl. 364—157 **29 Claims**



1. A process control apparatus for controlling a process through a control output signal as a function of a measured process variable, comprising:

control means having a process variable input and a control output, wherein the control means generates the control output signal on the control output in response to the measured process variable received on the process variable input and based on control function parameters; and

tuning means comprising:

excitation means having an excitation output coupled to the control output for generating an excitation signal which rises and falls over time;

estimating means for calculating a rise dead time L_R, a fall dead time L_F, a rising rate-of-change R_R and a falling rate-of-change R_F in the measured process variable in response to the excitation signal and for estimating a process model based on L_R, L_F, R_R and R_F; and

parameter calculating means coupled to the estimating means for calculating the control function parameters based on the process model.

5,691,897

MOTION CONTROL SYSTEMS

David W. Brown, White Salmon, and Jay S. Clark, Seattle, both of Wash., assignors to Roy-G-Biv Corporation, White Salmon, Wash.

Filed May 30, 1995, Ser. No. 454,736

Int. Cl.^{6} G05B *19/18;19/42*

U.S. Cl. 364—167.01 **25 Claims**

1. A method of moving an object in a desired manner, comprising the steps of:

defining a set of motion control operations, where each motion control operation is either a primitive operation that is necessary to perform motion control and that cannot be simulated using other motion control operations or a non-primitive operation that does not meet the definition of a primitive operation;

defining a core set of core driver functions, where each core driver function identifies one of the primitive operations;

defining an extended set of extended driver functions, where each extended driver function identifies one of the non-primitive operations;

defining a set of component functions;

providing component code for each of the component functions, where the component code cross-references at least some of the component functions with at least some of the driver functions;

developing a set of software drivers, where (i) each software driver is developed for a motion control device in a supported group of motion control devices and (ii) each software driver comprises driver code for implementing the motion control operations associated with at least some of the driver functions;

providing an application program comprising a series of component functions, where the application program defines the motion steps necessary to move the object in the desired manner;

selecting one motion control device from the group of supported motion control devices;

attaching the object to the selected motion control device;

selecting from the set of software drivers the software driver developed for the selected motion control device;

generating control commands based on the component functions of the application program, the component code of the component functions, and the driver code of the selected software driver; and

operating the selected motion control device based on the control commands to move the object in the desired manner.

5,691,898

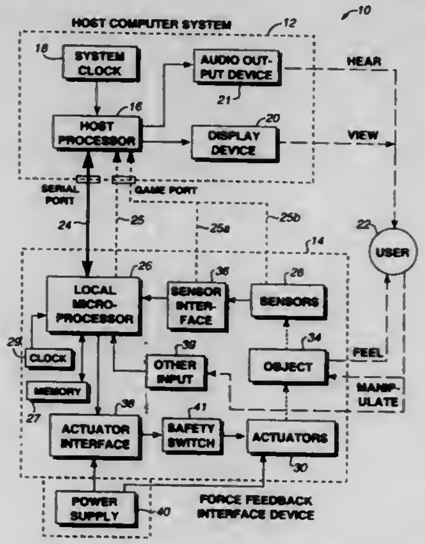
SAFE AND LOW COST COMPUTER PERIPHERALS WITH FORCE FEEDBACK FOR CONSUMER APPLICATIONS

Louis B. Rosenberg, Pleasanton; Adam C. Braun, Sunnyvale, and Bruce M. Schena, Menlo Park, all of Calif., assignors to Immersion Human Interface Corp., San Jose, Calif.

Continuation-in-part of Ser. No. 534,791, Sep. 27, 1995, and Ser. No. 566,282, Dec. 1, 1995. This application Mar. 28, 1996, Ser. No. 623,660

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—190 **83 Claims**



1. A force feedback interface apparatus for use with a host computer displaying a graphical environment, said interface apparatus providing locative signals to said host computer which are used by said host computer to update said graphical environment in response to user manipulation of said interface apparatus, said interface apparatus providing force sensations to the user and button reflex capability wherein a force sensation is generated locally in response to a press of a button of said interface apparatus, said interface apparatus comprising:

a user object being physically contacted and manipulated by a user and having at least one degree of freedom of movement with respect to an origin;

an actuator coupled to said user object for applying a force along said degree of freedom to said user object,

a sensor for detecting motion of said user object along said degree of freedom and outputting a sensor signal, wherein a representation of said sensor signal being received by said host computer via an interface bus coupling said interface apparatus to said host computer wherein said host computer updates said graphical environment in response to said sensor signal; and

at least one button coupled to said interface apparatus and manipulable by said user, said button providing a state signal to said host computer via an interface bus, said state signal conveying a state of said button as selected by said user, thereby allowing said host computer to execute a process in response to said state of said button;

control electronics coupled to said actuator and to said at least one button, said control electronics locally varying said force over time, thereby generating a force sensation felt by said user in said degree of freedom, said control electronics having button-reflex capability allowing local generation of a force sensation to be initiated in response to a locally detected change in said state of said button and generated locally over a period of time after being so initiated.

5,691,899

AUTOMOTIVE VEHICLE SUSPENSION CONTROL SYSTEM

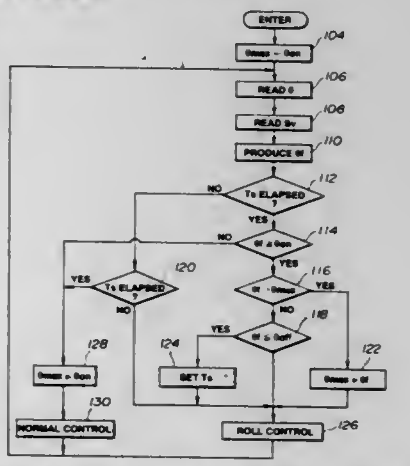
Hajime Terasaki, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Oct. 10, 1995, Ser. No. 541,446

Claims priority, application Japan, Oct. 14, 1994, 6-249060

Int. Cl.^{6} B60G *17/015*

U.S. Cl. 364—424.047 **2 Claims**



1. A suspension control system for an automotive vehicle, comprising:

at least one shock absorber provided between sprung and unsprung masses of the vehicle to provide a variable damping force characteristic;

first sensor means for sensing a behavior of the vehicle and producing a first sensor signal indicative of a sensed vehicle behavior;

second sensor means for sensing a vehicle steering angle and producing a second sensor signal indicative of a sensed vehicle steering angle;

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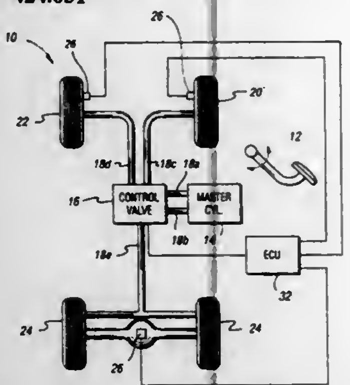
- a low pass filter for converting the second sensor signal into a noise removed steering angle indicative signal;
- a control unit operable in a normal control mode for controlling the shock absorber based on the first sensor signal to provide an optimum damping force characteristic and in a roll control mode for controlling the shock absorber based on the noise removed vehicle steering angle indicative signal to provide a damping force greater than that provided in the normal control mode, the control unit including means for detecting a peak value of the noise removed steering angle indicative signal, means for operating the control unit in the roll control mode when the noise removed steering angle indicative signal exceeds a predetermined first threshold value, means for setting a second threshold value in direct proportion with the detected peak value, and means for making a change from the roll control mode to the normal control mode a predetermined time after the noise removed steering angle indicative signal decreases below the second threshold value.

5,691,900
METHOD AND SYSTEM FOR TURNING DETECTION
Mark Luckevich, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Livonia, Mich.

Continuation-in-part of Ser. No. 282,520, Jul. 28, 1994, abandoned. This application Jun. 30, 1995, Ser. No. 497,409

Int. Cl.⁶ B60K *41/00*

U.S. Cl. 364—424.051 **34 Claims**



1. A method for use with a vehicle including a pair of front wheels, a pair of rear wheels, and an anti-lock brake system (ABS), the method for detecting when the vehicle is executing a turning maneuver, the method comprising:
- determining a speed difference between one pair of the vehicle wheels;
- determining the deceleration of each wheel of the one pair of vehicle wheels whose speed was utilized to determine the speed difference;
- comparing the speed difference to a turning detection threshold;
- comparing the decelerations to a deceleration threshold; and
- detecting a turning maneuver based on the comparison of the speed difference to the turning detection threshold and the decelerations to the deceleration threshold.

5,691,901
Patent Not Issued For This Number

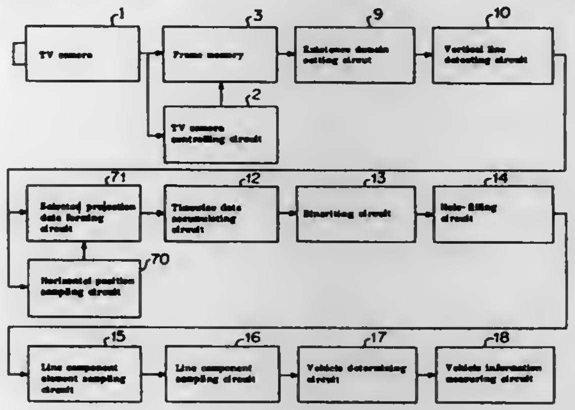
5,691,902
MOVING BODY MEASURING DEVICE AND AN IMAGE PROCESSING DEVICE FOR MEASURING TRAFFIC FLOWS
Hiroyasu Taniguchi; Haruki Furusawa; Jun Hatakenaka, and Akinobu Seki, all of Tsukaguchi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 375,552, Jan. 19, 1995, Pat. No. 5,598,338, which is a division of Ser. No. 201,267, Feb. 24, 1994, Pat. No. 5,396,283, which is a division of Ser. No. 852,652, Mar. 17, 1992, Pat. No. 5,313,295. This application Oct. 7, 1996, Ser. No. 726,945

Claims priority, application Japan, Mar. 9, 1991, 3-54281; Mar. 26, 1991, 3-61964; Jun. 28, 1991, 3-158300; Nov. 21, 1991, 3-306295

Int. Cl.⁶ G06F *19/00*

U.S. Cl. 364—438 **5 Claims**


1
TV camera
3
Frame memory
9
Existence domain setting circuit
10
Vertical line detecting circuit
2
TV camera controlling circuit
71
Selected projection data forming circuit
12
Timewise data accumulating circuit
13
Binarizing circuit
14
Hole-filling circuit
70
Horizontal position sampling circuit
15
Line component element sampling circuit
16
Line component sampling circuit
17
Vehicle determining circuit
18
Vehicle information measuring circuit

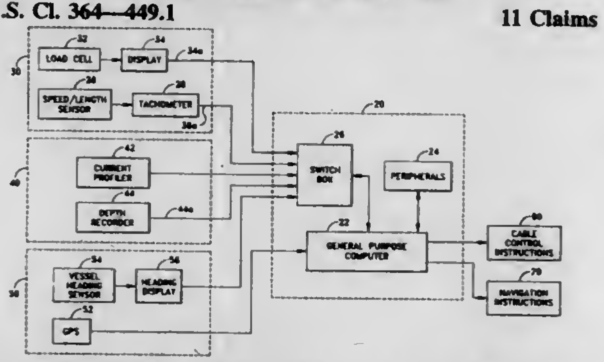
1. An image processing device for measuring traffic flows which comprises:
- means for taking an image;
- a frame memory for storing a plurality of image data elements that define the image;
- means for selecting a set of image data elements from the plurality of image data elements, the selected set of image data elements being indicative of a portion of the image within an existence domain, the existence domain defining an intended vehicle path in the image;
- means for selecting vehicle data representing potential vehicles from the set of image data elements, the vehicle data defining line edges;
- means for generating information that defines one of a center of gravity value and a width based upon the vehicle data defining the line edges, and preserving the information;
- means for selecting projection data from the vehicle data based on the information from the means for generating and preserving;
- accumulating means for timewisely accumulating the projection data selected by the means for selecting the projection data;
- vehicle determining means for determining the existence of a vehicle moving in the portion of the image within the existence domain based on the timewisely accumulated projection data;
- a vehicle motion detecting device for detecting a behavior of the vehicle determined by the vehicle determining means based on said generated information defining one of the center of gravity value and the width; and
- means for measuring state quantities of the vehicle determined by the vehicle determining means.

5,691,903
INTEGRATED CABLE NAVIGATION AND CONTROL SYSTEM
Russell A. Racette, III, Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1995, Ser. No. 525,803

Int. Cl.⁶ G06F *165/00;* **F16F** *1/00*

U.S. Cl. 364—449.1 **11 Claims**



1. A system for accurate guidance of a vessel and precise deployment of cable comprising:
- cable sensor means for monitoring cable payout speed;
- environmental sensor means for acquiring water data;
- navigation sensor means for acquiring vessel navigation data; and
- a cable navigation control processor, responsive to said cable sensor means, to said environmental sensor means and to said navigation sensor means, for generating vessel navigation instructions and cable control instructions.

5,691,904
PROCESS AND DEVICE FOR DETERMINING THE CONDITION OF MACHINES WITH SEVERAL MEASURING POINTS
Heinrich Lysen, Garching, Germany, assignor to Pruftechnik Dieter Busch AG, Ismaning, Germany

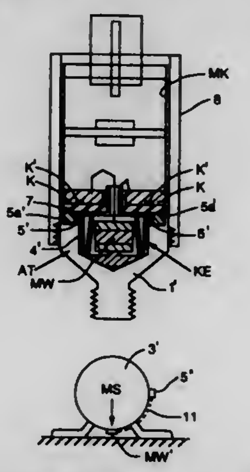
PCT No. PCT/EP94/02035, § 371 Date Feb. 22, 1995, § 102(e) Date Feb. 22, 1995, PCT Pub. No. WO95/00930, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 22, 1994, Ser. No. 387,878

Claims priority, application Germany, Jun. 22, 1993, 43 20 657.3

Int. Cl.⁶ G06G *7/78;* **G01B** *5/004*

U.S. Cl. 364—460 **18 Claims**



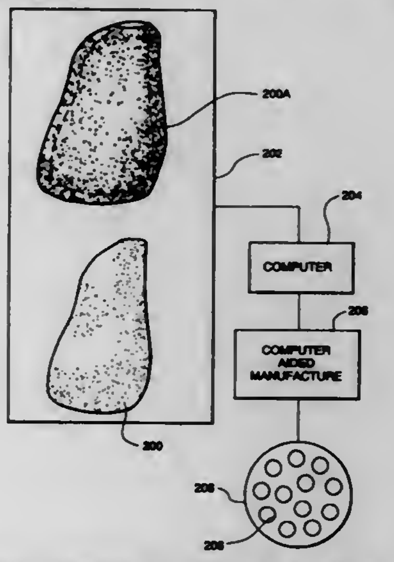
1. A method of identifying a measuring site on a machine, comprising the steps of:
- defining a plurality of encoding elements, with each encoding elements having a plurality of working conditions, and each encoding element is defining in one of the working conditions;
- engaging a plurality of contact units with the plurality of encoding elements, so that each contact unit reflects the working conditions of an encoding element;
- generating an electric signal for each contact unit, the electric signal being indicative of the working condition of the encoding element, wherein the electrical signal is generated by:
  - providing an input signal to the contact unit, the input signal having a magnitude, and
  - influencing the magnitude of the input signal as a function of the working condition of the encoding element to generate the electric signal by varying the resistance of a conductive pathway for the input signal; and
- identifying the measuring site based on the electric signals representative of the working conditions of the encoding elements.

5,691,905
PROSTHETIC TEETH AND MOLD MAKING AND POLISHING THEREFOR
Barry Dehoff, York; Jeffrey McGraw, Boiling Springs; James McNulty; Vickie Reynolds, both of York; Roger Shue, Red Lion, and Mark White, Shrewsbury, all of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Continuation-in-part of Ser. No. 503,565, Jul. 18, 1995, abandoned, which is a continuation of Ser. No. 219,804, Mar. 29, 1994, Pat. No. 5,452,219, which is a continuation of Ser. No. 536,137, Jun. 11, 1990, abandoned. This application Sep. 15, 1995, Ser. No. 529,117

Int. Cl.⁶ G06F *19/00;* **G05B** *19/4099*

U.S. Cl. 364—468.04 **21 Claims**



1. A method of milling and polishing at least first and second milled dental tooth enamel layer mold parts of a set of mold parts using a first and second tool path program, comprising:
- milling comprising directing machine milling of substrate material to form said tooth enamel layer mold parts, said milling of each said part comprising making a first pass with a first mill and making a second pass with a second mill,
- polishing said milled tooth enamel layer mold parts using said first and second tool path program, to form first and second polished tooth mold parts adapted to mold an enamel layer of a prosthetic tooth and
- repeatedly molding in said set of mold parts, artificial teeth each having an enamel layer.

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5,691,906

METHOD OF MANAGEMENT OF A PRODUCTION LINE AND A SYSTEM FOR USE IN THE MANAGEMENT

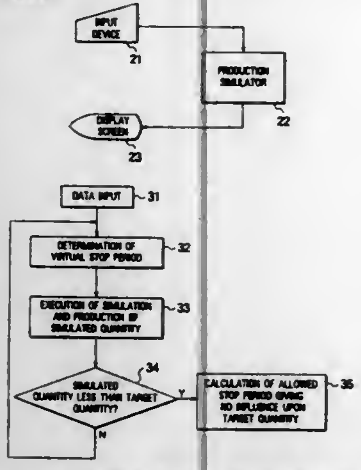
Takako Togashi, and Yukihiro Muraoka, both of Yamagata, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 20, 1995, Ser. No. 560,690

Claims priority, application Japan, Nov. 22, 1994, 6-287718

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—468.15 **9 Claims**


INPUT DEVICE
21
PRODUCTION SIMULATOR
22
DISPLAY SCREEN
23
DATA INPUT
31
DETERMINATION OF VIRTUAL STOP PERIOD
32
EXECUTION OF SIMULATION AND PRODUCTION OF SIMULATED QUANTITY
33
34
SIMULATED QUANTITY LESS THAN TARGET QUANTITY?
Y
N
CALCULATION OF ALLOWED STOP PERIOD GIVING NO INFLUENCE UPON TARGET QUANTITY
35

1. A method of managing a production line in which a product is produced using a plurality of production facilities, the method comprising:

- providing a production simulator responsive to data including:
  - maximum operating rate data for each said production facility,
  - product processing time data for each said production facility,
  - product processing route data,
  - product feed data, and
  - products-in-process data for each said production facility;
- inputting said data to said production simulator;
- executing on said production simulator a simulation; and
- predicting and controlling an influence of a stopped one of said plurality of production facilities on a production quantity, on the basis of results of said simulation;
- wherein said simulation models said plurality of production facilities taking into account a production facility stop period preliminarily determined by controlling a products-in-process transition in said one of said plurality of production facilities.

5,691,907

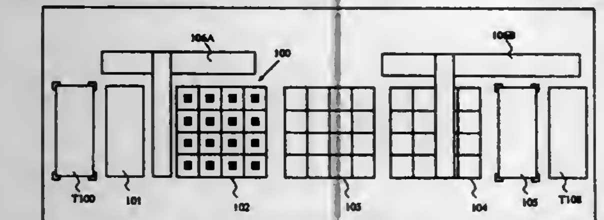
DEVICE FOR PROGRAMMING MULTIPLE ARRAYS OF SEMICONDUCTOR DEVICES

Edwin W. Resler, San Jose; Vincent L. Tong, Fremont; Russell C. Swanson, and W. Scott Bogden, both of San Martin, all of Calif., assignors to Xilinx Inc., San Jose, Calif.

Division of Ser. No. 74,190, Jun. 10, 1993, Pat. No. 5,466,117. This application Apr. 18, 1995, Ser. No. 425,017

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—468.28 **5 Claims**



1. A system of programming a plurality of semiconductor devices comprising:

- means for providing electrical connections to said plurality of semiconductor devices during programming;
- a plurality of programmer electronics, each programmer electronics coupled to said means for providing electrical connections;
- a plurality of modules for providing command signals to program said plurality of semiconductor devices, each module providing command signals to one programmer electronics; and
- means for transferring said command signals to said plurality of programmer electronics.

5,691,908

METHOD FOR ACTUATOR IDENTIFICATION DURING THE TRANSVERSE PROFILE CONTROL OF A CONTINUOUS MATERIAL WEB

Jürgen Adamy, Igensdorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

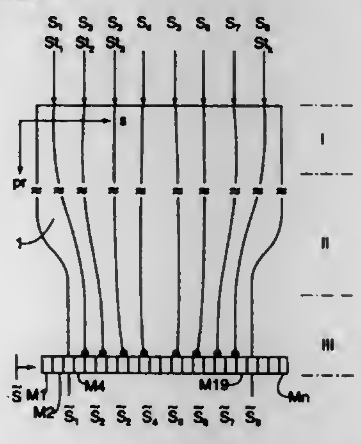
PCT No. PCT/DE93/01092, § 371 Date May 23, 1995, § 102(e) Date May 23, 1995, PCT Pub. No. WO94/12919, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 15, 1993, Ser. No. 448,349

Claims priority, application Germany, Nov. 23, 1992, 42 39 270.5

Int. Cl.^{6} G06F *19/00;* **G06G** *7/64;7/66*

U.S. Cl. 364—469 **17 Claims**



1. A method for actuator identification during the transverse profile control of a continuous material web such as a paper or plastic web, comprising the steps of:

- a) determining the temporal mean value of a transverse profile at a web end from a number of successive measurements with manipulated variables held constant;
- b) storing the determined temporal mean value;
- c) adjusting a specific number of identified actuators using identical absolute values which have an effect on the web end only within a noise level of the transverse profile;
- d) measuring a transverse profile of the web;
- e) subtracting the temporal mean value obtained in step a) from the transverse profile measured in step d);
- f) repeating steps d) and e) to the accompaniment of superimposition of the results obtained thereby, until a number of measuring signals, which corresponds to the number of identified actuators stands out in a clearly recognizable fashion in terms of amplitude and shape from the superimposed noise components of the transverse profile.

5,691,909

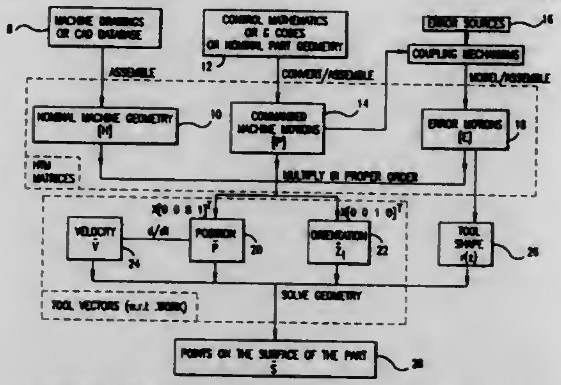
METHOD OF VIRTUAL MACHINING TO PREDICT THE ACCURACY OF PART TO BE MADE WITH MACHINE TOOLS

Daniel D. Frey, Cambridge, Mass.; Timothy W. Hykes, Greencastle, Pa., and Kevin N. Otto, Watertown, Mass., assignors to Western Atlas, Waynesboro, Pa.

Filed Dec. 29, 1995, Ser. No. 581,337

Int. Cl.^{6} G05B *19/4069;* **G06F** *15/46*

U.S. Cl. 364—474.01 **23 Claims**



1. A method for virtual machining to predict the accuracy of parts to be made with machine tools, to allocate errors of said machine tools and diagnose a source of said errors, comprising the steps of:

- performing a simulation taking into account nominal geometry of said machine tool, commanded machine tool motions as a function of time, error motions of said machine tool as a function of time, and a shape of a cutting tool;
- calculating an error shape which is a set of discrete points on a surface of said part based upon position, orientation, direction of motion and shape of said cutting tool; and
- predicting a magnitude and pattern of errors for said part.

5,691,910

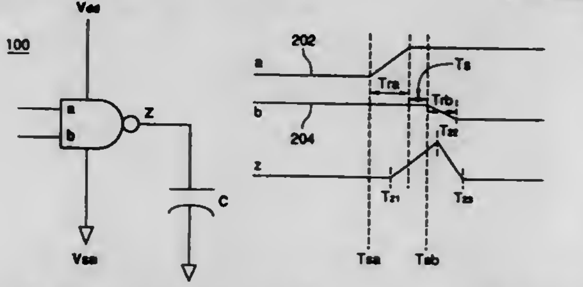
GENERIC GATE LEVEL MODEL FOR CHARACTERIZATION OF GLITCH POWER IN LOGIC CELLS

John A. Thodiyil, Sunnyvale, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 10, 1996, Ser. No. 661,186

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—483 **6 Claims**



1. A method for determining glitch power in a logic circuit having a power supply terminal, a first input, a second input, and an output coupled to a capacitive load, the method comprising:

- determining at least one ramp time sum, each ramp time sum corresponding to a pair of ramp times;
- determining a plurality of separation times by:
  - selecting a minimum separation time,
  - selecting a maximum separation time,
  - dividing a difference between the minimum separation time and the maximum separation by a step value to determine a separation time increment,
  - incrementing the minimum separation time by multiples of the separation time increment until the incremented minimum separation time approximately equals the maximum separation time;
- determining an average current flowing through the power supply terminal for each separation time and ramp time sum;
- storing the average current in a computer-readable medium; and
- interpolating an actual average current from the stored average current values based upon actual ramp times and an actual separation time.

5,691,911

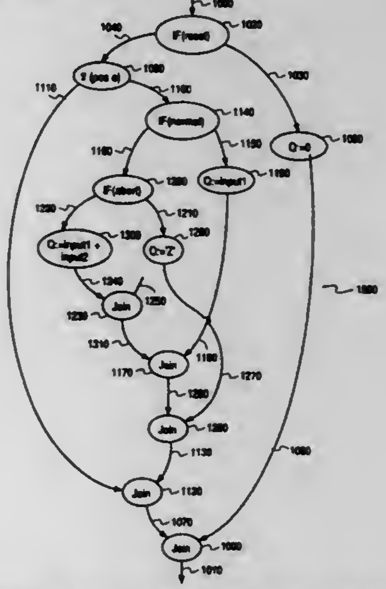
METHOD FOR PRE-PROCESSING A HARDWARE INDEPENDENT DESCRIPTION OF A LOGIC CIRCUIT

Brent L. Gregory, Sunnyvale, and Russell B. Segal, Mountain View, both of Calif., assignors to Synopsys, Inc., Mountain View, Calif.

Continuation of Ser. No. 632,439, Dec. 21, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 486,282

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—489 **10 Claims**



1. A method for converting a user logic circuit description, that is hardware independent, and that includes (i) an IF statement controlled by a logic state of a condition signal C, and (ii) a directive statement that assigns a logical value to a signal E and a GOTO statement within said IF statement, into a structure in a computer memory representing said logic circuit, said method comprising:

- generating a split node and a join node for said IF statement in said structure;
  - wherein said split node indicates a start of said IF statement and said join node indicates an end of said IF statement;
- generating an operation node for said directive statement with a single edge entering said operation node and another single edge leaving said operation node in said structure;
  - wherein said single edge is coupled to said split node and said another single edge is coupled to said join node; and
- generating yet another single edge for said GOTO statement in said structure;
  - wherein said yet another single edge is connected to one of (i) said split node for said IF statement; and (ii) a first node between said split node and said join node for said IF statement, and extends to yet another join node; and
- said yet another join node is positioned in any location in the group of location consisting of (i) a location in said structure between said operation node for said directive state and said join node for said IF statement; (ii) a location coincident with said join node of said IF statement so that said yet another

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join node and said join node of said IF statement are the same node; and (iii) a location in said structure after said join node for said IF statement.

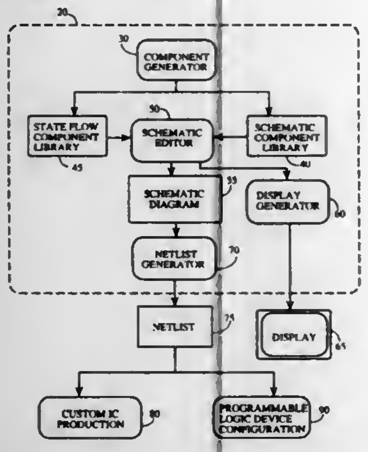
5,691,912
METHOD FOR ENTERING STATE FLOW DIAGRAMS USING SCHEMATIC EDITOR PROGRAMS

Robert G. Duncan, Castroville, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Division of Ser. No. 100,521, Jul. 30, 1993. This application Jun. 5, 1995, Ser. No. 465,635

Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—490 **6 Claims**



1. A computer readable medium storing an executable schematic capture program, the program having sequences of instructions which, when executed by a processor, cause the processor to perform the following steps:

forming a state flow diagram on a computer video terminal in response to a user selecting state flow components from a library and connecting the state flow components by flow bus segments, each state flow component in the library including a state flow symbol and an underlying circuit design, the library comprising at least one spawn state flow component connectable to at least two other state flow components, wherein states represented by each of the other state flow components are independent and simultaneously active; and

generating a netlist from netlists for underlying circuit designs of each of the state flow symbols and connections indicated by the flow bus segments.

5,691,913
LAYOUT DESIGNING APPARATUS FOR CIRCUIT BOARDS

Masayuki Tsuchida; Yukinobu Nishikawa, both of Osaka; Hirokazu Uemura, Yao, and Shinji Miura, Kyoto, all of Japan, assignors to Matsushita Electric Ind. Co., Osaka, Japan

Filed Mar. 27, 1995, Ser. No. 410,708

Claims priority, application Japan, Mar. 28, 1994, 6-057361; Oct. 14, 1994, 6-249384

Int. Cl.⁶ G06F *17/50*

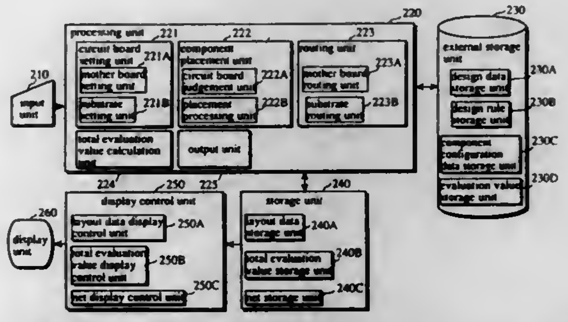
U.S. Cl. 364—491 **14 Claims**

1. A layout designing apparatus for circuit boards including a mother board and a substrate which is placed thereon comprising:

layout data storage means for having areas to store data;

operation means for giving directions;

mother board setting means for creating data about the mother board in the layout data storage means according to the operation means;


220
processing unit 221
222
223
230
210
input unit
circuit board setting unit 221A
mother board setting unit
221B
substrate setting unit
component placement unit
circuit board judgement unit 222A
placement processing unit 222B
routing unit
mother board routing unit 223A
substrate routing unit 223B
total evaluation value calculation unit
output unit
external storage unit
design data storage unit 230A
230B
design rule storage unit
component configuration data storage unit 230C
evaluation value storage unit 230D
224
250
225
240
260
display unit
display control unit
layout data display control unit 250A
total evaluation value display control unit 250B
net display control unit 250C
storage unit
layout data storage unit 240A
total evaluation value storage unit 240B
net storage unit 240C

substrate placement means for creating data in the layout data storage means according to the operation means so that the substrate of a given configuration is placed on a given place on the mother board;

component placement means for creating data in the layout data storage means according to the operation means so that components of predetermined configurations are placed on given places on the mother board and on the substrate;

routing means for creating data in the layout data storage means according to the operation means so that routing paths of given configurations are laid out on the mother board and on the substrate;

display means; and

layout data display control means for controlling the display means to display configurations and places of the mother board, the substrate, components and routing paths as created.

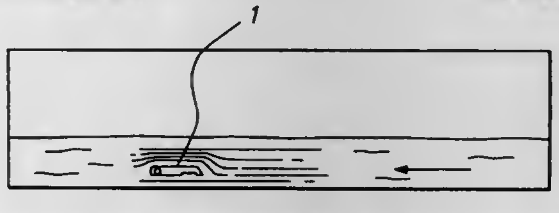
5,691,914
FLUID FLOW MEASUREMENT CORRECTING SYSTEM, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Gary Randolph, Lyndonville, N.Y., assignor to American Sigma, Inc., Medina, N.Y.

Filed Jul. 24, 1996, Ser. No. 685,502

Int. Cl.⁶ G01F *5/60*

U.S. Cl. 364—510 **20 Claims**



1. A method for measuring fluid flow in a channel, comprising the steps of:

obtaining a probe;

obtaining a computing means having stored therein drawdown data for said probe;

placing said probe in a channel where fluid flow is to be measured;

determining fluid depth in said channel with said probe;

correcting said fluid depth determination based upon said drawdown data using said computing means; and

calculating fluid flow rate based upon said corrected fluid depth determination using said computing means.

5,691,915
DATA TRANSMISSION DEVICE

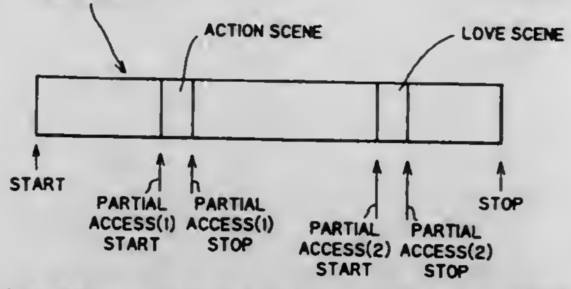
Yasuhiro Funahashi; Kazunori Ikami, both of Nagoya, and Yukie Hasegawa, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, and Xing, Inc., both of Nagoya, Japan

Filed Mar. 13, 1995, Ser. No. 402,377

Claims priority, application Japan, Mar. 14, 1994, 6-042585

Int. Cl.⁶ H04Q *1/00*

U.S. Cl. 364—514 A **15 Claims**



1. A data transmission device for transmitting a desired information via a transmission line from a central control unit to a plurality of terminals, the data transmission device comprising:

a central control unit including data memory means for storing information data, including image information, sound information, or both, in separate plural data units and in separate plural partial access data, at least a part of each partial access data being the same as a part of a corresponding data unit so as to indicate the content of the information data of the corresponding data unit; and

a plurality of terminals connected to said central control unit via a transmission line so that the information data can be transmitted from the central control unit to the plurality of terminals, each of the plurality of terminals including:

data selection means for selecting a desired information data of at least one data unit out of the information data stored in the memory means in the central control unit;

partial access request means for requesting partial access of the information data selected by the data selection means;

total access request means for requesting total access of the information data selected by the data selection means; and

output means for, based on the information data transmitted from the central control unit, reproducing and outputting image information, sound information, or both from the partial access data in response to the partial access request performed by the partial access request means and from the entire part of the data unit in response to the total access request performed by the total access request means, wherein each partial access data is included in a corresponding data unit as a predetermined portion of the corresponding data unit that indicates the content of the information data of the corresponding data unit.

5,691,916
METHOD AND DEVICE FOR CALCULATING THE QUALITY OF TRANSMISSION MEDIA CONTAINING CODECS

Wilhelmus Albertus Christianus Van Den Brink, Zoetermeer; Michel Johannes Wilhelmus Maria Emons, Leidschendam, and Robertus Laurentius Maria Dignum, Voorburg, all of Netherlands, assignors to Koninklijke PTT Nederland N.V., Groningen, Netherlands

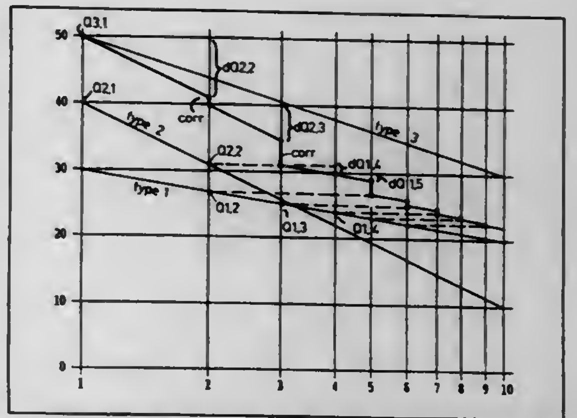
Filed Apr. 14, 1995, Ser. No. 421,841

Claims priority, application Netherlands, May 6, 1994, 9400751

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 364—514 B **20 Claims**

1. A method of calculating the transmission quality of a transmission medium which contains a series of cascaded codecs, comprising the steps of:



a) determining, for each type (t) of codec, a function specific to a relationship between a number (n) of codecs of a same type and a Q-equivalent (Qt,n) over the number (n) of codecs of the same type;

b) determining a type sequence (t1, t2, t3, . . .) of the series of codecs which are cascaded in the transmission medium; and

c) traversing the codec series step-by step and, starting from a Q-equivalent (Qt1,1) for a first codec of a type (t1) which occurs as a first codec type in the series of codecs, calculating a Q-equivalent over the traversed part of the series by calculating, starting from a Q-equivalent calculated last, a next Q-equivalent in accordance with the determined function specific to the type (t) of a last codec in the traversed part of the codec series.

5,691,917
EVENT-PROCESSING SYSTEM AND METHOD OF CONSTRUCTING SUCH A SYSTEM

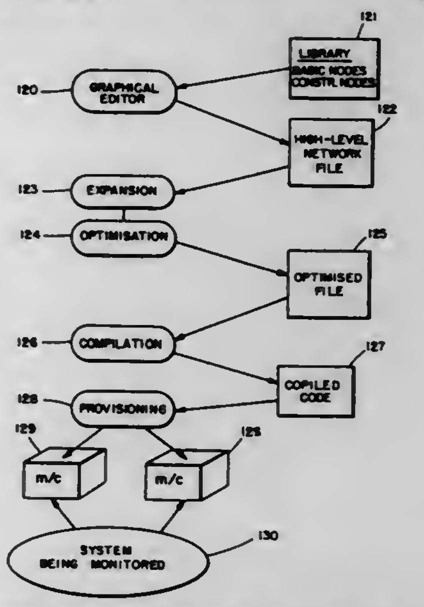
Keith Alexander Harrison, Chepstow, United Kingdom, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 5, 1995, Ser. No. 435,490

Claims priority, application European Pat. Off., Jun. 10, 1994, 94304210.1

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 364—514 B **18 Claims**



1. An event processing system for receiving and processing event information about basic events occurring in a system monitored, said basic events comprising changes in state in said system being monitored, the event-processing system comprising:

a plurality of discrete event-processing nodes, at least one event processing node being coupled to said system being monitored, each operative to process event data items, each said

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event data item relating either to a basic event or to a combination of such basic events and having event data that is indicative of a nature and time of occurrence of said basic event or combination of events, as the case may be, in the system being monitored, each node receiving at least one input of said event data items which it processes to produce at least one output stream of said event data items; and

means for coupling said nodes to form a network of nodes in which output streams of at least some said nodes form input data streams of other of said nodes, said at least one event processing node coupled to said system being monitored and constituting an input node for receiving said event information in the form of at least one said input data stream, said nodes, as so coupled, facilitating assessment of system operation.

5,691,918

CIRCUIT AND METHOD FOR DETERMINING QUANTIFICATION COEFFICIENTS IN PICTURE COMPRESSION CHAINS

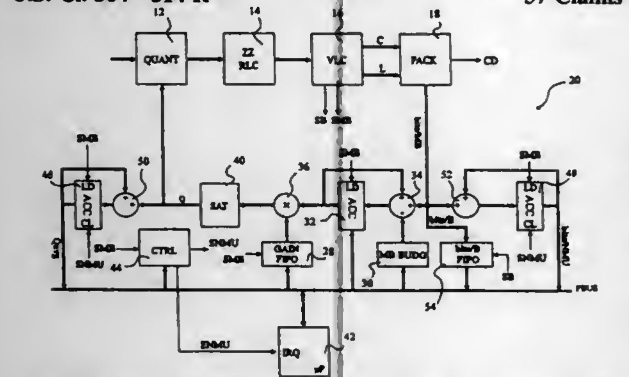
Martin Bolton, Tullins, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed May 24, 1995, Ser. No. 448,829

Claims priority, application France, May 27, 1994, 94 06725

Int. Cl.^{6} H04N ***7/26***

U.S. Cl. 364—514 R **37 Claims**



28. A method for determining a series of quantization coefficients to be used by a data compressor, the data compressor providing a series of bit counts that each represents an amount of compression achieved by the data compressor, the method comprising the steps of:

accumulating a difference between a target value and each bit count;

multiplying the accumulated difference by a gain value to yield one of the series of quantization coefficients; and

adjusting the target value.

5,691,919

SYSTEM AND METHOD FOR COLLECTING DATA ON TISSUE CONSUMPTION

Bruce M. Gemmell, Wilmington, Del.; Alan D. Frazier, West Chester, and Wesley James McConnell, Glen Mills, both of Pa., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Feb. 28, 1995, Ser. No. 395,771

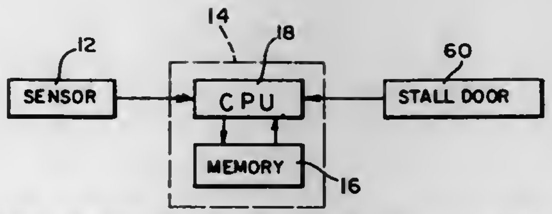
Int. Cl.^{6} G01B ***5/04***

U.S. Cl. 364—550 **15 Claims**

1. A system for collecting data on toilet tissue use at a particular location, comprising:

sensing means for sensing one or more characteristics of toilet tissue use at a particular dispensing location;

recording means, in communication with said sensing means, for receiving and recording data from said sensing means, whereby toilet tissue use at the dispensing location can be monitored and studied; and



analyzing means for analyzing information received from said sensing means, said analyzing means further for calculating a duration of time over which tissue is used.

4. A system for analyzing individual and aggregate usage of toilet tissue use at a particular toilet stall, comprising:

determining means for determining whether a person is present in a toilet stall;

sensing means for sensing one or more characteristics of toilet tissue use at the toilet stall;

analyzing means for analyzing data that is supplied by said sensing means, wherein said analyzing means is further for calculating a duration of time over which tissue is used; and

recording means for recording data from at least one of said sensing means and said analyzing means, whereby toilet tissue use at the toilet stall can be accurately monitored and studied.

5,691,920

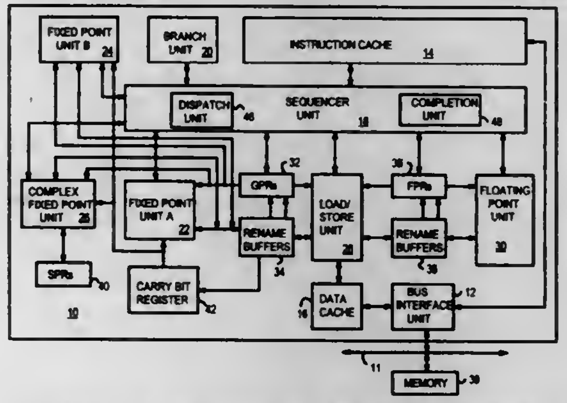
METHOD AND SYSTEM FOR PERFORMANCE MONITORING OF DISPATCH UNIT EFFICIENCY IN A PROCESSING SYSTEM

Frank Eliot Levine; Charles Philip Roth, and Edward Hugh Welbon, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1995, Ser. No. 538,070

Int. Cl.^{6} G06F ***15/00***

U.S. Cl. 364—551.01 **11 Claims**



1. A method for determining the efficiency of operation of a dispatch unit in a processing system, the processing system including special purpose registers, one or more of the special purpose registers designated as at least one performance monitor counter (PMC) and at least one monitor mode control register (MMCR) to configure the operations of the at least one PMC, the method comprising:

(a) counting a number of instructions dispatched by the dispatch unit during a predetermined sampling period;

(b) counting a number of times a predetermined number of instructions are dispatched by the dispatch unit per cycle during the predetermined sampling period; and

(c) determining the efficiency of the dispatch unit according to the counted number of instructions and the counted number of times the predetermined number of instructions are dispatched by the dispatch unit.

5,691,921

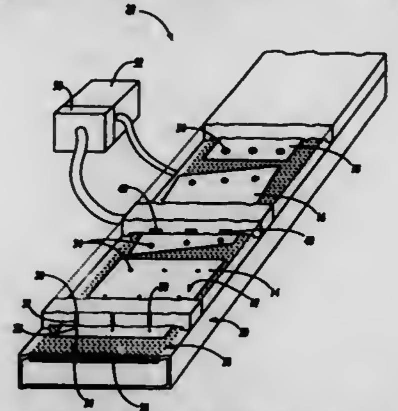
THERMAL SENSORS ARRAYS USEFUL FOR MOTION TRACKING BY THERMAL GRADIENT DETECTION

Andrew A. Berlin, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 5, 1996, Ser. No. 583,248

Int. Cl.^{6} G01K ***17/00***

U.S. Cl. 364—557 **14 Claims**



1. An object tracking and motion control system comprising

a thermal sensing unit having a plurality of temperature sensors for measuring a plurality of temperatures over localized regions of objects having thermal gradients, wherein the plurality of temperature sensors of the thermal sensing unit are arranged to form a two dimensional temperature sensing array, with the two dimensional temperature sensing array allowing calculation of a temperature centroid based on two dimensional temperature gradient information derived from subregion temperatures of objects,

a movement calculation unit connected to the thermal sensing unit to determine movement of the object based on the temperature centroid, and

a motion control unit connected to the movement calculation unit, the motion control unit configured to modify motion of objects in response to movement information received from the movement calculation unit.

5,691,922

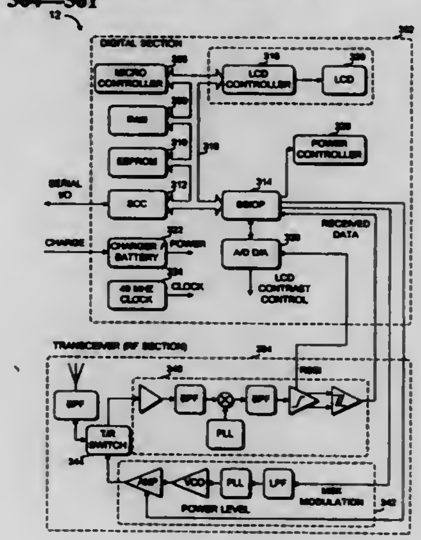
GOLF AUTORANGING SYSTEM

Charles McEwan, Rancho Mirage; Michael Maletta, San Jose; Robert Pompeani, San Jose, and Roberto Marcoccia, San Jose, all of Calif., assignors to Airwave Technology, Inc., Campbell, Calif.

Filed Nov. 14, 1995, Ser. No. 557,218

Int. Cl.^{6} G01S ***13/74***

U.S. Cl. 364—561 **10 Claims**



1. An electronic golf course ranging apparatus for determining a distance to a pin selected among pins of holes of a golf course, wherein a golfer's lie is a current position of a golf ball and the selected pin is a current target pin for the golfer, the apparatus comprising:

a hand-held golfer unit which is positionable near the golfer's lie, the hand-held golfer unit including:

a ranging transceiver activated by the golfer to send a direct sequence spread spectrum (DSSS) ranging signal to the selected pin;

a processor coupled to the ranging transceiver;

a plurality of offset pin units disposed about the selected pin, the offset pin units including digital circuitry coupled to a pin transceiver that receives the DSSS ranging signal, the digital circuitry being operable to acquire, track and hold the DSSS ranging signal, and to code and transmit a DSSS return signal back to the remote transceiver of the hand-held golfer unit; and

wherein the processor calculates ranging distances from the hand-held unit to each of the offset pin units utilizing time differences between the DSSS ranging signal and the DSSS return signal received by the hand-held unit, the distance to the pin from the golfer's lie being computed by the processor utilizing the ranging distances and a formula.

5,691,923

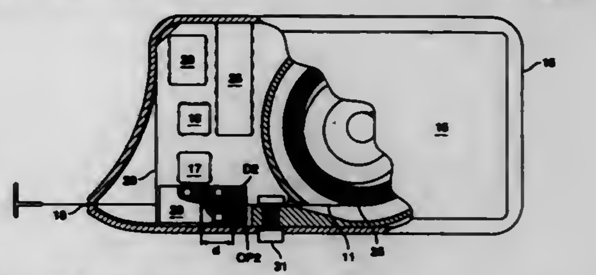
DIGITAL MEASURING SYSTEM

Maureen E. Adler, San Francisco, Calif., and Frederick N. Mueller, McKinney, Tex., assignors to Levi Strauss & Co., San Francisco, Calif.

Filed Apr. 25, 1995, Ser. No. 428,671

Int. Cl.^{6} G01B ***3/08***

U.S. Cl. 364—562 **21 Claims**



1. A digital measuring system comprising:

a. a case having an opening;

b. a measuring tape housed within the case, said measuring tape having a first end, a second end, and a plurality of regularly spaced measuring apertures each of which are spaced apart from an adjacent perforation by a first distance, the first end extending out through the case opening and the second end coiled within the case;

c. a recoil means coupled to the second end of said measuring tape for recoiling said measuring tape back into the case after the first end of said measuring tape has been pulled away from the case opening,

d. means for determining and recording the length of said measuring tape which extends outside of the case, said means including an electronic sensing means which detects the passage of predetermined increments of said tape, said electronic sensing means comprising a plurality of regularly-spaced optical sensors for sensing the passage of the measuring apertures, each of said sensors spaced from an adjacent sensor by a second distance, said second distance being smaller than said first distance and

e. a means for determining when the measuring tape is fully retracted, said means comprising at least two signal apertures located between said first end of said measuring tape and a first of said plurality of measuring apertures, said two signal apertures spaced from each other by said second distance whereby when said measuring tape is fully retracted, said

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signal apertures will be aligned with two adjacent optical sensors for generating a unique signal.

5,691,924

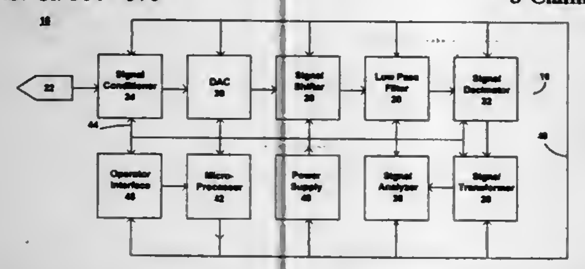
NARROW BAND SPECTRUM ANALYSIS METHOD AND APPARATUS

Zbigniew Czyzewski, and Ronald G. Canada, both of Knoxville, Tenn., assignors to Computational Systems, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 355,208, Dec. 9, 1994. This application Jul. 28, 1995, Ser. No. 508,851

Int. Cl.^{6} G01R *23/00*

U.S. Cl. 364—576 **8 Claims**



1. A method of zoom processing a time domain frequency signal digitized at a sampling frequency comprising:

providing a zoom processor having an input device, a memory, a processor, and an output device,

acquiring the digitized time domain frequency signal with the input device of the zoom processor, to produce an acquired signal,

lowering the frequency of the acquired signal with the processor of the zoom processor, by:

inputting a sine table into the zoom processor using the input device of the zoom processor, where the value of each entry in the sine table is based on one full period being represented by a predetermined number of entries, the entries being twenty-four bit numbers,

storing the sine table in the memory of the zoom processor,

solving the equation $f_c/f_s=(X+\Delta)/\Psi$ for X and Δ using the processor of the zoom processor, where X is a positive integer less than or equal to 800, Ψ is the predetermined number, and Δ is a non-negative number less than one,

selecting the ηX sine table entry using the processor of the zoom processor when Δ equals zero, the value of which entry equals $\sin[(2\pi)\eta(f_c/f_s)]$,

interpolating by Δ between the ηX sine table entry and η(X+1) sine table entry using the processor of the zoom processor, to determine an interpolated value when Δ does not equal zero, which interpolated value equals $\sin[(2\pi)\eta(f_c/f_s)]$, and

calculating $\cos[(2\pi)\eta(f_c/f_s)]$ using the processor of the zoom processor according to the equation $\cos(\theta)=\sin(\theta+\pi/2)$, and

multiplying the acquired signal by $\{\cos[(2\pi)\eta(f_c/f_s)]+j^*\sin[(2\pi)\eta(f_c/f_s)]\}$, where η is a consecutive data point number, j is an imaginary number having a value of $(-1)^{1/2}$, f_c is a frequency of the acquired signal, and f_s is the sampling frequency used to produce the digitized time domain frequency signal, to produce a shifted signal,

low-pass filtering the shifted signal, to produce a low-pass filtered signal, and

outputting the low-pass filtered signal with the output device of the zoom processor, to produce a zoom processed signal.

5,691,925

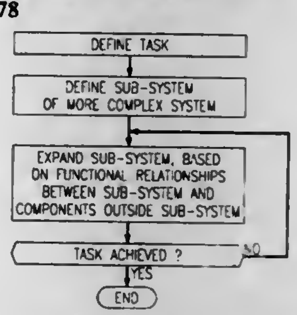
DERIVING TRACTABLE SUB-SYSTEM FOR MODEL OF LARGER SYSTEM

Ronald H. Hardin, Pataskala, Ohio, and Robert P. Kurshan, New York, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 906,082, Jun. 29, 1992, Pat. No. 5,483,470. This application Feb. 3, 1995, Ser. No. 383,341

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—578 **3 Claims**


DEFINE TASK
DEFINE SUB-SYSTEM OF MORE COMPLEX SYSTEM
EXPAND SUB-SYSTEM, BASED ON FUNCTIONAL RELATIONSHIPS BETWEEN SUB-SYSTEM AND COMPONENTS OUTSIDE SUB-SYSTEM
TASK ACHIEVED ?
NO
YES
END

1. A process of deriving a model of a sub-system from a model of a more complex system, comprising the following simulation steps:

a) defining a task;

b) defining a sub-system; and

c) successively expanding the sub-system, based on functional relationships between the sub-system and components not included in the sub-system, until the task is achieved.

5,691,926

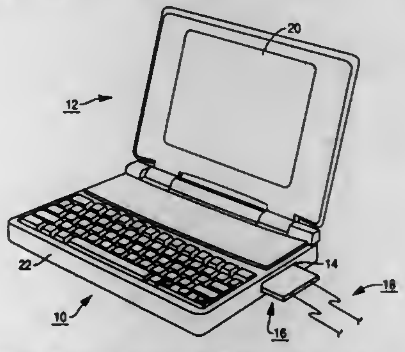
INTEGRATED TEST TOOLS FOR PORTABLE COMPUTER

Kim B. Cannon, Easley; Michael R. Hilley, Belton, and B. Russell Bryan, Easley, all of S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 20, 1994, Ser. No. 359,968

Int. Cl.^{6} G01R *19/00*

U.S. Cl. 364—579 **11 Claims**



1. A portable test tool system for field maintenance comprising:

a portable computer having a display;

a PCMCIA slot having a peripheral interface coupled to said portable computer for communicating data between said portable computer and a unit under test;

a PCMCIA card which is receivable into said PCMCIA slot, said PCMCIA card having a test tool included thereon for receiving and transmitting signals between said test tool and said unit under test when said PCMCIA card is received into said PCMCIA slot, and said test tool including a test tool identifier for identifying a functionality for said test tool to said portable computer through said peripheral interface; and

a tool interpreter for communicating with said test tool in accordance with said test tool identifier so that said portable computer may control said test tool and receive data from said test tool,

said test tool further including a signal interface for conditioning signals received from said unit under test so that said conditional signals may be transmitted to said portable computer.

5,691,927

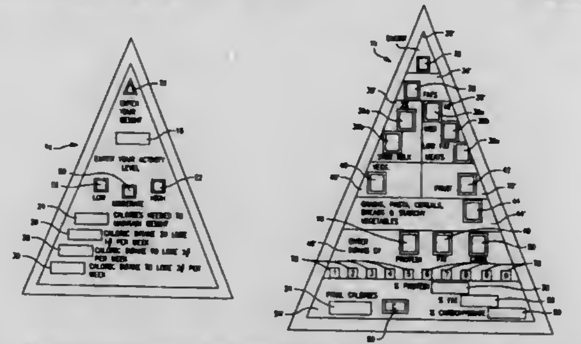
NUTRITIONAL AID AND METHOD OF OPERATING THE SAME

Carolyn Gump, 121 N. Fairfield St., Ligonier, Pa.

Filed Aug. 26, 1994, Ser. No. 296,759

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 364—709.01 **3 Claims**



1. A device for rendering numerical manipulations of data relating to personal nutrition, said device comprising:

first keyboard means, said first keyboard means comprising a plurality of keys, each of said plurality of keys corresponding to a different predetermined food exchange, wherein such a food exchange corresponds to a predetermined grouping of foodstuffs;

memory means for storing numerical values corresponding to a predetermined set of nutritional quantities associated with each food exchange;

first calculating means, said first calculating means having means for rendering numerical manipulations in response to manual activation of at least one of said plurality of keys of said first keyboard means;

first means for displaying, said first means for displaying having means for displaying at least two numerical values each corresponding, respectively, to at least two nutritional quantities, wherein one of said nutritional quantities is the approximate cumulative caloric level accumulated since a given starting time;

second keyboard means, said second keyboard means comprising a plurality of keys;

second calculating means, said second calculating means having means for rendering numerical manipulations in response to manual activation of at least one of said plurality of keys of said second keyboard means;

each of said plurality of keys of said second keyboard means being configured to enter, into said second calculating means, at least a user's weight; and

second displaying means, said second displaying means having means for displaying at least one numerical value corresponding at least to a recommended daily caloric intake for losing a predetermined amount of weight per week.

5,691,928

PORTABLE PERSONAL COMPUTER HAVING REMOVABLE SECURITY MODULE

Ken P. Okaya, and Bryan F. Howell, both of Austin, Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed Apr. 5, 1995, Ser. No. 417,307

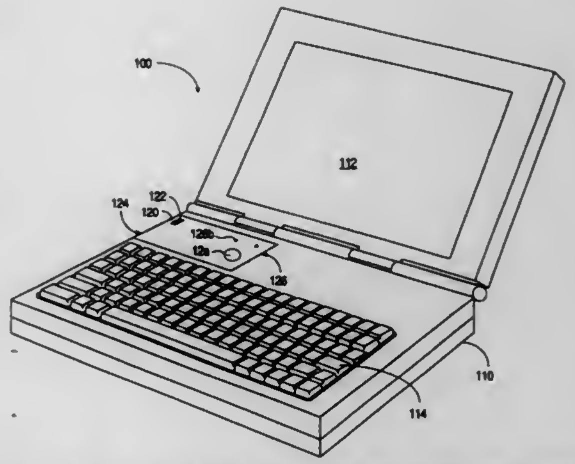
Int. Cl.^{6} G06F *3/00*; H04L *9/00*

U.S. Cl. 364—709.05 **20 Claims**

1. A portable computer, comprising:

a main chassis containing (a) data processing and volatile storage circuitry of said portable computer, (b) a nonvolatile storage unit coupled to said data processing and volatile storage circuitry and (c) a source of electrical power; and

a security module removably coupled to said main chassis and containing circuitry for (a) enabling decryption of encrypted data stored in said nonvolatile storage unit and (b) coupling said source of electrical power to said data processing and volatile storage circuitry only when said security module is coupled to said main chassis, said decryption disabled and said source of electrical power decoupled from said data processing and volatile storage circuitry when said security module is removed from said main chassis.



5,691,929

90-DEGREE PHASE SHIFT NETWORK, SYSTEM FOR CONTROLLING A 90-DEGREE PHASE SHIFT CHARACTERISTIC OF THE NETWORK, LINEARIZER USING ALL-PASS FILTERS, AND SYSTEM FOR CONTROLLING THE LINEARIZER

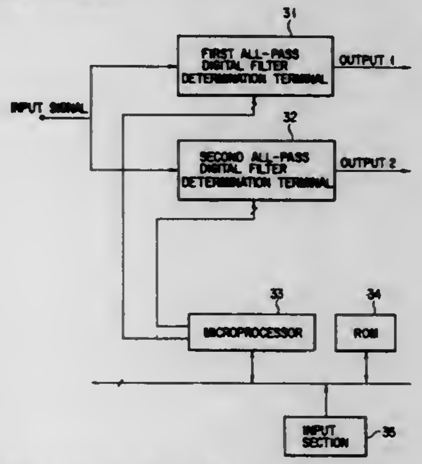
Weimin Sun, Ikoma-gun, Japan, assignor to Icom Incorporated, Osaka, Japan

Continuation of Ser. No. 220,430, Mar. 30, 1994. This application Nov. 21, 1996, Ser. No. 754,583

Claims priority, application Japan, Apr. 15, 1993, 5-88521; Apr. 19, 1993, 5-91234; Dec. 28, 1993, 5-336829

Int. Cl.^{6} G06F *17/10*

U.S. Cl. 364—724.01 **14 Claims**


31
FIRST ALL-PASS DIGITAL FILTER DETERMINATION TERMINAL
OUTPUT 1
INPUT SIGNAL
32
SECOND ALL-PASS DIGITAL FILTER DETERMINATION TERMINAL
OUTPUT 2
33
34
MICROPROCESSOR
ROM
INPUT SECTION
35

1. A system for controlling a 90-degree phase shift characteristic $\theta'(\omega)=\theta\,a(\omega)-\theta\,b(\omega)$ of a 90-degree phase shift network including first and second all-pass digital filters having phase characteristics $\theta\,a(\omega)$ and $\theta\,b(\omega)$, the system comprising:

means for setting a weight variable m and analog transfer functions Ha(s) and Hb(s) of the first and second all-pass digital filters, the weight variable m being a positive value other than 1;

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means for transforming the analog transfer functions Ha(s) and Hb(s) set by said setting means to digital transfer functions Ha(z) and Hb(z) by use of a variable bilinear z-transform

$$z = \frac{(2m + sT)}{(2m - sT)}$$

and outputting the digital transfer functions Ha(z) and Hb(z); and

means for controlling filter coefficients Pai and Pbi of the first and second all-pass digital filters in accordance with the digital transfer functions Ha(z) and Hb(z),

wherein the weight variable m is within a range which satisfies $|2m\omega| / |Pai| < 1$ and $|2m\omega| / |Pbi| < 1$ if ω is lower than 1, and within a range which satisfies $|-Pai\ \omega T^2| / 2m < 1$ and $|-Pbi\omega T^2| / 2m < 1$ if ω T is equal to π, where T represents a sampling period, s represents a Laplacian Factor, ω represents an angular frequency, and Pai and Pbi represent filter coefficients of the first and second all-pass digital filters.

5,691,930
BOOTH ENCODER IN A BINARY MULTIPLIER

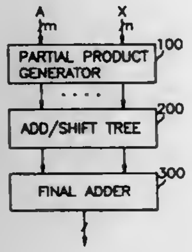
Young-Joon Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics, Co., Ltd., Seoul, Rep. of Korea

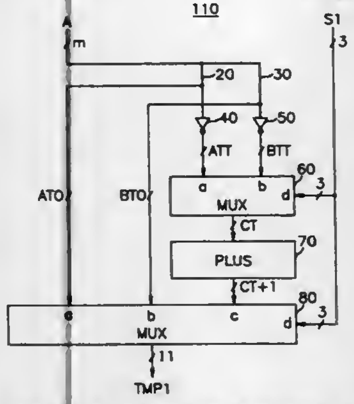
Filed Aug. 11, 1995, Ser. No. 514,048

Claims priority, application Rep. of Korea, Aug. 12, 1994, 94-19847

Int. Cl.⁶ G06F *7/52*

U.S. Cl. 364—760 **1 Claim**





1. A binary multiplier device for multiplying a parallel n-bit binary multiplier and a parallel m-bit binary multiplicand wherein n and m are positive integers, respectively, which comprises:

means, having n/2, if n is even, or n+1/2, if n is odd, number of partial product generating means, for multiplying the n bits in the multiplier with the m bits in the multiplicand to produce n/2, if n is even, or (n+1)/2, if n is odd, partial products;

means for grouping the n-bit binary multiplier together with a dummy bit placed to the right of the least significant bit ("LSB") of the n-bit binary multiplier into n/2, if n is even, or (n+1)/2, if n is odd, data groups of three bits grouped in a string starting from the dummy bit position, two neighboring groups of said n/2 or (n+1)/2 data groups having an overlapping bit therebetween, wherein each of the data groups is provided to each of the partial product generating means;

means for adding the n/2 or the (n+1)/2 partial products to produce a final partial product and a carry partial product therefor; and

means for adding the final partial product and the carry partial product to produce a final product,

wherein said each of the partial product generating means includes:

first extension means for extending the m-bit multiplicand by a parallel m+2 bit binary number, ATO, wherein the two extending bits in said ATO are copied twice from the most significant bit ("MSB") in the m-bit multiplicand and placed to the left of the MSB;

second extension means for extending the m-bit multiplicand by a parallel m+2 bit binary number, BTO, wherein one of the two extending bits in said BTO is copied from the MSB in the m-bit multiplicand and placed to the left of the MSB, and the other is a binary number "0" placed to the right of the LSB;

a first inverter for inverting the m+2 bit binary number ATO from the first extension means to produce an inverted m+2 bit binary number, ATT;

a second inverter for inverting the m+2 bit binary number BTO from the second extension means to produce an inverted m+2 bit binary number, BTT;

a first multiplexer, in response to a three bit data group provided thereto, for selectively outputting one of the inverted m+2 bit binary number ATT and the inverted m+2 bit binary number BTT, wherein the three bits of the data group are used as a selection code for the selective outputting operation;

a plus "1" logic circuit for logically adding a binary digit "1" to the selected output from the first multiplexer to produce an m+2 bit binary number, CT+1; and

a second multiplexer, in response to the three bit data group, for selectively outputting one of the m+2 bit binary number ATO, the m+2 bit binary number BTO and the m+2 bit binary number CT+1, the selected output from the second multiplexer being a partial product for said each of the partial product generators.

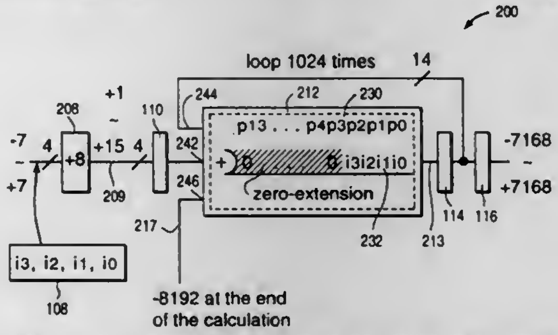
5,691,931
LOW POWER ADDER FOR ACCUMULATION

Kenichi Nitta, Kodaira, Japan, assignor to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Jun. 7, 1995, Ser. No. 481,048

Int. Cl.⁶ G06F *7/50; 1/00*

U.S. Cl. 364—768 **10 Claims**



1. A low-power method for accumulating for use in an integrated circuit performing an accumulate operation on R, K-bit, two's complement binary input numbers, R being an integer $\leqq 2^L$, where L is a predetermined integer value, said accumulate operation producing a N-bit, two's complement sum, wherein the most significant bit (MSB) of said K-bit input numbers is a sign bit and N is a second predetermined integer value no smaller than K+L, said method comprising the steps of:

receiving said input numbers one by one;

adding a K-bit binary offset equaling 2^{K-1} to each of said input numbers to generate corresponding K-bit, positive input numbers;

accumulating said positive input numbers one by one into a positive sum; and

subtracting a two's complement offset equaling $R*2^{K-1}$ from said positive sum to produce said N-bit two's complement sum; said N-bit two's complement sum being identical to the sum of said R, K-bit, two's complement input numbers,

the adding step minimizing the transition probability of higher order bits of the positive sum as said positive sum is accumulated, causing said integrated circuit to use less power to accumulate said 2's complement input numbers than when said integrated circuit directly accumulates said 2's complement input numbers without said adding step.

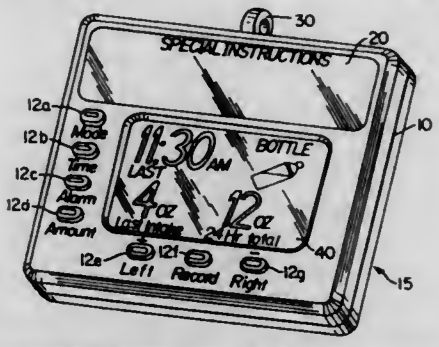
5,691,932
CARE GIVER DATA COLLECTION AND REMINDER SYSTEM

Nobert Leo Reiner, 21 Blakeslee Rd., Wallingsford, Conn. 06492, and Helaine Reiner Fischer, 5 Lancelot Way, Hamden, Conn. 06518

Filed Sep. 18, 1996, Ser. No. 710,667

Int. Cl.⁶ G04B *47/00;* **A61B** *5/04;* **G09G** *5/00*

U.S. Cl. 368—10 **20 Claims**



1. A programmable infant data collection and reminder apparatus within a housing, comprising:

a microprocessor connected to a temporary storage device and a permanent storage device, said temporary storage device provided to store data from an operator actuated data entry device and to store data resultants from program operations performed with said microprocessor and said permanent storage device provided with said program operations from said microprocessor to track time events;

said data entry device connected to said microprocessor providing mode selection and event data from timed events;

a display connected to said microprocessor providing icon representations and interrelated alpha-numeric information associated with individual mode selections;

said mode selections are associated with specific time events and specific icons and alpha-numeric information for each of said timed events selected;

an indicator connected to said microprocessor provided for output alarm conditions simultaneously with said icons and alpha-numeric information;

said data entry device having a mode selection input, whereby said operator actuation of said mode selection input in incremental steps sets said microprocessor into specific modes of operation;

said data entry device having a time selection input, whereby said operator actuation of said time selection input incrementally sets time operation within said microprocessor and said temporary memory;

said data entry device having an alarm selection input, whereby said operator actuation of said alarm selection input incrementally sets alarm operation events within said microprocessor and said temporary memory;

said data entry device having an amount selection input, whereby said operator actuation of said amount selection input sets an amount within said temporary memory;

said data entry device having a record selection input, whereby said operator actuation of said record selection input in single increments records a value into said temporary memory;

said data entry device having an input for incrementing and an input for decrementing, said incrementing input further functioning as a left breast input and said decrementing input further functioning as a right breast input; said event data depends upon said mode selection settings, whereby said mode selection for said timed events relates to care needs of an infant.

5,691,933
SEMICONDUCTOR MEMORY DEVICE HAVING IMPROVED BIT LINE DISTRIBUTION

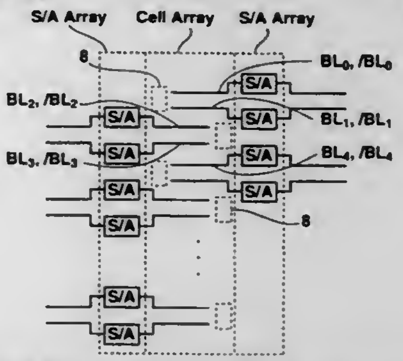
Hiroyuki Takenaka, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation of Ser. No. 571,559, Dec. 13, 1995, abandoned. This application Dec. 18, 1996, Ser. No. 769,185

Claims priority, application Japan, Dec. 16, 1994, 6-312990

Int. Cl.⁶ G11C *5/06*

U.S. Cl. 365—63 **20 Claims**



1. A semiconductor memory comprising:

a memory cell array including 2N (N≧2) bit line pairs arranged in columns, each of the bit line pairs coupled to a plurality of memory cells;

a first sense amplifier array having N first sense amplifier circuits arranged in a first column at one side of the memory cell array, each of the first sense amplifier circuits coupled to one of the bit line pairs, thereby coupling the first sense amplifier array to N of the bit line pairs;

a second sense amplifier array having N second sense amplifier circuits arranged in a second column at the opposite side of the memory cell array, each of the second sense amplifier circuits coupled to another of the bit line pairs, thereby coupling the second sense amplifier array to the other N of the bit line pairs; and

a plurality of regions, each of the regions located between ends of M of the bit line pairs and one of the sense amplifier arrays, wherein a first signal line and a second signal line are shunted at one or more of the regions;

wherein a first group of M (M≧2) adjacent bit line pairs is distributed to one of the sense amplifier arrays and a second group of M adjacent bit line pairs bordering the first group is distributed to the other sense amplifier array.

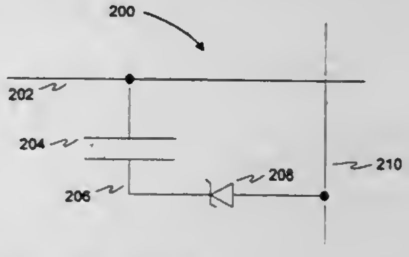
5,691,934
MEMORY CELL AND METHOD OF OPERATION THEREOF

Barry G. Douglass, 1930 W. Rundberg La., No. 1236, Austin, Tex. 78758

Filed Jul. 13, 1995, Ser. No. 502,243

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—149 **20 Claims**



1. A memory cell comprising:
a first memory cell node;
a second memory cell node;
a stored charge device; and

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a voltage dropping device having asymmetrical substantially definite voltage drops while conducting in each direction;

wherein the stored charge device and the voltage dropping device are coupled in series between the first cell node and the second cell node.

5,691,935

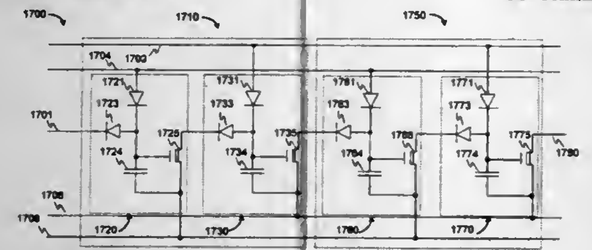
MEMORY ELEMENT AND METHOD OF OPERATION THEREOF

Barry G. Douglass, 1930 W. Rundberg La. Apt. 1236, Austin, Tex. 78758

Continuation-in-part of Ser. No. 502,243, Jul. 13, 1995, Pat. No. 5,691,934. This application Jul. 2, 1996, Ser. No. 675,388

Int. Cl.^{6} G11C *11/24*

U.S. Cl. 365—149 **86 Claims**



1. A memory comprising:

a first stored charge element having first and second terminals;

a first memory access node coupled to the first terminal of the first stored charge element;

a first charge input path having a second memory access node, the first charge input path being a charge path into the second terminal of the first stored charge element and having a substantially definite voltage drop threshold from the second memory access node to the second terminal of the first stored charge element above which conduction occurs with no significant deterioration over time and below which significant conduction does not occur; and

a first charge output path having a third memory access node, the first charge output path being a charge path from the second terminal of the first stored charge element and having a substantially definite voltage drop threshold from the second terminal of the first stored charge element to the third memory access node above which conduction occurs with no significant deterioration over time and below which significant conduction does not occur, the respective voltage drop thresholds of the first charge input path and the first charge output path being unequal;

wherein at least one of the first, second and third memory access nodes is a bit node.

5,691,936

MAGNETORESISTIVE ELEMENT AND MEMORY ELEMENT

Hiroshi Sakakima; Takeshi Uenoyama; Yasuhiro Kawawake, all of Kyoto, and Yousuke Irie, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

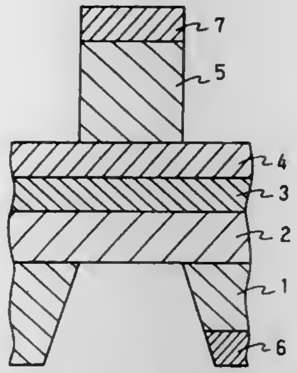
Filed Aug. 14, 1996, Ser. No. 702,382

Claims priority, application Japan, Aug. 21, 1995, 7-212165; Nov. 13, 1995, 7-294409

Int. Cl.^{6} G11C *11/15*

U.S. Cl. 365—158 **23 Claims**

12. A memory element comprising a polarizable light source, a semiconductor portion capable of spin polarization of electrons by light excitation using the light source, a magnetic film portion having a square magnetization curve contacting to the semiconductor portion, a conductor line portion for reading out information contacting both to the semiconductor portion and the magnetic film portion, and a conductor line portion for recording information arranged in the vicinity of the magnetic film portion via an insulating film.



5,691,937

STRUCTURE OF SPLIT GATE TRANSISTOR FOR USE IN A NON-VOLATILE SEMICONDUCTOR MEMORY AND METHOD OF MANUFACTURING SUCH A SPLIT GATE TRANSISTOR

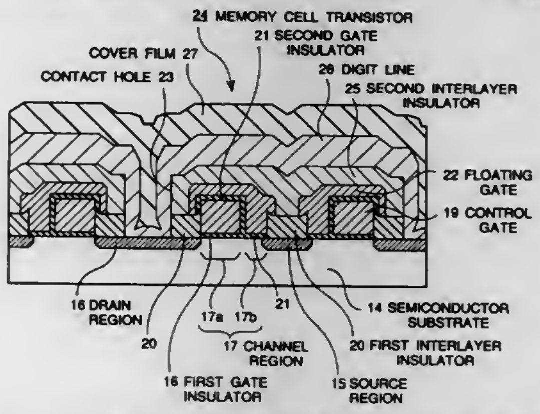
Noriyuki Ohta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 21, 1996, Ser. No. 701,013

Claims priority, application Japan, Aug. 25, 1995, 7-217834

Int. Cl.^{6} G11C *16/04;* H01L *29/68*

U.S. Cl. 365—185.01 **12 Claims**



1. A non-volatile semiconductor memory composed of split gate type memory cell transistors each having a floating gate electrode and a control gate electrode, wherein each of the memory cell transistors comprises:

first and second source/drain regions formed at a principal surface of a semiconductor substrate, separately from each other, to form a channel region between said first and second source/drain regions, said channel region being divided into a first channel region adjacent to said first source/drain region and a second channel region adjacent to said second source/drain region;

a first gate insulator film formed on a surface of said first channel region;

a first gate electrode formed on said first gate insulator film and having a pair of opposite side surfaces, a first side surface of said pair of opposite side surfaces being adjacent said first source/drain region and a second side surface of said pair of opposite side surfaces being adjacent said second channel region;

an insulator layer formed on a surface of each of said first and second source/drain regions;

a second gate insulator film formed on an upper surface and said first and second side surfaces of said first gate electrode and on a surface of said second channel region; and

a second gate electrode formed on said second gate insulator film and having opposite ends terminating on said insulator layer formed on said surface of said first source/drain region and said insulator layer formed on said surface of said second source/drain region, respectively,

wherein one of said first and second gate electrodes constitutes the floating gate electrode, and the other of said first and second gate electrodes constitutes the control gate electrode.

5,691,938

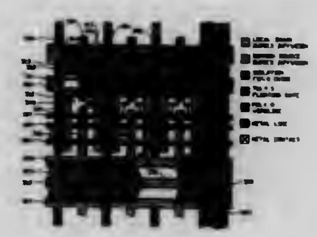
NON-VOLATILE MEMORY CELL AND ARRAY ARCHITECTURE

Tom Dang-Hsing Yiu, Milpitas, Calif.; Fuchia Shone, Hsinchu, Taiwan; Tien-Ler Lin, Cupertino, and Ling Chen, Sunnyvale, both of Calif., assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Continuation of Ser. No. 66,884, May 25, 1993, abandoned, which is a division of Ser. No. 823,882, Jan. 22, 1992, abandoned. This application May 3, 1994, Ser. No. 237,226

Int. Cl.^{6} G11C *16/06*

U.S. Cl. 365—185.11 **23 Claims**



1. A memory circuit on a semiconductor substrate, comprising:

K subarrays having N columns and M rows of floating gate storage cells, storage cells in the columns having respective first terminals in the substrate, second terminals in the substrate and control terminals;

a plurality of word lines coupled to the control terminals of storage cells in respective rows;

a patterned conductor layer isolated from and over the plurality of word lines including a plurality of global bit lines arranged in a first direction;

a plurality of local bit lines in the substrate, each coupled to the first terminals of the M storage cells in a respective column within a respective subarray;

resources that selectively connect the local bit lines in a subarray of storage cells to the corresponding global bit lines in response to first subarray select signals;

a plurality of local virtual ground lines in the substrate, each coupled to the second terminals of M storage cells in one adjacent column and M storage cells in another adjacent column within a respective subarray;

a plurality of virtual ground supply lines in the patterned conductor layer and located near respective sets of subarrays arranged in the first direction so as to be substantially parallel with the global bit lines;

virtual ground supply circuitry disposed beneath the patterned conductor layer, coupled to the plurality of virtual ground supply lines and the plurality of local virtual ground lines which connect virtual ground supply lines with local virtual ground lines in a subarray in a corresponding set of subarrays, the virtual ground supply circuitry includes a select transistor, the select transistor has one terminal coupled to more than one of the local virtual ground lines in the corresponding set of subarrays through a contactless connection, the select transistor has a second terminal coupled to a ground supply line in the corresponding set of subarrays, the select transistor has a control terminal coupled to a decoder; and

column select circuits, coupled to the global bit lines, which selectively enable access to the N columns of storage cells.

5,691,939

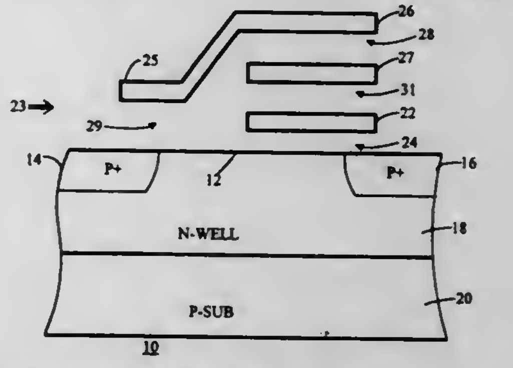
TRIPLE POLY PMOS FLASH MEMORY CELL

Shang-De Ted Chang, Fremont, and Jayson Trinh, Milpitas, both of Calif., assignors to Programmable Microelectronics Corporation, San Jose, Calif.

Filed Dec. 7, 1995, Ser. No. 568,835

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—165.18 **8 Claims**



1. A semiconductor memory cell comprising:

an N-type well region having formed therein a P+ source, a P+ drain, and a channel region extending between said source and said drain;

a first insulating layer overlying said well region;

a floating gate overlying said first insulating layer;

a second insulating layer overlying said floating gate;

a control gate overlying the second insulating layer;

a third insulating layer overlying the control gate; and

a select gate overlying said third insulating layer, the select gate including an elongated portion which extends over the source preventing overprogramming of the cell, the control gate for controlling the programming and erasing of the cell wherein during programming of said cell holes are accelerated across said channel region and collide with electrons in a depletion region of said drain to result in the generation of hot electrons via impact ionization, said hot electrons being injected into said floating gate of said cell and thereby negatively charging said floating gate.

5,691,940

METHOD AND APPARATUS FOR PROGRAMMABLE CURRENT LIMITS

Andrew Marshall; Kenneth G. Buss; Ross E. Teggatz, and Joe A. Devore, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 187,368, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 966,780, Oct. 27, 1992, abandoned. This application May 31, 1996, Ser. No. 656,553

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.24 **8 Claims**

1. A current limiting circuit, comprising:

a plurality of current limit programmable cells operable to be programmed with a current limit, said programmable cells comprising electrically erasable programmable read only memory cells;

output circuitry operable to output current; and

current limit circuitry coupled to said current limit programmable cells and said output circuitry, said current limit circuitry operable to limit said output current when said output current reaches said current limit; wherein:

said current limit circuitry includes current control circuitry coupled to said current limit programmable cells, said cur-

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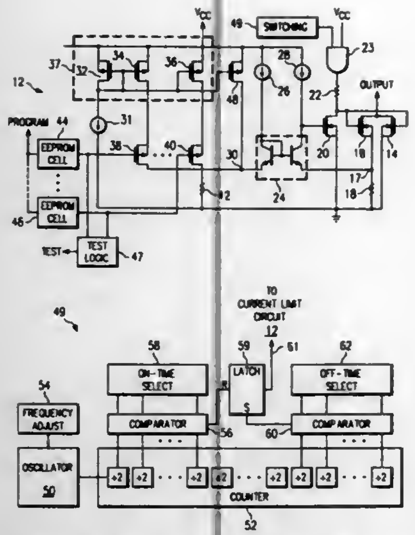


rent control circuitry operable to generate a first reference voltage based on said current limit stored in said current limit programmable cells;

said output circuitry is operable to generate a second reference voltage based on the output current; and

said current limit circuitry is operable to limit said output current when said first and second reference voltages are substantially equal.

5,691,941
NONVOLATILE SEMICONDUCTOR MEMORY CELL CAPABLE OF SAVING OVERWRITTEN CELL AND ITS SAVING METHOD

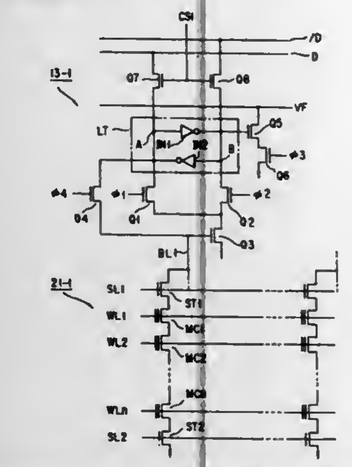
Keniti Imamiya, and Hiroshi Nakamura, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1995, Ser. No. 534,339

Claims priority, application Japan, Sep. 30, 1994, 6-238078; Sep. 20, 1995, 7-241394

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.3 **39 Claims**



1. A nonvolatile semiconductor memory device comprising:
a memory cell array including a plurality of memory cells:
a bit line connected to said memory cell array;
a latch circuit for latching data to be written to said memory cells and data read from said memory cells; and
controllers connected between said latch circuit and said bit line, wherein when one of said memory cells is in an overwritten state, said controllers controlling the copying of data from said memory cell to said latch circuit, data of said memory cell is erased, and thereafter the data copied to said latch circuit is written to said memory cell.

5,691,942
SEMICONDUCTOR MEMORY HAVING EXTENDED DATA OUT FUNCTION

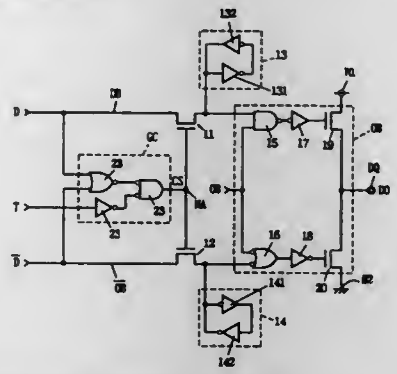
Yoshinori Inoue, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1995, Ser. No. 541,546

Claims priority, application Japan, Nov. 30, 1994, 6-296761

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **13 Claims**



1. A semiconductor memory comprising:
a memory cell array including a plurality of memory cells for storing bit data;
a data line which carries the bit data read out from a memory cell of said memory cell array;
gate control means configured for detecting, at the time of data readout, that the bit data from said memory cell array is placed on said data line, and in response generating a control signal;
gate means configured for receiving said control signal, and in response transferring the bit data placed on said data line;
latch means configured for receiving and holding the bit data from said gate means; and
output buffer means which outputs data represented by the bit data held in said latch means.

5,691,943
PAGE MODE MASK ROM USING A TWO-STAGE LATCH CIRCUIT AND A METHOD FOR CONTROLLING THE SAME

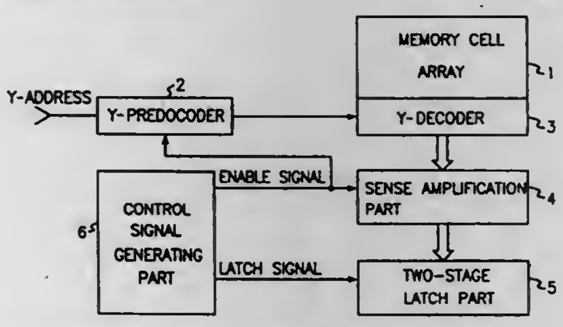
Chan Soo Yun, Kyoungkido, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungkido, Rep. of Korea

Filed Jun. 7, 1996, Ser. No. 659,837

Claims priority, application Rep. of Korea, Jun. 7, 1995, 1995-14967

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **13 Claims**



1. A memory device including a cell array storing data comprising:
an Y-predecoding means for decoding Y-addresses in response to an enable signal which is generated by a count circuit receiving clock signals, said count circuit being reset in response to an address transition pulse;

an Y-decoding means for reading said data stored in said cell array according to the output from said Y-predecoding means;
an amplification means for amplifying said data in response to said enable signal; and
a control signal generating means for providing said enable signal with said Y-predecoding means and said amplification means and generating a latch signal;
at least one latch means including:
a first latch means for storing said data from said amplification means;
a second latch means for storing said data from said first latch means; and
a switching means for transferring said data stored in said first latch means to said second latch means in response to said latch signal which is generated by said control signal generating means.

5,691,944
NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

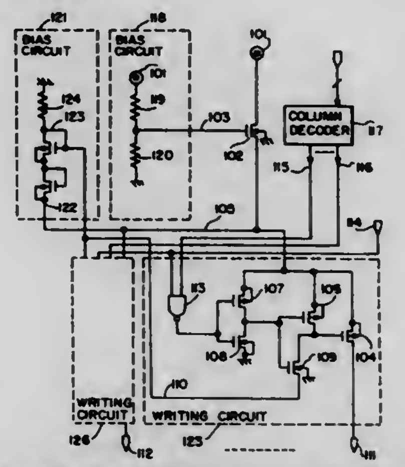
Ichiro Kondoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 22, 1996, Ser. No. 636,149

Claims priority, application Japan, Apr. 21, 1995, 7-096461

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.09 **9 Claims**



1. A non-volatile semiconductor memory device comprising:
a memory cell array which consists of a plurality of transistors each of which is capable of being written electrically with data as a memory cell;
a writing circuit which controls a connection of a writing load to a bit line in accordance with a combination of a writing data input signal and a column designation signal, said bit line being designated by outputs from a column decoder which decodes address signals to output said column designation signal for the bit line of said memory cell array; and
a bias circuit which outputs a bias voltage to set a cell writing voltage of said memory cell array by reducing a writing power source voltage;
said non-volatile semiconductor memory device further comprising:
a first field effect transistor which receives the output bias voltage of said bias circuit in its gate electrode, and outputs said cell writing voltage to a cell writing voltage line connected to its source electrode; and
a second field effect transistor, of a conductivity type complementary to that of said first field effect transistor, for connecting said writing load, said second field effect transistor being arranged between said cell writing voltage line and the bit line of said memory cell array.

5,691,945
TECHNIQUE FOR RECONFIGURING A HIGH DENSITY MEMORY

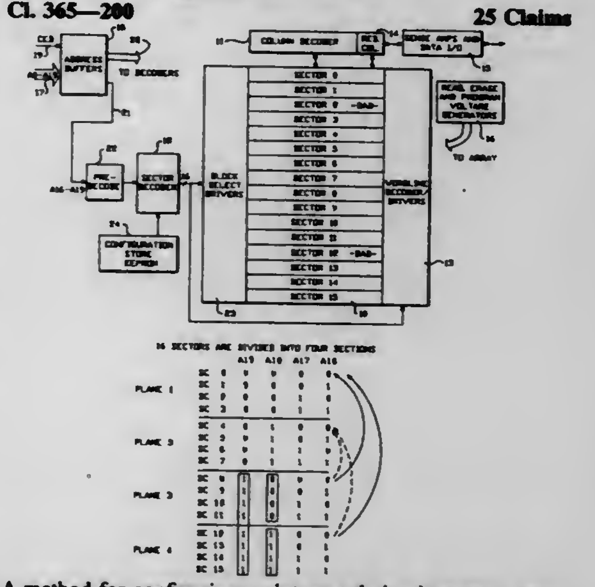
Kong-Mou Liou, San Jose; Tom Dang-Hsing Yiu; Ray-Lin Wan, both of Milpitas, all of Calif.; Yao-Wu Cheng, Taipei; Chun-Hsiung Hung, Hsin-Chu, both of Taiwan; Ting-Chung Hu, Milpitas, and Tien-Ler Lin, Saratoga, both of Calif., assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

PCT No. PCT/US95/06990, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO96/38845, PCT Pub. Date Dec. 5, 1996

PCT Filed May 31, 1995, Ser. No. 605,100

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **25 Claims**



1. A method for configuring an integrated circuit memory array having an address space and a plurality of sectors selected by an address decoder in response to an N bit field in an address, the address space defined by the N bit field, the method comprising:
detecting defective sectors in the plurality of sectors; and
if defective sectors are detected in the plurality of sectors, partitioning the plurality of sectors to disable defective sectors by configuring the address decoder reduce the address space to prevent access to the defective sectors while maintaining sequential addressing of remaining sectors in the plurality of sectors.

5,691,946
ROW REDUNDANCY BLOCK ARCHITECTURE

John DeBrosse, Burlington, Vt.; Toshiaki Kirihata, Wappingers Falls, N.Y., and Hing Wong, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1996, Ser. No. 758,783

Int. Cl.^{6} G11C *5/06*

U.S. Cl. 365—200 **17 Claims**

1. A random access memory redundancy block architecture comprising:
a memory array, said memory array being divided into two halves, each said half including a plurality of memory units, each said memory unit including a primary wordline block, a redundancy wordline block and a row redundancy control circuit;
a split-global-bus with local row redundancy wires, each said half of said memory array having a global bus on one side;
a local bus between said global busses;
a plurality of distributed wordline enable decoders, one for each of said memory units; and
half-length-one-way row redundancy-distributed wordline-enable-signal wires connecting said distributed wordline

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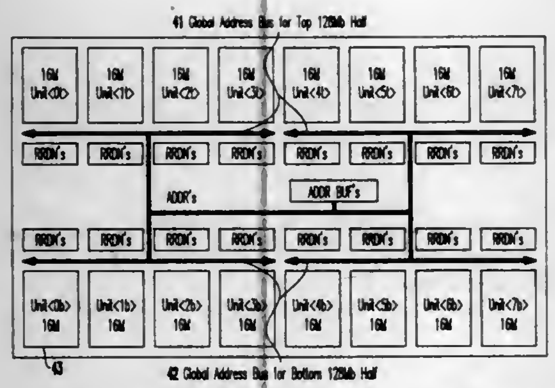


enable decoders to said split-global-bus, said half-length-one-way row redundancy-distributed wordline-enable-signal wires allowing space in which said distributed wordline enable decoders are fabricated.

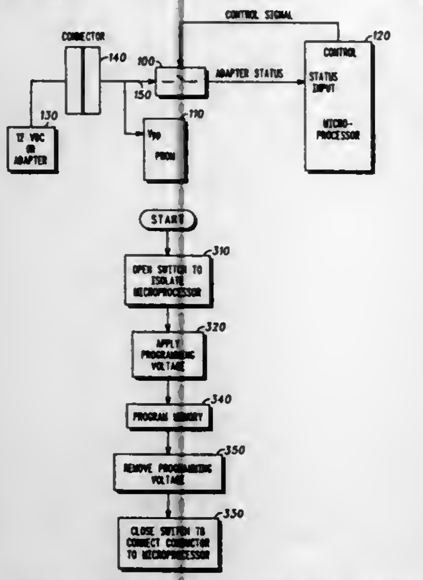
5,691,947
MULTIPLEXED PROGRAMMING VOLTAGE AND STATUS OVER SINGLE CONDUCTOR

Stefan Paun, Park Ridge, and Robert E. Garon, Downers Grove, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 316,053, Sep. 30, 1994, abandoned, which is a continuation of Ser. No. 993,345, Dec. 18, 1992, abandoned. This application Nov. 28, 1995, Ser. No. 563,245

Int. Cl.^{6} G11C *8/00;* **G06F** *19/00*

U.S. Cl. 365—226 **4 Claims**



1. An electronic device having circuitry for receiving a first voltage and circuitry for receiving a second voltage, the electronic device comprising:

an external connector having a plurality of conductors, said external connector being adapted to receive an external input signal having said first voltage or said second voltage from an external adapter;

programmable memory coupled to a single conductor of said plurality of conductors, the memory requiring said second voltage in order to be programmed;

means for multiplexing voltages coupled to the single conductor, the means for multiplexing having a closed, adapter status state for coupling said first voltage to said circuitry for receiving said first voltage and an open, memory programming state for coupling said second voltage to said programmable memory; and

means for generating a control signal coupled to the means for multiplexing, the means for multiplexing changing states in response to the control signal.

5,691,948
MEMORY APPARATUS

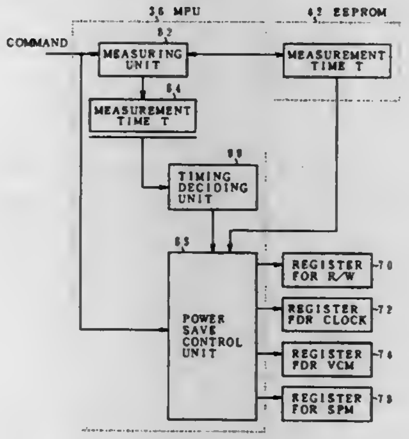
Tetsuya Sakabe, Higashine, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 620,005, Mar. 21, 1996, abandoned. This application Dec. 5, 1996, Ser. No. 761,009

Claims priority, application Japan, Jun. 8, 1995, 7-141687

Int. Cl.^{6} G11C *5/14*

U.S. Cl. 365—227 **18 Claims**



1. A memory apparatus comprising:

measuring means for measuring a time of a command interval from a timing when an execution of a command generated from an upper apparatus is finished to a timing when a next command is received;

timing deciding means for varying a timing to perform a power saving on the basis of the measurement time of the command interval measured by said measuring means; and

power save control means for controlling the apparatus to a power saving mode for a time interval from the timing decided by said timing deciding means after the end of the execution of the command received from said upper apparatus until a timing when a next command is obtained.

5,691,949
VERY HIGH DENSITY WAFER SCALE DEVICE ARCHITECTURE

James W. Hively, Sunnyvale; Mammen Thomas, San Jose, and Richard L. Bechtel, Sunnyvale, all of Calif., assignors to Tactical Fabs, Inc., Fremont, Calif.

Division of Ser. No. 247,729, May 23, 1994, Pat. No. 5,514,884, which is a division of Ser. No. 502,256, Mar. 30, 1990, Pat. No. 5,315,130. This application Jan. 17, 1996, Ser. No. 588,676

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—230.03 **16 Claims**

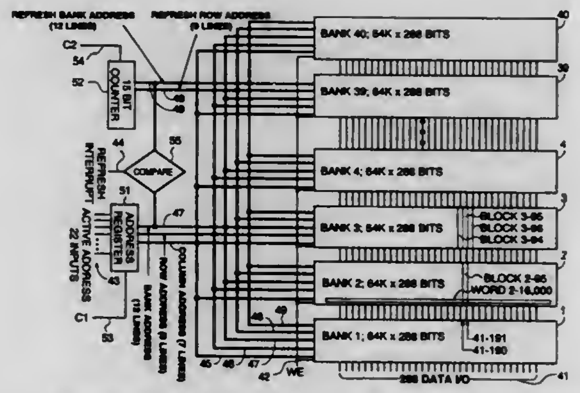
1. An integrated circuit structure comprising:

an array of elements, said elements being grouped into blocks and said blocks being grouped into banks;

means for receiving an address of each said elements comprising:

means for receiving an element address for selecting an element from each of said blocks;

means for receiving a bank address for each of said blocks, whereby said means for receiving a bank address selects all blocks in one of said banks upon receiving said bank address for one of said banks, said means for receiving a bank address comprising:



a true line and a complement line for each bit in said bank address, and

means for connecting either said true line or said complement line for each said bit in said bank address to a decode means in each block of said blocks, thereby establishing a bank address for said block.

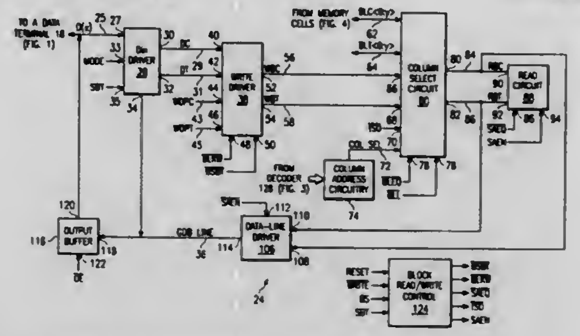
5,691,950
DEVICE AND METHOD FOR ISOLATING BIT LINES FROM A DATA LINE

David C. McClure, Carroliton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 19, 1996, Ser. No. 588,740

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—230.03 **23 Claims**



1. A memory device, comprising:

an address decoder;

a global data line; and

a plurality of memory blocks each coupled to said address decoder and said global data line, each memory block comprising,

a plurality of column lines,

a local data line,

a plurality of memory cells arranged in columns and each coupled to a corresponding one of said column lines,

a column-select circuit coupled to said column lines and to said local data line, said column-select circuit operable to couple a selected column line to said local data line when said memory block is selected, said column-select circuit operable to uncouple each of said column lines from said local data line when said memory block is unselected, and

a data-line driver coupled to said local data line and to said global data line, said driver operable to couple said local data line to said global data line when said memory block is selected.

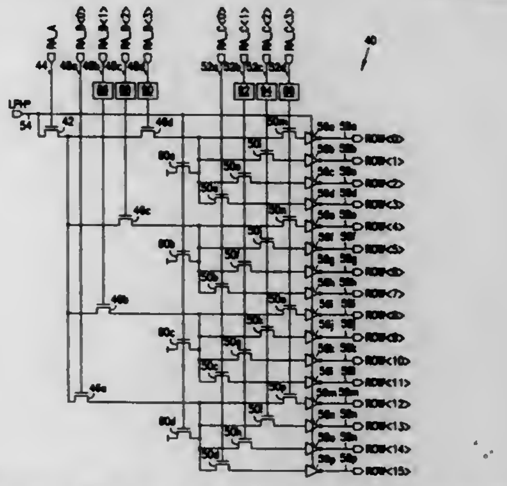
5,691,951
STAGGERED ROW LINE FIRING IN SINGLE RAS CYCLE

James P. Rupp, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Nov. 4, 1996, Ser. No. 743,476

Int. Cl.^{6} G11C *8/00;7/00*

U.S. Cl. 365—230.06 **22 Claims**



1. A row decoder circuit in a memory integrated circuit having an array of memory cells including row and columns, the row decoder comprising:

an address decode tree circuit receiving address signals and providing N decode signals being activated based on the state of the address signals;

N row line driver circuits, each receiving a corresponding one of the N decode signals and an enable signal, and each row line driver circuit firing a corresponding row line when the enable signal is activated and the corresponding one of the N decode signals is activated; and

delay circuitry coupled to the address signals to delay certain of the address signals to stagger the activation of certain of the decode signals.

5,691,952
SEMICONDUCTOR MEMORY DEVICE AND MEMORY MODULE USING THE SAME

Toshio Sasaki, Mizuho-machi; Kazumasa Yanagisawa, Kokubunji; Toshio Sugano, Kodaira; Kiyoshi Inoue, Tokyo; Seiichiro Tsukui, Sayama; Masakazu Aoki, Tokorozawa; Shigeru Suzuki, Kokubunji, and Masashi Horiguchi, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Tohbu Semiconductor, Ltd., Sairama, both of Japan

Filed Jan. 24, 1996, Ser. No. 590,608

Claims priority, application Japan, Jan. 27, 1995, 7-031403

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—230.08 **5 Claims**

1. A semiconductor memory device comprising:

a first input buffer for receiving an address signal therein;

an address selection circuit for selecting a memory cell based on the address signal input through said first input buffer;

a second input buffer for receiving therein a signal to be written into the memory cell;

an output buffer for outputting a signal read from the memory cell;

a sense amplifier connected to the memory cell so as to obtain the read signal;

a storing circuit for storing malfunction information; and

a power cut-off circuit for interrupting an operating voltage to said sense amplifier in response to the malfunction signal stored in said storing means;

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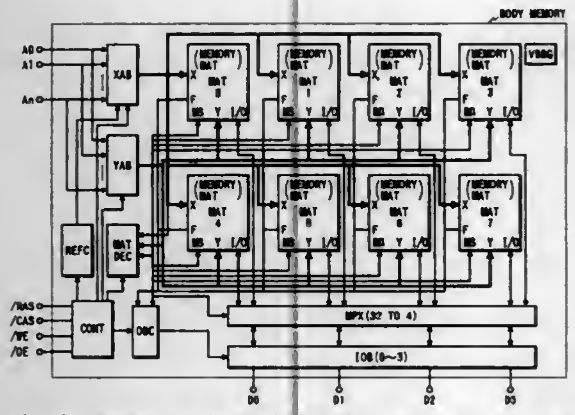


wherein outputs produced from said first and second input buffers and said output buffer are brought into high impedance based on the malfunction information.

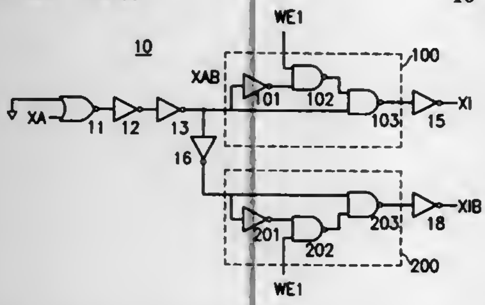
5,691,953
ADDRESS BUFFER FOR HIGH SPEED STATIC RANDOM-ACCESS-MEMORY DEVICES

Wen Chih Yeh, Hsinchu Hsien, and Hsiao-Yueh Chang, Taipei, both of Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Apr. 9, 1996, Ser. No. 629,641

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.08 **10 Claims**



1. An address buffer receiving an address signal and addressing a memory cell array of a static random-access-memory (SRAM) device in either a read period or a write period, said address buffer comprising:

a buffer stage which transmits said address signal, said buffer stage including a number of series-connected buffer units;

an out-phase variable buffer circuit connected to said buffer stage, said out-phase variable buffer circuit providing a first buffer characteristic in said write period and providing a second buffer characteristic in said read period, wherein said first buffer characteristic is different from said second buffer characteristic; and

an in-phase variable buffer circuit, which provides a third buffer characteristic in said write period and a fourth buffer characteristic in said read period, wherein said third buffer characteristic is different from said fourth buffer characteristic.

5,691,954
SEMICONDUCTOR MEMORY DEVICE IN WHICH DATA ARE READ AND WRITTEN ASYNCHRONOUSLY WITH APPLICATION OF ADDRESS SIGNAL

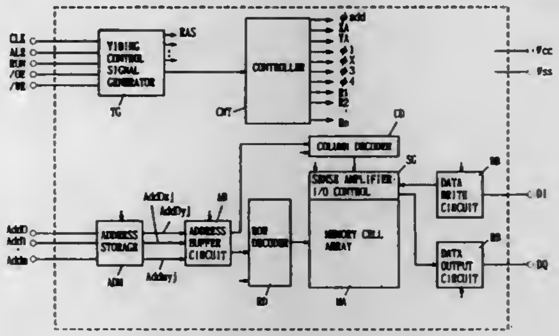
Tsukasa Ooishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 589,223, Jan. 22, 1996, abandoned, which is a division of Ser. No. 329,912, Oct. 26, 1994, Pat. No. 5,517,459. This application Dec. 16, 1996, Ser. No. 768,077

Claims priority, application Japan, Nov. 16, 1993, 5-286882

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.08 **27 Claims**



1. A semiconductor memory device comprising:

a memory array including a plurality of memory cells;

address storage means for sequentially incorporating address signals each designating at least a part of an address of said memory array to store a plurality of received address signals and for generating an address signal to be decoded from said plurality of received address signals through a predetermined operational processing; and

decoding means for receiving and decoding the address signal to be decoded from said address storage means to select an addressed memory cell of said memory cell array.

5,691,955
SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE OPERATING IN SYNCHRONIZATION WITH EXTERNAL CLOCK SIGNAL

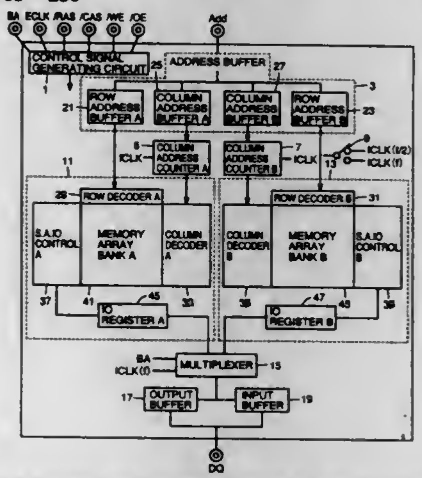
Tadaaki Yamauchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1996, Ser. No. 652,048

Claims priority, application Japan, Sep. 5, 1995, 7-227996

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—233 **18 Claims**



1. A synchronous semiconductor memory device, comprising:

an internal clock signal generating means for generating an internal clock signal in response to an external clock signal;

a plurality of memory array banks each having a plurality of memory cells for storing information;

a row address buffer for receiving a plurality of external row address signals for selecting a corresponding row of corresponding memory array bank and for generating a plurality of internal row address signals in response to said plurality of external row address signals;

a column address buffer for receiving a plurality of external column address signals for selecting a corresponding column of corresponding memory array bank and for generating a plurality of reference internal column address signals in response to said plurality of external column address signals; and

a plurality of address counter means each generating successively internal column address signals for selecting the columns of said memory array bank in response to said reference internal column address signal from said column address buffer in synchronization with said internal clock signals during normal access of said memory array bank, wherein

a plurality of said address counter means are provided so that a plurality of said reference internal column address signals can be allocated thereto, so that, upon every time an access is performed, input of said external column address signal corresponding to that access is not required,

said plurality of address counter means are employed for one of said memory array banks and generate alternately said plurality of internal column address signals in response to said plurality of reference internal column address signals to said plurality of memory array bank, and

access to the synchronous semiconductor memory device for an operation of continuously outputting or continuously inputting one or more data with one column address of one memory array bank as a start address is combined with the operation of continuously outputting or continuously inputting one or more data with one column address of another memory array bank as a start address.

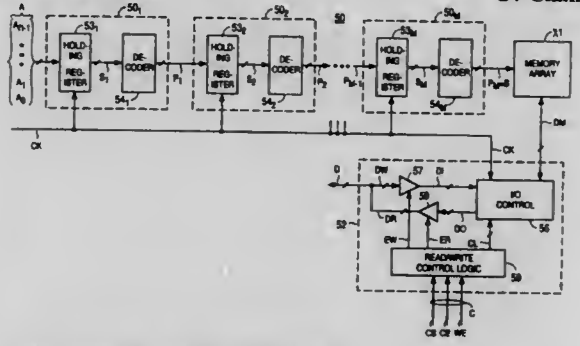
5,691,956
MEMORY WITH FAST DECODING

Edward C. M. Chang; Deirdre S. Chang, and Derek S. Chang, all of 863 26th Ave., San Francisco, Calif. 94121

Filed Jul. 17, 1996, Ser. No. 682,344

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—239 **24 Claims**



1. An electronic memory comprising:

a memory array for electronically storing information; and

address means for sequentially addressing information storage locations in the memory array by decoding a multiplicity of sequentially supplied input memory addresses to generate a like multiplicity of respectively corresponding decoded memory addresses, each identifying one of the storage locations, the address means comprising a plurality of decoding segments arranged in series, each decoding segment decoding part of each input memory address such that all the decoding segments together fully decode each input memory address to generate the corresponding decoded memory address, each decoding segment being operable to partially decode one of the input memory addresses while each other decoding segment is simultaneously operable to partially decode a different one of the input memory addresses.

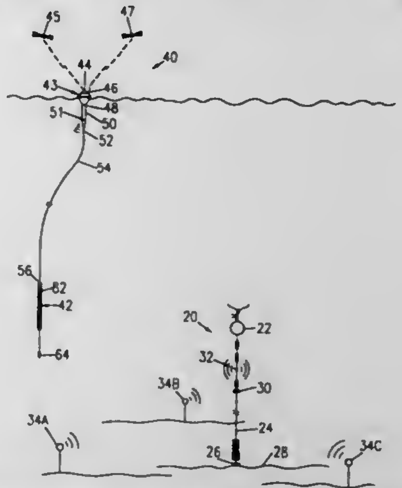
5,691,957
OCEAN ACOUSTIC TOMOGRAPHY

John L. Spiesberger, Port Matilda, Pa., assignor to Woods Hole Oceanographic Institution, Woods Hole, Mass.

Continuation of Ser. No. 424,630, Jun. 30, 1994, abandoned. This application Jan. 29, 1997, Ser. No. 792,701

Int. Cl.^{6} G01V *1/00*

U.S. Cl. 367—3 **20 Claims**



1. A method for collecting data in a large body of water, such as the ocean, comprising the steps of:

deriving an offset time interval related to source data to be transmitted;

transmitting an acoustic signal from an acoustic source delayed from a preselected transmission time by the offset time interval;

determining a measured arrival time at which the acoustic signal is received at a receiver, the travel time of the acoustic signal between the source and the receiver being distinguishably larger than the offset time interval; and

deriving the source data from the measured arrival time.

5,691,958
METHOD FOR DETERMINING FORMATION PROPERTIES FROM SEISMIC ATTRIBUTES

Craig S. Calvert, Houston; Vijay Khare, Sugar Land; Kenneth E. Dahlberg, and Leslie A. Wahrmund, both of Kingwood, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Apr. 13, 1995, Ser. No. 422,021

Int. Cl.^{6} G01V *1/30;* G06F *15/336*

U.S. Cl. 367—73 **17 Claims**

1. A method for predicting subsurface formation properties of a designated subsurface formation, which method comprises the steps of:

obtaining a seismic survey of said designated subsurface formation, said seismic survey comprising a set of seismic data traces;

selecting a calibration well;

generating a synthetic seismogram representative of the subsurface formations proximate to said calibration well;

selecting a study interval and identifying said study interval on both said synthetic seismogram and said seismic data traces;

selecting one or more seismic attributes for calibration and extracting said calibration attributes from said study interval on both said synthetic seismogram and at least a portion of said seismic data traces;

determining subsurface formation properties proximate to said calibration well;

selecting one or more of said seismic data traces, which traces have calibration attributes for said study interval which approximate those of said synthetic seismogram;

using calibration attributes extracted from said selected seismic data traces and said subsurface formation properties proxi-

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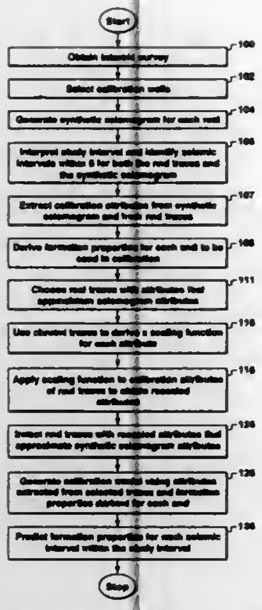


mate to said calibration well to construct a calibration model for said designated subsurface formation; and

using said calibration model to predict subsurface formation properties for said designated subsurface formation.

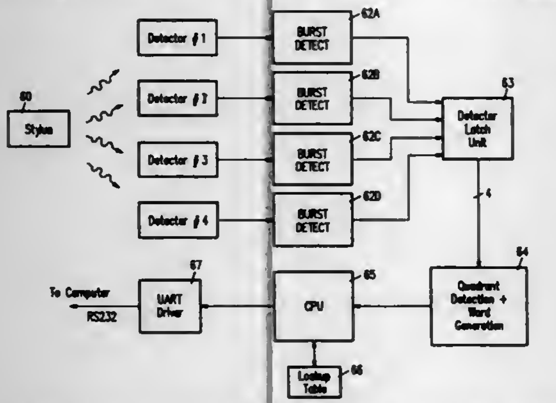
5,691,959

STYLUS POSITION DIGITIZER USING ACOUSTIC WAVES

James A. Kriewall, Saratoga; Edwin F. Johnson, Sunnyvale; Alan R. Selfridge, Los Gatos; John P. Fairbanks, Sunnyvale; Verne H. Wilson, Belmont; Robert W. Parry, Santa Cruz, and James D. Cummins, Union City, all of Calif., assignors to Fujitsu, Ltd., Tokyo, Japan

Filed Apr. 6, 1994, Ser. No. 223,897
Int. Cl.^{6} G08C ***21/00***

U.S. Cl. 367—129 **44 Claims**



1. A device for providing a digital representation of the location of a stylus on a plate, said device comprising:

a solid plate;

an untethered stylus for introducing a burst of acoustic waves into said plate;

a plurality of detectors positioned on said plate, each of said detectors for detecting the arrival of said burst of acoustic waves introduced into said plate by said stylus;

a first means for determining a difference in the respective arrival times of said burst at individual detectors in a first pair of said detectors; and

a second means for determining a difference in the respective arrival times of said burst at individual detectors in a second pair of said detectors, wherein at least one of said detectors in said second pair of detectors is not included in said first pair of detectors.

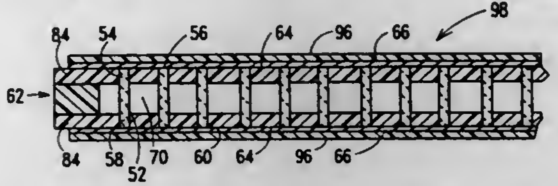
5,691,960

CONFORMAL COMPOSITE ACOUSTIC TRANSDUCER PANEL AND METHOD OF FABRICATION THEREOF

Richard L. Gentilman, Acton, and Leslie J. Bowen, Concord, both of Mass., assignors to Materials Systems, Inc., Concord, Mass.

Filed Aug. 2, 1995, Ser. No. 510,393
Int. Cl.^{6} H04R ***17/00***

U.S. Cl. 367—155 **8 Claims**



1. A conformable composite acoustic transducer panel comprising a conformable composite body having upper and lower planar faces and upper and lower thin, flexible electrodes bonded to said upper and lower faces, respectively, said composite body comprising:

an array of individual piezoelectric or electrostrictive ceramic elements, each of said elements having opposing ends and one or more sides interconnecting said opposing ends, said elements being disposed normal to said upper and lower faces and extending through said composite body from said upper face to said lower face to electrically contact each of said electrodes; and

an upper integral face plate and a lower integral face plate spaced apart from one another, each of said integral face plates extending through only a portion of the depth of said composite body and being bonded to each of said elements over only a portion of each of said element sides, the outer planar surfaces of said upper and lower integral face plates being coplanar with upper and lower ends, respectively, of said elements to provide said upper and lower faces, respectively.

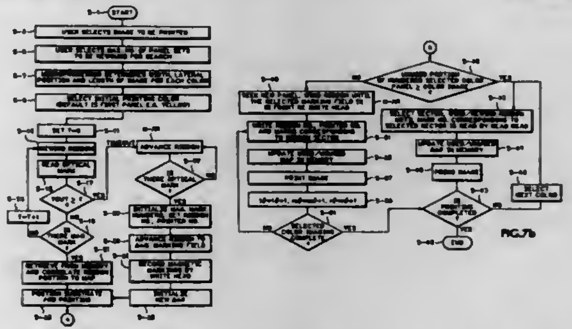
5,691,961

RIBBON CONSERVATION IN THERMAL PRINTING

Suresh C. Paranjpe, 5625 Summit Dr., West Linn, Oreg. 97068

Continuation-in-part of Ser. No. 318,240, Oct. 5, 1994, which is a continuation-in-part of Ser. No. 236,423, May 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 300,698, Sep. 2, 1994, which is a continuation-in-part of Ser. No. 47,144, Apr. 12, 1993, which is a continuation-in-part of Ser. No. 039,871, Mar. 30, 1993, which is a continuation-in-part of Ser. No. 163,325, Dec. 7, 1993. This application Mar. 17, 1995, Ser. No. 404,484
Int. Cl.^{6} B41J ***35/20;2/325***

U.S. Cl. 347—217 **9 Claims**



1. A method of improving ribbon usage in a non-impact color printer having a continuous ribbon installed in the printer, the ribbon comprising at least one panel of transfer material of predetermined width for transferring a predetermined image onto a substrate such as a sheet of paper, the method comprising the steps of:

selecting a predetermined image to be printed onto a substrate using the installed ribbon;

partitioning the panel of the ribbon so as to define an plurality of sectors, at least one of the sectors including a region having a width less than a total width of the panel, whereby said region extends laterally adjacent to another sector of the same panel;

determining a size and a location of the image to be printed;

selecting one or more unused sectors of the panel that provide an area of the panel having adequate size and location for printing the image;

printing the image onto the substrate using the selected sectors; and then

recording an indication of usage for each of the sectors that it is used for printing, thereby defining used and unused sectors of the panel.

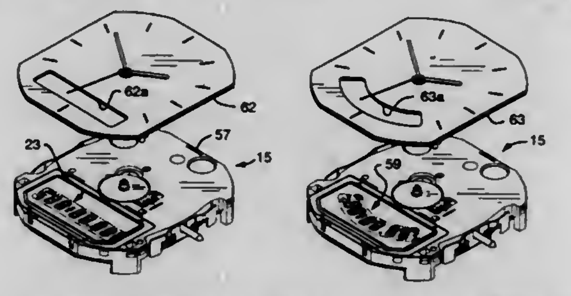
5,691,962

WRISTWATCH WITH ILLUMINATION SYSTEM FOR MULTIPLE DIGITAL AND ANALOG STYLES

Herbert Schwartz, Wurmberg; Friedrich Mose, Pforzheim, both of Germany, and Michel Plancon, Besancon, France, assignors to Timex Corporation, Middlebury, Conn.

Filed Nov. 24, 1995, Ser. No. 562,557
Int. Cl.^{6} G04B ***25/00***

U.S. Cl. 368—71 **7 Claims**



1. An improved illuminated watch movement with analog and digital features of the type having a movement frame with a movement side and a dial side and having a stepping motor and gear train disposed on the movement side connected to operate analog hands disposed on the dial side to rotate coaxially with an hour wheel having an axis and having a liquid crystal display with at least one row of actuatable digits thereon, and having an analog dial with a window for viewing said digits, the improvement comprising:

a recess defined in the dial side of the movement frame,

said liquid crystal display disposed in said recess and having an indicia pattern thereon, said liquid crystal display having a first dimension which extends substantially across the width of the movement frame and having a second dimension which extends substantially from an edge of the frame to the outer edge of the hour wheel, said indicia pattern having a size and shape selected from a group consisting of

a. a single arcuate line of digits extending substantially over the available surface of the liquid crystal display,

b. two rows of digits extending substantially over the available surface of the liquid crystal display,

c. a single row of digits extending over a portion of the liquid crystal display substantially smaller than the available surface of the liquid crystal display,

an electroluminescent lamp disposed beneath said liquid crystal display,

said analog dial comprising an electroluminescent dial disposed on the dial side of the movement frame and adapted to receive the axis of the hour wheel in the center of the dial, said dial defining a window opening therethrough framing the size and shape of the indicia pattern, and

circuit means connected to selectively actuate the electroluminescent lamp and/or the electroluminescent dial.

5,691,963

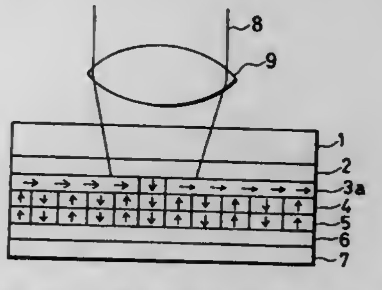
MAGNETO-OPTICAL RECORDING DEVICE USING LIGHT-MODULATED TECHNIC WITHOUT AN INITIAL MAGNETIC FIELD

Junji Hirokane; Hiroyuki Katayama; Akira Takahashi, all of Nara, and Kenji Ohta, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 447,612, May 23, 1995, abandoned, which is a division of Ser. No. 177,096, Dec. 30, 1993. This application Nov. 6, 1996, Ser. No. 744,565

Claims priority, application Japan, Jan. 7, 1993, 5-001375
Int. Cl.^{6} G11B ***11/00***

U.S. Cl. 369—13 **2 Claims**



1. A method of recording information on a magneto-optical recording medium comprising:

a base;

a readout layer formed on said base;

a recording layer formed on said readout layer;

an auxiliary recording layer formed on said recording layer, each of said readout layer, recording layer and auxiliary recording layer being made of an alloy of rare-earth metal and transition metal showing ferromagnetism,

wherein an alloy composition of each layer is determined so that said recording layer has a Curie temperature lower than Curie temperatures of said readout layer and said auxiliary recording layer and has a coercive force higher than coercive forces of said readout layer and said auxiliary recording layer at room temperature and that, when a temperature of said recording layer is raised to near its Curie temperature while perpendicularly applying a uniform recording magnetic field to each layer, a sublattice magnetic moment of the rare-earth metal of said readout layer and a sublattice magnetic moment of the rare-earth metal of said auxiliary recording layer are antiparallel to each other, and

wherein a laser light is applied to each layer of said magneto-optical recording medium after modulating laser light power between high and low according to information to be recorded while perpendicularly applying a uniform recording magnetic field to each layer, and an exchange coupling force between said recording layer and said readout layer and an exchange coupling force between said recording layer and said auxiliary recording layer are controlled to cause said recording layer to have upward magnetization or downward magnetization according to the laser light power.

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5,691,964
MUSIC PLAYING SYSTEM WITH DECENTRALIZED UNITS

Horst Niederlein, Bingen; Anton Huber, Muenster-Sarmsheim, and Armin Frank, Moenchweiler, all of Germany, assignors to NSM Aktiengesellschaft, Bingen, Germany

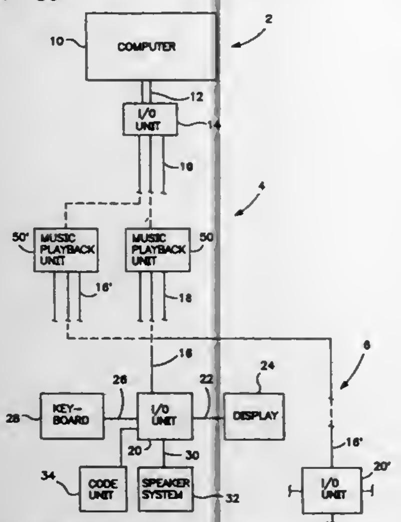
PCT No. PCT/DE93/01235, § 371 Date Jun. 14, 1995, § 102(e) Date Jun. 14, 1995, PCT Pub. No. WO94/15416, PCT Pub. Date Jul. 7, 1994

Continuation-in-part of Ser. No. 961,920, Jan. 7, 1993, Pat. No. 5,341,350. This PCT application Dec. 20, 1993, Ser. No. 448,525

Claims priority, application Germany, Dec. 24, 1992, 42 44 198.6

Int. Cl.⁶ G11B *17/22*

U.S. Cl. 369—30 **17 Claims**



1. A music playback system, comprising:

a plurality of music playback units;

a central computer having a memory that is provided in at least one of the music playback units;

at least one input unit for selecting pieces of music that are to be played back on a music playback unit; and

lines connecting the central computer to the music playback units and connecting the music playback units to each other,

wherein each of the music playback units has a number of pieces of music at its disposal for playback, and

wherein data about the pieces of music that are available in the music playback units is stored in the memory of the central computer but the pieces of music themselves are not stored in the memory of the central computer.

5,691,965
ACTUATOR COMPRISING A ROTATABLE MAGNET BODY; ACTUATOR UNIT COMPRISING THE ACTUATOR AND A CONTROL SYSTEM; MAGNETO-OPTICAL DEVICE COMPRISING THE ACTUATOR, AND SCANNER COMPRISING THE ACTUATOR

Gerardus L. M. Jansen, and Antonius T. A. Peijnenburg, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1995, Ser. No. 538,516

Claims priority, application European Pat. Off., Oct. 6, 1994, 94202894

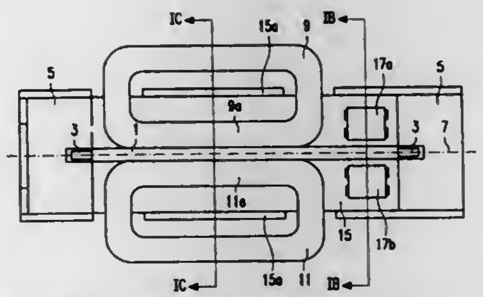
Int. Cl.⁶ G11B *7/12*

U.S. Cl. 369—44.14 **9 Claims**

1. A actuator unit comprising:

a) a permanent magnet body which is rotatable between stop positions about an axis of rotation, the magnet body having at least two magnet poles situated diametrically at opposite sides of the axis of rotation;

b) coil means for cooperation with the magnet body to move said body from one stop position to another stop position, the



coil means exclusively comprised of two active coil sections extending substantially parallel to the axis of rotation of the magnet body and substantially facing one and the same of said magnet poles in the stop positions of the magnet body;

c) ferromagnetic element means substantially facing one of the magnet poles in the stop positions of the magnet body; and

d) a control system, which control system comprises two Hall sensors, the Hall sensors of the control system, in the stop positions of the magnet body, being disposed at opposite sides of a plane which is oriented transversely of the magnet poles and passes through the axis of rotation, the control system having a matrix unit having a first input and a second input for signals issuing from the Hall sensors.

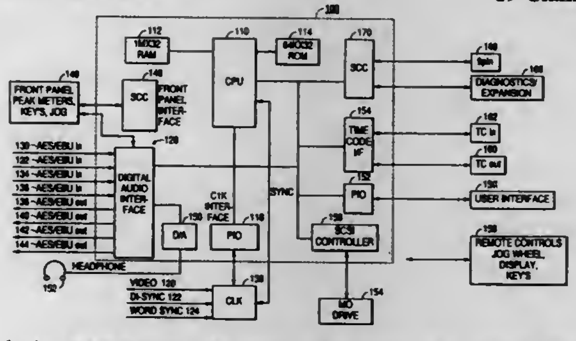
5,691,966
RECORDING EIGHT DIGITAL AUDIO CHANNELS ON A SINGLE MAGNETO OPTICAL DISK

Michael A. Zampini, Boca Raton; Sean Stevens, Pompano Beach, and David C. Schmidt, Jupiter, all of Fla., assignors to Sony Corporation, Japan, and Sony Electronics Inc., N.J.

Continuation of Ser. No. 128,717, Sep. 30, 1993, Pat. No. 5,493,547. This application Oct. 13, 1995, Ser. No. 542,705

Int. Cl.⁶ G11B *5/09*

U.S. Cl. 369—49 **19 Claims**



1. An apparatus for recording and playing back digital audio signals comprising:

input means for providing a plurality of channels of digital audio signals;

buffer means for storing digital data signals;

a direct memory access (DMA) controller for coupling the plurality of channels of digital audio signals to the buffer means;

a magneto optical disk drive; and

a small computer system interface (SCSI) for operatively coupling the MO disk drive with the DMA controller;

wherein the plurality of channels of digital audio signals is stored by the buffer means and provided to the MO disk drive;

wherein the plurality of channels of audio data consists of eight channels of audio data.

5,691,967
RECORDING OR REPRODUCING APPARATUS HAVING A SPINDLE SERVO CONTROL RUNAWAY PREVENT FEATURE

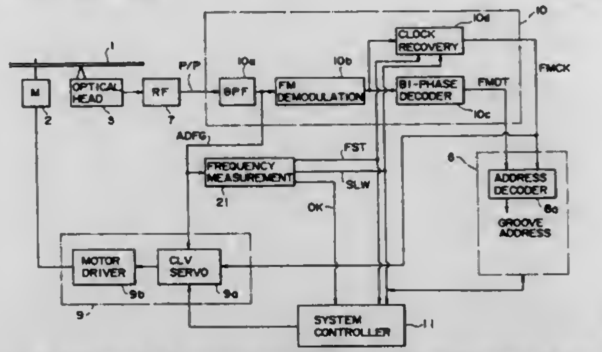
Ryo Ando, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1995, Ser. No. 528,353

Claims priority, application Japan, Sep. 20, 1994, 6-250210; Sep. 20, 1994, 6-250212

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—50 **3 Claims**



1. A recording or reproducing device for a disc-like recording medium having some recording tracks formed by grooves wobbled in response to their absolute positional information comprising:

information reading means for reading information, including groove information, from the disc-like recording medium;

frequency information extracting means for extracting groove frequency information from information extracted by said information reading means;

frequency measuring means for measuring a frequency of the frequency information extracted by said frequency information extracting means and generating a runaway state detection signal if the measured frequency exceeds a predetermined frequency;

clock generating means, including a phase locked loop (PLL) circuit, supplied with the groove frequency information from the frequency information extracting means for generating a clock;

rotational servo means for controlling a rotational speed of the disc-like recording medium; and

control means for controlling an operation of said rotational servo means in response to the clock and the runaway state detection signal and wherein the control means interrupts a phase lock operation of the PLL circuit in response to the runaway state detection signal.

5,691,968
OPTICAL DISK UNIT

Yuichiro Tomishima, Kojima, and Kiyoto Abe, Iwaki, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 441,131, May 15, 1995, abandoned. This application Sep. 24, 1996, Ser. No. 710,908

Claims priority, application Japan, May 23, 1994, 6-108606

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—50 **3 Claims**

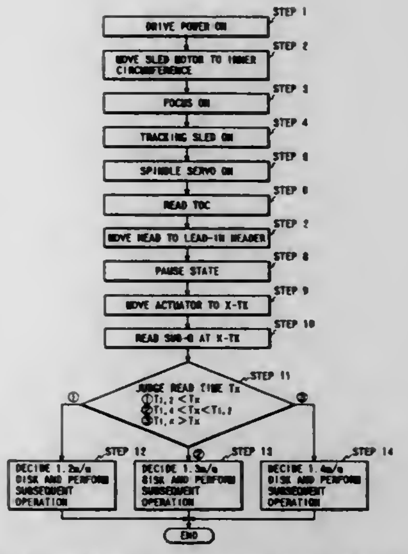
1. An optical disk unit comprising:

start position moving means for moving an optical head to a start position of a program area formed on a disk when power is applied;

specified distance moving means for moving said optical head from said start position of said program area by a specified distance;

reading means for reading a time code from sub-code Q information including an address, a track number, and said time code at a location defined by said specified distance;

deciding means for deciding a specified linear velocity of said disk currently mounted by making only two comparisons between a first preset value, a second preset value and said time code; and



means for adjusting a rotating speed of the disk to correspond with the specified linear velocity; wherein:

when said deciding means determines that said time code read from said sub-code Q information is greater than the first preset value, said means for adjusting adjusts the rotating speed to 1.2 m/s,

when said deciding means determines that said time code read from said sub-code Q information is less than the second preset value, said means for adjusting adjusts the rotating speed to 1.4 m/s, and

when said deciding means determines that said time code read from said sub-code Q information is less than the first preset code and greater than the second preset code, said means for adjusting adjusts the rotating speed to 1.3 m/s; and

wherein a value of the first preset code is lower than a value of said second preset code.

5,691,969
COMPACT DISK APPARATUS HAVING ENHANCED DISK HANDLING CAPABILITIES

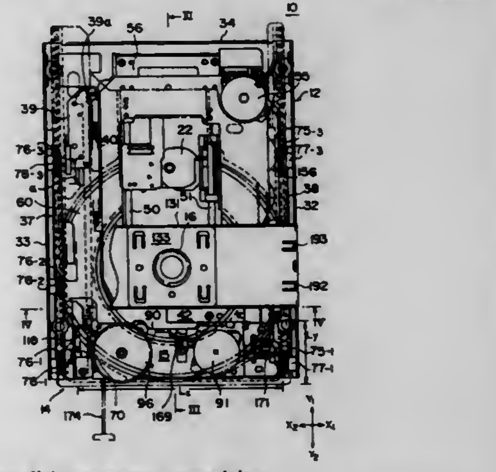
Shinichi Fujisawa, Akigawa, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Apr. 6, 1995, Ser. No. 418,270

Claims priority, application Japan, Apr. 7, 1994, 6-069782; Apr. 7, 1994, 6-069783

Int. Cl.⁶ G11B *33/02*

U.S. Cl. 369—77.1 **9 Claims**



1. A compact disk apparatus comprising:

a tray including a toothed surface, said tray being arranged to be movable between a disk inserting/removing position and a disk loaded position;

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a movable base unit including a supporting part, said supporting part being capable of supporting a disk when the tray is at the disk loaded position, said movable base unit being arranged to be movable between an unsupported position and a supported position, the disk being supported on said supporting part when said movable base unit is at the supported position;

drive means which converts electric current into a rotating force;

first gear means which is engaged with said toothed surface of said tray, said tray being moved between the disk inserting/removing position and the disk loaded position when said first gear means is rotated through an engagement with the toothed surface of the tray;

second gear means which is rotated by the rotating force of said drive means and engageable with said first gear means, said second gear means being arranged to be movable between a first position and a second position, wherein said second gear means is engaged with said first gear means when said second gear means is at the first position and rotated around a central rotation axis of the second gear means by said drive means, so that said first gear means is rotated through an engagement with said second gear means with the first gear means and the tray is moved to the disk loaded position,

and wherein, after the tray reaches the disk loaded position and the movement of the tray is stopped, said second gear means is, with the engagement with said first gear means being maintained, moved around a periphery of said first gear means by said drive means, so that said second gear means is moved from the first position to the second position; and

moving means for moving said movable base unit from the unsupported position to the supported position when said second gear means is moved from the first position to the second position; wherein

said moving means comprises a rotating base which rotatably supports the second gear means on said rotating base and is rotatable around a central rotation axis of said first gear means, said rotating base being arranged to be rotatable, co-axially with the first gear means, between a third position at which the second gear means is placed at the first position and a fourth position at which the second gear means is placed at the second position, said compact disk apparatus further comprising a rotating base locking mechanism which locks the rotating base of the moving means when the rotating base is at the third position, and cancels the locking of the rotating base when the rotating base is rotated from the third position and cancels the locking of the rotating base when the rotating base is rotated from the third position to the fourth position, said moving means is allowed to move the movable base unit from the unsupported position to the supported position when the locking of the rotating base is canceled.

5,691,970

OPTICAL PICKUP FOR HIGH-DENSITY RECORDING/REPRODUCING

Yong-Jae Lee, Uiwang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed May 16, 1996, Ser. No. 648,911

Claims priority, application Rep. of Korea, Aug. 18, 1995, 95-25457

Int. Cl.^{6} G11B *7/12*

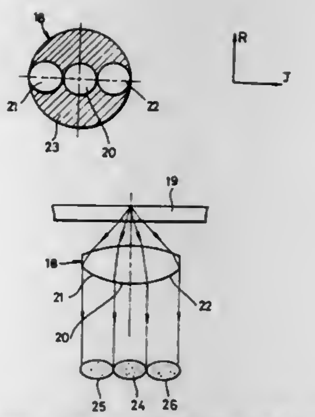
U.S. Cl. 369—109 **14 Claims**

1. An optical pickup for high-density recording/reproducing, comprising:

a light source for generating a light beam;

an objective lens for focusing the light beam on a light-recording medium; and

means for detecting an optical signal by receiving reflective light beams diffracted and reflected by the light-recording medium, wherein said objective lens includes a first portion for transmitting a zero-order optical component of the reflective light beams and second and third portions for respectively transmitting at least a portion of each ±1st-order diffracted optical components of the reflective light beams.



5,691,971

MULTIPLE RECORDING LAYER FOCUSING OF A LIGHT SPOT WITH AN ADDITION OF ZOOM LENS

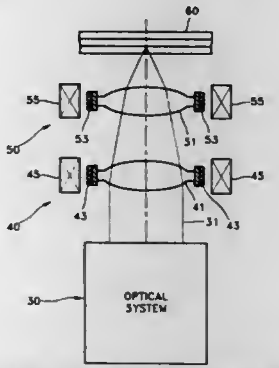
Jong-ryull Kim, Kwangmyung, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Apr. 5, 1996, Ser. No. 628,328

Claims priority, application Rep. of Korea, Apr. 13, 1995, 95-8719

Int. Cl.^{6} G11B *7/09*

U.S. Cl. 369—112 **8 Claims**



1. An optical pickup apparatus for an optical disk, the optical disk having multiple recording layers, said apparatus comprising:

a fixed optical system for emitting light toward the optical disk and receiving light reflected from the optical disk;

means for focusing light emitted from said fixed optical system to form a beam spot on the optical disk; and

means for zooming the beam spot formed by said means for focusing onto a desired recording layer selected from among the multiple recording layers of the optical disk.

5,691,972

MULTIMEDIA OPTICAL DISC WHICH CONFORMS TO THE MOTION PICTURE RATING SYSTEMS IN A VARIETY OF COUNTRIES AND A REPRODUCING DEVICE FOR SAID DISC

Kazuhiro Tsuga, Takarazuka; Masayuki Kozuka, Neyagawa; Yoshihisa Fukushima, Osaka; Hideki Mimura, and Takeshi Hagio, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, and Kabushiki Kaisha Toshiba, Kanagawa-ken, both of Japan

Filed Oct. 7, 1996, Ser. No. 727,710

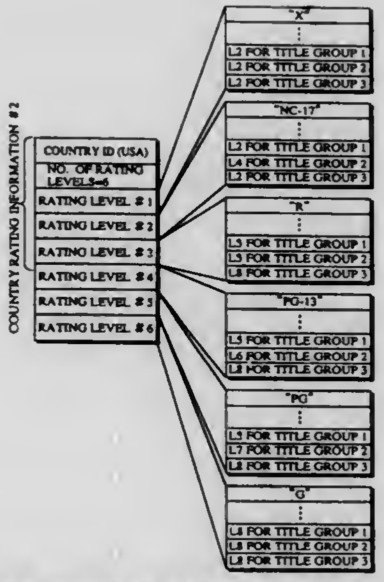
Claims priority, application Japan, Oct. 9, 1995, 7-261750

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—275.3 **37 Claims**

1. A multimedia disc, comprising:

a video data storage region for storing a plurality of video data sequences;



a management information storage region which stores management information, the management information comprising group information that shows which video data sequences have been grouped together to compose a group from which only one of the composing video data sequences is reproduced, a level ID for each video data sequence in a same group and a set of link information for each video data sequence which indicates a next video data sequence to be reproduced after completion of reproduction of a video data sequence in question; and

a level map storage region for storing a separate table for each country/region, wherein each table for a country/region includes information which maps each sort level in a sorting system for the country/region to a level ID.

5,691,973

MODULAR APPLICATION SOFTWARE FOR TELECOMMUNICATIONS EXCHANGES FOR PROVIDING ALL END USER SERVICES TRAFFIC HANDLING AND CHARGING REQUIREMENTS OF AN APPLICATION TYPE

Sune Ramström, Stockholm; Johan Törnström, Haninge; Arne Åkerfeldt, Huddinge; Lars Bengtsson, Trångsund, all of Sweden; Steve Doe, Shoreham-by-Sea, England; Jan Gustafsson, Huddinge, Sweden; Svante Haraldstad, Hägersten, Sweden; Lars Kari, Enskede, Sweden; Chris Kemp, Brighton, England; Jörgen Lantto, Tullinge, Sweden; Johan Lindström, Stockholm, Sweden; Bertil Nilsson, Skärholmen, Sweden; Peter Ohman, Enebyberg, Sweden; Jan van der Meer, Oosterhout, and Paul van Hal, Oosterhour, both of Netherlands, assignors to Telefonaktiebolaget LM Ericsson, Sweden

Continuation of Ser. No. 723,166, Jun. 28, 1991, abandoned.

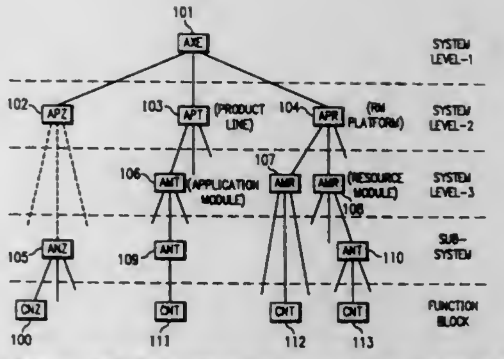
This application May 26, 1994, Ser. No. 250,337

Int. Cl.^{6} H04Q *11/04*

U.S. Cl. 370—58.2 **35 Claims**

33. A method for structuring the end user services software within a stored program controlled telecommunications switching exchange having hardware and software components for performing specific functional actions, and located and forming a node within a telecommunications network to provide end user service to a plurality of users having diverse communications applications among them, said method comprising the steps of:

storing within said exchange a plurality of software modules, each module containing control instructions and data for providing all of the end user service, traffic handling, and charging requirements of a particular application type, and each module acting as a software node within said exchange to map changes in network requirements into corresponding changes within the software nodes of said exchange; and



connecting the control instructions and data comprising each of said software modules within said exchange with each other node outside said exchange and within the network for data transfer therebetween.

5,691,974

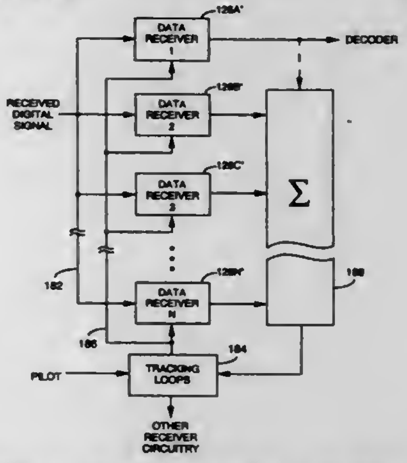
METHOD AND APPARATUS FOR USING FULL SPECTRUM TRANSMITTED POWER IN A SPREAD SPECTRUM COMMUNICATION SYSTEM FOR TRACKING INDIVIDUAL RECIPIENT PHASE, TIME AND ENERGY

Ephraim Zehavi, Haifa, Israel; Stephen S. Carter, San Diego, Calif., and Klein S. Gilhousen, Bozeman, Mont., assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Jan. 4, 1995, Ser. No. 368,570

Int. Cl.^{6} H04J *13/02;* **H04B** *7/216*

U.S. Cl. 370—203 **26 Claims**



1. A method for tracking the frequency and phase of carrier signals in a spread spectrum communication system in which information is communicated over signals that are bandwidth spread and encoded into channels using orthogonal codes, comprising the steps of:

receiving a plurality of spread spectrum communication signals having a common carrier frequency and converting said signals to digital form;

despreading said digital spread spectrum communication signals by applying at least one preselected despreading code at an adjustable phase angle; decoding multiple ones of said despread communication signals in parallel to remove said orthogonal encoding, over multiple orthogonal codes active within said communication system, to generate multiple data symbol signals; summing a plurality of said multiple data symbol signals to form a single phase detection signal; inputting said phase detection signal to at least one timing loop to track the frequency thereof and outputting a timing signal indicative of carrier signal frequency; and adjusting said

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phase angle in said despreading in response to said timing signal from said timing loop.

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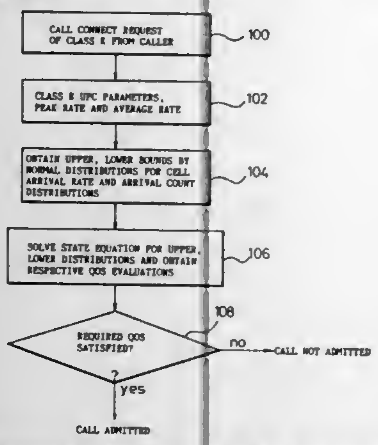
METHOD AND APPARATUS FOR CONTROL IN ATM

Takeo Hamada, and Takafumi Chujo, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
PCT No. PCT/JP93/01243, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/21068, PCT Pub. Date Sep. 15, 1994
PCT Filed Sep. 2, 1993, Ser. No. 290,728
Claims priority, application Japan, Mar. 12, 1993, 5-052415
Int. Cl.^{6} H04J *3/14;* **H04L** *12/56*
U.S. Cl. 370—232 **37 Claims**


CALL CONNECT REQUEST OF CLASS K FROM CALLER
100
CLASS K UPC PARAMETERS, PEAK RATE AND AVERAGE RATE
102
OBTAIN UPPER, LOWER BOUNDS BY NORMAL DISTRIBUTIONS FOR CELL ARRIVAL RATE AND ARRIVAL COUNT DISTRIBUTIONS
104
SOLVE STATE EQUATION FOR UPPER, LOWER DISTRIBUTIONS AND OBTAIN RESPECTIVE QOS EVALUATIONS
106
108
REQUIRED QOS SATISFIED?
no
CALL NOT ADMITTED
yes
CALL ADMITTED

1. A call admission control method in an asynchronous transfer mode, comprising the steps of:

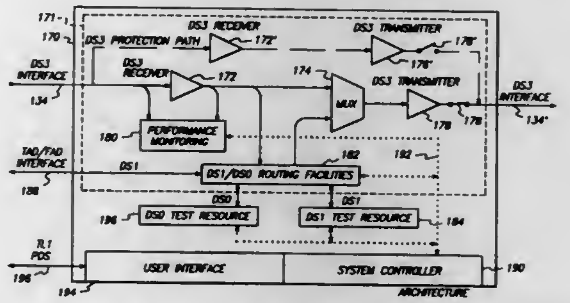
a) storing first data which include information concerning upper bounds of the probability distributions of the number of arrivals for a plurality of values of arrival rate;
b) determining an upper bound of a probability distribution of an arrival rate in a call admitted state which is to be evaluated;
c) determining, by using said first data, an upper bound of a probability distribution of a cell length which is given by upper bounds of the probability distributions of the number of arrivals along said determined upper bound of the probability distribution of the arrival rate;
d) determining, by using said upper bound of the probability distribution of the cell length, upper limits of parameters representing the quality of service in said call admitted state;
e) judging whether to admit or reject a requested call on the basis of said evaluated quality of service;
f) rejecting the requested call when the requested call is judged to be rejected in step e; and
g) admitting the requested call when the requested call is judged to be admitted in step e.

5,691,976
PERFORMANCE MONITORING AND TEST SYSTEM FOR A TELEPHONE NETWORK

Thomas L. Engdahl; Paul R. Hartmann, both of Escondido; Kevin Pope, Poway, and Kevin Cadieux, Escondido, all of Calif., assignors to Applied Digital Access, San Diego, Calif.
Continuation-in-part of Ser. No. 862,470, Apr. 2, 1992, abandoned. This application Sep. 7, 1993, Ser. No. 118,443
Int. Cl.^{6} H04J *3/14*
U.S. Cl. 370—242 **17 Claims**

1. In a telephone network, a DS3 signal access system comprising:

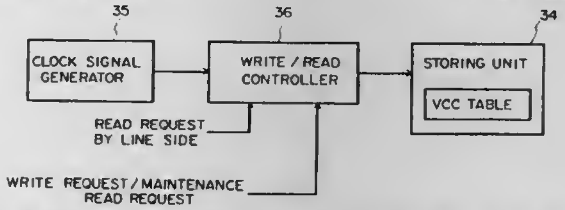
means for identifying a bit in the DS3 signal;
means for generating a selected bit; and



a combiner for substituting the identified bit with the selected bit in the DS3 signal.

5,691,977
VIRTUAL CHANNEL CONVERTER AND VCC TABLE ACCESS METHOD

Shuji Yoshimura; Satoshi Kakuma; Masami Murayama; Shiro Uriu, and Tadashi Hoshino, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Continuation of Ser. No. 216,526, Mar. 21, 1994, abandoned. This application Dec. 29, 1995, Ser. No. 580,534
Claims priority, application Japan, Sep. 20, 1993, 5-233462
Int. Cl.^{6} H04L *12/56*
U.S. Cl. 370—250 **26 Claims**



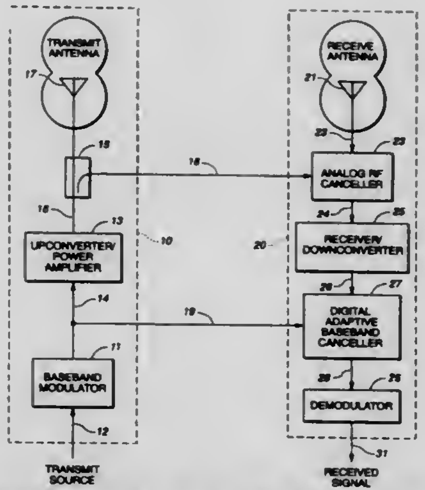
1. A data access device for writing or reading data on the basis of a first clock signal extracted from an incoming cell being sent over a line, comprising:

storage means for storing a data conversion table;
clock signal generating means for generating a second clock signal which is different from said first clock signal extracted from the incoming cell on the line; and
write/read control means for writing or reading data into or from said data conversion table when a request for access to said data conversion table is made by other than the line side on the basis of said second clock signal,
wherein said data conversion table for which access is requested by other than the line side can always be accessed on the basis of said second clock signal independently of whether or not failure has occurred in said line.

5,691,978
SELF-CANCELLING FULL-DUPLEX RF COMMUNICATION SYSTEM

Gary Robert Kenworthy, Pleasanton, Calif., assignor to Signal Science, Inc., Santa Clara, Calif.
Continuation of Ser. No. 418,679, Apr. 7, 1995, abandoned. This application Jan. 21, 1997, Ser. No. 786,197
Int. Cl.^{6} H04B *3/23*
U.S. Cl. 370—278 **19 Claims**

1. A full-duplex radio communications system comprising a first transceiver that transmits a first signal of a predetermined frequency and a second transceiver that transmits a second signal of substantially said predetermined frequency, the first signal being a desired signal of the second transceiver and the second signal being a desired signal of the first transceiver, wherein at a particular instant of time both the first signal and the second signal are being transmitted, at least one of the first transceiver and the second transceiver comprising:

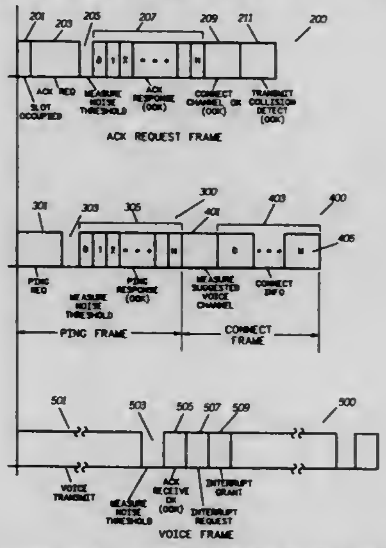


a modulator responsive to one of said first and second signals to be transmitted for producing a modulated signal;
means responsive to said modulated signal for producing an amplified signal of substantially said predetermined frequency;
a transmit antenna coupled to said amplified signal for radiating said amplified signal in a radiation pattern;
a receive antenna for picking up a radiated signal and producing in response thereto a picked-up signal, said receive antenna being positioned in at least a local minimum of said radiation pattern;
means responsive to said picked-up signal for selectively receiving a portion of said picked-up signal of substantially said predetermined frequency and for producing an intermediate signal; and
a demodulator responsive to said intermediate signal for producing the other of said first and second signals.

5,691,979
SIGNALING PROTOCOL FOR AN INFRASTRUCTURELESS COMMUNICATION SYSTEM AND METHOD OF USING SAME

Jimmy W. Cadd, Coral Springs, and Tracy L. Fulghum, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 251,441, May 31, 1994, abandoned. This application Mar. 29, 1996, Ser. No. 625,474
Int. Cl.^{6} H04J *4/00;* **H04B** *1/713*
U.S. Cl. 370—312 **19 Claims**

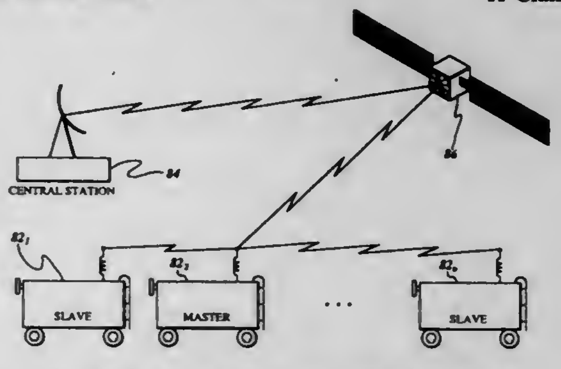
1. A method for initiating communication between a plurality of stations in a group in a wireless communication system having no centralized control, the method utilizing a signaling protocol utilizing a plurality of frames which are transmitted between an initiating station and at least one non-initiating station, the method for communicating comprising the steps of:



transmitting a first series of frames between the initiating station and the at least one non-initiating station for requesting and acknowledging establishment of communications;
transmitting a second series of frames between the initiating station and at least one non-initiating station for suggesting and measuring a suggested third frame used for voice or data communication for non-initiating stations in the group and for providing interim communication before transitioning to the third frame; and
transmitting a third series of frames between the initiating station and the at least one non-initiating station for conveying voice or data communication.

5,691,980
LOCAL COMMUNICATION NETWORK FOR POWER REDUCTION AND ENHANCED RELIABILITY IN A MULTIPLE NODE TRACKING SYSTEM

Kenneth Brakeley Welles, II, Scotia; Jerome Johnson Tiemann, Schenectady, both of N.Y.; Sandeep Chennakeshu, Cary, N.C., and Harold Woodruff Tomlinson, Jr., Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jun. 7, 1995, Ser. No. 484,750
Int. Cl.^{6} H04B *7/185*
U.S. Cl. 370—316 **11 Claims**



1. A method of tracking assets comprising the steps of:

affixing a tracking unit to each asset to be tracked;
establishing a mobile local area network of a plurality of tracking units in close proximity, each of said tracking units constituting a respective node of the mobile local area network; and
each of said tracking units capability to independently determine and report its location to a central station and capability to communicate locally with other cooperative tracking units via the mobile local area network, said method further comprising the step of dynamically reconfiguring the mobile local area network so that other cooperative tracking units that come into proximity with the network can join the network, and tracking units that distance themselves from the network can leave the network; and
identifying locations of tracked assets according to their connection in the mobile local area network where the exact location of at least one of the network nodes is known.

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5,691,981

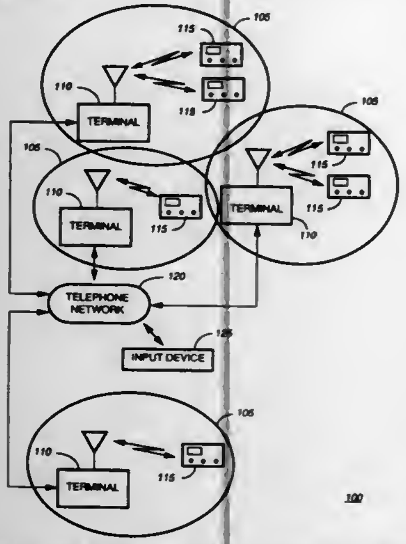
METHOD AND APPARATUS FOR PROVIDING ROAMING INSTRUCTIONS TO DATA COMMUNICATION RECEIVERS

Karl Robert Weiss, Singapore, Singapore, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 11, 1996, Ser. No. 584,666

Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—329 **20 Claims**



1. A method, in a communication system, for transmitting a signal containing roaming instructions to a data communication receiver, the signal comprising frames of data, the data communication receiver having a memory for storing a base frame number associated with a base frame during which the data communication receiver is assigned to wake for message reception, the method comprising the steps of:

batching information into a frame of data, wherein the frame comprises frame offset information for reception by the data communication receiver, the frame offset information indicating a substitute frame that is relative in location to the base frame and that is located within the signal received by the data communication receiver, wherein the data communication receiver is to thereafter wake for message reception in the substitute frame rather than the base frame; and

transmitting, within a predetermined geographic area, the information on a radio communication channel.

5,691,982

METHOD FOR TRANSFERRING DATA TRANSMITTED FROM BASE STATIONS TO A PAGING AREA CONTROLLER IN A PERSONAL PAGING NETWORK

Jarkko Vuori; Seppo Seltsonen, both of Espoo, and Esa Pulkki, Vantaa, all of Finland, assignors to Tecnomen Oy, Espoo, Finland

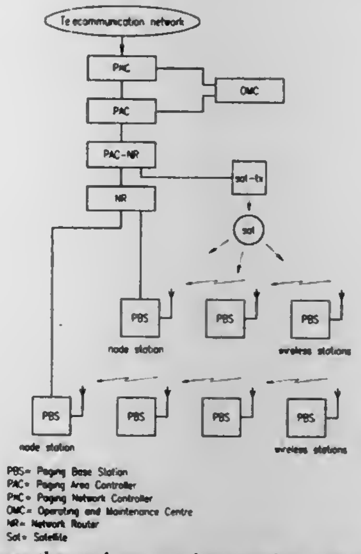
Filed Mar. 22, 1995, Ser. No. 408,224

Claims priority, application Finland, Mar. 23, 1994, 941346; Mar. 23, 1994, 941347

Int. Cl.^{6} H04Q *7/00;* **H04J** *3/00*

U.S. Cl. 370—336 **10 Claims**

1. A method for transferring data transmitted from paging base stations (PBS) to a central station (PAC) in a personal paging network, comprising: transmitting paging messages over a radio channel using the base stations (PBS); controlling operation of the base stations using the central station (PAC); using the radio channel both for transmitting the paging messages and for the transfer of said data transmitted from the base stations (PBS) to the central station (PAC); using said radio channel for the transfer of base-station data at preset times (D) between pagings (P), and transmitting the base-station data from a single base station (PBS) to the central station (PAC) through one or more other base stations in such a manner that at least one base station, which is a paging area node station (PBS01), is in a fixed data transfer communication with the central station (PAC), and transmitting the data to be transferred from the base stations to the central station by means of said radio channel from a plurality of base stations (PBS) to said node station.


Telecommunication network
PNC
PAC
OMC
PAC-NR
NR
sat-ts
sat
PBS
node station
wireless stations
PBS= Paging Base Station
PAC= Paging Area Controller
PNC= Paging Network Controller
OMC= Operating and Maintenance Centre
NR= Network Router
Sat= Satellite

5,691,983

COMMUNICATION SYSTEM WITH REPEATEDLY ALLOCATED CHANNEL ID NUMBERS

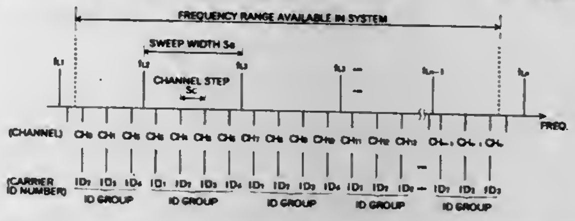
Hizuru Nawata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 31, 1996, Ser. No. 657,774

Claims priority, application Japan, May 31, 1995, 7-156899

Int. Cl.^{6} H04J *1/02;* **H04Q** *7/00*

U.S. Cl. 370—344 **19 Claims**



15. In a system for transmitting a signal from a transmitting side to a receiving side through a desired frequency channel, a communication method comprising the steps of:

preparing a channel assignment of the system such that a predetermined frequency range assigned to the system is logically divided into a plurality of subranges, each of the subranges including a plurality of frequency channels to which predetermined channel identifiers are assigned, respectively, and the channel identifiers being repeatedly assigned in the subranges;

at the transmitting side,

transmitting a signal through a desired frequency channel, the signal including a desired channel identifier corresponding to the desired frequency channel; and

at the receiving side,

specifying the desired frequency channel based on a demodulator frequency acquisition and the desired channel identifier included in a received signal.

5,691,984

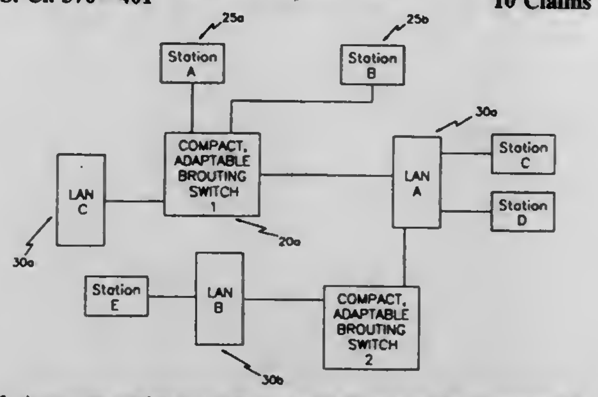
COMPACT, ADAPTABLE BROUTING SWITCH

Gary A. Gardner, Clearwater, and Stephen E. Belvin, Largo, both of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 15, 1995, Ser. No. 515,416

Int. Cl.^{6} H04L *12/66*

U.S. Cl. 370—401 **10 Claims**



1. A compact, adaptable brouting (CAB) switch for communication between multiple external systems comprising:

a central shared memory device which stores communication management data and information data wherein the communication management data is appended at the end of the information data to form a data frame;

a central processing device connected to the central shared memory device to control the movement of the information data within the CAB switch;

a plurality of switch ports, connected to the central shared memory device, to receive information data from external systems with the same or differing protocols and to transfer the information data to the external systems wherein the switch ports each comprise external interfaces connecting the external systems with the switch ports, data steering logic connected to the external interfaces to control the movement of the data frame in the switch port, a local memory connected to the data steering logic to store the data frame in the switch port wherein the switch ports are configured to store a data frame either as a single rotary buffer or as a multiple paged buffer as well as to accept different data sizes and types; and

a bus device which connects the plurality of switch ports to the central shared memory to transfer the communication management data and information data between the switch ports, and between the switch ports and the central shared memory device.

5,691,985

SYSTEM AND METHOD FOR INCREASING THROUGHPUT OF INTER-NETWORK GATEWAYS USING A HARDWARE ASSIST ENGINE

Diana Lynne Lorenz, Naperville, Ill.; Robert Francis Shaw, Clinton, N.J., and Ronald Anthony Spanke, Wheaton, Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 19, 1995, Ser. No. 426,425

Int. Cl.^{6} H04L *12/28;12/56*

U.S. Cl. 370—401 **24 Claims**

1. A gateway apparatus for connecting packet networks, said packet networks communicating with each other via packets transmitted through said gateway, said gateway comprising:

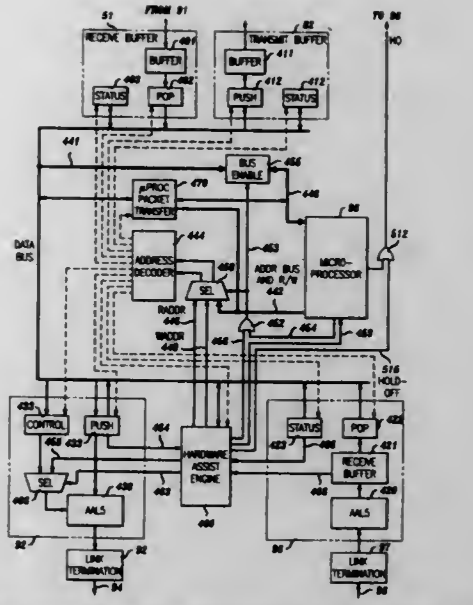
a receive buffer for receiving packets from one of said packet networks;

a transmit interface for transmitting said packets to another of said packet networks;

a microprocessor connected to said receive buffer and to said transmit interface, said microprocessor including means for transferring packets from said receive buffer to said transmit interface, and from a receive interface to a transmit buffer; and

a hardware assist means connected to said transmit interface and said receive buffer;

said microprocessor includes means for giving up control of said gateway to said hardware assist means, and said hardware assist means including means for detecting packets at said receive buffer, and means for transferring said detected packet to said transmit interface without transferring said packet data through said microprocessor.



5,691,986

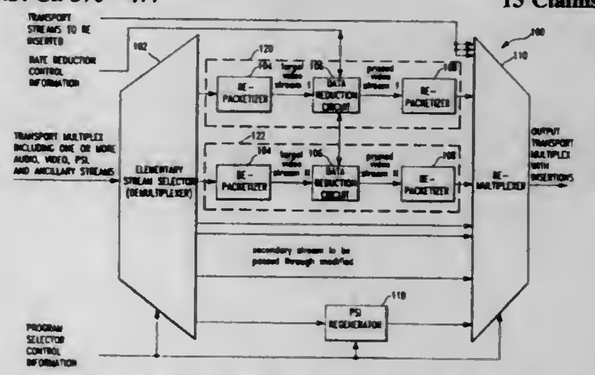
METHODS AND APPARATUS FOR THE EDITING AND INSERTION OF DATA INTO AN ENCODED BITSTREAM

Larry Pearlstein, Newton, Pa., assignor to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Jun. 7, 1995, Ser. No. 481,581

Int. Cl.^{6} H04N *7/12*

U.S. Cl. 370—477 **13 Claims**


TRANSPORT STREAMS TO BE INSERTED
RATE REDUCTION CONTROL INFORMATION
100
102
110
120
122
DE-PACKETIZER
DATA REDUCTION CIRCUIT
RE-PACKETIZER
TRANSPORT MULTIPLEX INCLUDING ONE OR MORE AUDIO, VIDEO, PSI, AND ANCILLARY STREAMS
ELEMENTARY STREAM SELECTOR (DEMULTIPLEXER)
RE-MULTIPLEXER
OUTPUT TRANSPORT MULTIPLEX WITH INSERTIONS
PSI REGENERATOR
PROGRAM SELECTOR CONTROL INFORMATION

1. A method of inserting data into an encoded data stream which is a first transport multiplex of a plurality of elementary data streams, the method comprising the steps of:

receiving the encoded data stream;

demultiplexing the encoded data stream to extract one of the individual elementary data streams;

performing a data reduction operation on the extracted one of the individual elementary data stream to generate a first elementary reduced content data streams; and

inserting the data into the first elementary reduced content data stream.

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5,691,987
FREQUENCY-CHANNEL MULTIPLEXER AND DEMULTIPLEXER

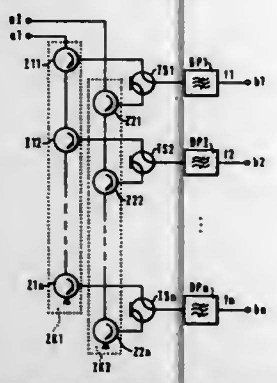
Lothar Friederichs, Backnang, Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Germany

Filed Mar. 8, 1995, Ser. No. 399,420

Claims priority, application Germany, Mar. 31, 1994, 44 11 233.5

Int. Cl.^{6} H04J *1/00*

U.S. Cl. 370—488 **15 Claims**



1. A frequency-channel multiplexer and demultiplexer arrangement, consisting of a plurality of bandpass filters which are tuned to respectively different individual frequency channels and which each have an input/output respectively connected to a gate of one of a plurality of circulators connected in a chain, wherein at least two circulator chains (ZK1, ZK2) are present, and a circulator (Z11, Z12 . . . Z1n; Z21, Z22 . . . Z2n) from one of the circulator chains (ZK1, ZK2) can optionally be switched to said input/output of each bandpass filter (BP1, BPn).

5,691,988
METHOD FOR MEASURING THE SENSITIVITIES AND INTERFERENCE WAVE PROPERTIES FO RECEIVERS

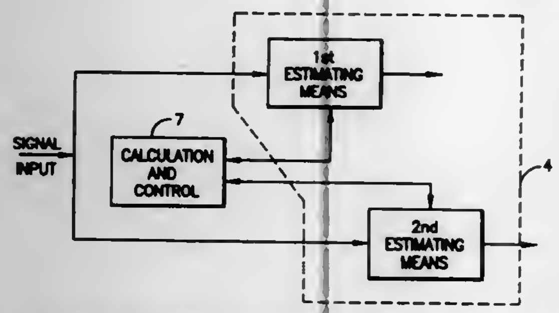
Katsuji Yamada; Mitusru Yokoyama, and Masatoshi Obara, all of Hyogo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 15, 1995, Ser. No. 559,438

Claims priority, application Japan, Nov. 17, 1994, 6-308181

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—5.1 **3 Claims**



1. A system for measuring sensitivities and interference wave properties of receivers, comprising:

first estimating means and second estimating means for estimating a reception input level at which a receiver's bit error rate becomes a prescribed value; and

control means for operating said first estimating means to derive an estimation error between at least one estimated bit error rate and at least one measured bit error rate value and when said error is less than a predetermined value, to estimate the reception input level; and when said error is greater than the predetermined value, causing operation of the second estimating means to estimate the reception input level.

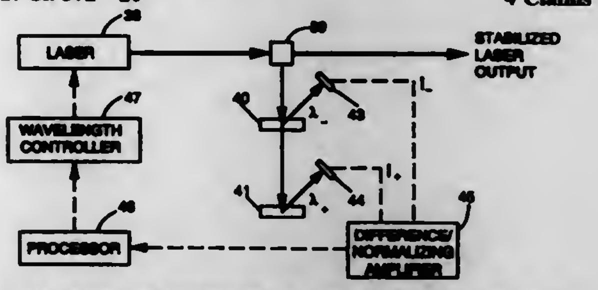
5,691,989
WAVELENGTH STABILIZED LASER SOURCES USING FEEDBACK FROM VOLUME HOLOGRAMS

George Anthony Rakuljic, Santa Monica; Amnon Yariv, San Marino; Victor Leyva, Los Angeles; Koichi Sayano, Montebello, and Charles E. Tyler, Sunnyvale, all of Calif., assignors to Accuwave Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 991,571, Dec. 16, 1992, Pat. No. 5,491,570, which is a continuation-in-part of Ser. No. 965,746, Oct. 23, 1992, Pat. No. 5,335,098, which is a continuation-in-part of Ser. No. 908,298, Jul. 2, 1992, Pat. No. 5,440,669, which is a continuation-in-part of Ser. No. 736,736, Jul. 26, 1991, abandoned. This application Sep. 14, 1993, Ser. No. 122,711

Int. Cl.^{6} G02B *5/32;* **G03H** *1/26*

U.S. Cl. 372—20 **4 Claims**



1. A method of stabilizing an optical source's output in a selected wavelength range, comprising the steps of:

generating a beam of electromagnetic wave energy as the output in the selected wavelength range;

filtering the beam using a holographic storage device including at least two reflective diffraction gratings having like response characteristics that intersect at a given wavelength in the selected wavelength range, where at least a portion of the beam is directed onto the diffraction gratings to generate reflections therefrom; and

controlling the optical source to alter the beam's wavelength in accordance with relative amplitudes of the reflections from the diffraction gratings.

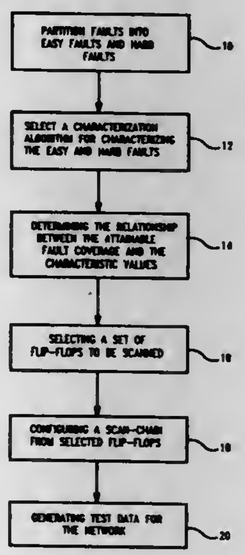
5,691,990
HYBRID PARTIAL SCAN METHOD

Rohit Kapur, Foster City, Calif.; Thomas J. Snethen, Endwell, and Kamran K. Zarrineh, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1996, Ser. No. 759,286

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—22.3 **13 Claims**


PARTITION FAULTS INTO EASY FAULTS AND HARD FAULTS
10
SELECT A CHARACTERIZATION ALGORITHM FOR CHARACTERIZING THE EASY AND HARD FAULTS
12
DETERMINING THE RELATIONSHIP BETWEEN THE ATTAINABLE FAULT COVERAGE AND THE CHARACTERISTIC VALUES
14
SELECTING A SET OF FLIP-FLOPS TO BE SCANNED
16
CONFIGURING A SCAN-CHAIN FROM SELECTED FLIP-FLOPS
18
GENERATING TEST DATA FOR THE NETWORK
20

1. A method for testing a digital integrated circuit having a plurality of flip-flops comprising the steps of:

a) partitioning the faults in the circuit into a first fault type and a second fault type;

b) selecting a static characterization algorithm for characterizing the first and second fault types;

c) determining the relationship between attainable fault coverage and the characterized values for the first and second fault types;

d) characterizing the first and second fault types for each candidate flip-flop for scan in the digital integrated circuit with the static characterization algorithm;

e) determining the first and second fault types that are the closest together in value;

f) selecting the flip-flop associated with the first and second fault types determined in step (e);

g) forming a shift register with the flip-flop selected in step (f);

h) repeating steps (d)–(g) until the attainable fault coverage determined in step (c) is attained; and

i) generating test data for the network with the shift register configured in step (h).

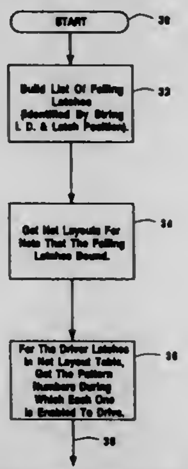
5,691,991
PROCESS FOR IDENTIFYING DEFECTIVE INTERCONNECTION NET END POINTS IN BOUNDARY SCAN TESTABLE CIRCUIT DEVICES

Brian Robert Kessler, Lagrangeville, N.Y., and Edward Everett Horton, III, Westford, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 384,859, Mar. 17, 1995, abandoned. This application Jan. 28, 1997, Ser. No. 789,857

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.3 **18 Claims**


START
30
Build List Of Failing Latches (Identified By String I. D. & Latch Position).
32
Get Net Layouts For Nets That The Failing Latches Bound.
34
For The Driver Latches In Net Layout Table, Get The Pattern Numbers During Which Each One Is Enabled To Drive.
36
38

1. A process for diagnosing test result data produced during boundary scan testing of a circuit device having a plurality of endpoints interconnected in a plurality of nets, the process comprising:

(a) selecting from the test result data a first endpoint that failed to produce an expected test value during a failed boundary scan test;

(b) determining a first test pattern used during the failed boundary scan test of the first endpoint;

(c) identifying additional endpoints interconnected in a first net to the first endpoint, the first net including a total of at least three endpoints;

(d) identifying a specific one of the endpoints in the first net as the driving endpoint in the first test pattern;

(e) determining from the test result data if all endpoints interconnected in the first net to the driving endpoint are listed in the test result data as failed during the boundary scan test using the first test pattern;

(f) identifying the driving endpoint in the first net as a defective endpoint if all the endpoints interconnected in the first net to the driving endpoint are listed in the test result data as failed during the boundary scan test using the first test pattern; and

(g) identifying the driving endpoint in the first net as a non-defective endpoint if some of the endpoints interconnected in the first net to the driving endpoint are listed in the test result data as not failed during the boundary scan test using the first test pattern.

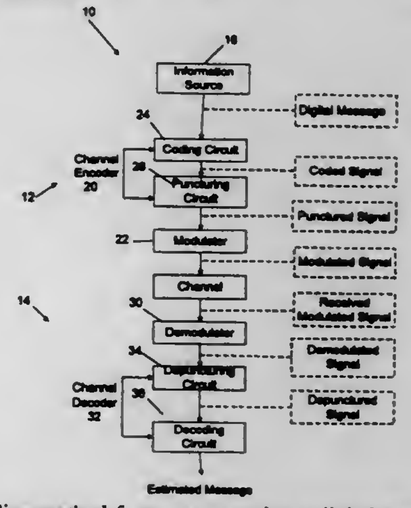
5,691,992
PUNCTURED CODING SYSTEM FOR PROVIDING UNEQUAL ERROR PROTECTION IN A DIGITAL COMMUNICATION SYSTEM

Barbara Davis Molnar; Stanley Lynn Reinhold, and Amer Aref Hassan, all of Cary, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Oct. 12, 1995, Ser. No. 542,276

Int. Cl.^{6} H03M *13/00*

U.S. Cl. 371—37.1 **21 Claims**



1. A coding method for error protecting a digital message to be transmitted from a transmitter to a receiver over a channel, comprising:

a) coding the digital message according to a predetermined code prior to transmission to produce codewords having significant message symbols, insignificant message symbols, and redundancy symbols, wherein the redundancy symbols error protect both the significant and insignificant message symbols;

b) puncturing τ insignificant symbols of each codeword prior to transmission so as to produce erasures in the codewords;

c) depuncturing the punctured codewords after transmission to produce depunctured codewords, the step of depuncturing received punctured codewords including:

  1) determining for each received punctured codeword if the punctured codeword is correctable, and

  2) correcting the punctured codewords determined to be correctable so as to produce corrected depunctured codewords;

d) decoding the depunctured codewords.

5,691,993
RATE 4/5 TRELLIS CODE FOR PR4 CHANNELS WITH IMPROVED ERROR PROPAGATION

Lisa Fredrickson, Ojai, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 7, 1995, Ser. No. 483,117

Int. Cl.^{6} G11B *20/18*

U.S. Cl. 371—38.1 **13 Claims**

1. A trellis encoding method that produces codewords that are combined in pairs, the two codewords in each pair together being encoded from three consecutive bytes of data and Reed Solomon error correction code values, the three bytes being from separate blocks of user data and Reed Solomon error correction code

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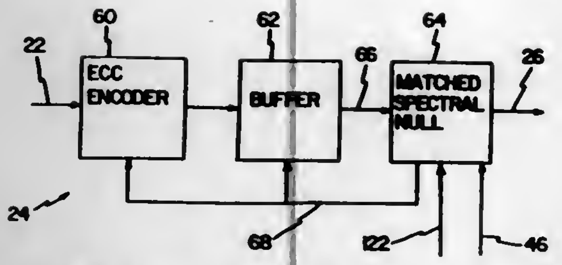


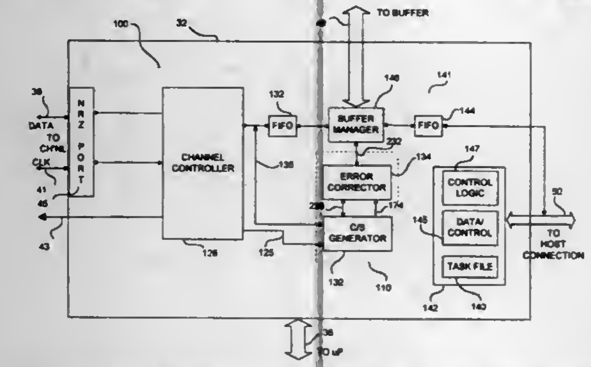
values, the Reed Solomon error correction code values being capable of correcting up to two bytes of user data and error correction code values per block.

5,691,994
DISK DRIVE WITH FAST ERROR CORRECTION VALIDATION

Marc Acosta, San Clemente; Carl Bonke, Rancho Santa Margarita; Trinh Bui, Mountain View; Stanley Chang, Irvine; Patrick Lee, San Jose; Phong Tran, Irvine, and Joanne Wu, Diamond Bar, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed May 8, 1995, Ser. No. 436,516
Int. Cl.^{6} G11C *29/00*

U.S. Cl. 371—40.1 **21 Claims**



1. A disk drive, adapted for storing a block of user data provided from a host, comprising:

a data storage disk having a disk surface with a plurality of data tracks on the disk;

means for reading and writing data to and from the data tracks; and

a host interface and disk controller coupled to the host to receive commands, and to receive the block of user data from the host to carry out a command entailing writing, and to provide the block of user data to carry out a command entailing reading, the controller comprising:

circuit means responsive to the block of user data received from the host for generating error detection code check symbols;

means for appending the error detection code check symbols to the block of user data received from the host to form an error detection code codeword in a first Reed-Solomon code;

circuit means responsive to the block of user data received from the host and to the error detection code check symbols for generating error correction code check symbols;

means for appending the error correction code check symbols to the error detection code codeword to form an error correction code codeword in a second Reed-Solomon code;

each error correction code check symbol being defined over a finite field having a first set of symbols, each of the symbols in the first set having a first number of bits; and

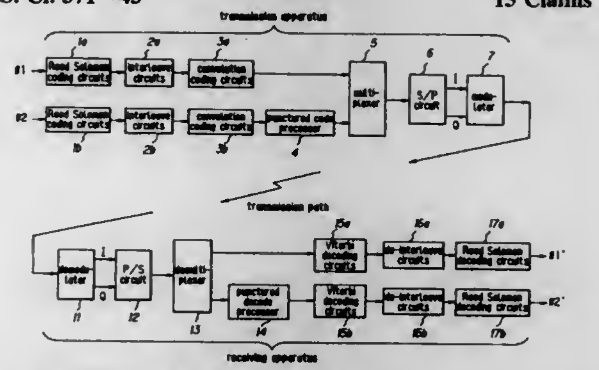
each error detection code check symbol being defined over an extension field of the finite field, the extension field having a second set of symbols, each of the symbols in the second set having a second number of bits, the second number being larger than and an integer multiple of the first number.

5,691,995
TRANSMISSION OF DATA BY USING CONVOLUTIONAL CODING OF DIFFERENT CODE RATES AND THE ENCODED DATA RECEPTION INCLUDING DECODING OF THE RECEIVED DATA

Yasunari Ikeda, Kanagawa; Tamotsu Ikeda, Tokyo, and Takahiro Okada, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,204
Claims priority, application Japan, Apr. 5, 1994, 6-066997
Int. Cl.^{6} H03M *13/12*

U.S. Cl. 371—43 **15 Claims**



1. A transmission apparatus, comprising:

coding means employing convolutional coding to code a plurality of inputted information series and carrying out code processing with a code rate for at least one information series of said plurality of inputted information series differing from the code rate for the remaining other information series, wherein the coding means is equipped with a plurality of convolutional signal processing parts for carrying out convolutional code processing on each of the plurality of inputted information series and a code processing part for raising the code rate of an output from said at least one of the plurality of convolutional signal processing parts;

multiplexing means for multiplexing a plurality of convolutional code series outputted from the coding means; and

transmission means for modulating and transmitting an output from the multiplexing means.

5,691,996
MEMORY IMPLEMENTED ERROR DETECTION AND CORRECTION CODE WITH ADDRESS PARITY BITS

Chin-Long Chen, Fishkill; Mu-Yue Hsiao, Poughkeepsie, both of N.Y.; Walter Heinrich Lipponer, Ammerbuch, Germany, and William Wu Shen, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

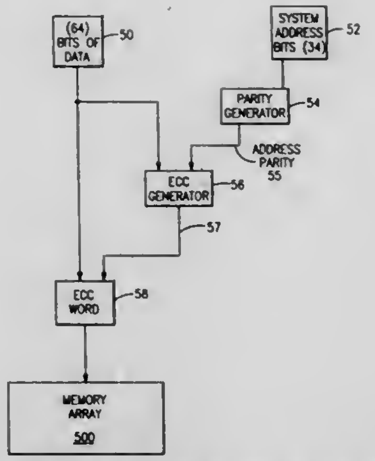
Filed Dec. 11, 1995, Ser. No. 570,446
Int. Cl.^{6} G11C *29/00*

U.S. Cl. 371—51.1 **2 Claims**

1. A method of generating at least two address parity bits in a computer system from a string of received incoming system address bits, said incoming address bits comprising a vector with a multiplicity of lines each having segments b bits in length, said method comprising the steps of:

dividing said vector lines into two groups as to provide at least two bits of address parity, wherein said first group having only high bits with a value of "1", and said second group having only low bits with a value of "0";

generating at least one address parity bit from each of said two groups by combining all bits of said first group to generate at least one high address parity bit, and combining all bits of said second group to generate at least one low address parity bit; said vector and said address parity having the following values:



DATA							
1	2	3	4	5	6	7	8
1000	1000	1000	1000	1000	1000	1000	1000
0100	0100	0100	0100	0100	0100	0100	0100
0010	0010	0010	0010	0010	0010	0010	0010
0001	0001	0001	0001	0001	0001	0001	0001
0110	1000	0010	1011	1010	1101	0101	1110
1101	0100	0001	0110	0101	1011	1111	1001
1011	0010	1010	1101	1000	0110	0100	1001
0110	0001	0101	1011	0100	1101	1100	0111
1000	1110	0111	1010	1001	0010	0110	0001
0100	1001	1110	0101	0111	0001	1101	0011
0010	1001	1110	1000	0111	1010	1011	0101
0001	0111	1001	0100	1110	0101	0110	1111

DATA							
9	10	11	12	13	14	15	16
1001	1101	1111	0011	1100	1100	1110	0110
0111	1011	1010	0010	1000	1000	1001	1101
0111	0110	1100	1111	0011	0011	1001	1011
1110	1101	1000	1010	0010	0010	0111	0110
1000	0001	1000	0111	1000	1110	1000	0100
0100	0011	0100	1110	0100	1001	0100	1100
0010	0101	0010	1110	0010	1001	0010	0001
0001	1111	0001	1001	0001	0111	0001	0011
0101	1000	1011	1000	0110	1000	0100	1000
1111	0100	0110	0100	1101	0100	1100	0100
0100	0010	1101	0010	1011	0010	0001	0010
1100	0001	1011	0001	0110	0001	0011	0001

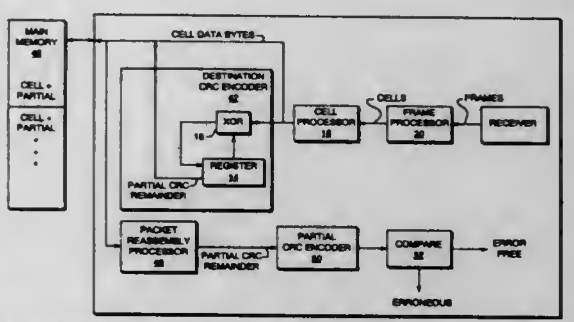
ECC			SYMBOL ID (CHIP) ID	ADDRESS PARITY BITS
17	18	19		20
1000	0000	0000	—	01
0100	0000	0000	—	11
0010	0000	0000	—	10
0001	0000	0000	—	11
0000	1000	0000	—	10
0000	0100	0000	—	01
0000	0010	0000	—	00
0000	0001	0000	—	00
0000	0000	1000	—	00
0000	0000	0100	—	00
0000	0000	0010	—	01
0000	0000	0001	—	10

5,691,997
ENCODER FOR USE IN ASYNCHRONOUS TRANSFER MODE SYSTEMS

Stanley A. Lackey, Jr., Groton, Mass., assignor to Cisco Systems, Inc., San Jose, Calif.

Filed Sep. 28, 1995, Ser. No. 535,453
Int. Cl.^{6} G06F *11/10*

U.S. Cl. 371—53 **11 Claims**



8. A system for determining if a data packet received in the form of cells contains errors, the system including:

A. a first encoder for encoding the data included in a received cell in accordance with a cyclic redundancy check code to produce an associated partial remainder;

B. storage means for storing the cell and the partial remainder, the storage means linking the cell and the partial remainder by pointers to previously stored cells and partial remainders associated with the same data packet;

D. means for determining if a cell is the last cell of a packet;

E. means for retrieving the stored partial remainders associated with the cells of a selected data packet once the last cell of the selected packet has been encoded by the first encoder; and

F. a second encoder for manipulating the partial remainders associated with the cells to produce a packet remainder;

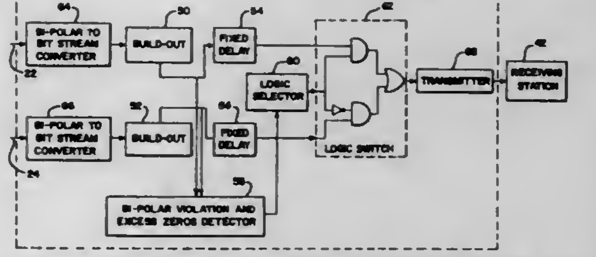
G. comparison means for comparing the packet remainder with a predetermined pattern, the comparison means determining that the data packet is error-free if the remainder and the pattern match.

5,691,998
DATA TRANSMISSION PROTECTION CIRCUIT WITH ERROR CORRECTION

Laurence L. Sheets, St. Charles, Ill., assignor to Teltrend Inc., St. Charles, Ill.

Filed May 10, 1995, Ser. No. 438,631
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—57.1 **26 Claims**


20
BI-POLAR TO BIT STREAM CONVERTER
BUILD-OUT
FIXED DELAY
LOGIC SELECTOR
TRANSMITTER
RECEIVING STATION
BI-POLAR TO BIT STREAM CONVERTER
BUILD-OUT
FIXED DELAY
LOGIC SWITCH
BI-POLAR VIOLATION AND EXCESS ZEROS DETECTOR
22
24
30
34
58

1. A protection system for transmitting selected data bits to a receiving station, said system interconnectable to at least two data transmission lines, each of said lines carrying a series of data bits substantially following a predetermined coding rule, said system comprising in combination:

a bi-polar to bit stream converter interconnected to said transmission lines;

a build-out circuit, interconnected to said converter, for receiving and storing build-out sequences of bit stream data from said transmission lines;

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a controller, operatively connected to said build-out circuit, and including a computational module for analyzing said build-out sequences of bit stream data stored in said build-out circuit to correlate a bit from said first transmission line with a bit from said second transmission line and to detect when one particular correlated bit follows said coding rule and a second correlated bit violates said coding rule; and

a switch, operatively connected to said build-out circuit and responsive to said controller, for allowing transmission to said receiving station the particular sequence carrying said one particular correlated bit that follows said coding rule.

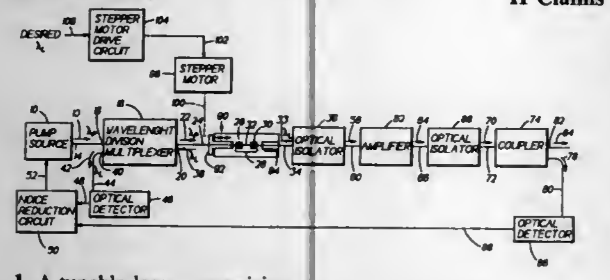
5,691,999
COMPRESSION-TUNED FIBER LASER

Gary A. Ball, Simsbury, and William W. Morey, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1994, Ser. No. 316,281

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—20 **11 Claims**



1. A tunable laser, comprising:

a laser cavity comprising a solid optical waveguide;

said waveguide being doped with a rare-earth dopant which provides a gain medium within said laser cavity;

a pair of reflective elements delimiting said laser cavity;

the length of said laser cavity, the gain of said gain medium, and the reflectivity of said reflective elements being so as to cause lasing to occur at a predetermined lasing wavelength;

said reflective elements reflecting incident light at said lasing wavelength; and

compression means for compressing said solid optical waveguide so as to change said lasing wavelength.

5,692,000

Patent Not Issued For This Number

5,692,001
OPTOELECTRONIC SEMICONDUCTOR DEVICE WITH A SEMICONDUCTOR DIODE LASER

Lukas F. Tiemeijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

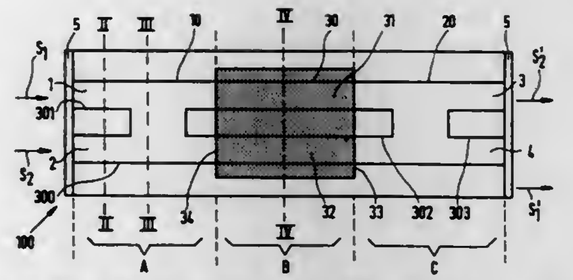
Filed Sep. 1, 1995, Ser. No. 523,066

Claims priority, application European Pat. Off., Sep. 6, 1994, 94202537

Int. Cl.^{6} H01S *3/19;3/08*

U.S. Cl. 372—44 **8 Claims**

1. An optoelectronic semiconductor device (**100**) comprising at least one semiconductor diode laser (**30**) with two mutually-parallel, strip-shaped active regions (**31, 32**) having substantially the same dimensions and comprising the same materials, whose ends are optically coupled at one side, characterized in that the ends of the active regions (**31, 32**) on both sides are coupled to a first and a second 3-dB radiation coupler (**10, 20**, respectively), wherein the first radiation coupler (**10**) forms a first (**1**) and a second gate (**2**) and the second radiation coupler (**20**) a third (**3**) and a fourth gate (**4**) for the device (**100**), and the geometry and material properties of the radiation couplers (**10, 20**) and the active regions (**31, 32**) are so chosen that electromagnetic radiation generated, amplified, or reflected in the device (**100**) during operation moves diagonally through the device (**100**) as a result of constructive interference.



5,692,002
BURIED HETEROSTRUCTURE SEMICONDUCTOR LASER FABRICATED ON A P-TYPE SUBSTRATE

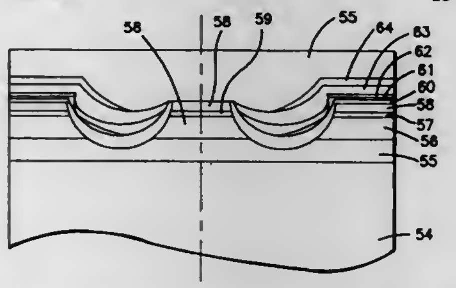
Tomoko Mizutani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 20, 1995, Ser. No. 531,314

Claims priority, application Japan, Sep. 20, 1994, 6-225131

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—46 **15 Claims**



1. A buried heterostructure semiconductor laser formed on a semiconductor substrate having a p-type conductivity comprising:

an active layer region having a striped-mesa shape elongated in a lasing cavity direction;

a pair of channels having a depth reaching a first p-type semiconductor layer and formed on both sides of said active layer region;

a second p-type semiconductor layer, a first semiconductor layer, a first n-type semiconductor layer, a third p-type semiconductor layer, and a second semiconductor layer sequentially laminated within said pair of channels to bury said pair of channels;

said first semiconductor layer and said second semiconductor layer each having a band gap smaller than the band gap of any of said second p-type semiconductor layer, said first n-type semiconductor layer, and said third p-type semiconductor layer; and

a second n-type semiconductor layer covering the surfaces of said active layer region said second semiconductor layer.

5,692,003
QUANTUM-DOT CASCADE LASER

Ned Scott Wingreen, Princeton, N.J., and Charles A. Stafford, Geneva, Switzerland, assignors to NEC Research Institute, Inc., Princeton, N.J.

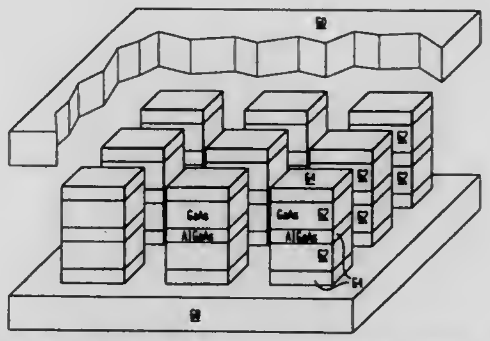
Filed Mar. 29, 1996, Ser. No. 625,029

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—50 **9 Claims**

1. A quantum-dot cascade laser device comprising:

a substrate layer having an electrical contact;



one or more double-dot layers overlying said substrate, each of said double-dot layers having:

an array of double-dots, each having a volume, surrounded by and separated from one another by a semiconductor barrier such that each one of said double-dots is sufficiently-spaced from one another to provide an effective dot density, wherein a double-dot comprises two quantum dots in sufficiently close proximity to allow quantum mechanical tunneling of an electron between the two quantum dots and a quantum dot is a sufficiently small volume of a semiconductor material surrounded on all sides by another suitable material; and

a contact layer having an electrical contact and overlying said double-dot layers whereby by the passage of current flow through the device laser operation may be achieved.

5,692,004
LASER ADAPTABLE TO LIGHTWEIGHT CONSTRUCTION

Benny Alian Greene, Fadden, Australia, assignor to Electro Optic Systems Pty. Ltd., New South Wales, Australia

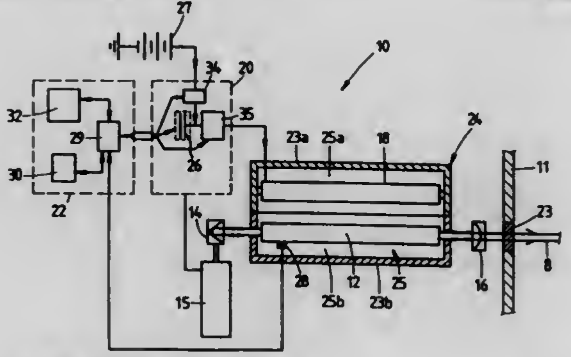
PCT No. PCT/AU94/00081, § 371 Date Dec. 22, 1995, § 102(e) Date Dec. 22, 1995, PCT Pub. No. WO94/19846, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 23, 1994, Ser. No. 513,788

Claims priority, application Australia, Feb. 23, 1993, PL 7462/93

Int. Cl.^{6} H01S *3/09*

U.S. Cl. 372—69 **17 Claims**



1. A laser assembly comprising:

a lasing medium, associated reflector components defining a resonant cavity for said laser, and means for outputting laser pulses therefrom;

means to pump the lasing medium with pumping pulses of predetermined energy;

a pumping circuit for activating the pump means; and

control means associated with said pumping circuit for determining the energy of said pumping pulses in dependence upon a monitored temperature at a location in, on or adjacent the lasing medium.

5,692,005
SOLID-STATE LASER

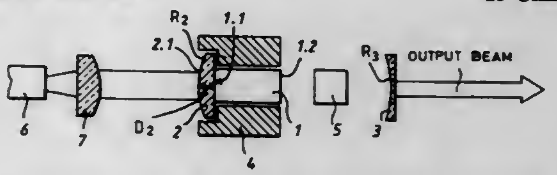
Robert Maag, Aalen; Heinz Abramowsky, Giengen; Peter Reimer, Ellwangen, and Martin Wiechmann, Jena, all of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Mar. 4, 1996, Ser. No. 611,983

Claims priority, application Germany, Mar. 4, 1995, 195 07 625.7

Int. Cl.^{6} H01S *3/091*

U.S. Cl. 372—70 **15 Claims**



1. A solid-state laser including a laser resonator comprising:

a rod-shaped laser medium (1) having end faces (1.1, 1.2),

an optical element (2) arranged adjacent an end face of and in thermal contact with said laser medium (1),

a pumping radiation source (6) for pumping radiation that reaches said laser medium (1) by means of said optical element (2),

said optical element (2) being optically dimensioned such that a minimum diameter of a transverse mode profile results within said laser resonator and having at least one optically effective surface that faces said pumping radiation source (6) and is curved to act as an end mirror for a fundamental wavelength of said laser resonator.

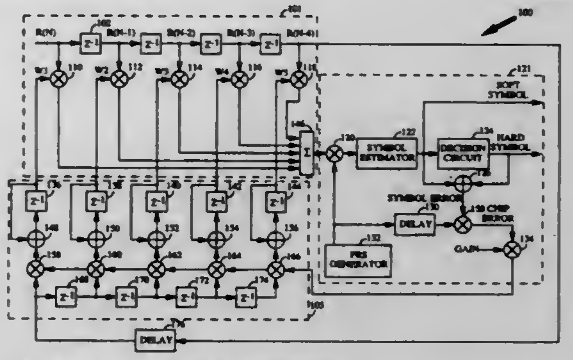
5,692,006
ADAPTIVE DESPREADER

Arthur Ross, Phoenix, Ariz., assignor to QUALCOMM Incorporated, San Diego, Calif.

Filed Jul. 31, 1995, Ser. No. 509,722

Int. Cl.^{6} H04B *15/00*

U.S. Cl. 375—200 **23 Claims**



1. An adaptive despreader comprising:

transversal filter means for receiving input samples and for filtering said input samples in accordance with a set of adaptive filter tap values to provide filtered chip values wherein said adaptive tap values are updated in accordance with a re-spread error signal;

de-spreading means for receiving said filtered chip values and de-spreading said filtered chip values in accordance with a direct sequence spread spectrum format to provide a first estimated symbol and for generating a second estimated symbol in accordance with a predetermined decision format;

error calculator means for receiving said first estimated signal and said second estimated signal and for generating an error signal in accordance with said first estimated signal and said second estimated signal;

spreading means for receiving said error signal and for spread spectrum spreading said error signal in accordance with a

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predetermined spread spectrum format to provide said re-spread error signal.

5,692,007

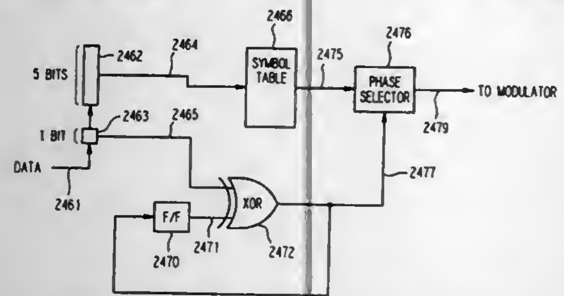
METHOD AND APPARATUS FOR DIFFERENTIAL PHASE ENCODING AND DECODING IN SPREAD-SPECTRUM COMMUNICATION SYSTEMS WITH CONTINUOUS-PHASE MODULATION

Randolph L. Durrant, Colorado Springs; Mark T. Burbach, Peyton, and Eugene P. Hoyt, Colorado Springs, all of Colo., assignors to Omnipoint Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 304,091, Sep. 9, 1994. This application Jun. 7, 1995, Ser. No. 477,480

Int. Cl.^{6} H04B *1/707*

U.S. Cl. 375—206 **36 Claims**



13. A method for differential phase encoding of signals, comprising the steps of:

dividing a signal stream into a plurality of sets of bits, wherein a first subset of a set of bits comprises a data symbol, wherein a second subset of said set of bits comprises a phase select symbol, and wherein at least one bit of said phase select symbol is mutually exclusive from the bits comprising said data symbol;

selecting in response to said data symbol a symbol code from a plurality of symbol codes stored in a symbol table;

selecting a phase value in response to said phase select symbol and a previous phase value; and

phase encoding said symbol code with said phase value.

5,692,008

APPARATUS FOR ESTIMATING A LINE OF SIGHT SIGNAL PROPAGATION TIME USING A REDUCED-MULTIPATH CORRELATION FUNCTION

Richard D.J. Van Nee, Delft, Netherlands, assignor to NovAtel, Inc., Calgary, Canada

Continuation of Ser. No. 157,476, Nov. 24, 1993. This application Sep. 19, 1995, Ser. No. 531,170

Int. Cl.^{6} H04B *1/707;1/12;* **G01S** *5/02;* **H03D** *1/04*

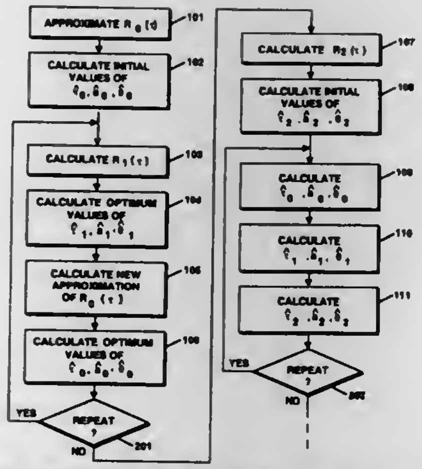
U.S. Cl. 375—208 **14 Claims**

1. A positioning signal processing system which receives from a transmitter a data carrying carrier modulated with a pseudo random noise signal, and processes the received data carrying signal to determine a propagation time τ_0 indicative of the time it takes the received data carrying signal to propagate directly from the transmitter to the positioning signal processing system, the system comprising:

a signal source for providing a reference signal;

means for performing a correlation operation on the received data carrying signal with said reference signal in order to provide a measure of the shape of the correlation function $R_x(\tau)$ of the received data carrying signal;

means for iteratively estimating the multipath-induced contribution to the correlation function and subtracting said estimated multipath-induced contribution from the correlation function to obtain an estimated line of sight contribution to the correlation function; and


APPROXIMATE R_0 (τ)
101
CALCULATE INITIAL VALUES OF τ̂_0, â_0, θ̂_0
102
CALCULATE R_1 (τ)
103
CALCULATE OPTIMUM VALUES OF τ̂_1, â_1, θ̂_1
104
CALCULATE NEW APPROXIMATION OF R_0 (τ)
105
CALCULATE OPTIMUM VALUES OF τ̂_0, â_0, θ̂_0
106
YES
REPEAT ?
NO
201
CALCULATE R_2 (τ)
107
CALCULATE INITIAL VALUES OF τ̂_2, â_2, θ̂_2
108
CALCULATE τ̂_0, â_0, θ̂_0
109
CALCULATE τ̂_1, â_1, θ̂_1
110
CALCULATE τ̂_2, â_2, θ̂_2
111
YES
REPEAT ?
NO

means for calculating the propagation time τ_0 from said estimated line of sight contribution to the correlation function.

5,692,009

JITTER MEASURING METHOD AND APPARATUS

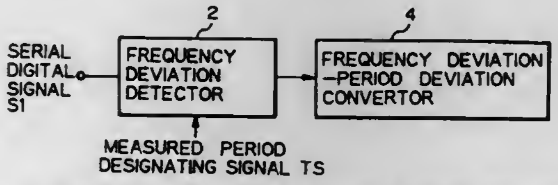
Masahiko Iijima, Kanagawa-ken, Japan, assignor to Leader Electronics Corporation, Kanagawa-ken, Japan

Filed Sep. 30, 1994, Ser. No. 316,104

Claims priority, application Japan, Oct. 1, 1993, 5-247042

Int. Cl.^{6} H04B *3/46;17/00;* **H04Q** *1/20*

U.S. Cl. 375—226 **17 Claims**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2
4
SERIAL DIGITAL SIGNAL S1
FREQUENCY DEVIATION DETECTOR
FREQUENCY DEVIATION —PERIOD DEVIATION CONVERTOR
MEASURED PERIOD DESIGNATING SIGNAL TS

1. A method for measuring a jitter in a digital data signal transmitted at a bit rate, comprising the steps of:

(a) defining a predetermined period associated with predetermined waveform portions included in said digital data signal, said predetermined waveform portions being used for measuring the jitter in the digital data signal;

(b) defining a maximum width of fluctuation of period for fluctuations of periods of said predetermined waveform portions from said predetermined period, said fluctuations of the periods of said predetermined waveform portions from said predetermined period being detected as the jitter;

(c) detecting a signal from said digital data signal, said detected signal including frequency components within a first range of frequency, said first range of frequency including a predetermined frequency corresponding to said predetermined period and having a bandwidth corresponding to said maximum width of fluctuation of period; and

(d) displaying said jitter from said detected signal.

5,692,010

ADAPTIVE EQUALIZER WITH IMPULSE NOISE PROTECTION

Larry E. Nielsen, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 17, 1996, Ser. No. 583,733

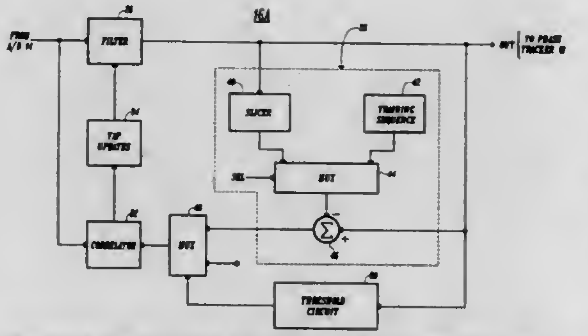
Int. Cl.^{6} H03K *5/1252;* **H04N** *5/44*

U.S. Cl. 375—232 **2 Claims**

1. A digital television receiver comprising:

means for receiving a multi level symbol signal;

means for developing an error signal indicative of impairments in said received multi level symbol signal;



means for compensating said error signal to nullify the effects of said impairments therein due to impulse noise;

means for supplying said compensated error signal for equalizing said received multi level symbol signal;

wherein said compensating means includes means for establishing a threshold for said received multi level symbol signal that is greater than the maximum symbol level in said received multi level symbol signal; and

means for nulling the effects of said impulse noise exceeding said threshold in said error signal.

5,692,011

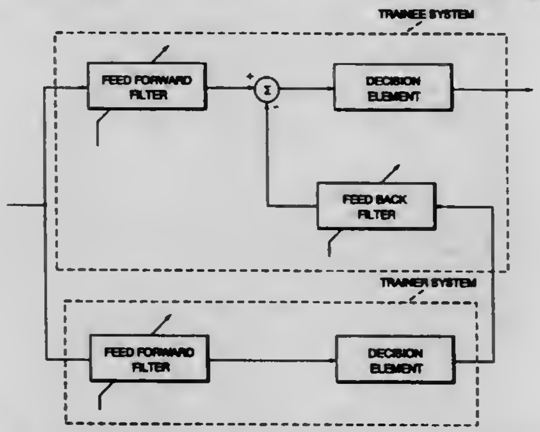
DUAL DECISION EQUALIZATION APPARATUS

Ramin Nobakht, and Jeyhan Karaoguz, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 259,850, Jun. 15, 1994, Pat. No. 5,539,774. This application Apr. 18, 1996, Ser. No. 633,253

Int. Cl.^{6} H03H *7/30*

U.S. Cl. 375—233 **4 Claims**



1. An equalization apparatus for the equalization of electrical signals codified into symbols and transmitted on a transmission channel comprising:

a decision direct equalizer, having a first adaptive feed forward filter coupled to a first decision element, with a received symbol sequence as input to the first adaptive feed forward filter with the first decision element outputting a first assigned symbol sequence; and

a modified decision feedback equalizer having a second adaptive feed forward filter, an adaptive feedback filter, and a second decision element, where the received symbol sequence is input to the second adaptive feed forward filter and where the first assigned symbol sequence is input to the adaptive feedback filter and where the second decision element provides a second assigned symbol sequence using only the combined output of the first adaptive feed forward filter and the adaptive feedback filter.

5,692,012

METHOD FOR IMAGE COMPRESSION CODING IN AN IMAGE TRANSMISSION SYSTEM

Jorma Virtamo, and Seppo Valli, both of Espoo, Finland, assignors to Valtion Teknillinen Tutkimuskeskus, Espoo, Finland

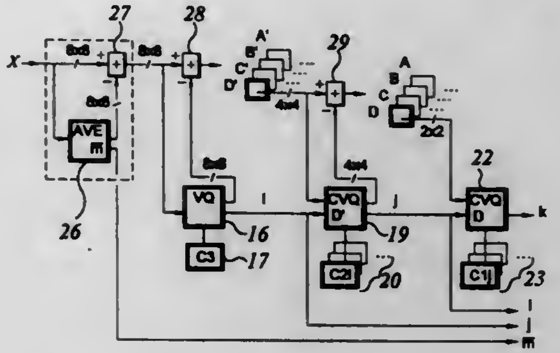
PCT No. PCT/FI93/00203, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO93/23956, PCT Pub. Date Nov. 25, 1993

PCT Filed May 11, 1993, Ser. No. 341,534

Claims priority, application Finland, May 20, 1992, 922300

Int. Cl.^{6} H04B *1/66*

U.S. Cl. 375—240 **7 Claims**



1. A method for image compression coding, particularly for doing compression coding in a digital image transmission system, the method utilizing a vector quantization process comprising the steps of:

dividing the image into blocks at a transmitting end;

searching a best corresponding codevector in a codebook for each block;

transmitting a vector index that is a codevector's location in the codebook to a receiving end;

looking in an identical codebook a respective codevector on a basis of the vector index;

reconstructing the image block by block by utilizing the codevectors, the codebook being designed beforehand by means of training images, which images are in similar fashion divided into blocks according to an employed block size;

dividing the block to be coded into a plurality of sub-blocks at the transmitting end;

submitting each sub-block to vector quantization with a classified codebook, a class thereof being defined on a basis of a first vector index of an original block and a quadrant label of the sub-block;

transmitting a second vector index of the sub-block with respect to the classified codebook to the receiving end;

utilizing a classified codebook which is chosen on a basis of the first vector index of the original block and the quadrant label of the sub-block at the receiving end; and

looking up the codevector on a basis of the second vector index of the transmitted sub-block at the receiving end, in the chosen classified codebook that is identical with the classified codebook at the transmitting end, so that a reconstruction is obtained for the sub-block; and in which method, while designing each classified codebook, a utilized training image material is that part of an original training image set which belongs to a respective class, that is those quadrantsize sub-blocks of the training image set which receive a class index corresponding to a particular class of the codebook, when the above described steps are applied to the training image set itself.

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5,692,013

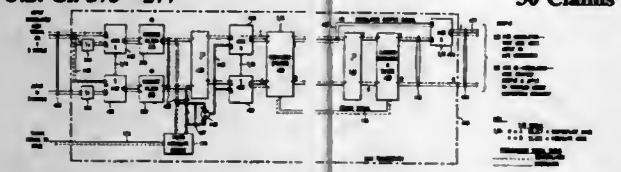
SHARED RESOURCES MODULATOR-DEMODULATOR CIRCUITS FOR USE WITH QUADRATURE AMPLITUDE MODULATED SIGNALS

Joshua Lawrence Koslov, Hopewell; Frank Anton Lane, Medford Lakes, and Carl G. Scarpa, Somerset, all of N.J., assignors to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Nov. 7, 1995, Ser. No. 554,696

Int. Cl.^{6} H04L *27/10*

U.S. Cl. 375—277 **30 Claims**



1. Apparatus for a quadrature amplitude modulated (QAM) demodulator/modulator comprising:

a complex multi-function filter, commonly used during QAM modulation and QAM demodulation and responsive to both an input signal and a mode signal, to provide an output filtered signal, wherein the multi-function filter imparts a different pre-defined function to the input signal corresponding to a current state of the mode signal; the mode signal being either in a pre-defined first or second state signifying QAM demodulation or QAM modulation, respectively; wherein the filter, during QAM demodulation and in response to the first state of the mode signal, equalizes the input signal such that the output filtered signal is an equalized version of the input signal, and the filter, during QAM modulation and in response to the second state of the mode signal, imparts a pre-defined frequency response characteristic to the input signal such that the output filtered signal is a frequency compensated version of the input signal; and

a first multiplexor, responsive to the mode signal, for selectively routing as the input signal to the complex multi-function filter either, during QAM demodulation, a complex Nyquist filtered QAM modulated signal or, during QAM modulation, Nyquist filtered symbols.

5,692,014

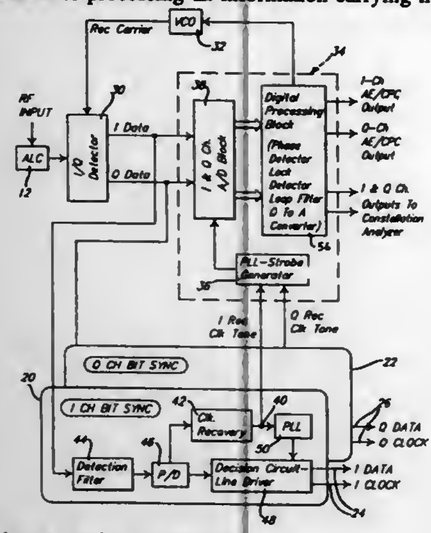
SUBSAMPLED CARRIER RECOVERY FOR HIGH DATA RATE DEMODULATORS

Jack K. Basham, Los Angeles; Keith K. Yamashiro; Pascal G. Finkenbeiner, both of Torrance, all of Calif., and Thomas J. Kolze, Phoenix, Ark., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 3, 1995, Ser. No. 383,381

Int. Cl.^{6} H04L *27/22;7/00*

U.S. Cl. 375—326 **34 Claims**



1. A method of processing an information carrying input signal impressed on a carrier, comprising:

detecting the input signal using an electrically controlled oscillator to generate a local carrier signal and extracting the local carrier signal from the input signal to recover a detected analog signal, said analog signal having a symbol rate;

producing a recovered clock signal in synchronism with the symbol rate of said analog signal;

subsampling the analog signal in an analog to digital conversion process at a sampling rate which is a function of said recovered clock signal, said sampling rate being lower than said symbol rate by a predetermined factor to generate a converted digital signal; and

using the converted digital signal to produce a feedback signal used to control the electrically controlled oscillator and to thereby lock the frequency and phase of the local carrier signal to that of the carrier of the input signal.

5,692,015

COHERENT DETECTOR AND A COHERENT DETECTION METHOD FOR A DIGITAL COMMUNICATION RECEIVER

Akihiro Higashi, Yokosuka; Fumiyuki Adachi; Koji Ohno, both of Yokohama, and Mamoru Sawahashi, Yokosuka, all of Japan, assignors to NTT Mobile Communications Network, Inc., Tokyo, Japan

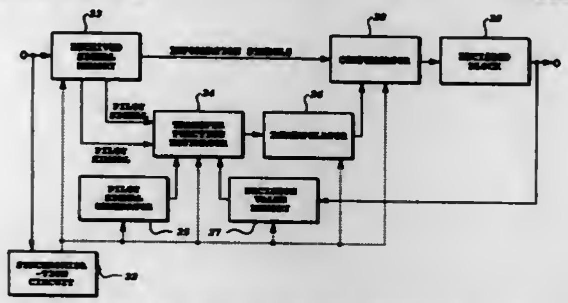
PCT No. PCT/JP95/01229, § 371 Date Nov. 28, 1995, § 102(e) Date Nov. 28, 1995, PCT Pub. No. WO95/35615, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 21, 1995, Ser. No. 553,464

Claims priority, application Japan, Jun. 22, 1994, 6-140569

Int. Cl.^{6} H03D *1/00;* **H04L** *27/06*

U.S. Cl. 375—340 **7 Claims**



1. A coherent detector for a digital communication receiver, which performs coherent detection of a received signal including pilot signals of a known pattern and information signals, by estimating transfer functions of a propagation path of said received signal for individual information symbols of said information signals on the basis of said pilot signals, by correcting said information symbols with said estimated transfer functions, and by deciding corrected information symbols, each of said pilot signals alternating with each one of said information signals at a fixed period, said coherent detector comprising:

a received signal memory for storing said received signal;

pilot signal generating means for generating said pilot signals of said known pattern;

transfer function estimation means for estimating said transfer functions of the propagation path using said pilot signals stored in said received signal memory and said pilot signals of said known pattern supplied from said pilot signal generating means;

interpolation means for interpolating a plurality of said estimated transfer functions estimated by said transfer function estimation means, thereby obtaining said transfer functions of the propagation path of said information symbols;

compensation means for compensating said information symbols stored in said received memory by using said transfer functions obtained by said interpolation means;

decision means for deciding said information symbols compensated by said compensation means; and

pseudo-pilot signal storing means for storing a predetermined number of said information symbols which are outputted from said decision means and adjacent to said pilot signals as pseudo-pilot signals,

wherein said transfer function estimation means reestimates said transfer functions of the propagation path for the individual information symbols corresponding to the pseudo-pilot signals by using the pseudo-pilot signals and said information symbols in said received signal memory which correspond to the pseudo-pilot signals.

5,692,016

PROCESS AND ARRANGEMENT FOR ADJUSTING THE LOCAL OSCILLATORS OF A RECEIVER IN A MULTI-CHANNEL TRANSMISSION SYSTEM

Frank Vanselow, Dormitz, Germany, assignor to Grundig E.M.V. Elektromechanische Versuchsanstalt Max Grundig GmbH Co. KG, Fuerth, Germany

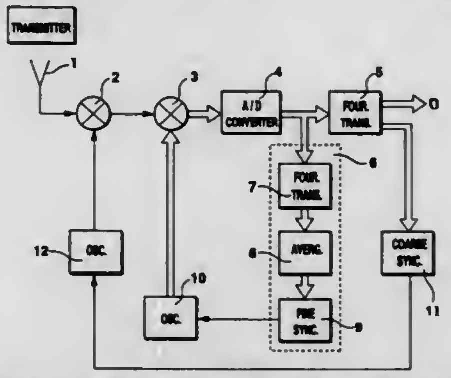
PCT No. PCT/EP94/01139, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO94/29984, PCT Pub. Date Dec. 22, 1994

PCT Filed Apr. 13, 1994, Ser. No. 557,073

Claims priority, application Germany, Jun. 15, 1993, 43 19 769.8

Int. Cl.^{6} H04L *7/04;27/16;27/22*

U.S. Cl. 375—344 **8 Claims**



6. An apparatus for synchronizing local oscillators of a receiver in a multi-channel transmission system, the system sending and receiving a first synchronism symbol at the beginning of a frame and additional synchronism Symbols in subsequent data symbols, the additional synchronism symbols having a spectral width smaller than a spectral width of the first synchronism symbol, the system comprising:

a first mixer having a radio frequency input and a first mixer output;

a first local oscillator connected to the first mixer for producing an intermediate frequency signal at the first mixer output;

a second mixer connected to the first mixer output and having a second mixer output;

a second local oscillator connected to the second mixer for producing two basis band signals in quadrature phase relationship at the second mixer output;

an analog to digital converter connected to the second mixer output for digitizing the two basis band signals;

a first Fourier transform device connected to the analog to digital converter for producing a first number of Fourier transformation values equal to a number of subcarriers in the multi-channel transmission system;

a device for coarse synchronization connected to the first Fourier transform device and to at least one of the first and the second local oscillators for coarse synchronization based on an analysis of the first synchronism symbol; and

a device for fine synchronization connected to the analog to digital converter and comprising a second Fourier transform device for producing a second number of Fourier transformation values in a frequency range occupied by the additional synchronism symbols, the second number being larger than the number of subcarriers, the fine synchronization device analyzing the first as well as the additional synchronism symbols, the fine synchronization device connected to at least one of the first and second local oscillators for fine synchronization.

5,692,017

RECEIVING CIRCUIT

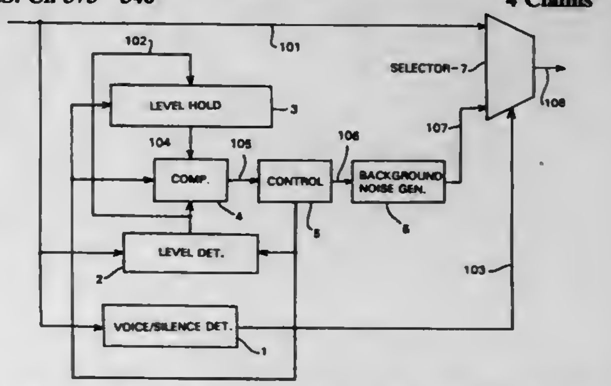
Toshimichi Shiokawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 20, 1995, Ser. No. 504,513

Claims priority, application Japan, Jul. 20, 1994, 6-189054

Int. Cl.^{6} H04M *1/74;* **H04L** *1/00*

U.S. Cl. 375—346 **4 Claims**



1. A receiving circuit comprising voice/silence detection means for detecting whether an input signal is voiced or voiceless, signal level detection means for detecting a signal level of said input signal, background noise outputting means for outputting a background noise signal, selection means for selecting and outputting said input signal during a voiced period and said background noise signal during a voiceless period, holding means for temporarily holding an output signal from said signal level detection means, and comparison means for comparing an output signal currently produced by said signal level detection means with an output signal from said holding means, said background noise outputting means outputting said background noise signal in response to an output of said comparison means.

5,692,018

TIME-DIVERSITY INTERFERENCE CANCELER WITH ADD/SUBTRACT/SELECT CIRCUIT RESPONSIVE TO DECISION ERROR

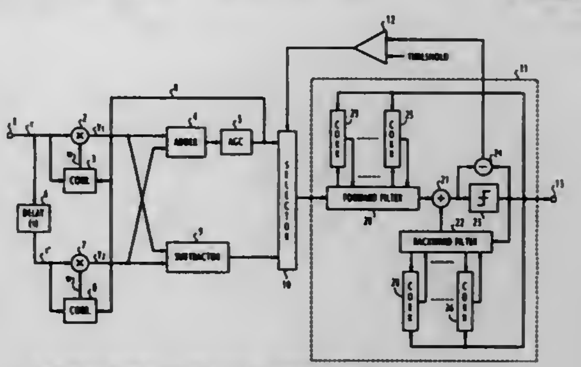
Shingo Okamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 10, 1996, Ser. No. 630,527

Claims priority, application Japan, Apr. 11, 1995, 7-085368

Int. Cl.^{6} H04B *7/08;* **H04L** *27/22*

U.S. Cl. 375—347 **4 Claims**



1. An interference canceler comprising:

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a first time-diversity branch including a first complex multiplier for multiplying a signal recovered from a quadrature modulated carrier by a first correlation value;

a second time-diversity branch including a delay element for producing a delayed version of the recovered signal and a second complex multiplier for multiplying the delayed version of the recovered signal by a second correlation value;

an adder for additively combining output signals from the first and second complex multipliers;

a subtractor for subtractively combining the output signals of said complex multipliers;

amplifier means for producing a reference signal representative of an envelope of the output signal of the adder;

a first correlator for detecting a correlation between the recovered signal and the reference signal and deriving therefrom said first correlation value;

a second correlator for detecting a correlation between the delayed version of the recovered signal and the reference signal and deriving therefrom said second correlation value;

a selector for selecting one of the outputs of the amplifier means and the subtractor;

a decision feedback equalizer for operating on the output signal selected by the selector to produce a decision output and a decision error; and

a comparator for comparing the decision error with a threshold value and controlling said selector depending on whether the decision error is higher or lower than the threshold value.

5,692,019

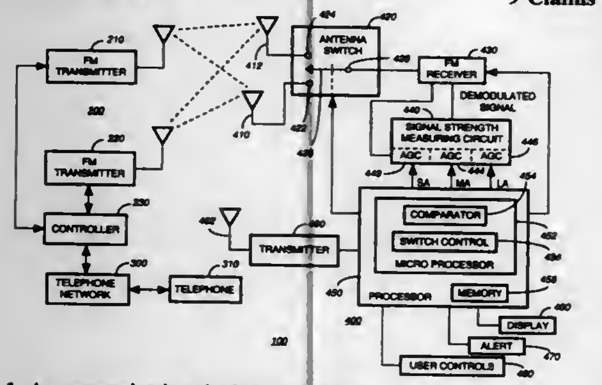
COMMUNICATION DEVICE HAVING ANTENNA SWITCH DIVERSITY, AND METHOD THEREFOR

Chun-Ye Susan Chang, Boca Raton; Jian-Cheng Huang, Lake Worth; Lu Chang, Boca Raton; Lorenzo Ponce De Leon; David Petreye, both of Lake Worth; James Michael Keba, Wellington, and Clinton C. Powell, II, Lake Worth, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Flied Jun. 17, 1996, Ser. No. 664,747

Int. Cl.^{6} H04B *7/10;* **H04L** *1/02*

U.S. Cl. 375—347 **9 Claims**



1. A communication device comprising:

a first antenna having substantially horizontal polarization for receiving transmitted simulcast signals;

a second antenna having substantially vertical polarization for receiving transmitted simulcast signals;

a receiver circuit for demodulating the transmitted simulcast signals received by the first antenna or the second antenna and generating a demodulated signal;

an antenna switch coupled to the receiver circuit, to the first antenna and to the second antenna, and being responsive to a switch control signal for coupling either the first antenna to the receiver circuit or the second antenna to the receiver circuit;

a signal strength measuring circuit coupled to the receiver circuit and measuring a signal strength of the demodulated signal and generating as output a short-term average signal power representing signal strength over a first predetermined number of symbol periods, a medium-term average signal power representing signal strength over a second predetermined number of symbol periods, and a long-term average signal power representing signal strength over a third predetermined number of symbol periods, the third predetermined number of symbol periods being greater than the second predetermined number of symbol periods which is greater than the first predetermined number of symbol periods, said signal strength measuring circuit periodically updating the short-term average signal power, the medium-term average signal power and the long-term average signal power; and

a switch control circuit coupled to the signal strength measuring circuit and the antenna switch, and generating the switch control signal to switch antenna selection from one of the first antenna and the second antenna to an other of the first antenna and the second antenna when the short-term average signal power decreases to less than a first predetermined fraction of the long-term average signal power when said one of the first antenna and the second antenna is coupled to the receiver circuit, and switching antenna selection from said other of the first antenna and the second antenna to said one of the first antenna and the second antenna when the short-term average signal power is greater than the first predetermined fraction of the long-term average signal power and the medium-term average signal power is less than a second predetermined fraction of the long-term average signal power while said other antenna of the first antenna and the second antenna is coupled to the receiver circuit.

5,692,020

SIGNAL PROCESSING APPARATUS AND METHOD

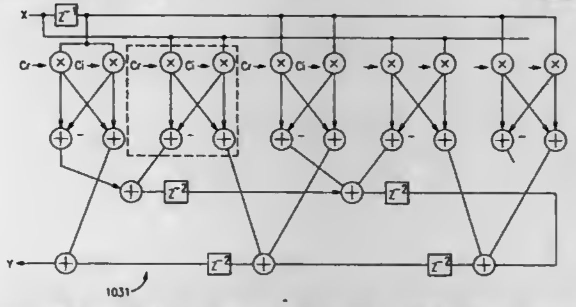
William P. Robbins, Cam, United Kingdom, assignor to Discovision Associates, Irvine, Calif.

Division of Ser. No. 481,107, Jun. 7, 1995. This application Jun. 7, 1995, Ser. No. 481,541

Claims priority, application United Kingdom, Jun. 7, 1995, 9511568

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 375—350 **5 Claims**



1. Apparatus for processing a train of signal pulses having even-numbered and odd-numbered pulses, comprising:

a pulse shaping Nyquist filter having a plurality of even-numbered taps and a plurality of odd-numbered taps;

a frequency down converter coupled to said filter, and operative on said signal pulses;

a circuit incorporated in said Nyquist filter for removing a portion of said signal pulses;

a stream-splitting circuit for connecting the even-numbered pulses to said even-numbered taps, and for connecting the odd-numbered pulses to said odd numbered taps;

a plurality of first multipliers for multiplying said even-numbered pulses by a first set of coefficients;

a plurality of second multipliers for multiplying said odd-numbered pulses by a second set of coefficients; and

a plurality of adding circuits, each connected to an output of one of said first multiplier and an output of one of said second multiplier.

5,692,021

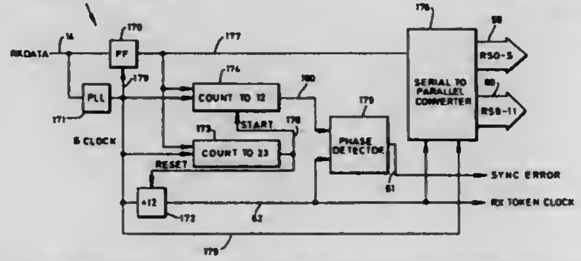
ENCODING DIGITAL DATA

Christopher Paul Hulme Walker, Portishead, United Kingdom, assignor to SGS-Thomson Microelectronics Limited, Bucks, United Kingdom

Division of Ser. No. 259,522, Jun. 10, 1994, abandoned. This application Jul. 25, 1996, Ser. No. 687,202

Int. Cl.^{6} H03L *7/07*

U.S. Cl. 375—354 **13 Claims**



1. Data receiving circuitry including a synchronisation detection circuit comprising;

a clock generator connected to receive an incoming stream of bits and to generate therefrom a bit clock having a clock edge defining each bit position in the bit stream;

a counter arranged to receive the incoming bit stream and the bit clock and to count the number of successive transitions in the incoming bit stream and to provide a first output signal when the count is twelve;

a clock divider for dividing the bit clock by twelve to produce a second output signal every twelfth clock edge; and

a phase detector means for comparing said first and second output signals and for providing an error signal when they are out of phase.

5,692,022

BIT SYNCHRONIZER

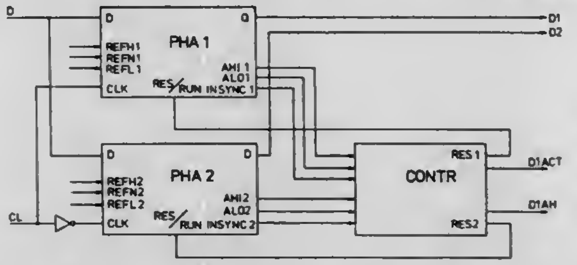
Tord Lennart Haulin, Upsala; Per M. Segerbäck, Vällingsby, both of Sweden, and Heinz Mäder, Weinfelden, Switzerland, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 472,879, Jun. 7, 1995, abandoned, which is a division of Ser. No. 203,382, Mar. 1, 1994, abandoned. This application Jul. 18, 1996, Ser. No. 683,410

Claims priority, application Sweden, Mar. 1, 1993, 9300679

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—357 **9 Claims**



1. A bit synchronizer for interpreting a bit data stream of preferably high data speed received by a receiver in a plesiochronous communication system having a global reference clock, said synchronizer comprising:

a first phase aligner and a second phase aligner; said first phase aligner being designated as a primary phase aligner and said second phase aligner being designated as a secondary phase aligner, said secondary phase aligner being deactivated into a standby state when the primary phase aligner delay is within a delay adjustment range,

wherein when the primary phase aligner is in danger of leaving its delay adjustment range as a result of following a varying phase relationship between said global clock and said bit data stream, said second phase aligner is activated and becomes the primary phase aligner upon achieving a lock to said global clock, said first phase aligner then becomes the secondary phase aligner being deactivated into a standby state when instructed by a function control, wherein the first phase aligner is ready to take over phase alignment when said second phase aligner is in danger of leaving its delay adjustment range as a result of following a varying phase relationship between said said reference clock and said bit data stream.

5,692,023

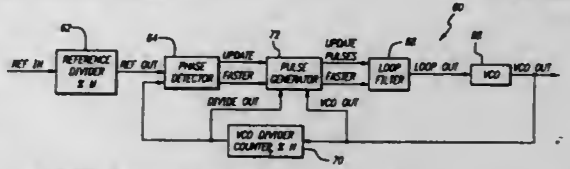
PHASE LOCKED LOOP INCLUDING DISTRIBUTED PHASE CORRECTION PULSES FOR REDUCING OUTPUT RIPPLE

Iain Clark, Newark, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Nov. 4, 1994, Ser. No. 334,747

Int. Cl.^{6} H03D *3/24*

U.S. Cl. 375—376 **24 Claims**



1. A phase locked loop circuit, comprising:

a voltage controlled oscillator (VCO) for producing VCO pulses having a frequency corresponding to a control voltage;

a phase detector for producing an update signal having a pulsewidth corresponding to a phase difference between said VCO pulses and input reference pulses;

a loop filter for producing said control voltage; and

a pulse generator connected between the phase detector and the loop filter for:

producing a plurality of update pulses having a combined pulsewidth that is substantially equal to said pulsewidth of said update signal;

substantially uniformly distributing said update pulses within a period of said input reference pulses; and

feeding said update pulses to the loop filter such that said control voltage is varied in response to said update pulses and said frequency of said VCO pulses is varied to adjust said phase difference toward zero.

5,692,024

REACTOR PRESSURE VESSEL TOP GUIDE STRUCTURE INSPECTION APPARATUS AND TRANSPORT SYSTEM

Richard G. McClelland, Richland; Lawrence R. Fox; Edward J. Ruzauskas, both of Kennewick, and Douglas A. Adkisson, Richland, all of Wash., assignors to Siemens Power Corporation, Richland, Wash.

Filed Aug. 16, 1996, Ser. No. 699,096

Int. Cl.^{6} G21C *17/00*

U.S. Cl. 376—245 **21 Claims**

1. A remotely positionable and controllable underwater crawler vehicle for traversing the top edges of a top guide structure of a reactor pressure vessel of a nuclear reactor, the top guide structure comprised of two sets of parallel grid members which are interconnected to form a lattice of rectangular shaped openings, a plurality of nuclear fuel assemblies each removable from and supported toward a lower end by a core support plate, the upper ends of said fuel assemblies extending into said rectangular shaped openings for lateral support in the top guide structure, said fuel assemblies having an outer channel wall extending from a lower end of the fuel assembly to an upper end of the fuel assembly terminating above the top edges of the top guide structure, said vehicle comprising:

a central frame for supporting a plurality of wheels;

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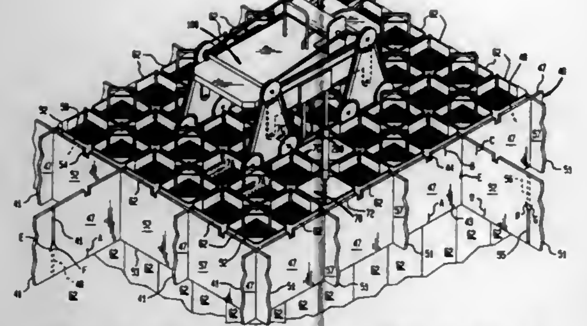


- a plurality of wheels for receiving a continuous track, at least one of the plurality of wheels for rolling on the top edges of the parallel grid members of the top guide structure;
- mounting means for mounting the plurality of wheels to the central frame;
- a continuous track extending around the plurality of wheels and for engaging the top edges of the parallel grid members of the top guide structure to provide movement of said crawler system vehicle along said top edges; and
- a drive means secured to the central frame for rotating at least one of the plurality of wheels to cause the continuous track to move and engage the top edges of the grid members.

5,692,025

IMAGE-SENSING-SYSTEM BOOSTER CIRCUIT FOR DRIVING IMAGE SENSOR

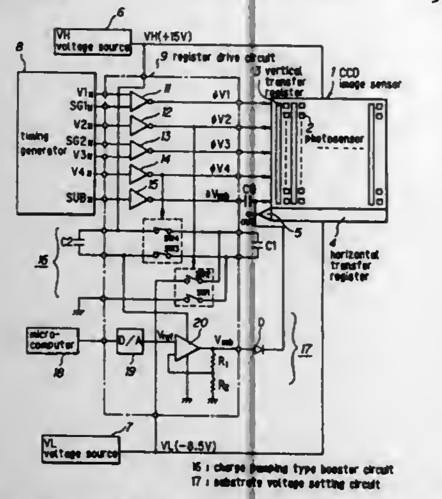
Yasushi Sato, and Nobuhiko Ohsawa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 242,864, May 16, 1994, Pat. No. 5,469,484, which is a continuation of Ser. No. 127,508, Sep. 28, 1993, abandoned. This application May 17, 1995, Ser. No. 442,684

Claims priority, application Japan, Sep. 29, 1992, 4-285224

Int. Cl.⁶ G11C *19/28;* **H01L** *27/14;* **H03K** *3/01;3/42*

U.S. Cl. 377—58 **9 Claims**



1. A driving circuit for a solid-state imaging device having a plurality of photo sensors generating charges corresponding to an incident light thereon and accumulating the charges therein, a video signal output means outputting a video signal corresponding to the accumulated charges and a charge drain discharging the charges from the plurality of photo sensors, the driving circuit comprising:

- a register drive circuit driving the video signal output means in response to a timing signal;
- a booster circuit receiving a first voltage and a second voltage, said booster circuit generating a third voltage greater than the second voltage, the second voltage being greater than the first voltage, said booster circuit being driven in synchronism with the timing signal; and
- a voltage setting means for setting a drive voltage of the charge drain based on the third voltage.

5,692,026

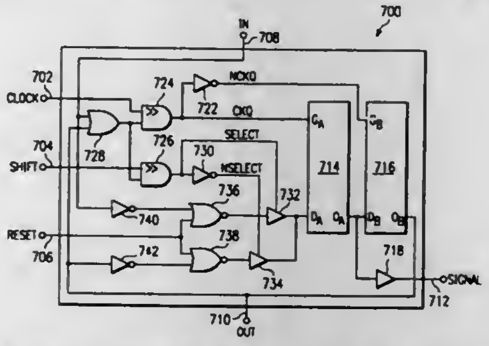
APPARATUS FOR REDUCING CAPACITIVE LOADING OF CLOCK AND SHIFT SIGNALS BY SHIFTING REGISTER-BASED DEVICES

Kenneth Koch, II, and William J. Queen, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 31, 1996, Ser. No. 657,732

Int. Cl.⁶ G11C *19/00*

U.S. Cl. 377—73 **5 Claims**



1. An enhanced data cell for reducing the capacitive load presented to at least one of the control signals used to drive a shift register, said shift register of the kind having a plurality of data cells, each of said plural data cells having a data input, a data output and at least one control input, said enhanced data cell comprising:

- a first pass-AND gate having a switched input and a switching input, said switching input operable to toggle the capacitive load of said switched input between two different values;
- a first OR gate; and
- wherein said switched input of said first pass-AND gate is adapted to be coupled to a first of said control signals, said switching input of said first pass-AND gate is coupled to the output of Said first OR gate, one input of said first OR gate is coupled to said data input, another input of said first OR gate is coupled to said data output, and the output of said first pass-AND gate is coupled to a first of said at least one control inputs.

5,692,027

RADIOGRAPHIC APPARATUS AND SUPPORTING DEVICE AND METHOD FOR THE SAME

Takahiro Yoshimura; Eiichi Arai, and Kouichi Sonobe, all of Kyoto, Japan, assignors to J. Morita Manufacturing Corporation, Kyoto, Japan

Filed Apr. 12, 1995, Ser. No. 420,578

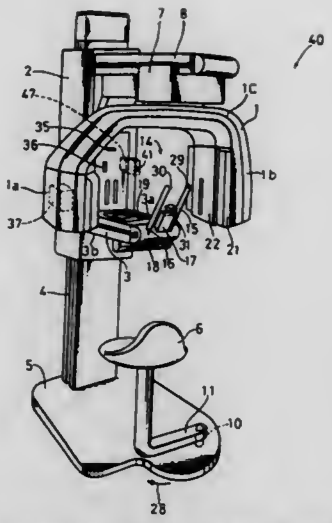
Claims priority, application Japan, Apr. 13, 1994, 6-075135; Mar. 29, 1995, 7-071944

Int. Cl.⁶ A61B *6/14*

U.S. Cl. 378—38 **5 Claims**

1. A radiographic apparatus comprising:

- a base;
- a post standing up on the base;
- an ascending/descending main body provided on the post so as to be free to move up and down;
- a swivel arm in which an X-ray source and detecting means for detecting X-rays radiated from the X-ray source are arranged so as to confront each other;



- swivel and driving means for moving and driving the swivel arm along a desired track, the swivel and driving means being interposed between the ascending/descending main body and the swivel arm;
- holding means for positioning and holding a head of a patient at a desired radiographic position between the X-ray source and the detecting means;
- a support frame, provided on and depended from the ascending/descending main body, for supporting the holding means, to which the holding means is attached; and
- an operation panel for inputting radiographic conditions, collectively disposed on an upper part of the support frame, the operation panel including input means for entering input information which determines the radiographic conditions as well as display means for displaying information which aids the input operation by the input means, and wherein:
  - the input means comprises selection means for selecting any one of a plurality of predetermined radiographic modes, means for selecting setting conditions of the radiographic mode selected by the radiographic mode selection means, and means for inputting parameters of the setting conditions selected by the setting conditions selection means; and the display means includes a display region to display the radiographic mode selected by the radiographic mode selection means, a display region to display the setting conditions of the radiographic mode displayed in the radiographic mode displaying region; a display region to display the parameters of the setting conditions displayed in the setting conditions display region, and a display region to schematically display in figures and characters information related to radiography, said information including desired radiographic position thereof, projection angle of said X-ray source, and tomographic shape, and
  - the display means displays a plurality of tomographic position display lines of a radiographic site and each of said display lines moves the radiographic site in response to the parameters of the setting conditions selected by the setting conditions selection means.

5,692,028

X-RAY EXAMINING APPARATUS FOR LARGE-VOLUME GOODS

Georg Geus, Wiesbaden-Freudenberg; Norman Hahn, Wiesbaden, and Bernd Zollmann, Hühnfeldern-Nauheim, all of Germany, assignors to Heimann Systems GmbH, Wiesbaden, Germany

Filed Sep. 6, 1996, Ser. No. 708,936

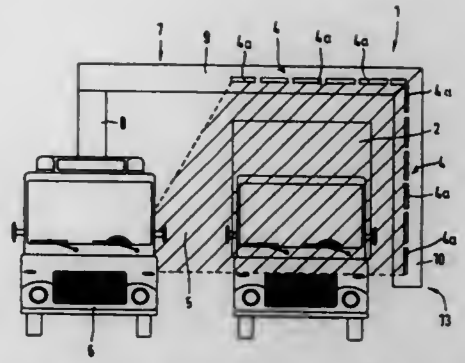
Claims priority, application Germany, Sep. 7, 1995, 195 32 965.1

Int. Cl.⁶ G01N *23/04*

U.S. Cl. 378—57 **5 Claims**

1. An X-ray examining system comprising

(a) a mobile vehicle; and



(b) an X-ray examining apparatus for ascertaining contents of an object; said apparatus including

- (1) a supporting structure mounted on said mobile vehicle; said supporting structure being portal-shaped for surrounding the object on top and on opposite sides thereof during X-ray examination; said supporting structure including
  - (i) a generally vertical column mounted on said vehicle and rotatable relative to said vehicle about a generally vertical axis; said column having an upper end;
  - (ii) a generally horizontal beam having opposite first and second end portions; said beam being attached to said upper end at said first end portion for rotation with said column as a unit for assuming an inoperative position vertically above said mobile vehicle and an operative position in which said beam extends laterally from said vehicle; and
  - (iii) an arm pivotally attached to said second end portion of said beam for assuming an inoperative position in which said arm extends parallel to said beam and an operative position in which said arm extends generally vertically downwardly from said beam;
- (2) an X-ray source for generating a fan-shaped X-ray beam; said X-ray source being carried by said vehicle; and
- (3) an X-ray detector mounted on said supporting structure; said X-ray examining system being adapted to travel along the object to be examined while irradiating the object and detecting the X-rays after passage thereof through the object.

5,692,029

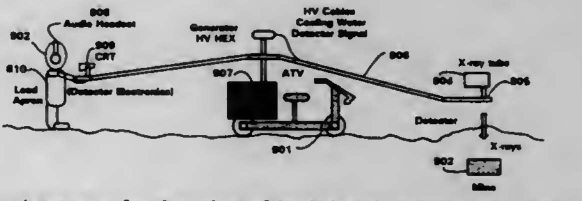
DETECTION OF CONCEALED EXPLOSIVES AND CONTRABAND

Abdo A. Husseiny, LaPlace; Edwin D. Stevens, New Orleans, and Zeinab A. Sabri, LaPlace, all of La., assignors to Technology International Incorporated, LaPlace, La.

Division of Ser. No. 341,139, Nov. 16, 1994, abandoned, which is a continuation of Ser. No. 4,858, Jan. 15, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 467,983

Int. Cl.⁶ G01N *23/201*

U.S. Cl. 378—88 **10 Claims**



1. Apparatus for detection of buried antipersonnel land mines and explosive-filled ordnance, comprising:

- a vehicle for articulatingly supporting a boom;
- an x-ray generation means mounted on a first end of said boom for generating x-rays;
- a detection means mounted on said first end of said boom for detecting backscattered x-rays from the earth surface and earth covered objects;

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an advance control means for controlling the advancement of said boom;

an audio and visual alarm means for notifying an operator of at least the possible presence of land mines and explosive-filled ordnance mounted on a second end of said boom; and

shielding means for shielding an operator;

wherein said vehicle is positioned between said first and second ends of said boom and is remotely operated by said operation.

5,692,030

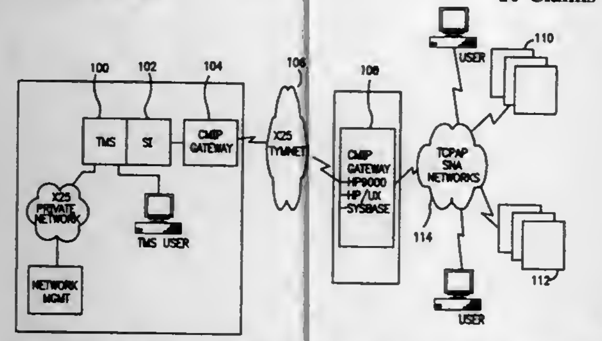
ELECTRONIC INTERFACE FOR EXCHANGE OF TROUBLE ADMINISTRATION INFORMATION IN TELECOMMUNICATIONS

Eugene William Teglovic; Mary Marguerite Oglesby, both of Colorado Springs; Bruce Kettle, and Susan Ann Weese, both of Monument, all of Colo., assignors to MCI Communications Corporation, Washington, D.C.

Filed May 31, 1995, Ser. No. 454,732

Int. Cl.^{6} H04M *3/00;3/08;7/00*

U.S. Cl. 379—14 **10 Claims**



8. A method for electronically exchanging a trouble information between a long distance carrier network and a local exchange carrier network, comprising:

opening a trouble ticket in a first trouble administration system in response to a notification of a problem;

determining a location of said problem;

in response to said problem occurring on another network, referring said trouble ticket to a second trouble administration system of said other network by converting said trouble ticket into a common data format and transmitting via a communications medium to said second trouble administration system.

5,692,031

METHOD FOR CONFIGURING A BASE STATION

Ronald Edward Sharp; Prashanth Makonahalli Lakshman Gowda; Baheerathan son of Rajalingam, and Ng See Woon, all of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 14, 1994, Ser. No. 275,224

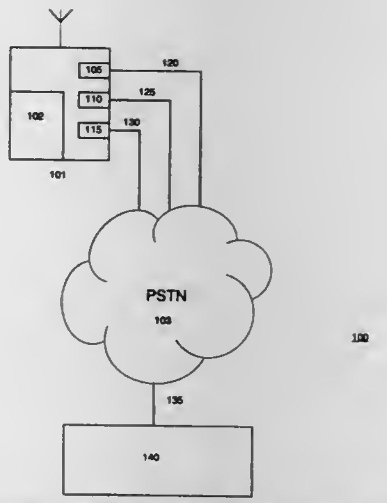
Int. Cl.^{6} H04M *11/00;* **H04Q** *7/00*

U.S. Cl. 379—58 **4 Claims**

1. A method for coupling a base station to a public switched telephone network (PSTN), wherein the base station has a base station channel therein, and wherein the base station channel has a base station channel identifier (ID) affiliated therewith, the method comprising the steps of:

a) coupling the base station channel of the base station to a subscriber channel of the PSTN, wherein the subscriber channel has a subscriber channel identifier (ID) affiliated therewith;

b) calling a controller on the base station channel employing a calling line identity function of the PSTN to provide the subscriber channel ID to the controller;



c) in response to the call in step (b), receiving a call from the controller via the base station channel, wherein the call from the controller provides the subscriber channel ID to the base station; and

d) upon receiving the subscriber channel ID, storing the subscriber channel ID with the base station channel ID at the base station, thereby affiliating the base station channel ID and the subscriber channel ID.

5,692,032

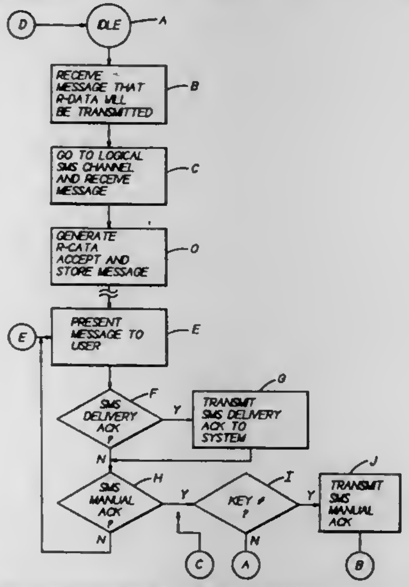
MOBILE TERMINAL HAVING ONE KEY USER MESSAGE ACKNOWLEDGMENT FUNCTION

Jorma Seppänen, Oulu; Juha Vaihoja, Tupos; Mikko Lietsalmi, and Jaakko Vänttilä, both of Oulu, all of Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Nov. 27, 1995, Ser. No. 562,900

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 379—59 **14 Claims**


D
IDLE
A
RECEIVE MESSAGE THAT R-DATA WILL BE TRANSMITTED
B
GO TO LOGICAL SMS CHANNEL AND RECEIVE MESSAGE
C
GENERATE R-DATA ACCEPT AND STORE MESSAGE
D
E
PRESENT MESSAGE TO USER
E
SMS DELIVERY ACK ?
F
Y
TRANSMIT SMS DELIVERY ACK TO SYSTEM
G
N
SMS MANUAL ACK ?
H
Y
KEY # ?
I
Y
TRANSMIT SMS MANUAL ACK
J
N
N
C
A
B

6. A method for operating a cellular radiotelephone of a type that is bidirectionally coupled to a network through an RF interface, said cellular radiotelephone comprising a keypad having a plurality of keys and a display device for displaying information, including messages, to a user, comprising the steps of:

transmitting a short message service (SMS) message from the network to the cellular radiotelephone;

receiving the SMS message from the network and storing the message in a memory of the cellular radiotelephone;

presenting the stored SMS message to a user;

determining if the presented SMS message requires a manual acknowledgment by the user and, if so, monitoring an output of the keypad to detect a single key depression by the user; and

determining if the user's single key depression is a depression of one of a predetermined set of keys and, if so, generating and transmitting to the network a SMS manual acknowledgement message that includes an identification of the single key depressed by the user.

5,692,033

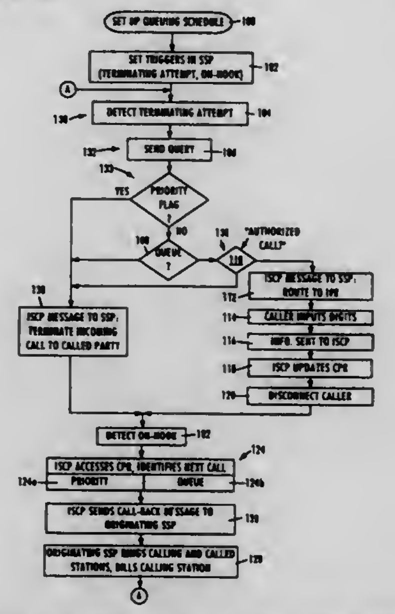
AIN QUEUING FOR CALL-BACK SYSTEM

Robert D. Farris, Sterling, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Jan. 22, 1996, Ser. No. 589,360

Int. Cl.^{6} H04M *3/00*

U.S. Cl. 379—67 **19 Claims**


SET UP QUEUING SCHEDULE
100
SET TRIGGERS IN SSP (TERMINATING ATTEMPT, ON-HOOK)
102
A
DETECT TERMINATING ATTEMPT
104
SEND QUERY
106
PRIORITY FLAG
YES
NO
QUEUE ?
"AUTHORIZED CALL?"
ISCP MESSAGE TO SSP: TERMINATE INCOMING CALL TO CALLED PARTY
ISCP MESSAGE TO SSP: ROUTE TO IPE
112
CALLER INPUTS DIGITS
114
INFO. SENT TO ISCP
116
ISCP UPDATES CPR
118
DISCONNECT CALLER
120
DETECT ON-HOOK
122
ISCP ACCESSES CPR, IDENTIFIES NEXT CALL
124
PRIORITY
QUEUE
124a
124b
ISCP SENDS CALL-BACK MESSAGE TO ORIGINATING SSP
126
ORIGINATING SSP RINGS CALLING AND CALLED STATIONS, BILLS CALLING STATION
128
A

1. A public telephone network for providing a queuing service for a called party without the necessity for computer-based queuing systems at a called party's premises, comprising:

a services control point database storing call processing data for the called party subscribing to the queuing service, said call processing data including a queue list for queued calling stations;

a plurality of interconnected central office switching systems forming connections between a plurality of local communication lines, one of the central office switching systems having a first of said local communication lines connected thereto and serving the called party, the one central office switching system outputting a first query message to the database in response to a service request to provide a communication connection between said first local communication line and an incoming call on a second of said local communication lines, the one central office switching system outputting a second query message to the database in response to a disconnect condition detected on said first local communication line;

a signaling communication system for two-way communications of messages between the central office switching systems and the services control point database;

wherein:

in response to said first query message, said database:

(1) outputs a first database message for said one central office switching system to connect the first and second local communication lines if the queue list is empty, and

(2) stores data identifying the second local communication line in the caller queue list if the queue list is not empty; and

in response to said second query message, said database outputs a second database message to initiate a call between the called party and a calling station identified at the top of the queue list.

5,692,034

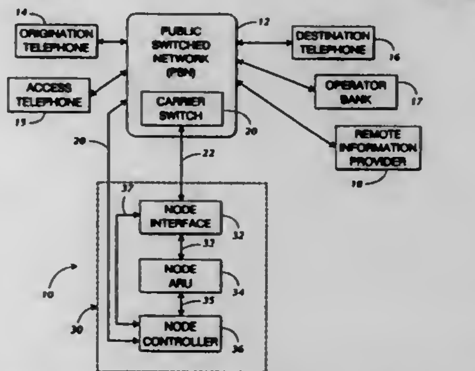
CUSTOMIZED, BILLING-CONTROLLED CALL BRIDGING SYSTEM

Charles Thomson Richardson, Jr., Norcross; Kevin Lee Austin, Roswell, and Samuel F. Billingsley, III, Atlanta, all of Ga., assignors to United States Advanced Network, Inc., Norcross, Ga.

Continuation of Ser. No. 254,166, Jun. 6, 1994, Pat. No. 5,581,607, which is a continuation of Ser. No. 861,630, Apr. 1, 1992, Pat. No. 5,355,403, which is a continuation-in-part of Ser. No. 852,491, Mar. 16, 1992, Pat. No. 5,317,627, which is a continuation of Ser. No. 591,047, Oct. 1, 1990, Pat. No. 5,113,430. This application May 19, 1995, Ser. No. 444,571

Int. Cl.^{6} H04M *1/64;3/42*

U.S. Cl. 379—88 **28 Claims**



1. A method of bridging a call between an origination telephone having an origination number and a destination telephone having a destination number, said method comprising the steps of:

connecting a self-controlled bridging node located outside of a public switched network to a telecommunications switch located within the public switched network, wherein the self-controlled bridging node includes, at least, a node interface having a plurality of ports connected to a plurality of trunks from the telecommunications switch and an audio response unit connected to the node interface, the audio response unit storing a plurality of messages;

receiving on a first communication path at the node interface from the telecommunications switch a call bridging request including, at least, a destination number assigned to a destination telephone located remotely from the bridging node, as a result of a caller dialing the destination number to initiate a telephone call from an origination telephone located remotely from the bridging node and to which origination telephone is assigned the origination number;

answering the telephone call on the first communication path at a first port of the plurality of ports;

supplying the destination number to the telecommunications switch, including a step of generating a plurality of signals representative of the destination number at the audio response unit and a step of transmitting the plurality of signals through a second communication path from a second port of the plurality of ports to the telecommunications switch; and

bridging together the first communication path and the second communication path at the node interface to provide a connection between the origination telephone and the destination telephone.

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5,692,035

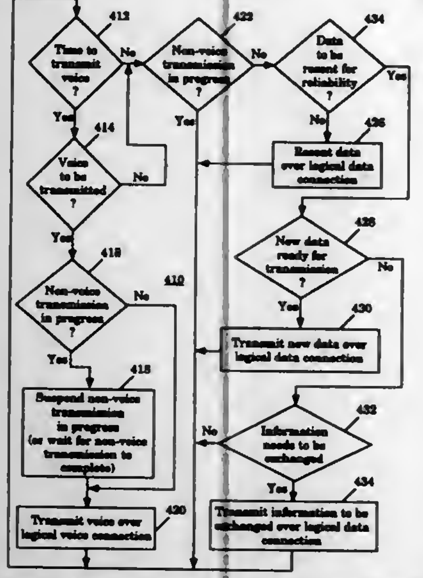
METHOD AND APPARATUS FOR MULTIPLEXING VOICE AND DATA ON A SINGLE ANALOG-LOOP TELEPHONE LINE

Barry O'Mahony, Banks, and Narjala Bhasker, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 265,326, Jun. 24, 1994, abandoned. This application Mar. 22, 1996, Ser. No. 622,444

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—93 **19 Claims**


412
Time to transmit voice ?
No
Yes
422
Non-voice transmission in progress ?
No
Yes
434
Data to be resent for reliability ?
Yes
No
426
Resent data over logical data connection
414
Voice to be transmitted ?
No
Yes
428
New data ready for transmission ?
No
Yes
416
Non-voice transmission in progress ?
No
Yes
410
430
Transmit new data over logical data connection
418
Suspend non-voice transmission in progress (or wait for non-voice transmission to complete)
432
Information needs to be exchanged
No
Yes
434
Transmit information to be exchanged over logical data connection
420
Transmit voice over logical voice connection

13. A method for multiplexing voice and data over an analog-loop telephone line by a data circuit terminating equipment (DCE), the method comprising the steps of:

(a) transmitting voice at nominally fixed time intervals, in accordance to a voice protocol over the telephone line by a microcontroller, using unnumbered information (UI) frames of a frame based transmission protocol that provides multiple logical channels, and identifying the voice transmissions as being intended for a first of the logical channels by setting a data link connection identifier of each of the UI frames to the first logical channel's identification value; and

(b) transmitting either data or information to be exchanged with a cooperating DCE at the other end of the telephone line over the same telephone line, by the microcontroller, when not transmittin.q voice, using numbered information (I) frames the same frame based transmission protocol, and identifying the non-voice transmissions as being intended for a second of the logical channels by setting the DLCI of each of the I frames to the second logical channel's identification value.

5,692,036

FACSIMILE APPARATUS HAVING AUTO CALLING FUNCTION

Toshiaki Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1995, Ser. No. 440,491

Claims priority, application Japan, May 13, 1994, 6-124283

Int. Cl.^{6} H04M *11/00;* H04N *1/00*

U.S. Cl. 379—100 **12 Claims**

1. A facsimile apparatus comprising:

a plurality of manipulation means for auto-calling;

memory means for storing call information on a call of a destination station, corresponding to each of said plurality of manipulation means,

said memory means including a first memory area for storing first information for a sub-address signal or a selective polling signal defined in ITU-T Recommendation T.30 and a second memory area for storing second information for a password signal defined in ITU-T Recommendation T.30;

	DESTINATION'S DIAL NUMBER	DESTINATION'S ABBREV. NAME	SERVICE ACCESS NUMBER	SERVICE ACCESS PASSWORD
ONE-TOUCH 1	5482-7200	A ENTERPRISE DIVISION	0001	NOT YET REGISTERED
ONE-TOUCH 2	5482-1111	B ENTERPRISE DIVISION	0020	1234
⋮	⋮	⋮	⋮	⋮
ONE-TOUCH N	5482-0123	N ENTERPRISE DIVISION	0990	1111

register means for registering the first information or the second information corresponding to each of said plurality of manipulation means in said memory means;

call means, responsive to manipulation of said manipulation means, for calling in accordance with the call information in said memory means corresponding to the manipulated manipulation means; generating means for generating data of the sub-address signal or the selective polling signal in accordance with the first information corresponding to the manipulated manipulation means, or generating data of the password signal in accordance with the second information corresponding to the manipulated manipulation means; and

sending means for sending, to a destination station, the sub-address signal, the selective polling signal, or the password signal in accordance with the generated data.

5,692,037

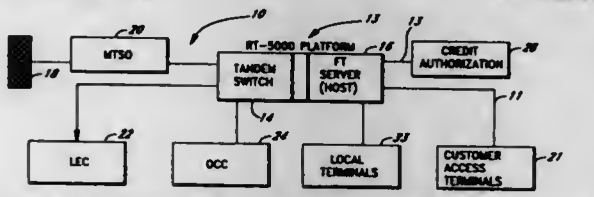
ON DEMAND REAL TIME TELEPHONE BILLING EQUIPMENT

Clarence Friend, Orange County, Calif., assignor to Cellular Development Systems, Huntington Beach, Calif.

Filed Mar. 31, 1995, Ser. No. 414,508

Int. Cl.^{6} H04M *11/00;15/00*

U.S. Cl. 379—114 **9 Claims**



1. An on demand, real time billing equipment for a customer of a rented, radio telephone, including

an unmodified radio telephone which is unable to provide a user on demand with immediate access to billing information,

a telephone switching platform in communication with said unmodified radio telephone and a radio telephone transmitting system, a local telephone transmitting system, and long distance telephone transmitting system,

said telephone switching platform including an unintelligent switch and a computer in communication with a credit authorization center which validates the credit of said customer,

said computer being programed to monitor, control and rate telephone calls made by said customer to tally for each separate customer billing information including the identification of each individual phone number called, the date of each individual phone number called, duration of each individual phone number called, and the cost of each individual call, and make available immediately on demand for each separate customer said billing information, and

an access terminal in communication with the credit authorization center at which the identification of the customer is entered, said terminal having a printer that prints a hard copy bill when the rented telephone is returned, said bill providing the phone numbers of each individual call made using the rented telephone, the date of each individual call, and duration of each individual call.

5,692,038

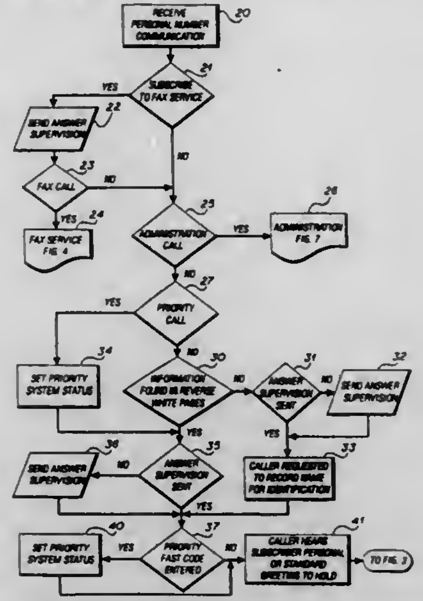
METHOD FOR IDENTIFYING THE SOURCE OF A TELEPHONIC COMMUNICATION

Evan Kraus; Drina C. Yue; Raymond J. Smets, all of Atlanta, and Thomas Joseph Moquin, Roswell, all of Ga., assignors to BellSouth Corporation, Atlanta, Ga.

Continuation of Ser. No. 367,697, Jan. 3, 1995, abandoned, which is a division of Ser. No. 936,384, Aug. 26, 1992, abandoned. This application Nov. 7, 1996, Ser. No. 743,751

Int. Cl.^{6} H04M *1/57;3/42*

U.S. Cl. 379—210 **7 Claims**



1. A method for identifying the source of a communication to a subscriber by a call processing system, comprising the steps of:

receiving said communication on a first calling line by said call processing system;

said call processing system residing within the public switched telephone network;

identifying the calling line number associated with said first calling line by automatic number identification;

accessing a reverse white pages database to provide an identity for said source by finding a database entry corresponding to said first calling line number;

announcing said identity to said source;

requesting said source to confirm said identity;

if confirmed, providing said identity to said subscriber;

routing said communication to said subscriber on a second calling line; and

disposing of said communication.

5,692,039

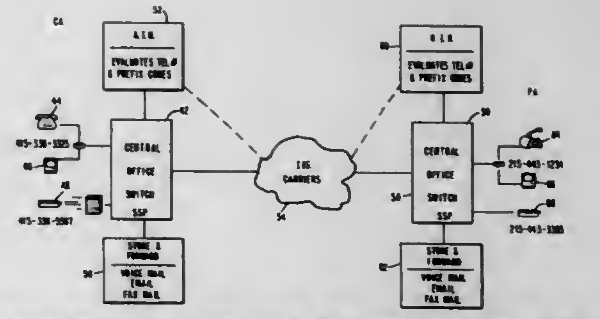
IMPROVED DATA TRANSMISSION VIA A PUBLIC SWITCHED TELEPHONE NETWORK

Russell J. Brankley, Willingboro, N.J., and James M. Dorsey, Havertown, Pa., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation of Ser. No. 232,841, Apr. 22, 1994, Pat. No. 5,467,390, which is a continuation of Ser. No. 859,580, Mar. 27, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,680

Int. Cl.^{6} H04M *3/42*

U.S. Cl. 379—229 **11 Claims**


CENTRAL OFFICE SWITCH SSP
CENTRAL OFFICE SWITCH SSP
EVALUATES TEL # & PREFIX CODES
EVALUATES TEL # & PREFIX CODES
STORE & FORWARD
VOICE MAIL EMAIL FAX MAIL
STORE & FORWARD
VOICE MAIL EMAIL FAX MAIL
52
54
56

1. In a communications system comprising local communication lines, a services control point comprising a database for storing call processing data, a plurality of interconnected central office switching systems each connecting to a plurality of said local communication lines and responding to a service request on a connected local communication line to selectively provide a communication connection for a requesting line, and a signaling communication system interconnecting the central office switching systems and connecting the central office switching systems to the services control point, a method of completing a call comprising the steps of:

receiving at an originating one of the central office switching systems via the requesting line an address for a message to be transmitted to a called party having a data terminal and a telephone, the address and message being generated at an originating facility and the address comprising an NPA-XXX-XXXX address of the called party and an added data set, said added data set being characteristic of a format of the message to be transmitted;

transmitting the address from the originating central office switching system to a destination central office switching system serving the called party via the signaling communication system;

outputting to the services control point via the signaling communications systems a query message from the destination central office switching system in response to the received address, the query message including said NPA-XXX-XXXX address and said added data set;

accessing call processing data corresponding to the called party from the database of said services control point to formulate a connecting message in response to said added data set;

sending a connecting message, generated in response to the accessing step, from the services control point to said destination central office switching system; and

selectively establishing a communication link to a device other than said telephone for the requesting line through said destination central office switching system, in response to said connecting message, to enable the communication of said message to be transmitted.

5,692,040

METHOD OF AND APPARATUS FOR EXCHANGING COMPATIBLE UNIVERSAL IDENTIFICATION TELEPHONE PROTOCOLS OVER A PUBLIC SWITCHED TELEPHONE NETWORK

Richard David Greenblatt, 154 Concord Ave., Belmont, Mass. 02178

Continuation of Ser. No. 269,816, Jun. 30, 1994, abandoned. This application Feb. 29, 1996, Ser. No. 608,977

Int. Cl.^{6} H04M *1/50*

U.S. Cl. 379—350 **17 Claims**

9. Apparatus for use in providing compatible universal identification telephone protocols in a telephone system wherein a plurality of telephones communicate over a telephone channel via a switched telephone network; said telephone protocols using Audio Icon signals consisting of predetermined standardized sequences of unique audio signals of complex rapidly changing spectrum having assigned predetermined meaning and distinct from dial, busy and ring tones, the apparatus comprising:

means for initiating a telephone call from one telephone to a second telephone over the telephone channel;

means for generating an Audio Icon signal at the second telephone in response to said telephone call;

means for sending the generated Audio Icon signal over the telephone channel to said one telephone; and

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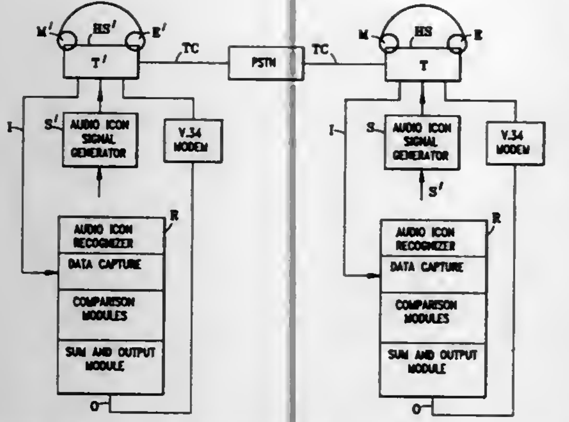


means for recognizing the Audio Icon signal received at said one telephone including signal processing and testing means to confirm the correct identification of the Audio Icon signal.

5,692,041

TELEPHONE SUBSCRIBER CIRCUIT WITH GALVANIC ISOLATION

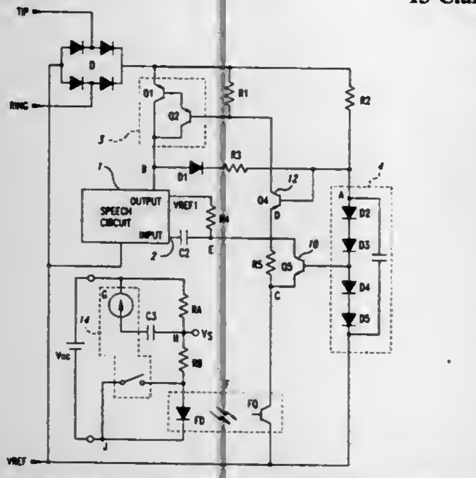
Aldo Torazzina, Blassono, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Oct. 27, 1994, Ser. No. 330,540

Claims priority, application European Pat. Off., Oct. 29, 1993, 93830434

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—379 **13 Claims**



1. A telephone subscriber circuit coupled to the terminals of a telephone subscriber line through a bridge circuit, the telephone subscriber circuit comprising:

a speech circuit for receiving voice signals from the subscriber line and outputting corresponding output voice signals which has at least one input terminal adapted for coupling to a telephonic subscriber apparatus not powered from the telephone line and an output terminal coupled to a terminal of the bridge circuit;

a switch having a first terminal, a second terminal, and a control terminal, the first terminal being coupled to said terminal of the bridge circuit and the second terminal being coupled to said output terminal of the speech circuit; and

a galvanic isolation element having at least one input terminal and one output terminal, wherein the input terminal of said isolation element is coupled to the subscriber apparatus and the output terminal of the isolation element is coupled both to the input terminal of the speech circuit and the control terminal of the switch at a circuit node.

5,692,042

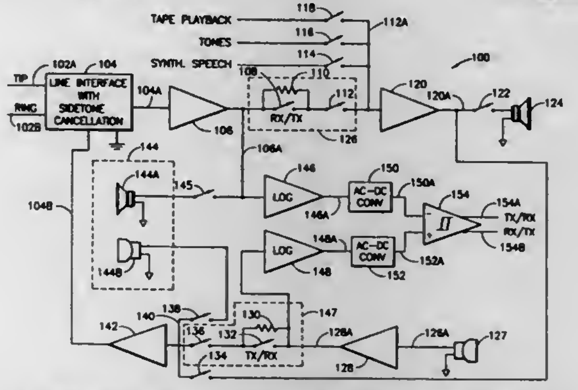
SPEAKERPHONE CONTROLLED BY A COMPARATOR WITH HYSTERESIS

Frank Sacca, West Covina, Calif., assignor to Casio Phone-Mate, Inc., Torrance, Calif.

Filed May 31, 1995, Ser. No. 455,227

Int. Cl.^{6} H04M *9/08*

U.S. Cl. 379—387 **25 Claims**



1. A switching type, half duplex, speakerphone, comprising:

a telephone line interface for receiving a receive signal from a telephone line and transmitting a transmit signal to a telephone line, said telephone line interface including a sidetone cancellation circuit for eliminating a substantial portion of the transmit signal from the receive signal;

a receive amplifier for amplifying the receive signal;

a transmit amplifier for amplifying signals from a main microphone to provide the transmit signal;

a main loudspeaker for converting the receive signal to an audible signal;

a first non-linear amplifier for compressing the receive signal to provide a compressed receive signal;

a second non-linear amplifier for compressing the transmit signal to provide a compressed transmit signal;

a first level detector for detecting a level of the receive signal;

a second level detector for detecting a level of the transmit signal;

a comparator with hysteresis for comparing the level of the compressed receive signal with the level of the compressed transmit signal, and providing a comparison output;

a first signal attenuator responsive to a first state of the comparison output to attenuate the receive signal; and

a second signal attenuator, responsive to a second state of the comparison output to attenuate the transmit signal;

whereby, when the receive signal is attenuated the transmit signal is unattenuated, and vice-versa.

5,692,043

ENCLOSURE FOR REMOTE TERMINAL IN A DISTRIBUTED DIGITAL LOOP SYSTEM WITH TRUNK UNIT INTERFACE

Alexandru S. Gliga, San Jose, and Stephen H. Diaz, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 163,258, Dec. 7, 1993, Pat. No. 5,592,475. This application Sep. 10, 1996, Ser. No. 707,890

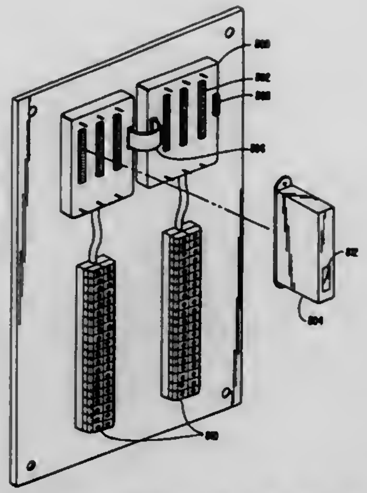
Int. Cl.^{6} H04M *5/02*

U.S. Cl. 379—399 **3 Claims**

1. In a digital loop telephone system, an enclosure for a remote terminal, comprising:

at least one backplane having at least one connector;

at least one environmentally sealed active electronics module having a connector adapted to plug into said at least one connector of said at least one backplane, said environmentally sealed active electronics module incorporating a processor coupled to a plurality of line circuits via a bus; and



a terminal block, connected to said at least one backplane via a connector cable, said terminal block incorporating a plurality of environmentally sealed subscriber terminals.

5,692,044

TELEPHONE HANDSET WITH ROCKER SWITCH DIRECTLY MOUNTED TO A CIRCUIT BOARD

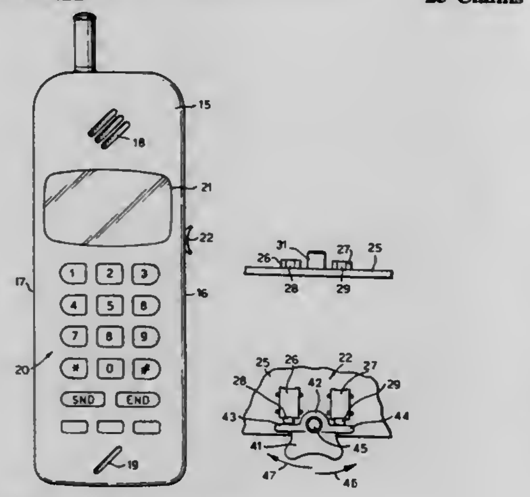
John Nevil Hughes, Woking, and Robert Clifford Newstead, Frimley, both of United Kingdom, assignors to Nokia Mobile Phones Limited, Espoo, Finland

Filed Dec. 21, 1994, Ser. No. 360,371

Claims priority, application United Kingdom, Dec. 22, 1993, 9326229

Int. Cl.^{6} H04M *1/02;1/60*

U.S. Cl. 379—422 **25 Claims**



1. A telephone handset comprising:

a housing;

a circuit board located in said housing;

a first switch mounted to said circuit board, said first switch including a first resiliently mounted push button arranged such that said first switch is in an operating condition when pressure is applied to said first push button and said first switch is in a non-operating condition when pressure is not applied to said first push button;

a second switch mounted to said circuit board, said second switch including a second resiliently mounted push button arranged such that said second switch is in an operating condition when pressure is applied to said second push button and said second switch is in a non-operating condition when pressure is not applied to said second push button;

a rocker member extending through a surface of said housing and attached to a pivot that is directly attached to said circuit board, whereby said rocker member is aligned to apply pressure to said first push button when manually pushed in a first direction and aligned to apply pressure to said second push button when manually pushed in a second direction;

a switch control electrically coupled to said first and second switches; and

a microprocessor for activating said switch control to selectably control at least two different parameters.

5,692,045

PORTABLE TELEPHONE HAVING A BIASED ROTATABLE COVER

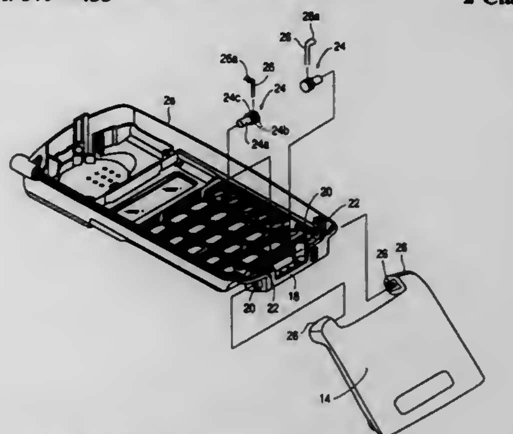
Hisamitsu Takagi, Inagi; Hideharu Suzuki, Kawasaki; Masashi Tomura, Tokyo, and Akihide Nishiyama, Yokohama, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 334,006, Nov. 2, 1994, abandoned, which is a continuation of Ser. No. 54,019, Apr. 29, 1993, abandoned, which is a division of Ser. No. 773,644, Oct. 17, 1991, Pat. No. 5,257,310. This application May 2, 1995, Ser. No. 434,121

Claims priority, application Japan, Feb. 27, 1990, 2-44641; Aug. 7, 1990, 2-207596

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—433 **2 Claims**



1. A portable telephone comprising:

a body including a speaker and switch means;

a cover rotatably mounted to said body, said cover covering at least said switch means when said cover is in a closed condition; and

cover holding means for rotatably holding said cover with respect to said body, said cover holding means including biasing means for exerting a biasing force to said cover so as to maintain said cover at a stable position in a rotational direction when said cover is in an open condition;

said cover holding means comprising a cover mounting projection integrally formed with said body and having a hole; a shaft rotatably inserted through said hole, said shaft having an end portion fixed to said cover and a plate portion with flat sides; and a spring fixed to said body so as to nip said plate portion of said shaft.

5,692,046

FOLDABLE TELEPHONE HANDSET HAVING TRANSFORMABLE HINGE

Shrirang N. Jambhekar, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 7, 1995, Ser. No. 553,207

Int. Cl.^{6} H04M *1/00;* H04B *1/38*

U.S. Cl. 379—433 **16 Claims**

1. A foldable telephone handset for storage in a closed position and for holding to a user's head in an open position, said foldable telephone handset comprising:

first and second substrates, each of the substrates comprising a hinged edge;

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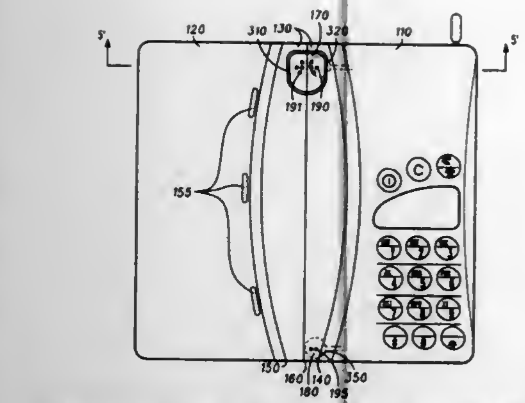


a transformable hinge foldably connected between the first and second substrates at the hinged edges of the first and second substrates, said transformable hinge capable of folding the first and second substrates almost 360 degrees between the closed position and the open position;

an earpiece located in the transformable hinge for orientation with the user's head when in the open position; and

an audio transducer operatively ported to the earpiece of the transformable hinge.

5,692,047

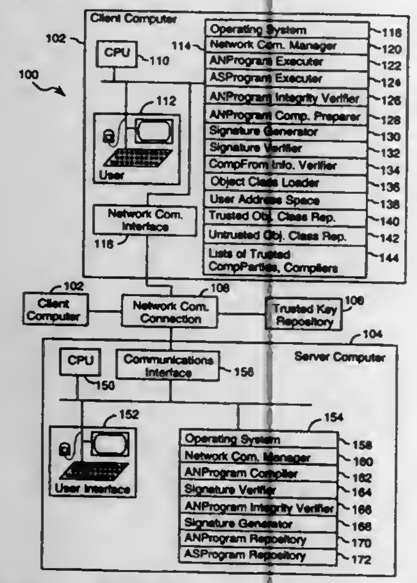
SYSTEM AND METHOD FOR EXECUTING VERIFIABLE PROGRAMS WITH FACILITY FOR USING NON-VERIFIABLE PROGRAMS FROM TRUSTED SOURCES

Charles E. McManis, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 8, 1995, Ser. No. 569,398

Int. Cl.⁶ G06F *9/44*

U.S. Cl. 380—4 **21 Claims**



8. A method of OPerating a computer system, comprising the steps of:

storing untrusted object classes in an untrusted object class repository;

storing trusted object classes in a trusted object class repository;

said object classes each including at least one program, each program comprising a program selected from the group consisting of (A) architecture neutral programs written in an architecture neutral language and (B) architecture specific programs written in an architecture specific language;

when execution of any program in the one object class is requested, loading the requested object class into a user address space for execution unless loading of the requested object class is prevented by a security violation, including preventing the loading of any requested object class, other than object classes in said trusted object class repository. that includes at least one architecture specific program unless every architecture specific program in the requested object class includes a digital signature and said digital signature is successfully verified by said digital signature verifier.

5,692,048

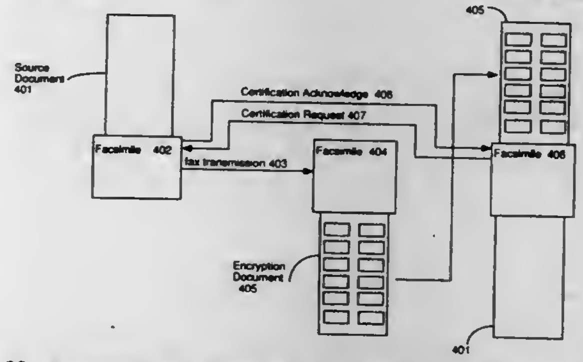
METHOD AND APPARATUS FOR SENDING SECURE FACSIMILE TRANSMISSIONS AND CERTIFIED FACSIMILE TRANSMISSIONS

Michael J. Gormish, Los Altos; Gregory J. Wolff, Mountain View; David G. Stork, Stanford; Peter E. Hart, Menlo Park, and Yoshio Kawajiri, San Jose, all of Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 48,376, Apr. 15, 1993, Pat. No. 5,337,362. This application Jul. 7, 1994, Ser. No. 271,871

Int. Cl.⁶ H04L *9/32*

U.S. Cl. 380—18 **48 Claims**



23. A method for producing a reconstructed version of an original document from a previously transmitted encrypted copy of the original document comprising the steps of:

scanning the previously transmitted encrypted copy into a series of digital data values using a scanner of a facsimile machine;

entering a first key;

the facsimile machine sending an indication to a location designated by the encrypted copy in response to the first key; and

decrypting the encrypted copy to produce the reconstructed version of the original document.

5,692,049

PERSONAL ACCESS MANAGEMENT SYSTEM

William Cedric Johnson, Los Angeles, Calif., and Charles C. McMullen, Colorado Springs, Colo., assignors to ETA Technologies Corporation, Los Angeles, Calif.

Filed Feb. 13, 1995, Ser. No. 388,279

Int. Cl.⁶ H04L *9/32*

U.S. Cl. 380—25 **51 Claims**

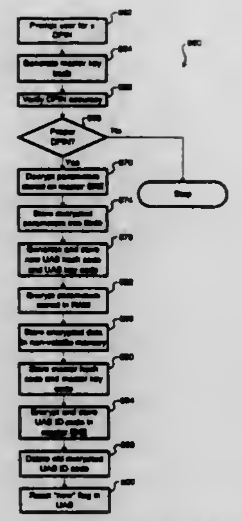
1. In a system comprising an initialized storage device having a set of processed parameters stored thereon, and an uninitialized processing device, a method for initializing the processing device, comprising the steps of:

generating a master key code;

processing said set of processed parameters using said master key code to derive a set of de-processed parameters;

generating a processing device key code;

processing said set of de-processed parameters using said processing device key code to derive a new set of processed parameters; and



storing said new set of processed parameters into the processing device to initialize the processing device.

5,692,050

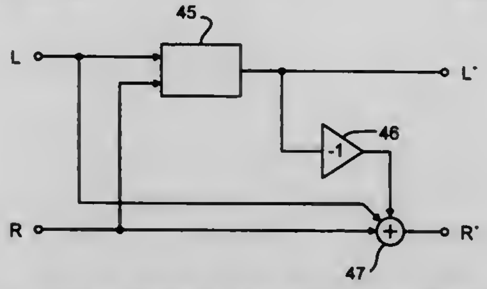
METHOD AND APPARATUS FOR SPATIALLY ENHANCING STEREO AND MONOPHONIC SIGNALS

Timothy J. Hawks, Palo Alto, Calif., assignor to Binaura Corporation, Menlo Park, Calif.

Filed Jun. 15, 1995, Ser. No. 491,138

Int. Cl.⁶ H04R *5/00*

U.S. Cl. 381—1 **22 Claims**



11. A system for enhancing an acoustic image comprising first and second input signals, said system comprising:

means for processing said first and second input signals to produce a first output signal; and

means for combining said first output signal and said first and second input signals to produce a second output signal, said first and second output signals comprising first and second channels of said enhanced acoustic image.

5,692,051

ELECTRONIC EQUALIZATION FOR RECESSED LOUDSPEAKER MOUNTING

Wayne M. Schott, Seymour, Tenn., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Jul. 8, 1996, Ser. No. 677,003

Int. Cl.⁶ H04R *5/00*

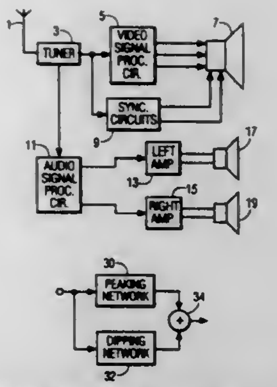
U.S. Cl. 381—1 **19 Claims**

1. A television receiver comprising:

a tuner for receiving and tuning to a television signal;

a video signal processing circuit coupled to a first output of said tuner for processing a video component of said television signal, said video signal processing circuit generating at least one display signal;

display means coupled to said video signal processing circuit for displaying said at least one display signal;



synchronizing signal generating means also coupled to said first output of said tuner for generating synchronizing signals for controlling said display means;

an audio signal processing circuit coupled to a second output of said tuner for processing an audio component of said television signal; said audio signal processing circuit generating at least one audio signal;

at least one loudspeaker coupled to an output of said audio signal processing circuit for reproducing the at least one audio signal;

a cabinet within which at least said at least one loudspeaker is mounted; and

an equalizing circuit for compensating frequency response perturbations in said at least one loudspeaker caused by a recessed mounting of said at least one loudspeaker in said cabinet, said equalizing circuit comprising:

an input for receiving the audio signal;

a peaking network coupled to said input for augmenting the audio signal in a first frequency range;

a dipping network coupled to said input for attenuating the audio signal in a second frequency range; and

means for combining an output of said peaking network to an output of said dipping network, an output of said combining means carrying a compensated audio signal for application to said loudspeaker.

5,692,052

ENGINE NOISE CONTROL APPARATUS

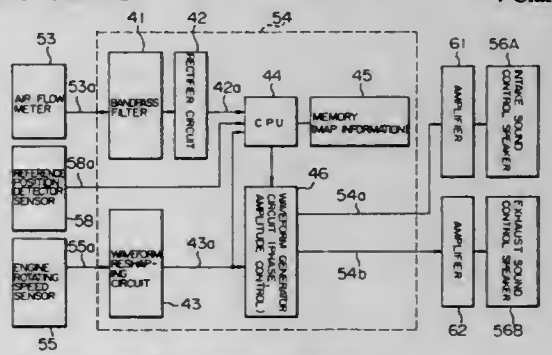
Katsuyuki Tanaka, Nishio; Yoshitaka Nishio, Nagoya; Tokio Kohama, Nishio; Satoshi Kameyama, Chiryu; Kouzi Ohara, Aichi-ken, and Masanori Kato, Seto, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, and Nippon Soken, Inc., Aichi-ken, both of Japan

Continuation-in-part of Ser. No. 142,116, Oct. 28, 1993, abandoned, which is a continuation of Ser. No. 899,533, Jun. 16, 1992, abandoned. This application May 2, 1994, Ser. No. 235,935

Claims priority, application Japan, Jun. 17, 1991, 3-144970; May 21, 1993, 5-142728

Int. Cl.⁶ A61F *11/06;* **H03B** *29/00*

U.S. Cl. 381—71 **4 Claims**



1. A sound control apparatus comprising:

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engine rotating speed detecting means for detecting a rotating speed of an engine;

engine load detecting means for detecting a load of said engine;

signal generation means for generating an oscillation signal having a frequency which is proportional to said detected engine rotating speed;

memory means including a control map for storing data of phases and amplitudes at a plurality of different addresses, said phases and said amplitudes corresponding to an engine rotating speed and an engine load;

signal modulation means for phase-controlling and amplitude-controlling said oscillation signal in accordance with a phase and an amplitude read from said control map using an address determined by both the detected engine rotating speed and the detected engine load;

control sound generation means for generating control sound in accordance with the signal of said signal modulation means and for supplying said control sound to a propagation path of the sound;

said engine load detecting means comprising a sensor for detecting a signal representing a flow rate of intake air supplied to said engine to be used for engine control, and detection means for detecting pulsation components of intake air flow supplied to said engine on the basis of a signal outputted by said sensor, said detection means detecting said pulsation components of intake air supplied to said engine; and

control signal generation means for generating a control signal in accordance with a magnitude of said detected pulsation components of said intake air supplied to said engine, wherein said control signal generation means takes an average of peak values of said pulsation components for cylinders of said engine in a corresponding predetermined period to generate said control signal for each of said cylinders of said engine, and wherein said signal modulation means modulates said oscillation signal on the basis of said each control signal.

5,692,053

ACTIVE ACOUSTIC TRANSMISSION LOSS BOX

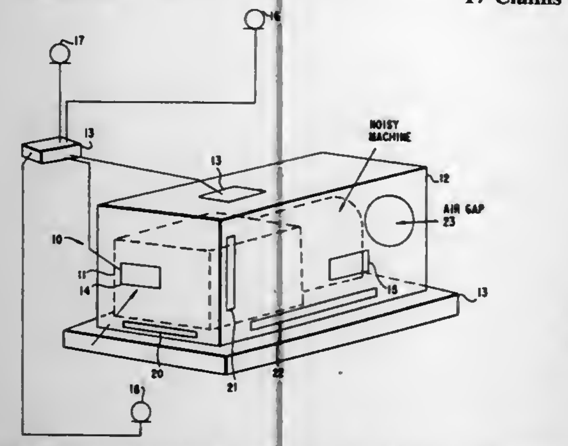
Christopher R. Fuller, Blacksburg, Va.; Michael P. McLoughlin, Sykesville, Md., and Stephen Hildebrand, Arlington, Va., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

PCT No. PCT/US92/08401, § 371 Date Jul. 7, 1995, § 102(e) Date Jul. 7, 1995, PCT Pub. No. WO94/09484, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 8, 1992, Ser. No. 411,779

Int. Cl.^{6} G10K *11/16*

U.S. Cl. 381—71 **17 Claims**



1. An active noise reduction system for canceling a noise disturbance, said system comprising

a structural container means surrounding a noise disturbance with actuator means directly attached thereto to generate anti-vibrations into said structural container means, and

a plurality of error sensing means in the radiated noise field sensing noise radiation external to said structural container means and providing error signals, and

a reference signal generator means for prodding a reference signal containing frequency and temporal information on the noise disturbance, and

a controller means composing circuit means for independently controlling each actuator in response to said error sensing means and said reference signal to drive said error signals to minimum values simultaneously.

5,692,054

MULTIPLE SOURCE SELF NOISE CANCELLATION

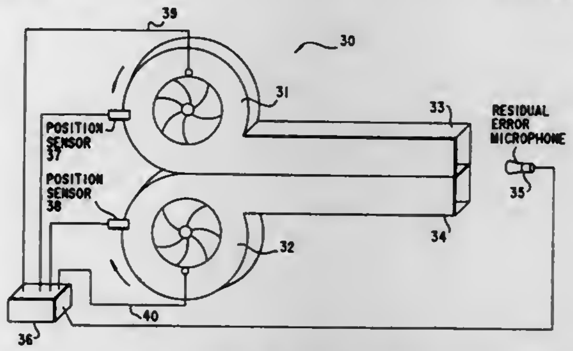
Michael J. Parrella, Weston, Conn., and Dexter G. Smith, Columbia, Md., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

PCT No. PCT/US92/08400, § 371 Date Jun. 30, 1995, § 102(e) Date Jun. 30, 1995, PCT Pub. No. WO94/09483, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 8, 1992, Ser. No. 411,785

Int. Cl.^{6} G10K *11/16*

U.S. Cl. 381—71 **28 Claims**



1. A repetitive phenomena canceling controller system for canceling unwanted repetitive phenomena generated by co-located rotating devices comprising

known frequency determining means for generating a known electrical frequency signal corresponding to the known fundamental frequencies of the unwanted repetition phenomena generated by the co-located rotating devices,

a means for determining the relative timing of the generation of the fundamental unwanted phenomena using said known electrical frequency signal as a synchronizing signal,

a single residual sensor for sensing and generating an electrical signal related to the residual unwanted noise,

a plurality of actuators for providing canceling phenomena signals at a plurality of locations,

controller means for automatically controlling each of the actuators as a function of the fundamental phenomena and the residual sensors while accommodating the interaction between various sensors and actuators.

5,692,055

ACTIVE NOISE-SUPPRESSIVE CONTROL METHOD AND APPARATUS

Hisashi Sano, Wako, and Shuichi Adachi, Utsunomiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

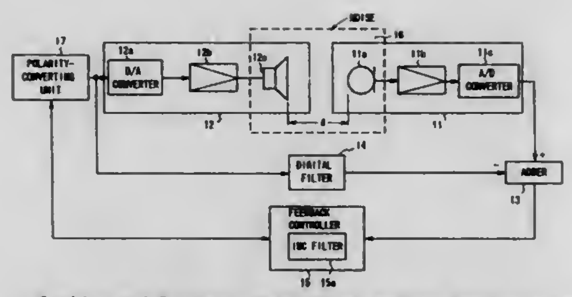
Filed Sep. 24, 1996, Ser. No. 719,027

Int. Cl.^{6} A61F *11/06;* **H03B** *29/00*

U.S. Cl. 381—71 **14 Claims**

1. An active noise-suppressive control method comprising the steps of:

producing an error signal by monitoring a difference between noise coming from the outside of a sound field into the inside



of said sound field and vibration for canceling said noise, and producing said error signal on the basis of said difference;

detecting a difference signal between said error signal and an output signal from a model having a fixed transfer function which is approximately equal to a transfer function of said sound field, a driving signal for producing said vibration for canceling said noise being supplied to said model so that variation of said transfer function of said sound field is detected;

IMC-filtering said difference signal to produce a noise cancel signal;

inverting polarity of said noise cancel signal to supply a polarity-inverted noise cancel signal as an input signal to said model;

converting said polarity-inverted noise cancel signal into said vibration for canceling said noise to supply, to said sound field, said cancel vibration for counteracting said noise coming into the inside of said sound field; and

selecting a variable parameter of an IMC filter for said IMC filtering by previously approximating and setting an amount of variation of said transfer function of said sound field affected by internal and external disturbance factors, as additive perturbation over a predetermined range of frequency so that an absolute value of a product of said approximated and set amount of variation, a distance from a position in said sound field for supplying said cancel vibration to a position for monitoring said difference between said noise coming from the outside of said sound field into the inside of said sound field and said vibration for canceling said noise, and a transfer function of said IMC filter is less than 1.

5,692,056

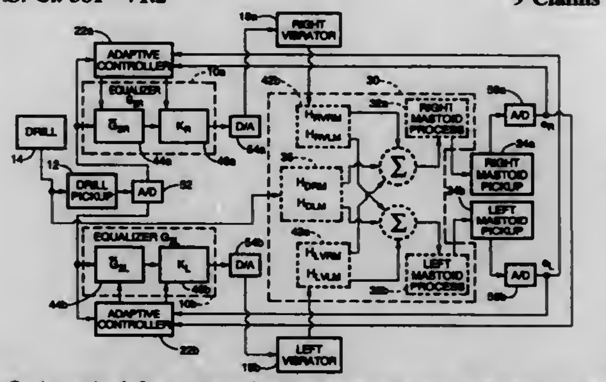
METHOD AND APPARATUS FOR INTRACRANIAL NOISE SUPPRESSION

William A. Gardner, 6950 Yount St., Yountville, Calif. 94599

Continuation-in-part of Ser. No. 35,100, Dec. 7, 1994, Pat. No. 5,570,426. This application Jun. 13, 1996, Ser. No. 662,692

Int. Cl.^{6} A61F *11/06*

U.S. Cl. 381—71.2 **9 Claims**



8. A method for suppressing intracranial noise generated by a medical instrument, comprising the steps of:

(a) sensing mechanical vibration signals generated by a medical instrument;

(b) sensing, from a vibration sensor attached to the head of a patient, intracranial vibration signals induced by said medical instrument in the patient;

(c) processing said mechanical and intracranial vibration signals and generating equalizing vibration signals which suppress said intracranial vibration signals;

(d) adapting said equalizing vibration signals to changes in said mechanical and intracranial vibration signals; and

(e) transmitting said equalizing vibration signals through a vibrator attached to the head of said patient.

5,692,057

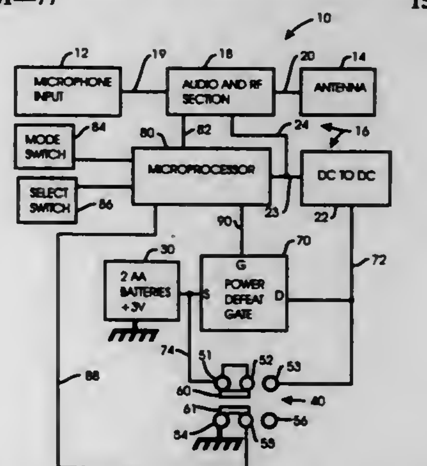
WIRELESS ELECTRONIC POWER DEFEAT TECHNIQUES

Steven M. Grad, Deerfield, and Irwin P. Singh, Carol Stream, both of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.

Filed Jun. 28, 1996, Ser. No. 672,431

Int. Cl.^{6} H04B *3/00;* **H04R** *3/00;* **H02B** *1/00*

U.S. Cl. 381—77 **15 Claims**



1. In a wireless audio system including an audio and radio frequency module, improved apparatus for preventing a user from accidentally turning off said system comprising in combination:

a source of electrical power for said system;

a power switch coupled to said source, said power switch having a first position for normally preventing electrical power from being coupled to said module and a second position for enabling electrical power to be coupled to said module;

an electronic gate responsive to a gate signal for coupling electrical power from said source to said module; and

means for generating said gate signal in response to operation by said user, whereby electrical power is delivered to said module when said power switch is in said first position so that said user cannot accidentally turn off said system by moving said power switch to said first position.

5,692,058

DUAL AUDIO PROGRAM SYSTEM

Philip E. Eggers, 5366 Reserve Dr., Dublin, Ohio 43017, and Gerald J. Sanders, 1000 Northlake Shore Dr., Apt. 1008, Chicago, Ill. 60611

Filed Mar. 2, 1995, Ser. No. 398,951

Int. Cl.^{6} H03G *3/00*

U.S. Cl. 381—107 **6 Claims**

1. Apparatus for simultaneously providing dual audio programs to a listener, the apparatus comprising;

circuitry for providing a plurality of audio programs, the circuitry including first and second circuits for receiving radio frequency transmissions;

storage means for storing pairs of first and second frequencies;

means for retrieving a selected one of the stored pairs of first and second frequencies and tuning the first and second circuits for receiving to the first and second frequencies, respectively;

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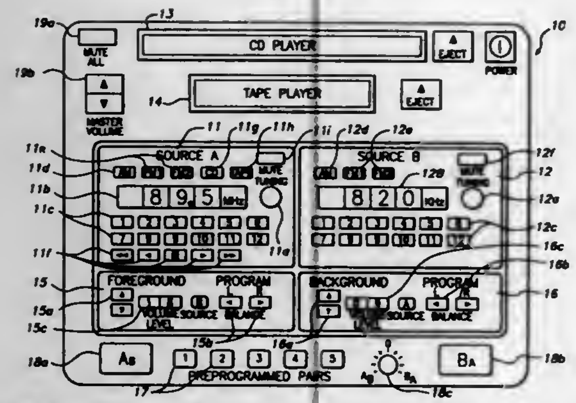


first listener operable program selection means for selecting a first one of the plurality of audio programs as a first audio program;

second listener operable program selection means for selecting a second one of the plurality of audio programs as a second audio program;

first listener operable volume selection means for setting a first audible volume setting;

second listener operable volume selection means for setting a second audible volume setting; and

means for selectively and reversibly switching between two discrete states; a first state in which the first audio program is played out at a volume determined by the first audible volume setting and the second audio program is played out at a volume determined by the second audible volume setting, and a second state in which the first audio program is played out at the volume determined by the second audible volume setting and the second audio program is played out at the volume determined by the first audible volume setting.

5,692,059

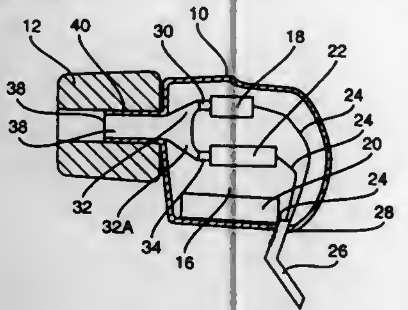
TWO ACTIVE ELEMENT IN-THE-EAR MICROPHONE SYSTEM

Frederick M. Kruger, 37 Somerset Dr., Comack, N.Y. 11725-1636

Filed Feb. 24, 1995, Ser. No. 393,839

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—151 **14 Claims**



13. Apparatus for detecting user speech for use in a system requiring voice input, said apparatus being adapted for placement in the ear of a user during operation, said apparatus comprising:

a housing having a dense outer surface for transmitting vibration therethrough, and a hollow ear canal tip mounted thereon for insertion into the ear canal of a user;

a first sound sensing and transducing means mounted within said housing in operating contact with said housing surface and adapted to detect speech generated sound vibration present in said surface, said first sound sensing and transducing means being adapted to generate first electrical signals responsive to detected speech generated sound vibration; and,

a second sound sensing and transducing means being adapted to generate second electrical signals responsive to airborne sound located in said ear canal.

5,692,060

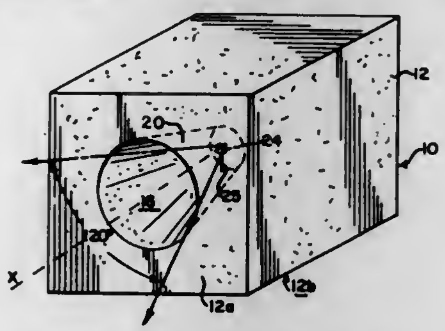
UNIDIRECTIONAL MICROPHONE

Timothy K. Wickstrom, Elk Grove Village, Ill., assignor to Knowles Electronics, Inc., Itasca, Ill.

Filed May 1, 1995, Ser. No. 431,763

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—169 **35 Claims**



1. A unidirectional microphone assembly for receiving sound within a range of sound frequencies, the microphone assembly comprising:

a housing formed of a sound absorbing material, said housing having an outer surface, and a bore extending inwardly along a bore axis from said outer surface to form a chamber within said housing; and

a directional microphone having an axis of maximum reception, said microphone disposed within said chamber and positioned with its axis of maximum reception directed outwardly substantially along said bore axis.

5,692,061

METHOD OF UTILIZING A TWO-DIMENSIONAL IMAGE FOR DETECTING THE POSITION, POSTURE, AND SHAPE OF A THREE-DIMENSIONAL OBJECTIVE

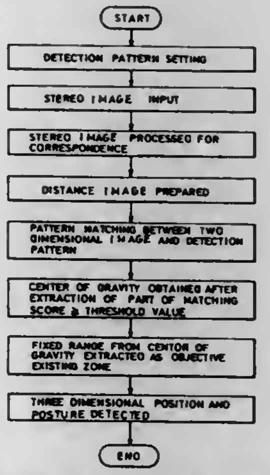
Katsuhiro Sasada; Tomoharu Nakahara, and Hidekazu Araki, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 21, 1995, Ser. No. 391,006

Claims priority, application Japan, Feb. 23, 1994, 6-025731; Dec. 20, 1994, 6-317279

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—106 **8 Claims**


START
DETECTION PATTERN SETTING
STEREO IMAGE INPUT
STEREO IMAGE PROCESSED FOR CORRESPONDENCE
DISTANCE IMAGE PREPARED
PATTERN MATCHING BETWEEN TWO DIMENSIONAL IMAGE AND DETECTION PATTERN
CENTER OF GRAVITY OBTAINED AFTER EXTRACTION OF PART OF MATCHING SCORE ≥ THRESHOLD VALUE
FIXED RANGE FROM CENTOR OF GRAVITY EXTRACTED AS OBJECTIVE EXISTING ZONE
THREE DIMENSIONAL POSITION AND POSTURE DETECTED
END

1. A method for detecting a position, posture and shape of an objective, the method comprising the steps of:

obtaining a two-dimensional image of the objective from the same viewing point as a distance image obtained by photographing the objective in a three-dimensional space;

specifying a partial image in the two-dimensional image;

extracting a partial image of a distance image at a position corresponding to the position of the specified partial image of the two-dimensional image; and

subjecting the partial image of the distance image to an objective detecting operation.

5,692,062

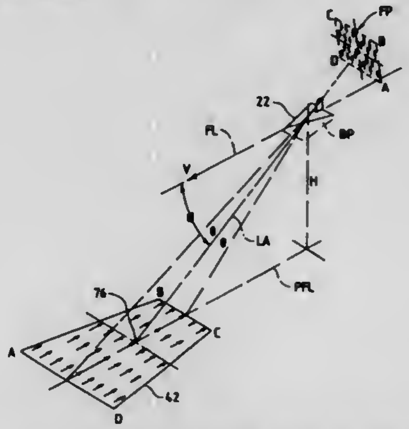
ELECTRO-OPTICAL IMAGING ARRAY WITH PROFILED FOWARD MOTION COMPENSATION

Andre G. Lareau, Bloomingdale; Brian James, Buffalo Grove, and Russell A. Bennett, McHenry, all of Ill., assignors to Recon/Optical, Inc., Barrington, Ill.

Filed Oct. 3, 1994, Ser. No. 316,734

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—107 **25 Claims**



1. In a system comprising a passive array of cells arranged in rows and columns for generating pixel information representing a scene, a method for practicing image motion compensation while generating images with said array of cells in a manner so as to compensate for scene topography variations during exposure of said array of cells to radiation from said scene, comprising the steps of:

generating first and second images of said scene with said array of cells, said second image generated by said array of cells at a later point in time from the generation of said first image and having associated with it a second image transfer rate U_D to compensate for forward motion of said array relative to said scene;

deriving from said first and second images an image correction velocity U_δ of at least one point in said scene relative to said array in the plane of said array of cells;

generating a third image of said scene with said array of cells, said third image generated at a point in time later than the generation of said second image; and

in response to said derived image velocity from said first and second images, transferring pixel information through at least a portion of said array, during the exposure of said array to said scene to generate said third image of said scene, at a third image transfer rate substantially equal to $U_0 - U_\delta$ derived from said first and second images;

whereby changes in image velocities in said array due to terrain variations are accounted for in said derived image velocity from said first and second images, adjustments of said second image transfer rate to derive said third image transfer rate may be made independent of aircraft navigation system inputs, and resolution of an image created from the array can be preserved.

5,692,063

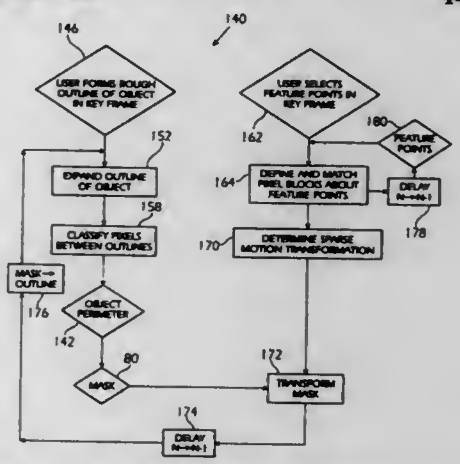
METHOD AND SYSTEM FOR UNRESTRICTED MOTION ESTIMATION FOR VIDEO

Ming-Chieh Lee, Bellevue, and Wei-ge Chen, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jan. 19, 1996, Ser. No. 588,057

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—107 **14 Claims**


140
146
USER FORMS ROUGH OUTLINE OF OBJECT IN KEY FRAME
USER SELECTS FEATURE POINTS IN KEY FRAME
152
162
180
FEATURE POINTS
EXPAND OUTLINE OF OBJECT
164
DEFINE AND MATCH PIXEL BLOCKS ABOUT FEATURE POINTS
DELAY
178
158
CLASSIFY PIXELS BETWEEN OUTLINES
170
DETERMINE SPARSE MOTION TRANSFORMATION
MASK→OUTLINE
176
OBJECT PERIMETER
142
80
MASK
172
TRANSFORM MASK
174
DELAY

1. A method of motion estimation, comprising:

identifying a group of border pixels of an object in a first video frame in contact with a boundary of said first video image frame, the border pixels having pixel characteristics representing the object;

appending a group of virtual pixels outside said first video image frame adjacent to said group of border pixels;

assigning to said group of virtual pixels, pixel characteristics related to the pixel characteristics of said group of border pixels; and

estimating a portion of said object in a second video image frame, subsequent to the first video image frame, from the pixel characteristics assigned to said group of virtual pixels.

5,692,064

METHOD AND APPARATUS FOR COUNTING UNDERWATER OBJECTS USING AN ULTRASONIC WAVE

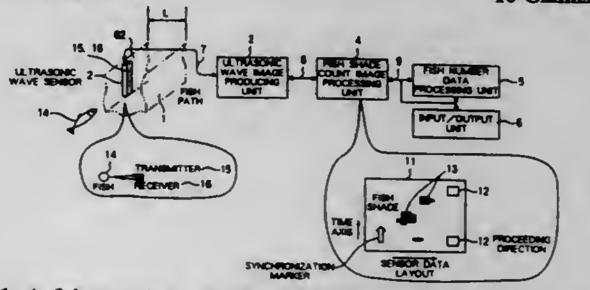
Yoichi Takagi; Masayasu Kato, both of Hitachi; Takashi Miyakita; Katsuji Terazono, both of Tokyo; Shigeharu Jikan, Omiya; Takeo Tamezawa, Kawasaki, and Toshiaki Hara, Otsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 330,156

Claims priority, application Japan, Nov. 1, 1993, 5-273647

Int. Cl.^{6} G06K *9/00;9/32;* **G01N** *29/04;* **G06M** *7/00*

U.S. Cl. 382—103 **16 Claims**



1. A fish counting method for counting a number of fish by emitting an ultrasonic wave to a predetermined area where fish pass in a body of water and receiving reflected waves from fish bodies,

wherein, a line image is produced in a predetermined cycle in a horizontal or vertical direction which shows a presence or absence of said reflected wave by a presence or absence of a pixel signal by corresponding said presence or absence of

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reflected wave to a depth direction or a width direction of a cross section of said predetermined area, a predetermined number of stored line images are scrolled in a vertical or horizontal direction in said predetermined cycle and an ultrasonic wave fish shade image is produced according to a plane image including a new line image, an image processing in a fish shade unit is carried out for said pixel signal or a group of pixel signals shown in said plane image on the basis of a predetermined fish shade decision rule in order to obtain a count fish shade image in such a manner that when a distance between adjacent left and right and/or up and down pixel signals is not larger than a predetermined distance, said adjacent pixel signals are merged into the same fish shade and when a distance between adjacent left and right and/or up and down pixel signals is larger than said predetermined distance, said adjacent pixel signals are separated from each other as different fish shades, and a number of fish is counted based on said predetermined fish shade decision rule utilizing the merging and separating processes effected in accordance with the distance between adjacent pixel images.

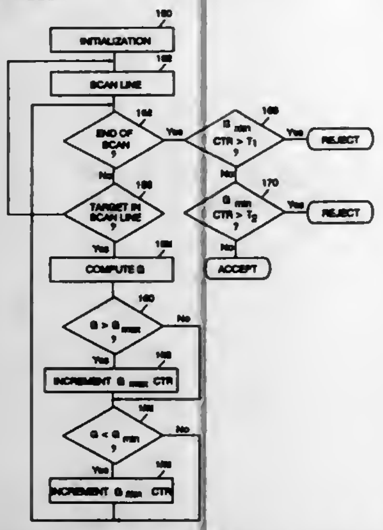
5,692,065
APPARATUS AND METHOD FOR DETERMINING IMAGE QUALITY

Ravinder Prakash, Concord; Michael J. Woolley, Charlotte, and Dale D. Decker, Harrisburg, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1994, Ser. No. 292,545

Int. Cl.⁶ G06T *7/00*

U.S. Cl. 382—112 **12 Claims**



1. Method for determining performance of an image capture device collecting a digital image, D, wherein D is represented as an L×W matrix of numbers representative of light intensity contained within cells denoted as D_{ij}, where i=0 to L−1, j=0 to W−1, L is the number of matrix rows, and W is the number of matrix columns, comprising the steps of:

(a) performing numerical analysis on the digital image with a computer by computing a maximum gradient of at least one scan line;

(b) rejecting the digital image when the maximum gradient is above a ceiling threshold value; and

(c) accepting performance of the image capture device when an average of maximum gradient values over some period of time exceeds a predefined threshold.

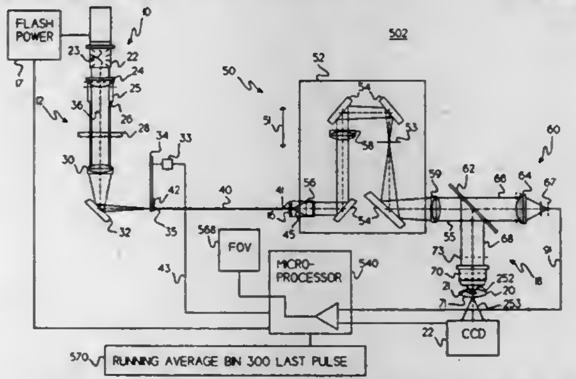
5,692,066
METHOD AND APPARATUS FOR IMAGE PLANE MODULATION PATTERN RECOGNITION

Shih-Jong J. Lee, Bellevue, and William E. Ortyn, Devall, both of Wash., assignors to NeoPath, Inc., Redmond, Wash.

Filed Sep. 20, 1994, Ser. No. 309,148

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—133 **33 Claims**



1. A method for automatic determination of a condition of a microscope slide coverslip, wherein the microscope slide coverslip covers a specimen, the method comprising the steps of:

(a) generating periodically structured light;

(b) illuminating the microscope slide with the periodically structured light;

(c) obtaining a digital representation of the specimen;

(d) recognizing at least one periodic modulation pattern in the digital representation; by detecting at least one stripe region in the digital representation and measuring an area of the at least one strip region; and

(e) processing the at least one periodic modulation pattern to determine the condition of the microscope slide coverslip.

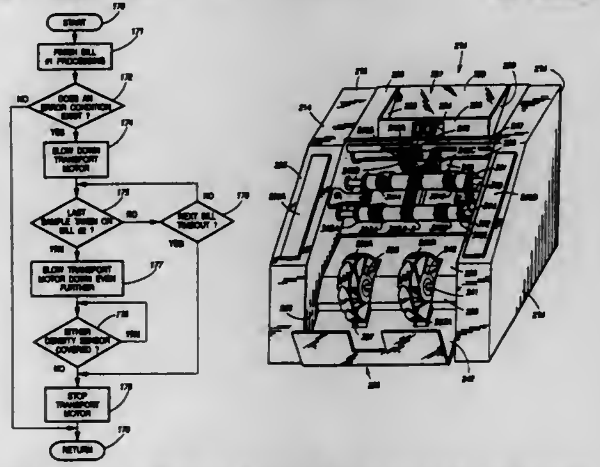
5,692,067
METHOD AND APPARATUS FOR CURRENCY DISCRIMINATION AND COUNTING

Donald E. Raterman, Deerfield; Bradford T. Graves; Lars R. Stromme, both of Arlington Heights, all of Ill., and Aaron M. Bauch, Boxborrow, Mass., assignors to Cummins-Allsion Corp., Mt. Prospect, Ill.

Continuation of Ser. No. 127,334, Sep. 27, 1993, Pat. No. 5,467,405, which is a continuation of Ser. No. 885,648, May 19, 1992, Pat. No. 5,295,196, which is a continuation-in-part of Ser. No. 475,111, Feb. 5, 1990, abandoned. This application Nov. 14, 1994, Ser. No. 339,337

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—135 **80 Claims**


START
FINISH BILL IN PROCESSING
DOES AN ERROR CONDITION EXIST ?
SLOW DOWN TRANSPORT MOTOR
LAST SAMPLE TAKEN ON BILL ?
NEXT BILL TIMEOUT ?
SLOW TRANSPORT MOTOR DOWN EVEN FURTHER
EITHER DENSITY SENSOR COVERED ?
STOP TRANSPORT MOTOR
RETURN
YES
NO

1. A currency evaluation device for receiving a stack of currency bills and rapidly evaluating all the bills in the stack, said device comprising:

an input receptacle for receiving a stack of bills to be evaluated;

a single output receptacle for receiving said bills after said bills have been evaluated;

a transport mechanism for transporting said bills, one at a time, from said input receptacle to said output receptacle along a transport path;

a discriminating unit for evaluating said bills, said discriminating unit including a detector positioned along said transport path between said input receptacle and said output receptacle, said discriminating unit counting and determining the denomination of said bills; and

means for flagging a bill when the denomination of said bill is not determined by said discriminating unit.

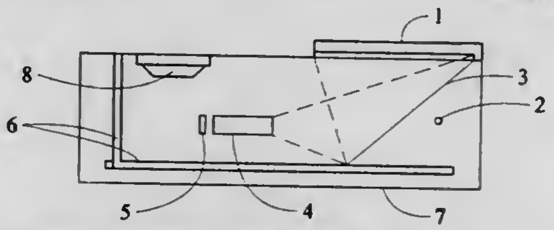
5,692,068
PORTABLE HAND-HELD BANKNOTE READER

E. L. Bryenton, 1800 Dorset Drive, Ottawa, Ontario, Canada, K1H 5T8; David A. Brulé, Nepean, and Alan L. Bryenton, Ottawa, both of Canada, assignors to E. L. Bryenton, Ottawa, Canada

Continuation-in-part of Ser. No. 263,785, Jun. 20, 1994, abandoned, which is a continuation of Ser. No. 72,645, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 722,516, Jun. 27, 1991, abandoned. This application Nov. 15, 1995, Ser. No. 555,892

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—135 **13 Claims**



1. A hand-held portable banknote reader comprising:

means for storing signals in a memory, said signals corresponding to at least a portion of a pattern of pixels defining indicia expected to be carried on the face of a banknote;

slot means for guiding the banknote into a stationary reading position;

sensing means for automatically detecting the presence of a banknote in said stationary reading position;

stationary means responsive to the detection of the banknote by said sensing means for imaging at least a portion of the banknote in said stationary reading position and providing output signals;

means for comparing groups of said output signals with said stored signals; and

means for indicating the presence of a valid banknote in the event a comparison is correct above a predetermined level of error.

5,692,069
APPARATUS FOR PERFORMING CHARACTER SEGMENTATION USING SLANT HISTOGRAMS

John Douglas Hanson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

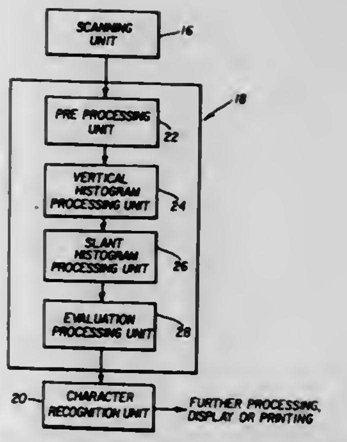
Filed Mar. 17, 1995, Ser. No. 406,264

Int. Cl.⁶ G06K *9/34*

U.S. Cl. 382—171 **7 Claims**

1. An apparatus for segmenting digitized character data comprising:

vertical histogram processing means for receiving digitized character data and calculating a vertical histogram for the digitized character data to identify vertical segmentation points, wherein the digitized character data is segmented into character blocks based on the vertical segmentation points;


SCANNING UNIT
16
18
PRE PROCESSING UNIT
22
VERTICAL HISTOGRAM PROCESSING UNIT
24
SLANT HISTOGRAM PROCESSING UNIT
26
EVALUATION PROCESSING UNIT
28
20
CHARACTER RECOGNITION UNIT
FURTHER PROCESSING, DISPLAY OR PRINTING

slant histogram processing means for receiving the character blocks and calculating a set of slant histograms for each character block; and

evaluation processing means for evaluating the set of slant histograms calculated for each of the character blocks to identify slant segmentation points based on minima, and for segmenting the character blocks based on the identified slant segmentation points to generate segmented characters.

5,692,070
CALIBRATION OF SEMICONDUCTOR PATTERN INSPECTION DEVICE AND A FABRICATION PROCESS OF A SEMICONDUCTOR DEVICE USING SUCH AN INSPECTION DEVICE

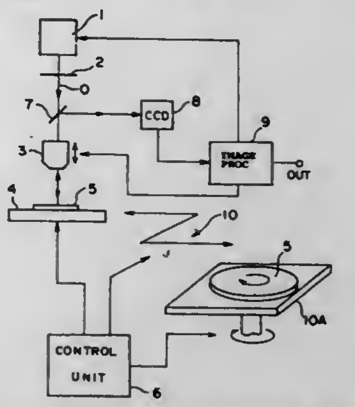
Katsuyoshi Kobayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 8, 1995, Ser. No. 385,685

Claims priority, application Japan, Mar. 15, 1994, 6-044469

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—145 **6 Claims**



1. A calibration method of a pattern alignment inspection device, said pattern alignment inspection device comprising: an optical source designed to emit an optical beam along a predetermined, designed optical axis; a stage for holding a substrate that carries at least first and second patterns thereon; an optical system provided on said optical axis for illuminating said substrate on said stage by said optical beam produced by said optical source; an imaging device for imaging said substrate illuminated on said stage, said imaging device acquiring an image of said first pattern and an image of said second pattern; and an analyzing system supplied with said images of said first and second patterns for detecting a deviation in position between said first pattern and said second pattern; said method comprising the steps of:

(a) disposing said substrate upon said stage in a first orientation;

(b) acquiring an image of said substrate disposed on said stage in said step (a), by said imaging device;

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(c) detecting a first positional offset between said first and second patterns on said substrate by processing said image of said substrate acquired in said step (b);
(d) disposing said substrate upon said stage with a second, different orientation;
(e) acquiring an image of said substrate disposed on said stage in said step (d), by said imaging device;
(f) detecting a second positional offset between said first and second patterns on said substrate by processing said image of said substrate acquired in said step (e); and
(g) detecting a deviation of an optical axis of said optical system with respect to said predetermined designed optical axis by comparing said first offset and said second offset;
wherein said first orientation and said second orientation are mutually offset by 180 degrees.

5,692,071
COLOR IMAGE PROCESSING METHOD AND APPARATUS FOR GENERATING DEVICE-DEPENDENT COLOR SIGNALS

René Raymond Govaert, Kapellen, Belgium, assignor to AGFA-Geveart, Mortsel, Belgium

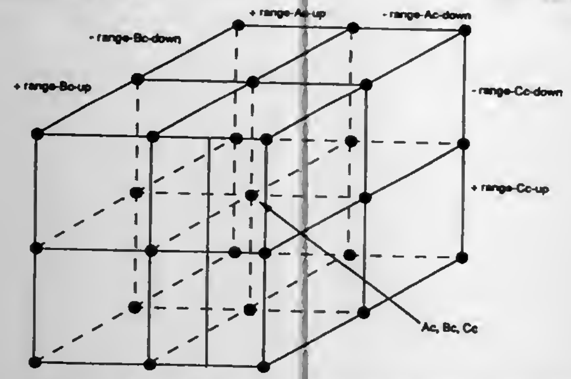
PCT No. PCT/EP93/02002, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO94/06242, PCT Pub. Date Mar. 17, 1994

PCT Filed Jul. 27, 1993, Ser. No. 397,084

Claims priority, application European Pat. Off., Sep. 8, 1992, 92115339

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—167 **32 Claims**



1. Method for generating device-dependent signals representative of target colors, using a first conversion table containing device-dependent color image signal triplets of a color output device and their corresponding device-independent coordinate triplets, said method comprising:
(1) determining in said conversion table a first device-independent coordinate triplet having the smallest first color difference value ΔE with respect to the device-independent coordinate triplet of a target color, and
(2) determining from said first determined device-independent coordinate triplet a device-dependent color image signal triplet which, when employed to generate a color with said output device at least approximates said target color wherein said second determining step (2) is based on a group of known preselected device-dependent color image signal triplets surrounding a given device-dependent color image signal triplet, the device-independent coordinate triplets of said preselected device-dependent color image signal triplets being either known or calculated by interpolation from device-independent coordinate triplet/device-dependent color image signal triplet sets known from said first conversion table, each one of the group of said device independent coordinate triplets of said preselected device-dependent color image signal triplets is compared with the device independent coordinate of said target color and the device-dependent color image signal triplet corresponding to the device independent coordinate triplet of said group for which a second color difference ΔE with respect to the device-independent coordinate triplet of said target color is the smallest is selected as said generated device-dependent color image signal triplet.

5,692,072
EDGE DETECTING DEVICE

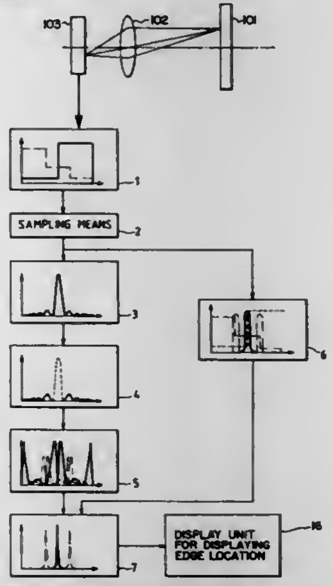
Takeshi Hashimoto, Fussa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 788,698, Nov. 6, 1991, abandoned. This application May 26, 1994, Ser. No. 249,641

Claims priority, application Japan, Nov. 6, 1990, 2-300687; May 15, 1991, 3-110305

Int. Cl.^{6} G06K *9/48*

U.S. Cl. 382—199 **7 Claims**



1. An edge detecting device comprising:
an image pickup unit including an image pickup device which receives an optical information from an object and converts said optical information into an electrical image signal;
sampling means electrically connected with said image pickup unit for converting said image signal into digital image data including a train of data elements;
a first calculation block for obtaining preliminary edge data, electrically connected with said sampling means and comprising:
Fourier transformation means for converting said digital image data obtained by said sampling means into data in a spatial frequency region by performing a high-speed Fourier transformation;
filtering means for filtering said data in a spatial frequency region obtained from said Fourier transformation means to remove at least a zero order spatial frequency component therefrom; and
inverse Fourier transformation means for converting the data in the spatial frequency region with said at least a zero order spatial frequency component thereof having been removed by said filtering means into data in real space to be output as the preliminary edge data, by performing a high-speed inverse Fourier transformation;
a second calculation block for detecting rough edge location, electrically connected with said sampling means and comprising:
a low pass filter, constructed and connected to remove high frequency components from said digital image data obtained by said sampling means to provide filtered data including a train of filtered data elements,
first calculation means for calculating at least a difference in value between each pair of the filtered data elements located adjacent to each other in the train of said filtered data obtained by said low pass filter, in a range of at least one partial train of said filtered data obtained by said low pass filter, to provide difference data including a train of difference data elements;
second calculation means for zeroing each value of a plurality of the difference data elements contained in two partial trains located at respective ends of said difference data obtained by said first calculation means to produce processed difference data elements; and
third calculation means for raising each value of the processed difference data elements from said second calculation means to a higher power to obtain rough edge data;
edge detecting means, electrically connected with each of said first calculation block and said second calculation block, for detecting an ultimate edge location information corresponding to edges contained in the optical information from the object, based on a correlation between the preliminary edge data obtained through said first calculation block and the rough edge data obtained through said second calculation block; and
signal transmitting means for transmitting said ultimate edge location information obtained by said edge detecting means to external devices.

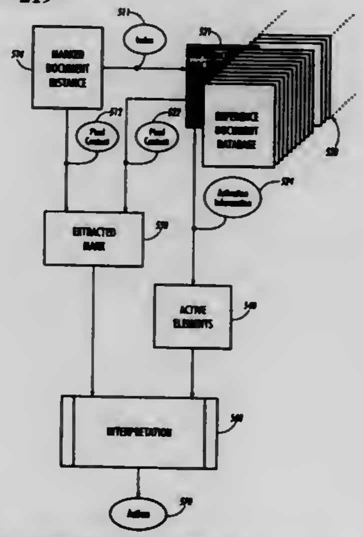
5,692,073
FORMLESS FORMS AND PAPER WEB USING A REFERENCE-BASED MARK EXTRACTION TECHNIQUE

Todd A. Cass, San Francisco, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 30, 1996, Ser. No. 688,704

Int. Cl.^{6} G06K *9/00;* **H04N** *1/32*

U.S. Cl. 382—219 **20 Claims**



1. A method comprising the steps of:
providing a processor with a first document image comprising digital image data including a first plurality of pixels, the first document image representing an instance of a reference document to which instance a mark has been added, the reference document having a plurality of elements;
providing the processor with a second document image comprising digital image data including a second plurality of pixels, the second document image being selected from among a plurality of document images and representing the reference document without the mark;
with the processor, automatically extracting from the first document image a set of pixels representing the mark by performing a reference-based mark extraction technique wherein the second document image serves as a reference image and wherein substantially the entirety of the first document image is compared with substantially the entirety of the second document image;
providing the processor with information about a set of active elements of the reference document, each active element being one element among the plurality of elements of the reference document, the reference document having at least one such active element, each active element being associated with at least one action;
interpreting with the processor the extracted set of pixels representing the mark by determining whether any of the active elements of the reference document is indicated by the mark; and
if an active element is indicated by the mark, facilitating with the processor the action with which such active element is associated.

5,692,074
IMAGE INFORMATION CODING DEVICE AND IMAGE INFORMATION COMMUNICATION DEVICE WITH BLOCK AVERAGE INFORMATION AND CONTROLLABLE COMPRESSION

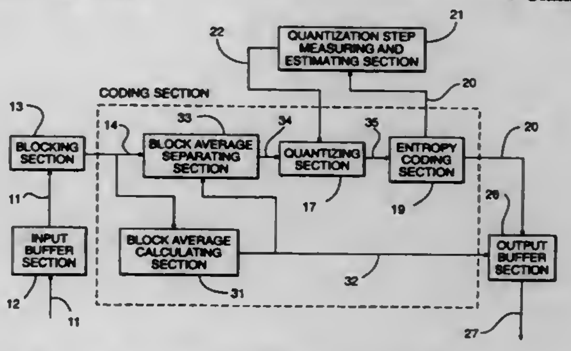
Setsu Kunitake, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 424,628

Claims priority, application Japan, Sep. 7, 1994, 6-213393

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—239 **4 Claims**



1. An image information coding device comprising:
blocking means for dividing input image information into blocks each consisting of a given number of pixels to obtain blocked image information;
image information coding means for coding said blocked image information obtained by said blocking means to obtain coded information and calculating an average of said blocked image information in each of said blocks to obtain an unencoded block average; and
code amount control means for controlling said image information coding means so that an amount of said coded information obtained by said image information coding means become equal to or less than a preset value;
wherein said image information coding means repeats coding of said blocked image information as updating a control parameter to be used in said coding under control by said code amount control means until said amount of said coded information becomes equal to or less than said preset value, and outputs said unencoded block average together with said coded information obtained in a final cycle of repetition of said coding.

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5,692,075

MACH-ZEHNDER TYPE ELECTRO-OPTIC POLYMER MODULATOR IN WHICH AN INITIAL OUTPUT STATE CAN BE CONTROLLED BY POST-PHOTOBLEACHING

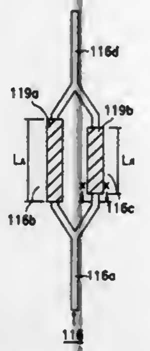
Wol-Yon Hwang, and Jang-Joo Kim, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Oct. 25, 1996, Ser. No. 736,207

Claims priority, application Rep. of Korea, Dec. 21, 1995, 95-53637

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—3 **1 Claim**



1. A mach-zehnder type electro-optic polymer waveguide modulator in which an initial output state can be controlled by post-photobleaching, having two electrodes formed on two arms of the modulator,

wherein said two electrodes have different length from each other in order to control a initial phase difference between said two arms by using post-photobleaching.

5,692,076

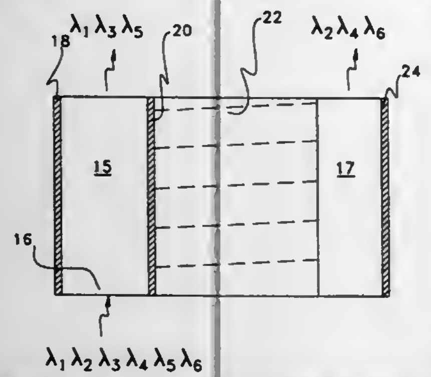
ANTIRESONANT WAVEGUIDE APPARATUS FOR PERIODICALLY SELECTING A SERIES OF AT LEAST ONE OPTICAL WAVELENGTH FROM AN INCOMING LIGHT SIGNAL

Vincent Delisle, Grenoble Cédex, France; Michel A. Duguay, Ste-Foy, Canada, and Udo Trutschel, Brockline, Mass., assignors to Université Laval, Québec, Canada

Filed Dec. 14, 1995, Ser. No. 570,891

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—15 **10 Claims**


18
$\lambda_1 \lambda_3 \lambda_5$
20
22
$\lambda_2 \lambda_4 \lambda_6$
24
15
17
16
$\lambda_1 \lambda_2 \lambda_3 \lambda_4 \lambda_5 \lambda_6$

1. An antiresonant waveguide apparatus for periodically selecting a first series of at least one optical wavelength from a first incoming light signal, comprising:

a first waveguide having an input for receiving the incoming light signal, the first waveguide having guiding mirrors for guiding the incoming light signal, one of the guiding mirrors being a first partial reflectivity mirror;

a second waveguide having guiding mirrors for guiding an outputting light signal containing the first series of at least one wavelength; and

a first Fabry-Perot resonator adjacent to the first partial reflectivity mirror, and forming one of the guiding mirrors of the second waveguide, the Fabry-Perot resonator being a second partial reflectivity mirror for the second waveguide, the Fabry-Perot resonator having a predetermined thickness determining the first series of at least one optical wavelength transmitted through the Fabry-Perot resonator from the first waveguide to the second waveguide.

5,692,077

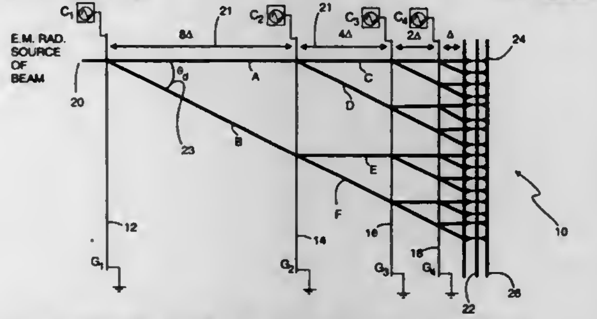
OPTICAL TIME SHIFTER AND ROUTING SYSTEM

Thomas W. Stone, and Michelie S. Malcult, both of Bethlehem, Pa., assignors to Wavefront Research, Inc., Bethlehem, Pa.

Filed Apr. 30, 1996, Ser. No. 640,187

Int. Cl.^{6} G02B *6/26;6/42*

U.S. Cl. 385—16 **35 Claims**



1. An optical time shifter and routing system comprising:

first switchable diffractive means for receiving a beam of electromagnetic radiation and for selectively directing said beam into at least first and second optical paths;

second switchable diffractive means interposed within said optical paths for receiving said beam of electromagnetic radiation and selectively directing said beam of electromagnetic radiation following said first optical path into at least third and forth optical paths, and for selectively directing said beam of electromagnetic radiation following said second optical path into at least fifth and sixth optical paths;

each of said optical paths being of a different predetermined length; and

means operably associated with said first and second means for controlling the path taken by said beam of electromagnetic radiation.

5,692,078

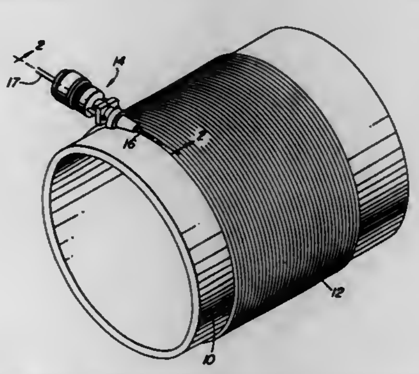
HIGH TEMPERATURE CONNECTOR FOR FUSED SILICA CAPILLARY BODY

David A. Le Febre, Camino, Calif., assignor to UOP, Des Plaines, Ill.

Filed Oct. 19, 1995, Ser. No. 545,080

Int. Cl.^{6} G02B *6/00;6/36*

U.S. Cl. 385—53 **24 Claims**



1. A connector arrangement for making connections to fused silica tubing and fibers capable of withstanding temperatures of 600° C. or more said connector comprising:

a fused silica body defining a convergent tapered surface formed on the outside of a distal end of said body, said convergent tapered surface having an included angle of from 20°–40°;

an alignment body comprising a material suitable for withstanding temperatures of up to 600° C. defining a bore forming a divergent tapered surface having substantially the same included angle as said first tapered surface for receiving said distal end of said silica body; and,

means for securing said fused silica body to said alignment body and urging said divergent and convergent tapered surfaces into contact.

5,692,079

MULTIFIBER CONNECTOR

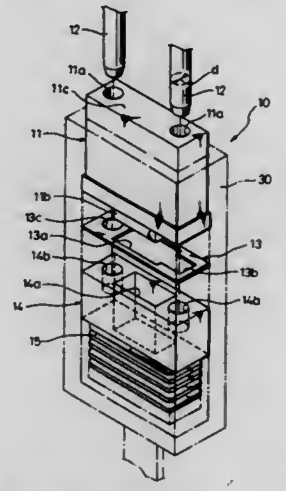
Takaaki Iso, Ichihara, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1996, Ser. No. 720,669

Claims priority, application Japan, Oct. 11, 1995, 7-262767

Int. Cl.^{6} G02B *6/00;6/36*

U.S. Cl. 385—59 **10 Claims**



1. A multifiber connector comprising:

a ferrule having a pair of pin holes formed therethrough at a predetermined distance from each other for receiving guide pins, respectively, in such a manner that a predetermined length of each guide pin received in the corresponding pin hole is projected from said ferrule in a direction of butt-connection;

a regulating member arranged at a rear of said ferrule, for regulating the length of projection of each of the guide pins, said ferrule and said regulating member being contained in a housing; and

a pin retaining member having elasticity and arranged between said ferrule and said regulating member, said pin retaining member having a center opening, and a pair of slits corresponding in position to the respective pin holes or a slit and a retaining hole corresponding in position to the pair of pin holes, respectively, the pair of slits or the slit and the retaining hole being located on opposite sides of the opening, each said slit extending outward along a line passing through centers of the pair of pin holes and having a width W (0.8d W<d) smaller than a diameter d of the guide pin, the retaining hole having a diameter D (0.8d<D<d) smaller than the diameter d of the guide pin.

5,692,080

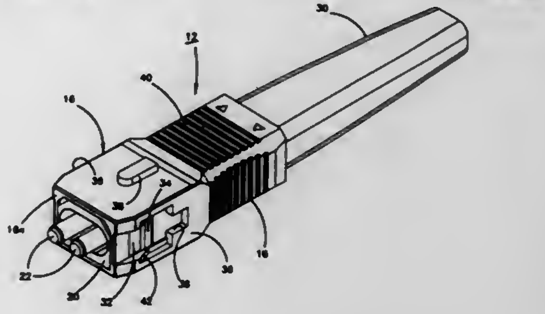
DOUBLE FERRULE SC CONNECTOR AND ADAPTER

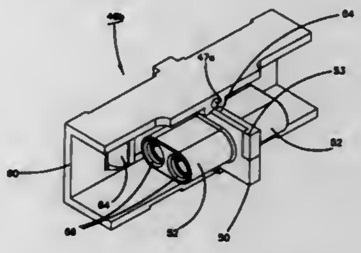
Liang-Ju Lu, Eden Prairie, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Oct. 3, 1996, Ser. No. 720,764

Int. Cl.^{6} G02B *6/38*

U.S. Cl. 385—60 **17 Claims**





1. An optical fiber connector assembly comprising:

a. a fiber optic connector having:
  i. a connector housing having a leading end;
  ii. at least a first ferrule and a second ferrule contained within said connector housing with;
    A. said first and second ferrules positioned in parallel, spaced-apart alignment at said leading end, and
    B. said ferrules having exposed ends at said leading end;
  iii. said connector housing including a first mating fastener exposed on exterior sides of said connector housing, said first mating fastener including a clip receiving detent formed on exposed external surfaces of said connector housing;
b. a fiber optic adapter having:
  i. an adapter housing having an open end sized to slidably receive said leading end of said connector housing with said connector housing moving toward a full insert position in a path of travel parallel to said ferrules;
  ii. at least a first and a second parallel sleeves contained within said adapter housing and positioned for said first and second sleeves to slidably receive respective ones of said first and second ferrules as said connector housing is moved toward said full insert position;
  iii. a second mating fastener including cantilevered clips on said adapter housing and exposed to an interior of said housing to releasably mate with said first mating fastener when said connector housing is moved to said full insert position; and
  iv. external walls of said adapter housing having voids formed therethrough, said clips at least partially disposed within said voids and said clips movable into said voids as said clips are deflected in response to insertion of said leading end of said connector housing into said adapter housing.

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5,692,081

FOUR POLARIZATION MAINTAINING OPTICAL FIBER FERRULE AND OPTICAL COUPLER USING SAME

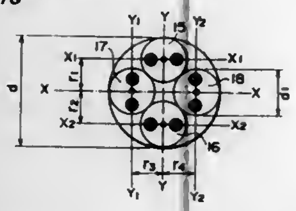
Mitsuo Takahashi, Matsudo, Japan, assignor to Seikon Giken Co., Ltd., Chiba-ken, Japan

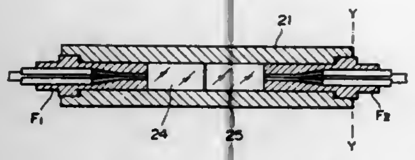
Filed Jan. 30, 1996, Ser. No. 594,279

Claims priority, application Japan, Jan. 31, 1995, 7-036123

Int. Cl.^{6} G02B *6/27*

U.S. Cl. 385—78 **12 Claims**





1. A four polarization maintaining optical fiber ferrule, comprising:

(a) a cylindrical body having an outer surface, a central axis, an end-face perpendicular to the central axis, and a throughhole at the center of the end-face extending along the central axis, said throughhole having a diameter at the end-face;

(b) at least one angular first reference portion on the outer surface of said cylindrical body;

(c) four polarization maintaining optical fiber elements fastened within said throughhole, each of the polarization maintaining optical fiber elements having a polarization maintaining plane and a diameter which is related to the diameter of said throughhole by the following formula:

$$d=(2^{1/2}+1)d_1+\delta$$

where

d: Diameter of the throughhole at the center of the end-face of said ferrule,

d_1: Diameter of the polarization maintaining optical fiber element,

and

δ: Allowance for error in μm; and

(d) wherein the polarization maintaining planes of at least one pair of polarization maintaining optical fiber elements arranged symmetrically with respect to said central axis are fastened at certain angles with respect to said angular first reference portion.

5,692,082

LASER DIODE MODULE AND DEPOLARIZER

Nobuhiro Fukushima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 30, 1995, Ser. No. 549,935

Claims priority, application Japan, Mar. 17, 1995, 7-059546

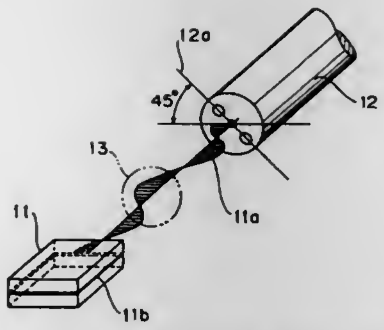
Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—88 **7 Claims**

1. A laser diode module comprising:

a laser diode;

a polarization-maintaining optical fiber arranged so that an axis of polarization of said fiber forms an angle of 45° with respect to a plane of polarization of incident light, said fiber having a length set so that an optical path difference between two polarization modes of transmitted light is greater than a coherence length of said incident light; and



optical coupling means for coupling emitting light from said laser diode to said polarization-maintaining optical fiber.

5,692,083

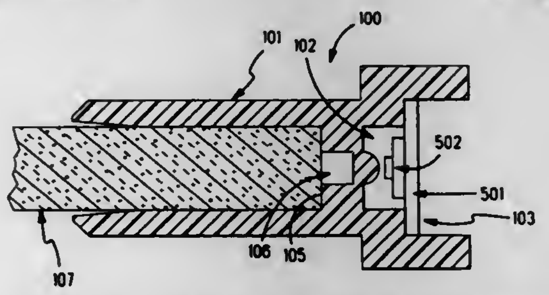
IN-LINE UNITARY OPTICAL DEVICE MOUNT AND PACKAGE THEREFOR

Christopher K. Bennett, Hamilton, N.J., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 13, 1996, Ser. No. 614,602

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—88 **4 Claims**



1. A device mount for aligning an optical fiber to an optoelectronic device comprising a unitary member having a sleeve for receiving said optical fiber; a lens for optical communications disposed between said optical fiber and a cavity in which an optoelectronic device header is disposed; an optoelectronic device disposed on said header, said header being passively aligned to said optical fiber and said lens; and

a ridge disposed about a perimeter of said header to effect said passive alignment.

5,692,084

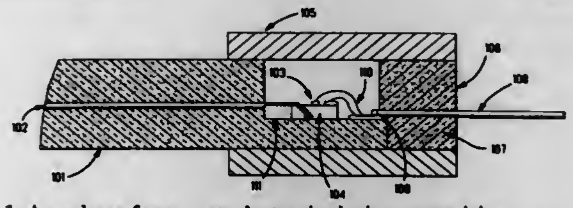
PACKAGE FOR AN OPTOELECTRONIC DEVICE

Robert Wallace Roff, Westfield, N.J., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 11, 1996, Ser. No. 665,072

Int. Cl.^{6} E02B *6/36*

U.S. Cl. 385—88 **5 Claims**



1. A package for an optoelectronic device, comprising:

a substrate having an optical fiber disposed thereon and in optical communication with an optoelectronic device mounted on said substrate; a ferrule having said optical fiber mounted therein and a substantially flat surface at one end of said ferrule, said substrate mounted on said substantially flat surface; a plug member, said plug member having electrical leads disposed therein; and

a housing member having a first end into which said ferrule is disposed and a second end to which said plug member is disposed.

5,692,085

METHOD OF ASSEMBLING A RADIATION SOURCE UNIT FOR SUPPLYING SHORT-WAVE OPTICAL RADIATION

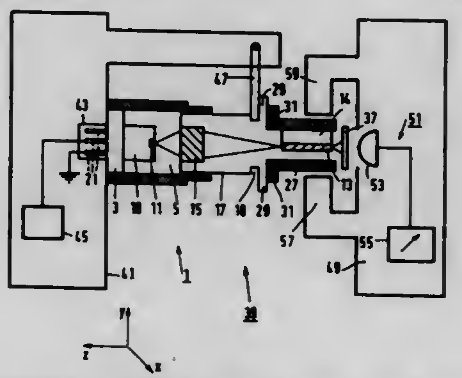
Michiel J. Jongerius, and Ronald R. Drenten, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1995, Ser. No. 515,311

Claims priority, application European Pat. Off., Aug. 23, 1994, 94202406

Int. Cl.^{6} G02B *6/42*

U.S. Cl. 385—91 **2 Claims**



1. A method of assembling a radiation source unit for supplying short-wave optical radiation; comprising the steps of:

positioning a diode laser within one end of a cylindrical bushing;

positioning a first holder within the opposite end of the cylindrical bushing, said first holder supporting a lens system;

positioning a second holder adjoining an end of the first holder remote from the diode laser, the second holder supporting therein a thin film waveguide of non-linear optical material;

actuating the diode laser to produce a beam of laser radiation, and moving the first holder by means of the second holder in a direction parallel to the direction of propagation of the laser beam so as to focus the laser beam on an entrance plane of the waveguide;

moving the second holder independently of the first holder in two mutually perpendicular directions with respect to said direction of propagation, so as to optimally position the focused laser beam in the entrance aperture of the waveguide;

fixing together the cylindrical bushing and the first holder;

moving the second holder independently of the first holder for a second time in said two mutually perpendicular directions so as to secure alignment of the chief ray of the laser beam, the optical axis of the lens system, and the axis of the waveguide; and

fixing together the first holder and the second holder.

5,692,086

OPTICAL FIBER LOCKING SUBMOUNT AND HERMETIC FEEDTHROUGH ASSEMBLY

Mark W. Beranek, Bellevue; Eric Y. Chan, Mercer Island; David Gastellum, Kent; Mostafa Rassaian, Bellevue, all of Wash., and Mark Voitek, Andover, N.J., assignors to The Boeing Company, Seattle, Wash.

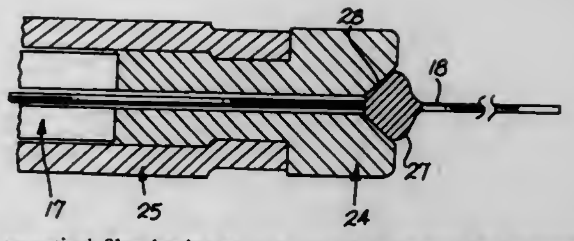
Filed Oct. 25, 1995, Ser. No. 548,179

Int. Cl.^{6} G02B *6/255*

U.S. Cl. 385—94 **17 Claims**

1. An optoelectronic package comprising:

a housing having a sidewall with an aperture therethrough and a floor with a substrate thereon;



an optical fiber having an end extending through said aperture into said housing, a portion of the end of said fiber which is within said housing being metallized;

a solder lock joint on said substrate formed of a first solder which surrounds at least some of the metallized portion of said fiber so as to maintain it in a desired position with said housing; and

a solder seal joint forming a hermetic seal between said aperture and said fiber, said solder seal joint being formed of a second solder, said second solder containing Au and Sn.

5,692,087

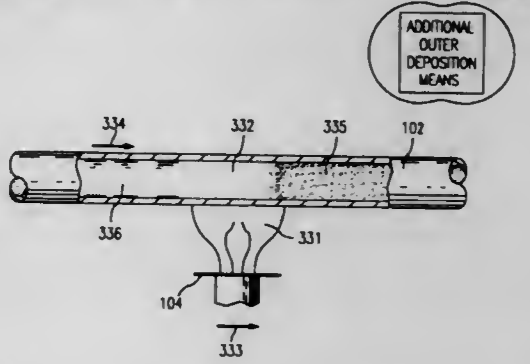
OPTICAL FIBER WITH LOW OH IMPURITY AND COMMUNICATION SYSTEM USING THE OPTICAL FIBER

Fred Paul Partus, Atlanta, Ga.; Gordon Albert Thomas, Princeton, N.J.; Robert Michael Atkins, Millington, N.J., and James William Fleming, Jr., Westfield, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 159,179, Nov. 30, 1993, Pat. No. 5,397,372. This application Mar. 13, 1995, Ser. No. 403,044

Int. Cl.^{6} G02B *6/16*

U.S. Cl. 385—123 **9 Claims**



1. An optical fiber substantially free of OH impurities, capable of transmitting an optical signal without loss due to sub-harmonic interference by OH absorption, wherein said optical fiber is drawn from a glass preform produced according to the following modified chemical vapor deposition method:

introducing a moving stream of vapor mixture including at least one glass-forming precursor and an oxidizing medium into a tube; and

heating the tube with a substantially hydrogen-free heat source, whereby the mixture reacts and a glassy deposit is produced on an inner surface of the tube.

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5,692,088
OPTICAL WAVEGUIDE TUBE

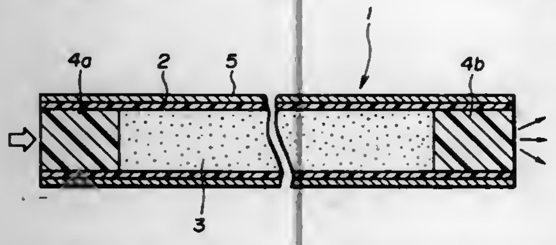
Minoru Ishiharada, Urawa; Hideo Sugiyama, Higashimurayama, and Itsuo Tanuma, Sayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 28, 1995, Ser. No. 508,684

Claims priority, application Japan, Jul. 29, 1994, 6-197468; Jul. 29, 1994, 6-197469; Jul. 29, 1994, 6-197470; Jul. 29, 1994, 6-197476; Jul. 29, 1994, 6-197477

Int. Cl.^{6} G02B *6/02*

U.S. Cl. 385—125 **32 Claims**



7. An optical waveguide tube comprising a transparent core and a cladding having a lower refractive index than the core, characterized in that

at least the inner surface of said cladding in contact with said core is formed of a fluororubber which has been vulcanized by radical reaction crosslinking and has a residual halide content of up to 80 ppm calculated as halogen atom, which further includes a protective sheath surrounding said cladding with a coloring substance trapping agent being interposed between the protective sheath and said cladding.

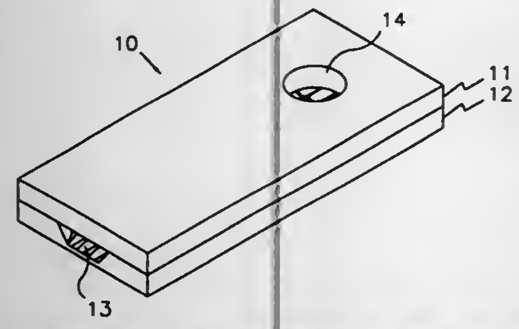
5,692,089
MULTIPLE FIBER POSITIONER FOR OPTICAL FIBER CONNECTION

Gregory J. Sellers, Naperville, Ill., assignor to Fotron, Inc., Naperville, Ill.

Filed Apr. 11, 1996, Ser. No. 630,153

Int. Cl.^{6} G02B *6/00*

U.S. Cl. 385—137 **20 Claims**



1. A unitary multiple fiber positioner having a base and a permanently attached cover, said cover having a flat inside surface that is attached to said base, said multiple fiber positioner possessing at least one passage to receive, locate, and position at least one optical fiber, each said passage defined by a fiber groove in said base and said flat inside surface of said permanently attached cover, said base comprising a silicon wafer and said fiber grooves being anisotropically partially etched therein.

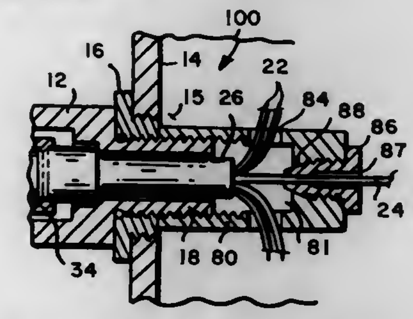
5,692,090
FIBER OPTIC CABLE END CONNECTOR

Andrew Szegda, Canastota, N.Y., assignor to John Mezzalingua Assoc. Inc., Manlius, N.Y.

Division of Ser. No. 135,166, Oct. 12, 1993, Pat. No. 5,444,810, which is a division of Ser. No. 832,706, Feb. 7, 1992, Pat. No. 5,315,684, which is a continuation-in-part of Ser. No. 713,821, Jun. 12, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 346,732

Int. Cl.^{6} G02B *6/00*

U.S. Cl. 385—139 **7 Claims**



1. An end connector for connecting a fiber optic transport cable to a port associated with an equipment, said cable having at least one optic fiber and at least one other support member surrounded by a jacket, said end connector comprising;

a clamp housing member adapted to clamp said cable in a secure position so as to provide resistance to longitudinal and rotational forces applied to said cable;

coupling means for releasably coupling said clamp housing member and said cable to said port; and

cable supporting means disposed internal said equipment for supporting said cable within said equipment and being releasably coupled to said coupling means, said cable supporting means including a frame member having a front end and a rear end with a passageway defined therethrough for receiving at least a portion of said cable, said front end of said frame member being releasably coupled to said coupling means to said port, and a support anchor member being releasably coupled to said rear end of said frame member and adapted to anchor said at least one support member associated with said cable.

5,692,091
COMPACT OPTICAL COUPLING SYSTEMS

William J. Cassarly; John M. Davenport, both of Lyndhurst, and Richard L. Hansler, Pepper Pike, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 20, 1995, Ser. No. 530,916

Int. Cl.^{6} G02B *6/24*

U.S. Cl. 385—146 **5 Claims**

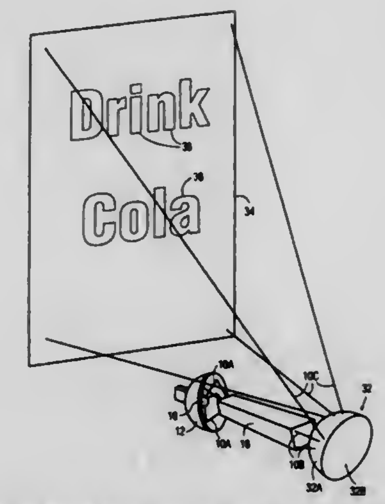
1. A compact optical coupling member for use in coupling non-coherent light from a source of light to a light distribution harness, in combination with the light distribution harness; said coupling member comprising:

(a) an elongated light transmissive body having a central longitudinal axis, an inlet end, non-coincident with the light source, and disposed at one end of said axis for receiving light from the light source, and an outlet end at another end of said axis for providing light to a leading end of a light distribution harness;

(b) said elongated body having a trapezoidal cross-sectional shape along said axis for providing increased light mixing of said non-coherent light;

(c) said inlet end having first and second adjacent, peripheral dimensions; and said outlet end having respectively corresponding first and second adjacent, peripheral dimensions which are both greater than the corresponding dimensions of said inlet end; and said trapezoidal shape of said elongated body increasing in size from a first cross-sectional area at said inlet end to an enlarged cross-sectional area at said outlet end; for reducing, with respect to said longitudinal axis, the maximum angle of light passed through said outlet end relative to the maximum angle of light received through said inlet end; and

(d) said light distribution harness comprises a plano-convex lens having a convex surface through which light is received from said coupling member, and a mirrored, planar surface confronting said coupling member and being for reflecting light at an angle that causes said light to substantially miss said coupler.



5,692,092
RECORDING AND PLAYBACK SYSTEM FOR VARIABLE SPEED PLAYBACK WHEREIN MORE A.C. COEFFICIENTS ARE ALLOTTED TO THE MACROBLOCKS IN THE CENTRAL PART OF AN IMAGE FRAME

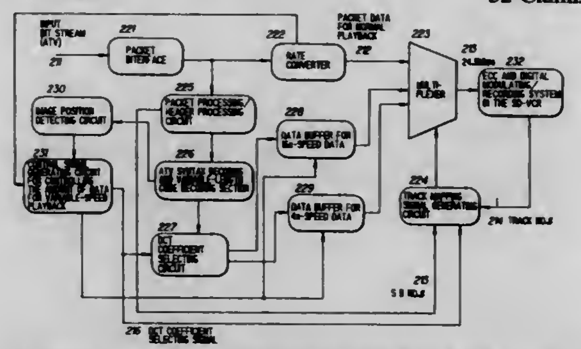
Hiroaki Nogami, Matsudo; Hironobu Katayama, Noda; Koichi Kawaguchi, Chiba; Kenichi Shiraishi, Noda; Kazuya Aoki, Chiba, and Saori Akimoto, Narashino, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1995, Ser. No. 557,498

Claims priority, application Japan, Nov. 14, 1994, 6-279389

Int. Cl.^{6} H04N *9/79;11/02;5/91;5/917*

U.S. Cl. 386—6 **32 Claims**


INPUT BIT STREAM (ATV)
211
221
PACKET INTERFACE
222
RATE CONVERTER
PACKET DATA FOR NORMAL PLAYBACK
212
223
MULTI-PLEXER
213
232
ECC AND DIGITAL MODULATING/RECORDING SYSTEM IN THE SD-VCR
230
IMAGE POSITION DETECTING CIRCUIT
225
PACKET PROCESSING/HEADER PROCESSING CIRCUIT
226
227
DCT COEFFICIENT SELECTING CIRCUIT
224
216
DCT COEFFICIENT SELECTING SIGNAL

1. A digital recording and reproducing apparatus which records a desired video signal onto a recording medium by compressing the band range of the desired video signal using a high-efficiency coding technique, the digital recording and reproducing apparatus comprising:

means for recording part of video data for variable-speed playback onto different recording tracks from those on which video data for normal playback is recorded; and

means for forming the video data for variable-speed playback to be recorded by extracting part of the video data for variable-speed playback from the desired video signal in such a manner that more a.c. components are allotted to a central part of an image frame than a peripheral part of the image frame such that the quality of a picture reproduced during a variable-speed playback mode is improved from the peripheral part of the image frame of the reproduced picture toward the central part thereof.

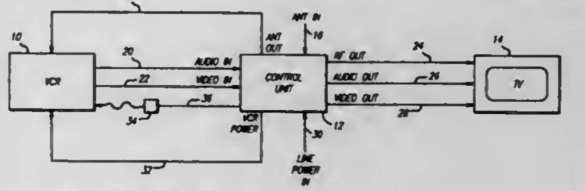
5,692,093
METHOD AND APPARATUS FOR ELIMINATING TELEVISION COMMERCIAL MESSAGES

Jerry Iggulden, Santa Clarita; Alan McFarland, North Hollywood, both of Calif.; Stuart J. Lipoff, Newton, Mass.; Jungming Wu; Richard H. Caro, both of Acton, Mass., and Raymond E. Debs, Saratoga, Calif., assignors to SRT, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 2,782, Jan. 8, 1993, Pat. No. 5,333,091, and a continuation-in-part of Ser. No. 103,067, Aug. 6, 1993, Pat. No. 5,455,630. This application Jan. 4, 1994, Ser. No. 177,813

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 386—46 **24 Claims**



1. A video recording and playback system comprising:

(a) a video recorder/player having a record mode, a play mode and a fast scan mode;

(b) a recording medium for insertion into the video recorder/player so as to record a video signal thereon in the record mode and play the video signal recorded thereon in the play mode, said video signal including program material and commercial message material;

(c) event detection means for detecting events within the video signal;

(d) a first data memory for storing times of occurrence of the events in the record mode;

(e) means for analyzing the times of occurrence of the events to classify segments of the video signal between events as either program material or commercial message material;

(f) a second data memory for storing a playback map identifying segments of the video signal classified as commercial message material;

(g) means for selecting between the fast scan mode and the play mode of the video recorder/player during playback of the recording medium having the video signal recorded thereon so as to scan past the segments of the video signal classified as commercial message material.

5,692,094
FILM IMAGE SCANNING APPARATUS FOR PICKING UP AN IMAGE AND MAGNETIC DATA RECORDED ON A FILM WITHOUT DETERIORATION FROM NOISE GENERATED BY A PERIPHERAL CIRCUIT

Kazuya Tsukamoto, Sagamihara, Japan, assignor to Olympus Optical Co., LTD., Tokyo, Japan

Filed May 3, 1996, Ser. No. 647,873

Claims priority, application Japan, May 17, 1995, 7-118491

Int. Cl.^{6} H04N *5/76;* **G11B** *5/633*

U.S. Cl. 386—46 **25 Claims**

1. A film image scanning apparatus comprising:

a light source for illuminating a developed silver salt photographing film having a magnetic recording portion on which magnetic data is recorded;

light source drive means for driving said light source;

image read means for reading image data from said film illuminated by said light source;

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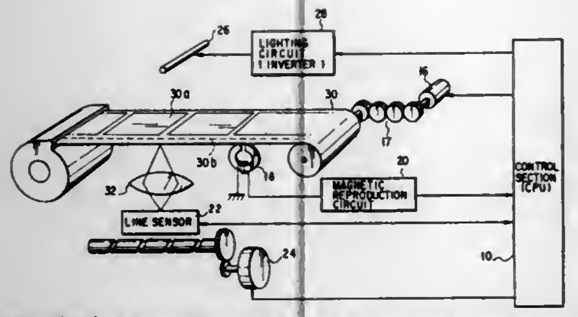
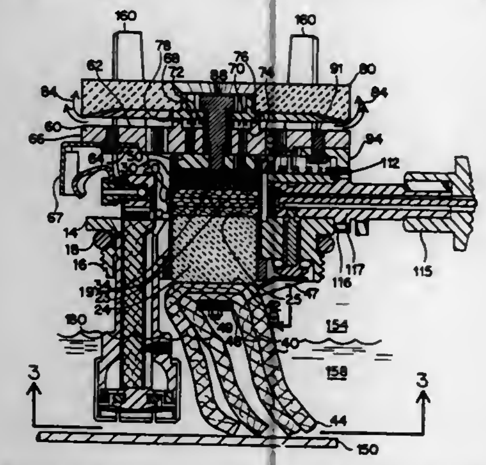


reproduction means for reproducing the magnetic data recorded on the magnetic recording portion of said film; and
power feeding control means for prohibiting a power feeding to said light source drive means or reducing an amount of the power feeding when the magnetic data is reproduced by said reproduction means.

5,692,095
CAPILLARY FEED BOILER

Niels Owen Young, Boise, Id., assignor to Allports, Inc., Boise, Id.

Filed May 10, 1995, Ser. No. 439,093
Int. Cl.^{6} F24F *6/98;* **F23D** *11/44*
U.S. Cl. 392—395 **8 Claims**

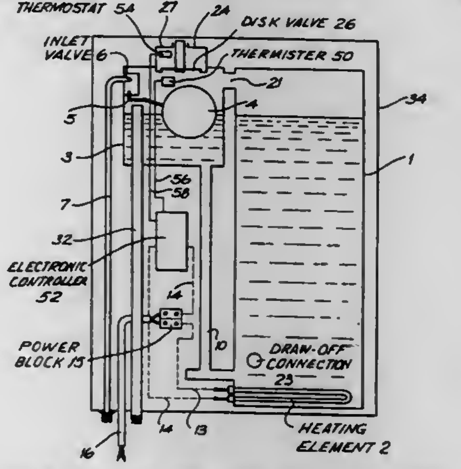


7. A portable liquid fuel delivery, vaporization and combusting device, comprising:
a fuel reservoir;
vent means for providing a path for air from atmosphere into the fuel reservoir;
a shroud;
a boiler wick contained within the shroud wherein liquid fuel is converted into vapor, the boiler wick having upper and lower faces and a continuous peripheral edge sealed along its entire length to the shroud;
a supply wick interconnecting the fuel reservoir with the lower face of the boiler wick;
a hot seat contained within the shroud, the hot seat having first and second faces and a continuous peripheral edge, wherein the first face of the hot seat is in contacting juxtaposition with the second face of the boiler wick;
means for heating the hot seat;
means for throttling the vapor produced by the boiler wick;
means for combusting vaporized fuel to form flames;
control means for manually controlling the combustion rate of the device, the control means comprising an aperture plate, a valve plate, an arcuate toothed member attached to the valve plate, a shaft housing atop the fuel reservoir lid portion forming an interior chamber, having an aperture for providing fluid communication between the interior chamber and the vent cylindrical guide means and, having a vent hole for providing fluid communication between atmosphere and the interior chamber, and a knob shaft and a pinion shaft each having a first and a second end, the first end of the knob shaft having a knob, the first end of the pinion shaft being received within the second end of the knob shaft, the second end of the pinion shaft being received within the interior chamber of the shaft housing means, the pinion shaft having a pinion gear for interengagement with the teeth of the arcuate toothed member of the valve plate means and for translating the arcuate toothed member relative to the pinion gear as the pinion shaft and pinion gear are rotated, and the pinion shaft being provided with an annular concentric cam slot and detent formed thereon near the pinion shaft second end, said annular concentric cam slot for receiving the vent piston first end and for holding the vent piston down against spring tension to allow fluid communication between the cylindrical guide means and the interior of the fuel reservoir, and said detent for receiving the vent piston first end and permitting the piston to slide upward under spring tension and seal the cylindrical guide means from the interior of the fuel reservoir; and
flame plate means for directing the flames formed by the means for combusting the vaporized fuel generally horizontally outward, fixedly attached to the means for combusting the vaporized fuel.

5,692,096
PROTECTION AND CONTROL OF CONTINUOUS BOILING WATER UNITS

Raymond Dennis Massey, Port Macquarie; David McLeod Massey, Bangalor; Wieslaw Henryk Sliwa, Macquarie Fields, and Philip Ross Pepper, Ashbury, all of Australia, assignors to Zip Heaters (Australia) Pty Limited, New South Wales, Australia

Filed Mar. 14, 1995, Ser. No. 403,336
Claims priority, application Australia, Mar. 15, 1994, PM4483
Int. Cl.^{6} H05B *1/02;* **F24H** *9/20*
U.S. Cl. 392—464 **7 Claims**

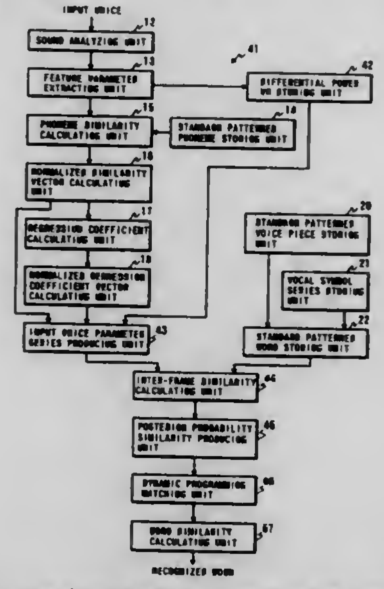


1. A continuous boiling water unit comprising a water heating tank containing an electric heating element near the bottom of the tank, a level control tank mounted alongside the heating tank, an interconnecting steam communication port between the level control tank and the heating tank, a draw-off connection from the heating tank, a flow connection between the level control tank and the water heating tank, a temperature sensing device operable to remotely sense the temperature of water in the heating tank, and control means, coupled to said temperature sensing device and said heating element, and operable to cause the cut-off of electricity from said heating element when said temperature sensing device senses water in said heating tank to be boiling, and wherein the control means includes an adjustable timer operable to determine elapsed time from the last occurrence of cut-off electricity, and when said elapsed time equals or exceeds a predetermined time interval, causing said control means to supply electricity to said heating element to heat said water.

5,692,097
VOICE RECOGNITION METHOD FOR RECOGNIZING A WORD IN SPEECH

Maki Yamada, Kawasaki; Masakatsu Hoshimi, Zama; Taisuke Watanabe, and Katsuyuki Niyada, both of Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1994, Ser. No. 347,089
Claims priority, application Japan, Nov. 25, 1993, 5-295137
Int. Cl.^{6} G10L *9/14*
U.S. Cl. 395—2.5 **28 Claims**

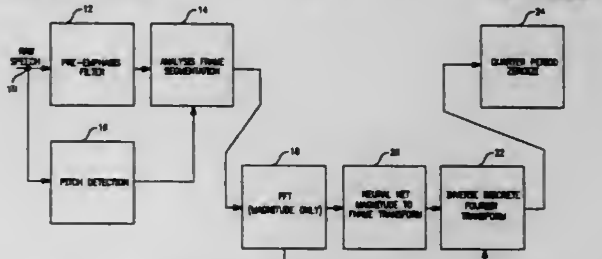

INPUT VOICE
12
SOUND ANALYZING UNIT
13
FEATURE PARAMETER EXTRACTING UNIT
41
42
DIFFERENTIAL POWER VU STORING UNIT
15
PHONEME SIMILARITY CALCULATING UNIT
14
STANDARD PATTERNED PHONEME STORING UNIT
16
NORMALIZED SIMILARITY VECTOR CALCULATING UNIT
17
REGRESSION COEFFICIENT CALCULATING UNIT
18
NORMALIZED REGRESSION COEFFICIENT VECTOR CALCULATING UNIT
20
STANDARD PATTERNED VOICE PIECE STORING UNIT
21
VOCAL SYMBOL SERIES STORING UNIT
22
INPUT VOICE PARAMETER SERIES PRODUCING UNIT
43
STANDARD PATTERNED WORD STORING UNIT
INTER-FRAME SIMILARITY CALCULATING UNIT
44
POSTERIOR PROBABILITY SIMILARITY PRODUCING UNIT
45
DYNAMIC PROGRAMMING MATCHING UNIT
46
WORD SIMILARITY CALCULATING UNIT
47
RECOGNIZED WORD

1. A voice recognizing method in which a word included in an input voice is recognized, comprising the steps of:
preparing a plurality of standard patterned words to be collated with the input voice, each of the standard patterned words being formed of a time series of standard patterned voice pieces;
producing a time series of input voice parameters from the input voice;
collating the time series of input voice parameters with the time series of standard patterned voice pieces indicating a standard patterned word for each standard patterned word to obtain an inter-frame similarity between an input voice parameter and a standard patterned voice piece at the same analyzing time for each analyzing time and for each standard patterned word;
subtracting a constant value from each of the inter-frame similarities respectively obtained for each analyzing time and for each standard patterned word to obtain a posterior probability similarity for each analyzing time and for each standard patterned word on condition that each of the posterior probability similarities for a correct standard patterned word agreeing with an input word uttered by the input voice has a positive value and each of the posterior probability similarities for standard patterned words other than the correct standard patterned word has a negative value;
accumulating the posterior probability similarities according to a continuous dynamic programming matching operation to obtain a word similarity for each standard patterned word, a sum of the posterior probability similarities for the correct standard patterned word being increased as the posterior probability similarities are accumulated, and a sum of the posterior probability similarities for standard patterned words other than the correct standard patterned word being decreased as the posterior probability similarities are accumulated;
selecting a maximum word similarity having a maximum value from among the word similarities defined for the standard patterned words, the maximum word similarity being obtained by accumulating the posterior probability similarities for the correct standard patterned word; and
outputting the correct standard patterned word as a recognized word of the input voice.

5,692,098
REAL-TIME MOZER PHASE RECODING USING A NEURAL-NETWORK FOR SPEECH COMPRESSION

Michael Thomas Kurdziel, Rochester, N.Y., assignor to Harris, Melbourne, Fla.

Filed Mar. 30, 1995, Ser. No. 414,012
Int. Cl.^{6} G10L *7/02*
U.S. Cl. 395—2.11 **16 Claims**

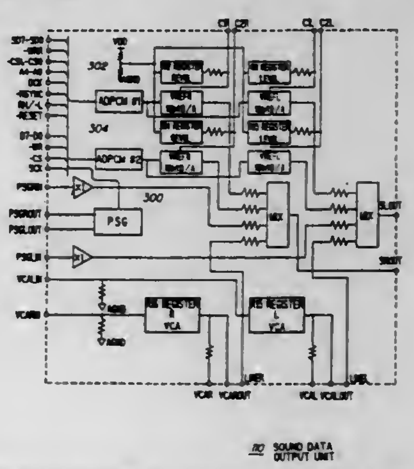

12
14
24
RAW SPEECH
10
PRE-EMPHASIS FILTER
ANALYSIS FRAME SEGMENTATION
16
PITCH DETECTION
18
FFT (MAGNITUDE ONLY)
20
NEURAL NET MAGNITUDE TO PHASE TRANSFORM
22
INVERSE DISCRETE FOURIER TRANSFORM

1. A method of compressing speech comprising the steps of:
(a) equalizing the spectral magnitudes of a raw speech waveform;
(b) segmenting the equalized raw speech into initial analysis frames;
(c) detecting the pitch of the raw speech in each segment;
(d) associating the detected pitch with each frame segment;
(e) determining the spectral magnitudes of each frame segment by a Discrete Fourier Transform or FFT at a plurality of points;
(f) normalizing the output signal from the FFT;
(g) applying the normalized FFT signal to a neural net magnitude to phase transform calculator to provide a recoded phase vector.
(h) calculating a new recoded speech waveform by use of an Inverse Discrete Fourier Transform and the un-normalized spectral magnitudes determined in the FFT;
(i) zeroing two quarters with minimum power to produce a compressed speech output signal; and
(j) selecting one of the two remaining quarters to characterize the entire frame.

5,692,099
COMPUTER SYSTEM INCLUDING RECOVERY FUNCTION OF ADPCM SOUND DATA

Katsunori Takahashi, and Masahide Tomita, both of Hokkaido, Japan, assignors to Hudson Soft Co., Ltd., Hokkaido, Japan

Division of Ser. No. 128,288, Sep. 29, 1993. This application Oct. 27, 1995, Ser. No. 549,444
Claims priority, application Japan, Sep. 30, 1992, 4-285154; Oct. 1, 1992, 4-284981; Oct. 2, 1992, 4-289634; Oct. 2, 1992, 4-289635; Oct. 7, 1992, 4-293769; Oct. 9, 1992, 4-298070
Int. Cl.^{6} G10L *9/00*
U.S. Cl. 395—2.21 **2 Claims**



1. A computer system for processing sound data comprising:

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a storage for storing adaptive difference pulse code modulation (ADPCM) sound data and a plurality of scale values, each ADPCM sound data having control data;
calculating means for calculating reproduced values based on said ADPCM sound data and said plurality of scale values;
an ADPCM decoder, connected with calculating means, for reproducing sound in accordance with said reproduced values; and
recovery means for calculating a recovery value based on said control data and an initial scale value in said plurality of scale values and replacing said reproduced value with said recovery value if a reproducing operation stops halfway through the sound data;
wherein said ADPCM decoder reproduces the sound from the place where said reproducing operation stops halfway through the sound data.

5,692,100
VECTOR QUANTIZER

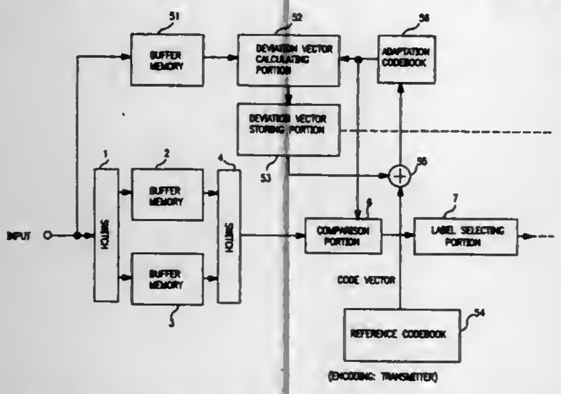
Eiichi Tsuboka, Neyagawa, and Junichi Nakahashi, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 1, 1995, Ser. No. 382,753

Claims priority, application Japan, Feb. 2, 1994, 6-010944; Mar. 24, 1994, 6-053973; Apr. 12, 1994, 6-073593; Sep. 16, 1994, 6-222269

Int. Cl.⁶ G10L *9/00*

U.S. Cl. 395—2.31 **32 Claims**



1. A vector quantizer comprising:
a reference codebook for storing several representative vectors in a feature vector space so that they can be retrieved using labels corresponding thereto;
a learning vector storing means for storing several vectors for learning;
an objective function calculating means for calculating an objective function defined as a function of said representative vectors and said vectors for learning;
a deviation vector calculating means for calculating deviation vectors; and
an adaptation means for obtaining new representative vectors by adding said deviation vectors to said representative vectors, wherein:
input vectors are encoded by converting the input vectors into labels or membership vectors whose components are the membership values of said input vector for the labels using said new representative vectors; and
said deviation vector calculating means calculates so that said new representative vectors maximize said objective function relative to said vector for learning.

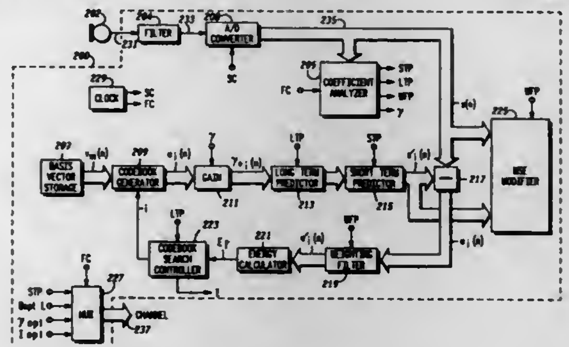
5,692,101
SPEECH CODING METHOD AND APPARATUS USING MEAN SQUARED ERROR MODIFIER FOR SELECTED SPEECH CODER PARAMETERS USING VSELP TECHNIQUES

Ira A. Gerson, Schaumburg; Mark A. Jasiuk, Chicago, and Matthew A. Hartman, Bloomington, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1995, Ser. No. 560,857

Int. Cl.⁶ G10L *9/14*

U.S. Cl. 395—2.31 **13 Claims**



5. A method of speech coding comprising the steps of:
receiving a speech data signal;
providing excitation vectors in response to said step of receiving;
determining an excitation gain coefficient and a long term predictor coefficient for use by a long term predictor filter and a Pth-order short term predictor filter;
filtering said excitation vectors utilizing said long term predictor filter and said short term predictor filter, forming filtered excitation vectors;
comparing said filtered excitation vectors to said speech data signal, forming difference vectors;
calculating energy of said filtered difference vectors, forming an error signal;
choosing an excitation code, I, using the error signals, which best represents the received speech data;
calculating optimal excitation gain and optimal long term predictor gain for the chosen excitation codebook vector;
forming a synthetic excitation signal using said chosen excitation code, the optimal excitation gain and said optimal long term predictor gain;
calculating an energy of the speech data signal, forming a speech data energy value;
calculating an energy of the synthetic excitation signal, forming a synthetic excitation energy value;
determining a gain bias factor to more closely match the speech data energy value and the synthetic excitation energy value; and
quantizing the optimal excitation gain and the optimal long term predictor gain to minimize the error between the speech data signal and the synthetic excitation signal.

5,692,102
METHOD DEVICE AND SYSTEM FOR AN EFFICIENT NOISE INJECTION PROCESS FOR LOW BITRATE AUDIO COMPRESSION

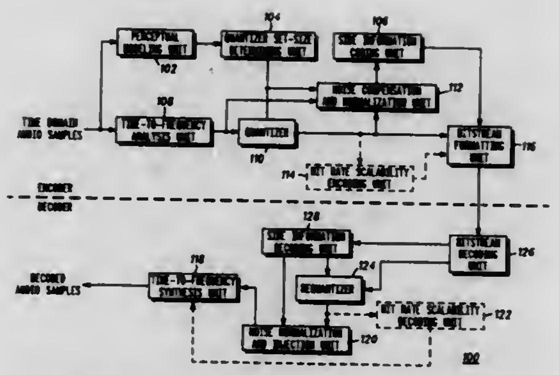
Davis Pan, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1995, Ser. No. 548,773

Int. Cl.⁶ G10L *7/00*

U.S. Cl. 395—2.39 **10 Claims**

1. A system for efficient noise injection for low bitrate audio compression to maximize audio quality, wherein the system includes at least one of A–B;
A) the encoder including a noise substitution and normalization unit comprising:


PERCEPTUAL MODELING UNIT
QUANTIZER SET-SIZE DETERMINING UNIT
SIDE INFORMATION CODING UNIT
NOISE COMPENSATION AND NORMALIZATION UNIT
TIME DOMAIN AUDIO SAMPLES
TIME-TO-FREQUENCY ANALYSIS UNIT
QUANTIZER
BITSTREAM FORMATTING UNIT
BIT RATE SCALABILITY ENCODING UNIT
ENCODER
DECODER
SIDE INFORMATION DECODING UNIT
BITSTREAM DECODING UNIT
DECODED AUDIO SAMPLES
TIME-TO-FREQUENCY SYNTHESIS UNIT
DEQUANTIZER
BIT RATE SCALABILITY DECODING UNIT
NOISE NORMALIZATION AND INJECTION UNIT
102
104
106
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126
128
100

1) an encoder zero detection unit, coupled to receive a frequency domain quantized signal, for determining a control signal that indicates whether noise injection is implemented in accordance with a predetermined audio compression scheme;
2) a normalization computation unit, coupled to receive at least unquantized subband values and the control signal from the encoder zero detection unit, for determining an energy normalization term based on the unquantized subband values when the control signal indicates all zero values for predefined regions;
B) the decoder including a noise normalization and injection unit comprising:
1) a decoder zero detection unit, coupled to receive a frequency domain quantized signal, for determining, a control signal that indicates implementation of noise injection is implemented in accordance with a predetermined audio compression scheme when values of the frequency domain quantized signal are zero; and
2) a noise generation and normalization unit, coupled to receive the energy normalization term and the control signal from the decoder zero detection unit, for substituting a predetermined noise signal multiplied by the energy normalization term where indicated by the control signal,
wherein the predetermined audio compression scheme comprises one of A–B;
A) coding an individual quantizer step-size for each pre-defined frequency region; and
B) coding a single global step-size for an entire frame of audio data.

5,692,103
METHOD OF SPEECH RECOGNITION WITH LEARNING

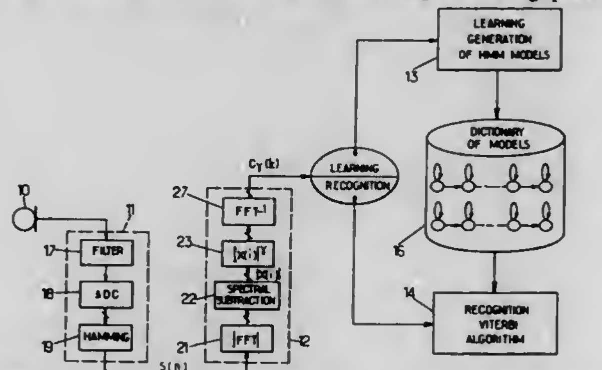
Philip Lockwood, Antony, and Patrice Alexandre, les Essarts le Roi, both of France, assignors to Matra Communication, Cedex., France

Filed Apr. 20, 1994, Ser. No. 230,140

Claims priority, application France, Apr. 23, 1993, 93 04849

Int. Cl.⁶ G10L *5/06*

U.S. Cl. 395—2.42 **15 Claims**



1. A speech processing method comprising a learning phase during which a signal originating from a sensor is processed to obtain parameters which represent voice structures uttered by a user in a mildly noise environment and said parameters are stored in a dictionary, and a subsequent recognition phase during which the signal originating from the sensor is processed to obtain parameters which are compared with those stored in the dictionary so as to recognize voice structures uttered by the user in a noisy environment, wherein the obtaining of said parameters during the learning and recognition phases includes the steps of:
forming frames of predetermined length from the signal originating from the sensor;
transforming each frame from the time domain to the frequency domain to obtain a spectrum X(i); and
determining the magnitude $|X(i)|^\gamma$, where $|X(i)|$ represents the modulus of the spectrum and γ represents an exponent lying between ½ and ¾;
applying an inverse transformation, from the frequency domain to the time domain, to said magnitude $|X(i)|^\gamma$.

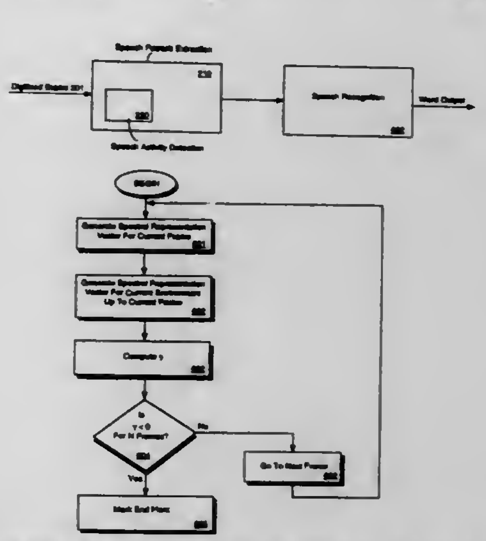
5,692,104
METHOD AND APPARATUS FOR DETECTING END POINTS OF SPEECH ACTIVITY

Yen-Lu Chow, Saratoga, and Erik P. Staats, Brookdale, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 999,128, Dec. 31, 1992, Pat. No. 5,596,680. This application Sep. 27, 1994, Ser. No. 313,430

Int. Cl.⁶ G10L *5/06*

U.S. Cl. 395—2.62 **28 Claims**


Speech Feature Extraction
Digitized Signal 201
Speech Recognition
Word Output
Speech Activity Detection
Begin
Generate Spectral Representation Vector For Current Frame
Compute γ
Go To Next Frame
Mark End Point
No
Yes

1. A method of detecting speech activity in a data input stream comprising the steps of:
(a) generating a set of spectral representation vectors to represent the data input stream, wherein each spectral representation vector of the set of spectral representation vectors represents a predetermined portion of the data input stream;
(b) generating a steady state spectral representation vector indicative of the state of the data input stream at a first predetermined portion of the data input stream;
(c) comparing a spectral representation vector corresponding to the first predetermined portion of the data input stream to the steady state spectral representation vector;
(d) determining a first end point of speech activity when the set of spectral representation vectors diverges from the steady state spectral representation vector; and
(e) determining a second end point of speech activity when a predetermined number of spectral representation vectors of the set of spectral representation vectors are within a predetermined distance of the steady state spectral representation vector for a continuous predetermined period of time.

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TRANSCODING AND TRANSDECODING UNIT, AND METHOD FOR ADJUSTING THE OUTPUT THEREOF

Reijo Leppänen, Espoo, and Marko Vänskä, Nummela, both of Finland, assignors to Nokia Telecommunications Oy, Espoo, Finland

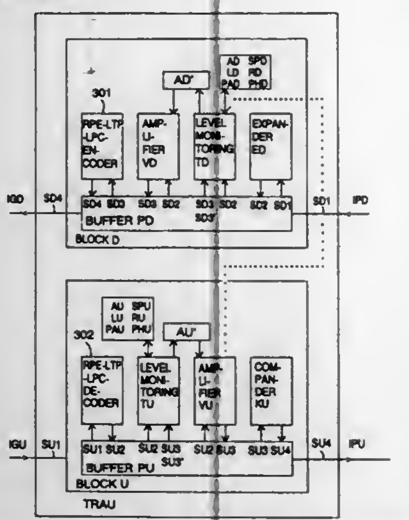
PCT No. PCT/FI94/00414, § 371 Date May 19, 1995, § 102(e) Date May 19, 1995, PCT Pub. No. WO95/08877, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 19, 1994, Ser. No. 428,220

Claims priority, application Finland, Sep. 20, 1993, 934116

Int. Cl.^{6} G10L *3/02*

U.S. Cl. 395—2.94 **22 Claims**



1. A transcoding unit in a digital mobile radio system, comprising:
- an expander unit for converting companded voice frequency digital data into an expanded linear signal;
- an amplifying means for amplifying said expanded linear signal to provide an amplified signal;
- a level-monitoring means for monitoring the amplitude of said expanded linear signal and for controlling said amplifying means such that said amplified signal produced by the amplifying means has a desired level; and
- a speech encoder for coding said amplified signal to provide an encoded signal.

5,692,106

SYSTEM MANAGEMENT METHOD AND APPARATUS

Simon J. Towers, Bath, and Paul V. Mellor, Bristol, both of England, assignors to Hewlett-Packard Company, Palo Alto, Calif.

PCT No. PCT/GB93/02106, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO94/09427, PCT Pub. Date Apr. 28, 1994

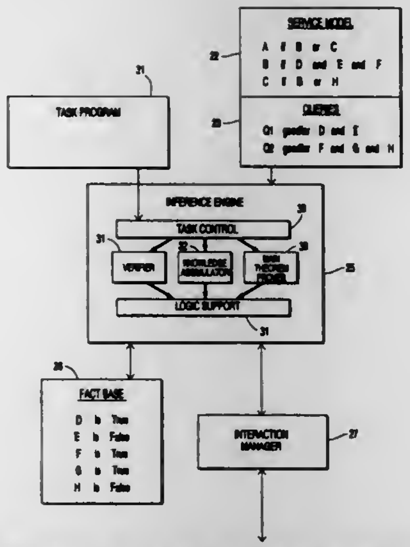
PCT Filed Oct. 12, 1993, Ser. No. 244,664

Claims priority, application WIPO, Oct. 13, 1992, PCT/GB92/01875

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 395—50 **19 Claims**

18. System management apparatus for carrying out at least one management task in relation to at least one service intended to be provided by a computer system including cooperating physical and logical entities, said apparatus comprising:
- a declarative model specifying independently of any particular said task, the requirements needing to be met for the service to be available, these requirements being set out in terms of the entities required and the inter-relationships of the required entities, one of said declarative models being provided for the or each said at least one service,
- inference engine means for carrying out inferencing operations in relation to a said declarative model,



- task control means, one of said task control means being respectively provided for the or each said at least one management task, each task control means being arranged for controlling performance of the corresponding task by said inference engine means in a manner independent of any particular said model and in terms of general inferencing operations, and
- means for causing a said at least one management task to be carried out in relation to a said at least one service, said means for causing being arranged for causing said inference engine means to operate on the corresponding declarative model under the control of the said task control means relevant to that management task.

5,692,107

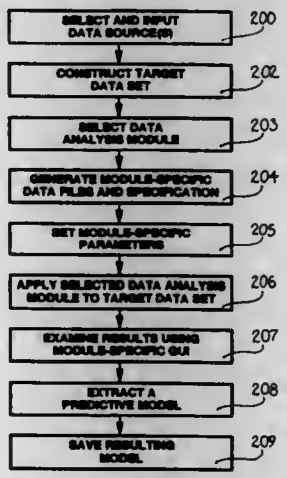
METHOD FOR GENERATING PREDICTIVE MODELS IN A COMPUTER SYSTEM

Evangelos Simoudis, San Mateo; Brian K. Livezey, Menlo Park, and Randy G. Kerber, San Jose, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 213,191, Mar. 15, 1994. This application Sep. 20, 1996, Ser. No. 718,226

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—50 **11 Claims**


SELECT AND INPUT DATA SOURCE(S)
200
CONSTRUCT TARGET DATA SET
202
SELECT DATA ANALYSIS MODULE
203
GENERATE MODULE-SPECIFIC DATA FILES AND SPECIFICATION
204
SET MODULE-SPECIFIC PARAMETERS
205
APPLY SELECTED DATA ANALYSIS MODULE TO TARGET DATA SET
206
EXAMINE RESULTS USING MODULE-SPECIFIC GUI
207
EXTRACT A PREDICTIVE MODEL
208
SAVE RESULTING MODEL
209

1. A data mining method for generating predictive models in a computer system, said computer system comprising:
- a user interface;
- at least one data source;
- at least one top-down data analysis module and at least one bottom-up data analysis module in cooperative communication with each other and in communication with the user interface, where the top-down data analysis module considers data supporting and refuting a piece of expressed knowledge, validates or invalidates the knowledge, and gives reasons for the validity or invalidity of the knowledge, and the bottom-up data analysis module discovers knowledge in data; and
- a server processor, in communication with each data source and with the data analysis modules;

the method comprising the steps of:
- selecting data from at least one data source;
- constructing a target data set from the data selected from the data source(s);
- extracting a predictive model using at least one of the data analysis modules based on the target data set;
- storing the predictive module for future use;
- generating a knowledge base set, wherein said knowledge base set includes a set of rules, a validated query phrase, and said predictive model;
- selecting the knowledge base set; and
- validating a query phrase against the target data set and the knowledge base set;
- wherein the step of extracting a predictive model comprises performing at least one process from the group of processes consisting of: detecting a collection of rules and extracting the collection; formulating a set of equations and extracting the set; and training a neural network and extracting parameters describing the neural network.

5,692,108

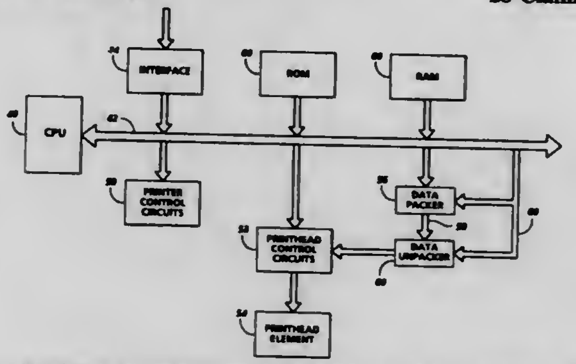
ODD/EVEN STROKE CONTROL FOR REDUCED VIDEO DATA CLOCKING

Frederick A. Donahue, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1994, Ser. No. 312,382

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—108 **28 Claims**



1. A printing apparatus having a printhead with a plurality of drivers for causing liquid ink to be ejected from nozzles for printing an image on a recording medium according to a bitmap of image data including a plurality of bits arranged in rows and columns, the printing apparatus comprising:
- selecting means for selecting a portion of the bitmap of image data with the selected portion having selected bits and unselected bits, the number of selected bits being less than the number of bits in the selected portion;
- a logic control line coupled to said selecting means, said logic control line transmitting a control signal indicating which of the bits of the selected portion are selected;
- directing means, coupled to said selecting means and to said logic control line, for directing the printhead to emit liquid ink from selected ones of the plurality of nozzles according to the selected bits in response to the control signal; and
- transfer means for transferring only the selected bits from said selecting means to said directing means.

5,692,109

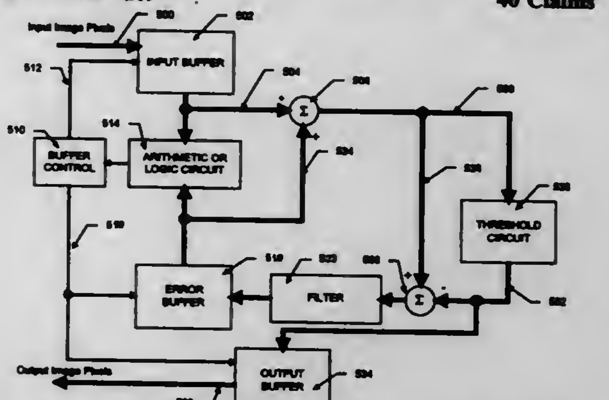
METHOD AND APPARATUS FOR MINIMIZING ARTIFACTS IN IMAGES PRODUCED BY ERROR DIFFUSION HALFTONING

Joseph S. Shu, San Jose, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 1, 1994, Ser. No. 269,708

Int. Cl.^{6} G06K *15/00;* H04N *1/40*

U.S. Cl. 395—109 **40 Claims**



1. A method of converting a continuous-tone image, represented as an array of electronically encoded pixels each specifying a gray-scale value, into a binary raster suitable for electronic printing, the method comprising the steps of:
- A. identifying a series of pixels corresponding to a linear segment of the image;
- B. processing the identified pixels, in a sequence corresponding to movement along the segment in a selected one of a first direction and a second direction, to convert the pixels into binary raster values; and
- C. repeating the identification and processing steps until the image has been fully processed,

wherein the selected one direction of a processing sequence is based on information from at least one previous processed pixel.

5,692,110

PRINTING DEVICE AND RECORDING PAPER CONTROL

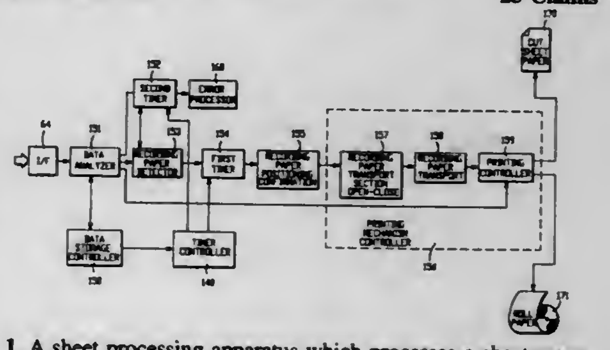
Masayo Miyasaka; Yoshikazu Ito; Masahiro Minowa, and Kazunari Yawata, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 397,009, Mar. 1, 1995, Pat. No. 5,555,349, which is a continuation of Ser. No. 139,627, Oct. 20, 1993, Pat. No. 5,437,004, which is a continuation of Ser. No. 902,318, Jun. 22, 1992, abandoned. This application Sep. 5, 1996, Ser. No. 708,598

Claims priority, application Japan, Jun. 21, 1991, 3-150312; Feb. 20, 1992, 4-033411

Int. Cl.^{6} G06K *15/06*

U.S. Cl. 395—111 **25 Claims**



1. A sheet processing apparatus which processes a sheet manually set therein comprising:
- sheet processing means for processing a sheet;

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sheet transport means for moving the sheet adjacent and past said sheet processing means;

sheet detection means for detecting one of a presence and an absence of the sheet set in said sheet transport means;

an interface for receiving from a host device a first time parameter representing a desired time duration for positioning the sheet in said sheet transport means;

first time setting means for setting a first time duration in response to said first time parameter received by said interface from the host device; and

timing means for initiating said sheet transport means to move the sheet to said sheet processing means after the first time duration set by said first time setting means has elapsed after said sheet detection means detects the presence of the sheet.

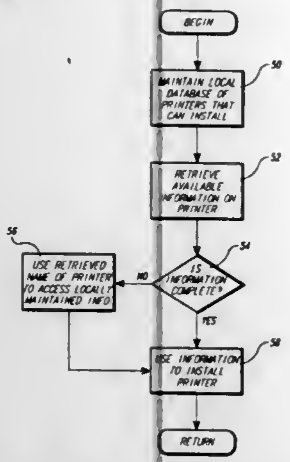
5,692,111

AUTOMATIC INSTALLATION OF PRINTERS IN A DISTRIBUTED ENVIRONMENT

Jonathan E. Marbry; Samuel J. McKelvie, both of Bellevue; David H. Tryon, Redmond; Lin F. Shaw, Redmond, and Chia-Chi Teng, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 318,070, Oct. 5, 1994, abandoned.
This application Apr. 29, 1996, Ser. No. 641,087
Int. Cl.⁶ H04N *1/23*

U.S. Cl. 395—114 **26 Claims**


BEGIN
50
MAINTAIN LOCAL DATABASE OF PRINTERS THAT CAN INSTALL
52
RETRIEVE AVAILABLE INFORMATION ON PRINTER
54
IS INFORMATION COMPLETE?
NO
YES
56
USE RETRIEVED NAME OF PRINTER TO ACCESS LOCALLY MAINTAINED INFO
58
USE INFORMATION TO INSTALL PRINTER
RETURN

1. In a distributed system comprising a first workstation and a remote network having a printer and a network server, a method comprising the computer-implemented steps of:

providing a database of printer configuration information, including printer configuration information for the printer in the remote network, in shared memory at the network server;

retrieving the printer configuration information for the printer from the shared memory of the network server in response to a request from the first workstation, said printer configuration information including information that identifies the printer;

using the information that identifies the printer to identify a printer driver to be installed at the first workstation and to determine where the printer driver is stored in the distributed system; and

retrieving the printer driver from where it is stored, installing the identified printer driver at the first workstation and storing at least some of the retrieved printer configuration information in the local storage of the first workstation.

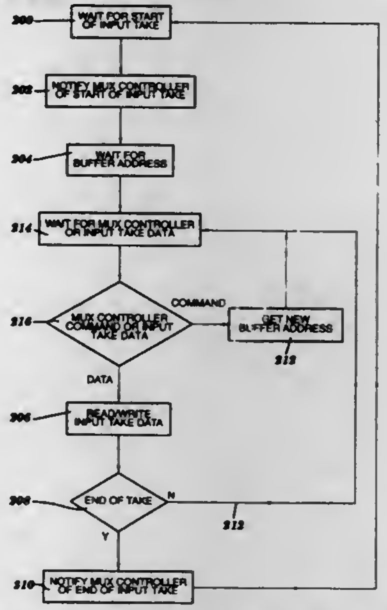
5,692,112

METHOD AND APPARATUS FOR BUFFERING DATA BETWEEN A RASTER IMAGE PROCESSOR (RIP) AND AN OUTPUT DEVICE

Thomas P. Brady, Methuen, Mass., assignor to Agfa Division, Bayer Corporation, Wilmington, Mass.

Filed Sep. 28, 1995, Ser. No. 534,904
Int. Cl.⁶ G06K *15/00*

U.S. Cl. 395—115 **21 Claims**


300
WAIT FOR START OF INPUT TAKE
302
NOTIFY MUX CONTROLLER OF START OF INPUT TAKE
304
WAIT FOR BUFFER ADDRESS
314
WAIT FOR MUX CONTROLLER OR INPUT TAKE DATA
316
MUX CONTROLLER COMMAND OR INPUT TAKE DATA
COMMAND
GET NEW BUFFER ADDRESS
318
DATA
306
READ/WRITE INPUT TAKE DATA
308
END OF TAKE
N
312
Y
310
NOTIFY MUX CONTROLLER OF END OF INPUT TAKE

1. In an imaging system including a raster image processor (RIP) for producing imaging data, an output device for consuming imaging data produced by said RIP, and a plurality of storage buffers, a data buffering method comprising the steps of:

storing a first supply of imaging data produced by said RIP on a first one of said storage buffers;

determining, during said storing step, if said output device requires a second supply of imaging data produced by said RIP and previously stored on said first storage buffer; and

segmenting said first supply of imaging data between said first storage buffer and a second one of said storage buffers of said output device requires said second supply of imaging data previously stored on said first storage buffer, and outputting said second supply of imaging data to said output device.

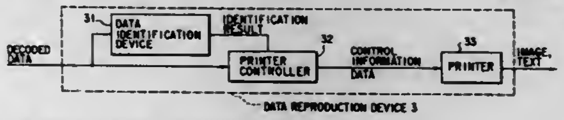
5,692,113

DATA REPRODUCTION SYSTEM FOR REPRODUCING AND OUTPUTTING MULTIMEDIA INFORMATION USING A PRINTER

Seiji Tatsuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 14, 1996, Ser. No. 645,776
Claims priority, application Japan, May 17, 1995, 7-118492
Int. Cl.⁶ G06K *15/00*

U.S. Cl. 395—117 **6 Claims**



1. A data reproduction system comprising:

a reader for optically reading a code with a predetermined format recorded in an optically readable manner on a data recording medium, and for decoding the code for respective sub-sets, multimedia information which includes at least one of voice information, image information and text information being coded, with a predetermined method, into the data, serving as the codes, in units of sub-sets in said data recording medium, said sub-sets being groups of data each of which can be identified as an information unit; and

a data reproduction device for reproducing and outputting the data decoded by said reader, wherein said data reproduction device includes:

a data identification device for identifying contents of data for the respective sub-sets, decoded by said reader;

a printer controller for controlling a printer based on an identification result of said data identification device; and

said printer, controlled by said printer controller, for printing out said data.

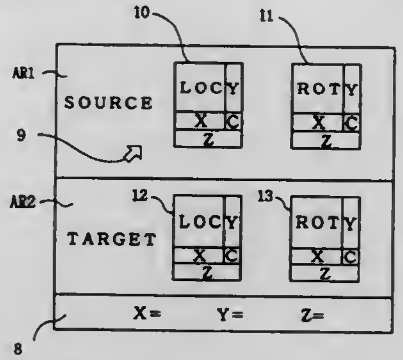
5,692,114

THREE-DIMENSIONAL PARAMETER INPUT DEVICE AND IMAGE PROCESSING APPARATUS

Atsushi Imai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1995, Ser. No. 576,760
Claims priority, application Japan, Dec. 26, 1994, 6-338205
Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—127 **10 Claims**



1. A three-dimensional parameter input device, comprising:

a monitor;

icon display means for displaying an icon composed of first, second and third regions on said monitor;

input means for inputting a location data and a definition data;

cursor display means for displaying a cursor at the position on the display surface of said monitor corresponding to said location data;

determination means for determining in which region among said first, second and third regions said cursor is positioned when said first definition data is supplied from said input means; and

parameter generation means for generating and outputting an X-directional location data or a data of amount of movement in the direction of X-axis from said location data supplied from said input means after the supply of said first definition data when said cursor is positioned in said first region, for generating and outputting a Y-directional location data or a data of amount of movement in the direction of Y-axis from said location data supplied from said input means after the supply of said first definition data when said cursor is positioned in said second region, and for generating and outputting a data showing enlargement ratio from said location data supplied from said input means after the supply of said first definition data when said cursor is positioned in said third region, based on the determination result of said determination means.

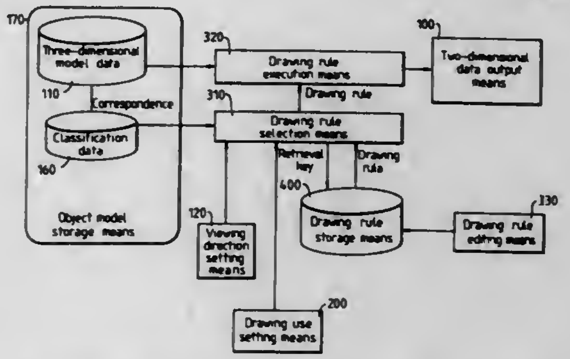
5,692,115

METHOD OF GENERATING AN IMAGE AND AN APPARATUS FOR CARRYING OUT SUCH A METHOD

Kumiko Itoh, Mito; Yasumasa Kawashima, Hitachi; Tomotoshi Ishida, Katsuta, and Naoyuki Honda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 220,250, Mar. 30, 1994, abandoned.
This application Oct. 8, 1996, Ser. No. 727,760
Claims priority, application Japan, Apr. 2, 1993, 5-077056
Int. Cl.⁶ G06F *17/50*

U.S. Cl. 395—127 **17 Claims**


170
Three-dimensional model data
110
Correspondence
Classification data
160
Object model storage means
320
Drawing rule execution means
100
Two-dimensional data output means
310
Drawing rule
Drawing rule selection means
Retrieval key
Drawing rule
400
Drawing rule storage means
130
Drawing rule editing means
120
Viewing direction setting means
200
Drawing use setting means

1. A method of generating an image of a feature of an object, comprising the steps of:

providing model data representing a three-dimensional image of said object, said model data including feature classification data representing at least one feature of said object;

storing a plurality of drawing rules for said at least one feature, each of said plurality of drawing rules corresponding to a two-dimensional representation of said at least one feature from one of a plurality of viewing directions, and each of said plurality of drawing rules for said at least one feature representing a different predetermined visual presentation of said at least one feature according to a different standard drawing convention;

selecting one of said plurality of viewing directions for said object;

selecting, in response to feature classification data and the selected viewing direction, one of said plurality of drawing rules for said at least one feature corresponding to a particular visual presentation of said at least one feature so as to display said at least one feature according to the standard drawing convention corresponding to the selected one of said plurality of drawing rules; and

generating a two-dimensional image of said at least one feature of said object from said model data and said selected one of said plurality of drawing rules, whereby said at least one feature is shown in said two-dimensional image with said particular visual presentation.

5,692,116

Patent Not Issued For This Number

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5,692,117
METHOD AND APPARATUS FOR PRODUCING ANIMATED DRAWINGS AND IN-BETWEEN DRAWINGS

Andrew Louis Charles Berend; Mark Jonathan Williams; Michael John Brocklehurst; Stuart Philip Hawkins, and Gavin Timothy Jones, all of Cambridge, United Kingdom, assignors to Cambridge Animation Systems Limited, United Kingdom

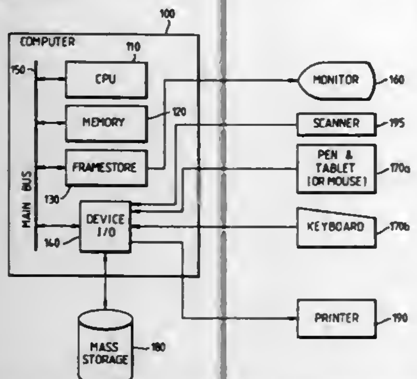
PCT No. PCT/GB91/02122, § 371 Date Mar. 30, 1992, § 102(e) Date Mar. 30, 1992, PCT Pub. No. WO92/09964, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 29, 1991, Ser. No. 844,634

Claims priority, application United Kingdom, Nov. 30, 1990, 9026120; Jan. 11, 1991, 9100632; Jan. 31, 1991, 9102125; May 21, 1991, 9110945; Aug. 12, 1991, 9117409

Int. Cl.^{6} G06T *13/00*

U.S. Cl. 395—152 **83 Claims**



1. Apparatus for generating a sequence of pictures for animation, the apparatus comprising:

a store for storing picture data defining first and second key pictures, each said key picture including an object represented by a plurality of lines, each said line being defined by a plurality of control points, wherein a first fine in the first key picture is comprised of a first number of control points and a second line in the second key picture corresponding to the first line is comprised of a second number of control points, the second number being greater than the first number,

said picture data comprising fine data defining said plurality of lines,

said line data comprising control point data defining said plurality of control points;

said control point data further comprising data defining at least one attribute point, said attribute point having a position relative to said first line of said first key picture, but said attribute point not being one of the plurality of control points defining said first line; and

an interpolator for reading the picture data of said first key picture and said second key picture, and for generating therefrom intervening picture data defining one or more intervening pictures for inclusion in said sequence between said first and second key pictures, said intervening picture data being generated in accordance with a topological correspondence which identifies, (a) for each control point of said first key picture, one corresponding control point of said second key picture, and (b) for each said attribute point, one of the plurality of control points in said second key picture.

5,692,118
AUTOFOCUS CONTROL DEVICE HAVING MOVING BODY TRACKING CONTROL

Seiichi Yasukawa, Yotsukaido, Japan, assignor to Nikon Corporation, Tokyo, Japan

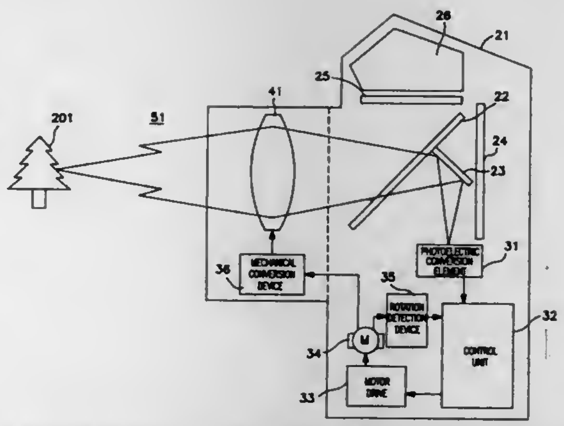
Filed Sep. 7, 1995, Ser. No. 524,577

Claims priority, application Japan, Nov. 2, 1994, 6-269302

Int. Cl.^{6} G03B *3/00;13/18;7/08*

U.S. Cl. 396—153 **16 Claims**

1. An autofocus control device to control focusing of a photographic lens on a subject, comprising:


28
21
25
22
201
51
41
24
23
31
36
MECHANICAL CONVERSION DEVICE
PHOTOELECTRIC CONVERSION ELEMENT
35
ROTATION DETECTION DEVICE
32
CONTROL UNIT
34
M
33
MOTOR DRIVE

a defocus amount computation device to periodically determine a defocus amount of a subject image;

a drive position computation device to compute drive target positions to which the photographic lens is to be driven corresponding to each periodically determined defocus amount;

a first direction computation device to determine respective changes in direction of drive target position between successive computed drive target positions;

a field travel speed computation device to compute a field travel speed for the subject based on drive target positions computed by the drive position computation device;

a second direction computation device to determine a direction of the computed field travel speed; and

a moving body determination device to determine whether the subject is a moving body based on the directions determined by the first direction computation device, the field travel speed determined by the field travel speed computation device, and the direction determined by the second direction computation device.

5,692,119
MANAGEMENT METHOD FOR A MULTIPROCESSOR SYSTEM

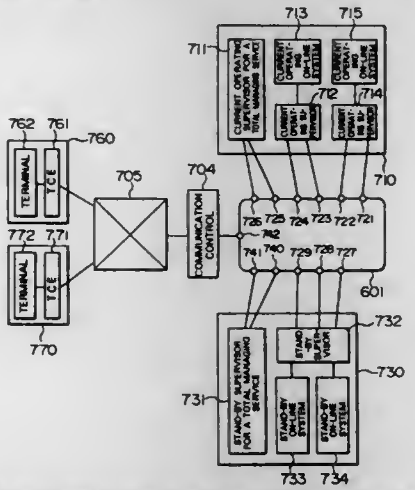
Yukio Koguchi; Nobuyuki Suzuki, both of Yokohama, and Toyojiro Hayashi, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1992, Ser. No. 865,330

Claims priority, application Japan, Apr. 10, 1991, 3-077571

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.02 **8 Claims**



1. A multiprocessor control method for controlling a multiprocessor system, wherein said multiprocessor system comprises:

a current multiprocessor system, including:

a plurality of first processors on which a current supervisor and at least one online system are executed, said at least one online system being a program for executing transaction processings under control of said current supervisor, and

at least a second processor on which a current management supervisor is executed, said current management supervisor being a program for controlling start operation of said current supervisor and for detecting a fault in said current supervisor;

a stand-by multiprocessor system including:

a plurality of third processors on which a stand-by supervisor and at least one stand-by online system are executed, said at least one stand-by online system being a program for executing transaction processings under control of said stand-by supervisor, and

at least a fourth processor on which a stand-by management supervisor is executed, said stand-by management supervisor being a program for controlling start operation of said stand-by supervisor and for detecting a fault in said stand-by supervisor, and

a transmission path for connecting said current multiprocessor system with said stand-by multiprocessor system,

wherein said multiprocessor control method comprises the steps of:

detecting, in said stand-by management supervisor, a fault in said current management supervisor;

starting, by said stand-by management supervisor, said stand-by supervisor when said stand-by management supervisor detects a fault in said current management supervisor; and

starting, by said stand-by supervisor, said stand-by online system to execute said transaction processings.

5,692,120
FAILURE RECOVERY APPARATUS AND METHOD FOR DISTRIBUTED PROCESSING SHARED RESOURCE CONTROL

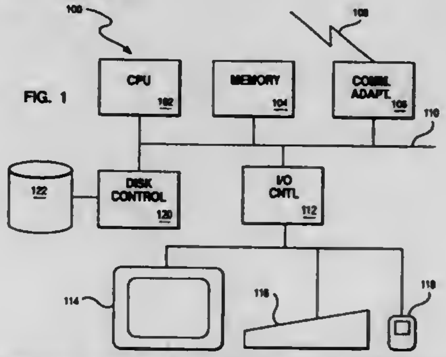
Ira Richard Forman, and Hari Haranath Madduri, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 287,046, Aug. 8, 1994, Pat. No. 5,463,733. This application May 30, 1995, Ser. No. 453,610

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.08 **3 Claims**

FIG. 1



1. A computer program product having a computer readable medium having computer program logic recorded thereon for causing a computer system to detect a master process failure in system having a plurality processes each controlled by a separate operating system and a plurality of shared resources each controlled by a master process and to notify all other processes of master process failure, the computer program product comprising:

program product means for causing said computer system to detect failure of a master process for a shared resource;

program product means for causing said computer system to request exclusive access to a shared resource control file using a network file management system procedure independent of said operating system for said processor;

program product means for causing said computer system to establish exclusive access to said shared resource control file, if said request is granted;

program product means for causing said computer system to determine from said control file the communications addresses of all other processes accessing said shared resource via the failed master process;

program product means for causing said computer system to invalidate said control file;

program product means for causing said computer system to send a message to each of said other processes indicating failure of said master process.

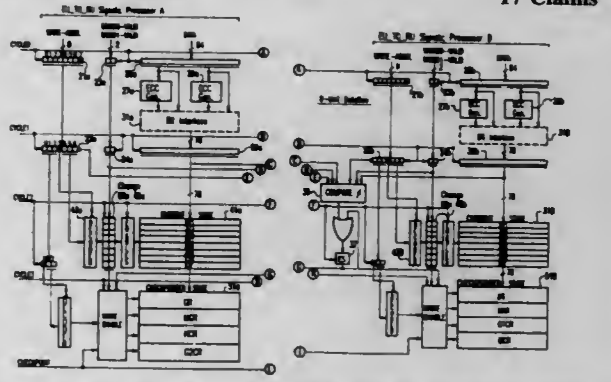
5,692,121
RECOVERY UNIT FOR MIRRORED PROCESSORS

Ferenc Miklos Bozso, Peekskill; Yiu-Hing Chan, Poughkeepsie, both of N.Y.; Philip George Emma, Danbury, Conn.; Algirdas Joseph Gruodis, Wappinger Falls, N.Y.; David Patrick Hillerud, Poughkeepsie, N.Y., and Scott Barnett Swaney, Catskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 421,411, Apr. 14, 1995, abandoned. This application Apr. 30, 1996, Ser. No. 641,771

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.11 **17 Claims**



1. A method for making a processor system immune to failure caused by external noise, said processor system having first and second identical processors running identical code in lock-step mode, including a recovery unit containing one or more checkpoint registers, each of said checkpoint registers having first and second partitions, the method comprising the steps of:

generating address data in each of said first and second processors;

generating identical operand data in each of said first and second processors;

initiating a fail-safe, no-fault error detection and recovery procedure comprising the steps of

partitioning the operand data generated by each of said first and second processors into respective first and second pluralities of data subsets,

generating error correction codes (ECCs) for each data subset of said first and second pluralities of data subsets,

bit interlacing the data subsets and corresponding ECCs to form an interlaced entity for each of said first and second processors, and

dividing each interlaced entity and loading the divide interlaced entities into first and second partitions of corresponding first and second current state registers; and

concluding said fail-safe, no-fault error detection and recovery procedure by the further steps of

comparing corresponding portions of the divided interlaced entities of each of said first and second processors and said address data,

if all comparisons are equal, then checkpointing said first partition of an interlaced entity from said first processor stored in a first partition of said first set of current state registers into a corresponding first partition of a checkpoint register specified by said address data from said first processor, and checkpointing said second partition of the interlaced entity from the second processor stored in a second partition of said second

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set of current state registers into said second partition of the checkpoint register specified by said address data from said second processor, wherein said address data from said first and second processors is known to have been equal at the time of the comparison step, and

if not all comparisons are equal, then implementing a recovery sequence.

5,692,122

GENERATION OF RANDOM CONVERSATION TESTCASES

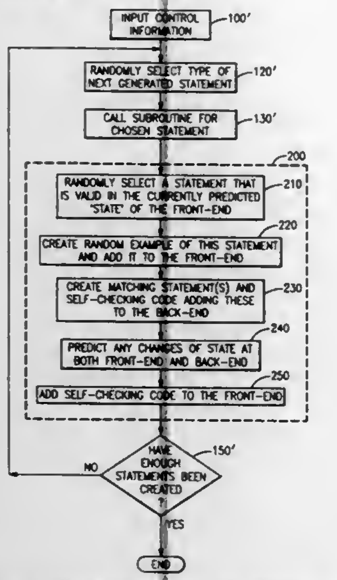
David L. Bird, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 169,091, Dec. 17, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,088

Claims priority, application United Kingdom, Mar. 30, 1993, 9306661

Int. Cl.^{6} G06F *11/30*

U.S. Cl. 395—183.14 **6 Claims**


INPUT CONTROL INFORMATION
100'
RANDOMLY SELECT TYPE OF NEXT GENERATED STATEMENT
120'
CALL SUBROUTINE FOR CHOSEN STATEMENT
130'
200
RANDOMLY SELECT A STATEMENT THAT IS VALID IN THE CURRENTLY PREDICTED "STATE" OF THE FRONT-END
210
CREATE RANDOM EXAMPLE OF THIS STATEMENT AND ADD IT TO THE FRONT-END
220
CREATE MATCHING STATEMENT(S) AND SELF-CHECKING CODE ADDING THESE TO THE BACK-END
230
PREDICT ANY CHANGES OF STATE AT BOTH FRONT-END AND BACK-END
240
ADD SELF-CHECKING CODE TO THE FRONT-END
250
HAVE ENOUGH STATEMENTS BEEN CREATED ?
150'
NO
YES
END

1. A method of generating testcase programs for a distributed computer system in which a conversation between partners in remote processors or regions at respective ends of said conversation employs interprogram conversation statements according to a predetermined protocol which also defines conversation states of said partners, each of said partners having a current conversation state, the method comprising the steps of:

(a) randomly generating an example of an interprogram conversation statement for one of said partners which is valid for the current conversation state of that partner;

(b) adding the randomly generated example of an interprogram conversation statement to a first testcase program for that partner;

(c) if any randomly generated statement for the first testcase program requires a matching statement at the other end of the conversation according to said protocol, randomly generating an example of an interprogram conversation statement for the other partner which is valid for the current conversation state of that partner;

(d) adding the matching statement to a second testcase program for the other partner; and

(e) predicting for each generated interprogram conversation statement any changes of state to said partners that will occur on execution of the respective randomly generated examples of interprogram statements prior to generation of each such subsequent statement, whereby the validity of subsequent statements under said protocol can be predetermined.

5,692,123

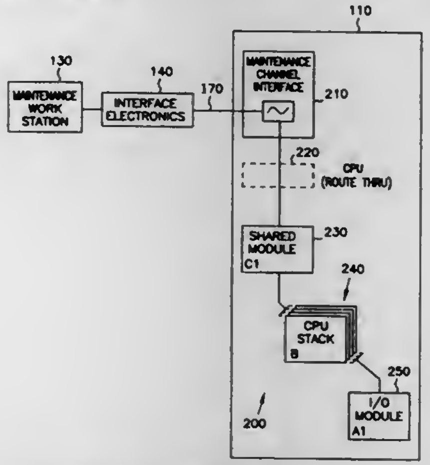
MAINTENANCE CHANNEL FOR MODULATOR, HIGHLY INTERCONNECTED COMPUTER SYSTEMS

Peter G. Logghe, Chippewa Falls, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Filed Dec. 7, 1994, Ser. No. 350,648

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.01 **12 Claims**



1. A modular computer system, comprising:

a plurality of modules for processing, storage, input/output, and error checking operations, wherein each module has at least one port for communications with other modules;

an interconnection network, connected to the ports of the plurality of modules;

a sanity code generator; and

a maintenance interface, connected to one of the plurality of modules, using sanity codes to control the modular computer system configuration, operation, and diagnostics;

wherein each module of the plurality of modules includes a sanity code recognizer for recognizing valid sanity codes and a sanity code retransmitter for retransmitting received, valid sanity codes.

5,692,124

SUPPORT OF LIMITED WRITE DOWNS THROUGH TRUSTWORTHY PREDICTIONS IN MULTILEVEL SECURITY OF COMPUTER NETWORK COMMUNICATIONS

James M. Holden, Valley Center; Stephen E. Levin, Poway, and Edwin H. Wrench, Jr., San Diego, all of Calif., assignors to ITT Industries, Inc., White Plains, N.Y.

Filed Aug. 30, 1996, Ser. No. 704,896

Int. Cl.^{6} H04L *9/00;* **G06F** *12/14;17/30*

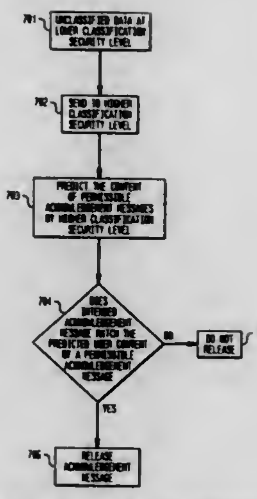
U.S. Cl. 395—187.01 **23 Claims**

1. A method for securing classified data residing with a user at a higher security classification level from covert transference with acknowledgment messages by said user at a higher security classification level for confirming data transfers across a computer network to a user at a lower security classification level, said method comprising the steps of:

sending data from said user at a lower security classification level with delivery information to said user at a higher security classification level;

predicting the user content of permissible acknowledgment messages supporting a legitimate transfer of said data from said user at a lower security classification level to said user at a higher security classification level; and,

releasing the predicted acknowledgment messages from said user at a higher security classification level to said user at a lower security classification level when the predicted acknowledgment message is a predetermined match with the content of said permissible acknowledgment messages.


701
UNCLASSIFIED DATA AT LOWER CLASSIFICATION SECURITY LEVEL
702
SEND TO HIGHER CLASSIFICATION SECURITY LEVEL
703
PREDICT THE CONTENT OF PERMISSIBLE ACKNOWLEDGEMENT MESSAGES BY HIGHER CLASSIFICATION SECURITY LEVEL
704
NO
DO NOT RELEASE
705
YES
706
RELEASE ACKNOWLEDGEMENT MESSAGE

5,692,125

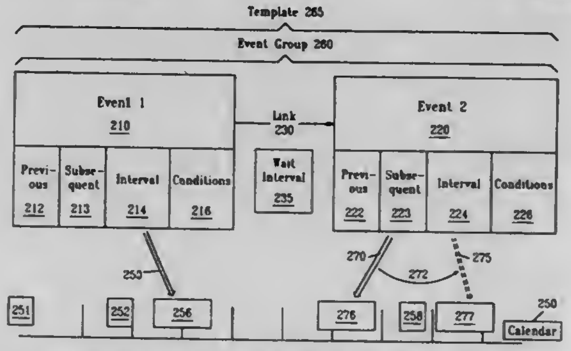
SYSTEM AND METHOD FOR SCHEDULING LINKED EVENTS WITH FIXED AND DYNAMIC CONDITIONS

Robert Jeffrey Schloss, Briarcliff Manor, and Linda Sue Tetzlaff, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1995, Ser. No. 438,153

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 395—209 **24 Claims**



1. A scheduling system for scheduling events, comprising:

a. a computer with a central processing unit and a memory;

b. one or more events to be scheduled and each event stored in the memory as an event data structure, one or more of the events having one or more event conditions, the event conditions defined in the respective event data structure and the event conditions being satisfied before the event can be performed;

c. one or more links, each link connecting two or more events, each link identified in one or more of the event data structures of the respective events that the link connects and each link establishing sequential relationships between the events that the link connects; and

d. a scheduler executed by the central processing unit to schedule one or more event groups, each event group having one or more events connected by one or more of the links, the scheduler scheduling the event group only if all of the event conditions in the event group are satisfied.

5,692,126

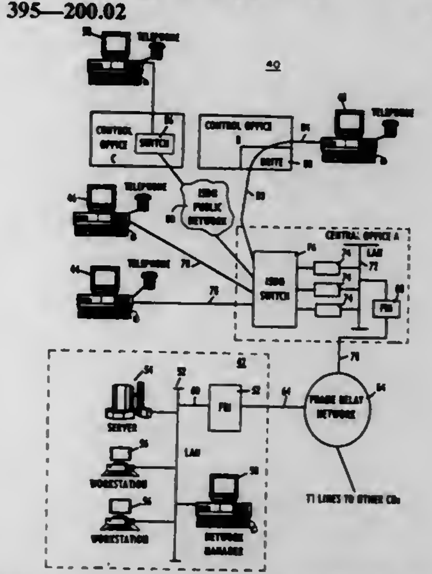
ISDN ACCESS TO FAST PACKET DATA NETWORK

Thomas N. Templeton, Bel Air, and John L. Burke, Joppatowne, both of Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Jan. 24, 1995, Ser. No. 377,565

Int. Cl.^{6} H04L *12/46*

U.S. Cl. 395—200.02 **40 Claims**



1. A data communications network for providing user terminals with access to a remote data center comprising:

a first local area network (LAN) arranged at said data center,

a fast packet network coupled to said first LAN for providing interconnection between said data center and a first central office having a fast packet interface coupled to said fast packet network,

an ISDN switch coupled to said user terminals via ISDN lines to provide said user terminals with Centrex services, and

a second LAN provided at said first central office for interfacing said fast packet network with said ISDN switch, and having a bus topology including a plurality of devices coupled to a common bus,

wherein said fast packet interface comprises a plurality of fast packet bridges coupled to said common bus, and

said second LAN is arranged so as to interconnect devices for bridging said second LAN to said ISDN switch, and devices for bridging said second LAN to said fast packet network.

5,692,127

SYSTEM FOR TRANSMITTING MULTIPLE PULSES PPM CONTROL SIGNAL TO WIRELESS DEVICE TO INDICATE COLLISION IN A WIRED NETWORK WHILE PLACING DATA ON THE NETWORK

Mark Daryl Devon, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 17, 1995, Ser. No. 406,378

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.06 **8 Claims**

1. A method for transmitting a collision indication to a device that is coupled to a wired network through a wireless connection, the method comprising the steps of:

receiving data over said wireless connection from said device, wherein said data is encoded in a pulse position modulation signal consisting of a series of pulse position modulation frames, wherein each pulse position modulation frame consists of a plurality of pulse windows;

placing said data on a backbone cable of said wired network;

determining if a collision occurred while placing said data on said backbone cable; and

if a collision occurred while placing said data on said backbone cable, then transmitting a control signal over said wireless

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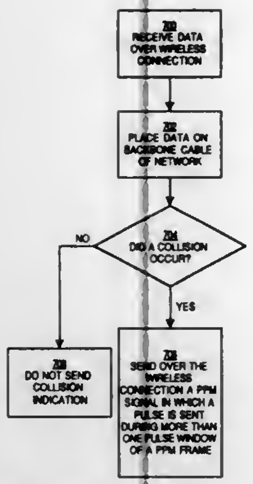
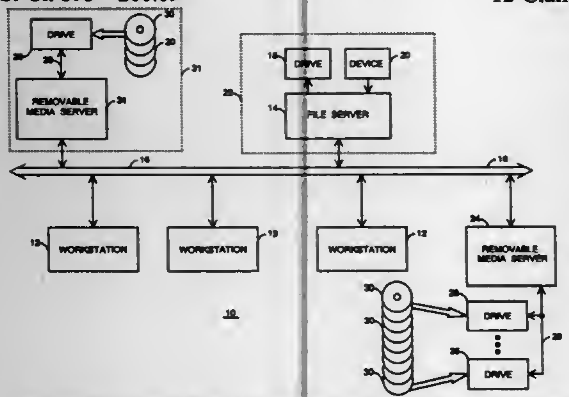

RECEIVE DATA OVER WIRELESS CONNECTION
PLACE DATA ON BACKBONE CABLE OF NETWORK
DID A COLLISION OCCUR?
NO
YES
DO NOT SEND COLLISION INDICATION
SEND OVER THE WIRELESS CONNECTION A PPM SIGNAL IN WHICH A PULSE IS SENT DURING MORE THAN ONE PULSE WINDOW OF A PPM FRAME

connection to said device, wherein said control signal is a pulse position modulation signal in which a pulse is sent during more than one pulse window of a pulse position modulation frame.

5,692,128
COMPUTER NETWORK WITH RELIABLE AND EFFICIENT REMOVABLE MEDIA SERVICES

David C. Bolles, Paradise Valley, and Alfred Robert Wilkinson, Phoenix, both of Ariz., assignors to Microtest, Inc., Phoenix, Ariz.

Filed Jun. 23, 1993, Ser. No. 82,083
Int. Cl.^{6} G06F *13/14*
U.S. Cl. 395—200.09 **12 Claims**



1. A method of operating a computer network of the type having a network communication link, at least one file server node connected to the network communication link, and at least one work station node connected to the network communication link, comprising the steps of:

connecting a removable media server to the network communication link, wherein said removable media server couples to a removable media drive which facilitates access to data on removable media;

detecting, at a file server node, a request received over the network communication link from a workstation node;

using said file server node to redirect said request to said removable media server over the network communication link;

servicing said request by said removable media server;

maintaining a list of recognized media;

verifying that a new removable medium is included in said list;

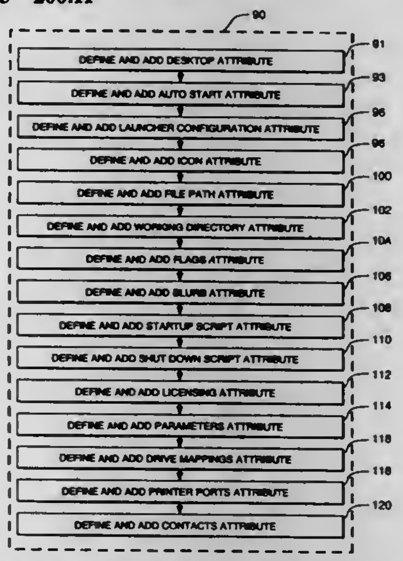
monitoring said removable media drive to detect a change from an old removable medium to said new removable medium; and

automatically mounting said new removable medium when said monitoring step detects a change in removable media to place said new removable medium in service on said computer network, said automatically mounting step being performed in response to said verifying step.

5,692,129
MANAGING APPLICATION PROGRAMS IN A COMPUTER NETWORK BY USING A DATABASE OF APPLICATION OBJECTS

Kelly E. Sonderegger; Kevin L. Hopton; Matthew G. Brooks; Andy Lawrence, all of Orem; Damon Janis; Lori K. Dayton, both of Provo, and Thomas B. Oldroyd, Orem, all of Utah, assignors to Novell, Inc., Orem, Utah

Filed Jul. 7, 1995, Ser. No. 499,711
Int. Cl.^{6} G06F *15/163;17/30*
U.S. Cl. 395—200.11 **71 Claims**


90
DEFINE AND ADD DESKTOP ATTRIBUTE
91
DEFINE AND ADD AUTO START ATTRIBUTE
93
DEFINE AND ADD LAUNCHER CONFIGURATION ATTRIBUTE
96
DEFINE AND ADD ICON ATTRIBUTE
98
DEFINE AND ADD FILE PATH ATTRIBUTE
100
DEFINE AND ADD WORKING DIRECTORY ATTRIBUTE
102
DEFINE AND ADD FLAGS ATTRIBUTE
104
DEFINE AND ADD BLURB ATTRIBUTE
106
DEFINE AND ADD STARTUP SCRIPT ATTRIBUTE
108
DEFINE AND ADD SHUT DOWN SCRIPT ATTRIBUTE
110
DEFINE AND ADD LICENSING ATTRIBUTE
112
DEFINE AND ADD PARAMETERS ATTRIBUTE
114
DEFINE AND ADD DRIVE MAPPINGS ATTRIBUTE
116
DEFINE AND ADD PRINTER PORTS ATTRIBUTE
118
DEFINE AND ADD CONTACTS ATTRIBUTE
120

1. A method of managing an application in a network, comprising the steps of:

selecting attributes for the application, one attribute capable of having as its value a brief identifier and another attribute selected from a group of attributes comprising an icon attribute, a working directory attribute, a blurb attribute, a licensing attribute, a drive mappings attribute, and a printer ports attribute; and

accessing an application object which is an instance of an application object class, the attributes for the application being associated with the application object in a database, the accessing step using the brief identifier.

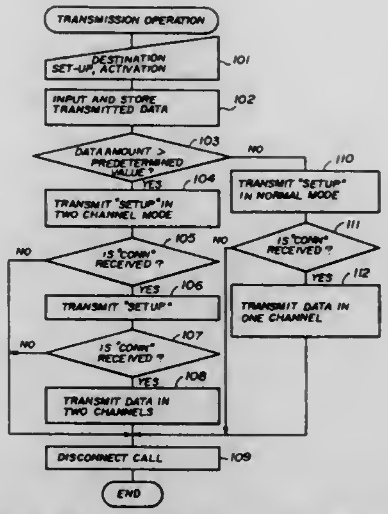
5,692,130
METHOD FOR SELECTIVELY USING ONE OR TWO COMMUNICATION CHANNEL BY A TRANSMITTING DATA TERMINAL BASED ON DATA TYPE AND CHANNEL AVAILABILITY

Toshifumi Shobu, Atsugi, and Fumihiro Ogasawara, Ebina, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 4,568, Jan. 14, 1993, abandoned.
This application Dec. 7, 1995, Ser. No. 568,810
Claims priority, application Japan, Jan. 14, 1992, 4-23410; Apr. 13, 1992, 4-118578
Int. Cl.^{6} G06F *13/00*
U.S. Cl. 395—200.12 **5 Claims**

1. A method of providing data transmission from a transmitting terminal connected to an integrated service digital network of data to a receiving terminal using a plurality of data channels in said network, said method comprising the steps of:

establishing at least a single channel of communication from said transmitting terminal to said receiving terminal;


TRANSMISSION OPERATION
DESTINATION SET-UP, ACTIVATION
101
INPUT AND STORE TRANSMITTED DATA
102
DATA AMOUNT > PREDETERMINED VALUE ?
103
NO
YES
104
TRANSMIT "SETUP" IN TWO CHANNEL MODE
IS "CONN" RECEIVED ?
105
NO
YES
106
TRANSMIT "SETUP"
IS "CONN" RECEIVED ?
107
NO
YES
108
TRANSMIT DATA IN TWO CHANNELS
110
TRANSMIT "SETUP" IN NORMAL MODE
IS "CONN" RECEIVED ?
111
NO
YES
112
TRANSMIT DATA IN ONE CHANNEL
DISCONNECT CALL
109
END

determining in said transmitting terminal if the amount of data to be transmitted from said transmitting terminal is greater than a predetermined amount and if said determination indicates that the amount of data exceeds the predetermined amount, forwarding a procedural request to said receiving terminal for access to a second channel;

responding by said receiving terminal, and indicating the availability of a second channel as well as the capability of said receiving terminal to accept data on a plurality of channels;

determining at said transmitting station based upon a returned signal from said receiving terminal that multiple channels may be employed, and capturing a second channel and dividing the data to be transmitted, wherein the dividing occurs in an independent first half and an independent second half;

transmitting via a first channel the first half of said data from said transmitting station and transmitting said second half via a second channel to said receiving station over mutually independent channels and wherein said division of the data is mutually independent based upon the division that occurs in said transmitting terminal;

transmitting via a single channel all of the data from said first terminal to said second terminal via a single channel in response to a denial of availability of multiple channel communication capability or availability of a second channel by said receiving terminal,

wherein said request for multiple channels is dynamically performed making it possible to release the second channel based on communication conditions; and

determining a type of data to be transmitted,

wherein the step of transmitting via the first and second channels and the step of transmitting via the single channel are alternatively performed based on the type of data which has been determined.

5,692,131
SYSTEM FOR CORPORATE TRAVEL PLANNING AND MANAGEMENT

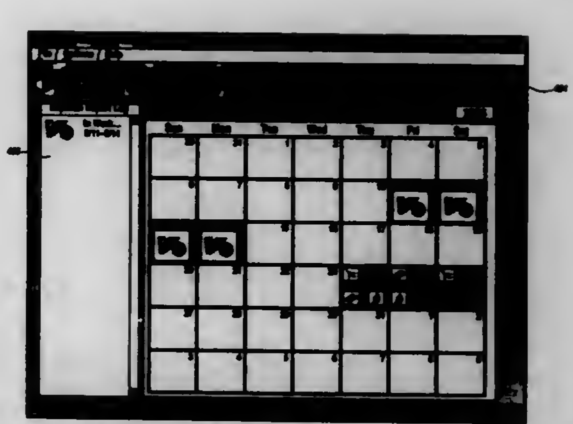
Arlene M. Vance, Flower Mound; Kerry Balch, Dallas; Karl Vochatzer, Flower Mound; Cynthia Sawtell, Arlington, and Sherry Williams, Dallas, all of Tex., assignors to The Sabre Group, Inc., Dallas, Tex.

Filed Sep. 6, 1995, Ser. No. 524,381
Int. Cl.^{6} G06F *17/60*
U.S. Cl. 395—206 **19 Claims**

1. A client-server system for corporate travel planning, expense reporting and travel management comprising:

a computerized reservation system;

a relational database server communicably linked to the computerized reservation system; and

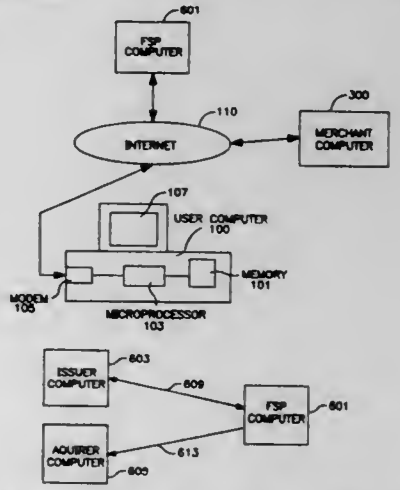


a travel planning, expense reporting and travel management system resident within a personal computer providing a graphical user interface for communication between the computer user, the travel planning, expense reporting and travel management system and the relational database server.

5,692,132
SYSTEM AND METHOD FOR CONDUCTING CASHLESS TRANSACTIONS ON A COMPUTER NETWORK

Edward J. Hogan, Bayside, N.Y., assignor to MasterCard International, Inc., New York, N.Y.

Filed Jun. 7, 1995, Ser. No. 477,438
Int. Cl.^{6} G06F *17/60*
U.S. Cl. 395—227 **71 Claims**



56. A method for extending funds from a host system to a consumer terminal apparatus comprising a memory storing an available fund separate from said host system to complete a cashless transaction over a network, comprising the steps of:

receiving at said host system over said network a request for an increase in said available fund from said consumer terminal apparatus to complete a cashless transaction;

determining at said host system whether to grant said received request for said consumer terminal apparatus; and

transmitting a reply signal from said host system to said consumer terminal apparatus indicating whether said request was granted,

wherein said available fund in said consumer terminal apparatus is increased if said request is granted and wherein said available fund is used to complete said cashless transaction.

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5,692,133
ARRANGEMENT HAVING SEVERAL FUNCTIONAL UNITS

Michael Abert, Au; Siegfried Block, Kandel; Johannes Bozenhardt; Franz Leigsnering, both of Ettlingen; Werner Pfattelcher, Pfinztal, and Franz-Clemens Schewe, Karlsruhe, all of Germany, assignors to Siemens Aktiengesellschaft, München, Germany

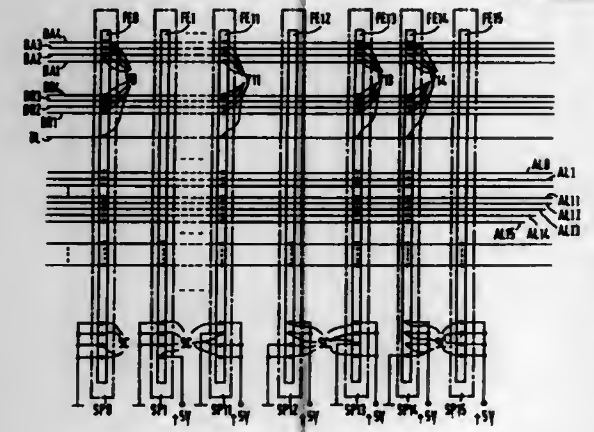
PCT No. PCT/DE93/01185, § 371 Date Jul. 20, 1995, § 102(e) Date Jul. 20, 1995, PCT Pub. No. WO94/14120, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 10, 1993, Ser. No. 454,165

Claims priority, application Germany, Dec. 14, 1992, 42 42 133.0

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—282 **8 Claims**



1. An arrangement for a programmable controller comprising:
(a) a system bus having data and control lines, said data and control lines comprising a bus request line, a bus grant line and a bus lock line;
(b) a plurality of address lines;
(c) a plurality of card slots interconnected by said system bus and by said address lines;
(d) a code generator for generating a card slot code for each of said plurality of card slots; and
(e) a plurality of functional units adapted to be plugged into said card slots, wherein each of said plurality of functional units includes:
  (i) means for determining a card slot code corresponding to a card slot into which a read/write functional unit is plugged, and
  (ii) an arbiter for managing said system bus, with said arbiter capable of being activated according to a selection code;
with at least two of said functional units comprising read/write functional units, wherein each of said read/write functional units includes:
  (i) a connector for coupling said read/write functional unit to said bus request line, said bus grant line and said bus lock line,
  (ii) means for determining a position code corresponding to a relative position of said read/write functional unit within the arrangement using said card slot codes associated with said plurality of functional units, and
  (iii) means for activating said arbiter when said position code corresponds to said selection code, said arbiter active during operation of the arrangement.

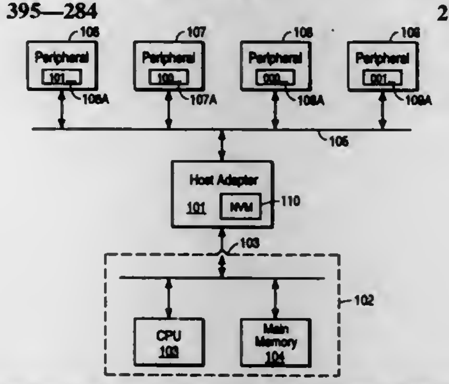
5,692,134
PRESERVING CONFIGURATION INFORMATION IN A SCAM BASED SCSI SYSTEM

Yee-Peng Wang, Milpitas, and Edward S. Chim, San Jose, both of Calif., assignors to Adaptec, Inc., Milpitas, Calif.

Filed Sep. 22, 1995, Ser. No. 532,919

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—284 **22 Claims**



1. A method for preventing a logical system identifier from being changed if a device is decoupled from a SCSI bus, comprising:
in a first isolating step, isolating a first device coupled to said SCSI bus;
transferring a first plurality of identification bits from said first device to a second device coupled to said SCSI bus;
from said first plurality of identification bits, obtaining a second plurality of identification bits, there being fewer of said second plurality of identification bits than there are of said first plurality of identification bits; and
storing said second plurality of identification bits in a non-volatile memory in said second device.

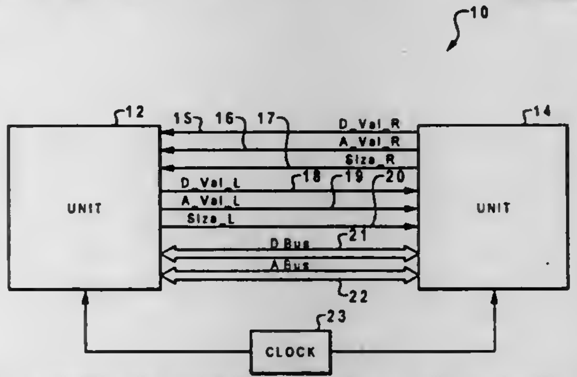
5,692,135
METHOD AND SYSTEM FOR PERFORMING AN ASYMMETRIC BUS ARBITRATION PROTOCOL WITHIN A DATA PROCESSING SYSTEM

Manuel Joseph Alvarez, II, Austin; Gregory Alan Hughes, Round Rock; Jeffrey Thomas Kreulen, Austin; Audrey Davis Romonosky, Austin, and Sanjay Raghunath Deshpande, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1995, Ser. No. 572,320

Int. Cl.⁶ G06F *13/36*

U.S. Cl. 395—287 **13 Claims**



1. A method for arbitrating an access to a data bus between a first unit and a second unit of a subsystem within a computer system, wherein each of said units has at least one control signal and a size signal, said method comprising:
asserting said at least one control signal by one of said units to initiate a first data transaction;
granting access to said data bus to whichever one of said units asserts said at least one control signal first;

transmitting a data size of said first data transaction via said size signal;
reserving said data bus for a second data transaction by another one of said units when said data bus is occupied by said first data transaction, wherein the length of said reservation is determined in response to said size signal for said data transaction; and
granting access to said data bus to another one of said units as soon as said first data transaction is completed such that no gap exists on said data bus for any back-to-back data transaction having a data size greater than one.

5,692,136
MULTI-PROCESSOR SYSTEM INCLUDING PRIORITY ARBITRATOR FOR ARBITRATING REQUEST ISSUED FROM PROCESSORS

Yuuki Date, and Masanobu Inaba, both of Yamanashi, Japan, assignors to NEC Corporation, Tokyo, Japan

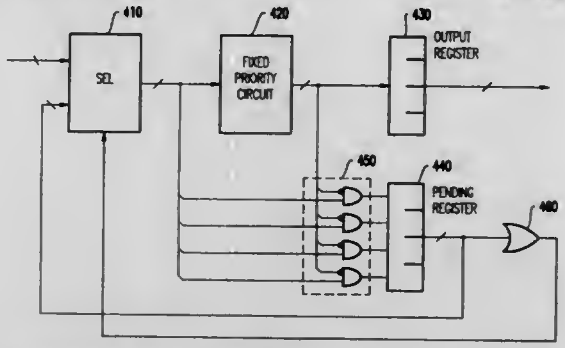
Continuation of Ser. No. 408,879, Mar. 24, 1995, abandoned.

This application Jul. 24, 1996, Ser. No. 685,748

Claims priority, application Japan, Mar. 30, 1994, 6-059696

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—287 **20 Claims**



1. A multi-processor system comprising:
a plurality of processors, a plurality of ports for outputting first requests from said processors, and a plurality of priority arbitrators for arbitrating the first requests from said processors for each of said plurality of ports,
wherein each of said plurality of priority arbitrators includes:
  a fixed priority arbitrating circuit;
  a pending circuit for detecting, by comparing between an input and an output of said fixed priority arbitrating circuit, such second request which have not been selected by said fixed priority arbitrating circuit but have been suspended, and for holding said second requests; and
  a selector which selects either one of said second requests from said pending circuit and said first requests from said processors,
wherein said fixed priority arbitrating circuit arbitrates to select one request from the output of said selector in accordance with a fixed priority order;
wherein said selector accepts further requests from any of said processors when there is no request in said pending circuit,
wherein said selector does not newly accept further requests from any of said processors when said second requests are held in said pending circuit, and
wherein sets of requests are processed such that there is no delay between adjacent sets of requests.

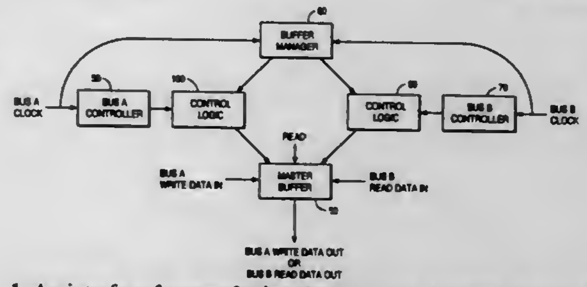
5,692,137
MASTER ORIENTED BUS BRIDGE

Michael L. Regal, Campbell, and Charles M. Flaig, Cupertino, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 8, 1995, Ser. No. 436,987

Int. Cl.⁶ G06F *13/00;13/38;13/40*

U.S. Cl. 395—309 **4 Claims**



1. An interface for transferring data between a master device on a first bus having timing controlled by a first clock and a slave device on a second bus having timing controlled by a second clock, the interface comprising:
  a buffer manager for producing a first control signal when a master write is attempted and a second control signal when a slave read is attempted;
  a first circuit, arranged to receive a clock signal from said first clock and said first control signal, for producing a write latch pulse signal based on said first clock signal;
  a second circuit, arranged to receive a clock signal from said second clock and said second control signal, for producing a read latch pulse signal based on said second clock signal; and
  a master buffer, arranged to receive write data from said first bus and read data from said second bus, and arranged to receive said write latch pulse signal and said read latch pulse signal, for producing as an output one of said write data latched by said write latch pulse signal and said read data latched by said read latch pulse signal in accordance with a control signal.

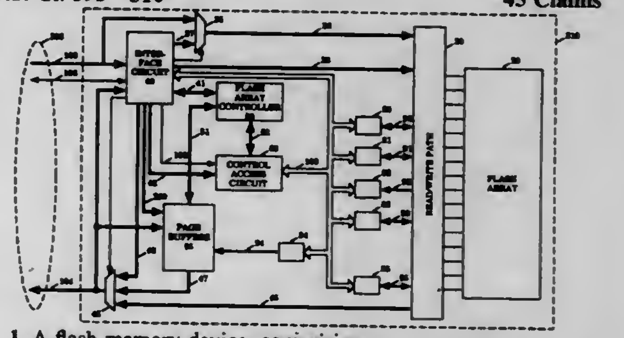
5,692,138
FLEXIBLE USER INTERFACE CIRCUIT IN A MEMORY DEVICE

Mickey L. Fandrich, Placerville; Richard J. Durante, Citrus Heights, and Rodney R. Rozman, Placerville, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 350,380, Dec. 5, 1994, abandoned, which is a continuation of Ser. No. 85,587, Jun. 30, 1993, abandoned. This application Nov. 21, 1996, Ser. No. 754,104

Int. Cl.⁶ G06F *12/00;13/00*

U.S. Cl. 395—310 **45 Claims**



1. A flash memory device, comprising:
interface circuit coupled to receive a user command and a set of command parameters over a bus, said command parameters comprising an address in a flash array of the flash memory device and data, the interface circuit having circuitry that allocates a set of limited resources in the flash memory device and that generates a set of limited resource control bits for the user command, said set of limited resources to process commands issued to the flash memory device; and

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controller circuit coupled to receive the user command, the command parameters and the limited resource control bits from the interface circuit and having circuitry that performs a program operation specified by the user command on a flash cell array and that also uses the limited resources specified by the limited resource control bits to perform the program operation.

5,692,139

VLIW PROCESSING DEVICE INCLUDING IMPROVED MEMORY FOR AVOIDING COLLISIONS WITHOUT AN EXCESSIVE NUMBER OF PORTS

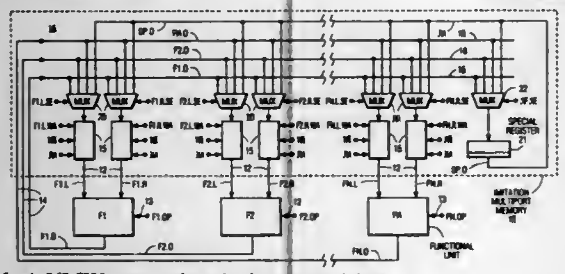
Gerrit Ary Slavenburg, Mountain View, and Jean-Michel Junien Labrousse, Palo Alto, both of Calif., assignors to North American Philips Corporation, Signetics Div., New York, N.Y.

Continuation of Ser. No. 63,850, May 19, 1993, abandoned, which is a continuation of Ser. No. 594,534, Oct. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 290,979, Dec. 28, 1988, abandoned. This application Apr. 19, 1995, Ser. No. 425,697

Claims priority, application Netherlands, Jan. 11, 1988, 8800053

Int. Cl.⁶ G06F *13/38*

U.S. Cl. 395—311 **25 Claims**



1. A VLIW processing device comprising:
- an instruction register for holding a plurality of operations to be begun in a same operating cycle;
- a plurality of functional units for executing the plurality of operations in parallel;
- a plurality of memory units, each memory unit being permanently and directly connected to a single respective one of the functional units via a respective read port which supplies input data directly to the respective one of the functional units;
- a delay element permanently connected in parallel with the plurality of memory units; and
- a unidirectional switching circuit for providing output signals from the plurality of functional units to write ports of the plurality of memory units and to the delay element, so that
  - at least one of the functional units is enabled to write data to one of the plurality of memory units that is connected with a target one of the plurality of functional units; and
  - when two of the plurality of functional units need to write to the one memory unit that is connected to the target, output from one of the two is directed to the delay element instead, and thence via the switching circuit to the target, so that a collision is avoided.

5,692,140

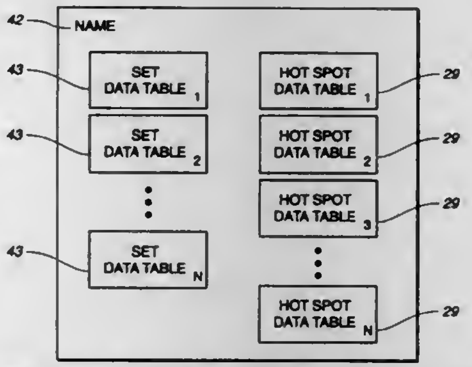
METHODS AND APPARATUS FOR SYNCHRONIZING APPLICATION AND UTILITY PROGRAMS

David Cornelius Schmitt, and Scott Steven Schafer, both of Novato, Calif., assignors to Intelltools, Inc., Novato, Calif.

Filed Jun. 12, 1995, Ser. No. 489,589

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—326 **16 Claims**



1. Apparatus for use with (1) a computer having a video display for displaying images on a screen, (2) an application program and (3) a utility program wherein the application program is capable of performing various routines and is characterized by a plurality of different screen images displayable on the screen one at a time, and the utility program is capable of performing various routines while the application program is operating and capable of maintaining a plurality of different operational feature sets configured for the different screen images of the application program, and wherein the application program is characterized by a set of selectable hot spots for each different screen image and wherein selection of a hot spot can activate an application routine, and wherein the operational feature set of the utility program is a hot spot data table recording the location of the hot spots for a particular screen image of the application program, the combination comprising:
- a screen image identifier which analyzes a unique and identifiable characteristic of the application program screen images in selecting an operational feature set; and
- an operational feature set selector operable in response to a particular application program screen image being identified by said screen image identifier to select an operational feature set.

5,692,141

GROUPWARE SYSTEM PROVIDING FACILITATED DATA TRANSFER AMONG COMMON AND INDIVIDUAL WORK AREAS

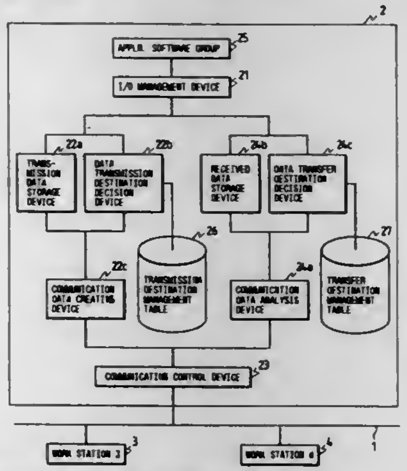
Maki Kamisango, and Hiroshi Katsurabayashi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 903,678, Jun. 24, 1992, abandoned. This application Apr. 4, 1995, Ser. No. 416,250

Claims priority, application Japan, Jun. 25, 1991, 3-178870

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—329 **6 Claims**


2
APPL. SOFTWARE GROUP 25
I/O MANAGEMENT DEVICE 21
22a TRANSMISSION DATA STORAGE DEVICE
22b DATA TRANSMISSION DESTINATION DECISION DEVICE
24b RECEIVED DATA STORAGE DEVICE
24c DATA TRANSFER DESTINATION DECISION DEVICE
22c COMMUNICATION DATA CREATING DEVICE
26 TRANSMISSION DESTINATION MANAGEMENT TABLE
24a COMMUNICATION DATA ANALYSIS DEVICE
27 TRANSFER DESTINATION MANAGEMENT TABLE
COMMUNICATING CONTROL DEVICE 23
WORK STATION 3
WORK STATION 4
1

1. A groupware system comprising:
- a plurality of data processing systems connected through a network to perform a cooperative operation with shared data;

each of said data processing systems having:
- a memory for storing group software;

- input/output management means for managing a display output to an operator and an input from the operator;
- input/output management means for managing a display output to an operator and an input from the operator;
- communication control means for controlling a procedure for communication with other operative data processing systems connected to the network;
- transmission data storage means for storing content data inputs from said input/output management means for transmission;
- a transmission destination management table for determining an address for a transmission destination, said transmission destination management table storing relationship data on relationships between positions on said display output and pieces of address data of transmission destinations;
- data transmission destination decision means referring to said transmission destination management table to find address information on the transmission destination based on a position said display output specified by the operator through said input/output management means;
- communication data creation means creating first communication data from said transmission destination address information obtained by said data transmission destination decision means and the content data to be transmitted that is stored in said transmission data storage means and transmitting the first communication data to said communication control means for output to at least one of the other operative data processing systems;
- communication data analysis means for analyzing second communication data input therein from said communication control means and for identifying and separating input content data and input address information of said input second communication data from each other;
- communication data storage means for storing said content data of said second communication data identified and separated by said communication data analysis means;
- a transfer destination management table for managing whether input content data can be transferred to respective pieces of application software in said group software memory in any one of said data processing systems; and
- data transfer destination decision means referring to said transfer destination management table according to said input address information identified and separated by said communication data analysis means to decide whether the input content data can be transferred to the application software stored in said group software memory.

5,692,142

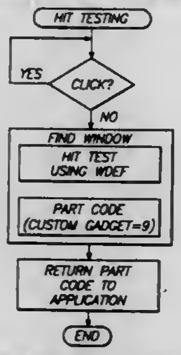
SUPPORT FOR CUSTOM USER-INTERACTION ELEMENTS IN A GRAPHICAL, EVENT DRIVEN COMPUTER SYSTEM

Timothy J. Craycroft, and Robert R. Ulrich, both of Mountain View, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 242,450, May 13, 1994, abandoned. This application Feb. 1, 1996, Ser. No. 593,171

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—333 **2 Claims**



1. For use in a graphical, event-driven computer system having a computer display, a method of providing a custom interactive user-interface element in a frame of a window of an application program, in addition to system-defined elements provided in each window displayed by said computer system, said method comprising the steps of:
- storing information referring to an icon, stored as part of said application program and used to visually represent the custom interactive user-interface element, in a location accessible to a window manager; and
- the window manager drawing on the computer display a frame of the window including drawing, at a size and location determined by the window manager, the icon used to visually represent the custom interactive user-interface element.

5,692,143

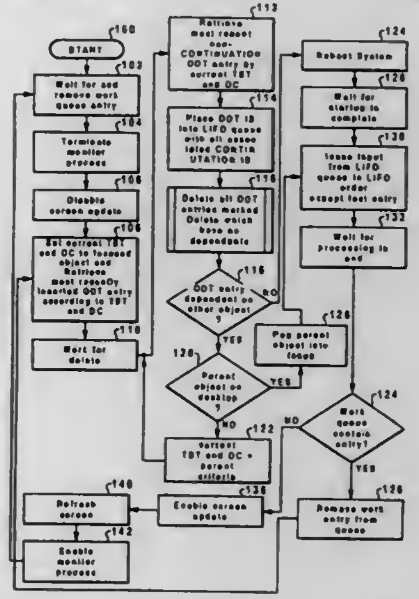
METHOD AND SYSTEM FOR RECALLING DESKTOP STATES IN A DATA PROCESSING SYSTEM

Sophia M. Johnson; William Jesse Johnson, both of Flower Mound, and Marvin L. Williams, Arlington, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1994, Ser. No. 366,531

Int. Cl.⁶ G06F *3/14;9/44*

U.S. Cl. 395—339 **13 Claims**


START
Wait for and remove work queue entry
Reboot System
Wait for startup to complete
Refresh screen
Enable screen update
Enable monitor process
Remove work entry from queue
YES
NO

1. A method within a data processing system for recalling a previous desktop state, wherein a desktop state comprises a dependence hierarchy and visual arrangement of a plurality of graphical objects representative of operating system functions and data processing applications that are displayed within a display device of said data processing system at a specified time, said method comprising:
- detecting each occurrence of a desktop event, which creates a new desktop state;
- in response to detecting an occurrence of a desktop event, recording said new desktop state; and
- in response to a particular input from a user, automatically returning said desktop state to a selected state which occurred prior to a current desktop state by referencing said recorded desktop states, wherein all operating system functions and data processing applications available at said selected state are enabled.

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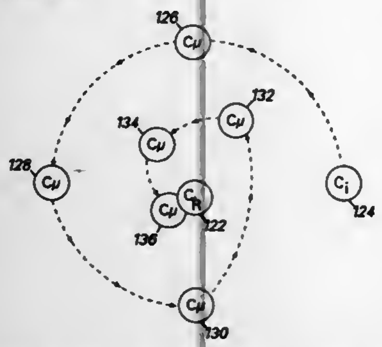
5,692,144
METHOD AND SYSTEM FOR DEPICTING AN OBJECT SPRINGING BACK FROM A POSITION

James Marion Thrush, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Aug. 3, 1995, Ser. No. 510,911

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—339 **17 Claims**



1. A method for depicting an object springing back from an initial position to oscillate about and ultimately rest in a resting position, comprising the steps of:

(a) displaying the object in the initial position;

(b) determining a bounce position for the object;

(c) displaying the object in the bounce position;

(d) noting that the bounce position of the object is within a predetermined distance of the resting position and that the velocity of the object towards the resting position is less than a predetermined value; and

(e) in response to the step of noting, displaying the object in the resting position.

5,692,145
METHOD AND APPARATUS FOR GENERATING AND PERFORMING OPERATIONS ON TABLE TYPE DATABASES USING ICONS

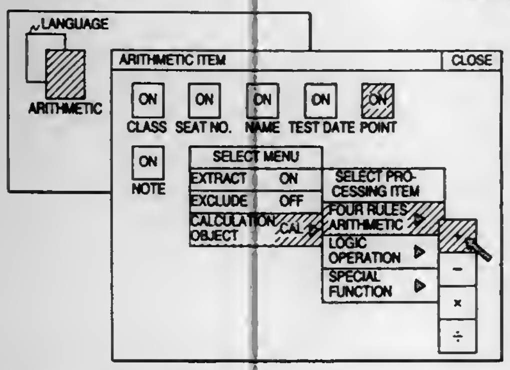
Jun Nakanishi, Kawasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 464,576

Claims priority, application Japan, Jul. 21, 1994, 6-169278

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—348 **24 Claims**



1. A method of performing operations between data of at least two tables, comprising the steps of:

displaying table icons each representing one of said at least two tables;

permitting a user to move one of said table icons to a position where the display of said one table icon overlaps the display of another of said at least two table icons;

automatically executing an operation selected by said user between data of tables corresponding to said one table icon and said another table icon when said one table icon is moved to a position overlapping said another table icon;

generating a new table including data resulting from said selected operation and a new table icon representing said new table; and

displaying said new table icon representing said new table.

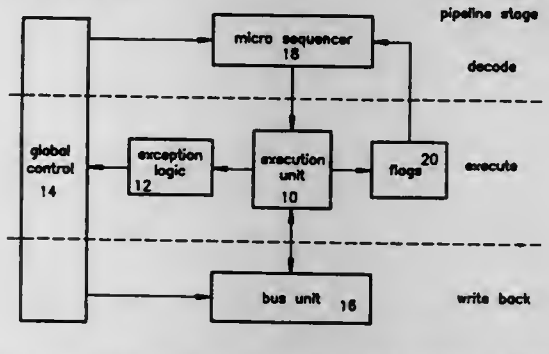
5,692,146
METHOD OF IMPLEMENTING FAST 486TM MICROPROCESSOR COMPATIBLE STRING OPERATIONS

Wayne Yamamoto, San Jose; Narendra Sankar, Sunnyvale, and Mario Nemirovsky, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1995, Ser. No. 451,742

Int. Cl.⁶ G06F *9/26;9/32;12/00;12/02*

U.S. Cl. 395—410 **8 Claims**



1. A method of repetitively implementing a string operation to move a block of data from a first memory location to a second memory location, comprising:

reading a portion of the block of data from the first memory location;

updating and committing a value of a first register which indicates an address of a next portion of the block of data to be moved from the first memory location;

setting an indicator corresponding to the first register to indicate that the first register is in an inconsistent state;

writing the previously read portion of the block of data to a portion of the second memory location;

updating and committing a value of a second register which indicates an address of the second memory location to which the next portion of the block of data should be written;

setting an indicator corresponding to the second register to indicate that the second register is in an inconsistent state; and

repeating the above steps of the method until the entire block of data has been moved from the first memory location to the second memory location, wherein if an exception occurs during the method steps, the method further comprises:

executing an exception handling routine which checks the state of the indicators corresponding to the first and second registers; and

restoring the values of the first and second registers to values they had prior to the occurrence of the exception by appropriately incrementing or decrementing the register values if the registers are in an inconsistent state.

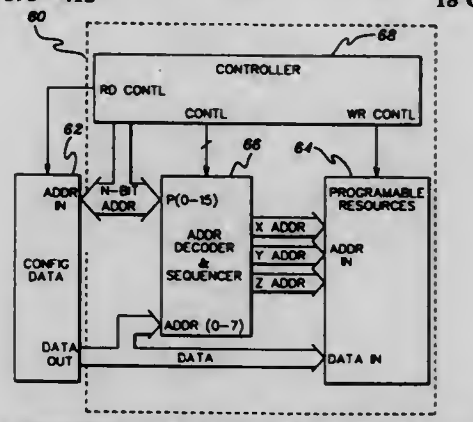
5,692,147
MEMORY MAPPING METHOD AND APPARATUS TO FOLD SPARSELY POPULATED STRUCTURES INTO DENSELY POPULATED MEMORY COLUMNS OR ROWS BY SELECTIVELY TRANSPOSING X AND Y ADDRESS PORTIONS, AND PROGRAMMABLE GATE ARRAY APPLICATIONS THEREOF

Wendell Ray Larsen, Essex Junction; Frank Ray Keyser, Colchester, and Brian A. Worth, Milton, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 488,314

Int. Cl.⁶ G06F *12/06*

U.S. Cl. 395—412 **18 Claims**



1. In a computing system having a plurality of addressable memory units and a plurality of controllable resources arranged in a two-dimensional array, individual ones of the plurality of controllable resources having an associated one of the plurality of memory units corresponding thereto, the plurality of memory units having an N-bit address associated therewith, a method for associating the plurality of memory units to the plurality of controllable resources comprising:

using first, second and third portions of the N-bit address, the first and third portions each being switchably associated with a respective one of the two dimensions of the two-dimensional array, the second portion being employed for determining which of the two dimensions each of the first and third portions is associated with.

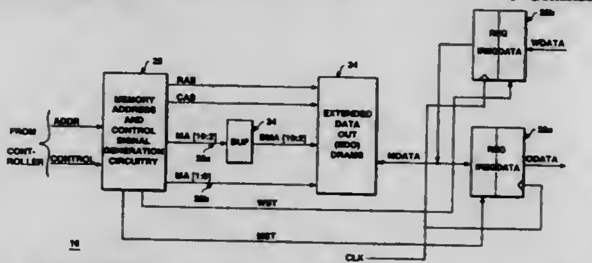
5,692,148
METHOD AND APPARATUS FOR IMPROVING SYSTEM MEMORY COST/PERFORMANCE USING EXTENDED DATA OUT (EDO)DRAM AND SPLIT COLUMN ADDRESSES

Aniruddha Kundu, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 11, 1994, Ser. No. 225,522

Int. Cl.⁶ G06F *12/06;13/00;* **G11C** *8/00;7/00*

U.S. Cl. 395—432 **6 Claims**


FROM CONT-ROLLER
ADDR
CONTROL
MEMORY ADDRESS AND CONTROL SIGNAL GENERATION CIRCUITRY
RAS
CAS
BUF
EXTENDED DATA OUT (EDO) DRAMS
MDATA
REG
WDATA
ODATA
WST
CLK

1. An apparatus comprising:

(a) address and control signal generation circuitry for receiving a start address of a memory access to a memory unit of a computer system, and in response, generating a series of memory addresses including a series of column addresses, and a plurality of control signals including a column address strobe (CAS) signal to perform the memory access, the memory unit comprising a plurality of banks of extended data out dynamic random access memory (EDODRAM),

the column addresses being generated as a set of high order address bits common to all the column addresses, supplemented by particularized sets of low order address bits, one particularized set for each of the column addresses, and

the CAS signal being generated with a plurality of corresponding active periods, one active period for each column address, with each active period being shorter in time than an amount of time required by a memory cell of the banks of EDODRAM to output or store data, to allow early precharge of memory cells of the banks of EDODRAM in preparation for response to the next column address;

(b) a buffer coupled to the address and control signal generation circuitry for storing and outputting the set of high order address bits during the memory access to lower power required of the address and control signal generation circuitry to provide the set of high order address bits to the banks of EDODRAM;

(c) a first address bus coupled to the buffer for delivering the set of high order address bits to the banks of EDODRAM; and

(d) a second address bus coupled to the address and control signal generation circuitry for directly delivering the particularized sets of low order address bits to the banks of EDODRAM, bypassing the buffer, to allow the particularized sets of low order address bits, and therefore the column addresses, to be rapidly provided to the banks of EDODRAM.

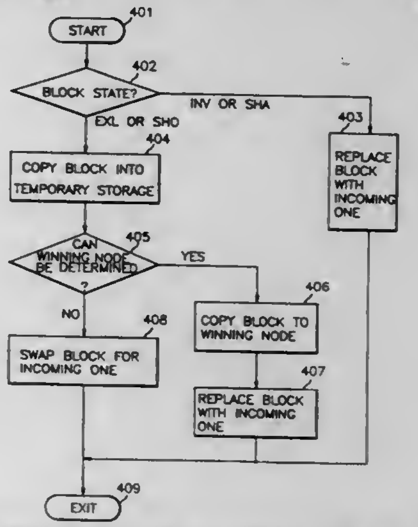
5,692,149
BLOCK REPLACEMENT METHOD IN CACHE ONLY MEMORY ARCHITECTURE MULTIPROCESSOR

Gyungho Lee, Plymouth, Minn., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea, and University of Minnesota, Minneapolis, Minn.

Filed Mar. 16, 1995, Ser. No. 405,335

Int. Cl.⁶ G06F *12/12*

U.S. Cl. 395—460 **8 Claims**


START
401
402
BLOCK STATE?
INV OR SHA
EXL OR SHO
403
REPLACE BLOCK WITH INCOMING ONE
404
COPY BLOCK INTO TEMPORARY STORAGE
405
CAN WINNING NODE BE DETERMINED ?
YES
NO
406
COPY BLOCK TO WINNING NODE
408
SWAP BLOCK FOR INCOMING ONE
407
REPLACE BLOCK WITH INCOMING ONE
409
EXIT

1. An improved block replacement method for use in a bus-based multiprocessor employing cache only memory architecture, the multiprocessor including a multiplicity of processing nodes connected via a system bus, each processing node having a cache memory contained in a processing block and a local memory for storing data decomposed into a plurality of blocks, the local memory acting as a cache with no backing main memory provided in the multiprocessor, the method being invoked when a block in the local memory of a first processing node in the multiprocessor is to be replaced to make a space for an incoming block supplied via the system bus from the local memory of a second processing node in the multiprocessor, the method comprising the steps of:

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(a) managing blocks in the local memory by using information on block states, each block state for denoting a current state of each block stored in the local memory, the block states containing:
  an invalid state in which the block is not a current copy,
  an exclusive state in which the block is the only valid copy in the multiprocessor,
  a shared state in which the block is a valid copy, and at least one other valid copy exists in the system, and
  a shared owner state in which the block of a processing node carries with it a responsibility for supplying its copy to another processing node upon receiving an access request for the block from said another processing node;
(b) if the block of the first processing node is in the invalid state, or in the shared state, overwriting the block of the first processing node with the incoming block from the second processing node;
(c) if the block of the first processing node is in the exclusive state, or in the shared owner state, relocating the block of the first processing node to a third processing node in the multiprocessor, selected in accordance with a predetermined priority scheme, and then overwriting the block of the first processing node with the incoming block from the second processing node; and
(d) if the third processing node cannot be determined among the processing nodes in the multiprocessor with the predetermined priority scheme in step (c), swapping the block of the first processing node for the incoming block from the second processing node.

5,692,150
CACHE FLASH CONTROLLING METHOD FOR CACHE MEMORY SYSTEM

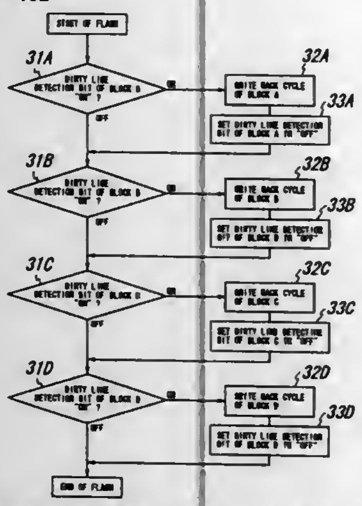
Shuichi Moriyama, and Kazuhisa Iga, both of Niigata, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 508,186

Claims priority, application Japan, Jul. 28, 1994, 6-176342

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—462 **1 Claim**



1. A cache flash controlling method for a cache memory system of he write back type, comprising the steps of:
  dividing lines having tag addresses in a cache memory into a plurality of blocks;
  setting, for each block of the blocks, a dirty detection bit indicating whether or not a dirty line is present in the block;
  discriminating, in a flash cycle, a condition of the dirty detection bit for each block of the blocks;
  flashing, when the discriminating step provides a discriminated condition of the dirty detection bit of a block indicating absence of a dirty line the block without performing detection of a dirty line from within lines of the block;
  detecting, when the discriminating step provides a discriminated condition of the dirty detection bit of a block indicating presence of a dirty line, the dirty line from within lines of the block;
  writing data of the dirty line detected by the detecting step back into a main storage apparatus; and
  flashing the block having the dirty line detected by the detecting step.

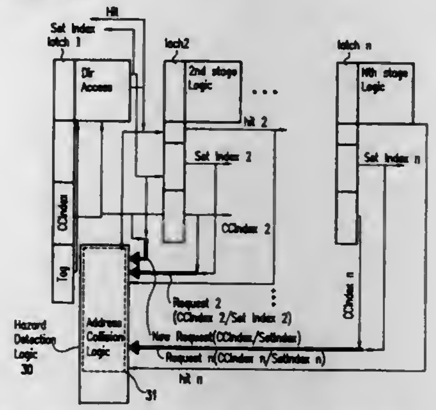
5,692,151
HIGH PERFORMANCE/LOW COST ACCESS HAZARD DETECTION IN PIPELINED CACHE CONTROLLER USING COMPARATORS WITH A WIDTH SHORTER THAN AND INDEPENDENT OF TOTAL WIDTH OF MEMORY ADDRESS

Hoichi Cheong, Austin; Dwain A. Hicks, Pflugerville, and Kimming So, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1994, Ser. No. 337,715

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—467 **2 Claims**



1. A pipelined cache controller for a set associative cache of a high performance computer comprising:
  a plurality of pipeline stages, each stage being isolated from a previous stage and a succeeding stage by boundary latches and having directory access logic storing a hit signal indicating that a set contains a requested address and a set select signal indicating the set that contains a requested address;
  a Congruence Class Index (CCIndex) field used to access the directory;
  a tag field used to determine if the access is a hit or a miss on the congruence class addressed by the CCIndex, the CCIndex, the hit signal and the set index being latched in the boundary latches in each of the subsequent pipeline stages as a request advances through the pipeline stages; and
  hazard detection logic receiving an associated hit signal, a CCIndex and a set index from the boundary latches when a request advances to a particular pipeline stage, the hazard detection logic comprising
    a plurality of comparators to compare a new request to stages with an old request for each other stage, the comparators comparing the new request against existing requests using only the CCIndex and the set index fields,
    a first plurality of AND gates enabled by a hit for a first stage and respectively responsive to hits from corresponding subsequent stages to provide outputs,
    a second plurality of AND gates receiving as one input the output of a corresponding one of the first plurality of AND gates and as a second input an output of a corresponding one of the comparators,
whereby if a previous request has already resulted in a cache hit and it matches a new request in both the CCIndex and the set index fields and if the new request is also a hit, the address collision logic will signal a positive detection.

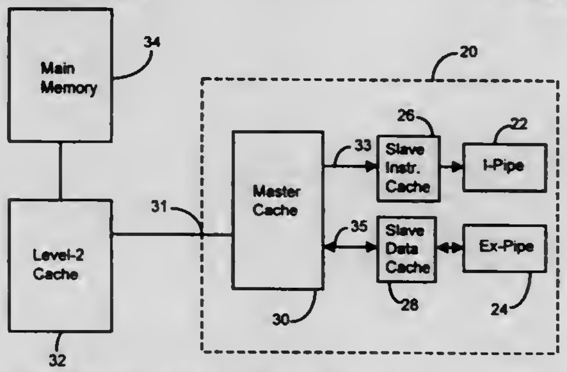
5,692,152
MASTER-SLAVE CACHE SYSTEM WITH DE-COUPLED DATA AND TAG PIPELINES AND LOOP-BACK

Earl T. Cohen, Fremont, and Jay C. Pattin, Redwood City, both of Calif., assignors to Exponential Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 267,658, Jun. 29, 1994, Pat. No. 5,551,001. This application May 14, 1996, Ser. No. 649,115

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—467 **19 Claims**



1. A master-slave cache system for access by a central processing unit's execution pipelines comprising:
  a slave cache for supplying instructions or operands to the CPU's execution pipelines;
  a master cache coupled to the slave cache and coupled to an external bus, the master cache organized as an N-way set-associative cache having N elements for each index-portion of an address, the master cache comprising:
    a tag RAM array for storing a tag and a master-valid indicator for each element for each index-portion of the address, the tag RAM array including slave-valid indicators for identifying elements in the tag RAM array which also have valid data in the slave cache, the master cache performing cache management operations for the slave cache by using the slave-valid indicators in the master cache;
    a data RAM array for storing sub-lines of data for each tag in the tag RAM array;
    a tag pipeline for accessing the tag RAM array, the tag pipeline having a plurality of stages for simultaneously processing a plurality of requests by passing the requests through successive stages of the tag pipeline in response to a clock;
    a data pipeline for accessing the data RAM array independently of the tag pipeline, the data pipeline having a plurality of stages simultaneously processing a plurality of requests by passing the requests through successive stages of the data pipeline in response to the clock;
    tag arbitration means, receiving a plurality of tag requests, for selecting a tag request from the plurality of tag requests for processing by the tag pipeline;
    data arbitration means, receiving a plurality of data requests, for selecting a data request from the plurality of data requests for processing by the data pipeline, the data arbitration means operating independently of the tag arbitration means; and
    source registers, coupled to the tag arbitration means and to the data arbitration means, for storing a plurality of requests for access of the master cache, including requests to access only the tag RAM array, requests to access only the data RAM array, and requests to access both arrays, the source registers storing completion status for each request;
    wherein the tag pipeline includes tag update means, coupled to the source registers, for updating the completion status for the request being processed by the tag pipeline;
    and wherein the data pipeline includes data update means, coupled to the source registers, for updating the completion status for the request being processed by the data pipeline,
    whereby the tag RAM array is accessed separately and independently from the data RAM array and whereby separate pipelines are used to access the tag RAM array and the data RAM array.

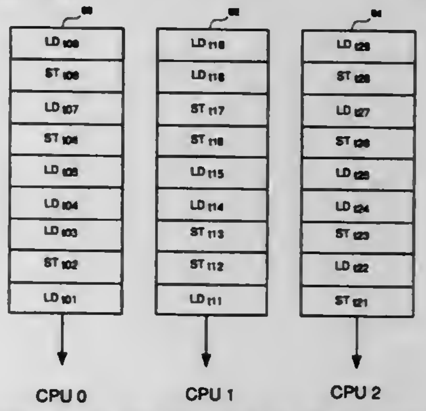
5,692,153
METHOD AND SYSTEM FOR VERIFYING EXECUTION ORDER WITHIN A MULTIPROCESSOR DATA PROCESSING SYSTEM

Nadeem Malik; Brian O'Krafka; Avijit Saha, and Shahram Salamian, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1995, Ser. No. 405,058

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—468 **10 Claims**



1. A system for verifying consistency of an instruction execution order of a multiprocessor data processing system with a specified memory consistency model, said multiprocessor data processing system having plurality of processors and a memory, wherein each of said plurality of processors executes instructions from an associated instruction stream, said system comprising:
  means for storing a plurality of unique values from said plurality of processors to a single selected location within said memory in an instruction execution order, said single selected location storing at most one of said plurality of unique values at a time;
  means for loading a unique value among said plurality of unique values from said single selected location to a particular processor among said plurality of processors;
  means for determining, in accordance with said specified memory consistency model, a set of valid values which may be loaded from said single selected location;
  means for comparing said unique value with members of said set of valid values, and means for indicating that said instruction execution is improper in response to determining from said comparison that said unique value among said plurality of unique values is not a member of said set of valid values.

5,692,154
CIRCUIT FOR MASKING A DIRTY STATUS INDICATION PROVIDED BY A CACHE DIRTY MEMORY UNDER CERTAIN CONDITIONS SO THAT A CACHE MEMORY CONTROLLER PROPERLY CONTROLS A CACHE TAG MEMORY

Brian B. Tucker, The Woodlands, and Gary W. Thome, Tomball, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 171,910, Dec. 20, 1993, abandoned. This application May 14, 1996, Ser. No. 645,921

Int. Cl.^{6} G06F *11/20;12/00*

U.S. Cl. 395—468 **8 Claims**

1. A computer system comprising:

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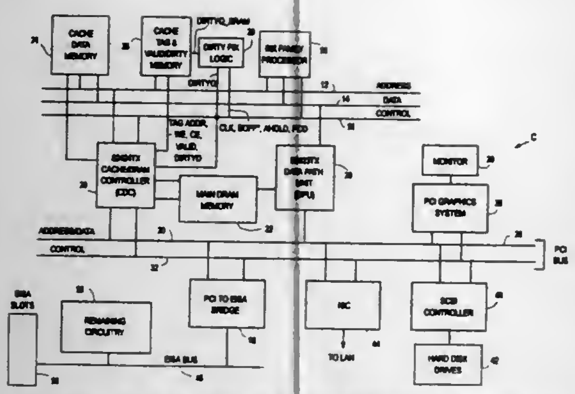


a processor having a page cacheable status signal indicative of a cacheable status of a page and inputs for receiving signals for releasing address lines and for releasing address, data and control lines, said inputs for receiving signals indicative of snoop or cache flush operations;

a bus master; and

a cache system including:

a writeback cache memory controller connected to said processor and said bus master for monitoring operations of said processor and maintaining said cache system and for monitoring operations of said bus master and maintaining said cache system;

cache data memory connected to said cache memory controller and coupled to said processor and to said bus master

cache tag memory connected to said cache memory controller for storing tag values associated with data stored in said cache system;

cache valid memory connected to said cache memory controller for storing a valid status of data stored in said cache system;

cache dirty memory connected to said cache memory controller for storing a signal indicating a dirty status of data stored in said cache system;

said cache controller improperly controlling said cache tag memory under predetermined certain conditions, including performance of non-cacheable operations when snoop or cache flush operations are not occurring; and

a masking circuit having:

a first gate receiving at a first input said dirty status signal from said cache dirty memory and at a second input an indication developed from said page cacheable status signal that said page is not cacheable;

a second gate receiving at a first input said dirty status signal from said cache dirty memory and at a second input an indication that said releasing address, data and control lines signal is asserted; and

a third gate receiving at a first input said dirty status signal from said cache dirty memory and at a second input an indication that said releasing address lines signal is asserted;

said circuit providing said cache dirty status signal under normal operations to said cache memory controller, said circuit masking said cache dirty status signal when a non-cacheable operation is occurring unless either a snoop operation or a cache flush operation is occurring so that said cache memory controller properly controls said cache tag memory.

5,692,155

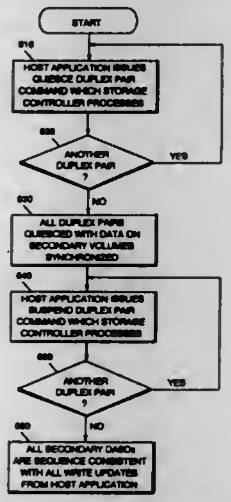
METHOD AND APPARATUS FOR SUSPENDING MULTIPLE DUPLEX PAIRS DURING BACK UP PROCESSING TO INSURE STORAGE DEVICES REMAIN SYNCHRONIZED IN A SEQUENCE CONSISTENT ORDER

James Lincoln Iskiyan; Robert Frederic Kern; William Frank Micka, all of Tucson, Ariz., and Robert Wesley Shomler, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1995, Ser. No. 424,930

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—489 **17 Claims**


START
HOST APPLICATION ISSUES QUIESCE DUPLEX PAIR COMMAND WHICH STORAGE CONTROLLER PROCESSES
ANOTHER DUPLEX PAIR ?
YES
NO
ALL DUPLEX PAIRS QUIESCED WITH DATA ON SECONDARY VOLUMES SYNCHRONIZED
HOST APPLICATION ISSUES SUSPEND DUPLEX PAIR COMMAND WHICH STORAGE CONTROLLER PROCESSES
ANOTHER DUPLEX PAIR ?
YES
NO
ALL SECONDARY DASDs ARE SEQUENCE CONSISTENT WITH ALL WRITE UPDATES FROM HOST APPLICATION

1. In a data storage system capable of writing records and record updates and copying said records and record updates for backup purposes, said data storage system including a host processor running an application generating records and record updates, a first duplex pair having a primary data storage device and a secondary data storage device, a second duplex pair having a primary data storage device and a secondary data storage device, a storage controller coupled between said host processor and said first and said second duplex pairs, a method for suspending said first and said second duplex pairs while copying said records and record updates such that said secondary data storage devices of said first and said second duplex pairs remain synchronized in a sequence consistent order comprising steps of:

quiescing said first duplex pair by said storage controller in response to an initial quiesce command from said application to inhibit writing future records and record updates from said application to said primary data storage device of said first duplex pair, wherein said quiescing does not halt said application running in said host processor;

quiescing said second duplex pair by said storage controller in response to a subsequent quiesce command from said application to Inhibit writing future records and record updates from said application to said primary data storage device of said second duplex pair and to synchronize records and record updates copied to said secondary data storage device of said first and second duplex pairs in a sequence consistent order, wherein said quiescing does not halt said application running in said host processor;

suspending said first and second duplex pairs by said storage controller receiving a suspend command from said application to inhibit copying, by said storage controller to said secondary data storage device of said first and second duplex pairs, of records and record updates transmitted from said application to said primary data storage device of said first and second duplex pairs; and

signalling said application by said storage controller that said first and second duplex pairs are suspended and subsequent records and record updates can be written to said primary data storage device of said first and second duplex pairs without copying said record to said secondary data storage device of said first and second duplex pairs.

5,692,156

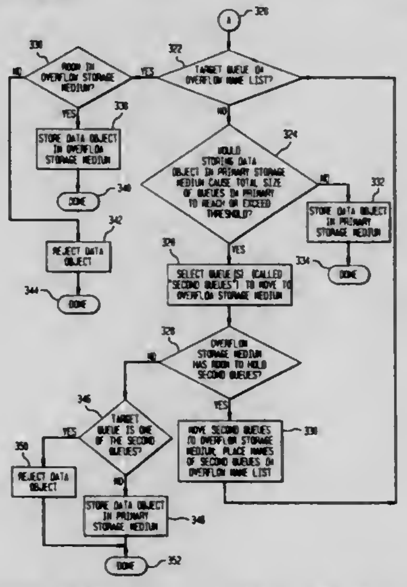
COMPUTER PROGRAM PRODUCT FOR OVERFLOW QUEUE PROCESSING

Jim W. Bahls, Pleasanton; George S. Denny, San Jose; Richard G. Hannan, San Jose; Janna L. Mansker, San Jose; Bruce E. Naylor, Morgan Hill; Betty J. Patterson, San Jose; Sandra L. Stoob, Morgan Hill; Judy Y. Tse, San Francisco, and Anuradha V. Vakkalagadda, San Jose, all of Calif., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 28, 1995, Ser. No. 508,911

Int. Cl.^{6} G06F *12/00;12/12;13/00*

U.S. Cl. 395—492 **28 Claims**


A
ROOM IN OVERFLOW STORAGE MEDIUM?
TARGET QUEUE ON OVERFLOW NAME LIST?
YES
NO
STORE DATA OBJECT IN OVERFLOW STORAGE MEDIUM
DONE
REJECT DATA OBJECT
DONE
STORE DATA OBJECT IN PRIMARY STORAGE MEDIUM
DONE
OVERFLOW STORAGE MEDIUM ROOM TO HOLD SECOND QUEUES?
TARGET QUEUE IS ONE OF THE SECOND QUEUES?
REJECT DATA OBJECT
STORE DATA OBJECT IN PRIMARY STORAGE MEDIUM
DONE

1. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for managing a plurality of data structures stored in a computer storage medium, the computer storage medium comprising a primary storage medium and an overflow storage medium, said method steps comprising:

(1) receiving a request to store a data object in a target data structure;

(2) determining whether an overflow mode condition currently exists;

(3) if an overflow mode condition does not currently exist, then determining whether a combined size of all data structures stored in the primary storage medium plus a size of the data object is greater than a predetermined threshold;

(4) if a combined size of all data structures stored in the primary storage medium plus a size of the data object is greater than a predetermined threshold, then:

(a) entering an overflow mode such that an overflow mode condition exists;

(b) selecting one or more data structures currently stored in the primary storage medium; and

(c) moving said selected data structures from the primary storage medium to the overflow storage medium.

5,692,157

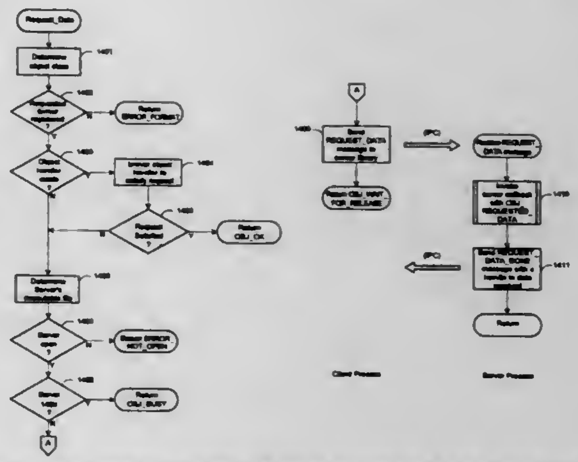
METHOD AND SYSTEM FOR TRANSFERRING DATA BETWEEN OBJECTS USING REGISTERED DATA FORMATS

Antony S. Williams, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 900,968, Jun. 17, 1992, abandoned. This application Jan. 30, 1995, Ser. No. 382,214

Int. Cl.^{6} G06F *5/00*

U.S. Cl. 395—500 **35 Claims**



29. A computer-readable medium containing instructions for causing a computer system to transfer data between a client and a server, the computer system having a persistent global registry for storing data format information, by:

under control of the computer system, storing in the persistent global registry a plurality of data formats that the server supports;

under exclusive control of the client and without arbitration from an external process,

determining from the persistent global registry without accessing the server at least one stored data format that the server supports; and

selecting a determined data format;

under control of the client, sending data to the server in the selected data format; and under control of the server, receiving the data sent by the client.

5,692,158

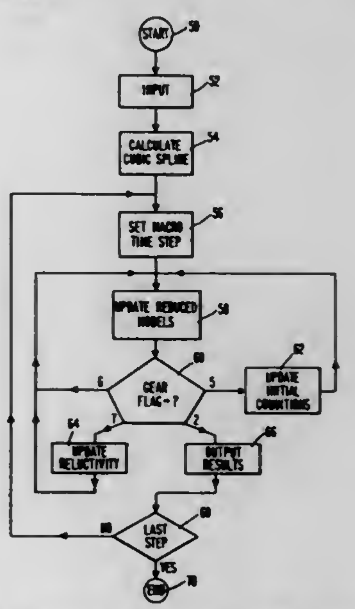
METHODS FOR GENERATING MODELS OF NON-LINEAR SYSTEMS AND COMPONENTS AND FOR EVALUATING PARAMETERS IN RELATION TO SUCH NON-LINEAR MODELS

Robert C. Degeneff, Niskayuna, and Moises R. Gutierrez, Troy, both of N.Y., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 936,828, Aug. 28, 1992, abandoned. This appilcation Dec. 9, 1994, Ser. No. 353,478

Int. Cl.^{6} G06F *17/50;9/455*

U.S. Cl. 395—500 **6 Claims**



1. A system for generating a reduced, computer-readable matrix model of a component of a system for use in analyzing said

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component, said component being initially represented by an equation model, comprising:

a computer; and

a computer-readable storage medium operatively coupled to said computer and containing:

(1) a first matrix model of said component, wherein said matrix model contains parameter values and is representative of said equation model;

(2) first code means for linearizing a portion of said first matrix model, thereby forming a second matrix model;

(3) second code means for reordering and reducing said second matrix model by eliminating certain of said parameter values, whereby said reduced model is formed; and

wherein both the first matrix model and the reduced model provide predictions of the performance of said component, and the accuracy of said reduced model is substantially identical to that of said first matrix model.

5,692,159

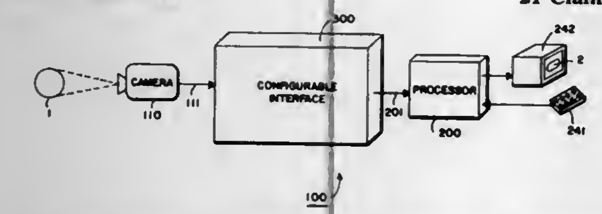
CONFIGURABLE DIGITAL SIGNAL INTERFACE USING FIELD PROGRAMMABLE GATE ARRAY TO REFORMAT DATA

Mark A. Shand, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 19, 1995, Ser. No. 444,453

Int. Cl.^{6} G06F *5/00*

U.S. Cl. 395—500 **21 Claims**



1. An apparatus for reformatting input signals to be compatible with a computer system, comprising:

a first set of combinations registers to store first portions of the input signals, each of the input signals having a first data type compatible with a source external to the computer system, being formed of a first portion combined with a second portion, and having a length different than a length of a second data type compatible with the computer system;

a first buffer to store a first combination of the first portions stored in the first set of registers, the first combination having the second data type; and

a controller to control transport of the first combination as output signals from the first buffer to a memory of the computer system.

5,692,160

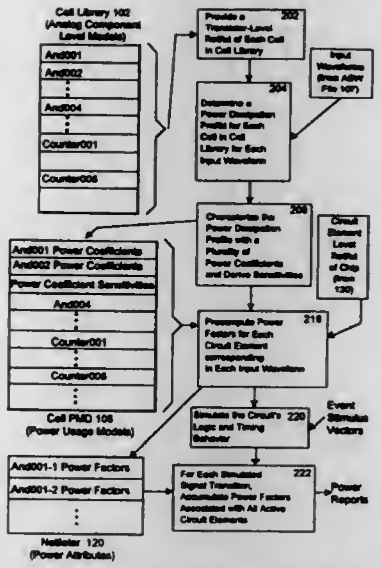
TEMPERATURE, PROCESS AND VOLTAGE VARIANT SLEW RATE BASED POWER USAGE SIMULATION AND METHOD

Harish K. Sarin, Fremont, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 357,843, Dec. 14, 1994, Pat. No. 5,625,803. This application Jun. 1, 1995, Ser. No. 457,034

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 395—500 **25 Claims**


Cell Library 102 (Analog Component Level Models)
And001
And002
And004
Counter001
Counter008
Provide a Transistor-Level Netlist of Each Cell in Cell Library
202
Input Waveforms
Determine a Power Dissipation Profile for Each Cell in Cell Library for Each Input Waveform
204
Characterize the Power Dissipation Profile with a Plurality of Power Coefficients and Derive Sensitivities
206
Circuit Element Level Netlist of Chip (from 120)
And001 Power Coefficients
And002 Power Coefficients
Power Coefficient Sensitivities
And004
Counter001
Counter008
Precompute Power Factors for Each Circuit Element corresponding to Each Input Waveform
218
Cell PMD 108 (Power Usage Models)
Simulate the Circuit's Logic and Timing Behavior
220
Event Stimulus Vectors
And001-1 Power Factors
And001-2 Power Factors
For Each Simulated Signal Transition, Accumulate Power Factors Associated with All Active Circuit Elements
222
Power Reports
Netlister 120 (Power Attributes)

1. A method for derating baseline power coefficients for non-baseline environmental conditions, said power coefficients developed for use in simulating power consumption of an electronic circuit having a plurality of circuit elements, where each said circuit element is an instance of a library cell selected from a predefined set of library cells, said method comprising the steps of:

(a) determining a range for environmental parameters for said circuit;

(b) determining a non-baseline power dissipation profile for a plurality of cells in said predefined set of library cells by maintaining all but a first one of said environmental parameters at a baseline value, and varying said first one of said environmental parameters over its entire range;

(c) characterizing each said non-baseline power dissipation profile for said cells with a plurality of power coefficients representing power dissipation for said cells as function of slew rate and output load;

(c1) varying a second one of said environmental parameters previously maintained at baseline,

(c2) determining a non-baseline power dissipation profile for each of said cells while varying only said first one of said environmental parameters over its entire range,

(c3) characterizing each said non-baseline power dissipation profile for said cell with a plurality of power coefficients representing power dissipation for said cell as function of said slew rate and said output load;

(c4) repeating said steps (c1) through (c3) for multiple values of said second one of said environmental parameters,

(c5) repeating steps (c1) through (c4) for multiple ones of said environmental parameters defined in step (a);

(d) characterizing said non-baseline power coefficients derived in step (c) to derive a power coefficient sensitivity value for each power coefficient for said varied parameter;

(e) repeating steps (b)–(d) for all environmental parameters defined in step (a) to derive power coefficient sensitivity values for all of said environmental parameters;

(f) storing said power coefficient sensitivity values;

(g) precomputing for each circuit element an input slew rate and an output load;

(h) determining an individual power coefficient scale factor for each power coefficient for each environmental parameter at said non-baseline environmental condition utilizing said power coefficient sensitivity value derived in step (e);

(i) determining an overall power coefficient scale factor for each power coefficient by multiplying all of said individual power coefficient scale factors derived in step (d); and

(j) multiplying each of said baseline power coefficients by a respective one of said overall power coefficient scale factors to yield power coefficients for said non-baseline environmental condition.

5,692,161

METHOD AND APPARATUS FOR OPERATING A MICROCOMPUTER IN AN EMULATION MODE TO ACCESS AN EXTERNAL PERIPHERAL

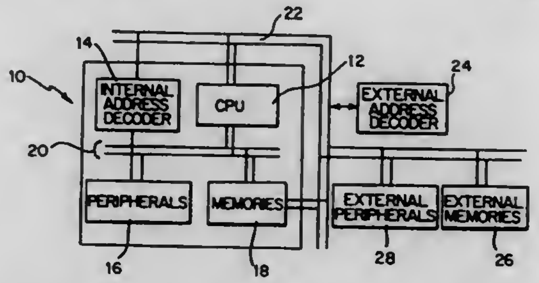
Philippe Basset, Meylan, and Pierre Tarayre, Echirolles, both of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis, France

Continuation of Ser. No. 128,532, Sep. 29, 1993, abandoned. This application Jul. 31, 1995, Ser. No. 509,218

Claims priority, application France, Oct. 2, 1992, 92 11716

Int. Cl.^{6} G06F *13/10*

U.S. Cl. 395—500 **19 Claims**



1. A microcomputer working in an emulation mode with at least one external peripheral to emulate another computer system capable of performing at least one function of the external peripheral, the microcomputer comprising:

a central processing unit that outputs addresses of peripherals to be accessed,

at least one internal peripheral,

an internal address decoder that is pre-loaded with addresses in response to a system clock signal, the internal address decoder decoding each pre-loaded address and selecting a corresponding internal peripheral, and

an internal memory connected to the central processing unit by a data and address bus,

the central processing unit having first and second input/output ports that, in the emulation mode, are respectively connected to said at least one external peripheral and to an external address decoder, the external address decoder sending out a signal applied to the central processing unit when an external peripheral is selected by an address output from the central processing unit, said microcomputer being configured to block the pre-loading of the internal address decoder in response to the signal from the external address decoder.

5,692,162

VIDEO ENTERTAINMENT SYSTEM ADAPTER AND IMAGE DISPLAY METHOD OF A VIDEO ENTERTAINMENT SYSTEM USING A VIDEO ENTERTAINMENT SYSTEM ADAPTER

Tetsuya Okawa, Tokyo, Japan, assignor to Sega Enterprises, Tokyo, Japan

Filed May 15, 1995, Ser. No. 440,914

Claims priority, application Japan, May 17, 1994, 6-103113

Int. Cl.^{6} G06F *3/00*

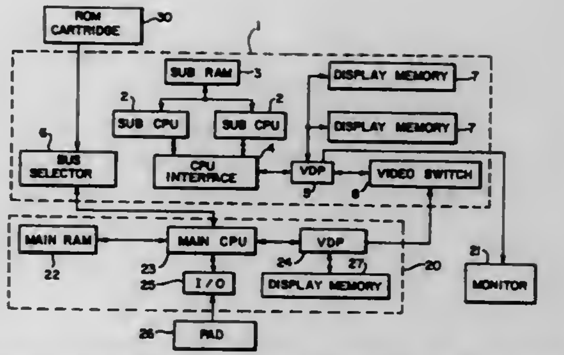
U.S. Cl. 395—503 **21 Claims**

1. A video entertainment system adapter for use on a video entertainment system comprising image display means for displaying images, main RAM for storing program data and image data, a main CPU for executing programs and for generating image data, and a first video display processor for controlling display images according to image data generated by the main CPU, said video entertainment system adapter comprising:

sub CPU for generating image data;

a second video display processor for controlling display images on the adapter according to image data generated by the sub CPU;

an interface for connecting said sub CPU and said main CPU;



priority determination means for comparing the priority of a display image from the unit of said video entertainment system with the priority of a display image from said adapter on a pixel basis; and

image selection means for selecting one of two display images, either a display image from the video entertainment system unit or a display image from the adapter, to be displayed in front of the other according to the priority determined by said priority determination means.

5,692,163

PROCESS SYSTEM WHICH GENERATES SETS OF OUTPUT DATA FROM SETS OF PREDETERMINED INPUT DATA WITH DUPLICATE DATA

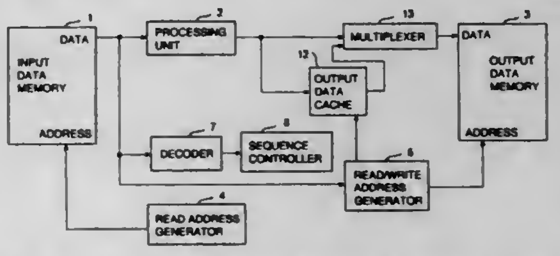
Masanobu Fukushima, Sanda, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,796

Claims priority, application Japan, Apr. 21, 1994, 6-082783

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—511 **15 Claims**



1. A processor system which generates a number of sets of output data by processing a number of sets of predetermined input data including duplicate data in accordance with a predetermined operation, comprising:

an input data memory for storing the sets of predetermined input data to be processed, said predetermined input data including sets of original input data and sets of substitute duplicate input data defining sets of duplicate output data;

processing means for processing each set of said original input data from said input data memory, to generate sets of original output data;

an output data memory for storing the sets of original output data and sets of duplicate output data, each set of said duplicate output data being a duplicate of a corresponding set of the original output data;

an output data cache for storing the sets of the original output data which are output from said processing means when the input data read from the input data memory is detected as being the original input data; and

switching control means for transferring the original output data stored in said output data cache into a location of said output data memory to store the duplicate output data when the input data read from the input data memory is detected as being the substitute duplicate input data, and for transferring the original output data output from said processing means into a location of said output data memory to store the original output data when the input data read from the input data memory is detected as being the original input data.

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5,692,164

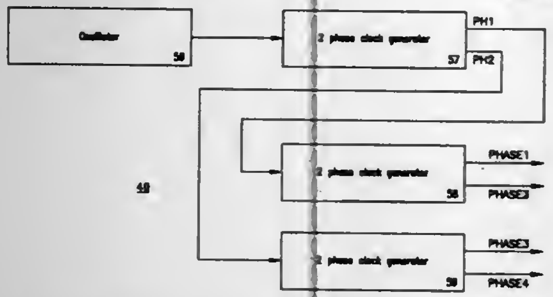
METHOD AND APPARATUS FOR GENERATING FOUR PHASE NON-OVER LAPPING CLOCK PULSES FOR A CHARGE PUMP

Dimitris Pantelakis, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 217,166, Mar. 23, 1994, abandoned. This application Dec. 18, 1996, Ser. No. 768,848

Int. Cl.^{6} G06F *1/06*

U.S. Cl. 395—556 **16 Claims**



1. A clock generation circuit comprising:

a first circuit for generating a first train and a second train of non-overlapping and opposite phase clock pulses from an input train of clock pulses;

a second circuit for generating a third train and a fourth train of non-overlapping and opposite phase clock pulses from the first train of clock pulses generated by the first circuit; and

a third circuit for generating a fifth train and a sixth train of non-overlapping and opposite phase clock pulses from the second train of clock pulses generated by the first circuit, wherein the third train of clock pulses and the fifth train of clock pulses are non-overlapping phase clock pulses.

5,692,165

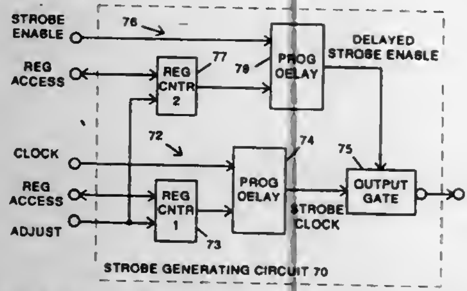
MEMORY CONTROLLER WITH LOW SKEW CONTROL SIGNAL

Joseph M. Jeddeloh, Minneapolis; Jeffrey J. Rooney, Red Wing; Richard F. Nicholson, and Dean A. Klein, both of Lake City, all of Minn., assignors to Micron Electronics Inc., Nampa, Id.

Filed Sep. 12, 1995, Ser. No. 526,988

Int. Cl.^{6} G06F *1/04*

U.S. Cl. 395—551 **29 Claims**



1. An apparatus for controlling a memory in response to an access request from a processor, the apparatus and the memory each electrically coupled to the processor across a bus of the type having information transferred thereon that is aligned with a clock signal, the memory of the type for receiving at least one strobe control signal, the apparatus comprising:

(a) a memory control circuit for providing control signals to the memory in response to an access request, wherein the control signal generating circuit generates a strobe enable signal; and

(b) a strobe generating circuit, electrically coupled to receive the strobe enable signal and the clock signal, for providing a strobe control signal to the memory, the strobe generating circuit including:

(1) a first delay for delaying the clock signal by a first alignment delay value to generate a strobe clock signal;

(2) a second delay for delaying the strobe enable signal by a second alignment delay value to generate a delayed strobe enable signal; and

(3) an output device, electrically coupled to the memory, for gating the strobe clock with the delayed strobe enable signal to thereby provide the strobe control signal to the memory; wherein the first alignment delay value is selected to align the strobe control signal with the clock signal and the second alignment delay value is selected to align the delayed strobe enable signal with the strobe clock.

5,692,166

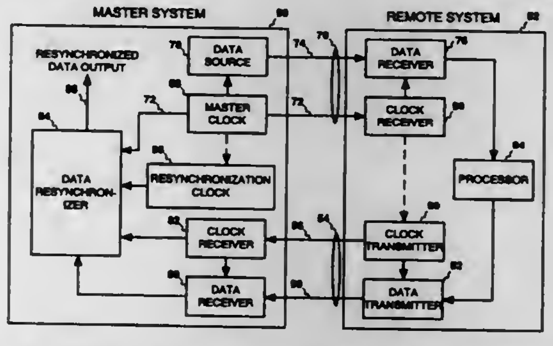
METHOD AND SYSTEM FOR RESYNCHRONIZING A PHASE-SHIFTED RECEIVED DATA STREAM WITH A MASTER CLOCK

Eric Richard Milbizer, Fort Worth, Tex.; Theodore Lawrence Willke, II, Madison, Wis., and Peter David Novak, Fort Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 19, 1996, Ser. No. 635,000

Int. Cl.^{6} G06F *1/04*

U.S. Cl. 395—551 **26 Claims**



1. A method in a data processing system for resynchronizing a received data stream with a master clock having a master clock frequency, wherein said received data stream is clocked with a received data clock that is out of phase with said master clock by an arbitrary number of degrees, said method comprising the steps of:

at a resynchronization clock frequency, comparing a master clock value and a received data clock value for a predetermined number of times to produce comparison results;

based upon said comparison results, producing a relative phase indicator;

in response to said relative phase indicator exceeding a predetermined phase shift threshold and said received data stream being clocked with a rising edge of said received data clock, sampling said received data stream at a rising edge of said master clock to produce a resynchronized data stream;

in response to said relative phase indicator being less than said predetermined phase shift threshold and said received data stream being clocked with said rising edge of said received data clock, sampling said received data stream at a falling edge of said master clock to produce said resynchronized data stream;

in response to said relative phase indicator exceeding a predetermined phase shift threshold and said received data stream being clocked with a falling edge of said received data clock, sampling said received data stream at said rising edge of said master clock to produce a resynchronized data stream; and

in response to said relative phase indicator being less than said predetermined phase shift threshold and said received data stream being clocked with said falling edge of said received data clock, sampling said received data stream at said falling edge of said master clock to produce said resynchronized data stream, wherein said resynchronized data stream is synchronized with said master clock and contains the data of said received data stream.

5,692,167

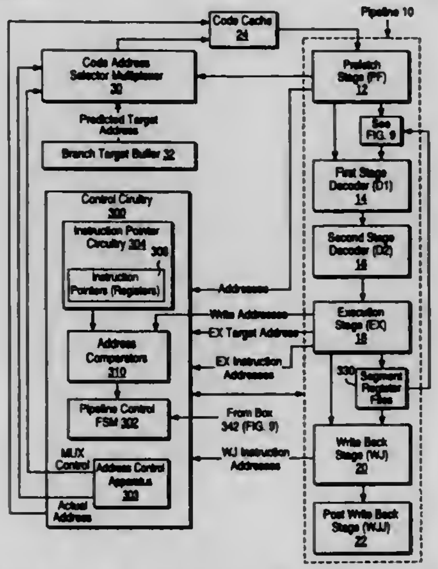
METHOD FOR VERIFYING THE CORRECT PROCESSING OF PIPELINED INSTRUCTIONS INCLUDING BRANCH INSTRUCTIONS AND SELF-MODIFYING CODE IN A MICROPROCESSOR

Edward T. Grochowski, San Jose, and Donald B. Alpert, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 354,453, Dec. 12, 1994, abandoned, which is a continuation of Ser. No. 938,387, Aug. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 922,855, Jul. 31, 1992, Pat. No. 5,442,756. This application Aug. 19, 1996, Ser. No. 697,028

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—567 **15 Claims**



1. A method for processing self-modifying code in a pipelined computer processor having a plurality of stages for simultaneously processing a stream of instructions in a pipeline, comprising the steps of:

(a) executing an in order write instruction in an execution stage to write data to a write address;

(b) comparing the write address with an address of each instruction in the pipeline that is subsequent to said write instruction to determine if the write address matches any of said addresses;

(c) if said comparisons do not find a match, then continuing operation; and

(d) if any of said comparisons find a match, then performing the steps of

flushing each of said instructions in the pipeline following the write instruction, and

pre-fetching the locations of said flushed instructions for decoding and execution.

5,692,168

PREFETCH BUFFER USING FLOW CONTROL BIT TO IDENTIFY CHANGES OF FLOW WITHIN THE CODE STREAM

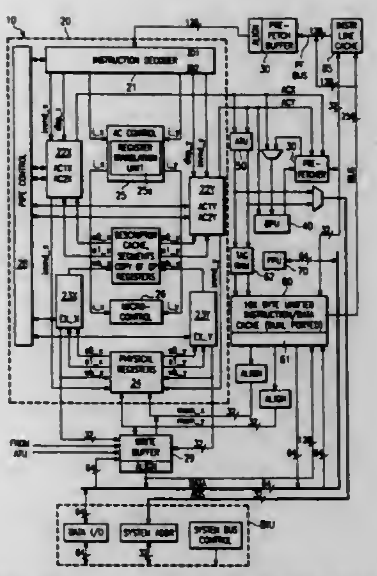
Steven C. McMahan, Richardson, Tex., assignor to Cyrix Corporation, Richardson, Tex.

Continuation-in-part of Ser. No. 324,992, Oct. 18, 1994, abandoned. This application Feb. 27, 1996, Ser. No. 607,539

Int. Cl.^{6} G06F *9/42*

U.S. Cl. 395—584 **5 Claims**

1. In a processor with a branch processing unit that detects changes of flow and supplies target addresses for prefetching prior to the associated change of flow (COF) instructions being decoded, a prefetch unit including a prefetch buffer with flow control for transferring instruction bytes to a decoder, comprising:



(a) a prefetch buffer in the prefetch unit that stores prefetched instruction bytes for transfer to the decoder;

(b) prefetch request logic in the prefetch unit that selectively issues prefetch requests for transferring a predetermined number of instruction bytes into the prefetch buffer, including target prefetch requests using target addresses supplied by the branch processing unit prior to confirmation of the associated COF instruction;

(c) the prefetch buffer including a plurality of prefetch blocks of instruction bytes, each having associated with it a flow control indication of whether the prefetch block includes a predicted COF instruction;

(d) flow control logic that receives the flow control indication for a current prefetch block when the transfer of instruction bytes from the current prefetch block is complete and the prefetch block increments to a next prefetch block for transferring instruction bytes to the decoder;

(e) wherein, when the decoder has received all of the instruction bytes in the current prefetch block, if the flow control indication for that prefetch block indicates that it includes a predicted COF instruction, instruction bytes will not be transferred from the next prefetch block unless the predicted COF instruction is confirmed.

5,692,169

METHOD AND SYSTEM FOR DEFERRING EXCEPTIONS GENERATED DURING SPECULATIVE EXECUTION

Vinod K. Kathail, Cupertino; Rajiv Gupta, Los Altos; Bantwal R. Rau, Los Altos; Michael S. Schlansker, Los Altos, all of Calif.; William S. Worley, Jr., Breckenridge, Colo., and Frederic C. Amerson, Santa Clara, Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 192,758, Feb. 7, 1994, abandoned, which is a continuation of Ser. No. 628,241, Dec. 14, 1990, abandoned. This application Oct. 18, 1994, Ser. No. 324,940

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—591 **19 Claims**

14. A method for supporting speculative execution comprising:

providing a predetermined number of speculative operations in an instruction set architecture of a central processing unit;

specifying a mode of the central processing unit by setting a mode bit in a register of the central processing unit;

reading the mode bit in the register to determine the mode of the central processing unit and if the mode bit indicates that the speculative operations are to be operated as non-speculative operations, then

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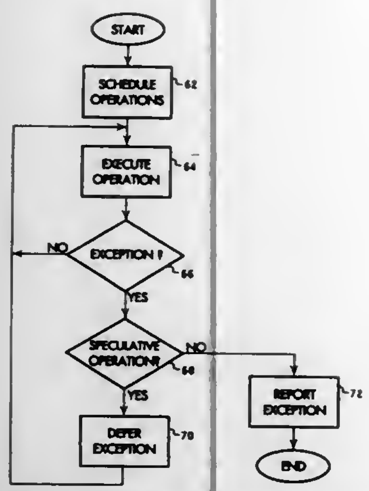


operating the speculative operations as non-speculative operations;

otherwise, executing speculative operations and if an exception is generated from a speculative operation then

deferring the exception by storing information that identifies that an exception has occurred,

executing a non-speculative operation including a check operation to check for a deferred exception,

checking for a deferred exception by reading a destination register of a speculative operation, and

if an exception is detected in a non-speculative operations, then reporting the exception.

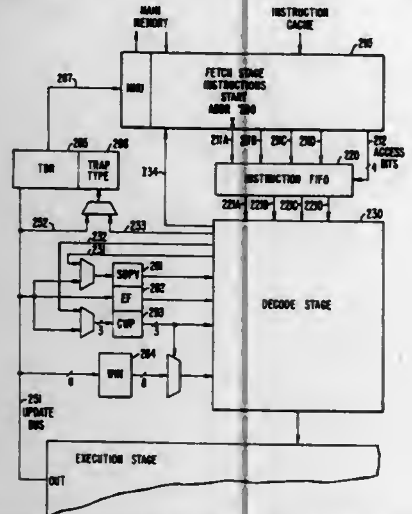
5,692,170
APPARATUS FOR DETECTING AND EXECUTING TRAPS IN A SUPERSCALAR PROCESSOR

David L. Isaman, San Diego, Calif., assignor to Metaflow Technologies, Inc., La Jolla, Calif.

Filed Apr. 28, 1995, Ser. No. 431,219

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—591 **11 Claims**



1. A method of responding to trapping conditions in a pipelined superscalar computer, said computer comprising several processing stages including a decode stage for examining at each clock cycle one or more instructions from a sequence of instructions and a plurality of state registers coupled to the decode stage for indicating the operating state of the computer, and an execution stage coupled to said decode stage for receiving decoded instructions supplied by the decode stage, assessing whether any of said decoded instructions satisfies any of a first set of trapping conditions, and performing a specified trap action for any instruction that does satisfy any of said set, said method comprising the steps at the decode stage of:

a) assessing whether any instruction being examined at the decode stage satisfies any of a second set of issue-time trapping conditions, said second set of issue-time traps being a subset of and disjointed from said first set of trapping conditions; and

b) when any instruction so assessed at the decode stage is determined to satisfy one of said second set of issue-time trapping conditions, then performing at the decode stage the substeps of:

(i) preventing the first such instruction in said sequence, as well as all of the one or more instructions that follow said first such instruction in said sequence, from being supplied to the execution stage; and

(ii) performing a specified trap action without waiting for completion of all previously issued instructions in the execution stage.

5,692,171
METHOD OF EXTRACTING STATISTICAL PROFILES, AND USE OF THE STATISTICS CREATED BY THE METHOD

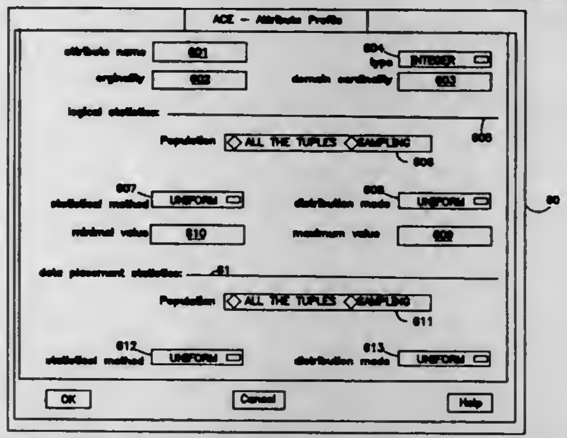
Frédéric Andres, Paris, France, assignor to Bull S.A., Paris, France

Continuation of Ser. No. 256,361, Jul. 20, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 622,932

Claims priority, application France, Nov. 20, 1992, 92 13988

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—601 **11 Claims**



1. A method of extracting statistical profiles from a relational data base organized by relation, attribute, and index, said method comprising the steps of:

selecting a target object from among possible choices, said possible choices being one column of a table, all the columns of a table, all the tables, or a predefined selection; and

generating statistical profiles of the target object and storing the statistical profiles in tables that are included in the database; wherein the step of generating statistical profiles includes:

generating value distribution statistics and value placement statistics, wherein the step of generating value placement statistics includes producing the statistics in the form of constant height histograms;

and further wherein the step of generating value distribution statistics includes:

verifying correlations to find mathematical dependencies;

verifying data distributions to determine whether a data distribution is uniform or nonuniform; and

producing statistics.

5,692,172

Patent Not Issued For This Number

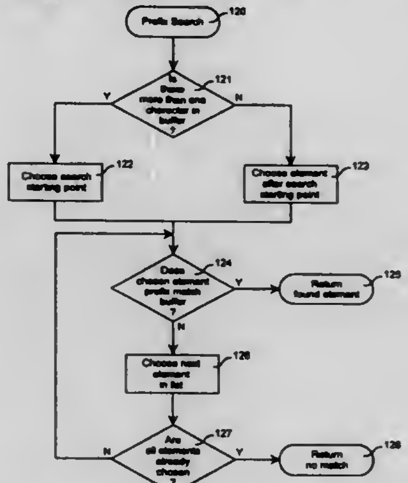
5,692,173
METHOD AND SYSTEM FOR COMBINING PREFIX AND FIRST CHARACTER SEARCHING OF A LIST

Chee Heng Chew, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Dec. 13, 1994, Ser. No. 354,913

Int. Cl.^{6} G06C *17/30*

U.S. Cl. 395—603 **31 Claims**


Prefix Search
120
121
Y
N
122
Choose search starting point
Choose element after search starting point
123
124
Y
Return found element
125
N
Choose next element in list
126
127
Are all elements already chosen ?
N
Y
Return no match
128

1. A method in a computer system for selecting a list element in a list, each list element having a sequence of characters and having a position in the list, the computer system having a user input buffer containing a plurality of search characters, the method comprising the steps of:

searching for a list element with a prefix that matches the search characters;

determining whether each of the search characters is the same character;

when it is determined that each of the search characters is the same character, searching for a list element whose first character matches a search character;

when the searching finds only one list element that matches, selecting that list element; and

when the searching finds two distinct list elements, wherein one list element has a prefix that matches the search characters and the other list element has a first character that matches a search character, selecting from the two list elements a final list element based on its position relative to the position of a predetermined list element.

5,692,174
QUERY PARALLELISM IN A SHARED DATA DBMS SYSTEM

William Robert Bireley, Morgan Hill; Tammie Dang; Paramesh Sampatrai Desai, both of San Jose; Donald James Haderle, Los Gatos; Fen-Ling Lin; Maureen Mae McDevitt, both of San Jose; Akira Shibamiya, Los Altos; Bryan Frederick Smith, Morgan Hill; James Zu-chia Teng, San Jose; Hong Sang Tie, Morgan Hill; Yun Wang, Saratoga; Jerome Quan Wong, Mountain View, all of Calif.; Kathryn Ruth Zeldenstein, Chicago, Ill., and Kou Horng Allen Yang, Santa Clara, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1995, Ser. No. 539,637

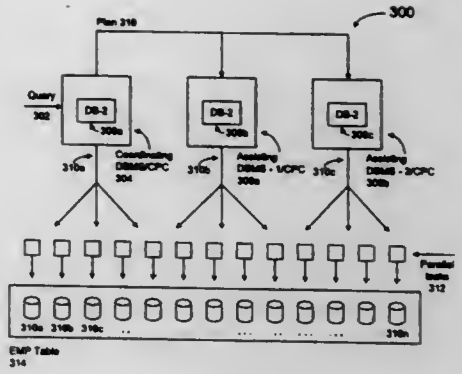
Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—603 **30 Claims**

1. The method for a plurality of DBMSs to process a query by one or more assisting DBMSs processing one or more parallel tasks allocated by a coordinating DBMS that decomposed a query into a plan of a plurality of parallel tasks, comprising the following steps:

(1) receiving the plan from the coordinating DBMS;

(2) executing the parallel tasks allocated to the assisting DBMS by the coordinating DBMS in the plan; and


300
Plan 316
Query 302
DB-2
306a
Coordinating DBMS/CPC 304
Assisting DBMS - MCPC 308a
Assisting DBMS - MCPC 308b
310a
310b
310c
Parallel tasks 312
EMP Table 314

Query Parallelism

(3) returning a result from the parallel tasks to the coordinating DBMS;

wherein any of said plurality of DBMSs may be the coordinating DBMS or the assisting DBMS.

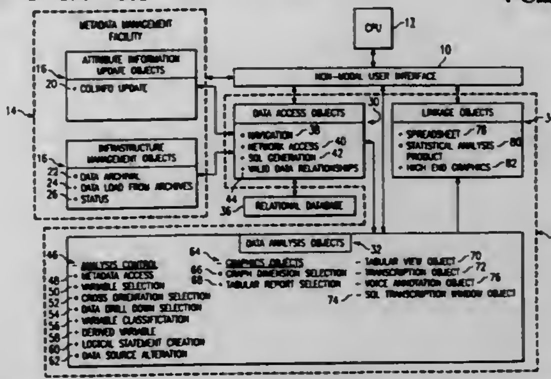
5,692,175
DECISION MODELING AND ANALYSIS FOR OBJECT ORIENTED DATA ACCESS AND ANALYSIS SYSTEM

Kathleen Marie Davies, Farmers Branch; Mark Makoto Kunichika, Dallas; Darren Bern Dayley, Fort Worth; Jeffery Dean Donaldson; Luke Joseph Temprine, both of Coppell; Mikael Herman Livingston, Euless; Nurman Haripin, Carrollton; Angelo Benedict Nasche, Lewisville; David Bryan Batchelor, Dallas, and Bernhard Otto Bauerle, Euless, all of Tex., assignors to The Sabre Group, Inc., Fort Worth, Tex.

Continuation of Ser. No. 196,412, Feb. 14, 1994, Pat. No. 5,586,311. This application Apr. 17, 1996, Ser. No. 633,881

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—603 **4 Claims**



1. A system for accessing and analyzing data through a central processing unit, said system comprising:

a non modal user interface for providing a user access to the system;

a plurality of application analysis objects for creating an analysis network, said analysis network comprising a plurality of user interactively selected nodes and connections wherein the nodes and connections determine the analysis of a selected database,

said application analysis objects having means for automatically generating the required analysis paths without user interaction responsive to the connection of selected analysis objects in the created analysis network and including decision model analysis means for analyzing said data analysis network in response to said decision model and for generating a new analysis network path in response to the requirement of said decision model;

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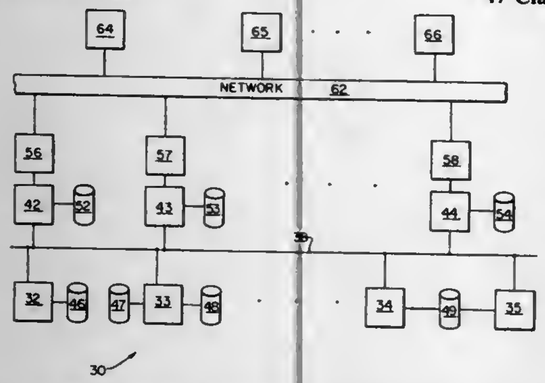
- a metadata management facility for providing data structure and location information to said application analysis objects;
- a plurality of application graphics objects for interactively manipulating the plurality of analysis objects through the non-modal user interface to create said analysis network; and
- a plurality of application data access objects for allowing application object to access required databases and for generating Structured Query Language in response to the analysis network.

5,692,176
ASSOCIATIVE TEXT SEARCH AND RETRIEVAL SYSTEM

John Holt, Centerville; David James Miller, Spring Valley; X. Allen Lu, Springboro; Ray Daley, Dayton; Minh Doan, Huber Hights; Richard G. Graham, Beavercreek; Catherine Leininger, Dayton; Darin W. McBeath, Miamisburg; Thomas Pease, Mason; Steven M. Sever, Kettering; Dale Waddell, and Franz Weckesser, both of Dayton, all of Ohio, assignors to Reed Elsevier Inc., Newton, Mass.

Filed Nov. 22, 1993, Ser. No. 155,304
Int. Cl.⁶ G06F *17/30*

U.S. Cl. 395—605 **47 Claims**



22. An associative text search and retrieval system, comprising:

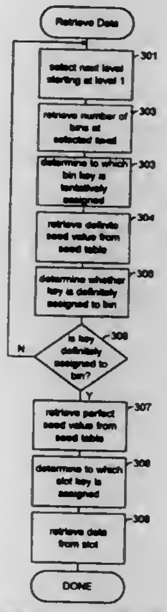
- front end processing means for interacting with a network having one or more user terminals connected thereto to allow a user to provide information to the system and receive information from the system;
- storage means for storing a plurality of text documents;
- processor means, coupled to the front end processing means and the storage means, for performing a search of the text documents using a plurality of search terms provided by the user, for calculating a score for each of the text documents containing at least one of the search terms, for ranking the text documents based on their scores, and for providing to the front end processing means a predetermined number of retrieved documents that are a subset of the text documents based on the documents' ranks, the retrieved documents having higher ranks than text documents not provided to the front end processing means, wherein the scores are calculated using a formula that varies according to the square of the frequency in each of the text documents of each of the search terms; and
- means for providing the user with a screen indicating for each retrieved document which search terms are present in which retrieved documents.

5,692,177
METHOD AND SYSTEM FOR DATA SET STORAGE BY ITERATIVELY SEARCHING FOR PERFECT HASHING FUNCTIONS

John Warren Miller, Kirkland, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Oct. 26, 1994, Ser. No. 329,241
Int. Cl.⁶ G06F *17/30*

U.S. Cl. 395—608 **70 Claims**


Retrieve Data
select next level starting at level 1
301
retrieve number of bins at selected level
302
determine to which bin key is tentatively assigned
303
retrieve definite seed value from seed table
304
determine whether key is definitely assigned to bin
305
is key definitely assigned to bin?
306
N
Y
retrieve perfect seed value from seed table
307
determine to which slot key is assigned
308
retrieve data from slot
309
DONE

1. A method in a computer system for storing data in storage of the computer system, the data organized into records, each record having a key, the storage organized into slots, each slot for storing a record, the method comprising the computer-implemented steps of:

- selecting a number of slots and designating the selected slots as a level;
- iteratively selecting from among the records not yet assigned to slots different sets of records to store into the slots of the level and searching for a perfect hashing function for assigning the selected records to the slots of the level based on the keys of the selected records until a perfect hashing function is found and selected;
- assigning the selected records to the selected slots in accordance with the selected perfect hashing function;
- storing each selected record in its assigned slot; and
- repeating the above steps for records not yet assigned to a slot until all the records are assigned to a slot.

5,692,178
SYSTEM AND METHODS FOR IMPROVED FILE MANAGEMENT IN A MULTI-USER ENVIRONMENT

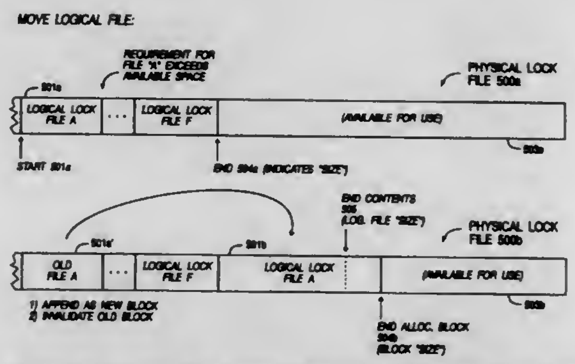
Steven T. Shaughnessy, Scotts Valley, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Division of Ser. No. 933,480, Aug. 20, 1992, Pat. No. 5,555,388. This application Jul. 16, 1996, Ser. No. 682,055
Int. Cl.⁶ G06F *12/00*

U.S. Cl. 395—608 **24 Claims**

1. In a multi-client data processing system, an improved method for storing files on a storage device, the method comprising:

- storing a plurality of files as a plurality of logical files stored in a single physical file, said physical file residing as a single disk file on a storage device, each logical file being stored as a contiguous sequence of uniform storage blocks in the physical file;
- storing with the physical file a directory describing each logical file stored within the physical file;
- receiving a first request from a client for information from a particular logical file;



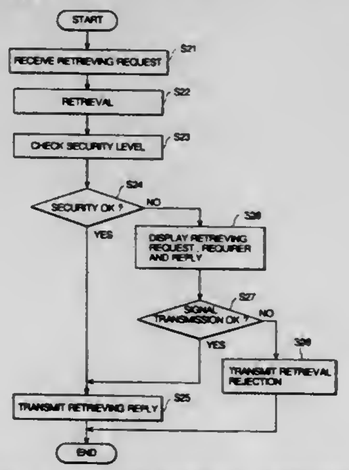
- in response to said first request, determining from said directory where said logical file is located in said physical file, and storing at the client information comprising a pointer describing that location, so that a subsequent request for the logical lock file can be satisfied without the directory;
- receiving a second request from another client for storing in the logical file new information which causes overflow of the logical file;
- in response to said second request, storing the new information by:
  - (i) appending to one end of the physical file a sufficient number of new uniform storage blocks for storing the new information,
  - (ii) storing information for the logical lock file together with the new information being added in said new uniform storage blocks,
  - (iii) marking storage blocks which previously comprised the logical file as invalid, and
  - (iv) storing with the invalidated storage blocks a pointer which points to said storage blocks being appended to said physical file; and
- as each client requests access to information stored in the logical file, updating the pointer stored at the client to reference a location in the physical file where the new storage blocks have been appended.

5,692,179
INFORMATION RETRIEVING APPARATUS

Toru Ueda, Ichihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 16, 1995, Ser. No. 389,806
Claims priority, application Japan, Apr. 22, 1994, 6-085073
Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—609 **17 Claims**


START
RECEIVE RETRIEVING REQUEST
S21
RETRIEVAL
S22
CHECK SECURITY LEVEL
S23
SECURITY OK ?
S24
NO
YES
DISPLAY RETRIEVING REQUEST, REQUIRER AND REPLY
S26
SIGNAL TRANSMISSION OK ?
S27
NO
YES
TRANSMIT RETRIEVAL REJECTION
S28
TRANSMIT RETRIEVING REPLY
S25
END

1. An information retrieving apparatus comprising:

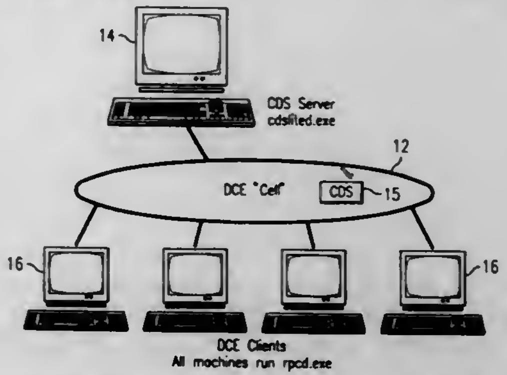
- data memory means for holding data and security levels corresponding to each of said data;
- data base means for registering identification information on inquirers and security levels assigned to each of the inquirers;
- receiving/transmitting means for receiving a retrieving request from an inquirer with identification information on the inquirer and for transmitting a result corresponding to said retrieving request;
- retrieving means for retrieving data from said data memory means in accordance with said retrieving request;
- judging means for judging whether the retrieved result should be transmitted through said receiving/transmitting means by comparing the security level corresponding to data in the retrieved result with the security level assigned to the inquirer; and
- input/display means for displaying the retrieving request and the identification information on the inquirer and for inputting an instruction whether a security level should be assigned to the inquirer, when the security level is not assigned to the inquirer,
- wherein a security level is newly registered in said data base means at the time when the instruction to assign a security level to the inquirer is inputted.

5,692,180
OBJECT-ORIENTED CELL DIRECTORY DATABASE FOR A DISTRIBUTED COMPUTING ENVIRONMENT

Henry Lee, Austin, Tex., assignor to International Business Machines Corporation, Austin, Tex.

Filed Jan. 31, 1995, Ser. No. 381,259
Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—610 **17 Claims**



1. A memory for storing data for access by application programs being executed in client machines of a distributed computing environment consisting of a small set of connected machines sharing a common name and namespace, the memory supported in a dedicated server machine of the distributed computing environment, the memory comprising:

- a data structure stored in said memory and used to emulate a directory service database optionally configured as a hierarchy of replicated directories, links and entries, the data structure including:
  - a plurality of common data objects categorized into a first class and having one or more predetermined instances configurable as directories, links and entries; and
  - a plurality of common data objects categorized into a second class and storing information about particular resources identified by one of the plurality of data objects in the first class;
- wherein the plurality of data objects of the first and second class are configurable into the namespace to thereby enable the application programs to locate resources in the distributed computing environment.

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5,692,181

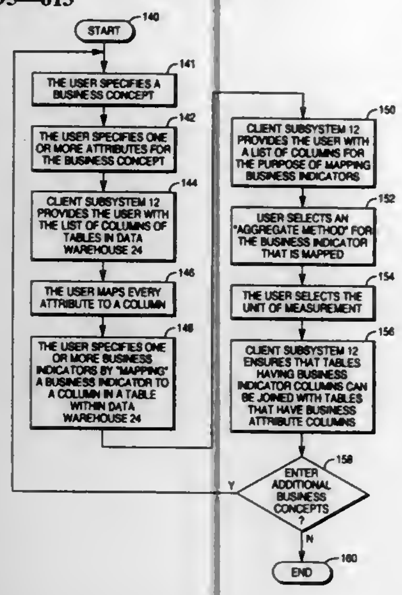
SYSTEM AND METHOD FOR GENERATING REPORTS FROM A COMPUTER DATABASE

Tejwansh S. Anand, Roswell, Ga.; Michael A. Georgantos, San Diego, Calif.; Yih-Shiuan Hu, Alpharetta; James F. Knutson, Roswell, both of Ga.; Drew T. Lettington; Marshall P. Lindsay, both of San Diego, Calif.; Alan J. Meyer, Riverside, Calif.; Kenneth W. O'Flaherty, Del Mar, Calif.; Richard N. Schubert, San Diego, Calif., and Peter G. Selfridge, Watchung, N.J., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 12, 1995, Ser. No. 542,267

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—613 **1 Claim**


START
140
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156
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160

1. A method of creating data types and relationships between the data types and data within a database for generating a report for a user regarding an enterprise of the user, comprising the steps of:

organizing the data within the database into columns of tables;

providing a computer coupled to the database that executes an application program that allows a user to define the data types, to define relationships between the data types, to define parameters for the report, to define a method of analysis for the report, and to create the report;

recording a business concept by the application program, the business concept being chosen by the user by operating an input device coupled to the computer;

recording an attribute associated with the business concept by the application program, the attribute being chosen by the user by operating the input device;

displaying a list of the columns of tables in the database by the computer;

recording a mapping of the attribute to one of the columns in the list, the mapping being chosen by the user by operating the input device, and creating an attribute table based upon the mapping;

displaying a list of business indicators by the computer;

recording a mapping of one of the business indicators to the column, the mapping being chosen by the user by operating the input device, and creating a business indicator table based upon the mapping; and

joining the attribute table with the business indicator table to produce an additional table;

wherein the application program uses the additional table to create the report.

5,692,182

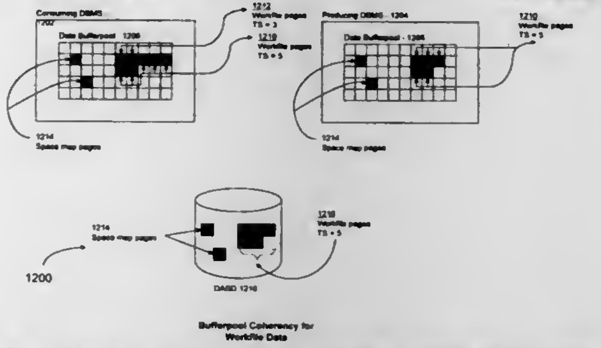
BUFFERPOOL COHERENCY FOR IDENTIFYING AND RETRIEVING VERSIONS OF WORKFILE DATA USING A PRODUCING DBMS AND A CONSUMING DBMS

Paramesh Sampatrai Desai, San Jose; Bryan Frederick Smith, Morgan Hill; James Zu-chia Teng, and Kou Horng Allen Yang, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1995, Ser. No. 539,411

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—610 **16 Claims**



9. A method for a consuming database management system (DBMS) to consume one or more workfiles produced by a producing DBMS, each workfile comprising a plurality of data buffer pages, comprising the steps of:

(1) receiving a notify message from the producing DBMS indicating that one of the workfiles is available for retrieval on a storage device, wherein each data buffer page of said one of the workfiles includes a page version identifier, wherein said notify message includes a workfile version identifier;

(2) retrieving said one of the workfiles from said storage device based on said workfile version identifier; and

(3) sending a reply message indicating that said one of the workfiles was retrieved from said storage device.

5,692,183

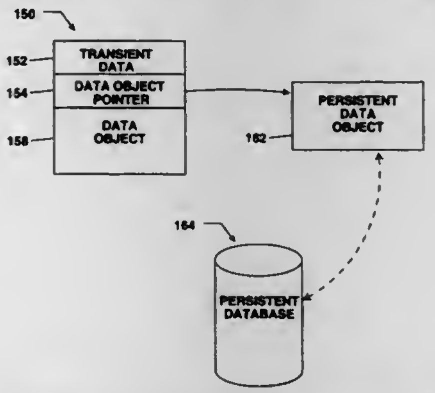
METHODS AND APPARATUS FOR PROVIDING TRANSPARENT PERSISTENCE IN A DISTRIBUTED OBJECT OPERATING ENVIRONMENT

Mark W. Hapner, San Jose, and Alan Snyder, Palo Alto, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 31, 1995, Ser. No. 414,770

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—614 **27 Claims**



1. A computer-implemented method for providing transparent persistent data support to distributed objects instantiated within a distributed object system wherein an instance of a servant object class is instantiated having a transient data portion in which transient data can be stored and a data object in which a finite, predefined amount of persistent data can be stored, the method comprising the steps of:

a) providing a particular servant object that is a particular instance of the servant object class, the particular servant object having an associated transient data portion in which transient data can be stored, an associated data object in which a finite, predefined amount of persistent data can be stored and a data object pointer that indirects to the associated data object, wherein the particular servant object inherits the data object from a data object class;

b) providing a persistent data storage mechanism having a persistent data object in which persistent data can be stored and a persistent data pointer that indirects to the persistent data object, the amount of persistent data which can be stored in the persistent data object substantially exceeding the finite, predefined amount of persistent data which can be stored in the associated data object, the persistent data storage mechanism operating independent of the particular servant object;

c) determining the value of the data object pointer; and

d) locating the data object pointer within the particular servant object and replacing the data object pointer with the persistent data pointer thereby providing transparent persistent data support to the particular servant object.

5,692,184

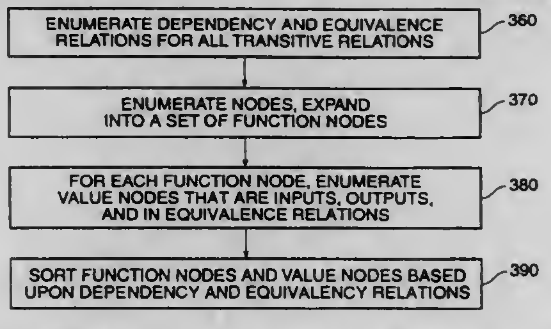
OBJECT RELATIONSHIP MANAGEMENT SYSTEM

Jean-Louis Ardoin, Clamart, France; Richard M. Eade, Madison; Robert Patience, Huntsville, both of Ala.; Alain Falasse, Paris, France; Dave L. Brann, Huntsville, Ala.; Gerard J. Attilio, and Alfredo Arce, both of Madison, Ala., assignors to Intergraph Corporation, Huntsville, Ala.

Filed May 9, 1995, Ser. No. 437,942

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—614 **45 Claims**


ENUMERATE DEPENDENCY AND EQUIVALENCE RELATIONS FOR ALL TRANSITIVE RELATIONS
360
ENUMERATE NODES, EXPAND INTO A SET OF FUNCTION NODES
370
FOR EACH FUNCTION NODE, ENUMERATE VALUE NODES THAT ARE INPUTS, OUTPUTS, AND IN EQUIVALENCE RELATIONS
380
SORT FUNCTION NODES AND VALUE NODES BASED UPON DEPENDENCY AND EQUIVALENCY RELATIONS
390

1. A method for maintaining relationships between entities in a computer system, the method comprising the steps of:

modifying a node in a first entity;

searching for a plurality of dependent nodes from a plurality of nodes in a plurality of second entities coupled to the node, wherein the plurality of nodes comprises a plurality of value nodes, a plurality of function nodes, and a plurality of predicate nodes, each of the plurality of function nodes having value nodes in a parent and child dependency relation, each of the plurality of predicate nodes having associated value nodes in an equivalence relation;

ordering the plurality of dependent nodes' into an evaluation order; and evaluating the plurality of dependent nodes in the evaluation order.

5,692,185

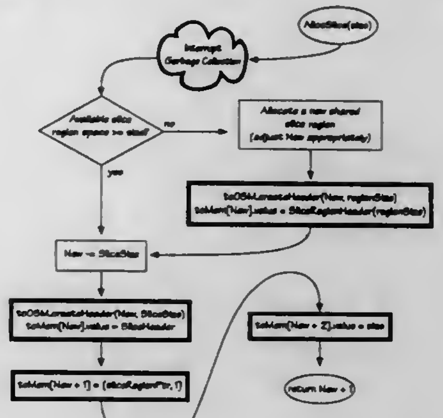
OBJECT SPACE MANAGER METHOD AND CIRCUIT

Kelvin D. Nilsen, Ames, Iowa, and William Schmidt, Rochester, Minn., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 994,517, Dec. 21, 1992, Pat. No. 5,560,003. This application Jan. 29, 1996, Ser. No. 592,956

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—615 **18 Claims**


AllocSlice(size)
Interrupt Garbage Collection
Available slice region space >= size?
no
yes
Allocate a new shared slice region (adjust New appropriately)
New -= SliceSize
return New + 1

1. An object space manager circuit for locating headers of objects in an associated memory containing L_1 memory cells, the individual memory cells being represented by the integers from 0 to L_1-1, L_1 having a plurality of submultiples $N_1, N_2, \ldots N_G$, the largest submultiple N_G being equal to L_1, an object being allocated memory cells from S_1 to S_2, S_1 containing the header of said object, said object space manager circuit comprising:

a code memory;

a coding circuit which generates an object locator code, for each associated memory cell S in the range S_1 to S_2, S_1 and S_2 being inputs to said coding circuit, M(S) being the subscript of the smallest of said submultiples for which $\mathrm{INT}(S/N_{M(S)})$ equals $\mathrm{INT}(S_1/N_{M(S)})$, INT( ) being the integer portion of the quantity in parentheses, said code being outputted to said memory for storage.

5,692,186

PRODUCTION SYSTEM, HIERARCHICAL NETWORK AND METHOD OF NODE CONTROL OF HIERARCHICAL NETWORK

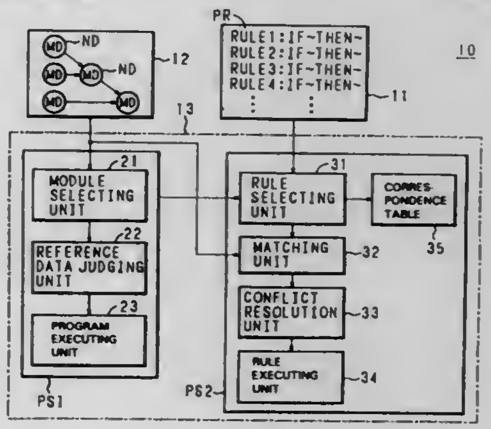
Toshiyuki Fukuoka, and Satoshi Hikida, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 18, 1995, Ser. No. 374,111

Claims priority, application Japan, Jan. 20, 1994, 6-004513; Jan. 20, 1994, 6-004514

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—617 **19 Claims**



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1. A production system, comprising:
a data base having a plurality of modules in a network structure, wherein each of said modules includes a data part storing data which change in time series and a program part which controls said data part;
a rule base having a plurality of production rules respectively including a condition part and an executing part which executes the production rule in accordance with the truth of the condition provided in said condition part; and
an inference control unit for inference control using said production rules and data included in said data base,
wherein said inference control unit includes
a network processing unit which enables one module, which refers to a data part of another module, to execute the program part of the one module only when the data part of the another module has changed, and
a production processing unit for executing the production rule, using the data of the data part of the module whose data part has changed.

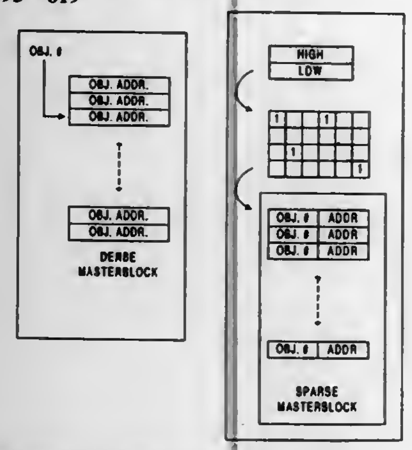
5,692,187
SHADOW MECHANISM HAVING MASTERBLOCKS FOR A MODIFIABLE OBJECT ORIENTED SYSTEM

Phillip Y. Goldman, Mountain View, and Andrew J. Hertzfeld, Palo Alto, both of Calif., assignors to General Magic, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 388,069, Feb. 14, 1995. This application Jun. 7, 1995, Ser. No. 474,278

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—619 **13 Claims**



1. An information handling system comprising
a processor,
a read only memory coupled to the processor, the read only memory storing a first version of a data element, the first version of the data element including a plurality of objects,
a random access memory coupled to the processor, the random access memory storing a second version of the data element, the second version of the data element including a plurality of objects, and
a shadow system, the shadow system transparently determining which of the first and second versions of the data elements the processor accesses, the shadow system including a masterblock for accessing objects of the first version of the data element, the masterblock including a list of address offsets, and the list of address offsets starting at a cluster pointer address.

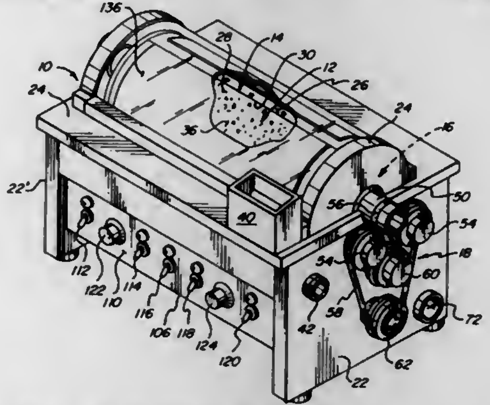
5,692,188
SYSTEM FOR PROCESSING AND WASHING PHOTOGRAPHIC IMAGES

Todd A. Watts, 167 Spring St., #5 SE., and Leonardo Sideri, 561 Broadway, both of New York, N.Y. 10012

Filed Jan. 11, 1996, Ser. No. 584,378

Int. Cl.^{6} G03D *13/08*

U.S. Cl. 396—634 **18 Claims**



1. A device for processing photographic sheet material with liquids to generate high quality, large scale photographic images comprising:
a trough for receiving the liquid;
a drum mounted within said trough in contact with the liquid, said drum having an outer surface for mounting the photographic sheet material such that a non-emulsion side of the sheet material contacts the drum outer surface;
motor means for rotating said drum outer surface to pass an emulsion side of the sheet material repeatedly through the liquid in said trough;
a groove on said outer surface of said drum for receiving an edge of the photographic material;
a cover for enclosing said trough and drum outer surface, said cover including a window extending along said drum permitting a user to view the photographic material during processing;
a pump connected to said trough for removal of liquids from the trough to
drum hub portions extending from ends of said drum and along an axis of said drum, said hub portions for mounting said drum within said trough; and
a pair of support rollers mounted near ends of said trough supporting said hub portions.

5,692,189
METHOD AND APPARATUS FOR ISOLATING CIRCUIT BOARDS IN A COMPUTER SYSTEM

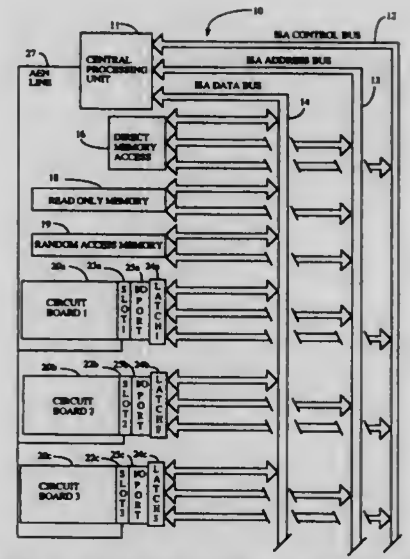
Ralph A. Lipe, Woodinville, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jul. 5, 1994, Ser. No. 270,670

Int. Cl.^{6} G06F *12/00;13/00*

U.S. Cl. 395—651 **9 Claims**

1. An apparatus for resolving resource conflicts within a computer system and having computer system resources interfaced via a computer system bus, said resource conflicts associated with the installation of a circuit board to said computer system, comprising:
a central processing unit connected to said computer system bus;
a memory unit connected to said computer system bus;
a slot connected to said computer system bus and coupling said circuit board to said computer system bus;
a latch connected to the address line of said slot that is operative for addressing the portion of said memory corresponding to default memory assignments for said circuit board, the output of said latch being connected to said address line of said slot and the inputs lines of said latch being connected to said computer system bus and said input lines operative to receive input signals from said central processing unit;



said central processing unit operative to generate an activating input signal, via said computer system bus, to said latch upon detection of a resource conflict; and
said latch responsive to said activating input signal to provide an output signal to said address line to selectively disable access by said circuit board to said memory unit.

5,692,190
BIOS EMULATION OF A HARD FILE IMAGE AS A DISKETTE

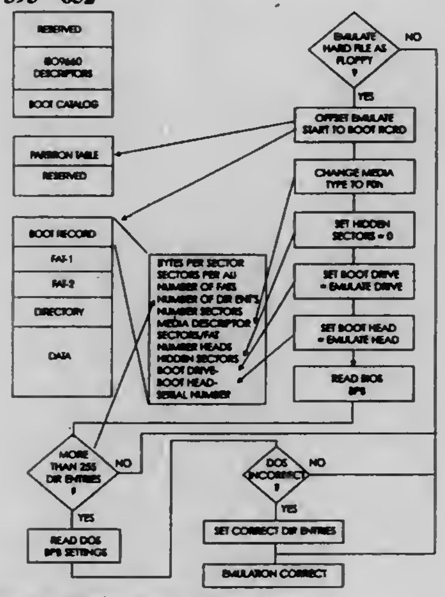
Donald D. Williams, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1994, Ser. No. 313,709

Claims priority, application France, Mar. 31, 1994, 94 03861

Int. Cl.^{6} G06F *9/445*

U.S. Cl. 395—652 **7 Claims**



1. A data processing system, comprising:
a central processing unit (CPU);
a system memory for storing data in the form of electrical signals;
a first port for receiving an input device generating electrical input signals;
at least one second port for supplying electrical output signals to output devices;
a system bus interconnecting the CPU, the system memory, the first port and the at least one second port;
a BIOS for carrying out prescribed functions including converting operating signals developed by an operating system executed by the CPU into electrical signals compatible with devices that are responsive to other signals applied by the CPU to the system bus;
a drive for a non-volatile mass storage medium, connected to the system bus, storing multiple independent applications in the form of data on respective BIOS emulated images; and
the BIOS includes programming to emulate a hard file image as a diskette image including a starting sector of a first hard file partition as a Partition Boot Record including a BIOS Parameter Block having physical parameters including a partition boot sector, hidden sectors, an IPL drive and an IPL head, wherein the BIOS programming:
offsets a Logical Block Address to point to the Partition Boot Record corresponding to the starting sector of the first hard file partition;
modifies the partition boot sector to refresh the physical parameters of the hard file emulated image;
sets the number of hidden sectors in the BIOS Parameter Block to zero;
sets the IPL drive in the BIOS Parameter Block to an emulated drive identification; and
sets the IPL head in the BIOS Parameter Block to 00.

5,692,191
ADDRESS SPACE UTILIZATION IN A DISTRIBUTED DATA PROCESSING SYSTEM

Taf Anthias, Ampfield; Harry Halliwell, Winchester, and John Francis Minshull, Kings Sombourne, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

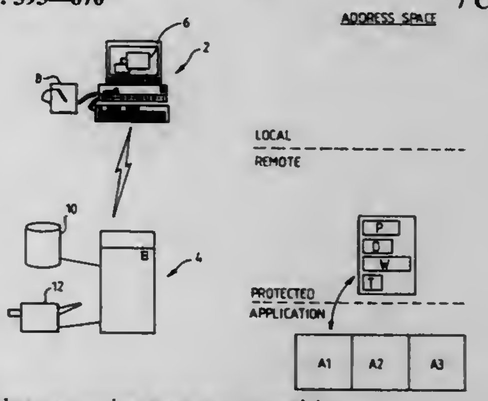
PCT No. PCT/GB93/02641, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO94/15288, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 23, 1993, Ser. No. 290,910

Claims priority, application United Kingdom, Dec. 24, 1992, 9226933

Int. Cl.^{6} G06F *13/42*

U.S. Cl. 395—670 **7 Claims**



1. A data processing apparatus comprising
a local processor including a display device, the local processor being coupled to a remote processor, for performing distributed multitasking processing with a plurality of application programs executable at said remote processor, and resources of various types including
at least one local resource associated with the local processor,
at least one shared resource associated with said remote processor and having an effect on an overall display of the system by said display device, and
at least one unshared resource associated with said remote processor and having no impact on an overall display of said display device,
wherein address spaces utilized by each resource are assigned in response to a resource type such that
said at least one local resource uses address space at said local processor,

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said at least one shared resource is stored in separate presentation address space common to all applications on the remote system in uses protected address space at said remote processor and

said at least one unshared resource uses and is stored in the application address space of a corresponding application at said remote processor such that only said corresponding application is affected by a corruption of said application address space.

5,692,192

LOAD DISTRIBUTION METHOD AND SYSTEM FOR DISTRIBUTED THREADED TASK OPERATION IN NETWORK INFORMATION PROCESSING APPARATUSES WITH VIRTUAL SHARED MEMORY

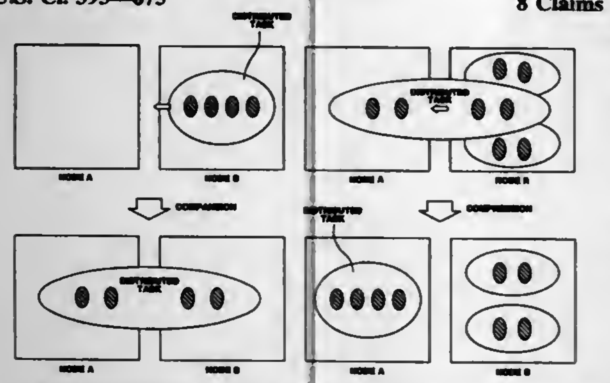
Yoshiaki Sudo, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1995, Ser. No. 502,702

Claims priority, application Japan, Jul. 19, 1994, 6-166824

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—675 **8 Claims**



1. A load distribution method having a mechanism of connecting a plurality of information processing apparatuses with a network, and executing a distributed task, whose main storage is shared by a distributed virtual shared memory method, present in the plurality of information processing apparatuses by distributing threads in the respective information processing apparatuses, said method comprising the steps of:

collecting load information about the plurality of information processing apparatuses;

controlling the degree of distribution of a distributed task in operation in accordance with the collected load information so that a heavily loaded information processing apparatus expands a distributed task operating therein to a lightly loaded information processing apparatus and compresses a distributed task expanded to the lightly loaded information processing apparatus to the lightly loaded information processing apparatus and so that the lightly loaded information processing apparatus expands the distributed task operating in the heavily loaded information processing apparatus to the lightly loaded information processing apparatus and compresses a distributed task expanded to the heavily loaded information processing apparatus from the lightly loaded information processing apparatus to the lightly loaded information processing apparatus; and

transferring threads operating in the heavily loaded information processing apparatus within distributed task to the lightly loaded information processing apparatus.

5,692,193

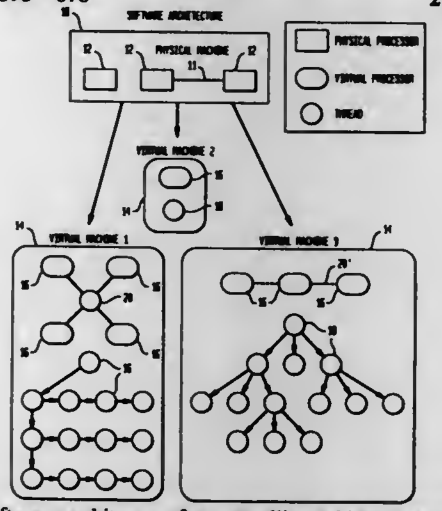
SOFTWARE ARCHITECTURE FOR CONTROL OF HIGHLY PARALLEL COMPUTER SYSTEMS

Suresh Jagannathan, Princeton, and James F. Philbin, Metuchen, both of N.J., assignors to NEC Research Institute, Inc., Princeton, N.J.

Filed Mar. 31, 1994, Ser. No. 221,026

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—676 **21 Claims**



1. A software architecture for controlling a highly parallel computer system comprising:

abstract physical machines comprising abstract physical processors forming a microkernel;

virtual machines associated with respective abstract physical processors, said virtual machines comprising virtual processors; and

thread groups comprising threads which run on said virtual processors,

where said virtual processors and said threads are first class objects.

5,692,194

SEQUENTIAL INFORMATION INTEGRATION SERVICE FOR AUTOMATICALLY TRANSFERRING A MOST RECENT DATA ENTITY BETWEEN A PLURALITY OF PROGRAM MODULES AND A STORAGE IN A COMPUTER

Ha T. Nguyen, Anaheim, and Willard H. Barrett, Garden Grove, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 24, 1993, Ser. No. 69,053

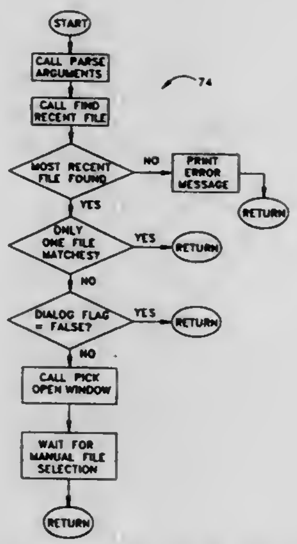
Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—680 **13 Claims**

1. A sequential information integration service for transferring files between a plurality of program modules and a storage of a computer, said computer having a control system and multiple files with different filenames in its storage, each said file having at least one version that is stamped with the date and time it was last modified by any one of said program modules, said program modules using said files to execute program functions, comprising:

a command parser for parsing a read command, which supports one or more filename designations and one or more file arguments that together designate a complete filename or a partial filename, from a requesting program module to specify a subset of the files in the storage, when said read command designates the complete filename, said subset includes only said one file, with its one or more versions, whose filename matches said complete filename, and when said read command designates the partial filename, said subset includes a plurality of said files, with their one or more versions, whose different filenames each include said partial filename; and

an automatic file selector connected to automatically search said subset, compare the dates and time of the most recent versions of each said file, select the one file that was most recently modified, and transfer the most recent version of the selected file from the storage to the requesting program module.



5,692,195

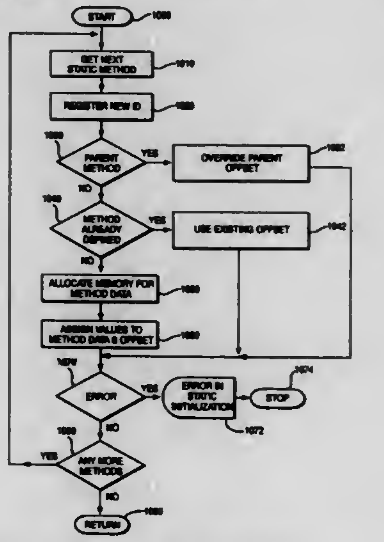
PARENT CLASS SHADOWING

Mike Haden Conner; Andrew Richard Martin, and Larry Keith Raper, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 299,233, Aug. 31, 1994, Pat. No. 5,418,964. This application Jan. 17, 1995, Ser. No. 375,329

Int. Cl.^{6} G06F *9/40*

U.S. Cl. 395—685 **5 Claims**



1. A computer program product comprising:

a computer readable medium having computer program logic recorded thereon for shadowing a parent class in an object oriented program with a statically linked object hierarchy, the program product having:

(a) program product means having computer readable means for use with a computer to replace a static class name resolution means in an executable copy of a statically compiled class hierarchy;

(b) program product means having computer readable means for use with a computer to register a new class object to replace one of a plurality of statically linked classes;

(c) program product means having computer readable means for use with a computer to determine a class address of a class based on a class name using said new class name resolution means to reference said new class without relinking any others of said plurality of statically linked classes.

5,692,196

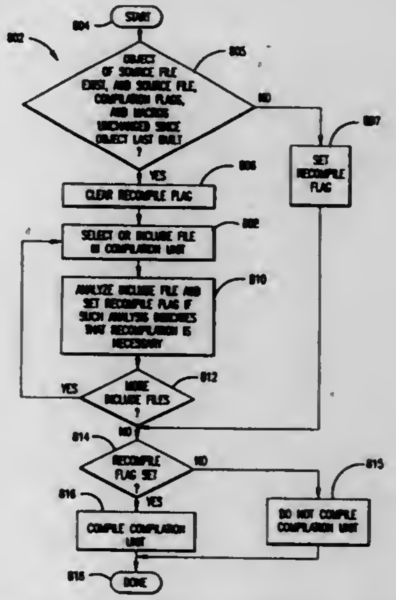
SYSTEM AND METHOD FOR CONDITIONALLY COMPILING A SOFTWARE COMPILATION UNIT

Shankar Unni, Campbell, and Andrew J. Palay, Mountain View, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Aug. 26, 1994, Ser. No. 294,823

Int. Cl.^{6} G06F *9/44*

U.S. Cl. 395—705 **19 Claims**


START
OBJECT OF SOURCE FILE EXIST, AND SOURCE FILE, COMPILATION FLAGS, AND MACROS UNCHANGED SINCE OBJECT LAST BUILT ?
NO
YES
SET RECOMPILE FLAG
CLEAR RECOMPILE FLAG
SELECT OR INCLUDE FILE IN COMPILATION UNIT
ANALYZE INCLUDE FILE AND SET RECOMPILE FLAG IF SUCH ANALYSIS INDICATES THAT RECOMPILATION IS NECESSARY
YES
MORE INCLUDE FILES
NO
RECOMPILE FLAG SET
NO
YES
COMPILE COMPILATION UNIT
DO NOT COMPILE COMPILATION UNIT
DONE

1. A method of conditionally recompiling a compilation unit having a plurality of source code modules, comprising the steps of:

(1) selecting:
  (i) compilation unit having a plurality of source code modules, said source code modules being non-compilation units and being explicitly incorporated into said compilation unit upon a compilation of said compilation unit, and
  (ii) one of said source code modules;

(2) determining whether it is necessary to generate a new condensed representation of said selected source code module;

(3) generating a new condensed representation of said selected source code module subject to said determination of step (2);

(4) identifying changes between said new condensed representation of said selected source code module and an old condensed representation of said selected source code module;

(5) classifying each of said changes as one of a compatible change and an incompatible change, an incompatible change being a change that requires recompilation of said compilation unit, and a compatible change being a change that does not require recompilation of said compilation unit; and

(6) enabling recompilation of said compilation unit if any of said changes is classified as being an incompatible change.

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5,692,197

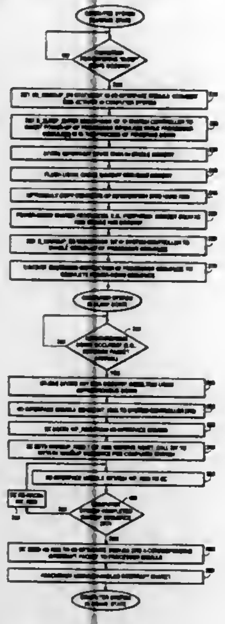
METHOD AND APPARATUS FOR REDUCING POWER CONSUMPTION IN A COMPUTER NETWORK WITHOUT SACRIFICING PERFORMANCE

Charles E. Narad, Santa Clara; Zahir Ebrahim, Mountain View; Satyanarayana Nishtala, Cupertino; William C. Van Loo, Palo Alto; Kevin B. Normoyle; Louis F. Coffin, III, both of San Jose, and Leslie Kohn, Fremont, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 31, 1995, Ser. No. 414,879

Int. Cl.⁶ G06F *1/32*

U.S. Cl. 395—750 **17 Claims**



6. A computer system comprising:
a processor module, including means for executing a power down sequence and for executing a wake-up sequence;
an input/output (I/O) interface module coupled to a network connection means for receiving network packets and detecting asynchronous events initiated by sources external to the computer system;
a main memory for storing data including state information of the processor module; and
a system controller coupled to the I/O interface module and the processor module;
the power down sequence including storing data including state information of the processor module in the main memory and powering down the processor module while the I/O interface module remains powered up;
the I/O interface module including means for responding to detection of the asynchronous event by sending an interrupt request to the system controller, and for regenerating the interrupt request until a positive acknowledgment of the interrupt request is received;
the system controller including means for responding to a first interrupt request corresponding to the asynchronous event by causing the processor module to power up and start executing the wake-up sequence, and for responding to each interrupt request corresponding to the asynchronous event by (A) sending the I/O interface module a negative acknowledgment of the interrupt request if the processor module has not completed the wake-up sequence, and (B) generating a positive acknowledgement of the interrupt request and sending to the processor module an interrupt packet corresponding to the asynchronous event if the processor module has completed the wake-up sequence.

5,692,198

METHOD FOR EXECUTING A PROCESS DEFINED BY A SCRIPT BY A PLURALITY OF TYPES OF DESCRIPTION LANGUAGES AND AN APPARATUS THEREFOR

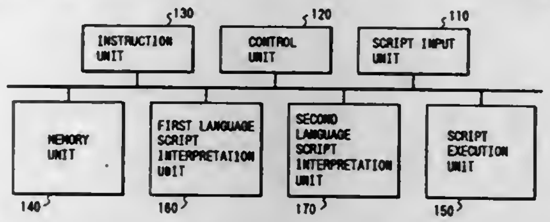
Toyohiko Ushiku, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 330,075

Claims priority, application Japan, Oct. 27, 1993, 5-291349

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—762 **12 Claims**



1. An apparatus for executing a process defined by a script, comprising:
memory means for storing an object;
instruction means for specifying the object stored in said memory means and instructing an operation to be performed the object,
determination means for determining a type of script description language describing the script held by the object specified by said instruction means;
a plurality of interpretation means for interpreting scripts described in a plurality of script description languages;
execution means for executing a process corresponding to the script interpreted by one of said interpretation means; and
control means for controlling said interpretation means to interpret the script held by the specified object by the interpretation means corresponding to the script type determined by said determination means.

5,692,199

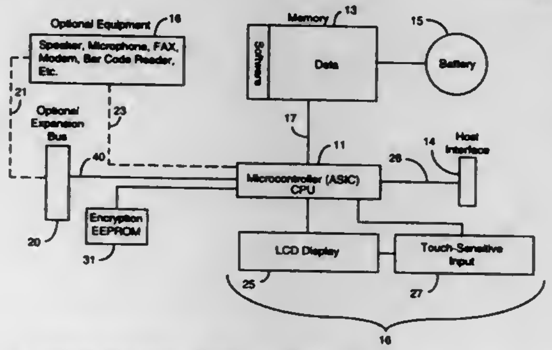
PERSONAL DIGITAL ASSISTANT MODULE HAVING A HOST INTERCONNECT BUS WITHOUT AN INTERRUPT LINE AND WHICH HANDLES INTERRUPTS AS ADDRESSES ASSOCIATED WITH SPECIFIC INTERRUPTS IN MEMORY

Dan Kikinis, Saratoga; Pascal Dornier, Sunnyvale, and William J. Seiler, Scotts Valley, all of Calif., assignors to Elonex I.P. Holdings, Ltd., London, United Kingdom

Continuation of Ser. No. 570,571, Dec. 11, 1995, abandoned, which is a division of Ser. No. 273,001, Jul. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 144,231, Oct. 28, 1993, and a continuation-in-part of Ser. No. 86,716, Jul. 2, 1993, abandoned. This application Mar. 11, 1997, Ser. No. 815,315

Int. Cl.⁶ G06F *13/00;13/24*

U.S. Cl. 395—733 **12 Claims**



1. A digital assistant module comprising:
an internal bus having address lines, data lines, and control signal lines, but no interrupt control lines;

a bus controller adapted to provide bus cycles, including address cycles;
a CPU connected to the bus;
a memory connected to the bus;
a video display coupled to the bus;
input apparatus coupled to the bus; and
an interrupt controller connected to the bus;
wherein interrupts are mapped in high memory as unused addresses, and the interrupt controller is adapted to compare addresses during address cycles with the memory-mapped interrupts, and to interrupt the CPU in those instances wherein an address on the address bus matches an address reserved as an interrupt.

5,692,200

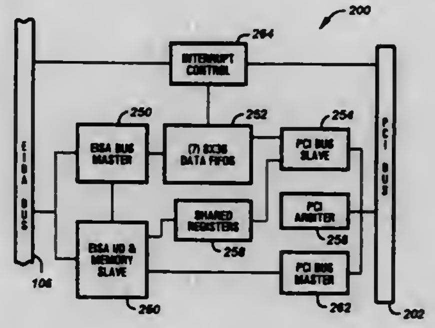
BRIDGE CIRCUIT FOR PREVENTING DATA INCOHERENCY BY HOLDING OFF PROPAGATION OF DATA TRANSFER COMPLETION INTERRUPTS UNTIL DATA CLEARS THE BRIDGE CIRCUIT

Jeff M. Carlson, Cypress, and William C. Galloway, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 16, 1995, Ser. No. 543,724

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—735 **25 Claims**



12. A bridge between a first bus and a second bus, comprising:
a first bus master;
a second bus master;
a bridge circuit for providing an interface between the first bus and the second bus, wherein the second bus provides a plurality of second bus interrupt signals which the bridge circuit provides to the first bus as a first bus interrupt signal, the bridge circuit comprising:
a plurality of data FIFOs for synchronizing data transfer between the first bus and the second bus, each data FIFO coupled between the first bus and the second bus, wherein each data FIFO provides an empty signal when said data FIFO is empty and wherein each data FIFO is associated with one of the plurality of second bus interrupt signals; and
an interrupt control circuit receiving the plurality of second bus interrupt signals and said plurality of data FIFO empty signals and providing the first bus interrupt signal and said plurality of data FIFO empty signal and providing the first bus interrupt signal to the first bus, the first bus interrupt signal provided when any of the second bus interrupt signal and the associated data FIFO empty signal are received, the first bus interrupt signal not provided when all of said second bus interrupt signals and said associated data FIFO empty signals are not received.

5,692,201

ELECTRIC POWER CONSUMPTION REDUCTION DEVICE

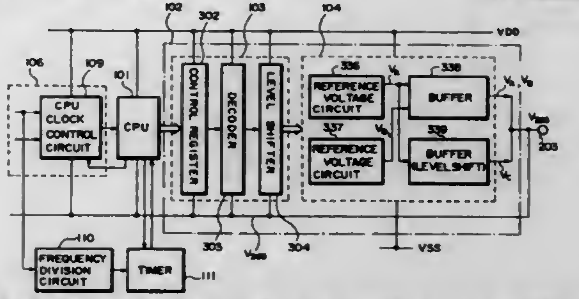
Hidenori Yato, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 17, 1995, Ser. No. 503,002

Claims priority, application Japan, Jul. 20, 1994, 6-168260; Jul. 14, 1995, 7-201318

Int. Cl.⁶ G06F *1/32*

U.S. Cl. 395—750 **26 Claims**



1. A semiconductor device which can change a power voltage of at least part of said semiconductor device, comprising:
a constant-voltage circuit for generating said power voltage, which comprises voltage generation means for generating at least first, second, and third voltages, wherein the absolute value of said first voltage is set to be less than the absolute value of said second voltage, and
the absolute value of said second voltage is set to be less than the absolute value of said third voltage, wherein;
said constant-voltage circuit further comprises control means for said voltage generation means such that, when switching from said first voltage to said third voltage, or from said third voltage to said first voltage is performed, said second voltage is generated before said switching to said first or third voltage is performed, thus implementing stepwise voltage switching.

5,692,202

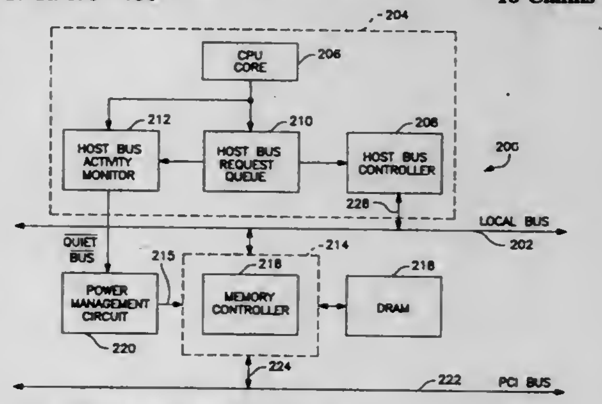
SYSTEM, APPARATUS, AND METHOD FOR MANAGING POWER IN A COMPUTER SYSTEM

James P. Kardach, Saratoga; Chih-Hung Chung, Santa Clara, and Jason Ziller, Mountain View, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 29, 1995, Ser. No. 581,164

Int. Cl.⁶ G06F *1/32*

U.S. Cl. 395—750 **18 Claims**



1. A computer system comprising:
a bus;
a processor having a bus controller coupled to said bus, said processor being configured to generate a signal indicating the beginning of a bus cycle;
a bus activity monitor circuit coupled to said bus controller for generating a bus activity signal indicative of activity in said bus controller, said bus activity signal being asserted at least one clock cycle before said signal indicating the beginning of a bus cycle is asserted;

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- a target controller, coupled to said bus controller, for controlling the exchange of information between said processor and a target circuit, said target controller having an input for receiving a control sequencing signal; and
- a power management circuit, for controlling a power consumption of said target controller, said power management circuit having an input, for receiving said bus activity signal and an output for generating, responsive to said bus activity signal, said control sequencing signal.

5,692,203

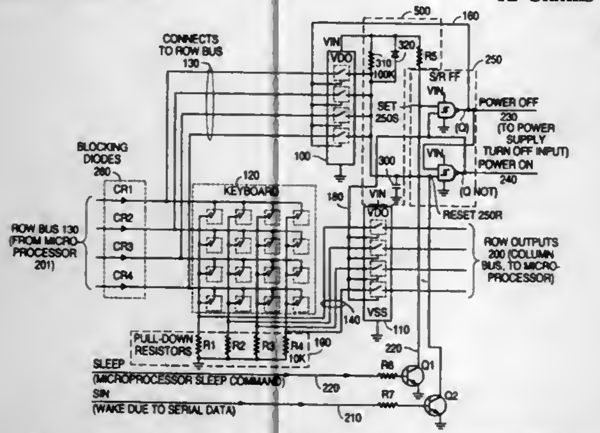
POWER UP/POWER DOWN FOR ELECTRONIC HARDWARE WHICH CONSERVES ELECTRIC POWER

Scott Grodevant, Hilton, N.Y., assignor to PSC, Inc., Webster, N.Y.

Continuation of Ser. No. 482,957, Jun. 15, 1995, abandoned, which is a continuation of Ser. No. 295,175, Aug. 23, 1994, abandoned, which is a continuation of Ser. No. 30,530, Mar. 12, 1993, abandoned. This application Feb. 23, 1996, Ser. No. 605,808

Int. Cl.⁶ G06F ***1/32***

U.S. Cl. 395—750 **12 Claims**


CONNECTS TO ROW BUS 130
500
160
VIN
VDD
320
R5
310 100K
250
S/R FF
SET 250S
POWER OFF 230 (TO POWER SUPPLY TURN OFF INPUT)
POWER ON 240
RESET 250R
BLOCKING DIODES 260
CR1
CR2
CR3
CR4
120
KEYBOARD
ROW BUS 130 (FROM MICRO-PROCESSOR 201)
ROW OUTPUTS 200 (COLUMN BUS, TO MICRO-PROCESSOR)
VSS
PULL-DOWN RESISTORS
R1
R2
R3
R4 10K
SLEEP (MICROPROCESSOR SLEEP COMMAND)
SIN (WAKE DUE TO SERIAL DATA)
Q1
Q2
R6
R7
210
220

1. A system for changing a state of electronic equipment which is operated from a power source from a power down state to a power up state by operation of any key of a keyboard which provides data entry signals via a plurality of data lines, said system comprising:

- a power flip-flop which has a power on output and a power off output and inputs which change the flip-flop between set and reset states,
- a first isolation switch connected to said flip-flop and connecting at least one of said keyboard data lines to said flip-flop for conditioning said flip-flop into one of the set and reset states which provides the power on output when any key of said keyboard is actuated, and
- a second isolation switch through which said data entry signals are transmitted, and one of said outputs from said flip-flop being connected to said second isolation switch for opening said second isolation switch to prevent said data entry signals from being transmitted except when said flip-flop is in said one of the set and reset states,
- wherein said system is continuously operated by direct connection to said power source,
- wherein said equipment is operated from said power source via a power supply which interconnects said power source and said equipment,
- wherein said power supply is switchable between an on state and an off state, and said power supply is in said on state when said power on output is asserted, and said power supply is in said off state when said power off output is asserted, and
- wherein said system further includes a sleep signal line input to said flip-flop for conditioning said flip-flop into the one of the set and reset states which provides said power off output when a sleep signal is provided on said sleep signal line.

5,692,204

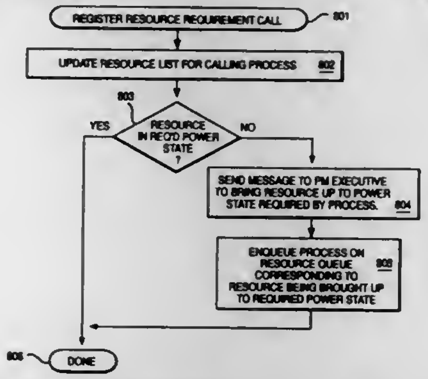
METHOD AND APPARATUS FOR COMPUTER SYSTEM POWER MANAGEMENT

Andrew Radcliffe Rawson, Cedar Park, Tex., and Guy Gil Sotomayor, Jr., West Palm Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 388,960, Feb. 15, 1995, abandoned. This application Jun. 19, 1996, Ser. No. 666,149

Int. Cl.⁶ G06F ***1/32***

U.S. Cl. 395—750 **46 Claims**


REGISTER RESOURCE REQUIREMENT CALL
801
UPDATE RESOURCE LIST FOR CALLING PROCESS 802
803
YES
NO
RESOURCE IN REQ'D POWER STATE ?
SEND MESSAGE TO PM EXECUTIVE TO BRING RESOURCE UP TO POWER STATE REQUIRED BY PROCESS. 804
ENQUEUE PROCESS ON RESOURCE QUEUE CORRESPONDING TO RESOURCE BEING BROUGHT UP TO REQUIRED POWER STATE 805
806
DONE

1. An apparatus for managing power states of hardware resources of a computing system comprising:

- means for receiving a service call from a software process;
- means, responsive to said service call, for registering a power state of at least one hardware resource to be utilized by an application program; and
- means for comparing a current power state of said at least one hardware resource to said registered power state and means for modifying said current power state prior to executing said application program if said current power state is lower than said registered power state.

5,692,205

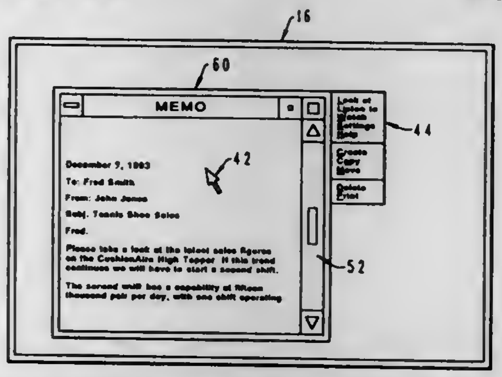
METHOD AND SYSTEM FOR INTEGRATION OF MULTIMEDIA PRESENTATIONS WITHIN AN OBJECT ORIENTED USER INTERFACE

Richard E. Berry, Georgetown, Tex., and Thomas Neil Richards, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 168,721, Dec. 16, 1993, abandoned. This application Nov. 15, 1996, Ser. No. 749,836

Int. Cl.⁶ G06F ***15/00;17/30***

U.S. Cl. 395—788 **18 Claims**



1. A method within a data processing system for integrating multimedia within an object oriented user interface, said method comprising the steps of:

- providing a plurality of polymorphic program objects within said data processing system, each of said plurality of polymorphic program objects including specified encapsulated data and functionality;
- for each of said plurality of polymorphic program objects, defining an associated plurality of user selectable data views of said specified encapsulated data, at least one of said associated plurality of user selectable data views comprising a multimedia data view; and
- in response to a user selection of a multimedia data view associated with a particular polymorphic program object among said plurality of polymorphic program objects, automatically presenting a multimedia data view within said data processing system of said specified encapsulated data of said particular polymorphic program object.

5,692,206

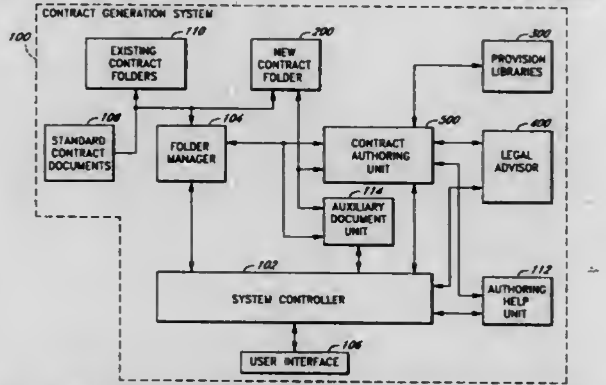
METHOD AND APPARATUS FOR AUTOMATING THE GENERATION OF A LEGAL DOCUMENT

Robert Bryce Shirley, Irvine, and Albert Michael Castro, Mission Viejo, both of Calif., assignors to Taco Bell Corporation, Irvine, Calif.

Filed Nov. 30, 1994, Ser. No. 347,644

Int. Cl.⁶ G06F ***17/21***

U.S. Cl. 395—793 **16 Claims**



1. A contract authoring system implemented on a computer, said contract authoring system comprising:

- a contract authoring unit, said contract authoring unit responsive to requests from a user to manage the creation of a contract document;
- a legal advisor coupled to said contract authoring unit, said legal advisor having information for display to said user in response to requests from said user, said information comprising explanations or definitions relating to provisions in the contract document;
- an auxiliary document unit coupled to said contract authoring unit, said auxiliary document unit responsive to requests from said user to create documents associated with said contract document; and
- provision libraries, said provision libraries having at least a plurality of provisions defined for said contract document.

5,692,207

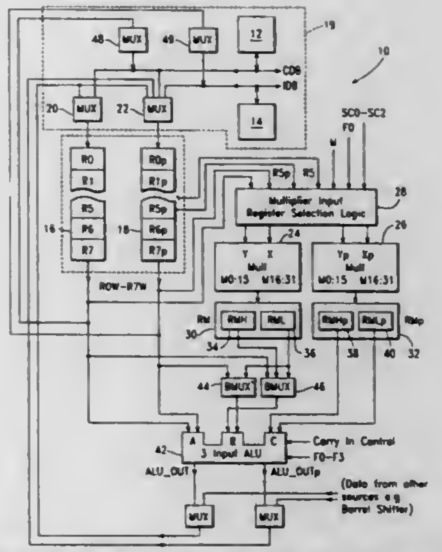
DIGITAL SIGNAL PROCESSING SYSTEM WITH DUAL MEMORY STRUCTURES FOR PERFORMING SIMPLEX OPERATIONS IN PARALLEL

Michael George Ho-Lung, Boca Raton; Judith Marie Linger, Delray Beach; Baiju Dhirajlal Mandalia, Boca Raton, and John Claude Sinibaldi, Pompano Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1994, Ser. No. 355,793

Int. Cl.⁶ G06F ***9/00***

U.S. Cl. 395—800 **25 Claims**



1. A digital signal processing system comprising:

- first and second register means for processing digital data,
- first memory means coupled to said first register means for storing a first plurality of data values, said first memory means being operative to transfer any of said first plurality of data values between said first memory means and said first register means,
- second memory means coupled to said second register means for storing a second plurality of data values, said second memory means being operative to transfer any of said second plurality of data values between said second memory means and said second register means,
- first and second multiplier means for producing first and second product outputs respectively, each of said first and second multiplier means being coupled to said first and said second register means, wherein said second multiplier means is separate from said first multiplier means,
- arithmetic logic means having first, second and third inputs and an output, said first input being coupled to said first product output, said second and third inputs being selectively coupled to either of said second product output and said first and second register means, said arithmetic logic means output being coupled to said first and second register means for accumulating sample values in said first and second register means,
- instruction control means for storing a plurality of instruction op codes and controlling said system to compute said sample values by performing simplex operations during each cycle of a plurality of operating cycles of a first digital signal processing procedure;
- wherein said first plurality of data values in said first memory means are real data values and real coefficient values and said second plurality of data values in said second memory means are imaginary data values and imaginary coefficient values, and
- wherein said instruction op codes are programmable and operative to control said system to perform the following operations during a single operating cycle within said plurality thereof: (1) transferring a first data value within said plurality thereof from said first memory means to said first register means, (2) transferring a second data value within said plurality thereof from said second memory means to said second register means, (3) multiplying data on said first multiplier means and produce a first product output, (4) multiplying data on said second multiplier means and produce a second product output, (5) performing an arithmetic operation on said first, second, and third arithmetic logic output, and (6) transferring said arithmetic logic output to said first and second register means.

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5,692,208

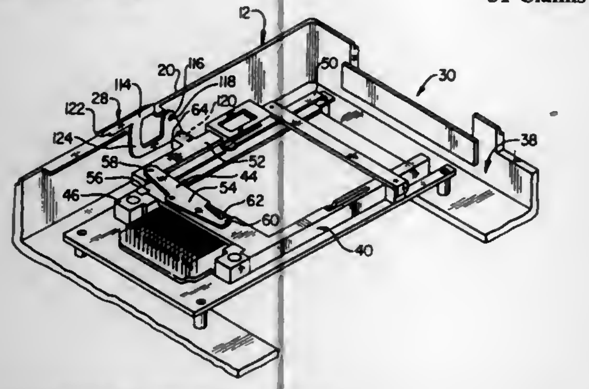
LEVER APPARATUS FOR AN EJECTOR MECHANISM IN A PERSONAL COMPUTER

Chris F. Felcman, Spring; Patrick V. Illingworth, Tomball, and Michael V. Leman, Spring, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Apr. 7, 1995, Ser. No. 418,814

Int. Cl.^{6} G06F *1/16*

U.S. Cl. 395—800 **31 Claims**



12. A personal computer, comprising:

a chassis having a side wall and an interior portion for housing electrical and mechanical components therein, said chassis further having a lever apparatus opening formed in said side wall;

a frame positioned within said interior portion and configured to retain an ejectable structure therein, said frame having an ejector mechanism associated therewith for ejecting said ejectable structure from said frame, said ejector mechanism having an actuating arm for actuating said ejector mechanism; and

an elongated body pivotally coupled to and having an axis of rotation with respect to said side wall, said elongated body having a digit contact end external to said interior portion and an oppositely disposed cam end operable against said actuating arm, said cam end exerting a leverage force against said actuating arm when said elongated body is pivoted from a non-engaged position to an engaged position to thereby eject said ejectable structure from said frame.

5,692,209

SYSTEM RESOURCE CONFLICT RESOLUTION APPARATUS

Patrick J. Meaney, and Adrian E. Seigler, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 414,856, Mar. 31, 1995. This application Jun. 7, 1995, Ser. No. 484,771

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—800 **12 Claims**

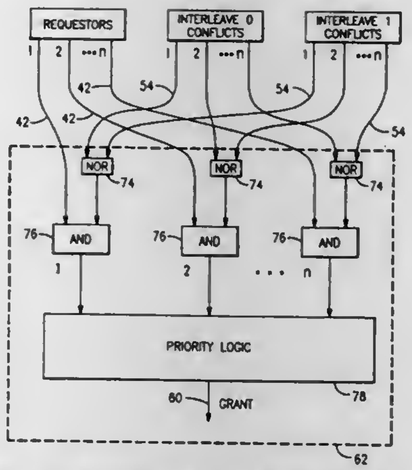
1. An apparatus for establishing priority among a plurarlity of requests for resource operations on a system resource, comprising:

a register representing current and future operations on the resource;

a pattern source that generates a pattern corresponding to a requested resource operation for each of a plurality of requests for resource operations in a queue;

compare logic that determines for each of said plurality of requests if the request will conflict with other resource operations by comparing the pattern generated for the request with said register; and

priority logic that grants priority to a request in the queue if no conflict is determined and to update said register according to the pattern generated for the request.



5,692,210

IMAGE PROCESSING APPARATUS HAVING PARALLEL PROCESSORS FOR COMMUNICATING AND PERFORMING POSITIONAL CONTROL OVER PLURAL AREAS OF IMAGE DATA IN ACCORDANCE WITH DESIGNATED POSITION INSTRUCTION

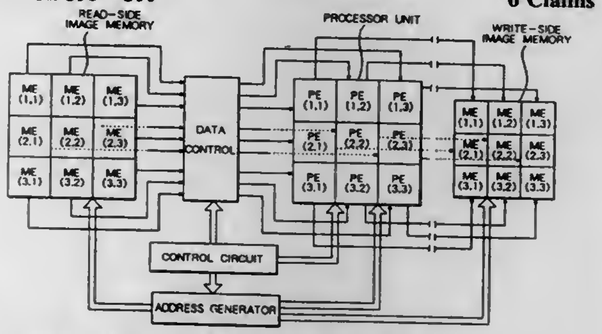
Yoshinobu Mita, Kawasaki; Miyuki Enokida, Yokohama; Yoshihiro Ishida, Kawasaki, and Naoto Kawamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 460,554, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 165,839, Dec. 14, 1993, abandoned, which is a division of Ser. No. 71,351, Jun. 3, 1993, Pat. No. 5,293,481, which is a continuation of Ser. No. 670,460, Mar. 12, 1991, abandoned, which is a continuation of Ser. No. 155,845, Feb. 12, 1988, abandoned. This application Nov. 18, 1996, Ser. No. 751,560

Claims priority, application Japan, Feb. 18, 1987, 62-033171; Feb. 18, 1987, 62-033172; Feb. 18, 1987, 62-033173; Feb. 18, 1987, 62-033174; Feb. 18, 1987, 62-033175; Feb. 18, 1987, 6-33176; Feb. 18, 1987, 62-033177; Feb. 18, 1987, 62-33178; Feb. 18, 1987, 62-33179; Feb. 18, 1987, 62-033180; Feb. 18, 1987, 62-033181; Feb. 18, 1987, 62-33182

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—800 **6 Claims**



1. An image processing apparatus comprising:

dividing means for dividing image data into a predetermined number of image areas;

receiving means for receiving a designated position instruction which includes positional control information; and

a plurality of processors for processing image data in the image areas divided from the image data by said dividing means, each of said plurality of processors performing positional control of image data in the image areas in accordance with the designated position instruction received by said receiving means, and each of said plurality of processors communicating positional control information with another of said plurality of processors.

5,692,211

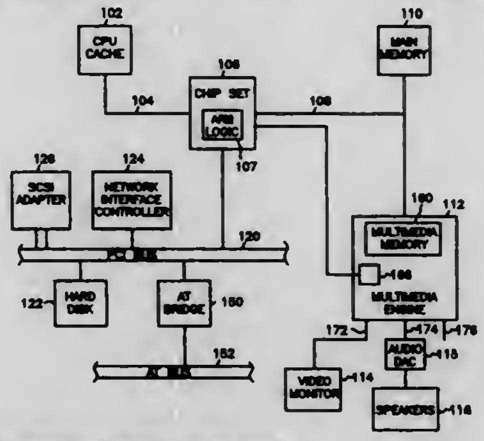
COMPUTER SYSTEM AND METHOD HAVING A DEDICATED MULTIMEDIA ENGINE AND INCLUDING SEPARATE COMMAND AND DATA PATHS

Dale E. Gulick; Andy Lambrecht; Mike Webb; Larry Hewitt, all of Austin, and Brian Barnes, Round Rock, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 11, 1995, Ser. No. 526,531

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—800 **34 Claims**



1. A computer system, comprising:

a bus for transferring data;

a CPU coupled to the bus which initiates transfers on said bus;

main memory coupled to said bus which stores data accessible by the CPU;

a multimedia engine coupled to said bus, wherein said multimedia engine comprises:

multimedia memory for storing multimedia data;

one or more DSP engines coupled to said multimedia memory, wherein said one or more DSP engines process said multimedia data stored in said multimedia memory;

one or more input/output channels coupled to said one or more DSP engines for transmitting data; and

one or more ports coupled to said one or more input/output channels for transmitting data externally from said multimedia engine; and

a command path coupled between said CPU and said multimedia engine, wherein said CPU and said multimedia engine are coupled to said command path, and wherein said command path is separate from said bus;

wherein said CPU provides commands over said command path to said multimedia engine.

5,692,212

INTERACTIVE MULTIMEDIA MOVIES AND TECHNIQUES

Richard Gregory Roach, 12840 SE. 3rd St., Bellevue, Wash. 98005

Filed Jun. 22, 1994, Ser. No. 263,856

Int. Cl.^{6} G06F *3/100;* **A63F** *9/22*

U.S. Cl. 395—806 **11 Claims**

1. A method for using a computer to convey information which is optional to a main storyline to a computer user receiving an audiovisual work having a main storyline from the computer through an audio interface and a visual interface operatively associated with the computer, without loss of continuity of the main storyline, said method comprising:

causing the computer to output the audiovisual work from the computer through the audio interface and the visual interface;

causing the computer to display an information icon on the visual interface to the user during the output of the audiovisual work from the computer, said information icon being associated with information which is optional to the main storyline and which is stored in a database operatively associated with the computer;

causing the computer to access the information stored in association with the icon;

causing the computer to pause the output of the main storyline upon receipt of the command;

causing the computer to output the information associated with the information icon; and

causing the computer to continue the output of the main storyline upon completing the output of the optional information without loss of continuity of the main storyline.

5,692,213

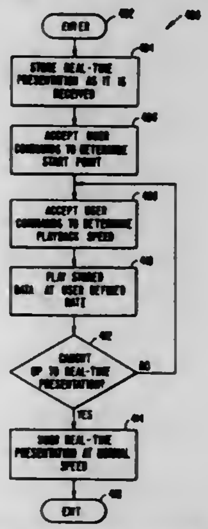
METHOD FOR CONTROLLING REAL-TIME PRESENTATION OF AUDIO/VISUAL DATA ON A COMPUTER SYSTEM

David Goldberg, Palo Alto; David A. Nichols, Mountain View; Scott L. Minneman, San Francisco, and Steve R. Harrison, Portola Valley, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 169,905, Dec. 20, 1993, abandoned. This application Oct. 16, 1995, Ser. No. 543,520

Int. Cl.^{6} G06T *13/00*

U.S. Cl. 395—806 **25 Claims**


ENTER
STORE REAL-TIME PRESENTATION AS IT IS RECEIVED
ACCEPT USER COMMANDS TO DETERMINE START POINT
ACCEPT USER COMMANDS TO DETERMINE PLAYBACK SPEED
PLAY STORED DATA AT USER DEFINED RATE
CAUGHT UP TO REAL-TIME PRESENTATION?
YES
SHOW REAL-TIME PRESENTATION AT NORMAL SPEED
EXIT

1. A method of replaying in an accelerated format a multimedia real-time presentation of audio data and image data on a first computer system, the first computer system including a processor, speaker display device, and user input device, the first computer system coupled to a storage area for storing data, the image data comprising a plurality of frames, the method comprising the steps of:

recording a portion of the presentation into a recording buffer in the storage area, the recording buffer including audio data and image data;

using the processor to accelerate playback of the audio data of the presentation in the recording buffer;

using the processor to accelerate playback of the image data of the presentation in the recording buffer in order to keep the accelerated image data playback synchronized with the accelerated audio data playback;

recording the presentation in progress into the recording buffer during the accelerated playback of the audio and image data in the recording buffer; and

presenting the presentation at a normal speed after the presentation in the recording buffer has been played back and the accelerated playback catches up to the real-time multimedia presentation in progress.

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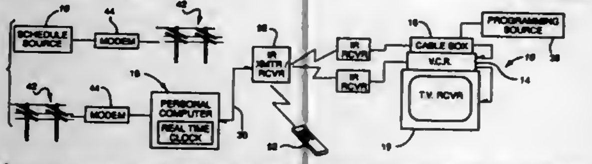
5,692,214

SYSTEM FOR UNATTENDED RECORDING OF VIDEO PROGRAMS BY REMOTE CONTROL CODE TRANSMITTER MODULE WHICH RECEIVES USER SELECTIONS FROM A PERSONAL COMPUTER

Michael R. Levine, 2122 NW. 60th Cir., Boca Raton, Fla. 33496
Continuation-in-part of Ser. No. 848,338, Mar. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 802,249, Dec. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 796,702, Nov. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 595,393, Oct. 10, 1990, abandoned, which is a continuation of Ser. No. 484,175, Feb. 23, 1990, Pat. No. 4,963,994, which is a continuation of Ser. No. 213,162, Jun. 29, 1988, Pat. No. 4,908,713, which is a continuation of Ser. No. 634,179, Jul. 24, 1984, abandoned, which is a continuation of Ser. No. 330,111, Dec. 14, 1981, abandoned.
This application Aug. 8, 1994, Ser. No. 287,343
Int. Cl.⁶ G06F *13/00*
U.S. Cl. 395—833 **23 Claims**



9. A system to bring about the unattended recording of a video program by a remotely controllable video recorder connected to a source of programs through a remotely controllable multi-channel tuner, the system comprising:

a personal computer of conventional design including a display and a mass storage facility to receive a database of video programs available from the video source, including program title, date of occurrence, start time and channel tuning information;
an application program to be executed by the personal computer which enables an operator to view portions of the database on the display and to select one or more of the video programs to be recorded; and
a transmitter module in an enclosure separate from that of the personal computer, the module including:
a data-input port,
a memory,
a time-keeping device,
a wireless remote-control transmitter, and
a central processing element connected to the data-input port, the memory, the time-keeping device, and the remote-control transmitter, the central processing element being pre-programmed to perform the following functions:
cause the data-input port receive information from the personal computer relating to a program to be recorded, and store the information in the memory,
compare the output of the time-keeping device with the information stored in the memory, and
cause the remote-control transmitter to activate the video recorder and multi-channel tuner to record the program.

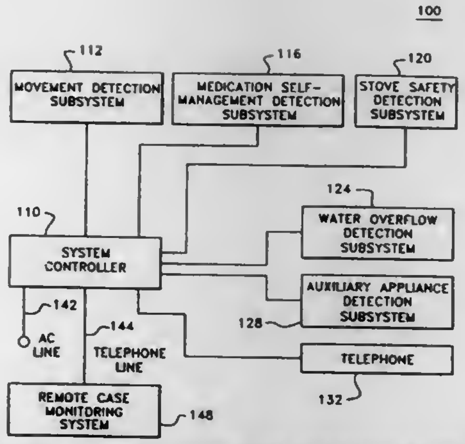
5,692,215

SYSTEM FOR GENERATING PERIODIC REPORTS, GENERATING TREND ANALYSIS, AND INTERVENTION IN ACCORDANCE WITH TREND ANALYSIS FROM A DETECTION SUBSYSTEM FOR MONITORING DAILY LIVING ACTIVITY

David M. Kutzik, Philadelphia; Anthony P. Glascock, Newtown Square; Douglas L. Chute, Devon; Thomas T. Hewett, Wallingford, and Barbara G. Hornum, Philadelphia, all of Pa., assignors to Gerotech, Inc.
Filed Dec. 23, 1994, Ser. No. 363,495
Int. Cl.⁶ G06F *12/00*
U.S. Cl. 395—838 **54 Claims**

1. A system for monitoring a user in a user living area, said system including a remote monitoring site, comprising:

a system controller;

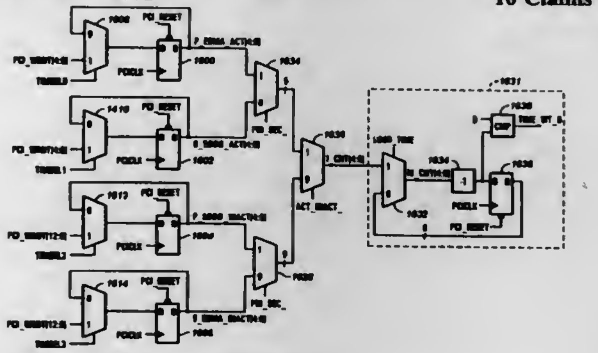

100
112
MOVEMENT DETECTION SUBSYSTEM
116
MEDICATION SELF-MANAGEMENT DETECTION SUBSYSTEM
120
STOVE SAFETY DETECTION SUBSYSTEM
124
WATER OVERFLOW DETECTION SUBSYSTEM
110
SYSTEM CONTROLLER
AUXILIARY APPLIANCE DETECTION SUBSYSTEM
128
142
AC LINE
144
TELEPHONE LINE
TELEPHONE
132
REMOTE CASE MONITORING SYSTEM
148

an activity detection subsystem for monitoring a daily living activity of the user independently of physiological measurements, said activity detection subsystem having at least one detector device capable of being activated in response to said occurrence of said daily living activity and capable of determining at said user living area that said daily living activity has occurred to provide to the system controller information representative or said daily living activity, said system controller having a control circuit for generating a control signal in response to said daily living activity information;
a control information communication channel for applying said control signal to said remote monitoring site;
a report generator for generating a scheduled periodic reports on daily living activities, said reports having collections of said information representative of selected daily living activities;
a generator for generating a trend analysis in accordance with said reports of said information on said daily living activities; and
means for intervening in said user living area in accordance with said trend analysis.

5,692,216

DIRECT MEMORY ACCESS CONTROLLER HAVING PROGRAMMABLE TIMING

Jeff W. Wolford, Spring, and Robert Allan Lester, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Continuation of Ser. No. 398,358, Mar. 3, 1995, Pat. No. 5,603,050. This application Aug. 19, 1996, Ser. No. 699,548
Int. Cl.⁶ G06F *13/00;13/28*
U.S. Cl. 395—821 **10 Claims**



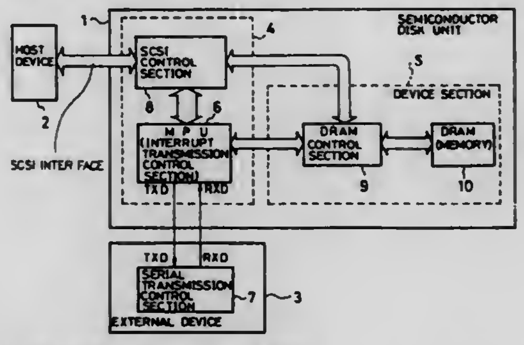
1. A computer system, comprising:

a microprocessor;
a memory device;
an I/O device;
a bus on which write cycles and read cycles are run;
said memory device and said I/O device being coupled to said bus;
a controller for controlling data transfers between said memory device and said I/O device, each data transfer being performed in one data transfer cycle defined by an active period and an inactive period, said controller comprising:
a first storage device for storing a value representing the active period, said active period value capable of being any one of a number of different values;
a second storage device for storing a value representing the inactive period, said inactive period value capable &being any one of a number of different values;
a data transfer circuit coupled to said bus and transferring data from said I/O device to the memory device in a data transfer cycle if a write cycle and from said memory device to said I/O device in a data transfer cycle if a read cycle, said transfer of data occurring during the active period of the data transfer cycle; and
a timer coupled to said first and second storage devices and to said data transfer circuit for indicating when the end of the active period occurs and when the end of the inactive period occurs based on said active period and inactive period values stored in said first and second storage devices.

5,692,217

SEMICONDUCTOR DISK UNIT WITH PROCESSOR FOR DIAGNOSIS AND COMMUNICATION WITH EXTERNAL DEVICE THROUGH A TWO LINES BUS

Takashi Maeda, Kanagawa-ken, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 893,433, Jun. 4, 1992, abandoned.
This application Jun. 7, 1995, Ser. No. 478,376
Claims priority, application Japan, Jun. 5, 1991, 3-134164
Int. Cl.⁶ G06F *13/12;13/00*
U.S. Cl. 395—825 **6 Claims**



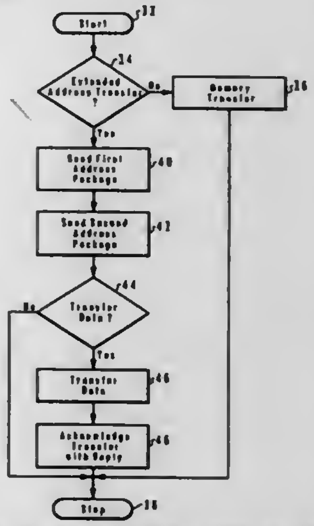
1. A data storage device comprising:

an interface control means coupled to a host device through an interface;
a device section comprising a memory means and a memory control means coupled to said interface control means and to said memory means;
a control means, coupled to said interface control means and to said memory control means and also coupled to an external device or to a second host device through a pair of data transmission and reception lines, for controlling said interface control means and said memory control means, and for executing diagnosis and test of said device section by interruption processing upon reception of a control command from said external device, said control means including:
means for determining whether said received command is correct;
means, responsive to the received command not being correct, for reporting that the received command is not correct to said external device; and
means, responsive to the received command being correct, for executing the received command by means of said interruption processing and for reporting the result of such execution to said external device through said transmission data signal line.

5,692,218

SYSTEM FOR TRANSFERRING DATA BETWEEN INPUT/OUTPUT DEVICES HAVING SEPARATE ADDRESS SPACES IN ACCORDANCE WITH INITIALIZING INFORMATION IN ADDRESS PACKAGES

Michael Scott Allen; Michael Julio Garcia; Charles Roberts Moore, and Robert James Reese, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y., and Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 10,901, Jan. 29, 1993, abandoned.
This application Apr. 25, 1996, Ser. No. 639,274
Int. Cl.⁶ G06F *13/00*
U.S. Cl. 395—853 **20 Claims**


Start
24
Extended Address Transfer ?
No
Memory Transfer
16
Yes
Send First Address Package
40
Send Second Address Package
42
44
Transfer Data ?
No
Yes
Transfer Data
46
Acknowledge Transfer with Reply
Stop

1. A method in a data processing system for transferring information between a first device and a second device, said first and second devices having a first and second separate address spaces, respectively, and said data processing system having a system bus which includes an address bus and data bus, comprising:

transmitting a transfer information signal from said first device to identify information to be transferred with respect to an address in said second address space, said transfer information signal having a first address package containing a first identifier associated with said first device and a second identifier associated with said second device, and a second address package containing a value representing the amount of information to be transferred and an address for the information to be transferred;
transferring data between said first device and said second device on said data bus in accordance with information in said address package; and
transmitting a reply signal acknowledging the data transmission on said address bus in response to said transferred data.

5,692,219

SYSTEM AND METHOD FOR DISABLING OR RE-ENABLING PCI-COMPLIANT DEVICES IN A COMPUTER SYSTEM BY MASKING THE IDSEL SIGNAL WITH A DISABLE OR RE-ENABLE SIGNAL

Wai-Ming Richard Chan; Stuart Hayes, and James Van Artsdalen, all of Austin, Tex., assignors to Dell USA, IP
Filed Jun. 7, 1995, Ser. No. 485,056
Int. Cl.⁶ G06F *13/00*
U.S. Cl. 395—869 **9 Claims**

1. A system for disabling and re-enabling PCI-compliant devices in a computer system, comprising:

(a) a central processing unit;
(b) a host bus coupled to said central processing unit for transmitting digital signals from and to said central processing unit;
(c) a PCI/Host bridge coupled to said bost bus;

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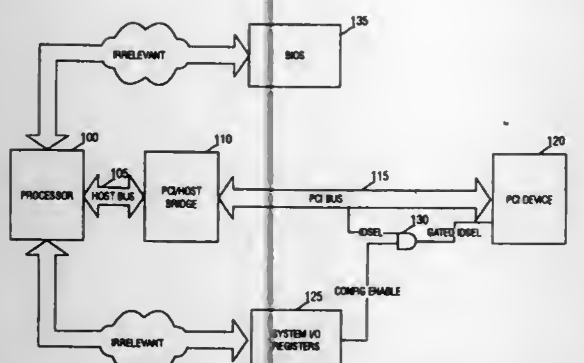


(d) one or more PCI-compliant devices, wherein each of said one or more PCI-compliant devices includes a readable and writeable configuration address space;

(e) a PCI bus coupled between said PCI/Host bridge and said one or more PCI-compliant devices for transmitting digital signals between said PCI/Host bridge and any of said one or more PCI-compliant devices, wherein said digital signals include an IDSEL signal that is directed to an IDSEL input pin of any of said PCI-compliant devices and made 'active' when a read or write operation is to be performed on said configuration address space of said PCI-compliant device; and

(f) means for selectively disabling or re-enabling any of said one or more PCI-compliant devices upon request by a user of said computer system.

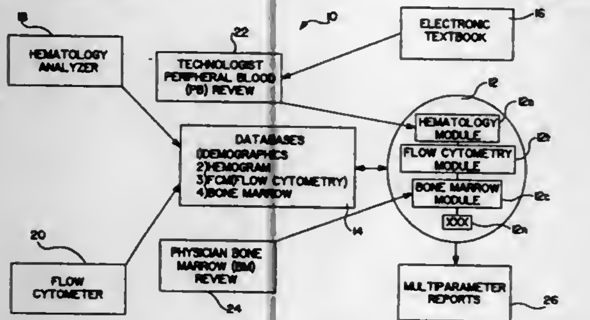
5,692,220
DECISION SUPPORT SYSTEM AND METHOD FOR DIAGNOSIS CONSULTATION IN LABORATORY HEMATOPATHOLOGY

Lawrence W. Diamond, and Doyen T. Nguyen, both of Cologne, Germany, assignors to Coulter Corporation, Miami, Fla.

Filed Sep. 2, 1993, Ser. No. 116,131

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 395—924 **18 Claims**



1. A method of interpreting hematopathology test results to arrive at a diagnosis of a patient comprising the steps of:

conducting at least one hematopathology test on at least one sample from a patient;

retrieving data from said at least one hematopathology test for the patient and storing said hematopathology test data in a database;

comparing said hematopathology test data with at least one set of a predetermined number of hematopathology patterns, each of said hematopathology patterns corresponding to different patient conditions and said patterns arranged in a predetermined hierarchy, to determine which patterns match said hematopathology test data in said database;

displaying the patterns matched, with recommendations corresponding to the matched patterns for one of no additional testing and one of a plurality of identified additional testing, the results of which are likely to lead to a diagnosis of the patient's condition;

conducting any additional testing recommended, retrieving the data therefrom and storing it in said database with said hematopathology test data;

comparing said additional test data and hematopathology test data with said predetermined number of patterns, to determine which patterns match said hematopathology test data in said database; and

identifying and displaying the highest ranked pattern in said hierarchy to arrive at a differential diagnosis of the patient's condition.

5,692,221
NARROW PROFILE LENS-FITTED FILM UNIT

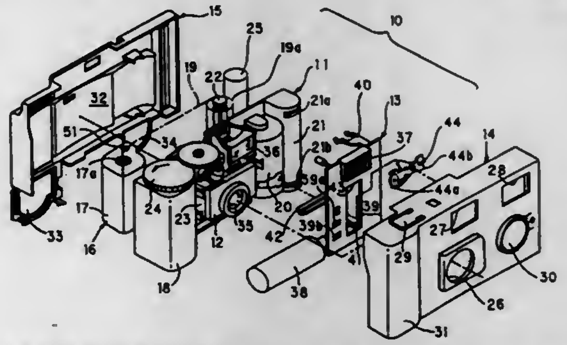
Takashi Tobioka, and Junichi Takagi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 21, 1996, Ser. No. 667,667

Claims priority, application Japan, Jun. 21, 1995, 7-154773

Int. Cl.^{6} G03B *15/03;17/02*

U.S. Cl. 396—6 **10 Claims**



1. A lens-fitted film unit equipped with a built-in electronic flash device, said lens-fitted film unit being provided with an exposure unit including a taking lens and an exposure mechanism, a film patron receiving chamber located on one side of the exposure unit and a film roll receiving chamber located on another side of the exposure unit, said film roll receiving chamber having a curved front face, all of which are enclosed between front and rear halves of a casing, said electronic flash device comprising:

a flash head including at least a flash tube;

a printed wiring board on which a flash circuit electrically connected to said flash tube is formed and which is provided with means for receiving said curved front face of said film roll receiving chamber therein.

5,692,222
CAMERA HAVING FOCUS DETECTION DEVICE

Akira Yamada; Yoshiaki Irie, both of Yokohama, and Akihiko Nagano, Ichihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1995, Ser. No. 552,116

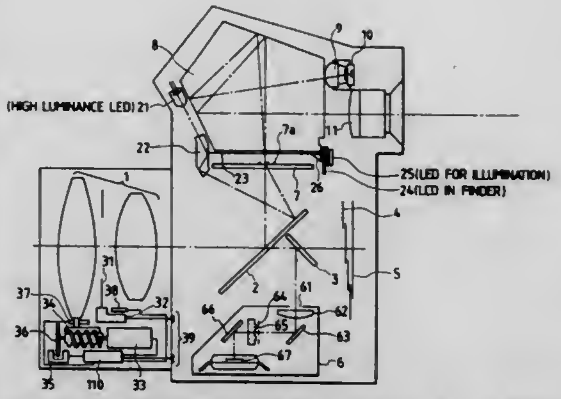
Claims priority, application Japan, Nov. 8, 1994, 6-298053

Int. Cl.^{6} G03B *13/36*

U.S. Cl. 396—51 **30 Claims**

1. A focus adjusting apparatus which comprises a focus detection device for independently detecting focus states of N different regions in a scene, said apparatus comprising:

(a) a selection circuit for simultaneously selecting, among the N regions, an arbitrary number of regions, the arbitrary number being less than N, and said selection circuit setting, among the N regions which are all selectable, a first number and a second number, different from the first number, of regions as regions simultaneously selected; and



(b) a focus adjustment circuit for performing focus adjustment on the basis of the focus states independently detected in the regions set by said selection circuit.

5,692,223
REMOTELY-CONTROLLED FLASH PHOTOGRAPHING SYSTEM

Tsutomu Ichikawa, Hashimoto, and Koutaro Kawabe, Neyagawa, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

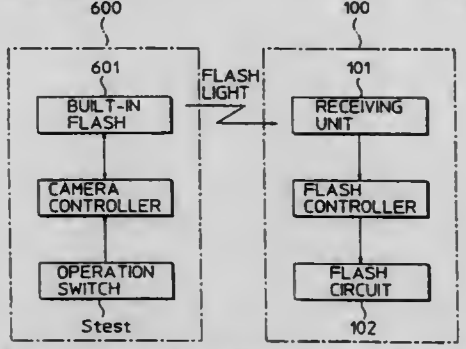
Continuation of Ser. No. 326,687, Oct. 20, 1994, abandoned.

This application Jan. 16, 1997, Ser. No. 784,230

Claims priority, application Japan, Oct. 22, 1993, 5-265279; Oct. 22, 1993, 5-265280

Int. Cl.^{6} G03B *15/03;15/05*

U.S. Cl. 396—182 **14 Claims**



1. A flash photographing system comprising a camera and an electrically actuated flash device:

the camera including:

a photographing device operable to photograph an object;

a first operable member to instruct a test firing of the electrically actuated flash device for producing a modeling illumination which enables a photographer to view a flash light illumination state of the object before the object is photographed under a flash light illumination by the electrically actuated flash device;

a second operable member to drive the photographing device to execute photography; and

a signal generator operable to generate a first control signal in accordance with an operation of the first operable member and a second control signal in accordance with an operation of the second operable member, and to transmit the thus generated first and second control signals to the electrically actuated flash device;

the electrically actuated flash device including:

a signal receiver operable to receive the first and second control signals from the camera;

a flash light emitter operable to emit flash light;

a first firing controller responsive to the thus received first control signal to control the flash light emitter and to generate intermittent signals to intermittently emit flash light a specified number of times to execute the test firing for the modeling illumination; and

a second firing controller responsive to the thus received second control signal to control the flash light emitter to emit flash light for the photography.

5,692,224
INFORMATION SETTING DEVICE OF A CAMERA

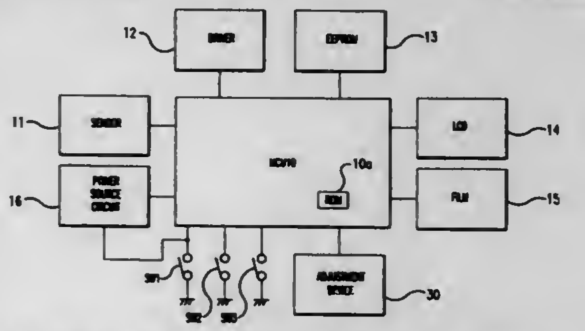
Takashi Saegusa, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 630,331

Claims priority, application Japan, Jun. 13, 1995, 7-146098

Int. Cl.^{6} G03B *17/36*

U.S. Cl. 396—207 **21 Claims**



1. An information setting device of a camera comprising:

a code read-in device to read codes representing characteristics of a recording medium,

a memory device to store information corresponding to the codes, wherein said memory device comprises at least a first memory device which exclusively stores and reads out information corresponding to defined codes for which information has been set and a second overwritable memory device which has an information storage area for undefined codes for which information has not been set,

an information read-out device to read from the memory device information corresponding to the defined codes read in by the code read-in device, and

an information writing device to write information for the undefined codes in the information storage area of the second overwritable memory device to thereby define the undefined codes after the information corresponding to the defined codes has been stored in the first memory device,

wherein the information read from the information read-out device is set in the camera.

5,692,225
VOICE RECOGNITION OF RECORDED MESSAGES FOR PHOTOGRAPHIC PRINTERS

Bryan David Bernardi, Rochester; Dale Frederick McIntyre, and Dana Whitney Wolcott, both of Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1994, Ser. No. 298,101

Int. Cl.^{6} G03B *29/00;17/24*

U.S. Cl. 396—318 **16 Claims**

1. A photographic print making system for reproducing and recognizing voice messages stored by a user in a memory associated with image frames of a film strip to be printed, the system comprising:

means for reading the voice messages from the memory and then for reproducing the stored voice messages;

voice recognition means, connected to the means for reading and reproducing, for conducting a voice recognition of voiced words of the reproduced messages; and

means, connected to the means for conducting a voice recognition, for printing the words recognized in alphanumeric char-

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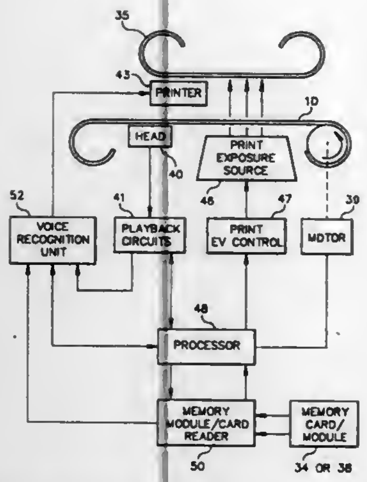


acters onto photographic prints made from the image frames with which the voice messages are associated, as a printed annotation.

5,692,226

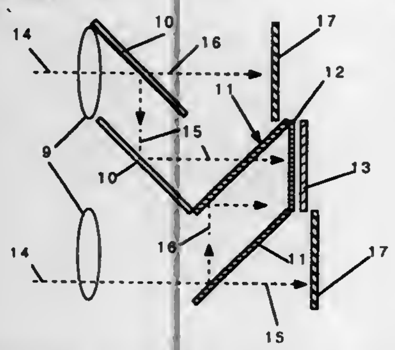
STEREOSCOPIC RECORDING SYSTEMS UTILIZING CHIRAL LIQUID CRYSTALS

Dennis R. Hall, 7075 SW. Hoodview Pl., Beaverton, Oreg. 97008

Filed Sep. 28, 1994, Ser. No. 314,134

Int. Cl.^{6} G03B *35/08*

U.S. Cl. 396—326 **25 Claims**



1. An apparatus for the recording of stereoscopic images, said images being comprised of first and second images, each having at least first and second color fields, said apparatus comprised of:

first and second lenses, transmitting light forming the color fields of the respective first and second images, and

polarization encoding means, wherein the light of each of said first and second color fields of each of said first and second image is polarized in one of two substantially orthogonal polarization states, wherein the polarization orientation of the light of said first color field of said first image has an orthogonal polarization orientation to the light of said first color field of said second image and the polarization orientation of the light of said second color field of said first image has an orthogonal polarization orientation to the light of said second color field of said second image, and

an image combining means, wherein the polarization encoded light forming the color fields of said first and second images is directed to form coextensive images upon a recording target, and

polarization analyzing means, wherein at least segments of the polarization encoded color fields of said first and second images are selectively directed to said target, and

a recording target, wherein at least segments thereof are sensitive to the light of said color fields.

5,692,227

VIEWFINDER

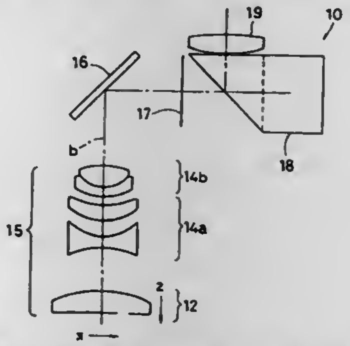
Hidetaka Yokota, Tokyo; Tetsuya Abe, Hokkaido, and Sachio Hasushita, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1994, Ser. No. 221,789

Claims priority, application Japan, Apr. 5, 1993, 5-016679 U; Apr. 22, 1993, 5-021026 U

Int. Cl.^{6} G03B *13/02;13/18;3/00*

U.S. Cl. 396—377 **40 Claims**



1. A camera viewfinder having a plurality of lens groups, wherein a photographing optical system of the camera is separate from the viewfinder, comprising:

a parallax error compensating and diopter adjusting lens group being one of said plurality of lens groups;

a guide for guiding said parallax error compensating and diopter adjusting lens group along a path which intersects an optical axis of the viewfinder so as to move said parallax error compensating and diopter adjusting lens group towards and away from an optical axis of the photographing optical system;

an object distance detector for detecting a distance of an object to be photographed; and

a movement control system for moving said parallax error compensating and diopter adjusting lens group, along said guide, to a plurality of different positions along said path, each of said positions being determined in response to a respective object distance detected by said object distance detector, said movement control system moving said parallax error compensating and diopter adjusting lens group towards the object and away from said optical axis of the photographing optical system when said object distance is shorter than a distance to a reference position, said movement control system moving said parallax error compensating and diopter adjusting lens group away from the object and towards said optical axis of the photographing optical system when said object distance is longer than a distance to said reference position.

5,692,228

PHOTOGRAPHIC FILM DEVELOPING APPARATUS

Shinji Fukushima, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama-Ken, Japan

Filed Feb. 14, 1994, Ser. No. 194,945

Claims priority, application Japan, Feb. 16, 1993, 5-026360; Mar. 18, 1993, 5-057641; Mar. 19, 1993, 5-059213

Int. Cl.^{6} G03D *3/08*

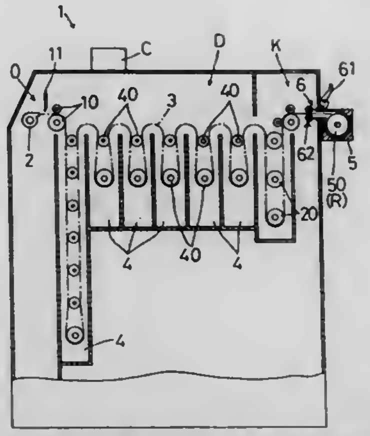
U.S. Cl. 396—613 **12 Claims**

1. A photographic film developing apparatus comprising:

a developing section including a developing tank for developing a photographic film strip;

a drying section for drying the developed film strip, said drying section including an exit for discharging the dried film strip and a holder support disposed adjacent to said exit;

a film collecting/storing holder disposed adjacent to and detachably attached to said exit of the drying section by said holder support, said film collecting/storing holder including a storage space for collecting and storing the dried film strip from said drying section;



wherein said film collecting/storing holder includes:

a projection insertable into said exit of the drying section, said projection defining a film passage communicating between said exit of the drying section and said storage space of the film collecting/storing holder; ad

a film rolling means for rolling the film strip for the storage thereof within said storage space of the holder, said film rolling means including a winder means disposed inside said film collecting/storing holder and having a projection engageable with a hole defined in a film transport guide leader joined to the film strip and drive means for driving said winder means for rotation, said drive means receiving a driving force from said drying section.

5,692,229

IMAGE FORMING SYSTEM WHICH SUPERIMPOSES ADDITIONAL INFORMATION ON AN IMAGE SIGNAL

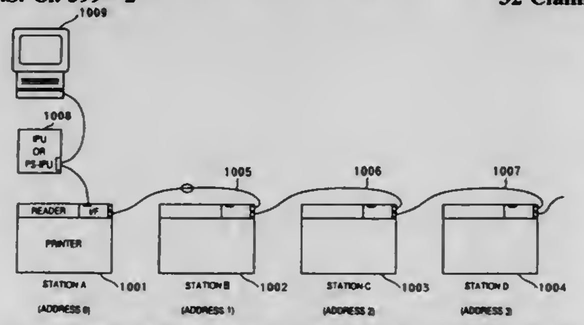
Koichi Ishimoto, Yokohama; Mitsuru Kurita, Tokyo, and Toshiyuki Kitamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1994, Ser. No. 252,163

Claims priority, application Japan, May 31, 1993, 5-129697; Jul. 22, 1993, 5-181188

Int. Cl.^{6} G03G *15/00;* **H04N** *1/00*

U.S. Cl. 399—2 **32 Claims**



1. An image forming system composed of a plurality of interconnected image forming devices each of which has storing means for storing an image signal, said system comprising:

image input means for entering an image signal;

image processing means for processing the image signal entered by said image input means;

transfer means for transferring the image signal, which has been processed by said image processing means, to the plurality of image forming devices simultaneously; and

additional information superimposing means for superimposing additional information on the transferred image signal, wherein additional information which differs for each image forming device is added on to output images obtained from the plurality of image forming devices.

5,692,230

IMAGE FORMING APPARATUS

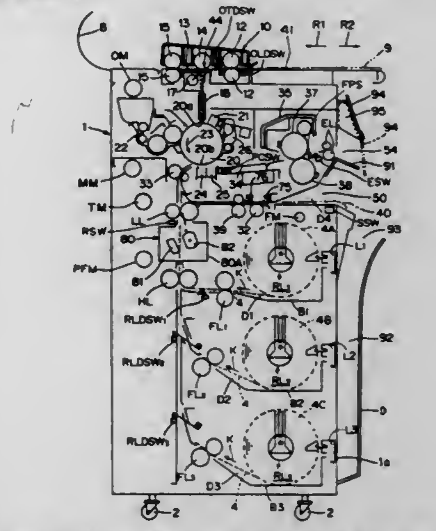
Katsuhiro Yoshiuchi, and Hiroshi Kageyama, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1996, Ser. No. 687,178

Claims priority, application Japan, Jul. 31, 1995, 7-195513

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—21 **4 Claims**



1. An image forming apparatus for forming an image on a sheet having a predetermined length cut from a strip-shaped continuous sheet, comprising:

image forming means for forming an image on the sheet;

sheet conveying means for conveying the sheet along a conveying path passing through the image forming means;

cutting means, provided in a position on the conveying path, for cutting the sheet;

jam detecting means for judging whether or not a jam occurs in the conveying path; and

jam-mode cutting controlling means for causing the cutting means to operate for cutting the sheet in response to a judgment that a jam has occurred by the jam detecting means.

5,692,231

IMAGE FORMING SYSTEM FOR ENABLING DETECTION OF THE QUANTITY OF SHEETS REMAINING IN A SHEET CASSETTE

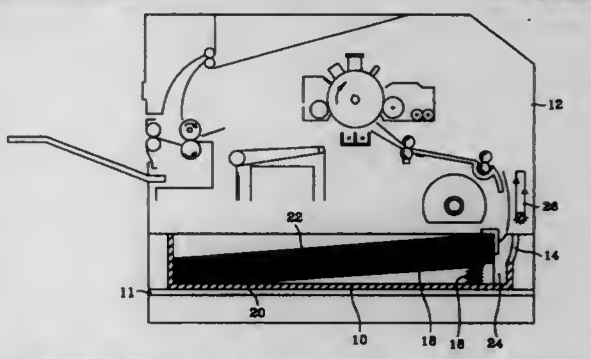
Gown-Jong O, Suwon; Won-Hyun Song, Goyang, and In-Soo Lee, Seoul, all of Rep. of Korea, assignors to SamSung Electronics Co. Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 24, 1996, Ser. No. 685,566

Claims priority, application Rep. of Korea, Jul. 24, 1995, 21892/1995; May 16, 1996, 163771996

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—23 **24 Claims**



1. An image forming system, comprising:

a sheet cassette installed within an insertion portion formed in a front face of a main body of said image forming system, and

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storing sheets of a printable medium that are operated upon by said image forming system;

a window formed along an outer surface of said sheet cassette to enable a user to visually detect a quantity of said sheets remaining within said sheet cassette without having to remove said sheet cassette from said insertion portion; and

light-emitting means positioned adjacent to said window to enable the user to visually detect the quantity of said sheets remaining within said sheet cassette in a dark environment.

5,692,232

ELECTROPHOTOGRAPHIC APPARATUS THAT PREVENTS TONER FROM ATTACHING TO A CONTACT MEMBER OF A TRANSFER DEVICE

Yoshiaki Okano; Hiroshi Hashizume; Hirotaka Fukuyama; Kouichirou Satou; Tetsuya Nakamura; Satoshi Katagata; Michihisa Iguchi; Seiji Arai; Chinobu Sakai, and Takahito Kabai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

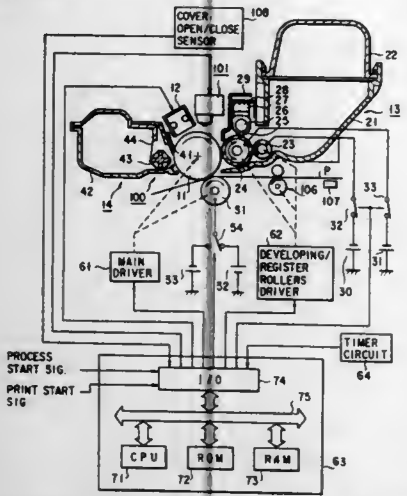
Continuation of Ser. No. 114,240, Aug. 31, 1993, abandoned.

This application Feb. 9, 1996, Ser. No. 599,101

Claims priority, application Japan, Aug. 31, 1992, 4-232405; Aug. 31, 1992, 4-232408; Sep. 2, 1992, 4-234611

Int. Cl.^{6} G03G *15/08*

U.S. Cl. 399—53 **12 Claims**



1. An electrophotographic apparatus comprising charging means and developing means which are respectively arranged at a predetermined charging position and a predetermined developing position along a surface of a photosensitive member, the photosensitive member having a predetermined point which is located at the charging position when charging of said photosensitive member by said charging means starts, said developing means including toner carrier means and carrier rotating means for rotating the toner carrier means, the apparatus further comprising:

development control means for keeping rotation of said toner carrier means by said carrier rotating means stopped from start of rotation of said photosensitive member until said predetermined point of said photosensitive member reaches the predetermined developing position.

5,692,233

INTEGRATED SYSTEM AND METHOD FOR ANALYZING DERIVATIVE SECURITIES

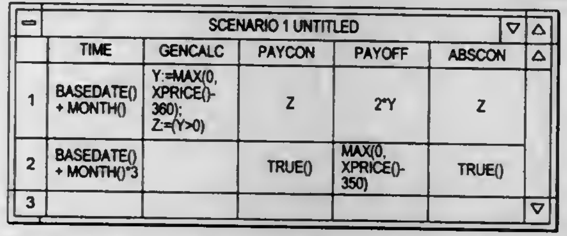
Mark B. Garman, Orinda, Calif., assignor to Financial Engineering Associates, Inc., Berkeley, Calif.

Continuation of Ser. No. 890,437, May 28, 1992, abandoned.

This application Feb. 3, 1995, Ser. No. 384,376

Int. Cl.^{6} G06F *17/60;* G06G *7/52*

U.S. Cl. 705—36 **15 Claims**


SCENARIO 1 UNTITLED

	TIME	GENCALC	PAYCON	PAYOFF	ABSCON
1	BASEDATE() + MONTH()	Y:=MAX(0, XPRICE()- 360); Z:=(Y>0)	Z	2*Y	Z
2	BASEDATE() + MONTH()*3		TRUE()	MAX(0, XPRICE()- 350)	TRUE()
3					

12. A computer implemented method for defining a simulation comprised of an ordered sequence of events, each event simulated at a time, comprising:

displaying a screen display comprising a plurality of ordered rows and ordered columns, forming a plurality of cells, each row for representing an event and having a plurality of ordered cells, one cell for each of the ordered columns,

receiving, as user inputs into the cells of at least one row, expressions defining an event by:

receiving into a time cell a user input time expression defining a simulated time of the event for the row;

for each of a number of other cells in the row, receiving a user input expression defining at least one variable or at least one equation for the event at the simulated time of the row, the ordered cells in each row forming an ordered sequence of expressions in the row; the plurality of ordered rows that include a user input time expression defining an ordered sequence of simulated times defined by a user for events in the simulation.

DESIGNS

GRANTED November 25, 1997

ERRATA

D28–055	D386–808
D32–053	D386–878
D24–214	D386–879

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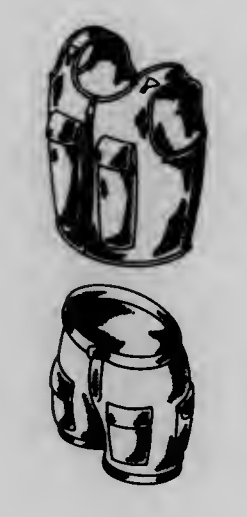
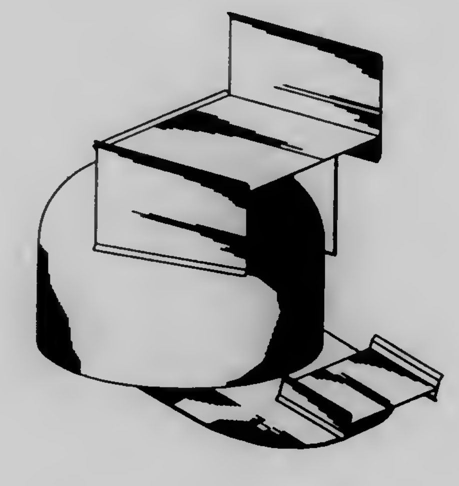
DESIGNS

NOVEMBER 25, 1997

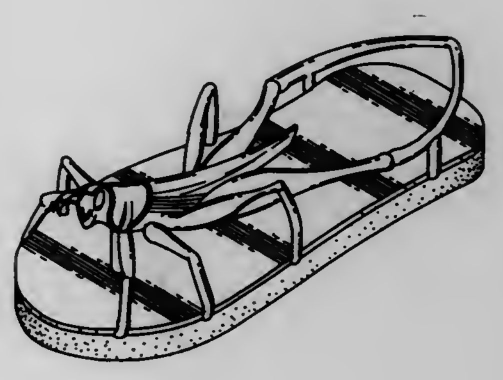
386,585
SUIT VEST AND SHORTS
Ronald J. Blaeske, Jr., 19119 Rogers Rd., Odessa, Fla. 33556
Filed Dec. 6, 1995, Ser. No. 47,503
Term of patent 14 years
LOC (6) Cl. 02 - *02*
U.S. Cl. D2—737



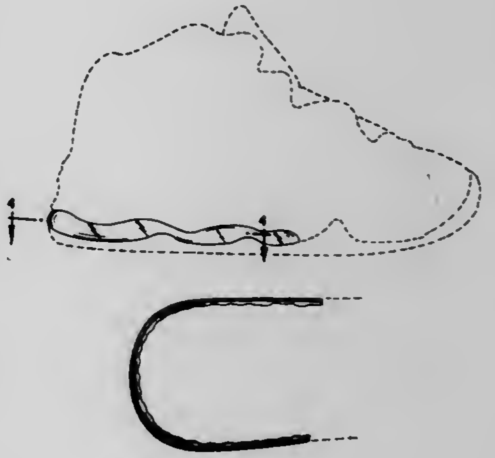
386,586
HAT SPRINT CAR WING
Curt K. Jensen, 3210 Frontier Pl., Rapid City, S. Dak. 57702
Filed Aug. 23, 1996, Ser. No. 58,816
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—866



386,587
SANDAL
Celia Jane Henson, 6912 - 77th Ct. NW., Gig Harbor, Wash. 98335
Filed Aug. 5, 1996, Ser. No. 57,967
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—916



386,588
ELEMENT OF A SHOE SOLE
Aaron Alexander Carroll Cooper, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 16, 1996, Ser. No. 61,077
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—947



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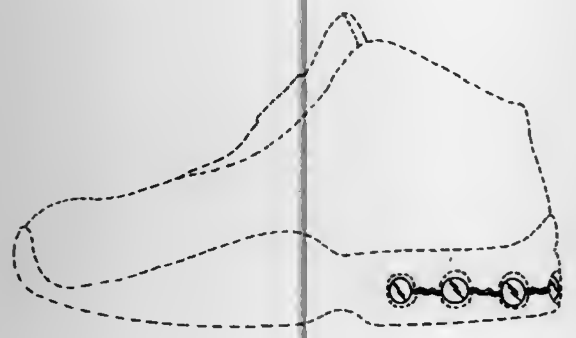
386,589
ELEMENT OF A SHOE SOLE

William J. Cass, Hillsboro, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Dec. 20, 1996, Ser. No. 64,042
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—947

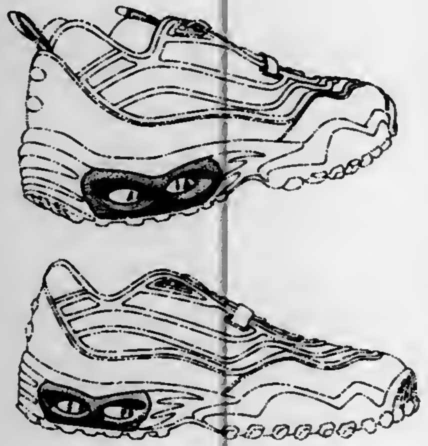


386,590
ELEMENT OF A SHOE SOLE

William J. Cass, Hillsboro, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 11, 1997, Ser. No. 66,348
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—947

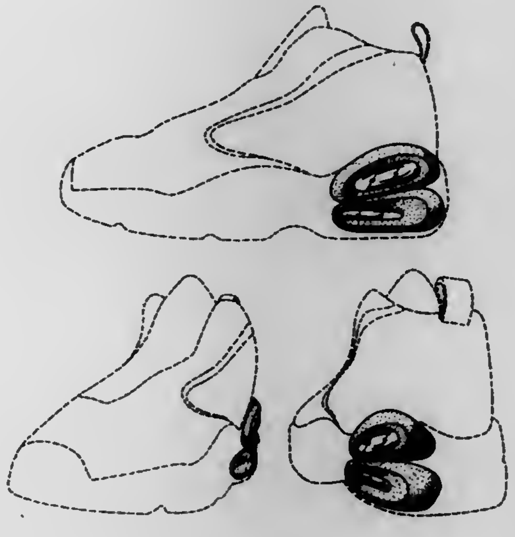


386,591
ELEMENT OF A SHOE SOLE

Tate E. Kuerbis, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 18, 1997, Ser. No. 66,577
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—947

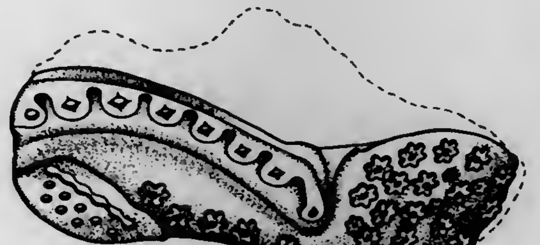


386,592
SHOE OUTSOLE

Robert J. Lucas, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 6, 1996, Ser. No. 49,981
Term of patent 14 years
LOC (6) Cl. 02 - *04*

U.S. Cl. D2—948

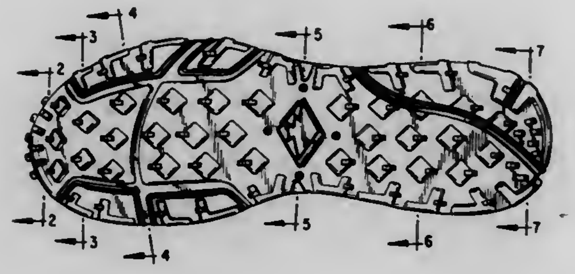


386,593
BOTTOM OF A SHOE OUTSOLE

Peter M. Fogg, Lake Oswego, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 8, 1996, Ser. No. 60,809
Term of patent 14 years
LOC (6) Cl. 02 - *04*

U.S. Cl. D2—953

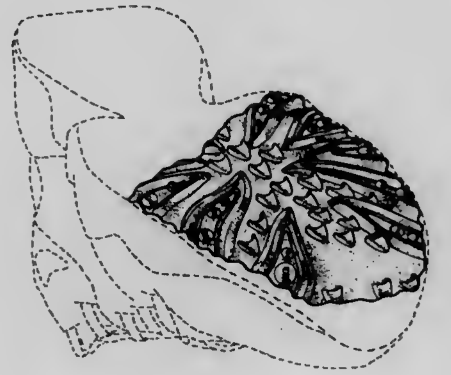


386,594
PORTION OF A SHOE OUTSOLE

Lawrence G. Selbiger, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 18, 1997, Ser. No. 66,497
Term of patent 14 years
LOC (6) Cl. 02 - *04*

U.S. Cl. D2—953

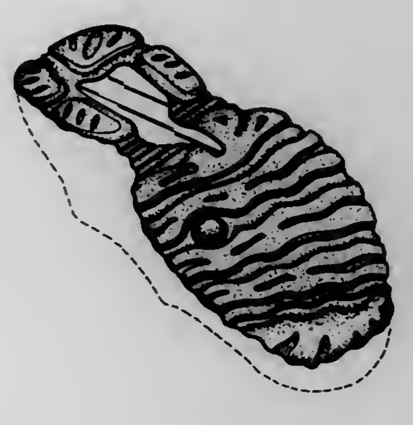


386,595
SHOE OUTSOLE

Tracy L. Teague, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Nov. 25, 1996, Ser. No. 62,800
Term of patent 14 years
LOC (6) Cl. 02 - *04*

U.S. Cl. D2—960

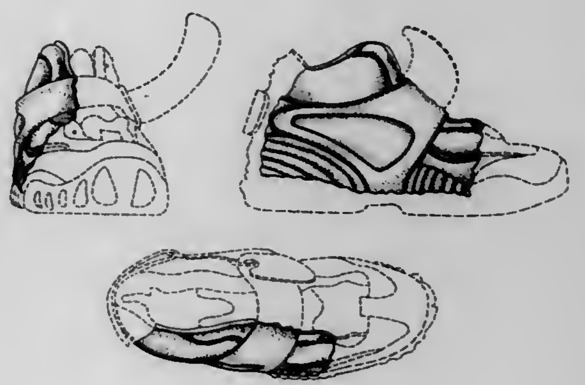


386,596
PORTION OF A SHOE UPPER

Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Continuation of Ser. No. 52,211, Mar. 26, 1996. This application Oct. 1, 1996, Ser. No. 60,555
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—972



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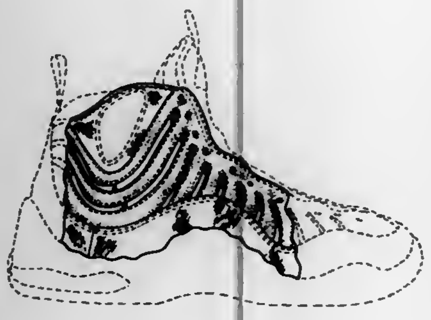
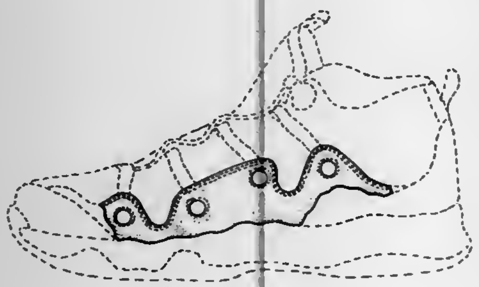
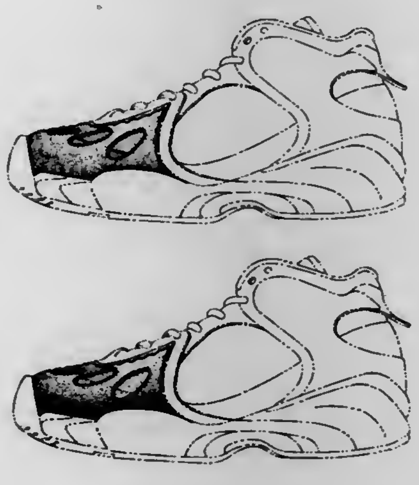
386,597
SIDE ELEMENT OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 8, 1996, Ser. No. 60,811
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



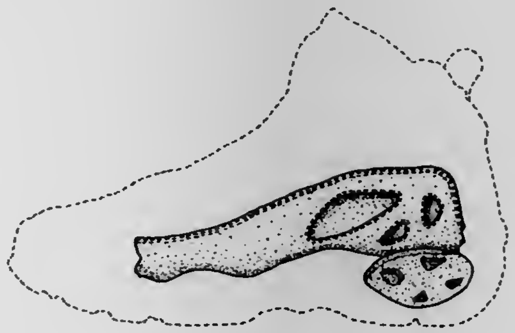
386,598
ELEMENT OF A SHOE UPPER
Peter M. Fogg, Lake Oswego, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 22, 1997, Ser. No. 65,146
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



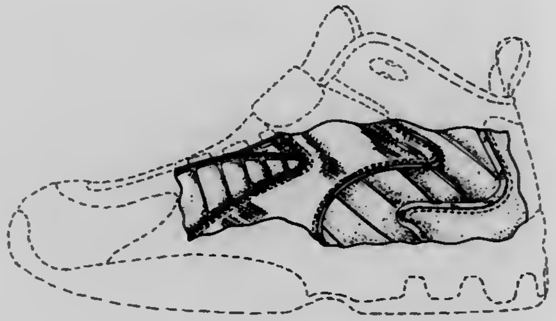
386,599
ELEMENT OF A SHOE UPPER
Peter LaRowe, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Mar. 10, 1997, Ser. No. 67,572
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



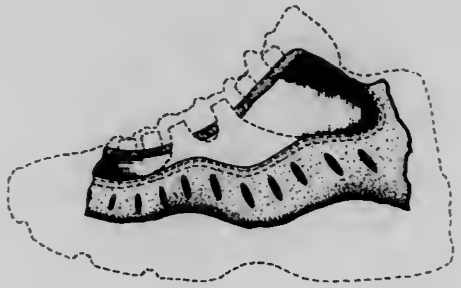
386,600
ELEMENT OF A SHOE
James K. Tong, Tigard, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 7, 1996, Ser. No. 60,754
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



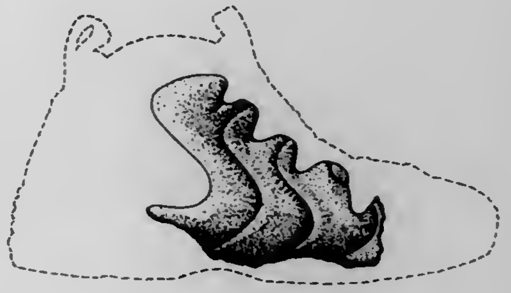
386,601
ELEMENT OF A SHOE UPPER
William J. Cass, Hillsboro, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 6, 1996, Ser. No. 63,383
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



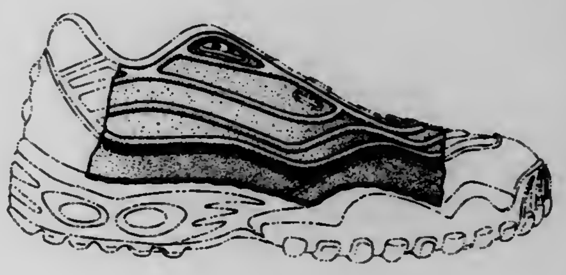
386,602
ELEMENT OF A SHOE UPPER
Robert McCourt, Newberg, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 7, 1997, Ser. No. 66,194
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



386,603
SIDE ELEMENT OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 11, 1997, Ser. No. 66,350
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



386,604
SIDE ELEMENT OF A SHOE UPPER
William J. Cass, Hillsboro, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 11, 1997, Ser. No. 66,349
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



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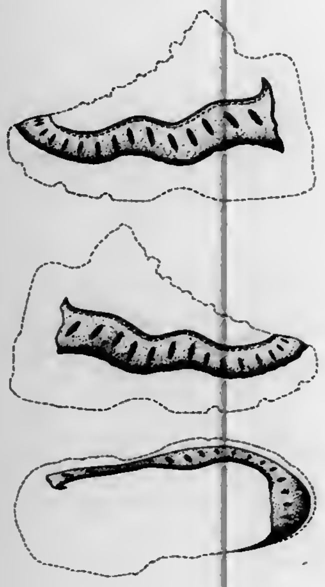
386,605
PORTION OF A SHOE UPPER

Robert McCourt, Newberg, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 7, 1997, Ser. No. 66,196
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—972

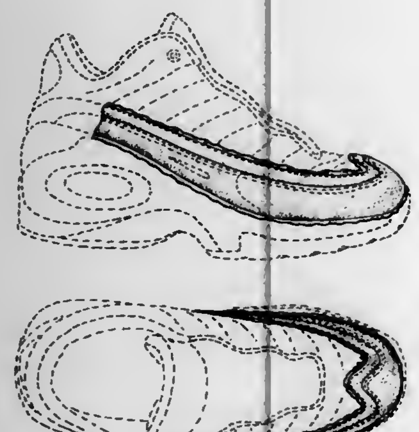


386,606
PORTION OF A SHOE UPPER

Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Mar. 17, 1997, Ser. No. 68,185
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—972

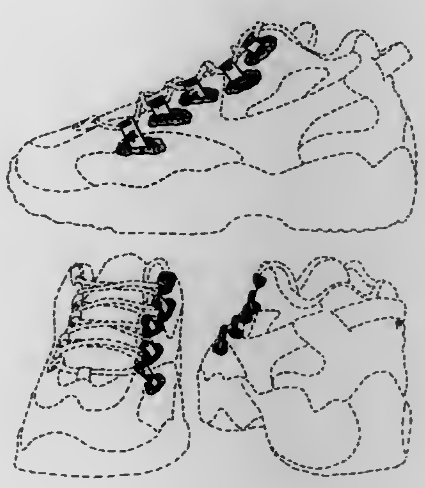


386,607
ELEMENT OF A SHOE UPPER

Lawrence Selbiger, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 7, 1997, Ser. No. 66,193
Term of patent 14 years
LOC (6) Cl. 02 - *99*

U.S. Cl. D2—973



386,608
SOCK

David Green, High Point, N.C., assignor to Sara Lee Corporation, Winston-Salem, N.C.

Filed Jul. 19, 1995, Ser. No. 41,600
Term of patent 14 years
LOC (6) Cl. 02 - *04*

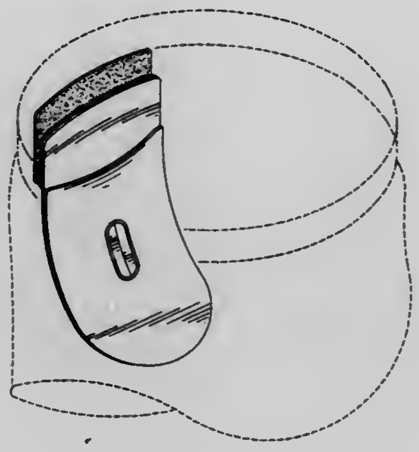
U.S. Cl. D2—980

386,609
BLADDER CONTROL RECEPTACLE

Vicki J. Green, 3038 Old Dufur Rd., The Dalles, Oreg. 97058

Filed May 6, 1996, Ser. No. 54,197
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—203

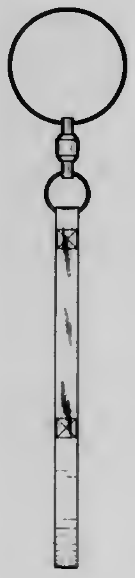


386,610
KEY RETENTION SERVICE

Stanford W. Wright, 234 Pecan Dr., Martinez, Ga. 30907

Filed Aug. 12, 1996, Ser. No. 58,344
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—207

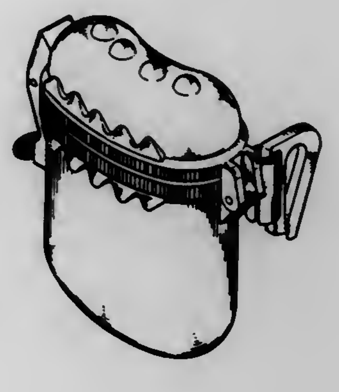


386,611
WATERPROOF CONTAINER

Muh-Chuen Sheu, P.O. Box 82-144, Taipei, Taiwan

Filed Jul. 8, 1996, Ser. No. 56,750
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—215

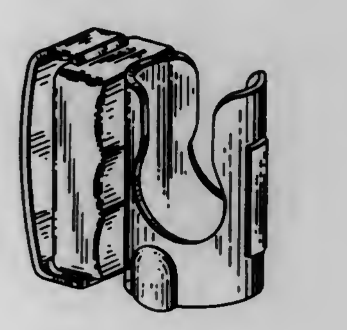


386,612
SIDE HANDLE POLICE BATON HOLDER

Paul D. Starrett, Jaffrey, N.H., assignor to Monadnock Lifetime Products, Inc., Fitzwilliam, N.H.

Filed Apr. 24, 1996, Ser. No. 53,598
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—229



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386,613

COMBINED CARRYING DEVICE AND SEPARABLE MINI-CARRYING DEVICE

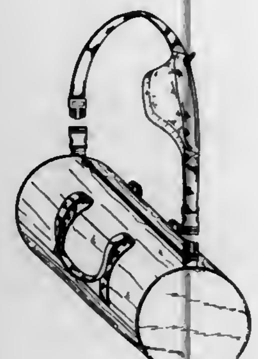
Martin Terzian, Corona, Calif., assignor to Pacific Connections of California, Inc., Corona, Calif.

Filed Apr. 7, 1995, Ser. No. 37,239

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—289



386,614

HAND LUGGAGE FOR CARRYING PET SUPPLIES

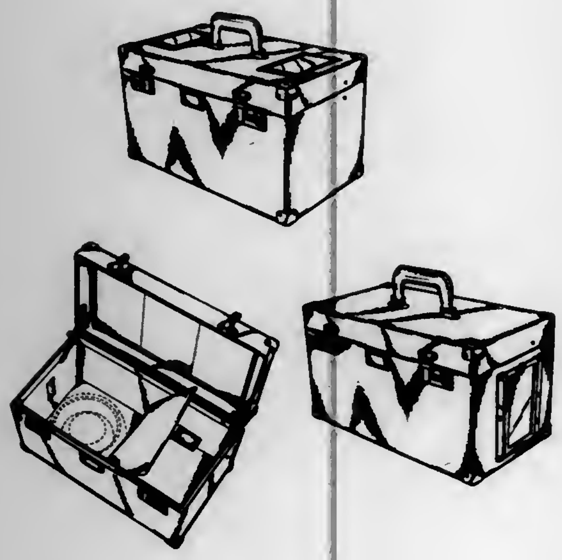
Judy Smith, P.O. Box 1784, Middleburg, Va. 22117

Filed Nov. 9, 1995, Ser. No. 46,204

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—291



386,615

HOLDING CASE FOR CARTRIDGE FILM

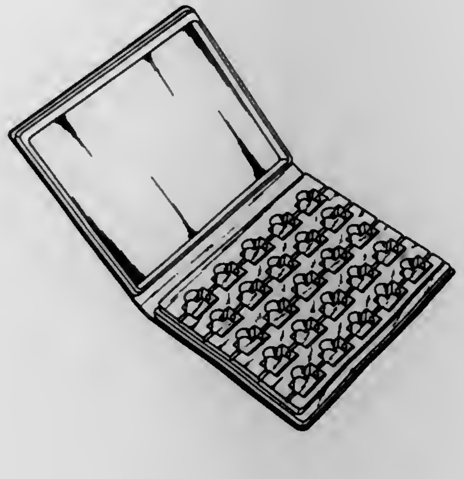
Takaaki Minami, Ichikawa, Japan, assignor to Hakuba Shashin Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1996, Ser. No. 56,788

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—295



386,616

MOLDED UTILITY BASKET

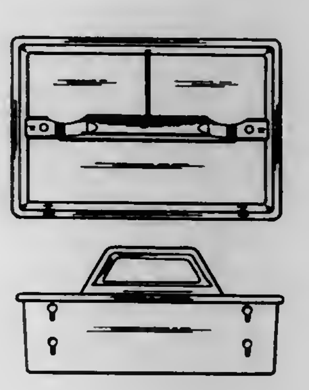
Fred Nimer, 1325 Swailes Rd., Troy, Ohio 45373

Filed May 13, 1996, Ser. No. 54,381

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—308



386,617

Y-SHAPED TOOTHBRUSH

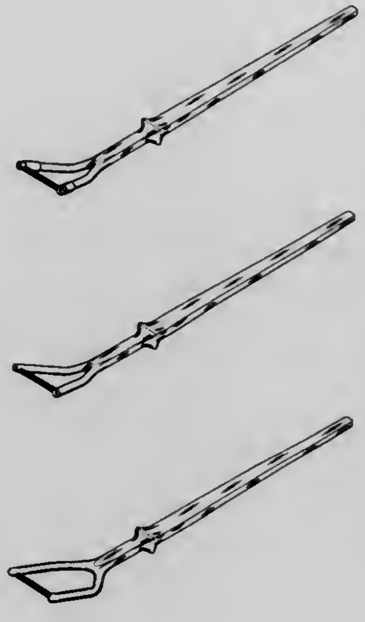
Jenq-Pyng Shyu, 26231 Carmel St., Laguna Hills, Calif. 92656

Continuation-in-part of Ser. No. 27,629, Aug. 25, 1994, abandoned. This application May 5, 1995, Ser. No. 38,423

Term of patent 14 years

LOC (6) Cl. 04 - *02*

U.S. Cl. D4—104



386,618

TOOTHBRUSH

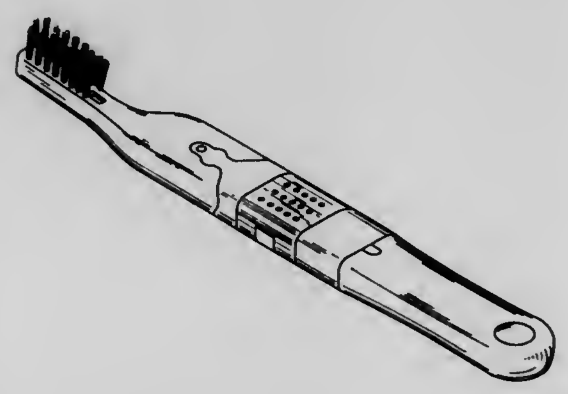
Laurie Braden, 776 S. Military Trail, Deerfield Beach, Fla. 33442

Filed Jul. 26, 1996, Ser. No. 57,531

Term of patent 14 years

LOC (6) Cl. 04 - *02*

U.S. Cl. D4—104



386,619

FABRIC

Fritz Bayer, 57-59, Neuenseer Str., 96244 Michelau, Germany

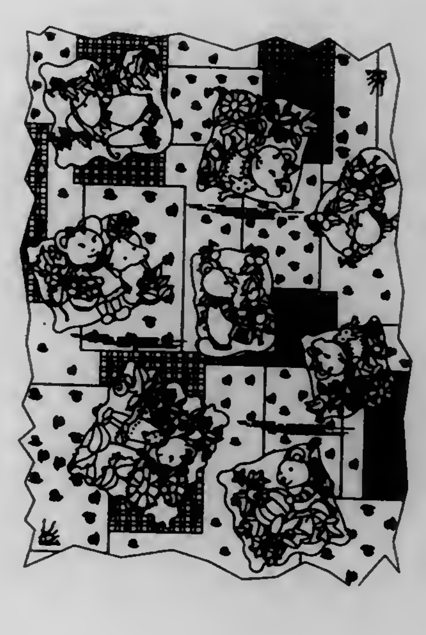
Filed Jun. 6, 1996, Ser. No. 55,495

Claims priority, application European Pat. Off., Dec. 18, 1995, MK/RE/PP003600

Term of patent 14 years

LOC (6) Cl. 05 - *06*

U.S. Cl. D5—26



386,620

EMBOSSED PAPER TOWELING

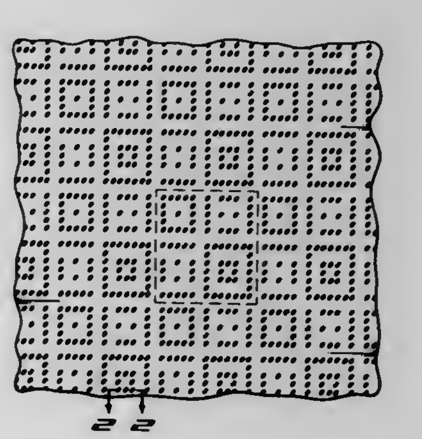
Ed Giesler, Suamico, Wis., assignor to Potlatch Corporation, San Francisco, Calif.

Filed Mar. 1, 1996, Ser. No. 51,056

Term of patent 14 years

LOC (6) Cl. 05 - *06*

U.S. Cl. D5—53



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386,621
SPORTS PICTURE FRAME

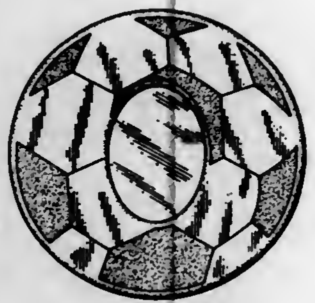
Michael P. Donoghue, 10361 Stratford Ave., and Gregory J. Maddox, 3508 Pinehurst Ave., both of Fairfax, Va. 22030

Continuation-in-part of Ser. No. 8,278, May 13, 1993, abandoned. This application Aug. 15, 1995, Ser. No. 42,623

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D6—303



386,622
CHAIR

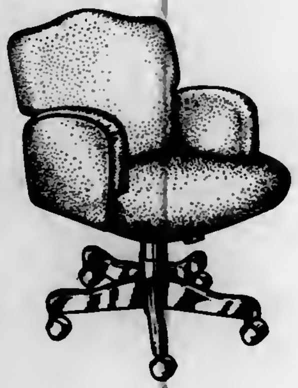
James O. Kelley, Spring Lake, and Errol S. Pearsons, Grand Haven, both of Mich., assignors to Sligh Furniture Company, Grand Rapids, Mich.

Filed Aug. 7, 1996, Ser. No. 58,082

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—366



386,623
SEAT

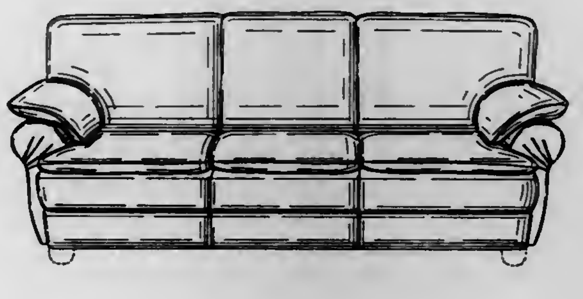
Pasquale Natuzzi, Santeramo In Colle, and Domenico Abbruzzese, Gioia del Colle, both of Italy, assignors to Industrie Natuzzi, Spa, Bari, Italy

Filed Aug. 2, 1996, Ser. No. 57,876

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—381



386,624
WORKBENCH INCORPORATING A UNIVERSAL DRAWER ACCESSORY

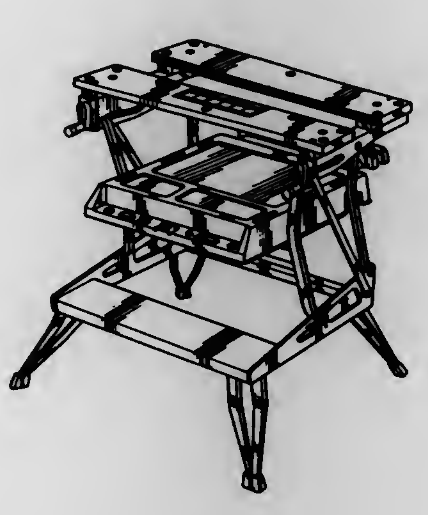
Edward H. Meisner, Short Hills, N.J.; Keith C. Kristiansen, Strafford, Conn.; John E. Kiely, Morristown, N.J., and Murray Hunter, Smith Falls, Canada, assignors to Black & Decker, Inc., Newark, Del.

Filed Aug. 11, 1995, Ser. No. 42,525

Term of patent 14 years

LOC (6) Cl. 06 - *03*

U.S. Cl. D6—400



386,625
MULTIPLE WORKSTATION UNIT

Ira Gary Bloom, Dallas, Tex., assignor to ASR Affiliates, Inc., Sarasota, Fla.

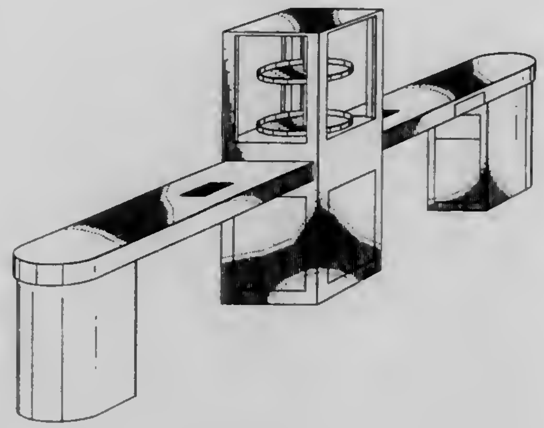
Filed Apr. 1, 1996, Ser. No. 52,480

The portion of the term of this patent subsequent to Feb. 4, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—423



386,626
STORAGE ORGANIZER

Zvi Yemini, Tel Aviv, Israel, assignor to Zag Ltd., Rosh Haayis, Israel

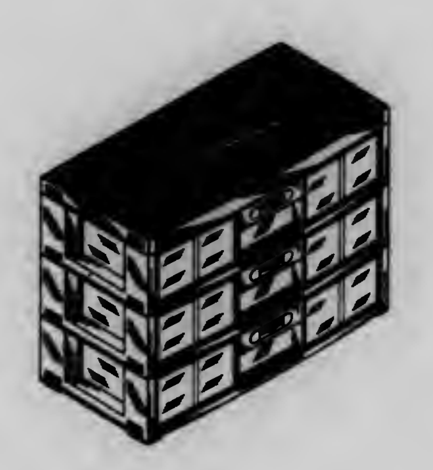
Filed Aug. 11, 1995, Ser. No. 42,537

The portion of the term of this patent subsequent to Nov. 4, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—445



386,627
ARMOIRE

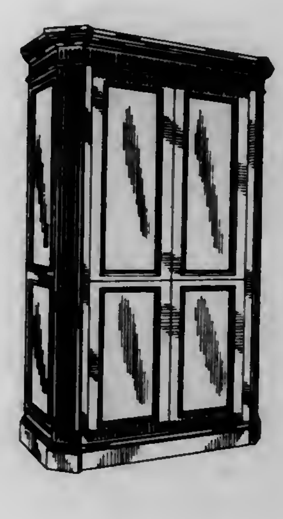
Jorge Estapé, and Joyce Estapé, both of 2453 San Pasqual Valley Rd., Escondido, Calif. 92027

Filed Mar. 29, 1996, Ser. No. 53,015

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—445



386,628
CABINET

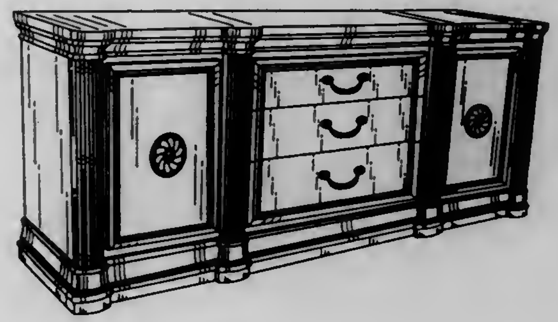
Timothy M. O'Hare, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.

Filed Aug. 7, 1996, Ser. No. 58,077

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—445



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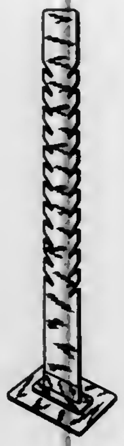
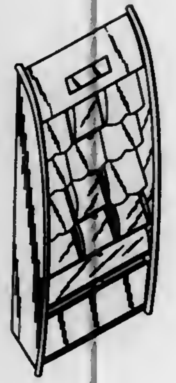
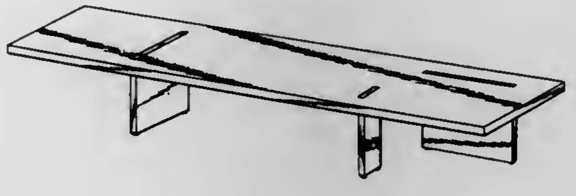
386,629
BAGS DISPLAY UNIT
Hervé Chapelier, 31 avenue du Lac Marion, Biarritz, 64200, France
Filed Jul. 10, 1996, Ser. No. 56,854
Claims priority, application France, Apr. 30, 1996, 962632
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—468



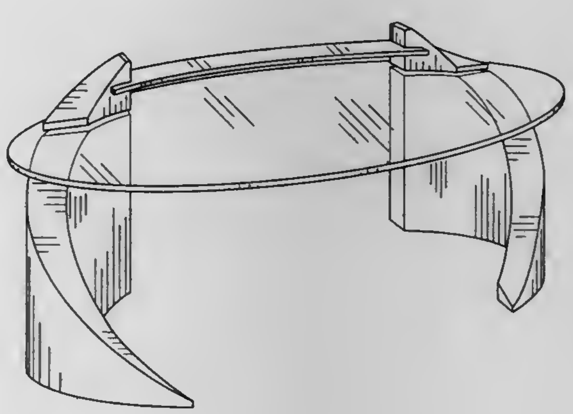
386,630
DISPLAY CASE
Francesco Mendini, Milan, Italy, assignor to Swatch AG (Swatch SA) (Swatch Ltd.), Bienne, Switzerland
Filed Oct. 16, 1995, Ser. No. 45,289
Claims priority, application WIPO, Jun. 27, 1995, DM/033 353
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D6—476



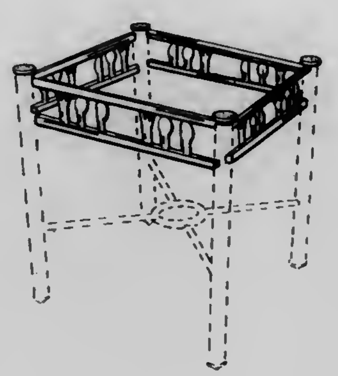
386,631
DESK
Richard Alan Meier, and Michael Gilchrist Duncan, both of New York, N.Y., assignors to Steelcase Inc., Grand Rapids, Mich.
Division of Ser. No. 29,855, Oct. 18, 1994, Pat. No. Des. 372,373. This application Apr. 10, 1996, Ser. No. 52,967
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—480



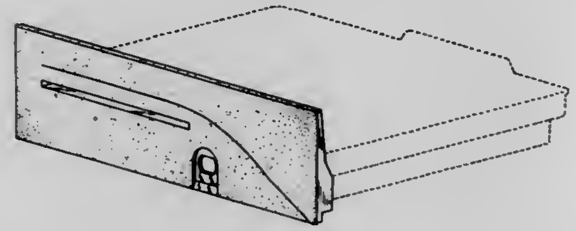
386,632
CANTILEVERED TABLE
Tod M. Robinson, 2162 Thomas Ave. #2, San Diego, Calif. 92109
Filed Jul. 15, 1996, Ser. No. 57,046
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—480



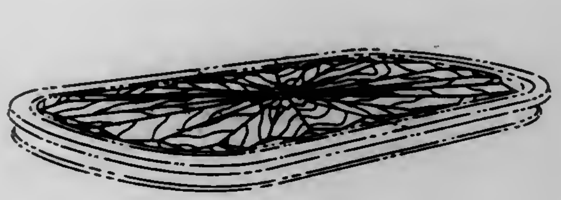
386,633
TABLE BASE
Ronald I. Pass, St. Louis, and Donald W. Bustraan, St. Peters, both of Mo., assignors to JDI Group, Inc., St. Louis, Mo.
Filed Oct. 15, 1996, Ser. No. 61,025
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—495



386,634
DRAWER FRONT
Robert Paul Daugs, Shoreview, Minn., assignor to Upper Midwest Industries, Inc., Minneapolis, Minn.
Filed Aug. 12, 1996, Ser. No. 58,322
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—510



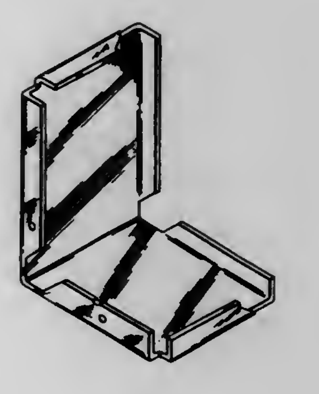
386,635
FURNITURE PATTERN
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Sep. 26, 1996, Ser. No. 60,325
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—511



386,636

Patent Not Issued For This Number

386,637
THEFT PROOF PACK DISPENSER
Yvon M. St-Pierre; Andre Dubeau; Francois Moreau, and Roch Cyr, all of Montreal, Canada, assignors to Imperial Tobacco Limited, Canada
Filed Jun. 19, 1996, Ser. No. 55,971
Claims priority, application Canada, Feb. 6, 1996, 1996-0236
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—515



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386,638

DISPENSER FOR ROLLED MATERIAL

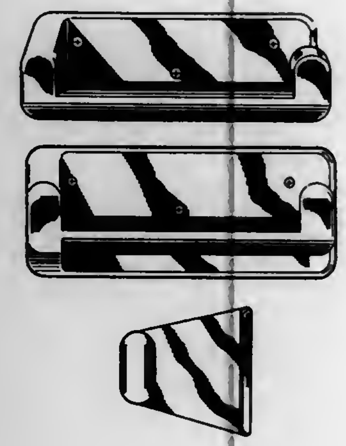
Daniel P. A. Fong, North Attleboro, Mass., assignor to Country Studio, Inc., North Attleboro, Mass.

Filed Nov. 4, 1996, Ser. No. 62,430

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—518



386,639

WALL RACK FOR TOILETRIES

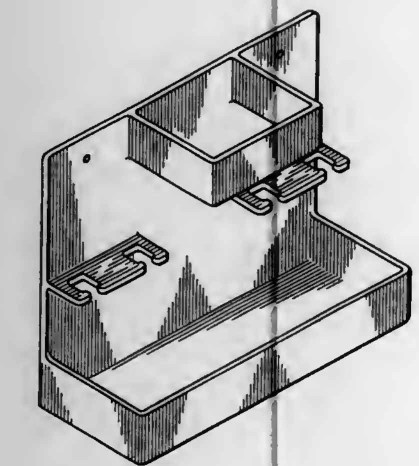
Daniel E. Everett, Box 161-G-Cora Lee Rd., Lynchburg, Va. 24502

Filed Jun. 3, 1996, Ser. No. 55,243

Term of patent 14 years

LOC (6) Cl. 06 - *02*

U.S. Cl. D6—525



386,640

SUPPORT AND RESERVOIR ASSEMBLY FOR A PRODUCT DISPENSER

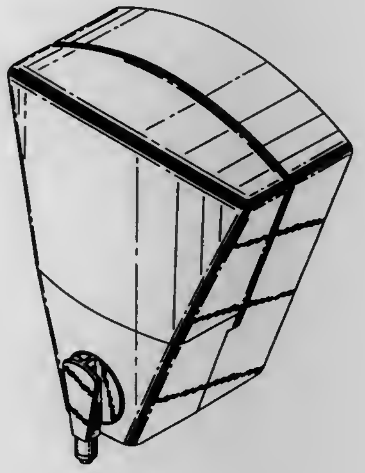
David F. Wirt, Prescott, and Floyd L. Foslien, Troy Township, both of Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 21, 1996, Ser. No. 56,095

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—545



386,641

WINDOW COVERING INCLUDING REAL WOOD VERTICAL BLINDS

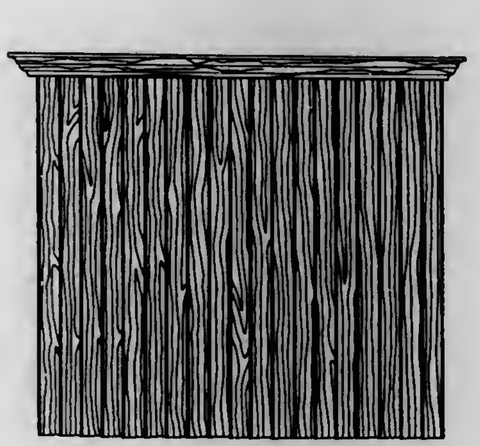
Welles A. Gray, III, Topanga, Calif., assignor to American Hardwood Company, Gardena, Calif.

Filed Apr. 3, 1996, Ser. No. 52,553

Term of patent 14 years

LOC (6) Cl. 06 - *10*

U.S. Cl. D6—575



386,642

VENETIAN BLIND SLAT

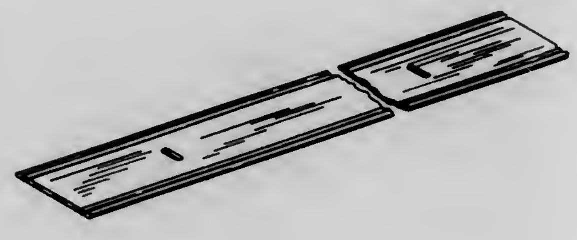
Paul A. Schneider, Rothschild, Wis., assignor to Springs Window Fashions Division, Inc., Middleton, Wis.

Filed May 21, 1996, Ser. No. 54,758

Term of patent 14 years

LOC (6) Cl. 06 - *10*

U.S. Cl. D6—580



386,643

PENTAGONAL SHAPED PILLOW WITH TWO PARALLEL GROOVES

Raymond J. C. Farrell, 46 Gladstone Avenue, Smiths Falls Ontario, Canada, K7A 1R7

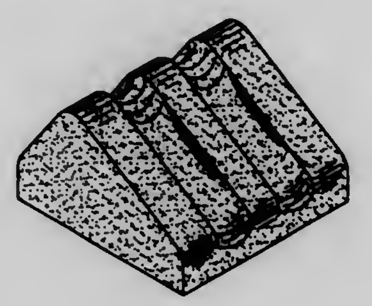
Filed Nov. 23, 1994, Ser. No. 31,921

Claims priority, application Canada, Oct. 7, 1994, 1994-1959

Term of patent 14 years

LOC (6) Cl. 06 - *09*

U.S. Cl. D6—601



386,644

DEVICE FOR MAKING COFFEE AND ESPRESSO BEVERAGES IN A MICROWAVE OVEN

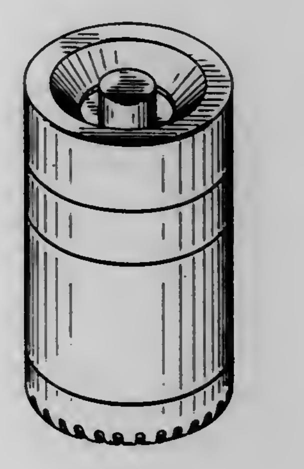
Mario Orrico, 6137 N. Harlem Ave., Chicago, Ill. 60631; Herb Velazquez, Two S. 041 Glen Ave., Lombard, Ill. 60148; Rou Farhadieh, 352 63rd St., Willowbrook, Ill. 60514; Rudy Avramovich, 125 E. Sunnyside Ave., Libertyville, Ill. 60048, and Stuart Koford, 19W281 Paul Revere La., Oak Brook, Ill. 60521

Continuation-in-part of Ser. No. 176,521, Jan. 3, 1994. This application Sep. 20, 1994, Ser. No. 28,708

Term of patent 14 years

LOC (6) Cl. 31 - *00*

U.S. Cl. D7—300



386,645

ESPRESSO COFFEE MACHINE

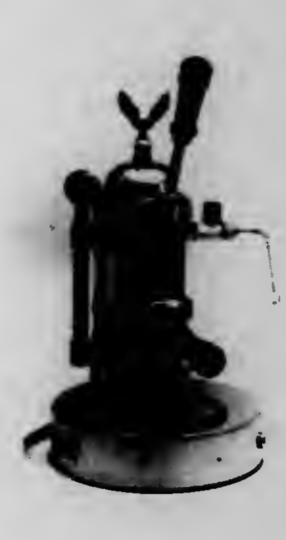
Florindo Fregnan, Via A. Volta, 14/16, Dosson, Italy, 31030

Filed Mar. 14, 1996, Ser. No. 51,707

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—301



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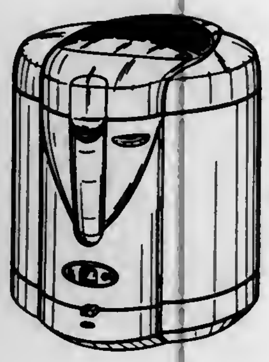
386,646

ELECTRIC FRYER

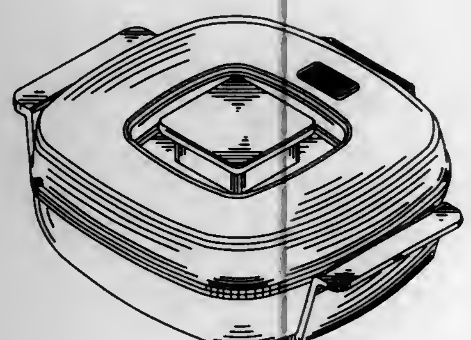
Robert Wurth, Dijon, France, assignor to SEB, Selongey, France
Filed Jul. 25, 1996, Ser. No. 57,431
Claims priority, application France, Jan. 25, 1996, 960536
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—354



386,647

SKILLET

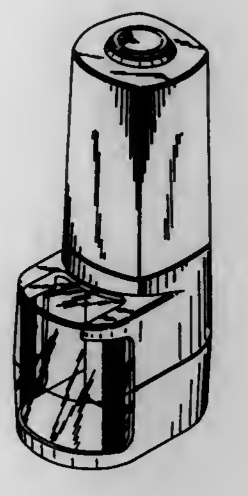
Suzie Ho, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jul. 15, 1996, Ser. No. 57,056
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—360



386,648

BATTERY-OPERATED CHEESE GRATER

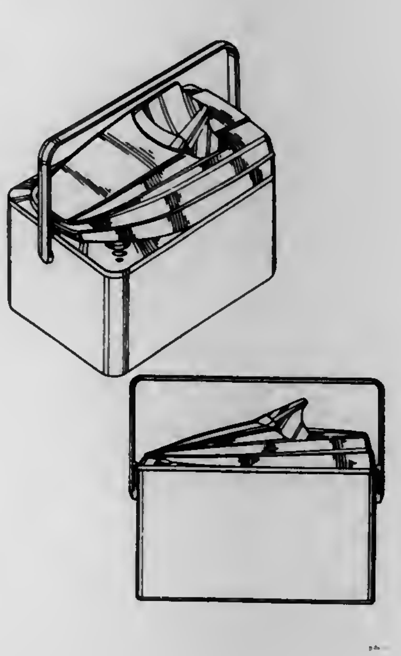
Marcus W. Kibbe, San Marcos, Calif., assignor to Dudley Kebow, Inc., Oceanside, Calif.
Filed Jun. 24, 1996, Ser. No. 56,117
Term of patent 14 years
LOC (6) Cl. 31 - *00*
U.S. Cl. D7—372



386,649

COOLER

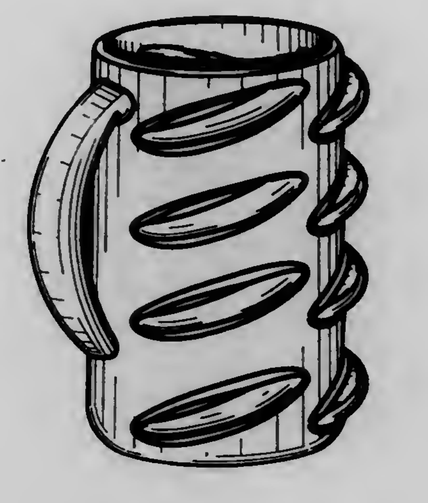
David A. Arnfelt, Waseca, Minn. 56093
Filed Sep. 17, 1996, Ser. No. 59,889
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—606



386,650

BOTTLE SLEEVE

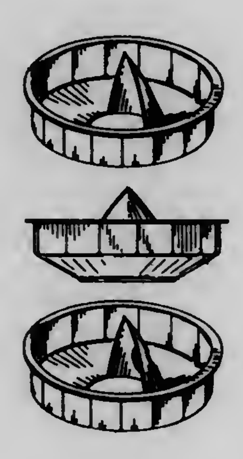
Tom B. Bennett, and Kevin Rausch, both of Wooster, Ohio, assignors to Rubbermaid Specialty Products Inc., Wooster, Ohio
Filed May 17, 1996, Ser. No. 54,664
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—624



386,651

TOOL FOR CORING AND CUTTING

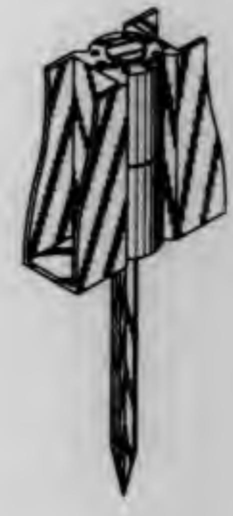
Chor Keung Chang, 19308 Homeway Ave., Cleveland, Ohio 44135
Filed Aug. 13, 1996, Ser. No. 58,602
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—693



386,652

LANDSCAPE TIMBER CONNECTING SYSTEM

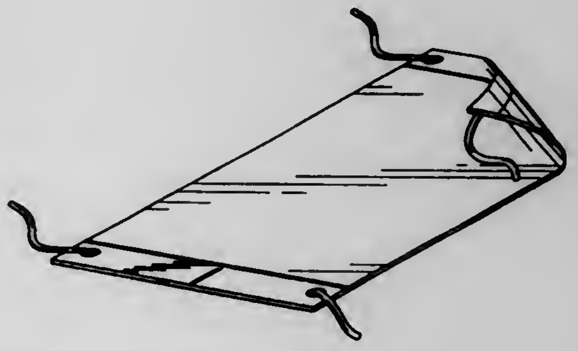
Peter Rimbeck, Cuyahoga County, and James Vidmar, Willoughby, both of Ohio, assignors to Hanover Catalog Holdings, Inc., Weehawken, N.J.
Filed Apr. 30, 1996, Ser. No. 53,771
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—1



386,653

PLANT PROTECTING TARP

Craig L. Brown, 7033 SW. 55th Ave., Portland, Oreg. 97219
Filed Aug. 21, 1996, Ser. No. 58,724
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—1



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386,654

ZIPPER BAG SEALING TOOL

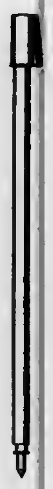
Michael Kosmyna, Toledo, Ohio, assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Dec. 6, 1995, Ser. No. 47,512

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—14



386,655

CHISEL BLADE

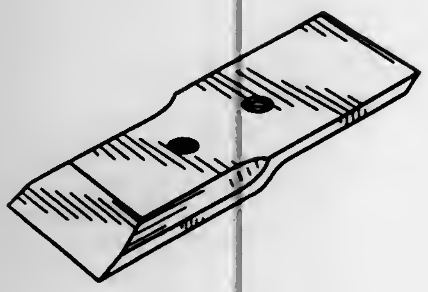
Steven E. Spirer, 91 Haworth Ave., N.J. 07641

Filed Jul. 30, 1996, Ser. No. 57,703

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—20



386,656

WRENCH EXTENSION

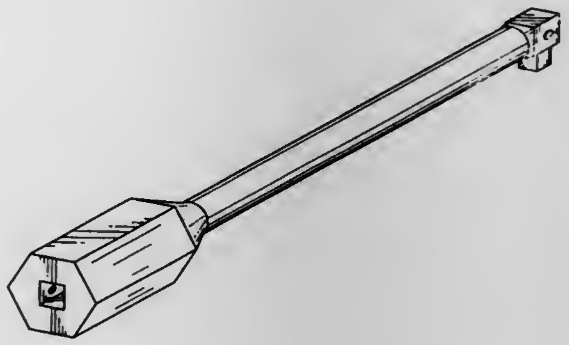
Bill Kyser, Rte. 2, Box 586, Greensboro, Ala. 36744

Filed Jun. 27, 1996, Ser. No. 56,374

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—21



386,657

CHISEL

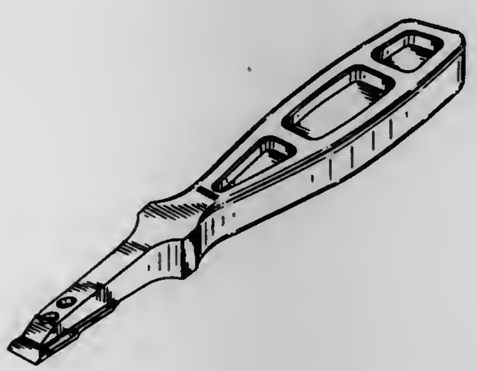
Steven E. Spirer, 91 Haworth Ave., N.J. 07641

Filed Jul. 30, 1996, Ser. No. 57,702

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—47



386,658

PLIERS

Conny Jansson, Enkoping; Hans Himbert; Håkan Bergqvist, both of Bromma, and Olle Bobjer, Spanga, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden

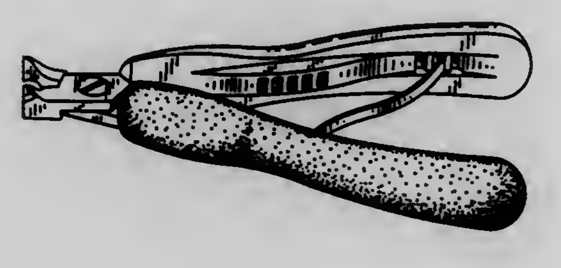
Division of Ser. No. 22,776, May 11, 1994, Pat. No. Des. 378,042. This application Aug. 8, 1996, Ser. No. 58,151

Claims priority, application Sweden, Nov. 11, 1993, 93-2538; Nov. 11, 1993, 93-2539; Nov. 11, 1993, 93-2540; Nov. 11, 1993, 93-2541; Nov. 11, 1993, 93-2542; Nov. 11, 1993, 93-2543

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—52



386,659

PLIERS

Conny Jansson, Enkoping; Hans Himbert; Håkan Bergqvist, both of Bromma, and Olle Bobjer, Spanga, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden

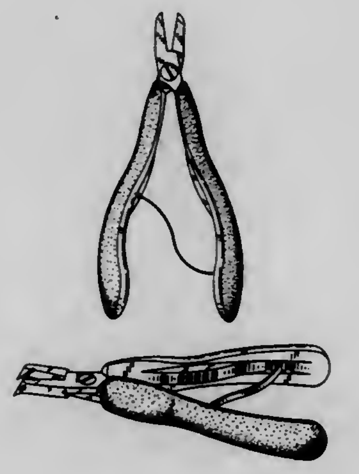
Division of Ser. No. 22,776, May 11, 1994, Pat. No. Des. 378,042. This application Aug. 8, 1996, Ser. No. 58,156

Claims priority, application Sweden, Nov. 11, 1993, 93-2538; Nov. 11, 1993, 93-2539; Nov. 11, 1993, 93-2540; Nov. 11, 1993, 93-2541; Nov. 11, 1993, 93-2542; Nov. 11, 1993, 93-2543

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—52



386,660

ELECTRIC CABLE CUTTER

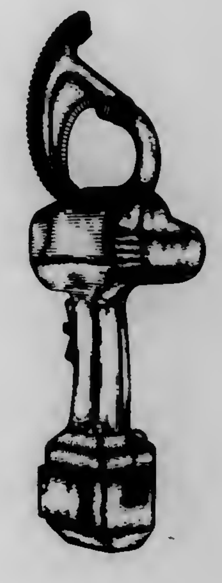
Shigeru Hirabayashi, Matsumoto, Japan, assignor to Izumi Products Company, Nagano ken, Japan

Filed May 20, 1996, Ser. No. 54,726

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—61



386,661

PORTABLE ELECTRO-HYDRAULIC CABLE CUTTER

Shigeru Hirabayashi, Nagano, and Tadashi Yasui, Kyoto, both of Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, and Izumi Products Company, Nagano, both of Japan

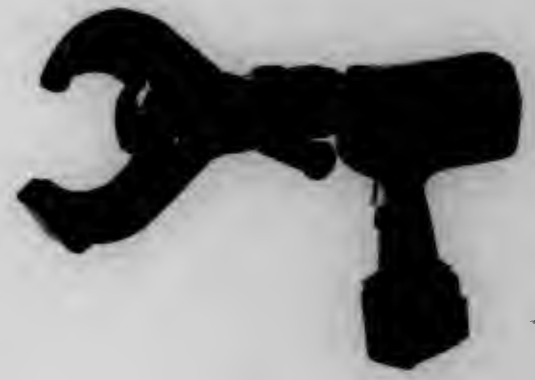
Filed Apr. 15, 1996, Ser. No. 53,119

Claims priority, application Japan, Oct. 13, 1995, 7-30682

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—68



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386,662

PORTABLE ELECTRIC SCREWDRIVER

Katsumi Tozawa; Naohiro Hayakawa; Norifumi Niwa, and Hiroshi Fujimoto, all of Anjo, Japan, assignors to Makita Corporation, Anjo, Japan

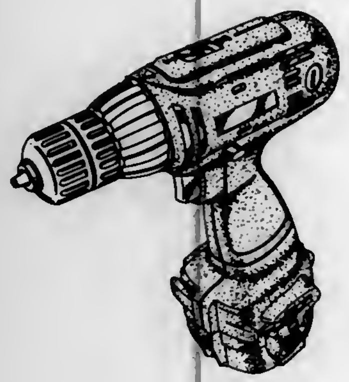
Filed Jul. 12, 1996, Ser. No. 56,979

Claims priority, application Japan, Jan. 16, 1996, 8-755; Jun. 19, 1996, 8-18349; Jun. 19, 1996, 8-18350

Term of patent 14 years

LOC (6) Cl. 08 - *04*

U.S. Cl. D8—68



386,663

VINYL SIDING CUTTER

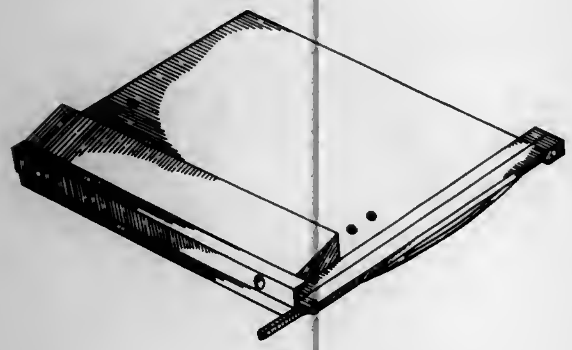
Gregory L. Kehres, R.R.1, Box 356A, and Harry R. Delaney, R.R. 1, Box 382E, both of Northumberland, Pa. 17857

Filed Aug. 29, 1996, Ser. No. 58,964

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—51



386,664

KNIFE GRIP

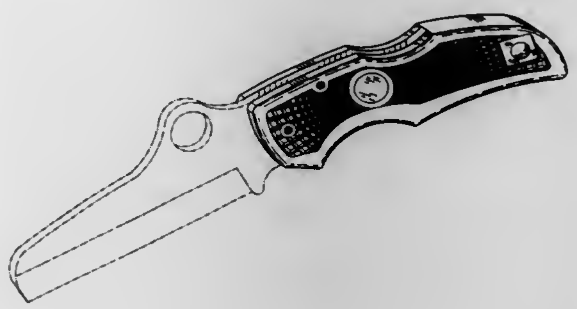
Louis S. Glesser, Golden, Colo., assignor to Spyderco, Inc., Golden, Colo.

Filed Apr. 29, 1996, Ser. No. 53,738

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—99



386,665

HANDLE

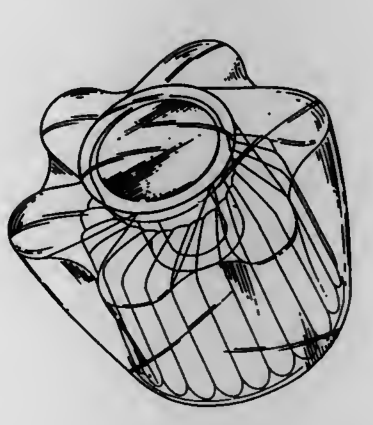
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.

Filed Sep. 22, 1995, Ser. No. 44,301

Term of patent 14 years

LOC (6) Cl. 08 - *06*

U.S. Cl. D8—307



386,666

ADJUSTABLE ENGINE, TRANSMISSION, DRIVE TRAIN AND FUEL CELL CRADLE SUPPORT

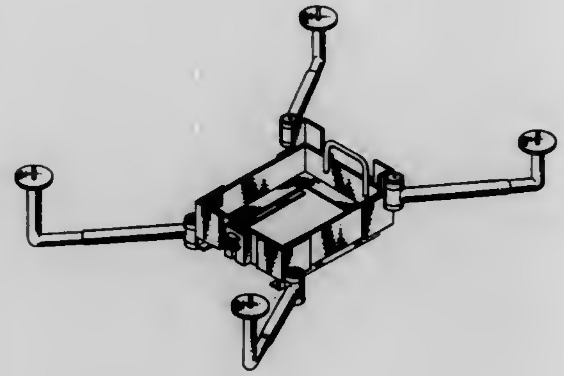
Douglas Hodges, 672 W. 12th St, Unit 4, San Pedro, Calif. 90731

Filed Feb. 22, 1995, Ser. No. 35,197

Term of patent 14 years

LOC (6) Cl. 02 - *01*

U.S. Cl. D8—349



386,667

FACEPLATE

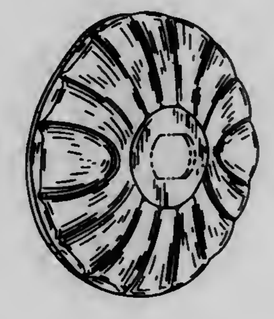
Rebecca J. Smith, Rockford, Ill., assignor to Newell Operating Company, Freeport, Ill.

Filed Mar. 8, 1996, Ser. No. 51,288

Term of patent 14 years

LOC (6) Cl. 11 - *05*

U.S. Cl. D8—352



386,668

CLOTHES HANGER

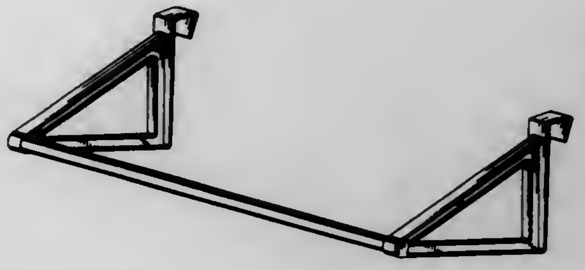
Richard B. Klein, Overland Park, and Chris Serslev, Leawood, both of Kans., assignors to Lynk, Inc., Shawnee Mission, Kans.

Filed Nov. 28, 1995, Ser. No. 47,145

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—376



386,669

MAGNETIC FASTENER

Yoshihiro Aoki, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan

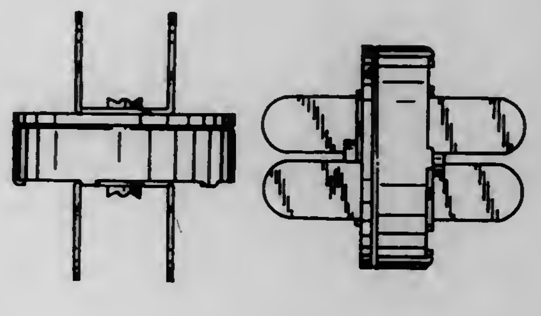
Filed Jan. 30, 1996, Ser. No. 49,768

Claims priority, application Japan, Aug. 3, 1995, 7-22788; Aug. 3, 1995, 7-22789

Term of patent 14 years

LOC (6) Cl. 08 - *08*

U.S. Cl. D8—382



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1204
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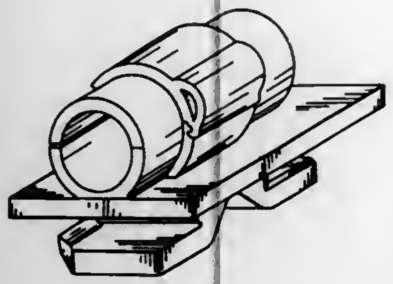
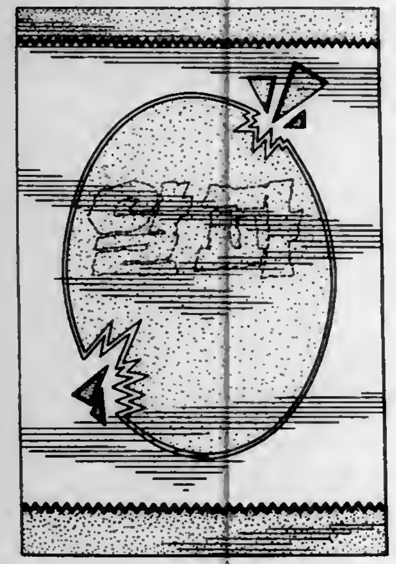
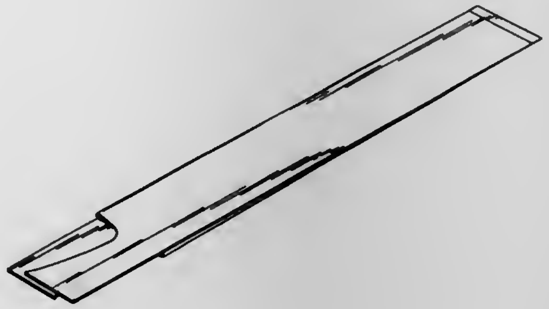
386,670
SUPPORT DEVICE FOR ELONGATE MEMBERS
Raymond John Phillips, Alton, United Kingdom, assignor to Speciality Holdings Limited, Tortolla, Virgin Islands (Br.)
Filed Jul. 19, 1996, Ser. No. 57,191
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D8—396



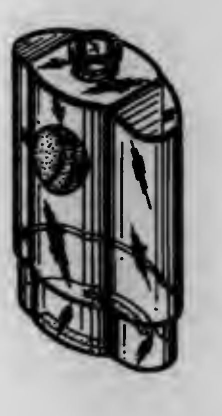
386,671
FLEXIBLE WRAPPER
Hyun Song Park, Kyungki-do, Rep. of Korea, assignor to Lotte Confectionery Co., Ltd., Rep. of Korea
Filed Aug. 1, 1995, Ser. No. 42,127
Term of patent 14 years
LOC (6) Cl. 09 - *05*
U.S. Cl. D9—305



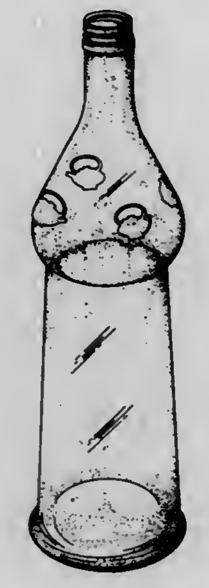
386,672
BAG
Garry Barlow, Tanbank, England, assignor to Poly-Lina Limited, Brimsdown, England
Filed Jan. 11, 1996, Ser. No. 48,833
Claims priority, application United Kingdom, Jul. 14, 1995, 2048822
Term of patent 14 years
LOC (6) Cl. 09 - *05*
U.S. Cl. D9—305



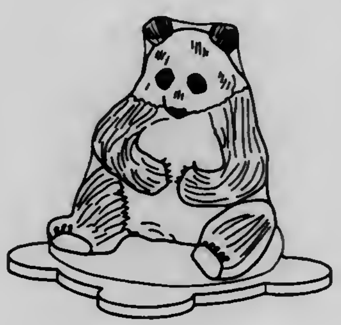
386,673
BOTTLE
Donald V. R. Thompson, Del Ray Beach, Fla., assignor to Newburgh Manufacturing Corp., Newburgh, N.Y.
Filed Jun. 17, 1996, Ser. No. 55,959
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—307



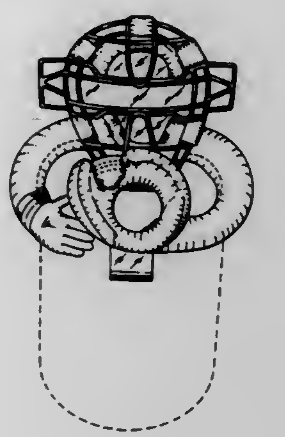
386,674
BOTTLE
Thomas L. Corcoran, and Christine Corday Schwartz, both of St. Louis, Mo., assignors to The Republic of Tea, Inc., Novato, Calif.
Filed Sep. 17, 1996, Ser. No. 59,894
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—307



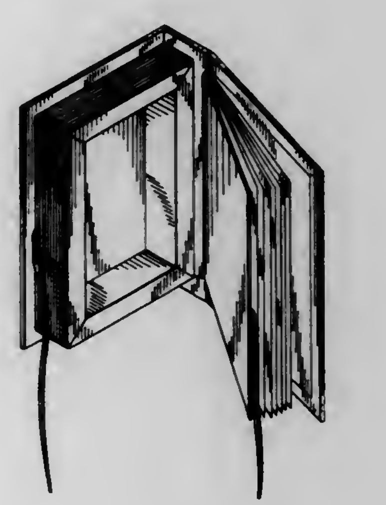
386,675
CONFECTION PACKAGE
Thomas W. Tolpin, 444 Dell La., Highland Park, Ill. 60035
Filed Dec. 4, 1995, Ser. No. 47,420
Term of patent 14 years
LOC (6) Cl. 01 - *01*
U.S. Cl. D9—310



386,676
CONTAINER ATTACHMENT
Gary Allen Hale, 51 Brook St., East Hartford, Conn. 06108
Filed Apr. 26, 1996, Ser. No. 53,665
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—316



386,677
BOX BOOK
Juliette Abiteboul, 59, boulevard des Invalides, 75007 Paris, France
Filed Mar. 27, 1995, Ser. No. 36,762
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—326



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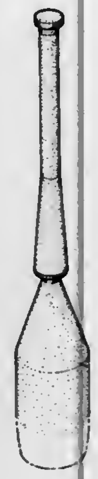
386,678

RECONFIGURABLE BOTTLE AND BAT

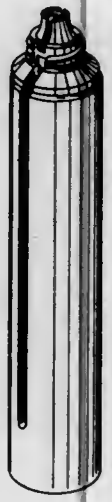
Brent A. Tyra, 14 Brush Creek Farms, Columbiana, Ala. 35051
Filed Jul. 25, 1996, Ser. No. 57,446
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—337



386,679

CONTAINER

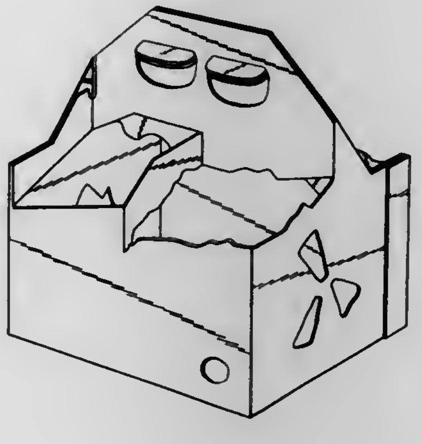
Ted L. Beaver, Roselle, Ill., assignor to Continental Plastic Containers, Inc., Norwalk, Conn.
Filed Nov. 27, 1995, Ser. No. 47,127
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—341



386,680

BOTTLE CARRIER

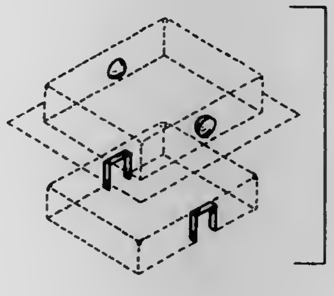
Jeffrey Johnson, Minneapolis, Minn., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Sep. 14, 1995, Ser. No. 43,962
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—346



386,681

SNAP CLOSURE FOR DISPLAY PACKAGE

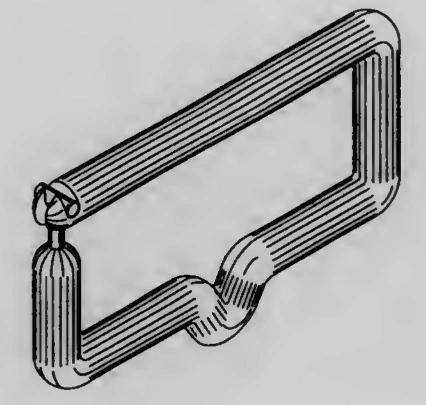
Vladimir Reil, 32405 Nautilus Dr., Rancho Palos Verdes, Calif. 90274
Filed Apr. 12, 1996, Ser. No. 52,770
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—434



386,682

BAG CARRYING AND ORGANIZING DEVICE

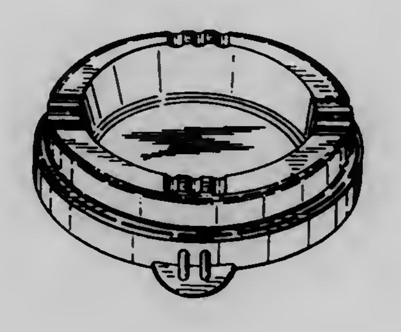
Nicholas C. Richardson, 5525 Southfield Dr., St. Louis, Mo. 63129; Mary L. Metcalf, and Ronald L. Metcalf, both of 9211 Alpine, St. Louis, Mo. 63123
Filed Sep. 23, 1996, Ser. No. 60,130
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—434



386,683

CLOSURE

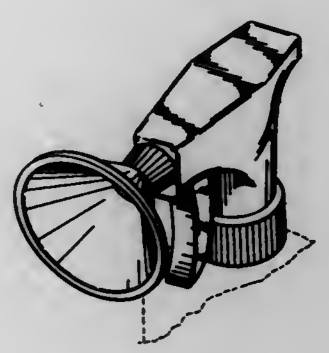
Koa Euan Wong, Box Hill, Australia, assignor to Bayly Design Associates Pty. Ltd., Victoria, Australia
Filed Jun. 15, 1995, Ser. No. 40,357
Claims priority, application Australia, Dec. 16, 1994, 4201/94
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—443



386,684

ANTISEPTIC SPRAY NOZZLE AND GUARD

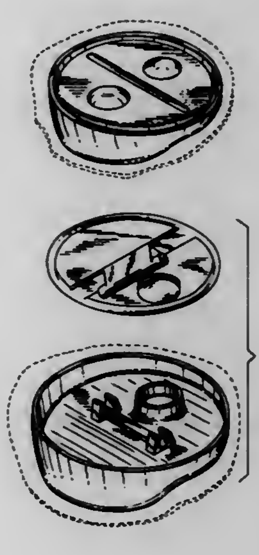
Joseph B. Marogil, 1720 Michigan N.E., Grand Rapids, Mich. 49503
Filed Jul. 16, 1996, Ser. No. 57,072
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—448



386,685

COVERED VENT

D. Scott Miller, Orlando, Fla., assignor to Dart Industries Inc., Orlando, Fla.
Filed Jul. 26, 1996, Ser. No. 57,557
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—449



VOL
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NO
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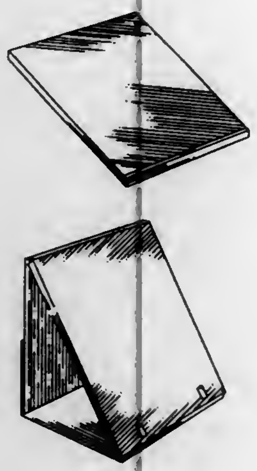
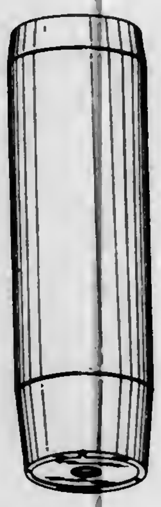
386,686
PAPERBOARD BOX THAT CONVERTS INTO A COPYHOLDER

Robert J. Alico, and Judith M. Alico, both of 808 Spindletree Ave., Naperville, Ill. 60565-2878
Filed Jul. 9, 1996, Ser. No. 56,804
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—433



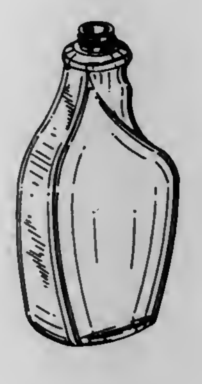
386,687
COMBINED BOTTLE, DISPENSING CLOSURE AND TRAVEL CAP

Timothy E. Fitten, Chaska, Minn.; Dieter F. Lay, Oconomowoc, Wis., and Thomas M. Bender, Reading, Pa., assignors to Redmond Products, Inc., Chanhassen, Minn.
Filed May 3, 1995, Ser. No. 38,332
The portion of the term of this patent subsequent to Nov. 18, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 09 - *1*
U.S. Cl. D9—504



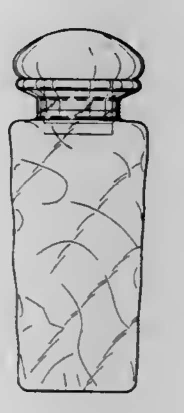
386,688
SPRAY BOTTLE

Russell Rowan Fenton, and Elmer (Chuck) H. Goss, both of East Amherst, N.Y., assignors to FWJ Plastics, Inc., Tonawanda, N.Y.
Filed Oct. 3, 1996, Ser. No. 60,675
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—543



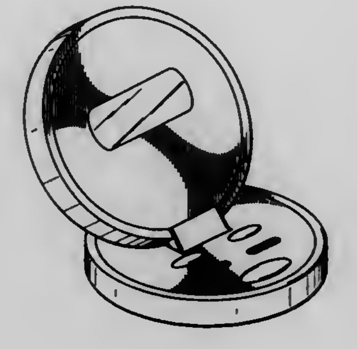
386,689
COMBINED BOTTLE AND STOPPER

Sam Schwartz, 21133 Superior St., Chatsworth, Calif. 91311
Filed Apr. 19, 1996, Ser. No. 53,300
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—546



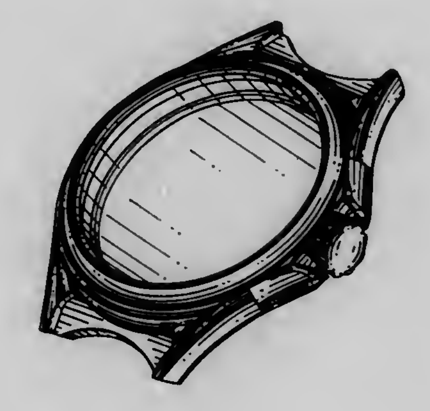
386,690
FOLDABLE CLOCK

Caroline Eiko Lewis, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.
Filed Feb. 28, 1996, Ser. No. 50,860
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—15



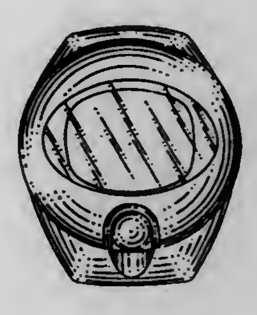
386,691
WATCH CASE

Martin Szekley, Paris, France, assignor to Titan Industries Limited, Bangalore, India
Filed Apr. 24, 1996, Ser. No. 53,539
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30



386,692
WATCH CASE

Toshiaki Kume, and Yoshimasa Shomura, both of Chiba, Japan, assignors to Seiko Instruments Inc., Japan
Filed May 6, 1996, Ser. No. 54,080
Claims priority, application Japan, Nov. 7, 1995, 7-33513; Dec. 6, 1995, 7-36850; Apr. 18, 1996, 8-11248; Apr. 18, 1996, 8-11249; Apr. 18, 1996, 8-11250
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30



386,693
CASING FOR A WATCH

Judith Reichel Riley, Goshen, Conn., assignor to Timex Corporation, Middlebury, Conn.
Filed May 3, 1996, Ser. No. 55,814
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30

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386,694

CASING FOR A DIGITAL WATCH

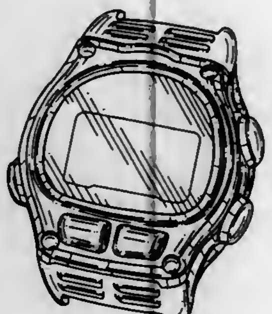
John T. Houlihan, Southbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 1, 1996, Ser. No. 56,460

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,695

WATCH BEZEL AND CASING

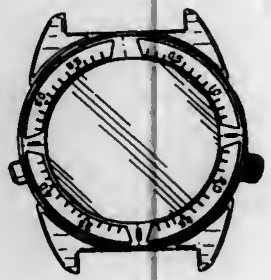
Daniel Lai Kong Sang, Ma On Shan, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 31, 1996, Ser. No. 57,783

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30



386,696

MULTIPIECE PLASTIC WRISTWATCH

Christophe Walch, St. Alban-Rheinweg 170, CH-4052 Basel, Switzerland

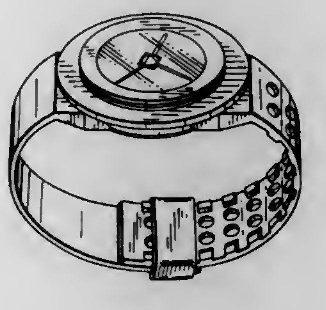
Filed Aug. 16, 1995, Ser. No. 42,655

Claims priority, application Denmark, Feb. 16, 1995, 4940024

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—32



386,697

WRISTWATCH

Severin S. Wunderman, South Laguna, Calif., assignor to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd), Lengnau, Switzerland

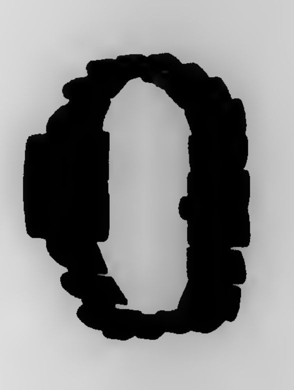
Filed Aug. 23, 1996, Ser. No. 58,798

Claims priority, application WIPO, Feb. 23, 1996, DMA/003237

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—32



386,698

WATCH

Barbara Giardiello, Naples, Italy, assignor to Artime SA, Neuchatel, Switzerland

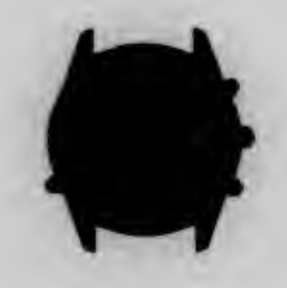
Filed Jun. 19, 1996, Ser. No. 55,997

Claims priority, application WIPO, Dec. 22, 1995, DMA/003186

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—39



386,699

BASE FOR COMPASS AND COMPASS

Erik Lindman, Espoo, Finland, assignor to Suunto Oy, Espoo, Finland

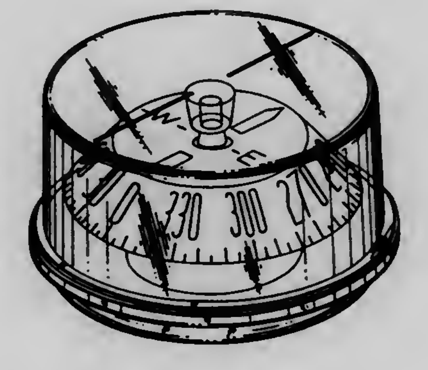
Filed Jul. 31, 1996, Ser. No. 57,789

Claims priority, application Finland, Jan. 31, 1996, 73/96

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—68



386,700

GAS SENSOR

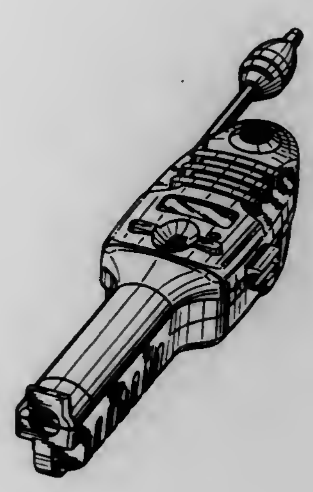
Daniel Casey Wright, Schaumburg, Ill., assignor to J & N Enterprises, Inc., Valparaiso, Ind.

Filed Jul. 26, 1996, Ser. No. 57,493

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—78



386,701

SCALE HOUSING

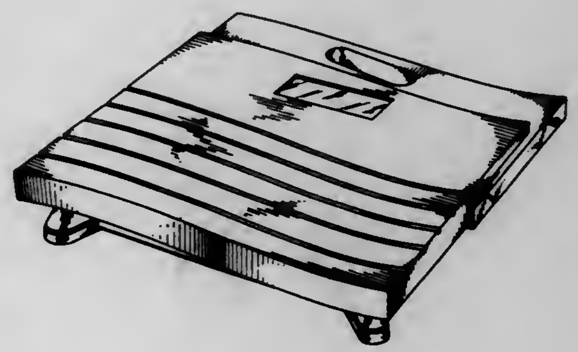
Phillip L. Brookshire, Cincinnati, and John Walther, Loveland, both of Ohio, assignors to Health o meter, Inc., Bridgeview, Ill.

Filed Jul. 19, 1996, Ser. No. 58,384

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—92



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386,702

FRAME FOR PRESSURIZED FLUID-OPERATING DEVICES

Shigekazu Nagai, and Koji Sugano, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

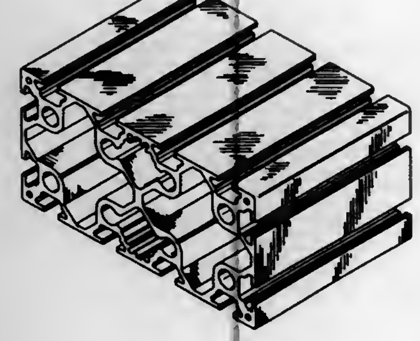
Filed Apr. 18, 1995, Ser. No. 37,755

Claims priority, application Japan, Oct. 19, 1994, 6-31726

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—94



386,703

BABY MONITOR RECEIVER

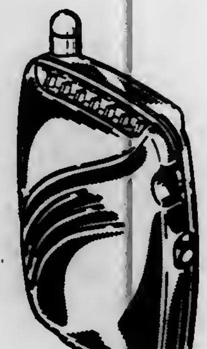
Ralph M. Nowak, Marblehead, Mass., assignor to The First Years Inc., Avon, Mass.

Filed Oct. 25, 1996, Ser. No. 61,512

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—104



386,704

ANTI-BURGLAR POCKET ALARM

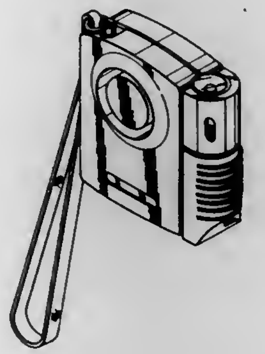
Gin-Sung Chang, No. 229-21, Kuang-Ming Rd., Chien-Chu Tsun, Wu-Jih Hsiang, Taichung Hsien, Taiwan

Filed Jun. 28, 1996, Ser. No. 56,446

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—106



386,705

COOLANT CONTAINER SAFETY CONE

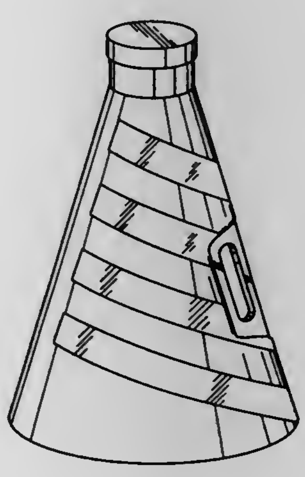
Edward D. Morgan, 144 New London Tpke., Wyoming, R.I. 02898

Filed Sep. 11, 1995, Ser. No. 43,695

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—113



386,706

RAISED PAVEMENT MARKER

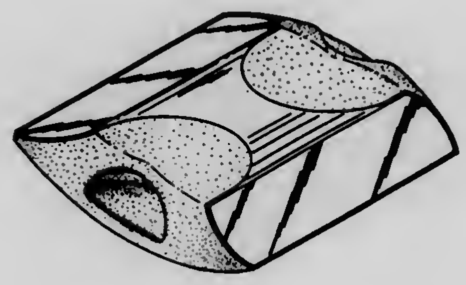
Sithya S. Khieu, Eden Prairie, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 39,172, May 19, 1995, abandoned. This application May 14, 1996, Ser. No. 54,447

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—113



386,707

BEZEL FOR A WATCH

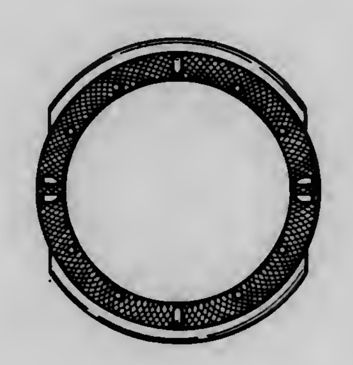
Moon K. Woo, Palisades Park, N.J., and Desmond Fung, Jubilee Garden, Hong Kong, assignors to Timex Corporation, Middlebury, Conn.

Filed May 20, 1996, Ser. No. 54,724

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—128



386,708

BEZEL RING FOR A WATCH

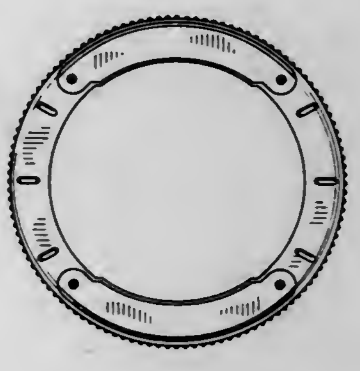
Daniel Lai Kong Sang, Shatin, Hong Kong, assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 3, 1996, Ser. No. 56,597

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—128



386,709

NECKLACE

Christiane Pandel, Chambesy, Switzerland, assignor to Rolex Watch U.S.A., Inc., New York, N.Y.

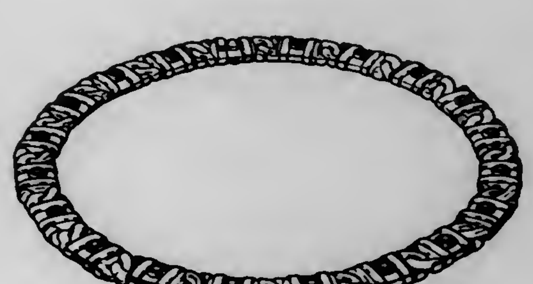
Filed Jul. 25, 1996, Ser. No. 57,457

Claims priority, application Switzerland, Apr. 17, 1996, 123222

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—3



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386,710

WATCH BRACELET

Christiane Pandel, Chambesy, Switzerland, assignor to Rolex Watch U.S.A., Inc., New York, N.Y.

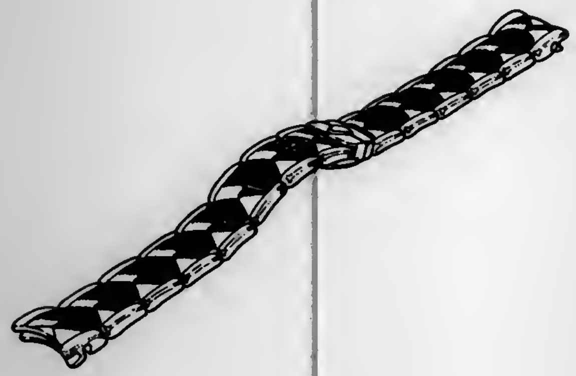
Filed Jul. 25, 1996, Ser. No. 57,458

Claims priority, application Switzerland, Apr. 17, 1996, 123222

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—24



386,711

EARRING

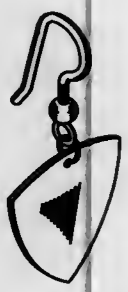
Randy P. Matye, 6102 Ridge Vale, San Antonio, Tex. 78250

Division of Ser. No. 32,655, Dec. 22, 1994, Pat. No. Des. 380,978. This application Sep. 19, 1995, Ser. No. 44,178

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—44



386,712

JEWELRY SETTING

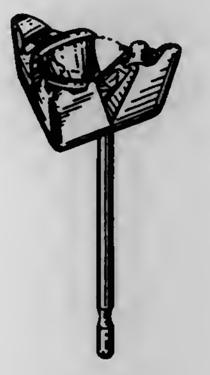
Joi Frankel, c/o Designs by Joi Frankel, Inc., 104 E. 35th St., Suite 2c, New York, N.Y. 10016, and Gary Sherman, c/o Gemstar, Inc., 20 Parkgate Dr., Edison, N.J. 08820

Filed Aug. 28, 1996, Ser. No. 58,926

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—91



386,713

JEWELRY SETTING

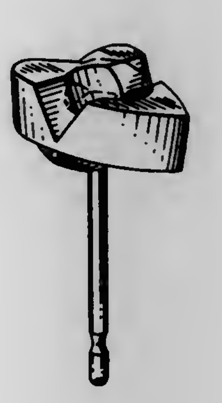
Joi Frankel, c/o Designs by Joi Frankel, Inc., 104 E. 35th St., Suite 2c, New York, N.Y. 10016, and Gary Sherman, c/o Gemstar, Inc., 20 Parkgate Dr., Edison, N.J. 08820

Filed Aug. 28, 1996, Ser. No. 58,927

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—91



386,714

FANCIFUL CROSS

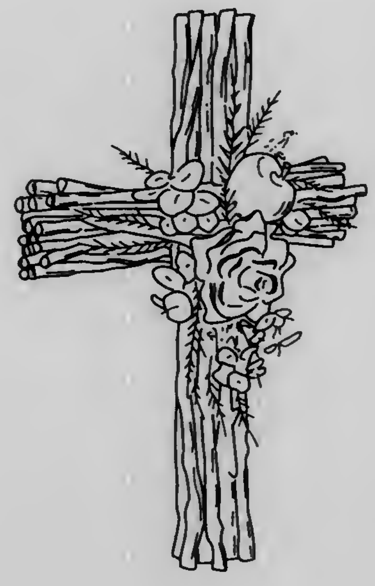
Ronald A. Ritter, 833A S. Main, #122, Fallbrook, Calif. 92028

Filed Mar. 12, 1996, Ser. No. 47,429

Term of patent 14 years

LOC (6) Cl. 11 - *99*

U.S. Cl. D11—121



386,715

MULTILOBED BOUQUET HOLDER

Kimberley D. J. Graham, and Gene A. Duguay, both of 2317 North Rice Lake Road, R.R. #6, Peterborough, Ontario, Canada, K9J 6X7

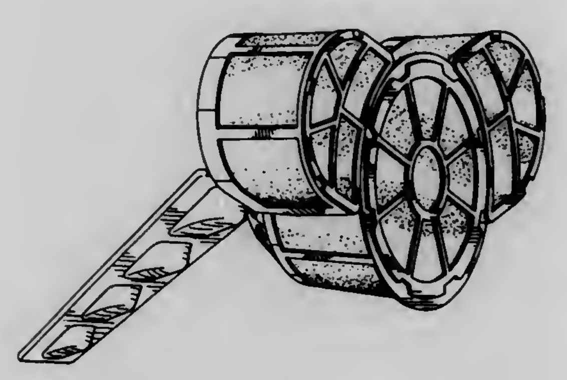
Filed Mar. 22, 1996, Ser. No. 52,098

Claims priority, application Canada, Sep. 22, 1995, 1995-2119

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—143



386,716

FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc.

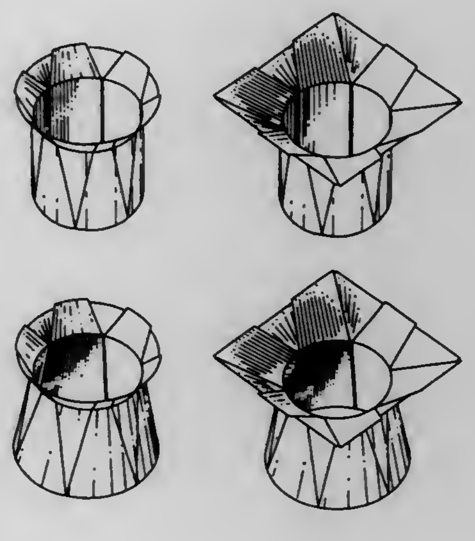
Division of Ser. No. 3,582, Jan. 8, 1993, Pat. No. Des. 364,586, which is a continuation-in-part of Ser. No. 808,315, Dec. 16, 1991, Pat. No. Des. 365,505, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Nov. 7, 1995, Ser. No. 46,124

The portion of the term of this patent subsequent to Dec. 19, 2009, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—164



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386,717
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc., not individually, but as trustee of The Family Trust U/T/A dated December 8, 1995, Charles A. Codding, Authorized Signatory for Southpac Trust International, Inc. trustee

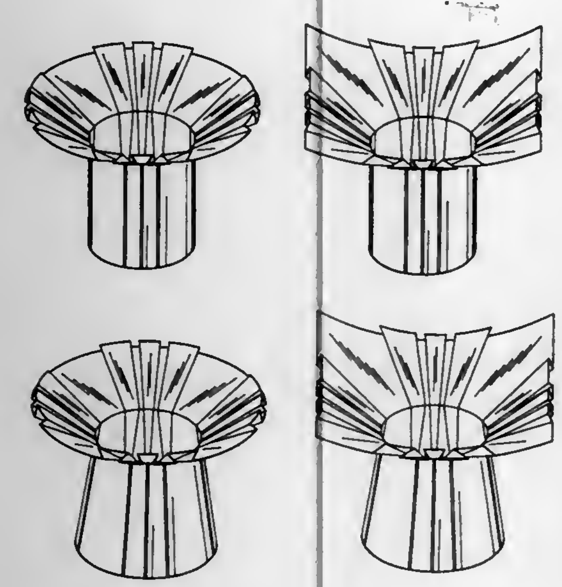
Division of Ser. No. 3,340, Jan. 5, 1993, Pat. No. Des. 371,519, which is a continuation-in-part of Ser. No. 808,560, Dec. 16, 1991, Pat. No. Des. 358,566, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application May 3, 1996, Ser. No. 55,813

The portion of the term of this patent subsequent to Nov. 29, 2008, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—164



386,718
FLOWER POT COVER

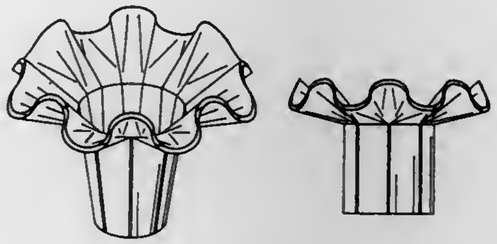
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc., Oklahoma City, Okla., not individually, but as trustee of The Family Trust U/T/A dated Dec. 8, 1995, Charles Codding, Authorized Signatory for Southpac Trust International, Inc., Trustee

Division of Ser. No. 3,685, Jan. 13, 1993, Pat. No. Des. 373,746, which is a continuation-in-part of Ser. No. 808,547, Dec. 16, 1991, Pat. No. Des. 360,388, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jun. 25, 1996, Ser. No. 56,206

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—164



386,719
BOW

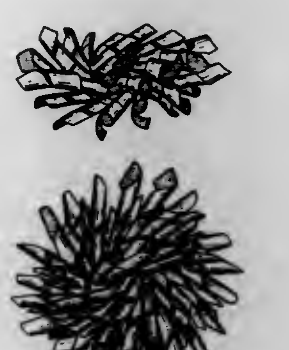
Kui-Eng Cheng, 99 Glencairn Street, Toronto, Ontario, Canada, M4R 1M7

Filed Feb. 21, 1996, Ser. No. 50,511

Term of patent 14 years

LOC (6) Cl. 11 - *05*

U.S. Cl. D11—184



386,720
SLIDE FASTENER SLIDER

Iwao Yaguramaki, Namerikawa, Japan, assignor to YKK Corporation, Tokyo, Japan

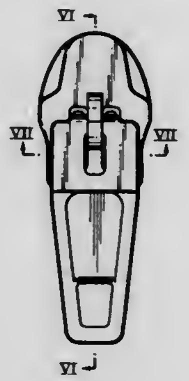
Filed Sep. 16, 1996, Ser. No. 59,779

Claims priority, application Japan, Mar. 15, 1996, 8-7132

Term of patent 14 years

LOC (6) Cl. 02 - *07*

U.S. Cl. D11—221



386,721
SNOWMOBILE TRACK

Serge A. Bedard, Valcourt, Canada, assignor to Bombardier Inc., Montreal, Canada

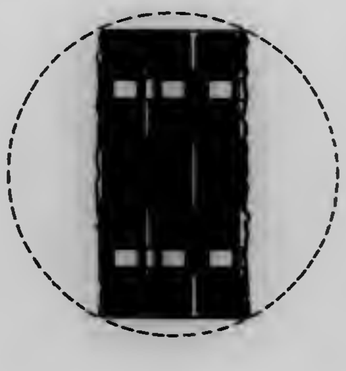
Continuation-in-part of Ser. No. 32,817, Dec. 29, 1994. This application Jan. 4, 1996, Ser. No. 48,578

The portion of the term of this patent subsequent to Jul. 1, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 12 - *14*

U.S. Cl. D12—7



386,722
TRUCK BODY

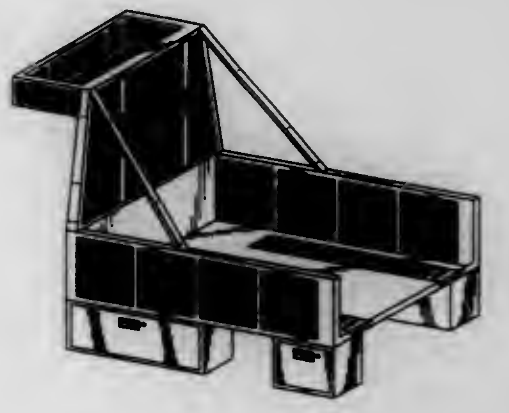
Scott Dunphy, P.O. Box 392, Island Falls, Me. 04747

Filed Jul. 25, 1996, Ser. No. 57,486

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—93



386,723
MOTORBIKE

Yoshiaki Fujieda, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Hamamatsu, Japan

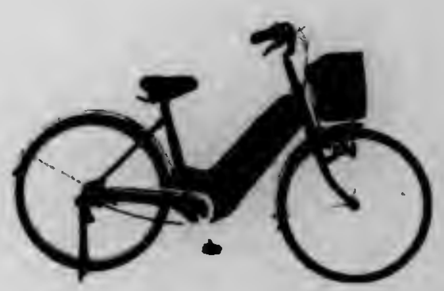
Filed Mar. 14, 1996, Ser. No. 51,593

Claims priority, application Japan, Jun. 10, 1995, 7-30052

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—110



386,724

BICYCLE

William Affolter, Courfaivre, Switzerland, assignor to Condor S.A., Switzerland

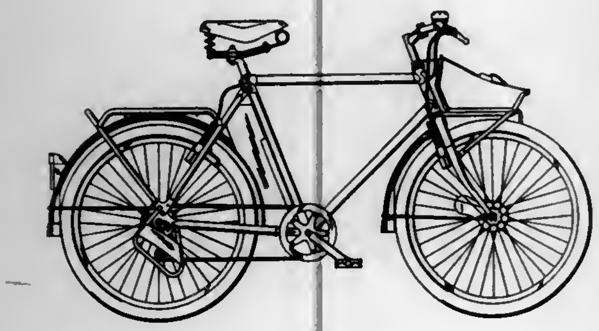
Filed Dec. 29, 1993, Ser. No. 16,928

Claims priority, application WIPO, Jun. 29, 1993, DM/026527

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—111



386,725

AUTOMOBILE TIRE

Shoichiro Matsuda; Sadakazu Takei, both of Hiratsuka; Hiroshi Tokizaki, and Izumi Kuramochi, both of Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

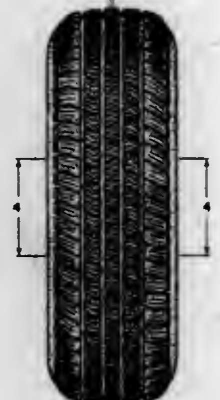
Filed Jan. 30, 1996, Ser. No. 49,744

Claims priority, application Japan, Aug. 31, 1995, 7-25197

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,726

TIRE TREAD

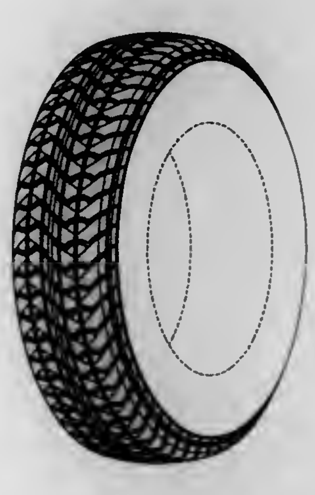
John Steven Attinello, Hartville, Ohio, and Kevin Alan Reid, Asheville, N.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 29, 1996, Ser. No. 50,898

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,727

AUTOMOBILE TIRE

Sonoko Sugimoto, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

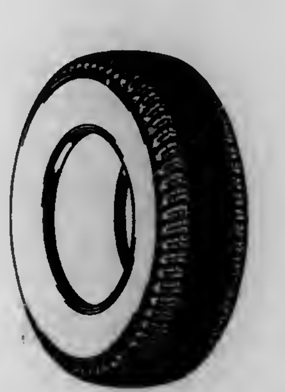
Filed May 15, 1996, Ser. No. 54,507

Claims priority, application Japan, Nov. 15, 1995, 7-34632

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,728

PNEUMATIC TIRE FOR VEHICLES

Taek-Gyun Jeong, Kwangju, Rep. of Korea, assignor to Kumho & Co., Inc., Seoul, Rep. of Korea

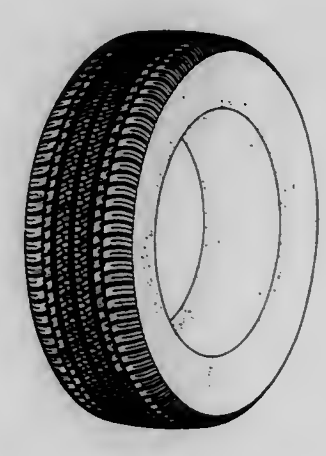
Filed Jun. 12, 1996, Ser. No. 55,749

Claims priority, application Rep. of Korea, Mar. 20, 1996, 4883

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,729

AUTOMOBILE TIRE

Yasuo Himuro, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

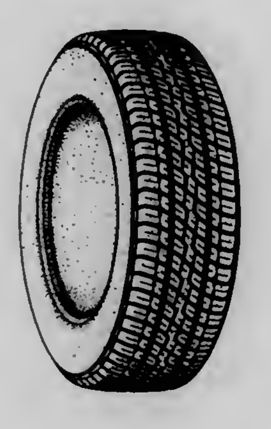
Filed Aug. 27, 1996, Ser. No. 58,887

Claims priority, application Japan, Mar. 5, 1996, 8-6008

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,730

TIRE TREAD

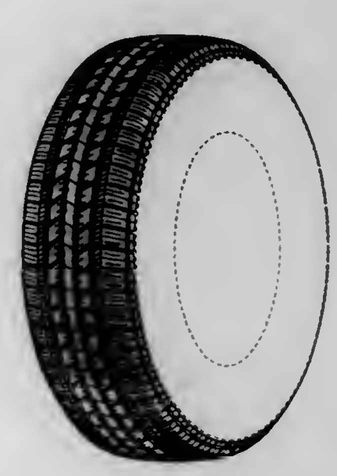
David Ray Hubbell, Jr., Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 49,102, Jan. 17, 1996. This application Nov. 6, 1996, Ser. No. 62,031

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



386,731

TIRE TREAD

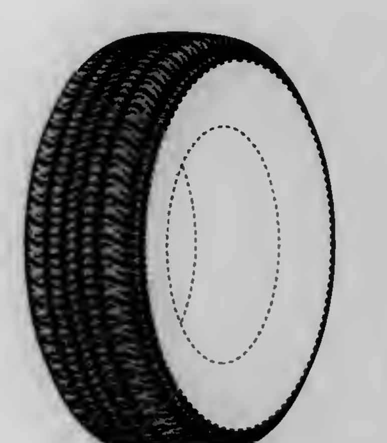
John Steven Attinello, Hartville; John Kotanides, Jr., Canton, and Samuel Patrick Landers, Uniontown, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 2, 1996, Ser. No. 62,890

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147



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386,732
TRACTION TIRE

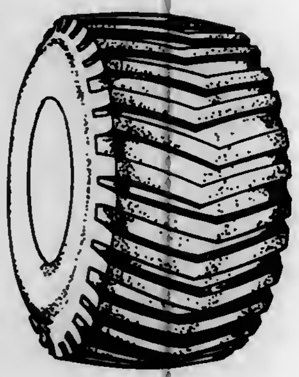
Michael L. Green, St. Louis, Mo., assignor to Tire Mart, Inc., St. Louis, Mo.

Filed Oct. 23, 1995, Ser. No. 45,513

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—151



386,733
BOAT FENDER

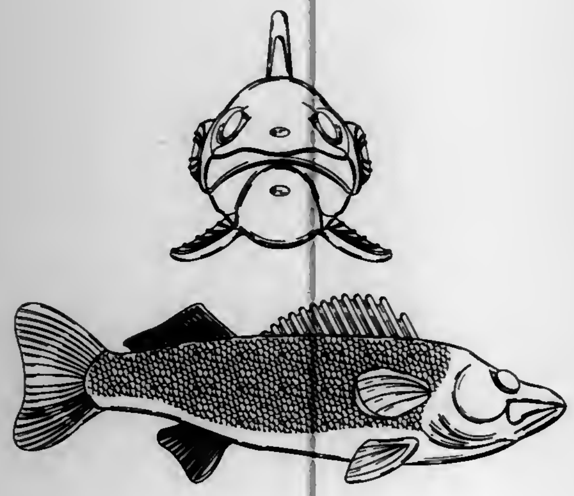
James P. Rossman, and Robert F. Selthofner, both of Elk River, Minn., assignors to Docks Edge, Inc., Elk River, Minn.

Filed Sep. 30, 1994, Ser. No. 30,163

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—168



386,734
BRAKE LEVER FOR A BICYCLE

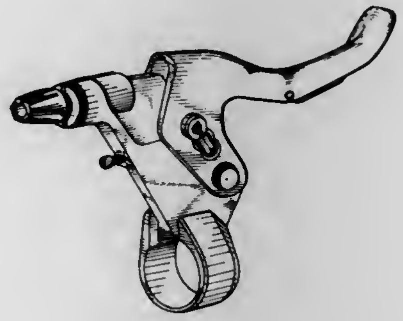
Tomohiko Nishimura, Osaka, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Jul. 2, 1996, Ser. No. 56,549

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—179



386,735
SIDE VENT FRAME

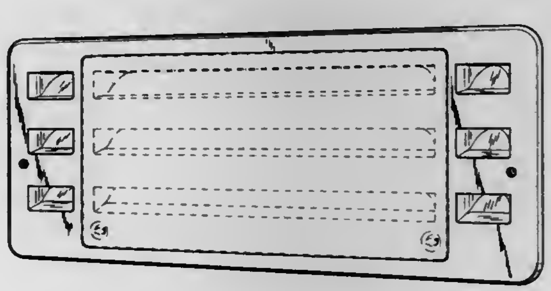
Jerry Krueger, Connersville, and Patrick McConnell, Goshen, both of Ind., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 6, 1996, Ser. No. 54,106

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—190



386,736
DECORATIVE FENDER MOLDING

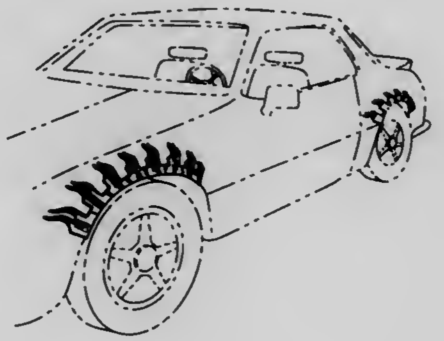
Theodore Madison, 540 W. 55th St. #6L, New York, N.Y. 10019

Filed Dec. 17, 1996, Ser. No. 63,834

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—190



386,737
FRONT END EXTERIOR SURFACE FOR VEHICLES

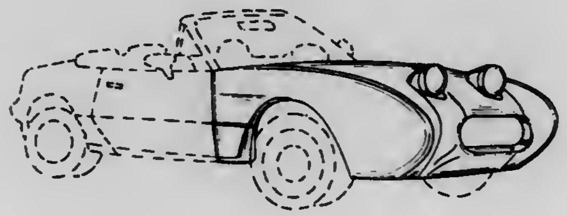
Frederick G. Feik, 4964 County Rd. 19, Maple Plain, Minn. 55359

Filed Jun. 6, 1996, Ser. No. 55,500

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—196



386,738
WHEEL COVER

David P. Doyle, Mission Viejo, Calif., assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 23, 1995, Ser. No. 43,036

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209

386,739
FRONT FACE OF A VEHICLE WHEEL

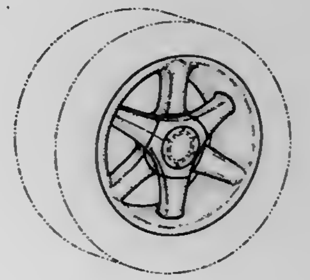
Marco Muzzarelli, Milan, and Giuseppe Amati, Varese, both of Italy, assignors to Claus Ettensberger Corporation, Gardena, Calif.

Filed May 24, 1996, Ser. No. 54,945

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



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VEHICLE WHEEL FRONT FACE

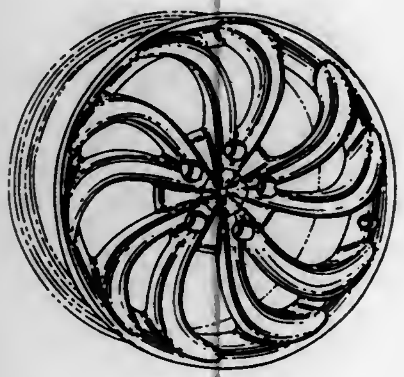
Murray S. Cullen, Irvine, Calif., assignor to Mobile Hi-Tech Wheels, Torrance, Calif.

Filed Nov. 4, 1996, Ser. No. 61,967

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



386,741

STORAGE UNIT

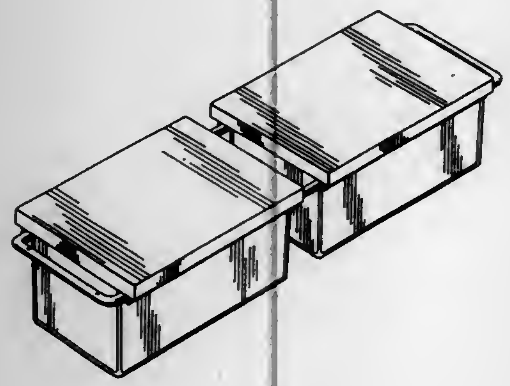
Mark A. Semak, 21 Harbour Drive, Stoney Creek, Ontario, Canada, L8G 3X5

Filed Oct. 18, 1994, Ser. No. 29,882

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—425



386,742

BATTERY PACK FOR A PORTABLE COMMUNICATIONS DEVICE

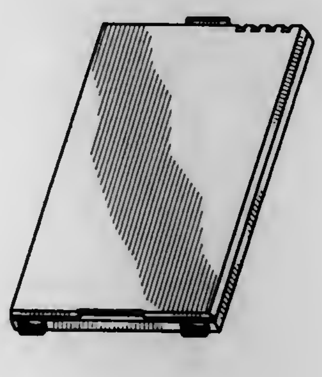
Willard F. Amero, Jr., Flowery Branch, and Steven L. Hassenzahl, Doraville, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 20, 1996, Ser. No. 54,728

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—103



386,743

BATTERY FOR A MOBILE PHONE

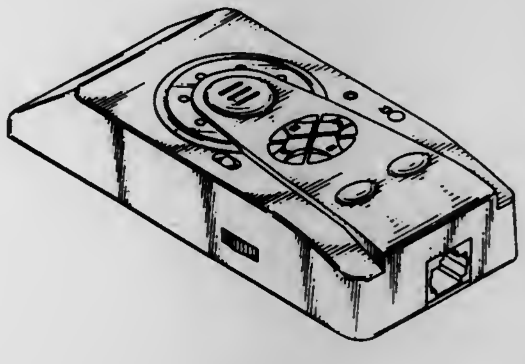
Li-ho Yao, 4th Fl., No. 99-4, Tungan St., Taipei, Taiwan

Filed Jul. 15, 1996, Ser. No. 57,019

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—103



386,744

MOTOR

Jean-Jacques Urvoy, Paris, France, assignor to Meccano, S.A., Calais, France

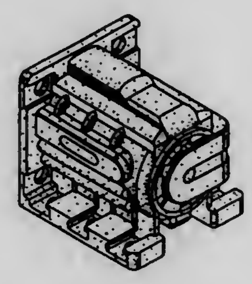
Filed Mar. 1, 1996, Ser. No. 51,000

Claims priority, application WIPO, Oct. 2, 1995, D12220

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—112



386,745

QUICK RELEASE OUTBOARD BATTERY CLASP FOR A COMPACT WIRELESS TELEPHONE

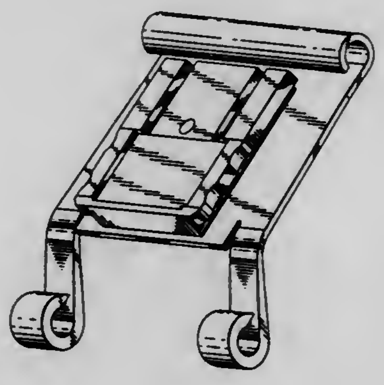
Daniel E. Kobylarz, Bloomington; Barry Voroba, Minnetonka, and Steven Maser, Hinckley, all of Minn., assignors to MicroTalk Technologies, Inc., Minnetonka, Minn.

Filed Jun. 20, 1994, Ser. No. 24,738

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—119



386,746

PULSE MODULATED MID-FREQUENCY CURRENT GENERATOR

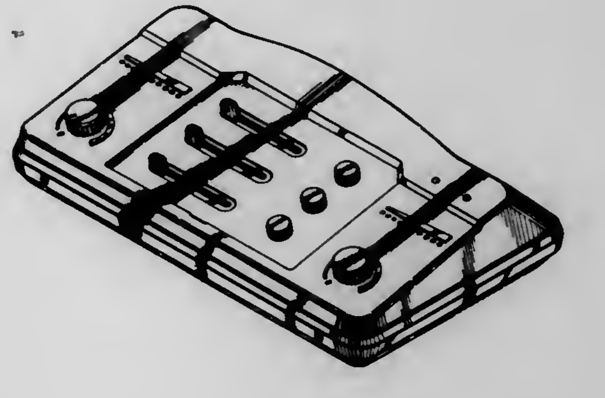
Shou-Mei Su, 1 3rd Floor, No. 193, Sec. 1, Tun-Hwa, South Road, Taipei, Taiwan

Filed Aug. 12, 1996, Ser. No. 58,353

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—123



386,747

SWITCH FOR A POWER MECHANISM

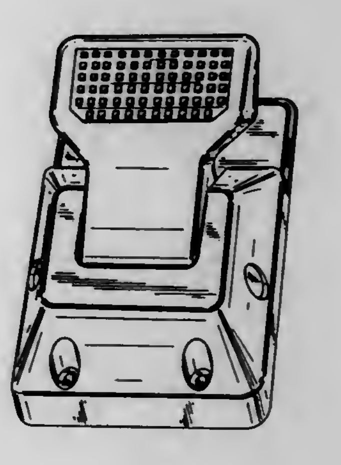
Robert P. Welsh, 913 Farmstead Rd., Hunt Valley, Md. 21030

Filed Mar. 1, 1996, Ser. No. 51,853

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—167



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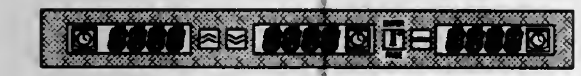
386,748
HOLDING CABINET CONTROL PANEL FACE

Anthony W. Arnold, Nashville; Steve Collins, Estill Springs; Jack Johnson, Nashville; Jeff Williams, Nolensville; John Cox, Brentwood; John Guthrie, and Tom McMillan, both of Nashville, all of Tenn., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 27, 1996, Ser. No. 56,333
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—177

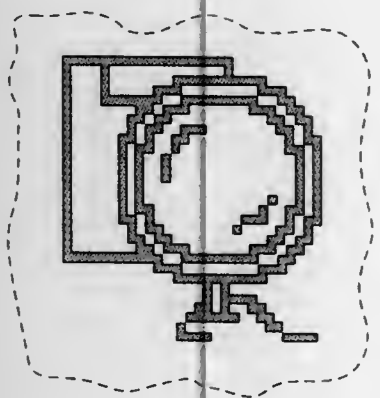


386,749
"SELECT FUNCTION" ICON FOR A DISPLAY SCREEN

Hitoshi Sakazume, Musashino, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 4, 1990, Ser. No. 592,902
Term of patent 14 years
LOC (6) Cl. 14 - *99*

U.S. Cl. D14—114.3

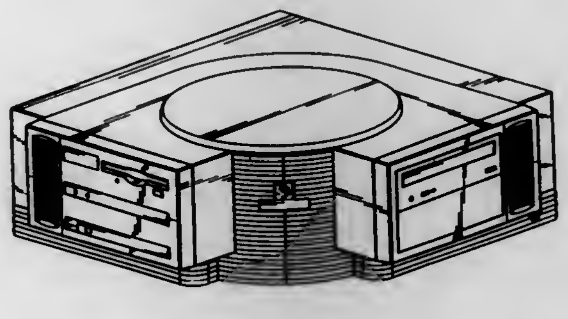


386,750
DESKTOP COMPUTER

Hartmut H. Esslinger, Los Gatos; Mark Friesen, Palo Alto, and Gadi Amit, Mountain View, all of Calif., assignors to Packard Bell Electronics, Inc., Westlake Village, Calif.

Filed Jun. 1, 1995, Ser. No. 39,624
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100

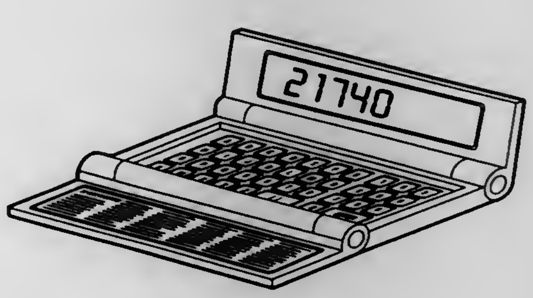


386,751
ELECTRONIC ZIP CODE DIRECTORY

Leslie Shannon Michael, III, 420 Brookline Ave., Hagerstown, Md. 21740

Filed Mar. 15, 1996, Ser. No. 51,726
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100

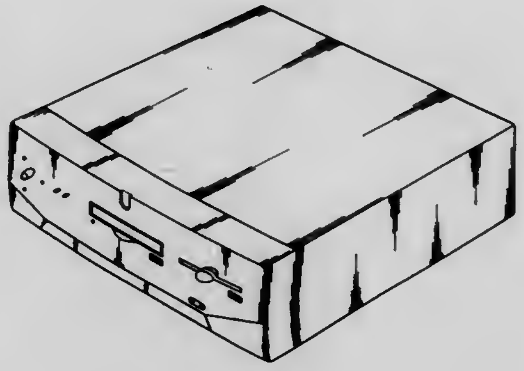


386,752
PERSONAL COMPUTER UNIT

Seung-Hyun Han, Incheon, Rep. of Korea, assignor to Daewoo Telecom Ltd., Incheon, Rep. of Korea

Filed Aug. 9, 1996, Ser. No. 58,242
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100

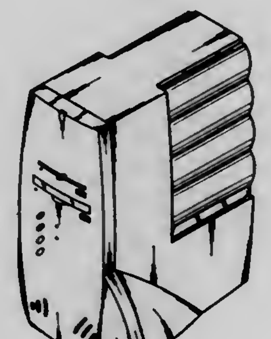


386,753
PERSONAL COMPUTER UNIT

In-Seok Han, Incheon, Rep. of Korea, assignor to Daewoo Telecom, Ltd., Incheon, Rep. of Korea

Filed Aug. 9, 1996, Ser. No. 58,241
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100

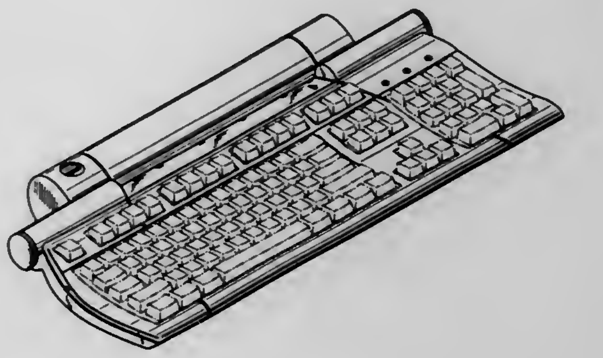


386,754
INTEGRATED DOCUMENT SCANNER AND KEYBOARD

Michael F. Gifford, San Jose; Michael S. Dann, Palo Alto; Stephen Peart, and Peter Schmidt, both of Campbell, all of Calif., assignors to Visioneer, Inc., Fremont, Calif.

Filed Jun. 13, 1996, Ser. No. 55,840
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—107

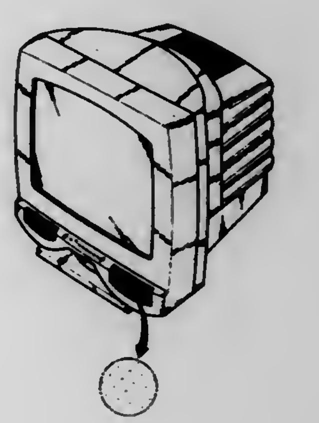


386,755
MONITOR FOR USE WITH A COMPUTER SYSTEM

Cheol-Ho Lee, Incheon, Rep. of Korea, assignor to Daewoo Telecom Ltd., Incheon, Rep. of Korea

Filed Aug. 9, 1996, Ser. No. 58,239
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—113



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386,756

COMPUTER KEYBOARD

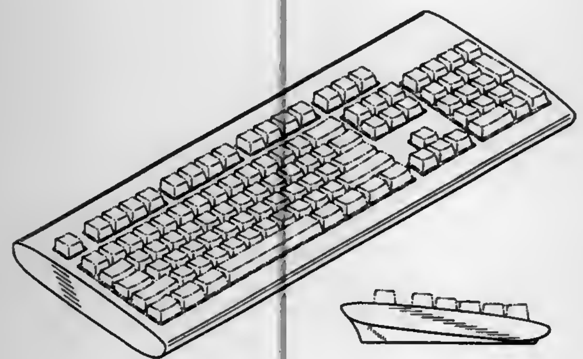
Herbert Kraus, Cypress, and Paul Eugene Bradley, Woodside, both of Calif., assignors to Alps Electric (U.S.A.), Inc., San Jose, Calif.

Filed Mar. 25, 1996, Ser. No. 52,173

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—115



386,757

PORTABLE RADIO COMMUNICATION DEVICE

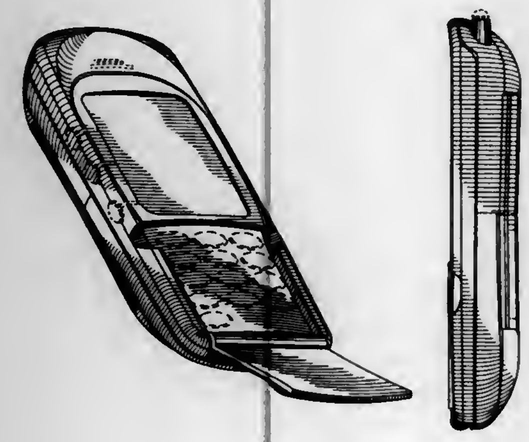
Daryl R. Harris, Evanston; Daniel L. Williams, Vernon Hills, and Albert L. Nagele, Wilmette, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1996, Ser. No. 51,573

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—138



386,758

TELEPHONE HANDSET AND CRADLE

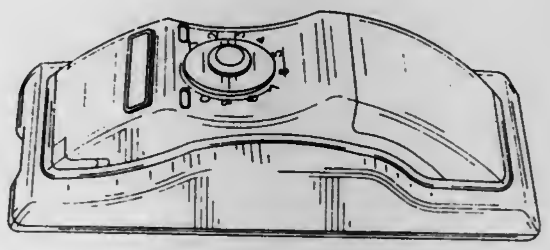
James E. Wicks, Tarrytown, N.Y., assignor to Sony Corporation, Tokyo, Japan, and Sony Corporation of America, New York, N.Y.

Filed Oct. 3, 1995, Ser. No. 44,926

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—150



386,759

TELEPHONE

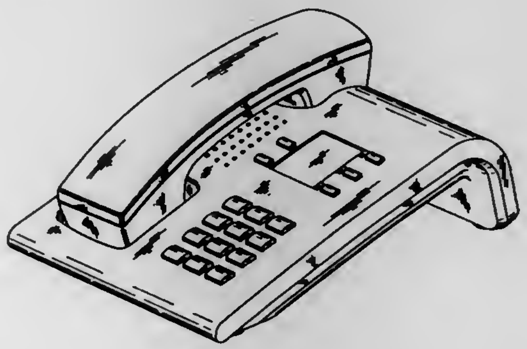
Erich C. Elkins, San Francisco, Calif.; Wayne E. McKinnon, Georgetown, Tex.; David E. Bryant, Austin, Tex.; Mary E. Kingsbury, Dallas, Tex.; Dong A. Erwin, Austin, Tex., and William C. McRight, Round Rock, Tex., assignors to Siemens Business Communication Systems, Iselin, N.J.

Division of Ser. No. 40,255, Jun. 2, 1995, Pat. No. Des. 374,667. This application Aug. 19, 1996, Ser. No. 62,962

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—151



386,760

CD-ROM JUKEBOX

Rolf Stuhler, Wiesbaden, Germany, assignor to NSM Jukebox GmbH, Bingen, Germany

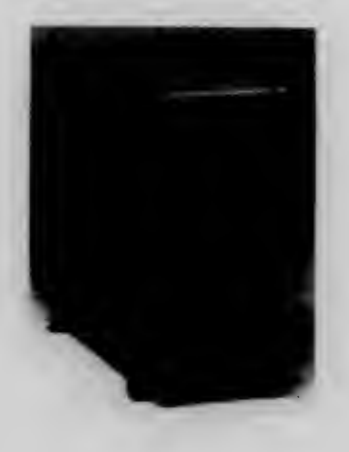
Filed Dec. 15, 1995, Ser. No. 47,954

Claims priority, application Germany, Jun. 16, 1995, 95 04 951.7

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—173



386,761

AUDIO AMPLIFIER

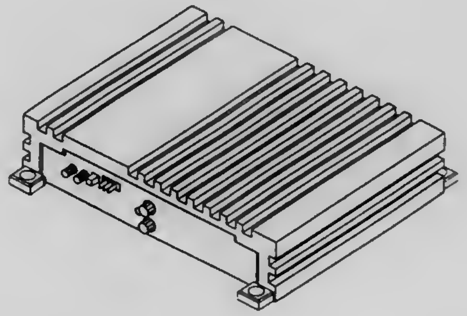
John Pleitz, Tempe, Ariz., assignor to Mitek Corporation, Phoenix, Ariz.

Filed Mar. 31, 1995, Ser. No. 36,985

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—188



386,762

AM/FM TRANSISTOR RADIO

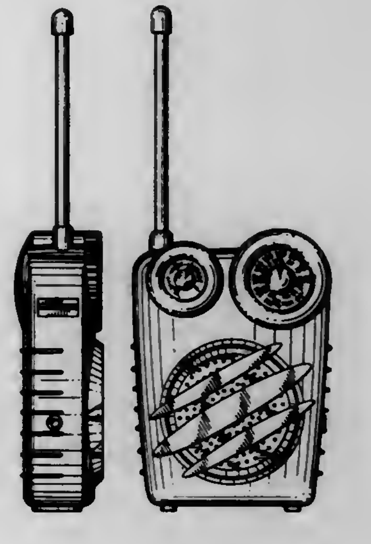
Marc H. Segan, New York; Gary Strauss, Mamaroneck, both of N.Y.; Gerald W. Cummings, Marlton, N.J.; Vint Gonser, Essex, Mass., and Paul Santarisiero, Avon, Conn., assignors to Long Hall Technologies, L.L.C., New York, N.Y.

Filed Aug. 5, 1996, Ser. No. 57,964

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—194



386,763

REMOTE CONTROL UNIT

Philippe Starck, Issy-les-Moulineaux, France, assignor to Thomson Consumer Electronics, Courbevoie, France

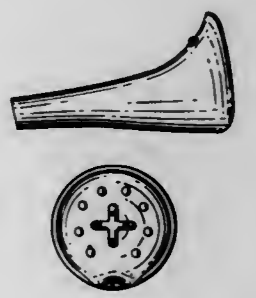
Division of Ser. No. 32,427, Dec. 19, 1994. This application Mar. 25, 1996, Ser. No. 52,179

Claims priority, application France, Jun. 30, 1994, 94 3844

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—218



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MICROPHONE

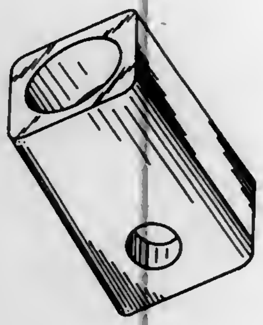
Thomas Lake, Eagan, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Apr. 17, 1996, Ser. No. 53,220

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—225



386,765

EAR CUSHION FOR TELEPHONES

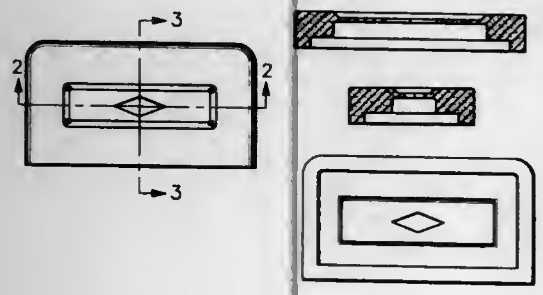
Ronald Brito, P.O. Box 309, San Dimas, Calif. 91773

Filed Mar. 11, 1996, Ser. No. 51,430

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—249



386,766

HOLDER FOR MOBILE TELEPHONE IN VEHICLE

Ebbe Johansson, Karlsborg, Sweden, assignor to Brodit Plast AB, Karlsborg, Sweden

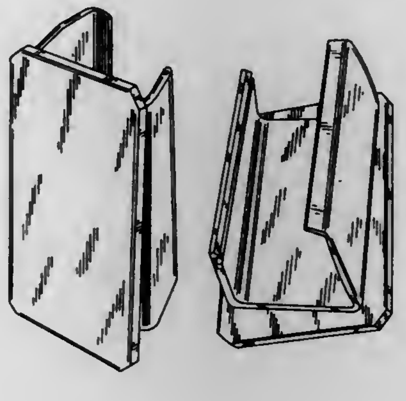
Filed Sep. 25, 1995, Ser. No. 44,467

Claims priority, application Sweden, Jun. 2, 1995, 95-1131

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—253



386,767

CONTROL HEAD FOR A MOBILE RADIO

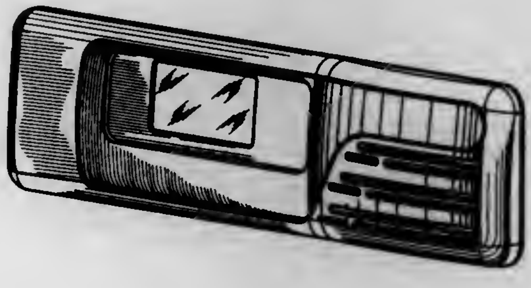
Masaru Tokiyama, Coral Springs, and Glen A. Oross, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 51,300, Mar. 4, 1996. This application Mar. 4, 1997, Ser. No. 67,158

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—258



386,768

BRUSH CUTTER

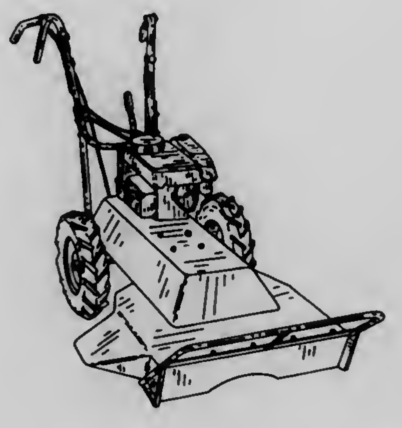
Robert M. Rubin, Lenexa, Kans.; Gerald K. Lauer, Kansas City, and Holland A. Mertell, Independence, both of Mo., assignors to Billy Goat Industries, Inc., Lee's Summit, Mo.

Filed Apr. 26, 1995, Ser. No. 38,016

Term of patent 14 years

LOC (6) Cl. 15 - *03*

U.S. Cl. D15—12



386,769

COMBINED TRACTOR AND TRUCK VEHICLE

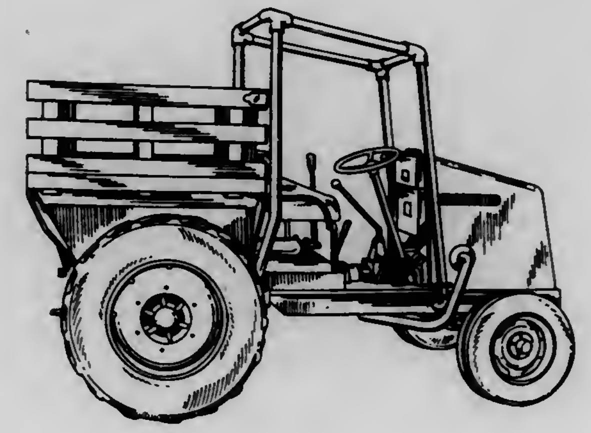
Robert A. Gibbons, 75 Converse Rd., Marion, Mass. 02738

Filed Feb. 12, 1996, Ser. No. 50,237

Term of patent 14 years

LOC (6) Cl. 15 - *03*

U.S. Cl. D15—23



386,770

BINOCULARS

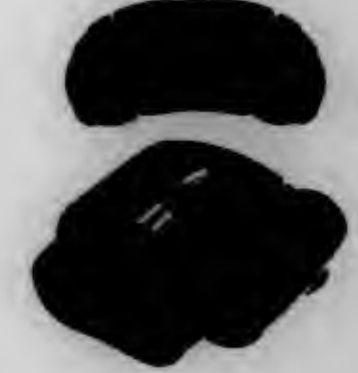
Shoko Ryuen, Ichikawa, and Ken Moro, Yokosuka, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 5, 1996, Ser. No. 49,923

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—133



386,771

VIDEO CAMERA WITH VIDEO TAPE RECORDER

Naofumi Sekine, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

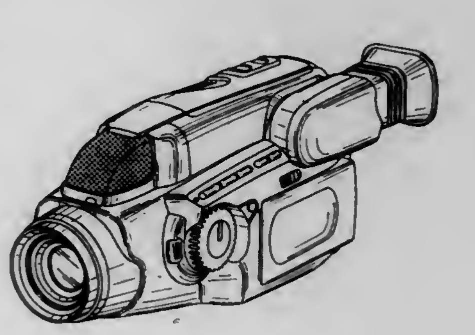
Filed Aug. 6, 1996, Ser. No. 58,019

Claims priority, application Japan, Feb. 8, 1996, 8-3131

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—202



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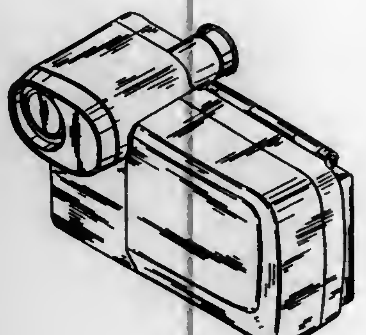
386,772

COMBINED VIDEO TAPE RECORDER AND CAMERA

Tetsu Kataoka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 36,697, Mar. 24, 1995, Pat. No. Des. 374,880. This application Sep. 25, 1996, Ser. No. 60,243
Term of patent 14 years
LOC (6) Cl. 16 - *01*

U.S. Cl. D16—202

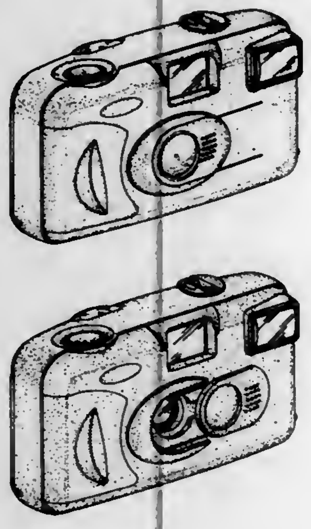


386,773

CAMERA WITH MOVABLE LENS COVER

Gary Kenneth Smithborne, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 2, 1996, Ser. No. 57,911
Term of patent 14 years
LOC (6) Cl. 16 - *01*

U.S. Cl. D16—209



386,774

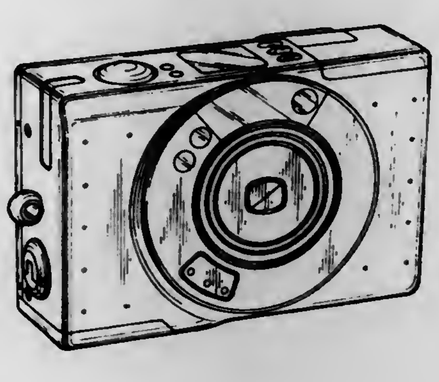
Patent Not Issued For This Number

386,775

CAMERA

Yasushi Shiotani, Hayama-machi, and Masakazu Taku, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo
Filed Jun. 25, 1996, Ser. No. 56,201
Claims priority, application Japan, Dec. 27, 1995, 7-39365
Term of patent 14 years
LOC (6) Cl. 16 - *01*

U.S. Cl. D16—218

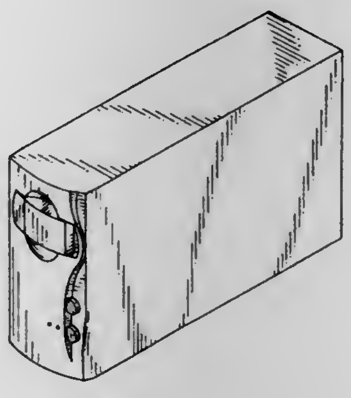


386,776

FILM SCANNER

Katsumi Hirabayashi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 19, 1996, Ser. No. 57,199
Claims priority, application Japan, Jan. 22, 1996, 8-1246
Term of patent 14 years
LOC (6) Cl. 16 - *04*

U.S. Cl. D16—246

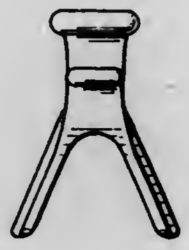


386,777

EYEWEAR FRAME NOSEPIECE

James Hall, Lincoln, R.I.; Raoul Desy, Sturbridge, and John E. Salce, Auburn, both of Mass., assignors to Cabot Safety Intermediate Corporation, Southbridge, Mass.
Filed May 2, 1996, Ser. No. 54,495
Term of patent 14 years
LOC (6) Cl. 16 - *06*

U.S. Cl. D16—332

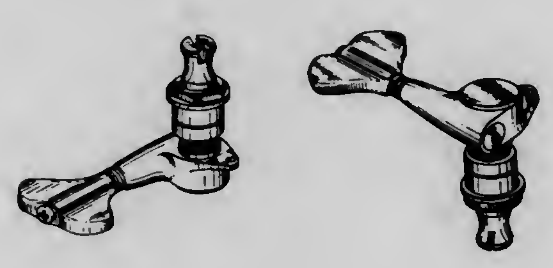


386,778

PEG OF A STRINGED INSTRUMENT

Takao Goto, Gunma-ken, Japan, assignor to Gotoh Gut Yugen Kaisha, Isezaki, Japan
Filed Jul. 29, 1996, Ser. No. 57,578
Claims priority, application Japan, Jan. 29, 1996, HE1SE18-1588; Jan. 29, 1996, HE1SE18-1589
Term of patent 14 years
LOC (6) Cl. 17 - *03*

U.S. Cl. D17—20

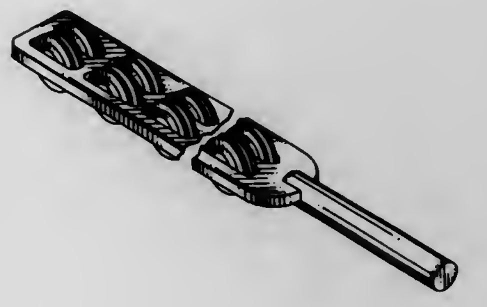


386,779

PADDLE TAMBOURINE

Ruben Burgos, 13908 Matanzas Dr., Fort Meyers, Fla. 33905
Division of Ser. No. 33,068, Jan. 4, 1995, Pat. No. Des. 371,156. This application Jun. 21, 1996, Ser. No. 56,079
Term of patent 14 years
LOC (6) Cl. 17 - *04*

U.S. Cl. D17—22

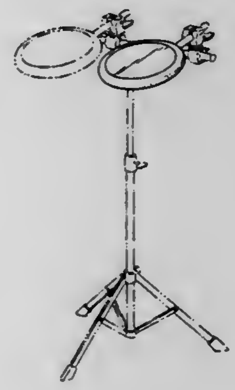


386,780

PAD FOR ELECTRONIC DRUM

Masaharu Ohno, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Sep. 4, 1996, Ser. No. 59,154
Claims priority, application Japan, Mar. 11, 1996, 8-6587
Term of patent 14 years
LOC (6) Cl. 17 - *04*

U.S. Cl. D17—22



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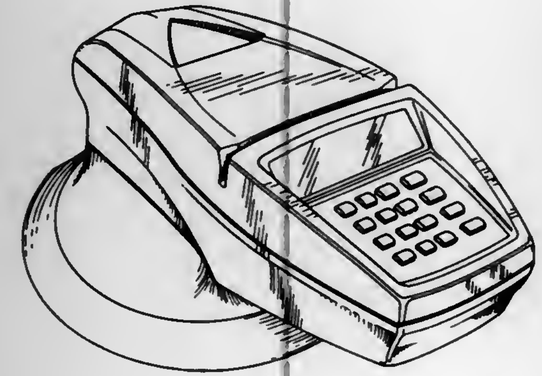
386,781
TRANSACTION TERMINAL CONSOLE AND SWIVEL STAND

Jeffrey Karl Sasaki, Redwood City, Calif., assignor to Verifone Inc., Redwood City, Calif.

Filed Jul. 23, 1996, Ser. No. 57,340
Term of patent 14 years
LOC (6) Cl. 08 - *01*

U.S. Cl. D18—4

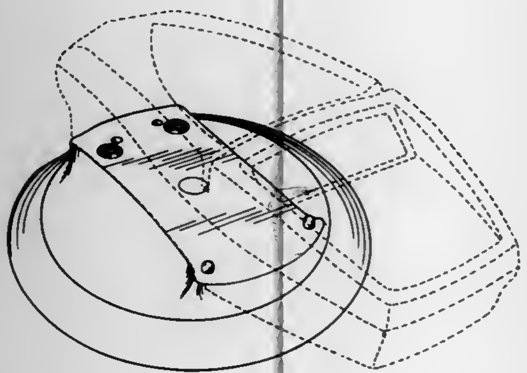


386,782
SWIVEL STAND FOR TRANSACTION TERMINAL CONSOLE

Jeffrey Karl Sasaki, Redwood City, Calif., assignor to Verifone Inc., Redwood City, Calif.

Filed Jul. 23, 1996, Ser. No. 57,341
Term of patent 14 years
LOC (6) Cl. 18 - *01*

U.S. Cl. D18—4

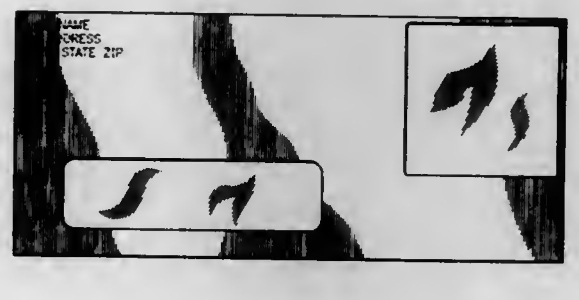


386,783
STAMPLESS ENVELOPE

Salim G. Kara, Houston, Tex., assignor to E-Stamp Corporation, Houston, Tex.

Division of Ser. No. 39,328, May 24, 1995. This application Aug. 5, 1996, Ser. No. 57,916
Term of patent 14 years
LOC (6) Cl. 19 - *01*

U.S. Cl. D19—3

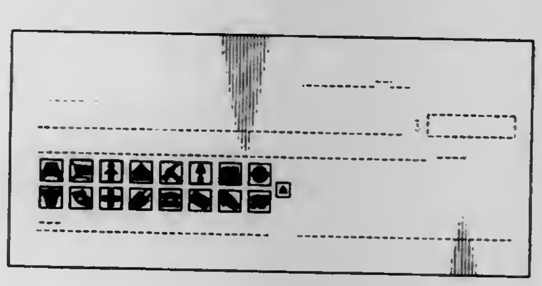


386,784
BANK CHECK

Todd M. Kunkler, 9530 E. Imperial Hwy., Suite F, Downey, Calif. 90242

Continuation-in-part of Ser. No. 20,420, Mar. 25, 1994, Pat. No. Des. 365,598. This application Dec. 21, 1995, Ser. No. 48,179
Term of patent 14 years
LOC (6) Cl. 19 - *08*

U.S. Cl. D19—11

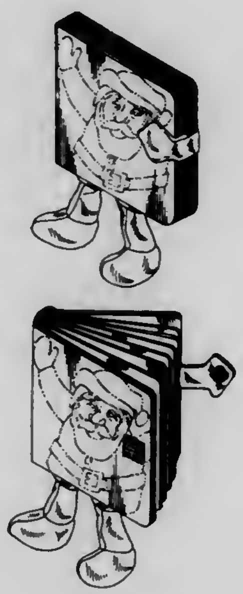


386,785
BOARD BOOK WITH FLEXIBLE EXTREMITIES

William N. Derraugh, Weston, Conn., assignor to Printlink Publishers, Inc., Monroe, Conn.

Filed Sep. 16, 1996, Ser. No. 59,757
Term of patent 14 years
LOC (6) Cl. 19 - *04*

U.S. Cl. D19—30

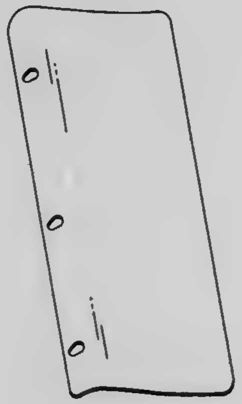


386,786
SHEET LIFTER FOR A RING BINDER

Billy D. Henderson, Crawfordsville, Ind., assignor to Plastics Innovations, Inc., Crawfordsville, Ind.

Filed Jan. 29, 1996, Ser. No. 49,706
Term of patent 14 years
LOC (6) Cl. 19 - *04*

U.S. Cl. D19—32

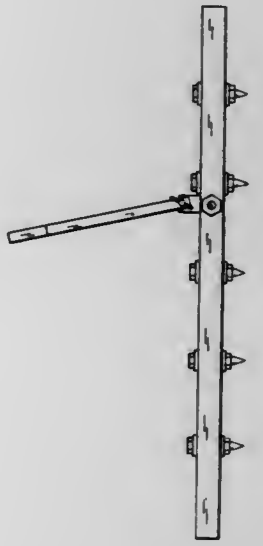


386,787
WALL MARKING DEVICE

James J. Quinlan, Rte. #2, Box 3434, Miles City, Mont. 59301, and **John A. Yonkaitis**, 1905 S. Idaho, Butte, Mont. 59701

Filed Jun. 6, 1996, Ser. No. 55,494
Term of patent 14 years
LOC (6) Cl. 19 - *06*

U.S. Cl. D19—36

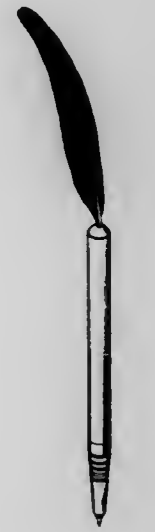


386,788
GOOSE-QUILL PEN

Chen Shui-Shang, P.O. Box 55-175, Taichung, Taiwan

Filed Sep. 12, 1996, Ser. No. 59,493
Term of patent 14 years
LOC (6) Cl. 19 - *06*

U.S. Cl. D19—42



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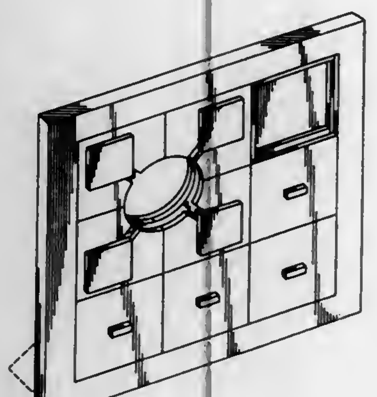
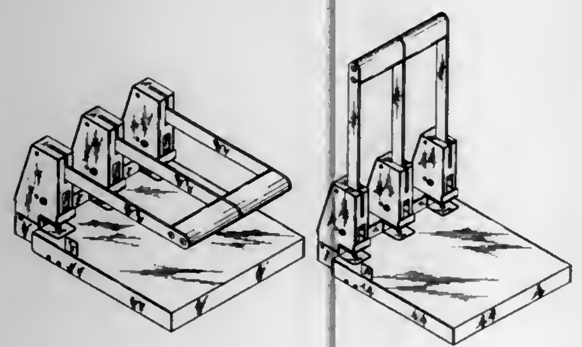
386,789
EDUCATIONAL TOY

James Edmund Willis, 10537 Music St., Newbury, Ohio 44065
Filed Sep. 30, 1996, Ser. No. 60,481
Term of patent 14 years
LOC (6) Cl. 19 - *07*
U.S. Cl. D19—59



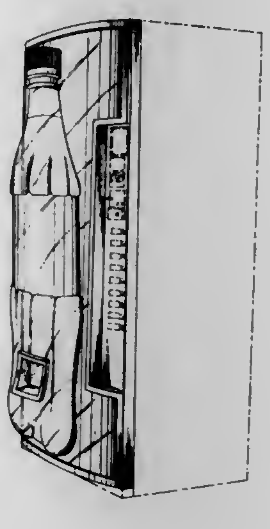
386,790
PUNCH

Chuzo Mori, Tokyo, Japan, assignor to Cari Jimuki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 12, 1996, Ser. No. 62,221
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D19—72



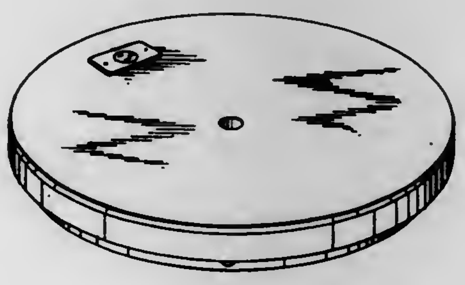
386,791
SIGN PANEL FOR A VENDING MACHINE

Leonard F. Antao, Lawrenceville; Tran Q. Minh, Stockbridge, and George L. Thompson, Snellville, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Feb. 23, 1996, Ser. No. 50,696
Term of patent 14 years
LOC (6) Cl. 20 - *01*
U.S. Cl. D20—5



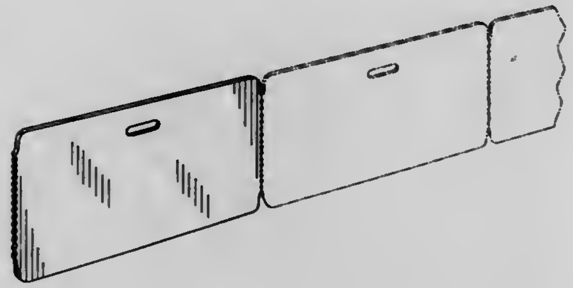
386,792
ROTATING DISPLAY

Garry A. Miller, P.O. Box 55083, 7196 Temple Dr. N.E., Calgary, Alberta, Canada, T1Y 4E0
Filed Jan. 18, 1996, Ser. No. 49,116
Claims priority, application Canada, Oct. 31, 1995, 1995-2434
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D20—21



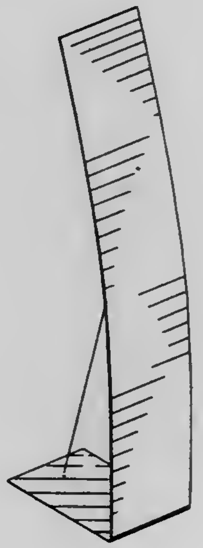
386,793
CARD BADGE

David J. Haas, and Sandra Haas, both of Suffern, N.Y., assignors to Temtec, Inc., Suffern, N.Y.
Filed Dec. 4, 1996, Ser. No. 63,584
Term of patent 14 years
LOC (6) Cl. 19 - *08*
U.S. Cl. D20—27



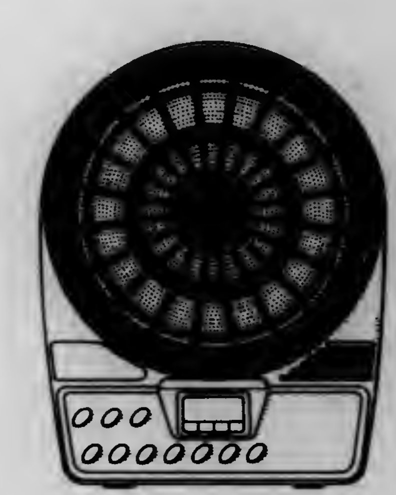
386,794
POST FOR A SIGN

Klaus Peter Rath, Vejle, Denmark, assignor to A/S Modulex, Billund, Denmark
Division of Ser. No. 44,154, Sep. 19, 1995, Pat. No. Des. 379,377. This application Jun. 17, 1996, Ser. No. 55,916
Claims priority, application Denmark, Mar. 31, 1995, MA2871995
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D20—41



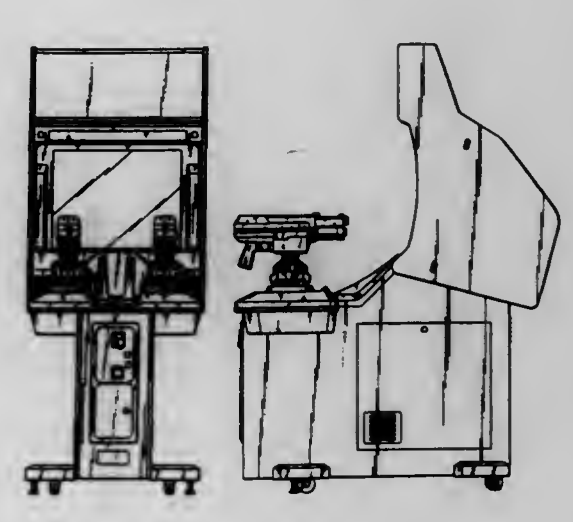
386,795
DART BOARD FOR USE ON A TABLE

Chih-Hao Yiu, 7F-1, No. 30, Lin Sen Road, Taichung, Taiwan
Filed Aug. 5, 1996, Ser. No. 57,976
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—6



386,796
SIMULATION SHOOTING GAME MACHINE

Yasuhiro Komori, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan
Filed Sep. 25, 1996, Ser. No. 60,271
Claims priority, application Japan, Apr. 10, 1996, 8-10248
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—13



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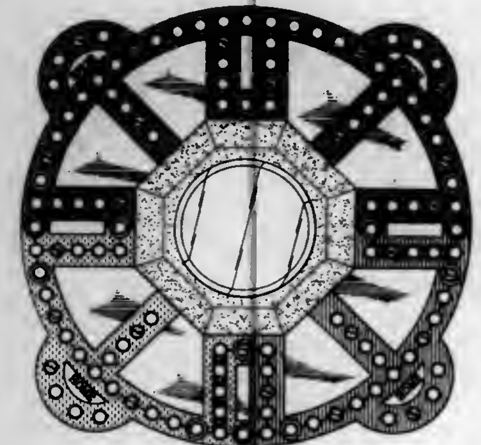
386,797
GAME BOARD

James G. Holder, 2125 Byrd Springs Rd., Huntsville, Ala. 35802

Filed Aug. 19, 1996, Ser. No. 58,583
Term of patent 14 years
LOC (6) Cl. 21 - *01*

U.S. Cl. D21—20

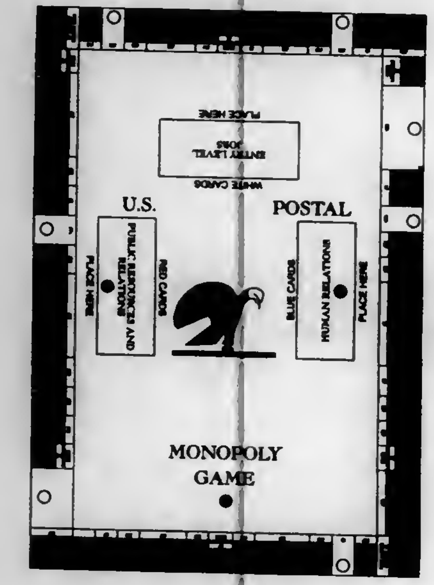


386,798
UNITED STATES POSTAL MONOPOLY GAME

Peggy A. Bonaparte, Los Angeles, Calif., assignor to Peggy Ann Bonaparte

Filed Oct. 26, 1995, Ser. No. 43,849
Term of patent 14 years
LOC (6) Cl. 21 - *01*

U.S. Cl. D21—25



386,799
GAME BOARD

Robert J. Harriman, 6538 Ferguson Place, R.R. #1, SITE 13B, C27, Peachland, British Columbia, Canada, V0H 1X0

Filed Feb. 8, 1996, Ser. No. 50,096
Term of patent 14 years
LOC (6) Cl. 21 - *01*

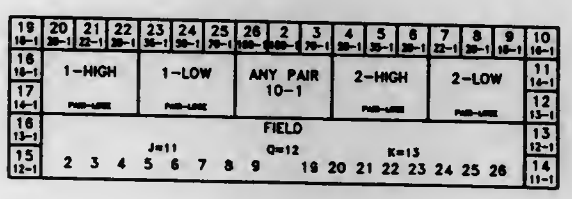
U.S. Cl. D21—27

386,800
PLAYING SURFACE FOR A BOARD GAME

Harold Wilfred Leroy Anderson, 139 "B" Swain La., Eugene, Oreg. 97404

Filed Jan. 24, 1995, Ser. No. 33,916
Term of patent 14 years
LOC (6) Cl. 21 - *02*

U.S. Cl. D21—37

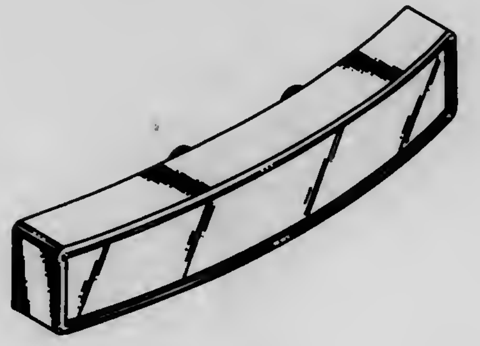


386,801
READING LIGHT BAR

Donald J. Orgovan, 1614 S. Cotter Ave., Duarte, Calif. 91010

Filed Sep. 30, 1996, Ser. No. 60,493
Term of patent 14 years
LOC (6) Cl. 26 - *06*

U.S. Cl. D26—31

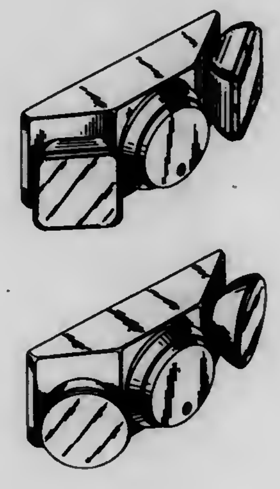


386,802
COMBINED EMERGENCY LIGHTS AND SMOKE DETECTOR UNIT

Il Kim, 3400 Avenue of the Arts, A-115, Costa Mesa, Calif. 92626

Filed Aug. 9, 1996, Ser. No. 58,260
Term of patent 14 years
LOC (6) Cl. 26 - *05*

U.S. Cl. D26—51

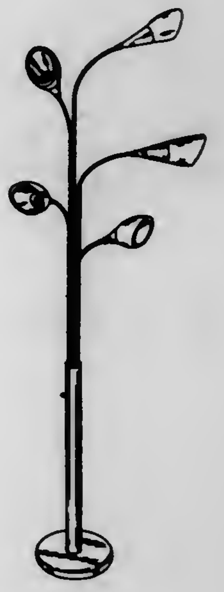


386,803
LAMP WITH MULTIPLE LIGHTS EACH MOUNTED ON A FLEXIBLE STEM

Dennis K. Swanson, Woodland Hills, Calif., assignor to Lamps Plus, Inc., Chatsworth, Calif.

Filed Jan. 31, 1996, Ser. No. 49,782
Term of patent 14 years
LOC (6) Cl. 26 - *05*

U.S. Cl. D26—62



386,804
LIGHT FIXTURE

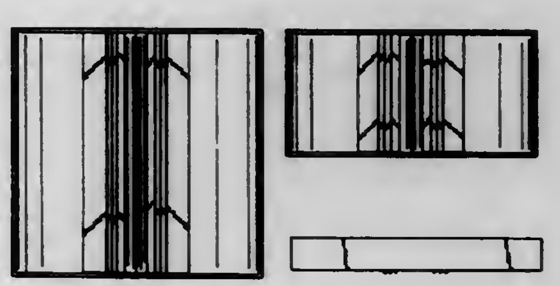
Hartmut S. Engel, Ludwigsburg, Germany, assignor to Luederlitz Licht GmbH, Luebbecke, Germany

Filed Oct. 3, 1995, Ser. No. 44,942

Claims priority, application Germany, Apr. 3, 1995, M 95 03 090.5

Term of patent 14 years
LOC (6) Cl. 26 - *05*

U.S. Cl. D26—74



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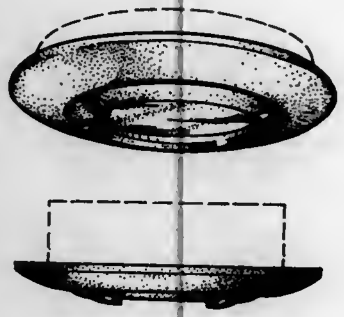
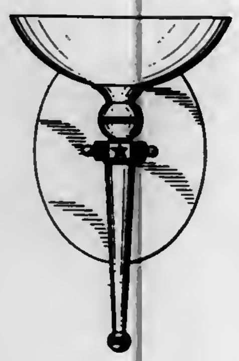
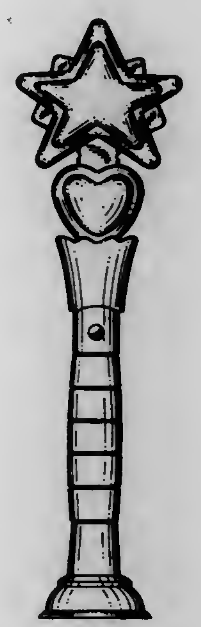
386,805
RECESSED SWIVEL LIGHT
Mark E. Bonnette; Rodger W. Eich, both of Holland, and Andrew C. Bartlett, Saugatuck, all of Mich., assignors to Ramco Industries, Inc., Elkhart, Ind.
Filed Aug. 26, 1996, Ser. No. 58,864
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—74



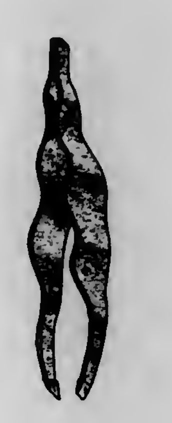
386,806
LIGHTING FIXTURE
Sandra E. Littman, and Kirina S. Kaufman, both of New York, N.Y., assignors to Sandy Littman, Inc., New York, N.Y.
Filed Dec. 26, 1995, Ser. No. 48,318
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—87



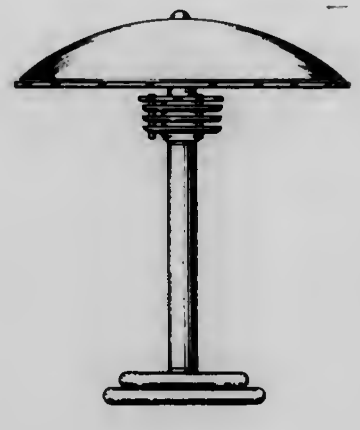
386,807
HEART AND STAR LIGHT
Marlene Moonshine-Voelker, McLean, Va., and Aaron Szymanski, Bristol, Conn., assignors to Sells Floto, Inc., Vienna, Va.
Filed Aug. 29, 1996, Ser. No. 58,979
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—94



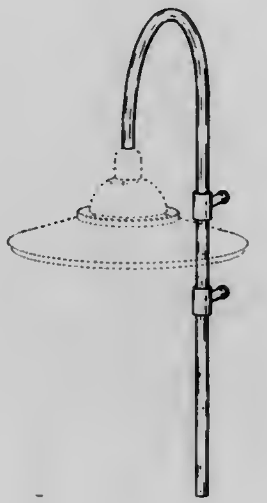
386,808
TWEEZER
Garfield Litton, Glenrock, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Filed Aug. 28, 1996, Ser. No. 59,710
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—55



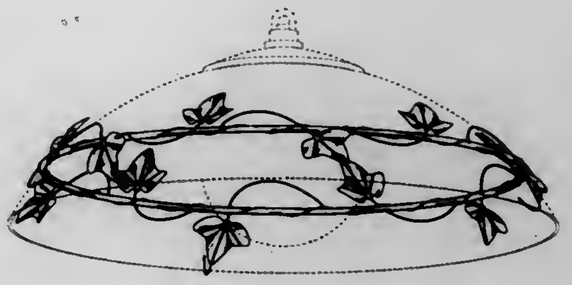
386,809
DESK LAMP
Dennis K. Swanson, Woodland Hills, Calif., assignor to Lamps Plus, Inc., Chatsworth, Calif.
Filed Nov. 8, 1995, Ser. No. 46,184
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—110



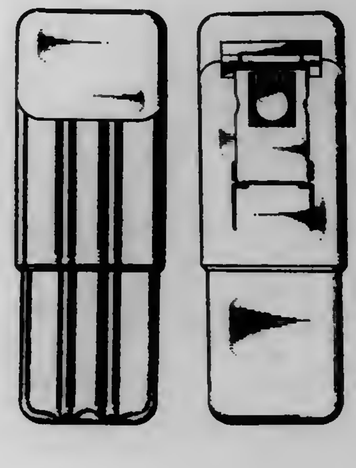
386,810
WALL LAMP SUPPORT
David H. Porter, Chagrin Falls, and Libbe A. Milicia, North Royalton, both of Ohio, assignors to The L.D. Kichler Co., Cleveland, Ohio
Filed Apr. 10, 1996, Ser. No. 52,839
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—145



386,811
IVY LEAF WIRE RING
Libbe A. Milicia, North Royalton, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Oct. 1, 1996, Ser. No. 60,595
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—156



386,812
CIGAR HUMIDOR
G. Gerry Schmidt, Newport Beach, Calif., assignor to Pacific Handy Cutter, Costa Mesa, Calif.
Filed Jun. 25, 1996, Ser. No. 56,172
Term of patent 14 years
LOC (6) Cl. 27 - *06*
U.S. Cl. D27—187



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386,813
CIGAR AROMATIZING INSERT DISH

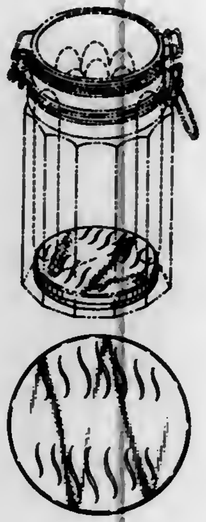
Christopher Scott Reno, Campbell, Calif., assignor to Cigaroma, Inc., Campbell, Calif.

Filed Aug. 14, 1996, Ser. No. 58,422

Term of patent 14 years

LOC (6) Cl. 27 - *06*

U.S. Cl. D27—194



386,814
END CUTTER FOR A CIGAR

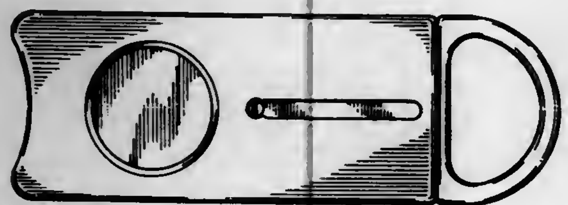
Craig B. Mesco, 116 Lithia Way #4, Ashland, Oreg. 97520

Filed Aug. 20, 1996, Ser. No. 58,694

Term of patent 14 years

LOC (6) Cl. 27 - *99*

U.S. Cl. D27—195



386,815
CORDLESS HAIR DRYER

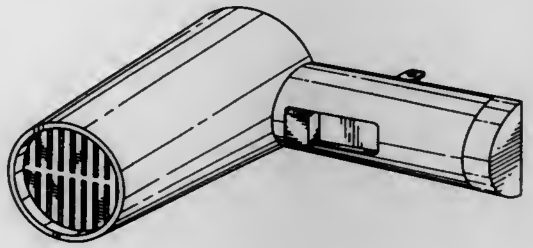
Lisa Muller, 25114 13 Ave. S., Seattle, Wash. 98198

Filed Sep. 27, 1996, Ser. No. 60,403

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—13



386,816
HAIR FORMING APPLIANCE

Cornelia Seifert, Bad Soden, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany

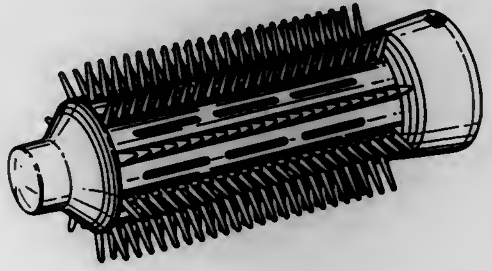
Filed Dec. 22, 1995, Ser. No. 48,264

Claims priority, application WIPO, Jul. 7, 1995, DM/033476

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—18



386,817
PERM ROD HOLDER

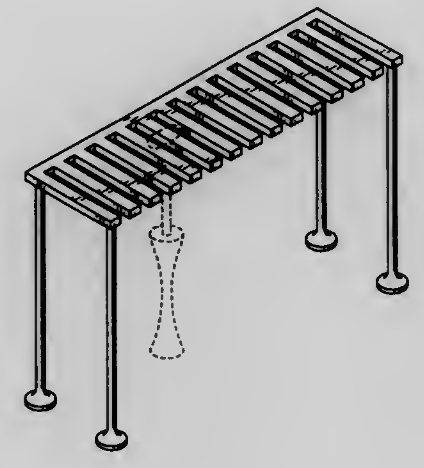
Elizabeth Chesney, 4765 W. 4985 South, Kerns, Utah 84118

Filed Jun. 10, 1996, Ser. No. 55,634

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—38



386,818
RECEPTACLE FOR A HAIR CURLING IRON

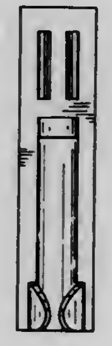
Cindy Boomfield, 1995 Westview La., Round Lake Beach, Ill. 60073

Filed Sep. 30, 1996, Ser. No. 60,547

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—38



386,819
FLEXIBLE FINGER-MOUNTED RAZOR

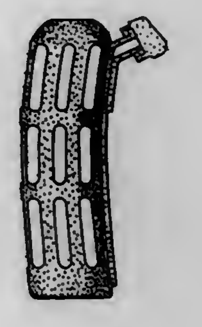
Donald E. Doyle, 4105 Hospital Rd., Ste. 102A, Pascaqoula, Miss. 39581

Filed Apr. 24, 1996, Ser. No. 53,544

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—46



386,820
COMBINED RAZOR AND SHAVING CREAM DISPENSER

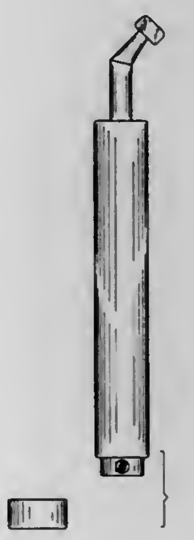
Andrew D. Morrissette, and Elizabeth A. Morrissette, both of 79B Blydenburg Rd., Centereach, N.Y. 11720

Filed Aug. 1, 1996, Ser. No. 57,845

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—46



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386,821

RAZOR HANDLE

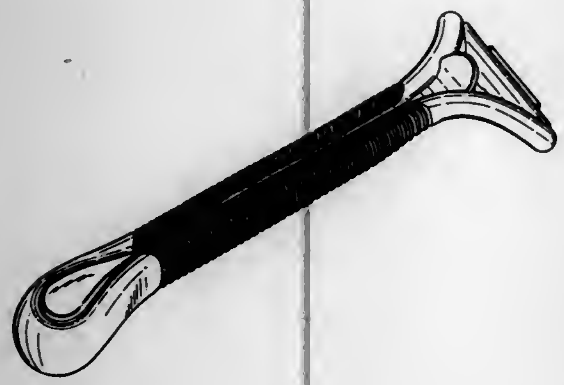
Jill Marie Shurtleff, South Boston, and Tzu-Jun Yen, Brookline, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed May 15, 1996, Ser. No. 54,576

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—48



386,822

LADIES SHAVER

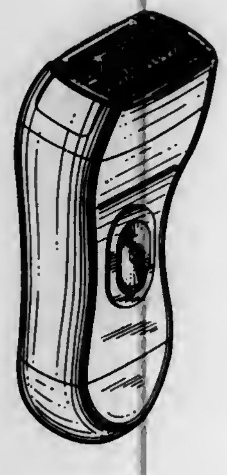
Velissa Van Scoyoc, Newton, Pa.; Ludwin Mora, Plainsboro, N.J.; Duncan Copland, Newton, Pa.; Joseph M. Sulik, Bridgeport, and George Parson, Thomaston, both of Conn., assignors to Remington Corporation, L. L. C., Bridgeport, Conn.

Filed Apr. 8, 1996, Ser. No. 52,581

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—49



386,823

COMBINATION ARTIFICIAL FINGERNAILS AND SIZING RING

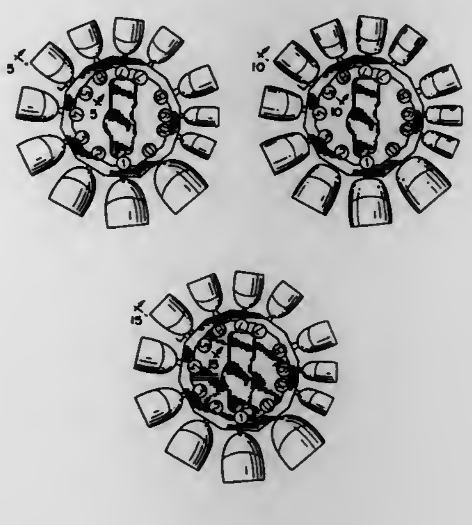
George H. Carroll, 2932 Foster Ave., Ventura, Calif. 93001, and Len InDelicato, 18080 Boris Dr., Encino, Calif. 91436

Filed Sep. 11, 1996, Ser. No. 59,466

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—56



386,824

NAIL FILE WITH PIVOT HANDLE

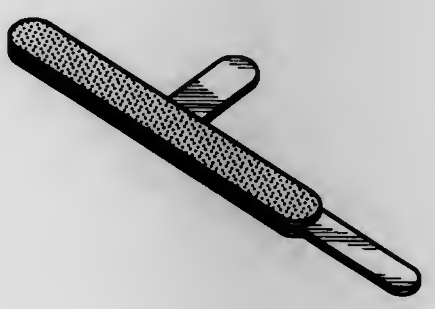
Larry P. Salvino, 1815 Elm Ct., Dundee, Ill. 60118

Filed Oct. 8, 1996, Ser. No. 60,988

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—59



386,825

NAIL FILE WITH GRIPPING HANDLE

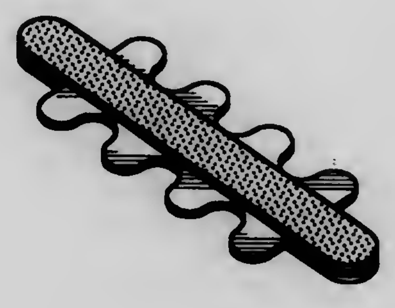
Larry P. Salvino, 1815 Elm Ct., Dundee, Ill. 60118

Filed Oct. 8, 1996, Ser. No. 60,987

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—59



386,826

DOUBLE NAIL FILE WITH VERTICAL HANDLE

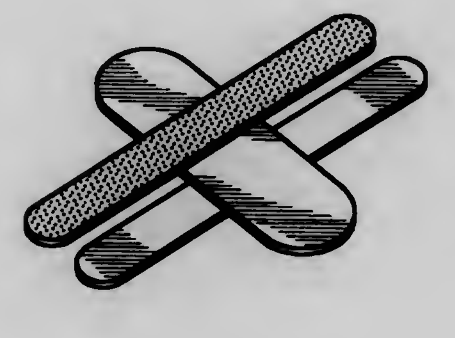
Larry P. Salvino, 1815 Elm Ct., Dundee, Ill. 60118

Filed Oct. 8, 1996, Ser. No. 60,990

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—59



386,827

NAIL FILE WITH TAB HANDLE

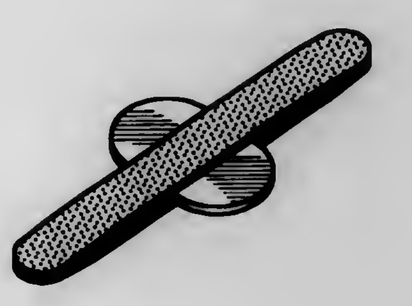
Larry P. Salvino, 1815 Elm Ct., Dundee, Ill. 60118

Filed Oct. 8, 1996, Ser. No. 60,991

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—59



386,828

COMBINED LIPSTICK HOLDER, MIRROR AND FLASHLIGHT

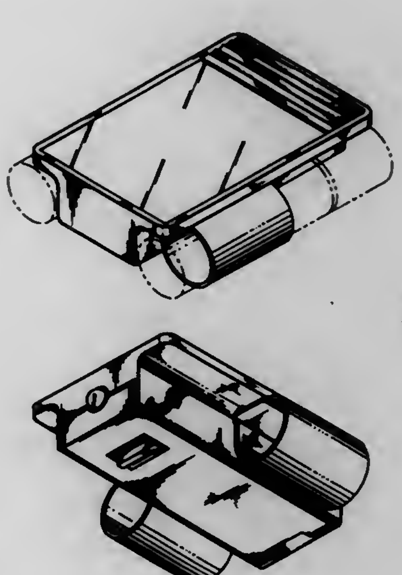
Burke C. Pullman, 390 Vereda Sur, Palm Springs, Calif. 92262

Filed Oct. 28, 1996, Ser. No. 61,623

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—77



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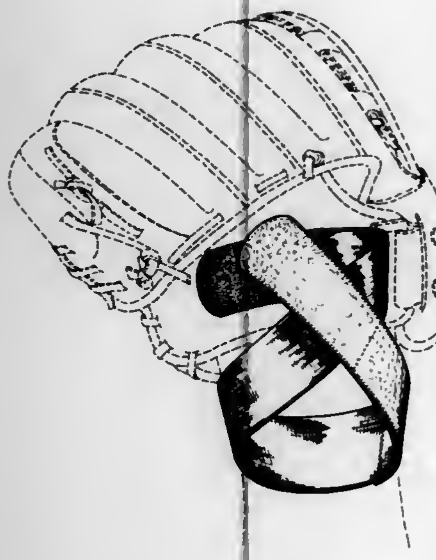
386,829

BASEBALL GLOVE ATTACHMENT

Kenneth Paul Lovin, 1514 S. Longview St., Beavercreek, Ohio 45432

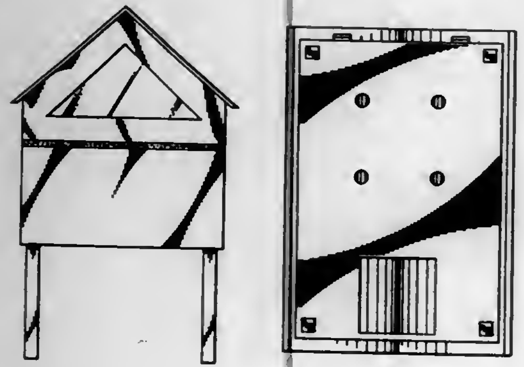
Filed Nov. 8, 1996, Ser. No. 62,194
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D29—122



386,830

ANIMAL SHELTER

Peter C. Meie, P.O. Box 533, Crown Point, N.Y. 12928
Filed Mar. 8, 1996, Ser. No. 51,352
Term of patent 14 years
LOC (6) Cl. 30 - *02*
U.S. Cl. D30—108

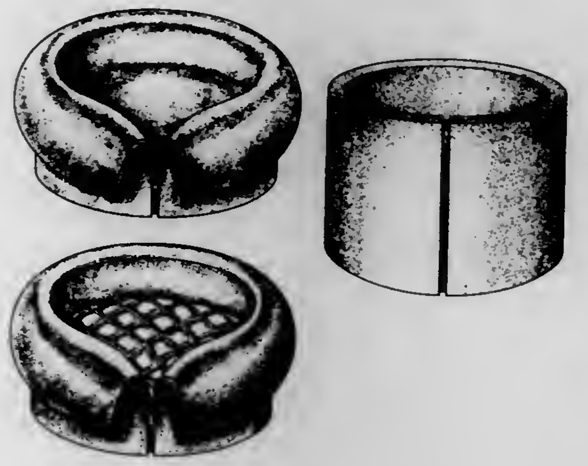


386,831

BED FOR PETS

Katherine Krizek, New York, N.Y., assignor to Franklin D. McMahon, New York, N.Y.

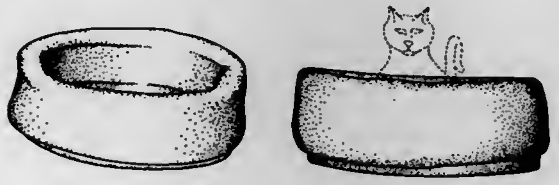
Continuation of Ser. No. 12,191, Aug. 26, 1993, abandoned. This application Dec. 14, 1995, Ser. No. 47,893
Term of patent 14 years
LOC (6) Cl. 30 - *06*
U.S. Cl. D30—118



386,832

CUSHION FOR A HOUSEHOLD PET

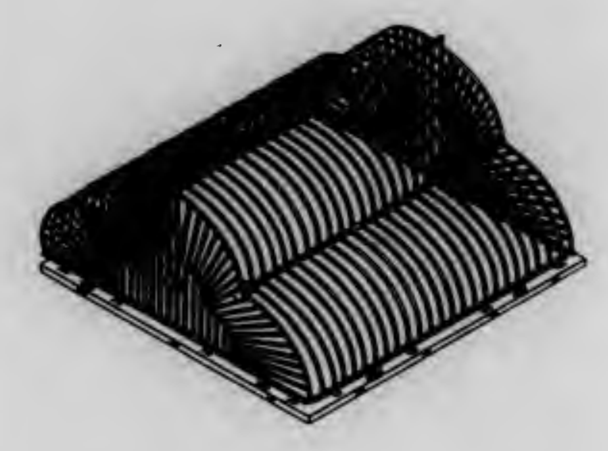
John B. McAlister, 424 Camping Creek Ct., Chapin, S.C. 29036
Filed Sep. 17, 1996, Ser. No. 59,913
Term of patent 14 years
LOC (6) Cl. 30 - *06*
U.S. Cl. D30—118



386,833

BIRD CAGE TOP

Richard King, 105 West La., Sayville, N.Y. 11782
Filed Dec. 15, 1994, Ser. No. 32,242
Term of patent 14 years
LOC (6) Cl. 30 - *02*
U.S. Cl. D30—119

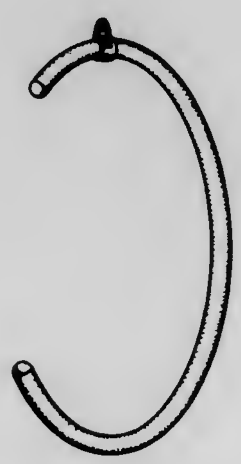


386,834

PERCH

Ofer Nissim, 49 White Birch Rd., Pound Ridge, N.Y. 10576, and Marc Goldblatt, 60 Harvest Hill La., Stamford, Conn. 06905

Filed May 17, 1996, Ser. No. 54,648
Term of patent 14 years
LOC (6) Cl. 30 - *02*
U.S. Cl. D30—119

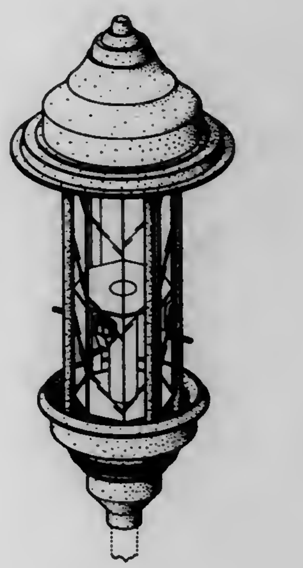


386,835

BIRD FEEDER

Patricia Rose Passamare, R.R. 33, Box 22, Site 304, Onoway, Alberta, Canada, T0E 1V0

Filed Apr. 15, 1996, Ser. No. 53,169
Term of patent 14 years
LOC (6) Cl. 30 - *03*
U.S. Cl. D30—124

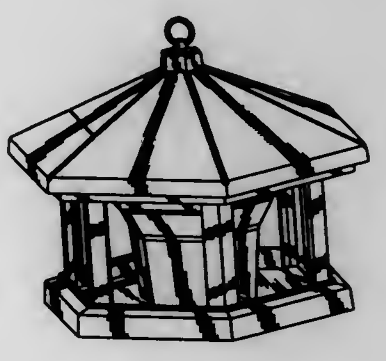


386,836

BIRD FEEDER

David L. Hunt, Cincinnati, Ohio, assignor to Rubbermaid Specialty Products Inc., Wooster, Ohio

Filed Jun. 4, 1996, Ser. No. 55,354
Term of patent 14 years
LOC (6) Cl. 30 - *03*
U.S. Cl. D30—124



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386,837
BIRD FEEDER

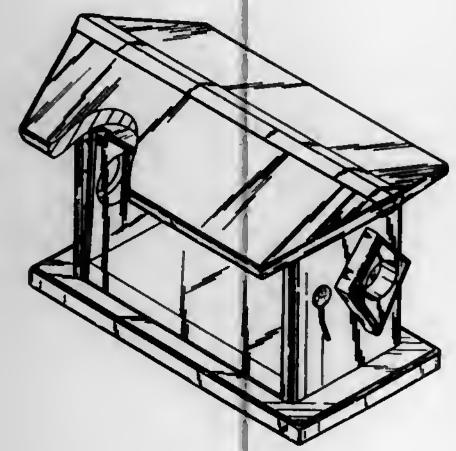
Bruce Johnson, 2795 Long Oak Dr., Germantown, Tenn. 38138-7160

Filed Aug. 16, 1996, Ser. No. 58,489

Term of patent 14 years

LOC (6) Cl. 30 - *03*

U.S. Cl. D30—124



386,838
MAT FOR PET FEEDING DISH

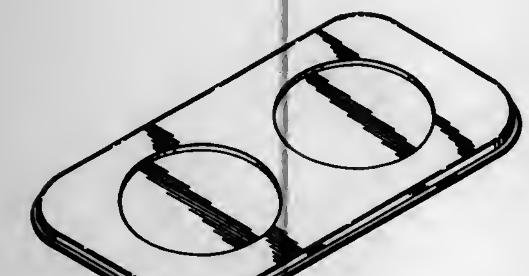
John F. Pini, Oglesby, and Kenneth A. Mollan, Peru, both of Ill., assignors to Ear-Clear Corporation, Streator, Ill.

Filed Feb. 22, 1996, Ser. No. 50,687

Term of patent 14 years

LOC (6) Cl. 30 - *03*

U.S. Cl. D30—133



386,839
CAT SCRATCHING POST COVERED WITH THE BACKSIDE OF CARPETING

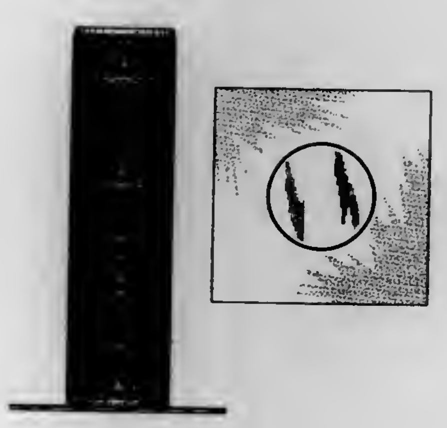
Darryl C. Jennus, 17 Springwood Dr., Lawrenceville, N.J. 08648

Filed Jul. 5, 1996, Ser. No. 56,689

Term of patent 14 years

LOC (6) Cl. 30 - *99*

U.S. Cl. D30—160



386,840
DOG WASTE COLLECTOR

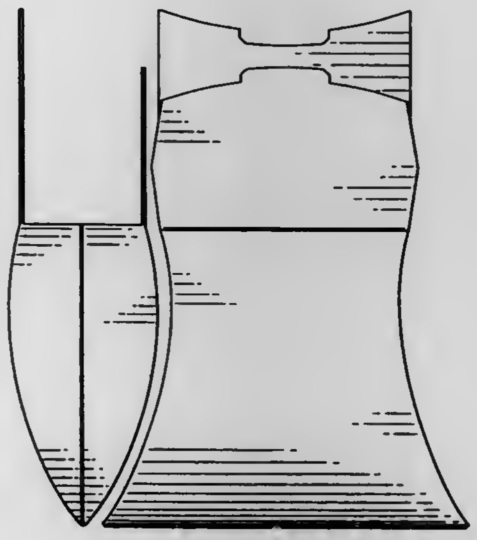
Gary S. Sturm, 3523 Voyager Cir., San Diego, Calif. 92130

Continuation-in-part of Ser. No. 48,366, Dec. 27, 1995, which is a continuation-in-part of Ser. No. 24,334, Jun. 10, 1994, abandoned. This application Jun. 17, 1996, Ser. No. 55,926

Term of patent 14 years

LOC (6) Cl. 30 - *99*

U.S. Cl. D30—162



386,841
VEGETATION BLOWER APPARATUS

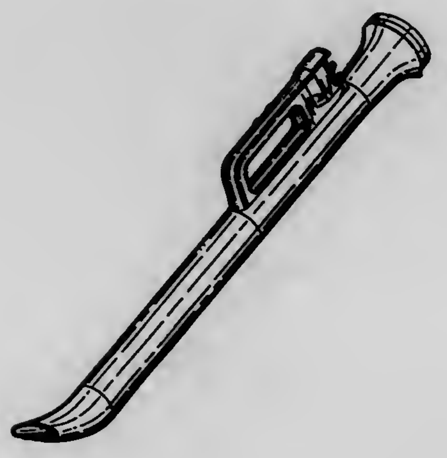
Anthony M. DeMore, Cockeysville; Martin P. Gierke, Baltimore; Robert I. Somers, Reisterstown, all of Md., and Peter F. Welch, Toronto, Canada, assignors to Black & Decker, Newark, Del.

Filed Jul. 11, 1995, Ser. No. 41,290

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D32—15



386,842
PORTABLE ELECTRIC TOOL VAC

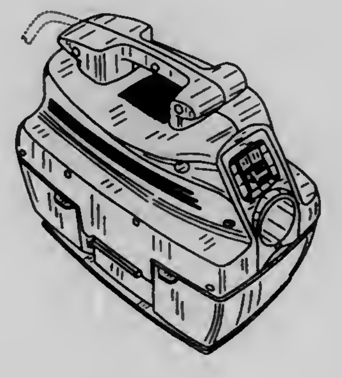
Kiyoshi Hoshino, Chesterfield; Stuart V. Holsten, O'Fallon, and David R. Hult, St. Peters, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 1, 1996, Ser. No. 56,511

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D32—21



386,843
VACUUM CLEANER

Rolf Strohmeyer, Remscheid, and Uwe Kemker, Wuppertal, both of Germany, assignors to Vorwerk Elektrowerke Stiftung & Co., KG, Wuppertal, Germany

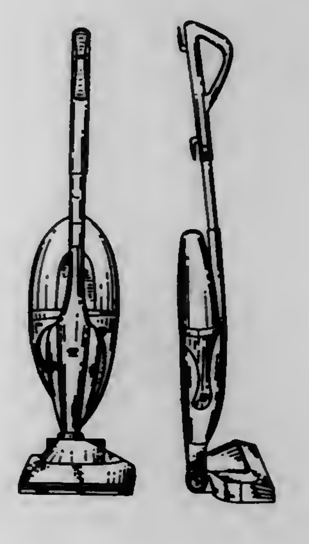
Filed Oct. 27, 1995, Ser. No. 46,717

Claims priority, application Germany, Apr. 28, 1995, M 95 03 474.9

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D32—22



386,844
LAWNMOWER WASHING DEVICE

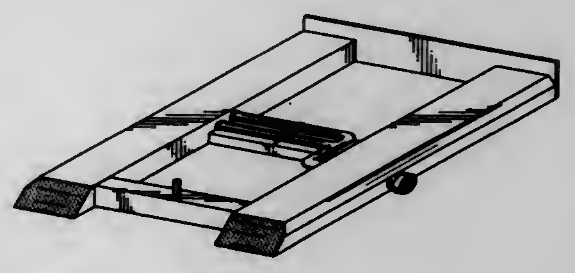
Louis A. Borysewicz, P.O. Box 445, Latham, N.Y. 12110

Filed May 24, 1996, Ser. No. 54,914

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D32—25



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386,845
VACUUM CLEANER CONVERSION ARRANGEMENT

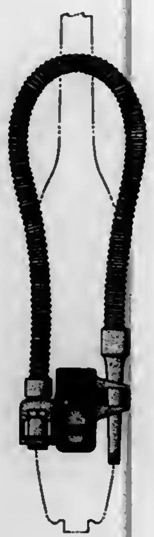
Richard A. Wareham, North Canton, and Lynn A. Frederick, Brady Lake, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Division of Ser. No. 50,730, Feb. 26, 1996. This application Sep. 23, 1996, Ser. No. 60,102

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D32—32



386,846
WOODEN DECK CLEANING TOOL

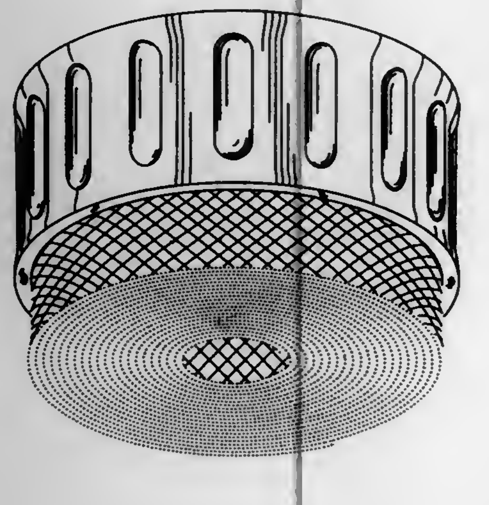
Michael J. Younger, 2125 Old Woods Rd., Green Lane, Pa. 18054

Filed Apr. 20, 1995, Ser. No. 37,804

Term of patent 14 years

LOC (6) Cl. 08 - *99*

U.S. Cl. D32—35



386,847
GOLF CLUB CLEANER

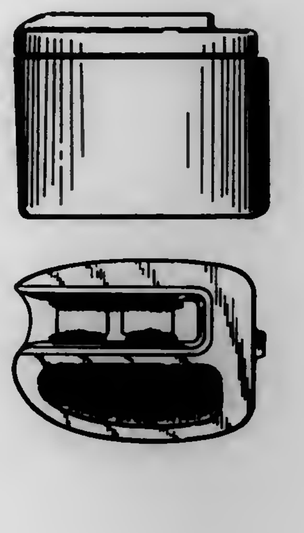
Ross J. Petrie, Broward County, Fla., assignor to James L. Franco, Sr., Boca Raton, Fla.

Filed Sep. 3, 1996, Ser. No. 59,107

Term of patent 14 years

LOC (6) Cl. 08 - *99*

U.S. Cl. D32—35



386,848
CLOTHESPIN CADDY

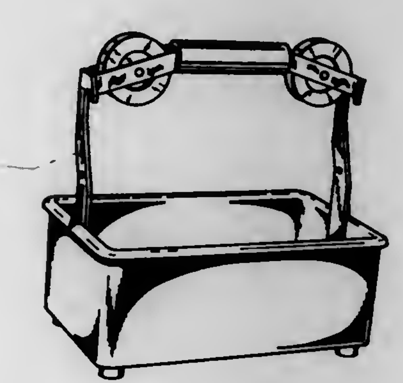
Marcel Allain, 454 Louis Street, Dieppe, New Brunswick, Canada, E1A 6X7

Filed Sep. 23, 1996, Ser. No. 60,128

Term of patent 14 years

LOC (6) Cl. 08 - *99*

U.S. Cl. D32—36



386,849
LIQUID APPLICATOR

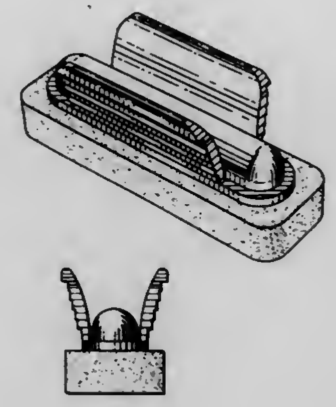
Lesley M. Dehavilland, Olathe, Kans., assignor to Medi-Flex Hospital Products, Inc., Overland Park, Kans.

Filed Jul. 23, 1996, Ser. No. 57,317

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D32—40



386,850
SNAP BACK SINK CLEANER

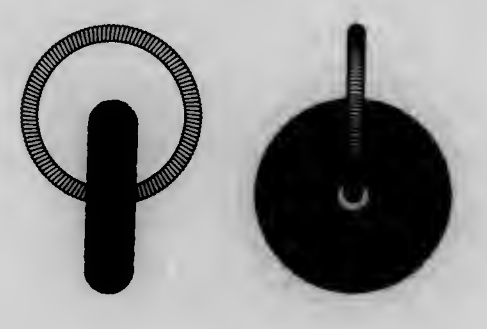
Viola Burke, P.O. Box 55, Perkins, Ga. 30822

Filed Aug. 8, 1996, Ser. No. 58,128

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D32—40



386,851
WINDSHIELD CLEANING TOOL

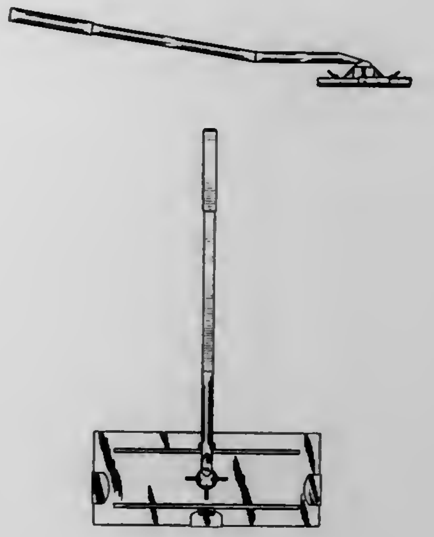
Edward Levine, 7 Green Hill Rd., Colts Neck, N.J. 07722

Filed Sep. 30, 1996, Ser. No. 60,482

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D32—40



386,852
HAND HELD SELF CONTAINED WINDOW WASHER

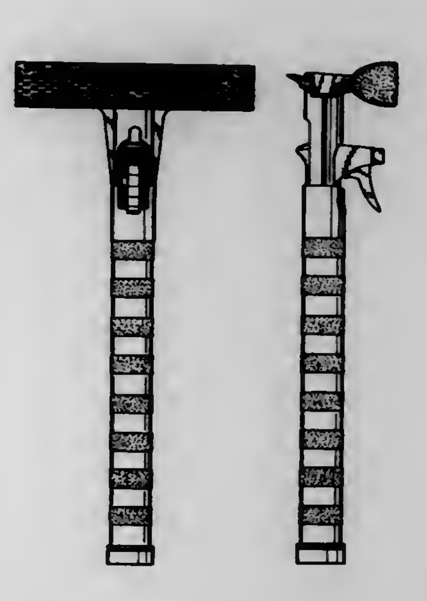
Sam I. Viner, 1411 N. Curson, Los Angeles, Calif. 90046

Filed May 17, 1996, Ser. No. 54,624

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D32—42



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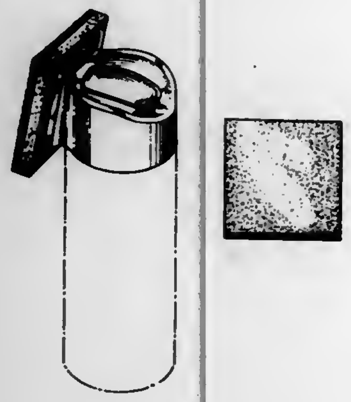
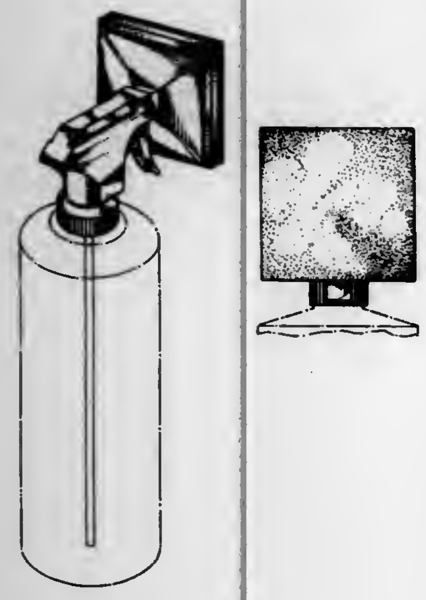
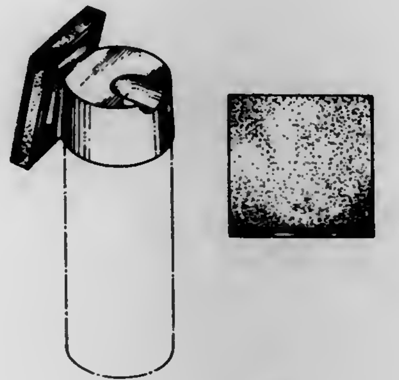
386,853
SPONGE APPLICATOR CAP
Kurt Koptis, Yucca Valley, Calif., assignor to Painter's Products Inc., Palm Desert, Calif.
Filed May 20, 1996, Ser. No. 54,671
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D32—45



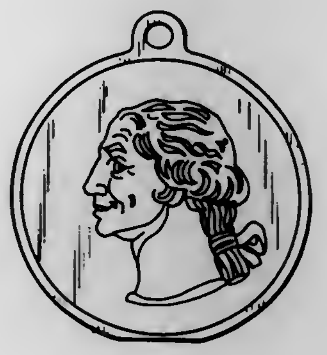
386,854
PUMP SPRAY SPONGE APPLICATOR
Kurt Koptis, Yucca Valley, Calif., assignor to Painter's Products, Inc., Palm Desert, Calif.
Filed May 20, 1996, Ser. No. 54,672
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D32—45



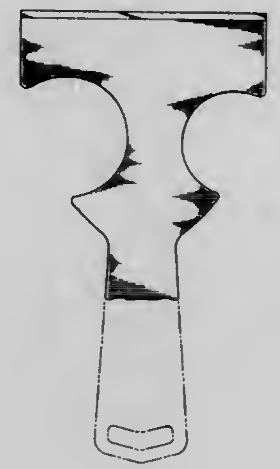
386,855
SPONGE APPLICATOR CAP
Kurt Koptis, Yucca Valley, Calif., assignor to Painter's Products Inc., Palm Desert, Calif.
Filed May 20, 1996, Ser. No. 54,673
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D32—45



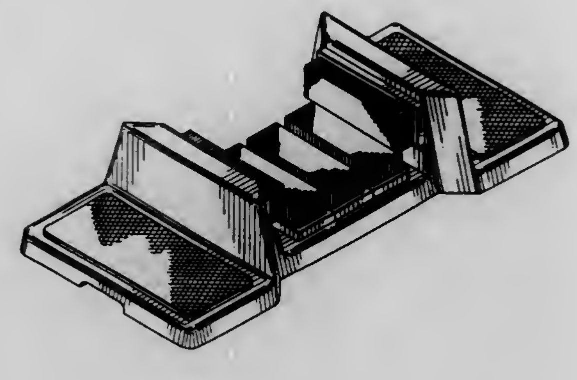
386,856
LOTTERY TICKET SCRATCHER
Celeste Cefalu, and Anthony Cefalu, both of 35 Forbes Rd., Milton, Mass. 02186
Filed Feb. 21, 1996, Ser. No. 50,959
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D32—46



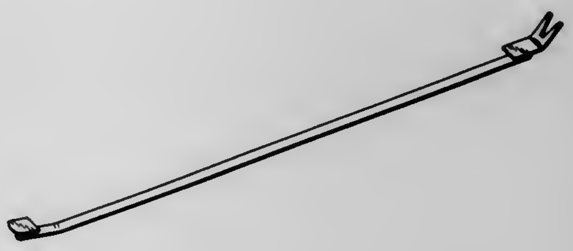
386,857
PAINT BRUSH AND ROLLER CLEANING TOOL
James C. Lawrence, 7466 Marelis Ave., North Canton, Ohio 44721
Filed May 15, 1996, Ser. No. 54,584
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D32—46



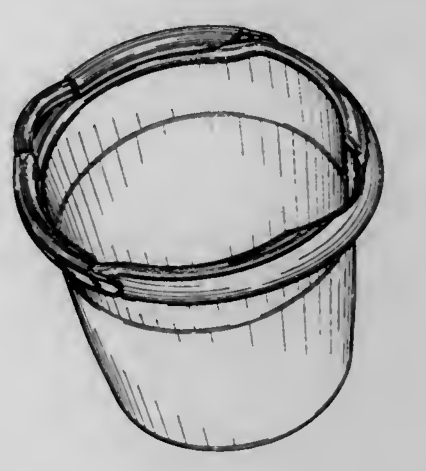
386,858
SHOE AND BOOT CLEANER
Theodore O. Mandish, 5055 State Road 46, Mims, Fla. 32754
Filed May 14, 1996, Ser. No. 54,444
Term of patent 14 years
LOC (6) Cl. 08 - *99*
U.S. Cl. D32—47



386,859
GRILL CLEANING TOOL
Dan Rostron, 2493 Victoria Park Cir., Riverton, Utah 84065
Filed May 9, 1996, Ser. No. 54,322
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D32—49



386,860
BUCKET
John D. Breen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Apr. 30, 1996, Ser. No. 53,768
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D32—53



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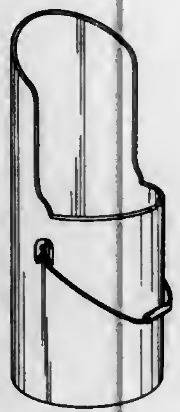
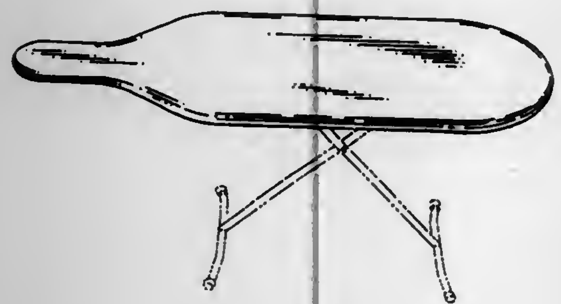
386,861
BUCKET WITH A PROJECTING LIP PORTION

Roger A. Sutton, 5545 Oak Bluff, Rochester, Mich. 48306
Filed May 13, 1996, Ser. No. 54,369
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D32—53



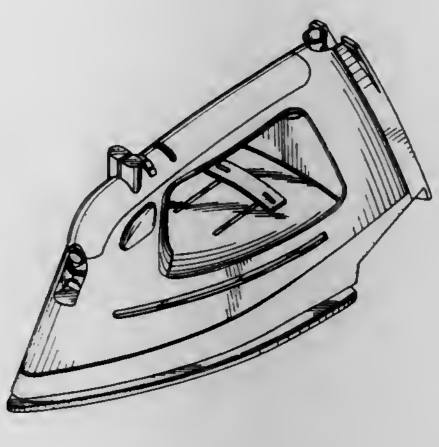
386,862
IRONING BOARD

Annette S. J. Austen-Meek, 22 Grove Road, Harrogate, North Yorkshire, United Kingdom, HG1 5EP
Filed Jun. 13, 1995, Ser. No. 40,242
Term of patent 14 years
LOC (6) Cl. 07 - *05*
U.S. Cl. D32—66



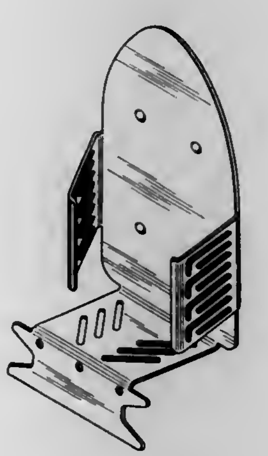
386,863
IRON

Yu-Yuan Lin, No. 72-1, Shin-Lo Rd., Tainan, Taiwan
Filed Apr. 26, 1996, Ser. No. 53,701
Term of patent 14 years
LOC (6) Cl. 07 - *05*
U.S. Cl. D32—70



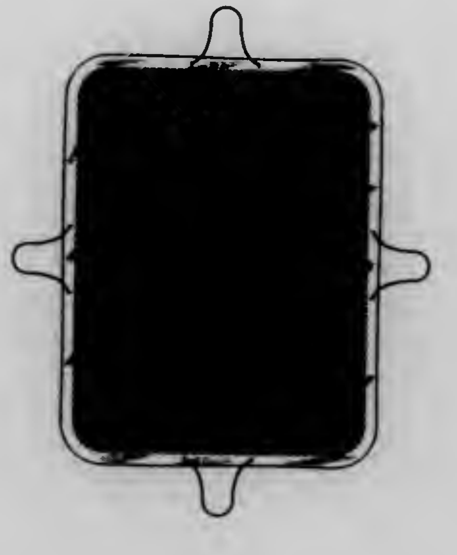
386,864
IRON HOLDER

Sharon L. Ratliff, 7425 Walnut Ave., Fair Oaks, Calif. 95628, and James W. Johnson, 616 Vernon Oaks Dr., Roseville, Calif. 95678
Filed Oct. 11, 1996, Ser. No. 61,365
Term of patent 14 years
LOC (6) Cl. 07 - *05*
U.S. Cl. D32—73



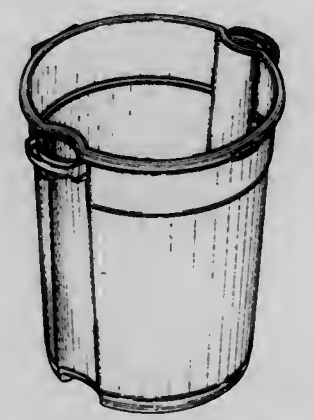
386,865
DISPOSABLE LEAF COLLECTOR

Karl A. Storm, 107 Roundhill Rd., Kennett Square, Pa. 19348
Filed Jan. 29, 1996, Ser. No. 49,539
Term of patent 14 years
LOC (6) Cl. 09 - *09*
U.S. Cl. D34—1



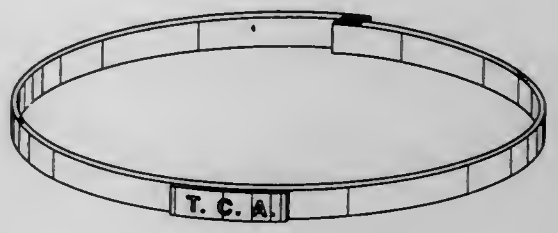
386,866
REFUSE CONTAINER BASE

Charles W. Craft, Apple Creek; Stephen P. Casteel, Wadsworth, both of Ohio, and Richard O'Grady, Southington, Conn., assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Apr. 17, 1996, Ser. No. 53,213
Term of patent 14 years
LOC (6) Cl. 09 - *09*
U.S. Cl. D34—1



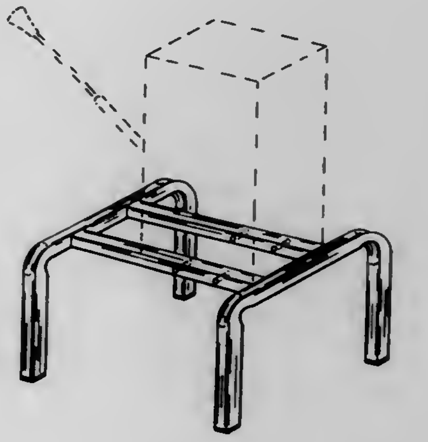
386,867
TRASH BAG RETAINER

Theodore Clark, P.O. Box 28111, Cleveland, Ohio 44128
Filed Mar. 8, 1996, Ser. No. 51,393
Term of patent 14 years
LOC (6) Cl. 09 - *09*
U.S. Cl. D34—10



386,868
MOBIL CART FOR CHAIN CUTTER

Timothy J. Catlett, Maryville, Miss., assignor to Laclede Chain Manufacturing Co., St. Louis, Mo.
Filed Jun. 14, 1996, Ser. No. 55,867
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—17



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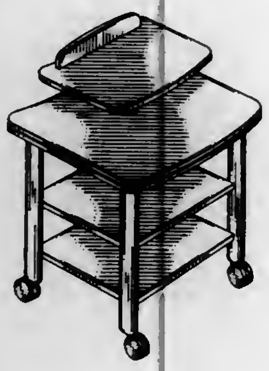
386,869
MOBILE OFFICE CART

Nicholas Q. Dormon, London, Great Britain, and Greg D. Lamke, Hastings, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

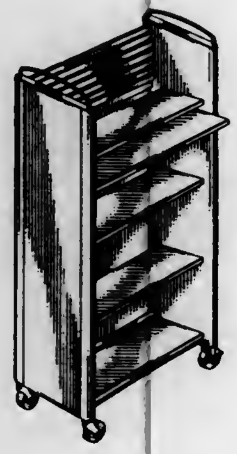
Filed Jun. 7, 1996, Ser. No. 55,579
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—21



386,870
MOBILE CART

Harold Halvorson, Jr., Grand Rapids; Greg D. Lamke, Hastings, and Joyce S. Bromberg, Grand Rapids, all of Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.

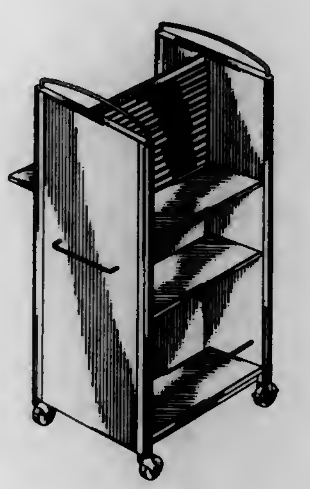
Filed Jun. 7, 1996, Ser. No. 55,580
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—21



386,871
MOBILE CART

Harold Halvorson, Jr., Grand Rapids; Greg D. Lamke, Hastings, and Joyce S. Bromberg, Grand Rapids, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

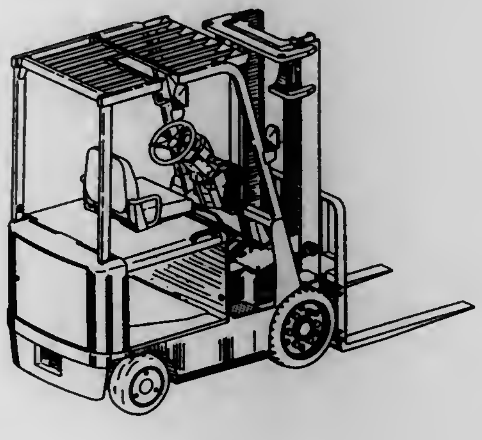
Filed Jun. 7, 1996, Ser. No. 55,598
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—21



386,872
FORKLIFT

Sean E. Rick, Muscatine, Iowa, and Jay B. Stotts, Houston, Tex., assignors to Mitsubishi Caterpillar Forklift America Inc., Houston, Tex.

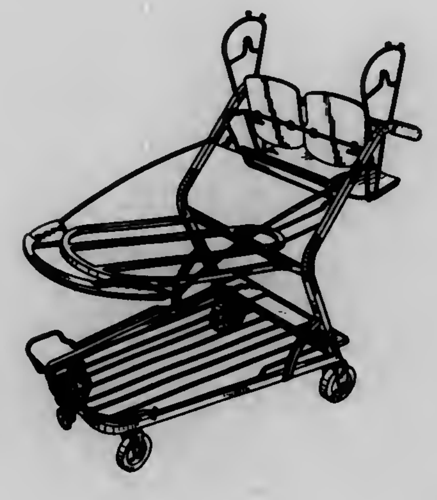
Filed Jun. 1, 1995, Ser. No. 39,647
The portion of the term of this patent subsequent to Sep. 30, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 12 - *05*
U.S. Cl. D34—34



386,873
CADDY OR CART FOR SELF SERVICE STORES

Pierre Langlois D'Estaintot, Meudon, and Jean-Charles Detallante, Paris, both of France, assignors to Societe Anonyme des Marches-Usines Auchan S.A.M.U., Villeneuve D'Ascq, France

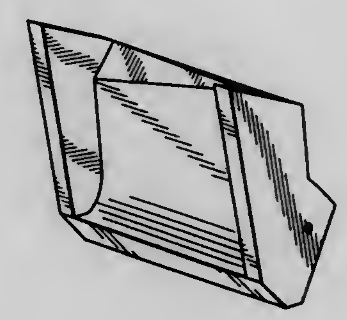
Filed Sep. 15, 1995, Ser. No. 44,723
Claims priority, application France, Mar. 15, 1995, 951564
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—21



386,874
ACCELERATOR VANE FOR A CENTRIFUGE

J. Asher Glaun, Sharon, Mass., assignor to Baker Hughes Incorporated, Houston, Tex.

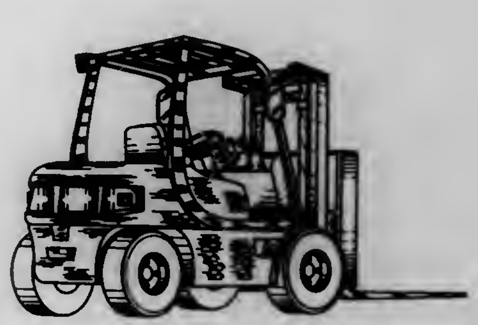
Filed Jun. 27, 1995, Ser. No. 40,792
Term of patent 14 years
LOC (6) Cl. 12 - *05*
U.S. Cl. D34—29



386,875
FORKLIFT

Jong Hyun Kim, Masan, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea

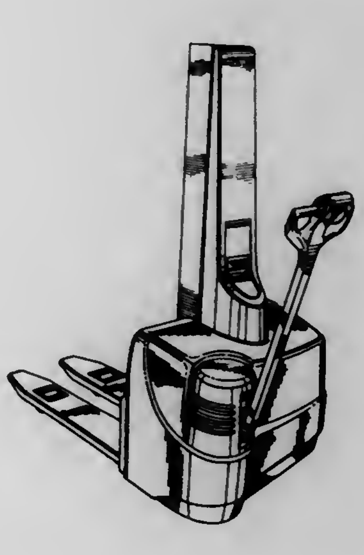
Filed Oct. 20, 1995, Ser. No. 45,462
Term of patent 14 years
LOC (6) Cl. 12 - *05*
U.S. Cl. D34—34



386,876
FORK LIFT TRUCK

Michael Niebuhr, Bargteheide, Germany, assignor to Jungheinrich AG, Hamburg, Germany

Filed Jan. 26, 1996, Ser. No. 49,485
Claims priority, application Germany, Jul. 26, 1995, M95 05 780.3
Term of patent 14 years
LOC (6) Cl. 12 - *05*
U.S. Cl. D34—34



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386,877
FORKLIFT

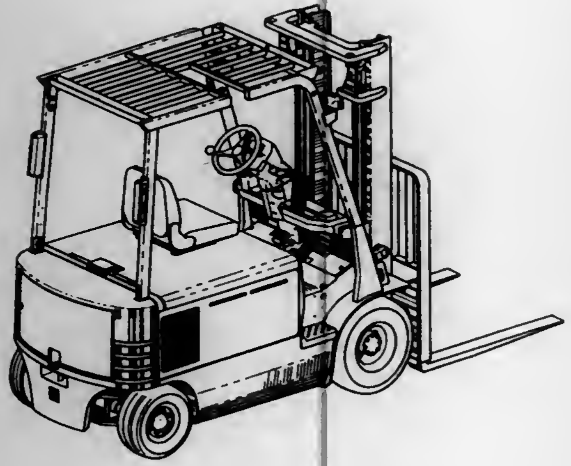
James W. Russey, Katy, and Gary F. Burkholder, Houston, both of Tex., assignors to Mitsubishi Caterpillar Forklift America Inc., Houston, Tex.

Filed Feb. 21, 1996, Ser. No. 50,957

Term of patent 14 years

LOC (6) Cl. 12 - *05*

U.S. Cl. D34—34



386,878
VENETIAN BLIND WASHER TUB

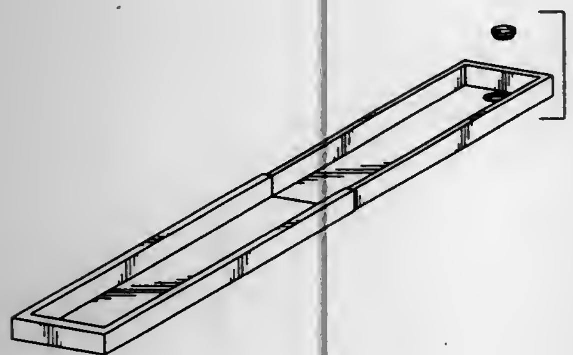
Marc Brunette, P.O. Box 89, Saint Adolphe, MB, Canada, R5A 1A1

Filed Dec. 8, 1995, Ser. No. 47,618

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D32—53



386,879
MASSAGE TOOL

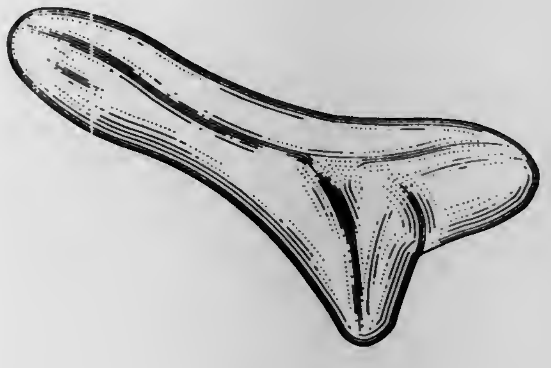
Michael P. Daniels, P.O. Box 32, Soulsbyville, Calif. 95372

Filed Nov. 12, 1996, Ser. No. 64,076

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—214



386,880
MEMORIAL PICTURE FRAME WITH BOUQUET HOLDER

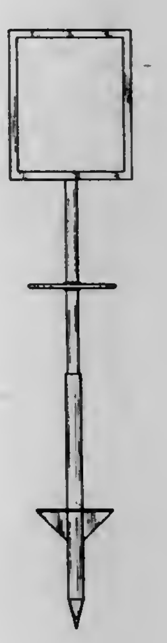
Brenda Vaske, 306 S. Portland, Bancroft, Iowa 50517

Filed Oct. 17, 1996, Ser. No. 61,195

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D99—18



386,881
AUTOMATIC TELLER MACHINE CABINET

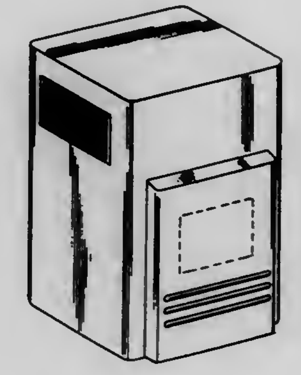
Ernest R. Dallman, 9200 Fanchon Dr., Zionsville, Ind. 46077

Filed Feb. 20, 1996, Ser. No. 50,627

Term of patent 14 years

LOC (6) Cl. 99 - *00*

U.S. Cl. D99—28



386,882
ISLAND PAYMENT TERMINAL

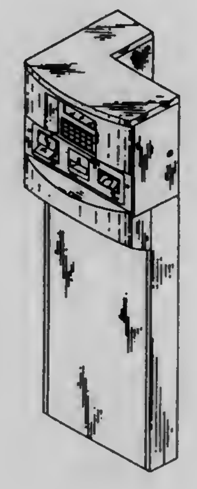
Ervin M. Smith, 530 N. 200 West, Monroe, Ind. 46772; John A. Todd, 5214-2 Stonehedge Blvd., Fort Wayne, Ind. 46835; Dennis K. Troy, 7515 Antebellum Blvd., Fort Wayne, Ind. 46815, and Phillip L. Brookshire, 808 Ludlow Ave., Cincinnati, Ohio 45220

Filed Jul. 25, 1996, Ser. No. 57,450

Term of patent 14 years

LOC (6) Cl. 17 - *60*

U.S. Cl. D99—28



386,883
AUTOMATED TELLER MACHINE

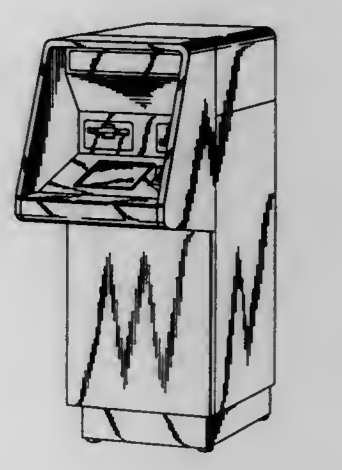
Cuong Do, Woodland Hills; Xuan S. Bui, Culver City; Edward M. R. Dudasik, West Hills, and Nhut Trung Ha, Los Angeles, all of Calif., assignors to Transaction Technology, Inc., Santa Monica, Calif.

Filed Oct. 29, 1996, Ser. No. 61,693

Term of patent 14 years

LOC (6) Cl. 17 - *60*

U.S. Cl. D99—28



386,884
COMBINATION MAILBOX AND LIGHT POLE

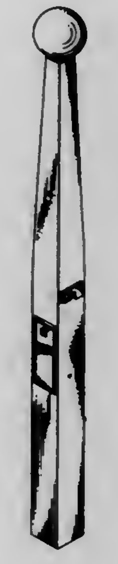
Charles E. Barnes, P.O. Box 327, Colchester, Ill. 62326

Filed Jul. 23, 1996, Ser. No. 57,336

Term of patent 14 years

LOC (6) Cl. 99 - *00*

U.S. Cl. D99—32



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Tokyo Electron Kabushiki kaisha: *See—*

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Takekoshi, Kiyoshi; Iino, Shinji; and Iida, Itaru, 5,691,764, Cl. 348-86.000.

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Tolerans Ingol Sweden AB: *See—*

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  Bennoit, Horst; Müller, Gerhard; and Zorn, Friedhelm, 5,690,834, Cl. 210-703.000.
Zotter, Johann: *See—*
  Freisinger, Henry; and Zotter, Johann, 5,690,352, Cl. 280-632.000.
Zou, Hehong; Hedstrom, Kale P.; Warrior, Jogesh; and Hays, Coy L., to Rosemount, Inc. Field based process control system with auto-tuning. 5,691,896, Cl. 364-157.000.
Zukowski, Joseph Michael: *See—*
  Mason, Brent William; Zukowski, Joseph Michael; Robinson, Larry Richard; and Hillebrand, Greg George, 5,691,380, Cl. 514-562.000.
Zummer, Anthony S.: *See—*
  Murphy, Kevin P.; Smith, Garland Y.; and Zummer, Anthony S., 5,690,139, Cl. 137-317.000.
Zumstein, Eduard; and Amrein, Heinz, to Schurter AG. Electrotechnical article. 5,690,512, Cl. 439-545.000.
Zushma, Stephen: *See—*
  Emert, Jacob; Horvath, Istvan T.; Schlosberg, Richard H.; Thaler, Warren A.; Young, David A.; and Zushma, Stephen, 5,691,422, Cl. 525-338.000.
Zwick, Kenneth John, to University of Pennsylvania, The Trustees of the. Method and apparatus for decreasing the time needed to die bond microelectronic chips. 5,690,766, Cl. 156-73.600.
Zwickey, Robert S.: *See—*
  Danner, David A.; Verzal, Jamie S.; and Zwickey, Robert S., 5,690,333, Cl. 273-260.000.
Zwijsen, Jan: *See—*
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PATENTS WERE ISSUED ON THE 25th DAY OF NOVEMBER, 1997

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Albertson, Orris E. Sludge collection apparatus and method. RE. 35,668, Cl. 210-803.000.
Hartoog, Mark R., to VLSI Technology, Inc. Predictive capacitance layout method for integrated circuits. RE. 35,671, Cl. 364-491.000.
Heiligman, Randy B., to Ultrapure Systems, Inc. Faucet-mounted water filter with wall inlet and annular chamber. RE. 35,667, Cl. 210-266.000.
Huang, Ben. Golf club grip. RE. 35,673, Cl. 473-302.000.
Imamura, Makoto; Tanimoto, Kazushi; Tanaka, Yoichiro; Sonobe, Yoshiaki; and Kitagawa, Katsuyoshi, to Kabushiki Kaisha Toshiba. Flexible information storing disk apparatus having laminar air flow. RE. 35,670, Cl. 360-103.000.
Kabushiki Kaisha Toshiba: *See*—
  Imamura, Makoto; Tanimoto, Kazushi; Tanaka, Yoichiro; Sonobe, Yoshiaki; and Kitagawa, Katsuyoshi, RE. 35,670, Cl. 360-103.000.
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  Imamura, Makoto; Tanimoto, Kazushi; Tanaka, Yoichiro; Sonobe, Yoshiaki; and Kitagawa, Katsuyoshi, RE. 35,670, Cl. 360-103.000.
Paskey, Curtis W.: *See*—
  Paskey, Robert L.; Paskey, Janice M.; Paskey, Curtis W.; and Paskey, William D., RE. 35,669, Cl. 280-763.100.
Paskey, Janice M.: *See*—
  Paskey, Robert L.; Paskey, Janice M.; Paskey, Curtis W.; and Paskey, William D., RE. 35,669, Cl. 280-763.100.
Paskey, Robert L.; Paskey, Janice M.; Paskey, Curtis W.; and Paskey, William D. Ram guard. RE. 35,669, Cl. 280-763.100.
Paskey, William D.: *See*—
  Paskey, Robert L.; Paskey, Janice M.; Paskey, Curtis W.; and Paskey, William D., RE. 35,669, Cl. 280-763.100.
Sanden Corporation: *See*—
  Taguchi, Yukihiko, RE. 35,672, Cl. 417-222.200.
Smith, Allen L. Tile saw apparatus and method. RE. 35,666, Cl. 125-13.010.
Sonobe, Yoshiaki: *See*—
  Imamura, Makoto; Tanimoto, Kazushi; Tanaka, Yoichiro; Sonobe, Yoshiaki; and Kitagawa, Katsuyoshi, RE. 35,670, Cl. 360-103.000.
Taguchi, Yukihiko, to Sanden Corporation. Slant plate type compressor with variable capacity control mechanism. RE. 35,672, Cl. 417-222.200.
Tanaka, Yoichiro: *See*—
  Imamura, Makoto; Tanimoto, Kazushi; Tanaka, Yoichiro; Sonobe, Yoshiaki; and Kitagawa, Katsuyoshi, RE. 35,670, Cl. 360-103.000.
Tanimoto, Kazushi: *See*—
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VLSI Technology, Inc.: *See*—
  Hartoog, Mark R., RE. 35,671, Cl. 364-491.000.

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Brooks, John A., Jr., to Poly-Vac, Inc. Sterilization and storage container tray. B1 098,676, Cl. 422-292.000.
Poly-Vac, Inc.: *See*—
  Brooks, John A., Jr., B1 098,676, Cl. 422-292.000.
Snuba International, Inc.: *See*—
  Stafford, Michael V., B1 919,631, Cl. 441-40.000.
Stafford, Michael V., to Snuba International, Inc. Underwater diving system. B1 919,631, Cl. 441-40.000.

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  Natuzzi, Pasquale; and Abbruzzese, Domenico, 386,623, Cl. D6-381.000.
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Affolter, William, to Condor S.A. Bicycle. 386,724, Cl. D12-111.000.
Alico, Judith M.: *See*—
  Alico, Robert J.; and Alico, Judith M., 386,686, Cl. D9-433.000.
Alico, Robert J.; and Alico, Judith M. Paperboard box that converts into a copyholder. 386,686, Cl. D9-433.000.
Allain, Marcel. Clothespin caddy. 386,848, Cl. D32-36.000.
Alps Electric (U.S.A.), Inc.: *See*—
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  Muzzarelli, Marco; and Amati, Giuseppe, 386,739, Cl. D12-209.000.
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  Gray, Welles A., III, 386,641, Cl. D6-575.000.
Amero, Willard F., Jr.; and Hassenzahl, Steven L., to Motorola, Inc. Battery pack for a portable communications device. 386,742, Cl. D13-103.000.
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Attinello, John Steven; Kotanides, John, Jr.; and Landers, Samuel Patrick, to Goodyear Tire & Rubber Company, The. Tire tread. 386,731, Cl. D12-147.000.
Austen-Meek, Annette S. J. Ironing board. 386,862, Cl. D32-66.000.
Avar, Eric P., to Nike, Inc. Portion of a shoe upper. 386,596, Cl. D2-972.000.
Avar, Eric P., to Nike, Inc. Side element of a shoe upper. 386,597, Cl. D2-972.000.
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  Jansson, Conny; Himbert, Hans; Bergqvist, Håkan; and Bobjer, Olle, 386,659, Cl. D8-52.000.
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  - Smith, Ervin M.; Todd, John A.; Troy, Dennis K.; and Brookshire, Phillip L., 386,882, Cl. D99-28.000.
- Tyra, Brent A. Reconfigurable bottle and bat. 386,678, Cl. D9-337.000.
- Universal Furniture Industries, Inc.: *See—*
  - Paus, Michael J., 386,635, Cl. D6-511.000.
- Upper Midwest Industries, Inc.: *See—*

  - Daugs, Robert Paul, 386,634, Cl. D6-510.000.
- Urvoy, Jean-Jacques, to Meccano, S.A. Motor. 386,744, Cl. D13-112.000.
- Van Scoyoc, Velissa; Mora, Ludwin; Copland, Duncan; Sulik, Joseph M.; and Parson, George, to Remington Corporation. L. L. C. Ladies shaver. 386,822, Cl. D28-49.000.
- Vaske, Brenda. Memorial picture frame with bouquet holder. 386,880, Cl. D99-18.000.
- Velazquez, Herb: *See—*
  - Orrico, Mario; Velazquez, Herb; Farhadieh, Rou; Avramovich, Rudy; and Koford, Stuart, 386,644, Cl. D7-300.000.
- Verifone Inc.: *See—*
  - Sasaki, Jeffrey Karl, 386,781, Cl. D18-4.000.
  - Sasaki, Jeffrey Karl, 386,782, Cl. D18-4.000.
- Vidmar, James: *See—*
  - Rimback, Peter; and Vidmar, James, 386,652, Cl. D8-1.000.
- Viner, Sam I. Hand held self contained window washer. 386,852, Cl. D32-42.000.
- Visioneer, Inc.: *See—*
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- Walch, Christophe. Multipiece plastic wristwatch. 386,696, Cl. D10-32.000.
- Walther, John: *See—*
  - Brookshire, Phillip L.; and Walther, John, 386,701, Cl. D10-92.000.
- Wareham, Richard A.; and Frederick, Lynn A., to Hoover Company, The. Vacuum cleaner conversion arrangement. 386,845, Cl. D32-32.000.
- Weder, Donald E.; and Straeter, Joseph G., to Southpac Trust International, Inc. Flower pot cover. 386,716, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Southpac Trust International, Inc. Flower pot cover. 386,717, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Southpac Trust International, Inc. Flower pot cover. 386,718, Cl. D11-164.000.
- Welch, Peter F.: *See—*
  - DeMore, Anthony M.; Gierke, Martin P.; Somers, Robert I.; and Welch, Peter F., 386,841, Cl. D32-15.000.
- Welsh, Robert P. Switch for a power mechanism. 386,747, Cl. D13-167.000.
- White Consolidated Industries, Inc.: *See—*
  - Krueger, Jerry; and McConnell, Patrick, 386,735, Cl. D12-190.000.
- Wicks, James E., to Sony Corporation; and Sony Corporation of America. Telephone handset and cradle. 386,758, Cl. D14-150.000.
- Williams, Daniel L.: *See—*
  - Harris, Daryl R.; Williams, Daniel L.; and Nagele, Albert L., 386,757, Cl. D14-138.000.
- Williams, Jeff: *See—*
  - Arnold, Anthony W.; Collins, Steve; Johnson, Jack; Williams, Jeff; Cox, John; Guthrie, John; and McMillan, Tom, 386,748, Cl. D13-177.000.
- Willis, James Edmund. Educational toy. 386,789, Cl. D19-59.000.
- Wirt, David F.; and Foslien, Floyd L., to Minnesota Mining and Manufacturing Company. Support and reservoir assembly for a product dispenser. 386,640, Cl. D6-545.000.
- Wong, Kon Euan, to Bayly Design Associates Pty. Ltd. Closure. 386,683, Cl. D9-443.000.
- Woo, Moon K.; and Fung, Desmond, to Timex Corporation. Bezel for a watch. 386,707, Cl. D10-128.000.
- Wright, Daniel Casey, to J & N Enterprises, Inc. Gas sensor. 386,700, Cl. D10-78.000.
- Wright, Stanford W. Key retention service. 386,610, Cl. D3-207.000.
- Wunderman, Severin S., to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd). Wristwatch. 386,697, Cl. D10-32.000.
- Wurth, Robert, to SEB. Electric fryer. 386,646, Cl. D7-354.000.
- Yaguramaki, Iwao, to YKK Corporation. Slide fastener slider. 386,720, Cl. D11-221.000.
- Yamaha Corporation: *See—*
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- Yao, Li-ho. Battery for a mobile phone. 386,743, Cl. D13-103.000.
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- Yemini, Zvi, to Zag Ltd. Storage organizer. 386,626, Cl. D6-445.000.
- Yen, Tzu-Jun: *See—*
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- Yiu, Chih-Hao. Dart board for use on a table. 386,795, Cl. D21-6.000.
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LIST OF PLANT PATENTEES

Carruth, Thomas F., to Weeks Wholesale Rose Grower, Inc. Floribunda rose plant variety named 'Wekplapep'. 10,126, Cl. Plt.-22.000.

Dümmen, Günter, to Dümmen Jungpflanzenkulturen. New Guinea Impatiens plant named 'Dueada'. 10,130, Cl. Plt.-87.600.

Dümmen Jungpflanzenkulturen: *See*—
- Dümmen, Günter, 10,130, Cl. Plt.-87.600.
- Dümmen, Marga, 10,131, Cl. Plt.-87.600.

Dümmen, Marga, to Dümmen Jungpflanzenkulturen. New Guinea Impatiens plant named 'Dueconto'. 10,131, Cl. Plt.-87.600.

Fincham, Robert, to Monrovia Nursery Company. *Parthenocissus quinquefolia* plant variety named 'Monham'. 10,128, Cl. Plt.-54.100.

Gardner, Leith Marie: *See*—
- Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,127, Cl. Plt.-43.100.

Hartman, Robert D.: *See*—
- Lamb, Ann E.; and Hartman, Robert D., 10,133, Cl. Plt.-88.100.

Kleinhanns, Christoph, to Saatzucht Quedlinburg GmbH. Dahlia plant named Bawhi. 10,132, Cl. Plt.-87.800.

Lamb, Ann E.; and Hartman, Robert D., to Twyford International, Inc. Anthurium plant named Sundial. 10,133, Cl. Plt.-88.100.

Monrovia Nursery Company: *See*—
- Fincham, Robert, 10,128, Cl. Plt.-54.100.

Saatzucht Quedlinburg GmbH: *See*—
- Kleinhanns, Christoph, 10,132, Cl. Plt.-87.800.

Stravers, Lambertus Johannes Maria, to Terra Nigra Holding B.V. Gerbera plant named 'Terflorin'. 10,129, Cl. Plt.-68.100.

Terra Nigra Holding B.V.: *See*—
- Stravers, Lambertus Johannes Maria, 10,129, Cl. Plt.-68.100.

Twyford International, Inc.: *See*—
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Weeks Wholesale Rose Grower, Inc.: *See*—
- Carruth, Thomas F., 10,126, Cl. Plt.-22.000.

Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene. Peach tree "Gayla Rich". 10,127, Cl. Plt.-43.100.

Zaiger, Gary Neil: *See*—
- Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,127, Cl. Plt.-43.100.

Zaiger, Grant Gene: *See*—
- Zaiger, Chris Floyd; Zaiger, Gary Neil; Gardner, Leith Marie; and Zaiger, Grant Gene, 10,127, Cl. Plt.-43.100.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 25, 1997

NOTE—First number, class; second number, subclass; third number, patent number

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77	5,689,829
195.1	5,689,830
209	5,689,831
227	5,689,832
427	5,689,833
436	5,689,834
446	5,689,835
465	5,689,836
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246.1	5,689,838
452	5,689,840
498	5,689,841
661	5,689,842
675	5,689,843
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425	5,689,839
636	5,689,844
654	5,689,845
CLASS 8	
102	5,690,694
158	5,689,846
159	5,689,847
	5,689,848
409	5,690 695
411	5,690,696
423	5,690,697
532	5,690,698
549	5,690,699
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146 M	5,689,849
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22.1	5,689,850
159.1	5,689,851
405	5,689,852
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82	5,689,853
115	5,689,854
235	5,689,855
CLASS 19	
157	5,689,856
200	5,689,857
262	5,689,858
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301	5,690,700
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115 F	5,689,860
265 WS	5,689,861
284	5,689,862
297	5,689,863
514	5,689,864
523	5,689,865
587	5,689,866
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685	5,689,868
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890.053	5,689,881
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401.1	5,689,871
515	5,689,872
525.11	5,689,873
564.4	5,689,874
599	5,689,875
623.1	5,690,702
623.5	5,690,703
722	5,689,876
825	5,689,877
841	5,689,878
846	5,689,879
890.06	5,689,880
898.1	5,689,882
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34.2	5,689,883
123.3	5,689,884
160	5,689,885
162	5,689,886
220	5,689,887
250	5,689,888
332	5,689,889
340	5,689,890
394	5,689,891
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292	5,689,892
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80	5,689,893
86	5,689,894
92	5,689,895
97	5,689,896
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270	5,689,899
631	5,689,900
CLASS 36	
7.6	5,689,901
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77 R	5,689,903
129	5,689,904
CLASS 37	
403	5,689,905
418	5,689,906
CLASS 42	
50	5,689,907
77	5,689,908
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19	5,689,909
42.24	5,689,910
43.16	5,689,911
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280	5,690,704
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1.01	5,689,912
1.5	5,689,913
58	5,689,914
72	5,689,915
CLASS 49	
252	5,689,916
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295	5,690,705
307	5,690,706
309	5,690,707
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7	5,689,917
153	5,689,918
167.6	5,689,919
169.1	5,689,920
169.5	5,689,921
210	5,689,922
223.13	5,689,923
239	5,689,924
282.2	5,689,926
297	5,689,927
302.1	5,689,928
648.1	5,689,929
786.11	5,689,930
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201	5,689,932
399	5,689,933
	5,689,934
412	5,689,935
413	5,689,936
433	5,689,937
445	5,689,938
464	5,689,939
475	5,689,940
529	5,689,941
550	5,689,942
592	5,689,943
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348	5,690,709
366	5,690,710
380	5,690,711
428	5,690,712
490	5,690,713
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16.8	5,689,944
CLASS 57	
315	5,689,945
408	5,689,946
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80	5,689,947
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39.05	5,689,948
39.06	5,689,949
202	5,689,950
203.1	5,689,951
277	5,689,952
316	5,689,953
322	5,689,954
442	5,689,955
491	5,689,956
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	5,689,958
6	5,689,959
77	5,689,960
78	5,689,961
90	5,689,962
129	5,689,963
151	5,689,964
211	5,689,965
238.6	5,689,966
255	5,689,967
259.3	5,689,968
262	5,689,969
372	5,689,970
484	5,689,971
511	5,689,972
644	5,689,974
652	5,689,973
653	5,689,975
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448	5,690,715
CLASS 66	
174	5,689,976
219	5,689,977
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208	5,689,980
226	5,689,981
247	5,689,982
252	5,689,983
416	5,689,984
438	5,689,985
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157	5,689,988
187	5,689,989
196	5,689,990
202	5,689,991
347	5,689,992
CLASS 73	
23.31	5,691,464
24.02	5,691,465
29.05	5,691,466
105	5,691,467
117.3	5,691,469
162	5,689,993
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504.041	5,691,471
514.02	5,691,472
573	5,691,473
580	5,691,474
597	5,691,475
644	5,691,476
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721	5,691,478
756	5,691,479
	5,691,480
790	5,691,481
842	5,691,482
861.05	5,691,483
861.13	5,691,484
861.357	5,691,485
863.73	5,691,486
863.86	5,691,487
	5,691,488
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89.15	5,689,994
	5,689,995
335	5,689,996
	5,689,997
371	5,689,998
527	5,689,999
560	5,690,000
606 R	5,690,001
650	5,690,002
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231	5,690,716
381	5,690,717
711	5,690,718
CLASS 76	
108.6	5,690,003
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53.2	5,690,004
57.3	5,690,005
177.2	5,690,006
CLASS 82	
70.1	5,690,007
CLASS 83	
26	5,690,008
76.8	5,690,009
198	5,690,010
319	5,690,011
507	5,690,012
762	5,690,013
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21	5,691,489
170	5,691,490
291	5,691,491
421	5,691,492
602	5,691,493
609	5,691,494
618	5,691,495
661	5,691,496
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13	5,690,014
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1.4	5,691,497
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369.1	5,690,015
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58.1	5,690,016
100	5,690,017
CLASS 96	
17	5,690,719
26	5,690,720
CLASS 99	
330	5,690,018
428	5,690,019
470	5,690,020
513	5,690,021
590	5,690,022
CLASS 100	
29	5,690,023
34	5,690,024
35	5,690,025
207	5,690,026
CLASS 101	
2.18	5,690,029
120	5,690,027
211	5,690,028
232	5,690,030
CLASS 102	
202.2	5,691,498
202.5	5,691,499
361	5,691,500
444	5,691,501
494	5,691,502
CLASS 104	
168	5,690,031
172.1	5,690,032
CLASS 105	
3	5,690,033
199.1	5,690,034
452	5,690,035
CLASS 106	
31.13	5,690,721
31.58	5,690,722
31.75	5,690,723
198.1	5,690,724
217.7	5,690,725
287.17	5,690,726
287.18	5,690,727
416	5,690,728
682	5,690,729
744	5,690,730
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51.3	5,690,037
60	5,690,038
CLASS 110	
264	5,690,039
CLASS 112	
235	5,690,040
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21.2	5,690,041
230	5,690,042
	5,690,043
238	5,690,044
259	5,690,045
270	5,690,046
294	5,690,047
356	5,690,048
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284	5,690,049
CLASS 117	
13	5,690,731
14	5,690,732
18	5,690,733
	5,690,734
35	5,690,735
86	5,690,736
92	5,690,737
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260	5,690,739
300	5,690,740
404	5,690,741
500	5,690,742
715	5,690,743
	5,690,744
723 MP	5,690,050
723 MW	5,690,745
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52.3	5,690,056
166	5,690,051
171	5,690,052
248	5,690,053
259	5,690,054
309	5,690,055
623	5,690,057
856	5,690,059
858	5,690,060
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CLASS 123	
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73 A	5,690,063
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90.16	5,690,065
	5,690,066
	5,690,067
184.21	5,690,068
339.25	5,690,070
436	5,690,071
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443	5,690,073
490.2	5,690,069
491	5,690,074
	5,690,075
520	5,690,076
525	5,690,077
529	5,690,078
538	5,690,079
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570	5,690,081
	5,690,082
571	5,690,083
572	5,690,084
644	5,690,085
674	5,690,086
675	5,690,087
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25.7	5,690,088
26	5,690,089
80	5,690,090
	5,690,091
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13.01	Re.35,666
21	5,690,092
CLASS 126	
299 D	5,690,093
350 R	5,690,094
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201.23	5,690,095
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205.24	5,690,098
	5,690,100
205.27	5,690,101
207.11	5,690,102
632	5,690,103
633	5,690,104
637	5,690,105
653.1	5,690,106
	5,690,107
	5,690,108
653.2	5,690,109
660.04	5,690,111
660.07	5,690,113
660.1	5,690,110
661.01	5,690,114
661.08	5,690,115
	5,690,116
662.06	5,690,117
696	5,690,118
706	5,690,119
772	5,690,120
858	5,690,121
876	5,690,122
898	5,690,123
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319	5,690,130
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3	5,690,748
6	5,690,749
11	5,690,750
30	5,690,751
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79	5,690,135
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177	5,690,770
244.11	5,690,771
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308.4	5,690,777
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324	5,690,779
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566	5,690,783
626.1	5,690,784
	5,690,785
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84.04	5,690,156
199	5,690,157
327	5,690,158
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6	5,690,786
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113	5,690,788
134	5,690,789
175	5,690,790
205	5,690,791
301	5,690,792
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358	5,690,161
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480	5,690,163
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160	5,690,169
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55	5,690,170
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123	5,690,172
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278	5,690,175
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321	5,690,177
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112	5,690,180
378	5,690,181
439	5,690,182
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65 R	5,691,506
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225	5,691,510
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	5,691,513
CLASS 180	
65.1	5,690,185
273	5,690,186
CLASS 181	
129	5,691,514
	5,691,515
199	5,691,516
CLASS 182	
70	5,690,187
CLASS 187	
319	5,690,188
335	5,690,189
406	5,690,190
CLASS 188	
2 D	5,690,191
24.22	5,690,192
72.9	5,690,193
82.1	5,690,194
299	5,690,195
CLASS 190	
115	5,690,196
CLASS 191	
12.2 R	5,690,198
13	5,690,197
CLASS 192	
3.29	5,690,199
	5,690,200
35	5,690,201
46	5,690,202
70.25	5,690,203
85 C	5,690,204
133	5,690,205
136	5,690,206
138	5,690,207
214.1	5,690,208
CLASS 198	
370.06	5,690,209
853	5,690,210
CLASS 200	
6 A	5,691,517
50.21	5,691,518
61.54	5,691,519
61.62	5,691,520
CLASS 203	
17	5,690,793
CLASS 204	
157.47	5,690,794
192.1	5,690,795
192.16	5,690,796
229	5,690,797
279	5,690,798
293	5,690,799
424	5,690,800
486	5,690,801
	5,690,802
	5,690,803
CLASS 205	
99	5,690,804
118	5,690,805
560	5,690,806
655	5,690,807
775	5,690,808
CLASS 206	
5.1	5,690,211
37.8	5,690,212
45.21	5,690,213
209.1	5,690,214
213.1	5,690,215
214	5,690,216
278	5,690,217
303	5,690,218
308.1	5,690,219
	5,690,220
	5,690,221
339	5,690,222
363	5,690,223
387.1	5,690,224
416	5,690,225
438	5,690,226
442	5,690,227
554	5,690,228
	5,690,229
555	5,690,230
573	5,690,231
585	5,690,232
714	5,690,233
CLASS 208	
48 R	5,690,809
135	5,690,810
428	5,690,811
CLASS 209	
164	5,690,812
CLASS 210	
86	5,690,813
94	5,690,814
97	5,690,815
130	5,690,816
138	5,690,817
139	5,690,818
150	5,690,819
170	5,690,820
195.1	5,690,821
248	5,690,822
266	Re.35,667
321.8	5,690,823
333.01	5,690,824
350	5,690,825
384	5,690,826
602	5,690,827
634	5,690,828
636	5,690,829
	5,690,830
646	5,690,831
661	5,690,832
662	5,690,833
703	5,690,834
739	5,690,835
791	5,690,836
803	Re.35,668
CLASS 211	
22	5,690,234
60.1	5,690,235
104	5,690,236
105.1	5,690,237
106	5,690,238
189	5,690,239
CLASS 212	
180	5,690,240
CLASS 215	
28	5,690,241
273	5,690,242
329	5,690,243
382	5,690,244
CLASS 216	
17	5,690,837
22	5,690,838
24	5,690,839
34	5,690,840
39	5,690,841
CLASS 218	
123	5,691,521
128	5,691,522
CLASS 219	
58	5,690,842
69.17	5,690,843
121.47	5,690,844
121.74	5,690,845
121.78	5,690,846
233	5,690,847
444	5,690,848
497	5,690,849
535	5,690,850
635	5,690,851
725	5,690,852
727	5,690,853
CLASS 220	
23.4	5,690,245
254	5,690,246
403	5,690,247
404	5,690,248
666	5,690,249
CLASS 221	
47	5,690,250
76	5,690,251
CLASS 222	
56	5,690,252
102	5,690,253
135	5,690,254
	5,690,255
402.1	5,690,256
593	5,690,854
CLASS 223	
94	5,690,257
CLASS 224	
160	5,690,258
310	5,690,259
505	5,690,260
578	5,690,261
667	5,690,262
CLASS 226	
1	5,690,263
187	5,690,264
CLASS 227	
81	5,690,265
	5,690,266
130	5,690,267
156	5,690,268
176.1	5,690,269
CLASS 228	
180.22	5,690,270
254	5,690,271
CLASS 229	
23 R	5,690,272
107	5,690,273
117	5,690,274
120	5,690,275
CLASS 235	
78 R	5,691,523
379	5,691,524
	5,691,525
385	5,691,684
449	5,691,526
456	5,691,527
462	5,691,528
487	5,691,530
CLASS 236	
34.5	5,690,276
94	5,690,277
CLASS 238	
10 E	5,690,278
CLASS 239	
127.3	5,690,279
265.25	5,690,280
395	5,690,282
CLASS 241	
34	5,690,283
41	5,690,284
172	5,690,285
296	5,690,286
CLASS 242	
255	5,690,287
268	5,690,288
282	5,690,289
283	5,690,290
340	5,690,291
	5,690,292
354	5,690,293
355.1	5,690,294
374	5,690,295
521	5,690,296
533.4	5,690,297
542.3	5,690,298
571.2	5,690,300
597.8	5,690,301
598.3	5,690,302
CLASS 244	
3.14	5,691,531
CLASS 248	
188.3	5,690,303
188.4	5,690,304
200	5,690,305
222.52	5,690,306
274.1	5,690,307
311.2	5,690,308
444	5,690,309
448	5,690,310
681	5,690,311
CLASS 249	
114.1	5,690,759
CLASS 250	
214 R	5,691,532
222.1	5,691,533
231.14	5,691,534
234	5,691,535
239	5,691,536
251	5,691,537
363.05	5,691,538
370.09	5,691,539
372	5,691,540
492.1	5,691,541
495.1	5,691,542
559.06	5,691,543
559.29	5,691,544
559.38	5,691,545
CLASS 251	
81	5,690,313
321	5,690,312
CLASS 252	
182.27	5,690,855
186.26	5,690,856
299.01	5,690,858
299.1	5,690,857
299.67	5,690,859
309	5,690,860
364	5,690,862
582	5,690,863
CLASS 254	
88	5,690,314
93 R	5,690,315
104	5,690,316
CLASS 256	
1	5,690,317
CLASS 257	
19	5,691,546
40	5,691,089
67	5,691,547
232	5,691,548
282	5,691,549
301	5,691,550
303	5,691,551
316	5,691,552
	5,691,560
328	5,691,553
	5,691,554
332	5,691,555
350	5,691,556
357	5,691,557
367	5,691,558
369	5,691,559
	5,691,561
391	5,691,562
449	5,691,563
509	5,691,564
632	5,691,565
664	5,691,566
675	5,691,567
691	5,691,568
692	5,691,569
693	5,691,570
751	5,691,571
	5,691,572
758	5,691,573
	5,691,574
786	5,691,575
CLASS 261	
122.1	5,690,864
CLASS 264	
1.38	5,690,865
2.6	5,690,866
3.1	5,690,867
	5,690,868
4.1	5,690,869
41	5,690,870
45.4	5,690,871
73	5,690,872
103	5,690,873
129	5,690,874
146	5,690,875
151	5,690,876
161	5,690,877
203	5,690,878
237	5,690,879
257	5,690,880
263	5,690,881
295	5,690,882
318	5,690,883
328.1	5,690,884
328.12	5,690,886
328.4	5,690,885
430	5,690,887
CLASS 266	
45	5,690,888
CLASS 267	
64.19	5,690,319
140.12	5,690,320
140.14	5,690,321
148	5,690,322
CLASS 269	
20	5,690,323
CLASS 270	
58.02	5,690,324
CLASS 271	
65	5,690,325
90	5,690,326
106	5,690,327
204	5,690,328
227	5,690,329
CLASS 273	
108.56	5,690,330
146	5,690,331
260	5,690,332
	5,690,333
261	5,690,334
292	5,690,335
302	5,690,336
309	5,690,337
393	5,690,338
400	5,690,339
459	5,690,340
CLASS 277	
9	5,690,341
180	5,690,342
235 B	5,690,343
CLASS 280	
11.28	5,690,344
210	5,690,345
234	5,690,346
432	5,690,347
477	5,690,348
610	5,690,349
613	5,690,350
618	5,690,351
632	5,690,352
688	5,690,353
728.2	5,690,354
730.1	5,690,355
735	5,690,356
737	5,690,357
743.1	5,690,358
759	5,690,359
	5,690,360
763.1	Re.35,669
771	5,690,361
775	5,690,362
779	5,690,363
CLASS 283	
2	5,690,364
67	5,690,365
83	5,690,366
94	5,690,367
CLASS 285	
158	5,690,368
CLASS 289	
17	5,690,369
	5,690,370
CLASS 292	
163	5,690,371
169	5,690,372
201	5,690,373
CLASS 294	
57	5,690,374
CLASS 295	
33	5,690,375
CLASS 296	
99.1	5,690,376
100	5,690,377
181	5,690,378
CLASS 297	
118	5,690,379
225	5,690,380
234	5,690,381
256.15	5,690,382
274	5,690,383
283.1	5,690,384
344.26	5,690,385

367	5,690,386
397	5,690,387
447.2	5,690,388
452.41	5,690,389
CLASS 299	
4	5,690,390
39.3	5,690,391
81.1	5,690,392
107	5,690,393
CLASS 300	
2	5,690,394
CLASS 301	
105.1	5,690,395
CLASS 303	
3	5,690,396
119.2	5,690,397
CLASS 305	
162	5,690,398
CLASS 307	
10.7	5,691,576
105	5,691,577
112	5,691,578
113	5,691,579
119	5,691,580
CLASS 310	
13	5,691,581
14	5,691,582
49 R	5,691,583
67 R	5,691,584
71	5,691,585
75 D	5,691,586
92	5,691,588
103	5,691,587
156	5,691,589
180	5,691,590
198	5,691,591
317	5,691,592
328	5,691,593
330	5,691,594
370	5,691,595
CLASS 312	
9.58	5,690,399
107	5,690,400
	5,690,401
128	5,690,402
223.6	5,690,403
310	5,690,404
348.2	5,690,405
CLASS 313	
318.1	5,691,596
402	5,691,597
493	5,691,598
495	5,691,599
497	5,691,600
571	5,691,601
CLASS 315	
5.48	5,691,602
209 R	5,691,603
291	5,691,604
307	5,691,605
	5,691,606
308	5,691,607
383	5,691,608
398	5,691,609
CLASS 318	
6	5,691,610
254	5,691,611
444	5,691,612
500	5,691,613
561	5,691,614
609	5,691,615
615	5,691,616
632	5,691,617
CLASS 320	
2	5,691,618
13	5,691,619
15	5,691,620
29	5,691,622
31	5,691,621
39	5,691,623
48	5,691,624
CLASS 322	
20	5,691,625
CLASS 323	
205	5,691,626
222	5,691,627
237	5,691,628
266	5,691,629
267	5,691,630
272	5,691,631
282	5,691,632
CLASS 324	
71.1	5,691,633
107	5,691,634
115	5,691,635
207.15	5,691,636
207.23	5,691,637
207.25	5,691,638
207.26	5,691,639
233	5,691,640
309	5,691,641
464	5,691,642
510	5,691,643
543	5,691,644
637	5,691,645
662	5,691,646
714	5,691,647
716	5,691,648
755	5,691,649
	5,691,650
760	5,691,651
CLASS 326	
26	5,691,652
39	5,691,653
80	5,691,654
86	5,691,655
CLASS 327	
7	5,691,656
94	5,691,657
104	5,691,658
143	5,691,659
147	5,691,660
172	5,691,661
292	5,691,662
560	5,691,663
565	5,691,664
CLASS 329	
313	5,691,665
319	5,691,666
CLASS 330	
44	5,691,667
151	5,691,668
CLASS 331	
17	5,691,669
96	5,691,670
158	5,691,671
CLASS 333	
26	5,691,672
33	5,691,673
202	5,691,674
	5,691,675
204	5,691,676
219.1	5,691,677
CLASS 335	
216	5,691,678
	5,691,679
256	5,691,680
284	5,691,681
302	5,691,682
306	5,691,683
CLASS 336	
61	5,691,685
90	5,691,686
120	5,691,687
CLASS 338	
22 R	5,691,688
	5,691,689
309	5,691,690
CLASS 340	
310.02	5,691,691
438	5,691,692
439	5,691,693
442	5,691,694
461	5,691,695
471	5,691,696
544	5,691,697
572	5,691,698
578	5,691,699
600	5,691,700
603	5,691,701
626	5,691,702
628	5,691,703
	5,691,704
646	5,691,706
682	5,691,707
686	5,691,705
825.31	5,691,711
825.44	5,691,708
	5,691,709
825.72	5,691,710
853.3	5,691,712
870.01	5,691,713
870.05	5,691,714
870.09	5,691,715
CLASS 341	
22	5,691,716
50	5,691,717
126	5,691,718
141	5,691,719
143	5,691,720
154	5,691,721
161	5,691,722
178	5,691,723
CLASS 342	
104	5,691,724
126	5,691,725
357	5,691,726
361	5,691,727
373	5,691,728
374	5,691,729
560	5,690,299
CLASS 343	
702	5,691,730
742	5,691,731
745	5,691,732
795	5,691,734
	5,691,735
872	5,691,736
CLASS 345	
8	5,691,737
58	5,691,739
76	5,691,738
96	5,691,740
112	5,691,741
116	5,691,742
123	5,691,743
146	5,691,744
148	5,691,745
150	5,691,746
167	5,691,747
173	5,691,748
181	5,691,749
CLASS 347	
7	5,691,750
68	5,691,752
85	5,691,753
	5,691,754
86	5,691,755
102	5,691,756
155	5,691,757
171	5,691,758
217	5,691,961
233	5,691,759
238	5,691,760
241	5,691,761
CLASS 348	
86	5,691,763
	5,691,764
97	5,691,771
223	5,691,772
249	5,691,773
335	5,691,765
370	5,691,766
384	5,691,767
392	5,691,768
403	5,691,769
405	5,691,770
408	5,691,777
413	5,691,774
416	5,691,775
467	5,691,776
564	5,691,778
645	5,691,779
743	5,691,780
827	5,691,781
CLASS 349	
1	5,691,784
8	5,691,785
39	5,691,786
40	5,691,787
47	5,691,782
48	5,691,783
96	5,691,788
98	5,691,789
113	5,691,790
	5,691,791
124	5,691,792
155	5,691,793
158	5,691,794
169	5,691,795
CLASS 351	
55	5,691,796
161	5,691,797
169	5,691,798
204	5,691,799
212	5,691,800
CLASS 352	
184	5,691,801
CLASS 353	
25	5,690,406
88	5,690,407
CLASS 355	
53	5,691,802
55	5,691,803
72	5,691,805
	5,691,806
210	5,691,807
CLASS 356	
5.01	5,691,808
72	5,691,809
237	5,691,810
	5,691,811
243	5,691,812
375	5,691,813
	5,691,814
	5,691,815
402	5,691,816
405	5,691,817
CLASS 358	
299	5,691,818
310	5,691,819
434	5,691,820
445	5,691,821
454	5,691,822
457	5,691,823
487	5,691,824
497	5,691,825
498	5,691,826
530	5,691,827
534	5,691,828
CLASS 359	
7	5,691,829
15	5,691,830
18	5,691,831
115	5,691,832
200	5,691,833
202	5,691,834
206	5,691,835
247	5,691,836
324	5,691,837
359	5,691,838
385	5,691,839
386	5,691,840
391	5,691,841
432	5,691,842
464	5,691,843
465	5,691,844
497	5,691,845
530	5,691,846
565	5,691,847
601	5,691,848
603	5,691,849
644	5,691,850
683	5,691,851
684	5,691,852
740	5,691,853
823	5,691,854
866	5,691,855
CLASS 360	
73.03	5,691,856
77.06	5,691,857
85	5,691,858
92	5,691,859
97.02	5,691,860
103	Re.35,670
104	5,691,861
	5,691,862
108	5,691,863
113	5,691,864
	5,691,865
126	5,691,866
	5,691,867
133	5,691,868
CLASS 361	
42	5,691,869
86	5,691,870
96	5,691,871
119	5,691,872
166	5,691,873
170	5,691,874
222	5,691,875
234	5,691,876
313	5,691,877
674	5,691,878
681	5,691,880
682	5,691,881
684	5,691,882
685	5,691,879
697	5,691,883
707	5,691,884
735	5,691,885
CLASS 362	
32	5,690,408
61	5,690,409
72	5,690,410
103	5,690,411
104	5,690,412
108	5,690,413
120	5,690,414
125	5,690,415
191	5,690,416
244	5,690,417
259	5,690,418
269	5,690,419
275	5,690,420
283	5,691,886
293	5,690,421
297	5,690,422
365	5,690,423
373	5,690,424
376	5,690,425
410	5,690,426
CLASS 363	
49	5,691,887
65	5,691,888
89	5,691,889
	5,691,890
93	5,691,891
145	5,691,892
CLASS 364	
148	5,691,893
	5,691,894
	5,691,895
157	5,691,896
167.01	5,691,897
190	5,691,898
424.047	5,691,899
424.051	5,691,900
438	5,691,902
449.1	5,691,903
460	5,691,904
468.04	5,691,905
468.15	5,691,906
468.28	5,691,907
469	5,691,908
474.01	5,691,909
483	5,691,910
489	5,691,911
490	5,691,912
491	Re.35,671
	5,691,913
510	5,691,914
514 A	5,691,915
514 B	5,691,916
	5,691,917
514 R	5,691,918
550	5,691,919
551.01	5,691,920
557	5,691,921
561	5,691,922
562	5,691,923
576	5,691,924
578	5,691,925
579	5,691,926
709.01	5,691,927
709.05	5,691,928
724.01	5,691,929
760	5,691,930
768	5,691,931
CLASS 365	
63	5,691,933
149	5,691,934
	5,691,935
158	5,691,936
165.18	5,691,939
185.01	5,691,937
185.11	5,691,938
185.24	5,691,940
185.3	5,691,941
189.05	5,691,942
	5,691,943
189.09	5,691,944
200	5,691,945
	5,691,946
226	5,691,947
227	5,691,948
230.03	5,691,949
	5,691,950
230.06	5,691,951
230.08	5,691,952
	5,691,953
	5,691,954
233	5,691,955
239	5,691,956
CLASS 366	
100	5,690,427
172.1	5,690,428
CLASS 367	
3	5,691,957
73	5,691,958
129	5,691,959
155	5,691,960
CLASS 368	
10	5,691,932
71	5,691,962
CLASS 369	
13	5,691,963
30	5,691,964
44.14	5,691,965
49	5,691,966
50	5,691,967
	5,691,968
77.1	5,691,969
109	5,691,970
112	5,691,971
275.3	5,691,972
CLASS 370	
58.2	5,691,973
203	5,691,974
232	5,691,975
242	5,691,976
250	5,691,977
278	5,691,978
312	5,691,979
316	5,691,980
329	5,691,981
336	5,691,982
344	5,691,983
401	5,691,984
	5,691,985
477	5,691,986
488	5,691,987
CLASS 371	
5.1	5,691,988
22.3	5,691,990
	5,691,991
37.1	5,691,992
38.1	5,691,993
40.1	5,691,994
43	5,691,995
51.1	5,691,996
53	5,691,997
57.1	5,691,998
CLASS 372	
20	5,691,989
	5,691,999
44	5,692,001
46	5,692,002
50	5,692,003
69	5,692,004
70	5,692,005
CLASS 374	
1	5,690,429
126	5,690,430
CLASS 375	
200	5,692,006
206	5,692,007
208	5,692,008
226	5,692,009
232	5,692,010
233	5,692,011
240	5,692,012
277	5,692,013
326	5,692,014
340	5,692,015
344	5,692,016
346	5,692,017
347	5,692,018
	5,692,019
350	5,692,020
354	5,692,021
357	5,692,022
376	5,692,023
CLASS 376	
245	5,692,024
CLASS 377	
58	5,692,025
73	5,692,026
CLASS 378	
38	5,692,027
57	5,692,028
88	5,692,029
CLASS 379	
14	5,692,030
58	5,692,031
59	5,692,032
67	5,692,033
88	5,692,034
93	5,692,035
100	5,692,036
114	5,692,037

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UMI

210	5,692,038
229	5,692,039
350	5,692,040
379	5,692,041
387	5,692,042
399	5,692,043
422	5,692,044
433	5,692,045
	5,692,046

CLASS 380

4	5,692,047
18	5,692,048
25	5,692,049

CLASS 381

1	5,692,050
	5,692,051
71	5,692,052
	5,692,053
	5,692,054
	5,692,055
71.2	5,692,056
77	5,692,057
107	5,692,058
151	5,692,059
169	5,692,060

CLASS 382

103	5,692,064
106	5,692,061
107	5,692,062
	5,692,063
112	5,692,065
133	5,692,066
135	5,692,067
	5,692,068
145	5,692,070
167	5,692,071
171	5,692,069
199	5,692,072
219	5,692,073
239	5,692,074

CLASS 384

15	5,690,431
482	5,690,433
545	5,690,432
613	5,690,434

CLASS 385

3	5,692,075
15	5,692,076
16	5,692,077
53	5,692,078
59	5,692,079
60	5,692,080
78	5,692,081
88	5,692,082
	5,692,083
	5,692,084
91	5,692,085
94	5,692,086
123	5,692,087
125	5,692,088
137	5,692,089
139	5,692,090
146	5,692,091

CLASS 386

6	5,692,092
46	5,692,093
	5,692,094

CLASS 392

395	5,692,095
464	5,692,096

CLASS 395

2.11	5,692,098
2.21	5,692,099
2.31	5,692,100
	5,692,101
2.39	5,692,102
2.42	5,692,103
2.5	5,692,097
2.62	5,692,104
2.94	5,692,105
50	5,692,106
	5,692,107
108	5,692,108
109	5,692,109
111	5,692,110
114	5,692,111
115	5,692,112
117	5,692,113
127	5,692,114
	5,692,115
152	5,692,117
182.02	5,692,119
182.08	5,692,120
182.11	5,692,121
183.14	5,692,122
185.01	5,692,123
187.01	5,692,124
200.02	5,692,126
200.06	5,692,127
200.09	5,692,128
200.11	5,692,129
200.12	5,692,130
206	5,692,131
209	5,692,125
227	5,692,132
282	5,692,133
284	5,692,134
287	5,692,135
	5,692,136
309	5,692,137
310	5,692,138
311	5,692,139
326	5,692,140
329	5,692,141
333	5,692,142
339	5,692,143
	5,692,144
348	5,692,145
410	5,692,146
412	5,692,147
432	5,692,148
460	5,692,149
462	5,692,150
467	5,692,151
	5,692,152
468	5,692,153
	5,692,154
489	5,692,155
492	5,692,156
500	5,692,157
	5,692,158
	5,692,159
	5,692,160
	5,692,161
503	5,692,162
511	5,692,163
551	5,692,165
	5,692,166
556	5,692,164
567	5,692,167
584	5,692,168
591	5,692,169
	5,692,170
601	5,692,171
603	5,692,173
	5,692,174
	5,692,175
605	5,692,176
608	5,692,177
	5,692,178
609	5,692,179
610	5,692,180
	5,692,182
613	5,692,181
614	5,692,183
	5,692,184
615	5,692,185
617	5,692,186
619	5,692,187
651	5,692,189
652	5,692,190
670	5,692,191
675	5,692,192
676	5,692,193
680	5,692,194
685	5,692,195
705	5,692,196
733	5,692,199
735	5,692,200
750	5,692,197
	5,692,201
	5,692,202
	5,692,203
	5,692,204
762	5,692,198
788	5,692,205
793	5,692,206
800	5,692,207
	5,692,208
	5,692,209
	5,692,210
	5,692,211
806	5,692,212
	5,692,213
821	5,692,216
825	5,692,217
833	5,692,214
838	5,692,215
853	5,692,218
869	5,692,219
924	5,692,220

CLASS 396

6	5,692,221
51	5,692,222
153	5,692,118
182	5,692,223
207	5,692,224
318	5,692,225
326	5,692,226
377	5,692,227
613	5,692,228
634	5,692,188

CLASS 399

2	5,692,229
21	5,692,230
23	5,692,231
53	5,692,232

CLASS 400

74	5,690,435
120.01	5,690,436
120.14	5,690,437
197	5,690,438
206.2	5,690,439
279	5,690,440

CLASS 401

127	5,690,441
216	5,690,442

CLASS 402

63	5,690,443

CLASS 403

268	5,690,444
306	5,690,445
361	5,690,446

CLASS 404

64	5,690,447

CLASS 405

129	5,690,448
303	5,690,449

CLASS 406

39	5,690,450

CLASS 408

113	5,690,451
204	5,690,452

CLASS 410

24	5,690,453

CLASS 411

30	5,690,454
55	5,690,455
383	5,690,456
400	5,690,457
432	5,690,458
304	5,690,459
551	5,690,460

CLASS 414

111	5,690,461
228	5,690,462
266	5,690,463
286	5,690,464
408	5,690,465
526	5,690,466
795.2	5,690,467

CLASS 415

177	5,690,468
189	5,690,469
214.1	5,690,470
229	5,690,471

CLASS 416

97 A	5,690,473
97 R	5,690,472
134 A	5,690,474

CLASS 417

32	5,690,475
44.2	5,690,476
222.2	Re.35,672
533	5,690,478

CLASS 418

26	5,690,479
55.2	5,690,480
126	5,690,481

CLASS 420

83	5,690,889
559	5,690,890
590	5,690,891

CLASS 422

63	5,690,892
67	5,690,893
68.1	5,690,894
73	5,690,895
191	5,690,896
292	B2 5,098,676

CLASS 423

173	5,690,897
210	5,690,898
243.01	5,690,899
392	5,690,900
449.6	5,690,901
658	5,690,902

CLASS 424

1.49	5,690,903
1.65	5,690,904
1.69	5,690,905
1.85	5,690,906
9.32	5,690,908
9.363	5,690,909
9.5	5,690,907
45	5,690,910
49	5,690,911
52	5,690,912
53	5,690,913
59	5,690,914
	5,690,916
60	5,690,915
	5,690,917
64	5,690,918
65	5,690,919
70.12	5,690,920
70.13	5,690,921
76.1	5,690,922
78.02	5,690,923
85.5	5,690,925
93.1	5,690,926
93.21	5,690,927
94.5	5,690,928
	5,690,929
	5,690,930
94.64	5,690,931
94.67	5,690,932
144.1	5,690,933
178.1	5,690,934
183.1	5,690,935
199.1	5,690,937
215.1	5,690,938
229.1	5,690,939
	5,690,940
272.1	5,690,941
283.1	5,690,942
400	5,690,943
401	5,690,944
	5,690,945
	5,690,946
	5,690,947
	5,690,948
402	5,690,949
405	5,690,950
410	5,690,951
423	5,690,952
429	5,690,953
434	5,690,954
443	5,690,955
450	5,690,956
	5,690,957
451	5,690,958
472	5,690,959
480	5,690,960
488	5,690,961
489	5,690,962
533	5,690,963
545	5,690,964
583	5,690,966
642	5,690,967
718	5,690,968

CLASS 425

3	5,690,969
46	5,690,970
113	5,690,971
133.1	5,690,972
436 R	5,690,973
577	5,690,974

CLASS 426

34	5,690,975
68	5,690,976
105	5,690,977
237	5,690,978
307	5,690,979
523	5,690,980
531	5,690,981
550	5,690,982
566	5,690,983
590	5,690,984
601	5,690,985
604	5,690,986
632	5,690,987
635	5,690,988
641	5,690,989
650	5,690,990

CLASS 427

62	5,690,991
64	5,690,992
145	5,690,993
171	5,690,994
180	5,690,995
244	5,690,996
249	5,690,997
255.6	5,690,998
355	5,690,999
388.4	5,691,000
398.1	5,691,001
407.1	5,691,002
437	5,691,003
455	5,691,004
508	5,691,005
510	5,691,006
531	5,691,008
534	5,691,009
576	5,691,007
577	5,691,010

CLASS 428

1	5,691,011
13	5,691,012
34.4	5,691,013
34.5	5,691,014
35.2	5,691,015
35.7	5,691,016
	5,691,017
36.8	5,691,018
40.1	5,691,019
	5,691,020
	5,691,021
	5,691,022
42.1	5,691,437
43	5,691,023
99	5,691,025
100	5,691,026
	5,691,027
101	5,691,028
107	5,691,029
	5,691,030
116	5,691,031
136	5,691,032
147	5,691,033
152	5,691,034
	5,691,035
172	5,691,036
	5,691,037
194	5,691,038
195	5,691,039
198	5,691,040
209	5,691,041
211	5,691,042
212	5,691,043
216	5,691,044
304.4	5,691,045
310.5	5,691,046
315.7	5,691,047
334	5,691,048
336	5,691,049
344	5,691,050
354	5,691,051
355	5,691,052
357	5,691,053
359	5,691,054
367	5,691,055
369	5,691,056
373	5,691,057
379	5,691,058
402.21	5,691,060
404	5,691,059
408	5,691,061
411.1	5,691,062
	5,691,063
	5,691,064
421	5,691,065
	5,691,066
447	5,691,067
500	5,691,069
516	5,691,070
607	5,691,071
694 ML	5,691,072

CLASS 429

7	5,691,073
27	5,691,074
32	5,691,075
53	5,691,076
62	5,691,077
78.03	5,690,924
92	5,691,078
152	5,691,079
190	5,691,080
192	5,691,081
193	5,691,082
194	5,691,083
	5,691,084
217	5,691,085
218	5,691,086
245	5,691,087

CLASS 430

5	5,691,088
	5,691,090
19	5,691,091
20	5,691,092
47	5,691,093
49	5,691,094
106	5,691,095
109	5,691,096
110	5,691,097
158	5,691,098
162	5,691,099
170	5,691,100
176	5,691,101
200	5,691,102
	5,691,103
204	5,691,104
	5,691,105
254	5,691,106
264	5,691,108
	5,691,109
270.1	5,691,110
	5,691,111
	5,691,112
274.1	5,691,113
302	5,691,114
311	5,691,115
321	5,691,116
329	5,691,117
357	5,691,118
363	5,691,119
393	5,691,120
410	5,691,121
430	5,691,122
495.1	5,691,123
505	5,691,124
	5,691,125
522	5,691,126
567	5,691,127
569	5,691,128
578	5,691,129
611	5,691,130
639	5,691,131

CLASS 431

2	5,690,482
266	5,690,483
291	5,690,484

CLASS 432

8	5,690,485

CLASS 433

29	5,690,486
91	5,690,487
116	5,690,488
141	5,690,489
226	5,690,490

CLASS 434

16	5,690,491
20	5,690,492
178	5,690,493
252	5,690,494
258	5,690,495
307 R	5,690,496
322	5,690,497

CLASS 435

2	5,691,132
	5,691,133
5	5,691,134
	5,691,135
6	5,691,136
	5,691,137
	5,691,138
	5,691,139
	5,691,140
	5,691,141
	5,691,142
	5,691,143
	5,691,144
	5,691,145
	5,691,146
	5,691,149
	5,691,153
7.1	5,691,147
	5,691,148
	5,691,150
7.2	5,691,151
7.21	5,691,155
	5,691,156
7.25	5,691,157
7.5	5,691,152
7.6	5,691,154
7.92	5,691,158
11	5,691,159
13	5,691,160
15	5,691,161
23	5,691,162
40.52	5,691,164
41	5,691,163
68.1	5,691,165
69.1	5,691,166
69.3	5,691,167
69.4	5,691,168
69.7	5,691,169
	5,691,170
118	5,691,171
125	5,691,172
	5,691,173
135	5,691,174
172.3	5,691,175
	5,691,176
	5,691,177
209	5,691,178
240.1	5,691,179
	5,691,180
	5,691,181
	5,691,182
252.3	5,691,183
	5,691,185
	5,691,186
	5,691,187
254.2	5,691,188
254.21	5,691,189
255.1	5,691,190
256.8	5,691,191
278	5,691,193
282.5	5,691,192
287.1	5,691,194
309.1	5,691,195
320.1	5,691,196
	5,691,197
	5,691,198
325	5,691,199
349	5,691,200
368	5,691,201
391	5,691,202
402	5,691,203

CLASS 436

63	5,691,204
125	5,691,205
178	5,691,206
525	5,691,207
526	5,691,208

CLASS 437

7	5,691,209
8	5,691,210
10	5,691,211
24	5,691,212
27	5,691,213
31	5,691,214
44	5,691,215
45	5,691,216
47	5,691,217
48	5,691,218
52	5,691,219
	5,691,220
	5,691,221
	5,691,222
	5,691,223
56	5,691,224
57	5,691,225
59	5,691,226
60	5,691,227
	5,691,228
	5,691,229
62	5,691,230
	5,691,231
67	5,691,232
69	5,691,233
186	5,691,234
190	5,691,235
194	5,691,236
195	5,691,237
	5,691,238
	5,691,239
	5,691,240
206	5,691,241
	5,691,242
209	5,691,243
	5,691,245
225	5,691,246
	5,691,247
227	5,691,248
233	5,691,249
247	5,691,250
919	5,691,252

CLASS 438

690	5,691,253

CLASS 439

22	5,690,498
157	5,690,499
164	5,690,500
165	5,690,501
268	5,690,281
328	5,690,502
348	5,690,503
378	5,690,504
402	5,690,505
419	5,690,506
464	5,690,507
484	5,690,508
490	5,690,509
496	5,690,510
502	5,690,511
545	5,690,512
567	5,690,513
578	5,691,251
797	5,690,515
798	5,690,516
839	5,690,517
851	5,690,518

CLASS 440

6	5,690,519
46	5,690,520
75	5,690,521

CLASS 441

1	5,690,522
35	5,690,523
40	B1 4,919,631
85	5,690,524
129	5,690,525

CLASS 442

59	5,690,526
76	5,690,527
260	5,690,528
414	5,690,529

CLASS 445

24	5,690,530
26	5,690,531
49	5,690,532

CLASS 446

34	5,690,533
205	5,690,534
236	5,690,535

CLASS 450

37	5,690,536
57	5,690,537

CLASS 451

32	5,690,538
38	5,690,539
41	5,690,540
63	5,690,541
	5,690,542
76	5,690,543
359	5,690,545
365	5,690,546
444	5,690,544
524	5,690,547

CLASS 452

160	5,690,548

CLASS 454

137	5,690,549
155	5,690,550

CLASS 463

32	5,690,551
47.7	5,690,552

CLASS 464

68	5,690,553
	5,690,554

CLASS 473

137	5,690,555
252	5,690,556
265	5,690,557
285	5,690,558
286	5,690,559
301	5,690,560
302	Re.35,673
330	5,690,561
340	5,690,562
399	5,690,563
417	5,690,565
420	5,690,564
549	5,690,566

CLASS 474

73	5,690,567
85	5,690,568
111	5,690,569
158	5,690,570
212	5,690,571
266	5,690,572
273	5,690,573

CLASS 475

128	5,690,574
204	5,690,575
211	5,690,576
265	5,690,577
269	5,690,578
281	5,690,579

CLASS 477

8	5,690,580
176	5,690,581

CLASS 482

4	5,690,582
16	5,690,583
35	5,690,584
47	5,690,585
49	5,690,586
54	5,690,587
57	5,690,589
58	5,690,588
70	5,690,590
71	5,690,591
82	5,690,592
96	5,690,593
121	5,690,594
124	5,690,595
126	5,690,596
	5,690,597
127	5,690,598

CLASS 493

212	5,690,600
340	5,690,601

CLASS 494

43	5,690,602

CLASS 501

17	5,691,254
36	5,691,255
63	5,691,256
84	5,691,257
95	5,691,259
96	5,691,258
	5,691,260
97	5,691,261

CLASS 502

38	5,691,262
66	5,691,263
134	5,691,264
242	5,691,266
330	5,691,267
345	5,691,268
347	5,691,269
416	5,691,270

CLASS 503

204	5,691,271
217	5,691,272
227	5,691,273

CLASS 504

105	5,691,274
108	5,691,275
134	5,691,276
244	5,691,277
252	5,691,278

CLASS 505

239	5,691,279
329	5,691,280

CLASS 507

103	5,691,281

CLASS 508

113	5,691,282
186	5,691,283
472	5,691,284
491	5,691,285
	5,691,286

CLASS 510

151	5,691,287
171	5,691,288
174	5,691,289
212	5,691,290
214	5,691,291
221	5,691,292
224	5,691,293
349	5,691,294
392	5,691,295
441	5,691,296
444	5,691,297
475	5,691,298
501	5,691,299
514	5,691,300

CLASS 512

4	5,691,303

CLASS 514

2	5,691,301
8	5,691,304
	5,691,305
11	5,691,306
12	5,691,307
	5,691,308
	5,691,309
	5,691,310
	5,691,311
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CLASS 585

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CLASS 602

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	866	386,586		515	386,637		504	386,687		196	386,737		42	386,788			386,837
	916	386,587		518	386,638		543	386,688		209	386,738		59	386,789		133	386,838
	947	386,588		525	386,639		546	386,689			386,739		72	386,790		160	386,839
		386,589		545	386,640	D10—	15	386,690			386,740	D20—	5	386,791		162	386,840
		386,590		575	386,641		30	386,691		425	386,741		21	386,792	D32—	15	386,841
		386,591		580	386,642			386,692	D13—	103	386,742		27	386,793		21	386,842
	948	386,592		601	386,643			386,693			386,743		41	386,794		22	386,843
	953	386,593	D7—	300	386,644			386,694		112	386,744	D21—	6	386,795		25	386,844
		386,594		301	386,645			386,695		119	386,745		13	386,796		32	386,845
	960	386,595		354	386,646		32	386,696		123	386,746		20	386,797		35	386,846
	972	386,596		360	386,647			386,697		167	386,747		25	386,798			386,847
		386,597		372	386,648		39	386,698		177	386,748		27	386,799		36	386,848
		386,598		606	386,649		68	386,699	D14—	100	386,750		37	386,800		40	386,849
		386,599		624	386,650		78	386,700			386,751	D24—	214	386,879			386,850
		386,600		693	386,651		92	386,701			386,752	D26—	31	386,801			386,851
		386,601	D8—	1	386,652		94	386,702			386,753		51	386,802		42	386,852
		386,602			386,653		104	386,703		107	386,754		62	386,803		45	386,853
		386,603		14	386,654		106	386,704		113	386,755		74	386,804			386,854
		386,604		20	386,655		113	386,705		114.3	386,749			386,805			386,855
		386,605		21	386,656			386,706		115	386,756		87	386,806		46	386,856
		386,606		47	386,657		128	386,707		138	386,757		94	386,807			386,857
	973	386,607		51	386,663			386,708		150	386,758		110	386,809			
	980	386,608		52	386,658	D11—	3	386,709		151	386,759		145	386,810		47	386,858
D3—	203	386,609			386,659		24	386,710		173	386,760		156	386,811		49	386,859
	207	386,610		61	386,660		44	386,711		188	386,761	D27—	187	386,812		53	386,860
	215	386,611		68	386,661		91	386,712		194	386,762		194	386,813			386,861
	229	386,612			386,662			386,713		218	386,763		195	386,814			386,878
	289	386,613		99	386,664		121	386,714		225	386,764	D28—	13	386,815		66	386,862
	291	386,614		307	386,665		143	386,715		249	386,765		18	386,816		70	386,863
	295	386,615		349	386,666		164	386,716		253	386,766		38	386,817		73	386,864
	308	386,616		352	386,667			386,717		258	386,767			386,818	D34—	1	386,865
D4—	104	386,617		376	386,668			386,718	D15—	12	386,768		46	386,819			386,866
		386,618		382	386,669		184	386,719		23	386,769			386,820		10	386,867
D5—	26	386,619		396	386,670		221	386,720	D16—	133	386,770		48	386,821		17	386,868
	53	386,620	D9—	305	386,671	D12—	7	386,721		202	386,771		49	386,822		21	386,869
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	366	386,622		307	386,673		110	386,723		209	386,773		56	386,823			386,871
	381	386,623			386,674		111	386,724		218	386,775		59	386,824			
	400	386,624		310	386,675		147	386,725		246	386,776			386,825			386,873
	423	386,625		316	386,676			386,726		332	386,777			386,826		29	386,874
	445	386,626		326	386,677			386,727	D17—	20	386,778			386,827		34	386,872
		386,627		337	386,678			386,728		22	386,779		77	386,828			386,875
		386,628		341	386,679			386,729			386,780	D29—	122	386,829			386,876
	468	386,629		346	386,680			386,730	D18—	4	386,781	D30—	108	386,830			386,877
	476	386,630		433	386,686			386,731			386,782		118	386,831	D99—	18	386,880
	480	386,631		434	386,681		151	386,732	D19—	3	386,783			386,832		28	386,881
		386,632			386,682		168	386,733		11	386,784		119	386,833			386,882
	495	386,633		443	386,683		179	386,734		30	386,785			386,834			386,883
	510	386,634		448	386,684		190	386,735		32	386,786		124	386,835		32	386,884

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	43.1	0,127	68.1	0,129		0,131	88.1	0,133

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